

ORNITHOLOGICAL LITERATURE

Two divergent reviews of the following title, *Nomina Anatomica Avium: an Annotated Anatomical Dictionary of Birds*, have been received by the Editor. Both are published for the benefit of the readers.

NOMINA ANATOMICA AVIUM: AN ANNOTATED ANATOMICAL DICTIONARY OF BIRDS. By J. J. Baumel, A. S. King, A. M. Lucas, J. E. Breazile and H. E. Evans, (eds.), with R. L. Zusi (consultant for taxonomy) and L. Malinovsky (consultant for classical languages). Academic Press, London and New York, 1979:xxv + 637 pp. \$64.50.—The study of avian anatomy is pursued by workers in a variety of fields including systematics, neurobiology, veterinary medicine, physiology, poultry science and others. Communication between workers in different areas, and even in the same area, has long been hampered by the lack of a universal system of names for the parts of the avian body. This problem has now been remedied by the publication of the *Nomina Anatomica Avium* (NAA) after a decade of work by the approximately 80 scientists constituting the International Committee on Avian Anatomical Nomenclature. The purpose of NAA is to provide a list of terms for the parts of the avian body, and thereby to advance the anatomical study of birds. Subcommittees dealing with the different body systems attempted to minimize changes in well-established terms while providing for each structure a single term that is short, easy to remember and informative. Topographically related structures are given similar names, and eponyms are avoided. The nomenclature is in Latin for the sake of international communication.

The book opens with a brief history of the project and information on the use of the NAA, followed by a series of chapters dealing with the individual organ systems. Few readers will make use of the whole book, but workers who study avian anatomy for any reason should find one or more chapters dealing with organ systems relevant to their investigations, and which will provide them with a standardized terminology for use in publication and other technical communications. The book is much more than just a collection of terms, however. It is extensively illustrated with labeled drawings of various anatomical structures, some of them taken from published research reports, but many of them newly drawn for this volume. The lists of terms are heavily annotated with explanations of the reasons for the choice of terms, homologies, synonyms and variations in different groups of birds. There is an extensive list of references establishing the authority for the decisions made in the choice of terms, and a lengthy index to the terms themselves and their major synonyms. The content of the book is accurately described by its subtitle.

The ultimate success of this venture will depend upon the extent to which the NAA nomenclature is adopted by researchers and writers. If the ideal of a unified nomenclature is to be achieved, it will be necessary for virtually all workers to use the system in their publications, even when it differs significantly from that to which they are accustomed. This may pose some temporary inconvenience but should be beneficial in the long run. Most investigators will probably find that the new nomenclature is not radically different from older ones because changes were not made for the sake of novelty but only to introduce clarity and eliminate confusion. Nevertheless, there will be some workers who will find themselves unwilling to adopt the NAA nomenclature. In such cases it would be useful to provide a table correlating the terms used with their NAA counterparts. If the reason for reluctance to adopt NAA terms is substantive then I recommend strongly that the individual communicate with the appropriate subcommittee chairman (listed in the book) and explain the objections to the NAA terms. If the reasons for rejection are sufficiently compelling, it

may be possible to change them in a future edition of the NAA. Workers whose investigations reveal new variations in anatomical structure, or who discover that the current terminology is based on incorrect or inadequate information should also communicate their discoveries by sending reprints or comments to the appropriate subcommittee chairman. The first edition of NAA is not intended to be the final word on avian anatomical nomenclature. It is intended that revised editions will be prepared in future years so that the work will increase in effectiveness as a basis for communication among avian anatomists.—ROBERT J. RAIKOW.

NOMINA ANATOMICA AVIUM: AN ANNOTATED ANATOMICAL DICTIONARY OF BIRDS. A second review.—The *Nomina Anatomica Avium* (NAA) is an ambitious work, necessitated by the nomenclaturally confusing mosaic of over- and under-represented areas confronting avian morphologists. Eighty contributors labored for more than a decade to produce the NAA, taking as their objectives the “promotion of international communication by establishing an agreed list of terms in a universally acceptable language” and “the advancement of anatomical knowledge of birds.” If these intentions had been met the NAA would indeed be a pearl beyond price and justify the claim on the flyleaf that “it is an essential work of reference for all avian scientists and every zoological library.” Unfortunately, neither objective has been completely fulfilled and while many sections are excellent, the resultant hybrid may be problematical enough to dissuade ornithologists from perusing subsequent editions or following current recommendations.

There is no question that communication is enhanced by nomenclatural stability, so any work, such as the NAA, that attempts to provide the framework for standardization is to be commended. However, if stability is to be maintained in derivative studies, it is imperative that the syntax of the terminology be intelligible, and this is a facet of standardization for which little provision has been made in the NAA. In common with other anatomical reference works (e.g., *Nomina Anatomica Veterinaria*, *Jena Nomina Anatomica*, etc.), Latin was the nomenclatural source chosen by the International Committee on Avian Anatomical Nomenclature (ICAAAN) for the NAA.

The fact that most ornithologists (including anatomists, who tend to work in their own vernacular) are unfamiliar with the language was recognized in the introduction to the NAA, where it was suggested nevertheless that “the *Nomina* should not be neglected simply because of the unfamiliarity of Latin. It bears repeating that the official Latin terms should be used in scientific articles and books in order to enhance international scientific communication.” It may also reasonably be argued that many researchers are already familiar with the vernacularized Latin of textbooks and that attempts have been made in the NAA to provide some Latin equivalents at least suggestive of the terms already used in the Romance languages and English. However, textbook Latin is hardly adequate preparation for the nomenclature of the NAA, where nouns and associated adjectives mostly exhibit the number, gender and case of the unadulterated forms. To ornithologists with little or no formal knowledge of the language, the rules which distinguish *Os palatinum* (palatine bone), *Processus palatinus* (palatine process) and *Facies articularis palatina* (surface which articulates with the palatine) are not clear. In addition, those unfamiliar with the manner in which word stems affect the declension of a noun would be hard pressed to recreate the procedure which derives a nominative plural of *tractus* from *Tractus* but *musculi* from *Musculus*. As the list of terms given in the NAA is deliberately not exhaustive, the potential for a new era of nomenclatural confusion in subsequent studies is obvious. The remedy for this difficulty is simple enough, and it is hard to rationalize the absence (in a work already comprising 637 pages) of a short appendix which comprehensively lists plural and adjectival forms and which explains the syntax of the present terminology clearly enough to serve as a guide for future

use. Criticism of the NAA for failure to provide a Latin grammar, however brief, should not be dismissed as yet another example of pedantic nit-picking. Haphazard or arbitrary 'Latinization' of terms by ornithologists anxious to comply with NAA principles, but unable to locate appropriate sources or to deduce suitable terms from questionable analogues will promote neither communication nor standardization.

The second intent, that of advancing anatomical knowledge of birds, suffers from the same theme of critical omission as the first objective. The NAA is subtitled 'an annotated anatomical dictionary of birds' giving the misleading impression that the annotations are supplemental to the regular dictionary format of comprehensive definition. Although there is some variation (for example, the chapter on the respiratory system is comprehensively annotated and illustrated), in general the list of terms which prefaces each chapter is incompletely annotated, and even fewer structures are figured. As a result, many features are both undescribed and unillustrated. The practice of differential annotation is easily justified when a system of nomenclature has stabilized sufficiently that some terms require no further definition. It is an inappropriate principle for any study that attempts to be the definitive work within a discipline, especially if the *raison d'être* for that study has been long-standing nomenclatural confusion. Non-morphologically oriented ornithologists seeking, for example, to extend their knowledge of the oral cavity will find the listing of terms such as *Radix linguae* or *Fenulum lingualis* less than informative in the absence of further description. The dictionaries (Donath and Crawford 1969, Kennen 1966) cited in the introduction as useful in the development (in the sense of etymology, not syntax) of Latin terms, are limited in the extent to which they may be used to supplement the NAA. Many terms (e.g., *Ovognonium*, *Polocytus secundarius*) undescribed and unfigured in the NAA are similarly absent in the references mentioned. In addition, the dictionary by Donath and Crawford is pertinent to human, not avian, anatomy and there are often radical differences in the meaning of similar terms. For example, the principal aortic vessel in birds is derived from the right member of the embryonic fourth pair of aortic arches while the principal vessel in mammals is the left member of the fourth pair. Extreme caution is therefore required in extrapolating explanations from other dictionaries to undefined terms of the NAA.

Differential annotation is equally problematical for avian anatomists familiar only with the vernacular terms of their specialties. As the index is exclusively in Latin and as vernacular synonyms are generally (though again, variably) lacking in the text, a dubious combination of translation and elimination is required to match undescribed Latin terms with their vernacular equivalents. Anatomical knowledge of birds seems hardly likely to be advanced while ornithologists are unable to readily locate or identify features of interest. Exhaustive annotation and a vernacular index would do much to eliminate these problems.

Quite apart from the difficulties described above, the NAA contains a number of inconsistencies, errors and ambiguities, illustrated by the following examples. In the chapter on muscles, the term 'Pars' (to denote a distinct and consistent subdivision of a muscle) is capitalized throughout the list of terms, whereas the lower case is used throughout the annotations; in the list of terms the muscles of the jaw are referred to Figs. 2 and 3, which in fact illustrate the muscles of the hyoid apparatus and tongue, and *Musculus pectoralis* is used both to indicate an entire muscle (said to comprise 3 parts: *pars subcutanea thoracica*, *pars subcutanea abdominalis* and *pars propatagialis*) and, in Figs. 5 and 6, a prominent, previously unidentified, subdivision (? *M. pectoralis pars thoracicus*, *sensu* George and Berger 1966) ventrocaudal to the *M. pectoralis pars propatagialis*. Other examples abound: the *Lamina parabasisphenoidalis* (p. 90, annotation 98) was previously referred to as the *Lamina basiparaspheoidalis* (p. 89, annotation 96) while the *Tuba pharyngotympanica communis* (p. 89, annotation 94) is shortened to *Tuba pharyngotympanica* on p. 90 (annotation 98); the *Canalis olfactorius* and *Palatum* are not on the pages (108 and 282, respectively) cited in the

index; the Rostrum sphenoidale is missing from Fig. 1 of the osteology section, in contrast to the reference given in the list of terms, and although *Musculus subscapularis* is described, no corresponding description is given of *Musculus subcoracoideus*. The list could be extended, but the examples given are sufficient to demonstrate that the NAA could have benefited from more careful proof-reading.

Despite these difficulties, there is valuable information to be gleaned from the NAA by those ornithologists willing to brave the problems imposed by the format. The notes appended to the chapter on the respiratory system, for example, are models of informed comment unimpeded by jargon, while critical analysis of the literature in the light of new (often previously unpublished) information elevates many other annotations from the realm of simple description. Many of the illustrations throughout the book are superb, although it must be admitted that others (e.g., Fig. 1) seem more likely to amuse than enlighten. Finally, more than 900 citations in the bibliography ensure adequate extension of the anatomical foundation laid by the text, regardless of the area of specialty. Given that the problems previously described can be resolved, the excellence of much of the text and many of the figures indicates the potential of subsequent editions of the NAA for meeting the objectives of the current contributors. For the present, let the buyer beware.—R. JOHNSON.

DONATH, T. AND G. N. C. CRAWFORD. 1969. *Anatomical dictionary with nomenclatures and explanatory notes*. 1st English Edition. Pergamon Press, London, England.

GEORGE, J. C. AND A. J. BERGER. 1966. *Avian Myology*. Academic Press, New York, New York.

KENNETH, J. H. 1966. *Henderson's dictionary of biological terms*. 8th Edition. Van Nostrand, New York, New York.

BRITISH BIRDS—A FIELD GUIDE. By Alan J. Richards. David & Charles Ltd., North Pomfret, Vermont, 1979:192pp., 186 color photographs, 186 line drawings. \$14.00. — This is an attractive book in many ways. Well produced, with good illustrations, clear type on good paper, and a sturdy binding, it is a pleasure to thumb through. It contains species accounts of 186 British birds, one to a page, each with a color photograph and a line drawing. The photographs are of excellent quality and accurately reproduced; the adequate, if not inspiring drawings by Rob Hume supplement the photographs by showing the birds in flight or in different plumages or poses. The species accounts are divided into five sections: characteristics, voice, habitat, nest and status. Under "characteristics" are included a description, often rather abbreviated, and notes on locomotion, behavior, food, roosting and other points of general interest. Under "status" are included population figures for each species, taken from Sharrock's *Atlas of Breeding Birds in Britain and Ireland* (1976). This is a useful feature for the layman who may not have access to the *Atlas*. Some species accounts have a sixth section, "similar or allied species," where some of the more common British birds not among the favored 186 are briefly described.

As far as it goes, this is a worthwhile book. But how far does it go? For an ornithologist or a keen birder, not nearly far enough. The British list contains ca. 475 species, of which some 270–290 occur every year. A great many have been left out of this book, thus rendering it useless to the person who wants to identify every bird he sees. According to the very skimpy introduction, the book is aimed at "those thousands of people interested in the birds in their gardens and local parks, in the countryside or on the moors . . ." etc.; in other words, the armchair or junior-intermediate birder who has perhaps graduated from the bunny slopes but is not yet ready for the advanced runs. The 186 species treated are described as

"those which might be seen in Britain without too much effort over the course of a year," although the choice sometimes favors distinctive or photogenic species over those less well endowed. The drab Rock Pipit (50,000 breeding pairs) only appears under "similar or allied species," whereas the Dotterel (100 pairs), Red Kite (30 pairs) and Osprey (several pairs) are accorded full treatment.

In spite of its title, this is only a partial field guide to British birds, and it will certainly not replace any of the existing works. It is a book for the educated layman. My advice to readers of *The Wilson Bulletin* is: if someone gives it to you for Christmas, accept and enjoy; but don't spend hard-earned money adding it to your library.—STUART KEITH.

HAWKS AND OWLS OF NORTH AMERICA. By Donald S. Heintzelman. Universe Books, New York, New York, 1979:197 pp., 68 photographs (8 color), 4 figs., 1 table. \$18.50.—While the title of this book recalls the excellent but out-of-print classic *Hawks of North America* by Dr. John B. May, and its successor *North American Birds of Prey* by Alexander Sprunt, Jr., the present book is less a systematic treatment than a more popular book addressed, in the author's words, "to raptor enthusiasts at less than the professional level." Its chief feature is its display of photographs, some in color, of most of our raptors. The informal text of discursive, rather than ordered systematic accounts, is a vehicle to show more of the rapidly-growing files of hawk photographs. Many of these are excellent (but that of a disheveled captive White Gyrfalcon is not). Some half of these photographs are by the author, but the rest are by many different photographers. The author acknowledges his debt to many sources, but for the most part there is little to indicate sources of information. (Who supplied the information about the subspecies of Black Hawk which lives "in southern Florida"?)

There are separate chapters on vultures, kites, accipiters, soaring hawks, etc., and the individual species are afforded a variable selection of information and comment, but I find little here to commend it to other than the general reader. The species accounts are followed by chapters on matters of current interest, such as endangered species, habitat loss, ecology (an over-worked term in this text), migration, conservation and chemical pollution.

At recent meetings of Raptor Research, the number of attending raptor enthusiasts doubled that of A.O.U. and Wilson Society meetings. Many of these have seemingly little other contact with wildlife biology, but my acquaintance with them leads me to believe they are more sophisticated than the audience to which this book is addressed. It seems unfortunate that we in North America do not have a volume in any way comparable to Leslie Brown's superb *British Birds of Prey*.—WALTER R. SPOFFORD.

THE PEREGRINE FALCON IN GREENLAND: OBSERVING AN ENDANGERED SPECIES. By James T. Harris. University of Missouri Press, Columbia and London, 1979:255 pp., 39 plates, 1 map. \$15.95.—This is neither a scientific treatise nor the definitive monograph on Greenland's Peregrine Falcons (*Falco peregrinus*). A "narrative of a summer's research in Greenland," it is much more than an ordinary diary. Harris has written an unusual and fascinating book that should be a must for all collectors of good bird books.

The title and subtitle should be reversed, as the book deals more with the adventure of observing falcon cliffs, their birds and their weather than with the Peregrine Falcon in Greenland. Thus, at first glance, I was disappointed: I expected graphs, tables and statistics. Many of these data are included, woven skillfully into the personal narrative of the Greenland

experience of 1972. It is difficult, however, to find them quickly: the index is short and emphasizes the work of other authors rather than Harris' own observations. Apart from these slight disappointments for the raptor expert there is much to admire in this handsome book, and we must congratulate the publisher for an excellent and esthetic production. The cover design (by Jerry Dadds), the selection of black-and-white photographs and even the italic print of the whole book enhance the author's objectives and style. Harris attempts to blend three different stories together: the search for falcon eyries (partly a travelogue and diary), the observations of falcon activities and behaviors at one eyrie (the proper topic of the book) and "the development of my feelings toward the species and the individual falcon" (the most difficult part to write).

The book serves as an excellent introduction to the tundra ecosystem and to the care and preparation that must go into such a wilderness study. Thus, I recommend it highly as background reading for anyone bound for the Arctic. Songbirds, mammals and other raptors are not only described but also followed through the seasonal cycle as long as they occur within the "falconscape."

The peregrine story is two-fold. The author makes an admirable attempt to provide extensive background notes on the species. He begins by recounting the general population decline and its inter-relationship with the use of pesticides, then introduces the species and subspecies concepts, and talks about distribution, population surveys and other topics. Finally, we learn about captive breeding at Cornell up to 1977, and the latest breeding data for Greenland. These sections come somewhat abruptly and distract from the ongoing narrative. Yet, for most readers, Harris has written an excellent summary of the complex peregrine problem.

The account of breeding activities is rather general and contains only the occasional "bon-bon" for the specialist, e.g., the observation of "hop hunting" Lapland Longspurs (*Calcarius lapponicus*) on the ground. This is not mentioned in the index. The interested reader must go to various journals where scientific papers by some of Harris' companions have been published in the meantime. Thus, the jacket's promise, "Harris' reporting is a model of scientific accuracy," is certainly exaggerated. Today, the term scientific accuracy should mean more than occasional behavioral anecdotes.

Finally, the most difficult part of this review, an evaluation of Harris' feelings and his writing about them. Everyone who has watched birds in the wilderness will share some of the conscious and unconscious thoughts and moods that he felt sitting day after day amidst flowers and mosquitos. Occasionally, however, he slips into metaphors and statements too grandiose for this context. Examples are: "A sense of kinship had crept upon me, a feeling that we shared the difficulty of living, and their presence, their successes, even the humming of mosquitoes, encouraged me." (p. 63); "The mammals and I seemed to share an immediate recognition. An illusion took hold of me, that we had a mutual understanding of and interest in our parallel lives, because we all had fur or four-chambered hearts or some bond." (p. 64); "Most oologists alive today are aging retired men with rich memories." (p. 85); "Almost always humans are individuals. Animals are not." (p. 193).

There are many dialogues in this book that do not sound at all like field ornithologists talking in the field. They are too clean, too literate compared to my experience of many years. This introduces some element of artificiality, and quite a bit of distance from such writers as Matthiessen and Abbey, to whom Harris is compared on the book jacket. Still, we learn quite a bit about the author. He immerses himself in the tundra wilderness, becomes extremely protective of the falcons, and finds himself ill at ease with the sudden appearance of human visitors. Harris—in one of the best dialogue areas of the book—is caught breathlessly almost stunned by the sudden confrontation with another world, and escapes back into the tundra night.

This beautifully produced book is a successful and rare (albeit not perfect) blend of ornithological adventure, scientific information and personal touch. It is well worth its price.—HARTMUT WALTER.

SHOREBIRDS IN MARINE ENVIRONMENTS. By Frank A. Pitelka (ed.). Studies in Avian Biology, No. 2, Cooper Ornithological Society, 1979:261 pp., 70 figs., 52 tables. \$8.00.—This volume is a collection of papers from a symposium on shorebirds held at the 1977 meeting of the Pacific Seabird Group. The symposium, organized by F. Pitelka, was composed of two sessions: one on distribution, migration and conservation (15 papers); and the other on ecology of shorebirds (5 papers, 4 abstracts). The objectives of the symposium were to look at distribution, migration and ecology of shorebirds in terms of the basic information currently available, and to examine shorebird biology in terms of the conservation and management of coastal wetlands. Pitelka sets the stage for the discussion by examining shorebird distribution on the Pacific Coast. Such a larger view of an entire coast is essential since shorebirds are long-distance migrants. Pitelka lists the new world shorebirds, and comments on their status on the Pacific Coast. He then analyzes the world shorebird fauna (fig. 1). One particularly helpful figure shows the occurrence by five degree latitude intervals of shorebird species in North and South America. He briefly outlines the current problems in shorebird distribution: the importance and occurrence of staging areas, migration behavior (group dynamics), age and sex differences in patterns, and winter site tenacity. His introduction is an excellent starting point for the collection of papers, and for graduate students interested in shorebirds.

The papers on distribution, migration and conservation cover a wide range of topics including censuses of restricted areas and wide-ranging areas, habitat use, timing of migration, migration patterns of particular species and the evaluation and conservation of coastal wetlands. Some papers merely report on census techniques; illustrating the kinds of information available from large-scale censuses (see Prater), or in-depth censuses of small bays (see Gerstenberg). Other papers illustrate the importance of particular bays for migrating shorebirds. The Copper River Delta is a critical habitat for migrating shorebirds as some 20 million shorebirds pass through this area each spring (see Isleib). The delta is particularly important to species such as Western Sandpiper (*Calidris mauri*) and Dunlin (*C. alpina*) that forage there and lay down fat reserves for continued northward migration (Senner). Senner found that Dunlin migrate collectively, shift from one place to another as flocks, and show greater weight gain than do Western Sandpipers that migrate independently of each other in less organized flocks while in the Copper River Delta. The information provided by Senner is critical to protecting these areas against human activities (such as oil spills). Similarly, Gill and Jorgensen present quantitative data on shorebirds' use of another Alaskan bay.

The paper by Page et al. is an excellent example of the information that can be gained by censuses for many years. The mass of data fall into species patterns, and provide insights into habitat requirements and site tenacity. Many species returned to the same foraging areas year after year. Winter feeding site fidelity was also found by Smith and Stiles, who banded shorebirds in 2.5 years at a mudflat in Costa Rica.

Two excellent papers on migration patterns deserve special mention: Jehl's on the autumnal migration of Baird's Sandpiper (*C. bairdii*), and Harrington and Morrison's on migration of Semipalmated Sandpiper (*C. pusilla*). Jehl's is an innovative examination of the migration pattern of Baird's Sandpiper using specimens from 35 museum and university collections (if I count the acknowledgments correctly!). The project involved a good deal of work and imagination, and the end results of the country-wide survey indicate sexual and age differences in the migration pattern of this species. Adults may migrate some 9000 miles in 5

weeks, whereas juveniles migrate more leisurely over a broad front (Jehl). Although I would have liked to know exactly how many specimens were examined, the paper illustrates how museum specimens can be used to answer ecological questions.

Harrington and Morrison's paper on the Semipalmated Sandpiper uses a variety of techniques (banding studies at James Bay and Massachusetts, and examinations of museum specimens) to show that different populations have different morphological characteristics that allow for identification of the source of migrants. The paper clearly indicates that a variety of strategies are employed by one species while migrating. Their migration pattern is a very complex system in which breeders from different geographical areas use different routes and their patterns vary seasonally. Such large-scale, cooperative studies can provide information necessary for an overview of migration and habitat use that is simply not possible by individual investigators working by themselves in one bay.

Two other papers in this section (Speth, Goss-Custard) comment on the management of wetlands, and the effects of habitat loss on overwintering shorebirds. The paper by Goss-Custard is excellent in that it makes predictions about the food base of shorebirds, and provides data relevant to them. Jehl's concluding remarks are concise and point out topics requiring extensive work.

The second part of the book deals with the ecology of shorebirds and includes papers on flocking behavior, winter and summer ecology, feeding ecology, energetics, and territoriality of wintering shorebirds. This section is mainly papers on particular research topics with one or a few species. As such, the papers are excellent, and provide good reviews of topics, quantitative data, and fruitful discussions. The inclusion of the abstracts was frustrating, as I wished to see the entire papers.

Strauch and Abele's paper on feeding ecology of plovers wintering in Panama was particularly interesting in illustrating that some species feed only at low tide whereas others are tidally independent. The study by Myers, Connors and Pitelka on territoriality in non-breeding shorebirds is a landmark study showing that a wide variety of species will defend territories during the winter, although its expression differs among species, individuals and habitats. These data suggest that extensive cost-benefit analysis of foraging may lead to more quantitative predictions of the point at which particular species will stop defending territories. Goss-Custard's analysis of the energetics of foraging Redshanks (*Tringa totanus*) is an excellent example of an examination of these cost-benefit considerations. J. Wiens' concluding remarks point out some of the areas that need further research, making a plea for long-term studies.

Altogether this volume is essential for all ornithologists, particularly those working with shorebirds, migration patterns, foraging behavior, territoriality, habitat selection and conservation. Although papers vary from brief essays without quantitative data, to hypothesis-testing and data-based papers, the overall quality is excellent. The papers provide documentation on several important aspects of shorebird biology (i.e., age and sex differences in migration patterns, site tenacity during the winter, winter territoriality). In the very least they provide quantitative data on migration patterns essential to understanding the importance of coastal wetlands. I was disappointed in the lack of any papers on non-Pacific coast areas (except for Harrington and Morrison). Although it would have taken a lot of time, an index would have made this volume more useful for beginning graduate students or others interested in tracing particular ideas (for example, feeding site tenacity over the winter). Similarly, the volume was a long time in coming out, which resulted in some key papers not being cited. All in all, I cannot recommend this volume more highly. And for \$8.00, it's clearly the bargain of the year.—JOANNA BURGER.

A FIELD GUIDE TO WESTERN BIRDS' NESTS. By Hal H. Harrison, illus. by the author unless otherwise credited; map, endpapers and logo by Mada Harrison. Houghton Mifflin Company, Boston, 1979:xxx + 279 pp., 32 color plates with captions, 153 black-and-white photographs, 1 map, glossary. \$11.95 (hard cover).—Here is another attractive addition to The Peterson Field Guide Series—the eagerly awaited companion volume to Hal Harrison's 1975 A Field Guide to Birds' Nests of 285 species found breeding in the United States east of the Mississippi River. The latest work represents a more exhaustive review of the literature than the earlier one; included are all species, even the casual or rare ones, known to breed in the contiguous United States west of the Mississippi River. For nearly each of the 520 species there is a succinct description of its breeding range, habitat, nest, eggs and other pertinent notes. This handy pocket-sized book is packed full of practical information that I am already putting to good use.

The color illustrations are excellent despite their tiny size (only 40 × 53 mm). The nests centered in the 256 color photographs are so graphically portrayed that one can identify many of them without using the captions; the same can be said of the eggs whose markings and colors for the most part are clearly defined and lifelike. The eggs especially are so well illustrated and described that one wonders why the author failed to include them in the book's title. However well done, I find it somewhat disappointing to look at photographs of nests situated in artificial nest boxes, but so many birds these days raise broods in human-contrived sites that the author logically illustrated a number of them. If that unavoidable little problem over natural vs artificial sites disturbed me, I find it hard to fault the numerous black-and-white photos—all of very high quality and nicely placed throughout the text.

Harrison's use of the Mississippi as a boundary between east and west—a method devised earlier by Olin Sewall Pettingill, Jr.—seems to work well. Inasmuch as I spend a fair share of my time on the upper Mississippi, I can vouch for Harrison's accuracy for this region. I also note that he left few stones unturned in other areas of the country familiar to me, e.g., Kansas with its many unusual records, including that remarkable Harris' Hawk (*Parabutea unicinctus*) nesting far beyond the species' usual breeding range. The few places where I find omissions in the text are readily referable to unpublished material—hardly the fault of the author! By and large, Harrison's careful coverage of the huge block of 22 states appears to be nothing less than outstanding.

One is impressed by the fact that nearly all of the photographs were taken by the author. Only those who know how difficult it is to find the nests of a good many of our birds will appreciate Harrison's special talents, perseverance and endurance. I personally have seen so few nesting birds west of the Rocky Mountains that I hope to spend my retirement days chasing them down in the far west. One reliable reference that will accompany me will be this western guide.—DAVID F. PARMELEE.

NORTH AMERICAN DUCKS, GEESE AND SWANS. By Donald S. Heintzelman. Winchester Press, New York, New York, 1978:xiv + 236 pp., color and black-and-white photographs, wildlife refuge maps. \$15.00.—A GUIDE TO NORTH AMERICAN WATERFOWL. By Paul A. Johnsgard. Indiana Univ. Press, Bloomington and London, 1979:274 pp., color plates, black-and-white drawings, range maps. \$15.95.

In these volumes we have a mixed bag of information concerning the waterfowl of North America. One offers an invariably sparse treatment of field recognition, size, flight habits and ranges in North America, and the second a relatively complete coverage of each species

(food habits, range maps, behavior, etc.). Both books contain numerous photographs of varying quality.

Heintzelman states his purpose as helping hunters and birders to identify waterfowl and to highlight selected national and state wildlife refuges where waterfowl are prominent. The species accounts are brief and general with most of the limited text devoted to field recognition. Habitat for the Gadwall (*Anas strepera*) is "ponds, lakes, rivers, freshwater marshes" and its North American range described as "southern Canada and the United States." I doubt that the comments under the rubric "flight style" (e.g., "direct and rapid," "graceful and rapid," etc.) will really be of much aid to even novice observers. The photographs accompanying the species accounts are black-and-white, and average in quality, but a selection of better quality color photographs graces the book's centerfold. The author employs a taxonomic scheme of subfamilies that is generally outdated in usage (e.g., Aythyinae) but otherwise has presented current nomenclature for the species.

A naive chapter devoted to "Techniques of Waterfowl Study" tells us that "a pair of binoculars is very helpful to people looking at waterfowl," mentions that telescopes are also useful ("a minimum magnification of 20× is necessary"), notes that blinds are also helpful, since hunters have long used them, and sketches the vicissitudes of common and scientific names and "the species problem." Subsequent chapters briefly—some are scarcely more than two pages in length—describe eclipse plumages and hybrids, migrations (with flyway maps), prairie pothole breeding grounds and local viewing areas. The final chapter is more extensive, and presents maps and succinct descriptions of waterfowl refuges in the U.S. Four appendices treat accidental sightings, Canadian wildlife areas, conservation organizations and homes for Wood Ducks (*Aix sponsa*).

The book contains some errors (e.g., Hockbaum for Hochbaum in the suggested reading section) and poor layout in some places (e.g., the figure on p. 226 describing construction of predator guards for Wood Duck nest boxes has no caption or cross-reference with the associated text on p. 220). On balance, this is not a book for ornithologists and, considering the competition available, it may be of marginal value (at \$15.00) to anyone.

Johnsgard's prolific pen adds yet another waterfowl book to his long list of credits. To be sure, this is a shortened version of his treatise *Waterfowl of North America* (1978), as the author freely admits. The range maps and "in hand," "in field" identification sections are unchanged for the most part, whereas a "natural history" section condenses the more detailed material appearing in the earlier volume. The condensed text remains a useful reference to habitat, foods, behavior, breeding and conservation for each species, but without extensive literature citations. Most species accounts are accompanied, however, by at least one suggested reading and, while some of these may be overly general or indeed quite narrow, it is not easy to assign a single reference or two with equal coverage for the likes of a Mallard (*Anas platyrhynchos*) or, conversely, a Steller's Eider (*Polysticta stelleri*).

The color plates are largely the same as appeared before but some new drawings (the author's) are included. Sketches of head profiles (where plate numbers are missing but the sketches are cross-referenced with a numbered species list) are new and supplement the dichotomous key repeated from the 1978 volume.

Johnsgard intended this volume to reach the "middle ground" of his reading audience, those whose needs lie between heavier works and a simple field guide. Perhaps one might have wished for a slightly smaller-sized book, with soft cover, to make it more field-worthy, but I believe Paul Johnsgard adequately has met his goal, and I can recommend the book, as is, for its stated purpose.—ERIC G. BOLEN.