REVIEWS

EDITED BY WALTER BOCK

The Bird Life of Texas.—Harry C. Oberholser. 1974. Austin, Texas, University of Texas Press. Paintings by Louis Agassiz Fuertes. Edited by Edgar B. Kincaid, Jr., Suzanne Winckler, and John L. Rowlett. Pp. xxviii + 1069 (2 vols.) 36 col. and 36 black-and-white pls., 39 photos, 480 distributional maps, 2 full-page maps, 3 diagrams. Hardbound. $60.00.—This work of the birds of Texas is a condensed, updated version of the original manuscript of the late Harry Church Oberholser (1870–1963). The study was initiated at the turn of the century, and its history from conception to publication would make an interesting volume in itself. A history of the later years of this project, concerned with efforts to publish the manuscript, has been written by Frank Wardlaw (1975, Scholarly Publishing, Jan.: 159–163). Other valuable information is provided in the biography of Oberholser by John W. Aldrich (1968, Auk 85: 25–29).

As would be expected, editing and publishing a 3-million-word manuscript proved to be a difficult task. Frank Wardlaw undertook supervision of its publication and established an advisory committee, consisting of John Aldrich, Robert Selander, and the late Clarence Cottam, to be responsible for general policy decisions required in the editorial task. This committee selected Edgar Kincaid, Jr. to edit, abridge, and update the manuscript. At Aldrich's request the nomenclature Oberholser used is retained throughout the text. Also unaltered, according to the introduction, are the "Detailed Accounts," containing extensive descriptions of the external morphology of each nominate race or species if monotypic. The "Species Account" sections, however, were edited and much new information provided. Moreover, Aldrich states in the preface that: "Other sections, including the introduction, have been condensed and modernized considerably." In hopes of gaining some insight into the nature of these modifications, I examined Oberholser's original manuscript at the University of Texas archives. The more important findings will be noted in the course of the review.

The introduction cannot be attributed to Oberholser, as only two sections of his original manuscript were retained and these have been altered drastically. The first part in the introduction, "The History of Texas Ornithology," is a greatly abridged version of Oberholser's manuscript, but little of pertinent interest was lost. Retained were Oberholser's interesting observations and comments on the collection of Frank Blake Armstrong.

The section, "Ecology of Texas Birds," cannot be credited to Oberholser although a goodly portion was based on his original manuscript. It is divided into a number of subsections concerned with climate, physiography, vegetation and regional bird life, and illustrated with 38 excellent black-and-white habitat photographs. None of these photographs is from the large and varied collection Oberholser assembled for his book, nor is any mention made of them. The latter include, in addition to habitat shots, many bird and bird-related photographs. A number of these are of special interest, such as one of a male Whip-poor-will feeding a nestling, and another of a Mexican Spotted Owl at the nest. Although this section is heavily illustrated it lacks substance and scope. The important papers by Blair on the biotic provinces of Texas (1950, Tex. J. Sci. 2: 93–117) and Vernon Bailey's discussion of the life zones of the state (1905, North Amer. Fauna No. 25) are cited but not discussed or utilized. Selected elements of these two works would have contributed more useful information

than all but a small part of the 45 pages of this section. In view of the great diversity of flora, fauna, climate, and geography, the absence of an adequate analysis of the broad distributional patterns and of the general zoogeography is a notable shortcoming. It should be noted here that Oberholser's original manuscript included a section devoted to the life zones of the state, one on "Peculiar Distribution of Some Texas Birds" which, although brief, proves to be of considerable interest, one on bird migration, listings of federal, state, and private refuges and sanctuaries, and various tabulations of species occurrences by seasons of the year and other criteria. In summary, much can be said in favor of retaining Oberholser's introduction intact even though it would have added to the length of the text. His introductory material, I believe, was quite as important a scientific contribution as is his descriptive taxonomy and his nomenclatorial comments and more appropriate for a state bird book.

Two maps are included in the editor's introduction—one concerned with important ornithological localities (including National Wildlife Refuges and State Parks) and one illustrating the "ornithological regions" of the state. Unfortunately no explanation is offered as to how these regions are constituted or how derived. Little use appears to have been made of these maps in the text. The 36 color and 36 black-and-white reproductions and 4 pen-and-ink drawings by Louis Agassiz Fuertes are of great interest, as half are early Fuertes paintings commissioned for this book and here published for the first time.

In the text, English names are usually those of the 5th editions of the A.O.U. Checklist (1957). English names are also assigned to subspecies—a common practice in earlier years, but long since discontinued. Each "Species Account" opens with a brief summary of field characters followed by a statement of the overall range of the species and then a detailed account of the species' distribution by seasons in Texas. The last is augmented by a state map with county outlines. Two systems of five symbols each, one for collected specimens and one for sight records, are used to indicate the species' status in each county where it is known to occur. This peculiar method used to map species' distribution provides a maximum of data possible employing a single format. Many of the maps are too cluttered for ready reference, but their use made possible a major two-thirds reduction of the original manuscript.

Under the heading "Changes" is a most informative account of the changes of a species' status and distribution over the years. These contain, in my opinion, the most informative and interesting material in the text. It was most edifying to see sensible use being made of the extensive data available in the Audubon Christmas counts. While not convinced in all cases of the editor's explanations, overall I find his comments well considered and at times ingenious, as in the case of his explanations of the declining vulture populations in Texas (pp. 202 and 204). Most of the credit for this material and presentation must go to Kincaid. Recognition and congratulations are also due Kincaid who initiated and directed a major ornithological survey of Texas for additional and more recent distributional data. He and his associates covered more than 400,000 miles, mostly in the "underbirded" counties, during all seasons of the year.

"Haunts and habits" are generally brief sketches based upon the extensive field experience of the author and the editor; they are well written and are comparable in information content to most good state bird books. "Nesting" is included under "Detailed account" with useful data on nest structure, clutch size, and egg color and size.

Under "Detailed accounts" nominate races and monotypic species are described in detail. These descriptions are nondiagnostic, consisting of straightforward, usually

detailed accounts of plumage and feather coloration, running in some cases to more than 2000 words. Included are accounts of molt and colors of soft parts. Neither the House Sparrow nor Starling escape such detailed treatment and an unspecified race (or hybrid) of pheasant receives some 1500 words of color description. These accounts may well be the most detailed ever published in the ornithological literature. Races other than the nominate form are given a more succinct diagnosis. These detailed descriptions take up 70% of some sections of the text (e.g. the longspurs) and together must account for well over half of the main text. The paragraphs concerned with differences between various subspecies are thorough, based on large series and, as far as I can discern, reliable. The descriptions contain brief but highly useful notes on the timing and sequence of molt of each species. No doubt these exhaustive descriptive accounts will be of interest on occasion to a select few avian taxonomists, but it seems unlikely that most readers will ever have occasion to refer to them.

Oberholser follows Ridgway for terminology of color. About 550 of these color terms are defined in Appendix B, the "Glossary of Colors." Ridgway's color key is difficult enough to follow at times, and an eight-page verbal glossary of colors, arranged alphabetically, is of very doubtful value indeed.

Oberholser had been urged by his colleagues to publish the results of his studies, especially of his taxonomic and nomenclatorial research, as they progressed. He declined to do so. Why he chose not to follow convention and publish his findings in scientific journals is something of a mystery. One species and 35 subspecies are described as new in this work (list on p. 1069). Of the 35 subspecies only 15 might be said to be "Texas birds." The new species, a hummingbird (pp. 485–6) is based on a unique specimen, which may be a hybrid, and is presumably invalid; the type appears to be lost. In describing new races, the formal descriptions generally include a brief description of a sample series. Lacking, however, are critical data as to the number of specimens in the sample series, dates of collection, localities where specimens were collected. In Appendix A (titled "Nomenclature" but containing mostly purely taxonomic material), additional information of taxonomic interest on these new taxa is sometimes provided, including a diagnosis lacking in the formal description.

So many controversial scientific names are introduced that K. C. Parkes published a warning against their uncritical use (1975, Amer. Birds 29: 17–18). While new generic and specific names are discussed in Appendix A, no explanation is provided for use of familial names, many of which are notable departures from current and, in some instances, past usage (e.g. Micropodidae and Dryocopidae). Where Oberholser's name is a departure from current usage, the more current name or names are provided under "Species Account."

Wherein lies the value of "The Bird Life of Texas" and should it (the original Oberholser manuscript) have been published as a state bird book? The essence of Oberholser's descriptions and his taxonomic and nomenclatural conclusions—the only parts directly attributable to him—published as they were in 1974, will have negligible influence on systematic ornithology. The detailed accounts have value because of their extensive information on molt, soft part colors, juvenal and natal plumages, etc., but they are of interest to a very limited number of ornithologists and should have been published in a proper scientific format. Although it is argued that Oberholser's manuscript would never have been published unless as a state bird book, the soundness of the decision to publish it is questionable because of the few workers who will use his scientific contributions and because the resulting high cost of these volumes will keep them out of reach of many ornithologists and birders. Certainly those concerned with publishing the manuscript were aware of these difficulties and, thanks

to sensible editing, the final publication is a great improvement over the original manuscript. The full magnitude of the contribution made by Kincaid and his associates can be fully appreciated only after comparing the original manuscript with the published text. Kincaid is to be congratulated for contributing much of the valuable natural history and distributional data; indeed this material should be reprinted in an abridged edition to make it more readily available to the large numbers of people interested in the avifauna of Texas.—JOHN J. MORONY.

Competition and the structure of bird communities.—Martin L. Cody. 1974. Princeton, New Jersey, Princeton University Press. Monogr. in Population Biol, no. 7. Pp. viii + 318. Cloth $12.50. Paper $6.95.—Studies of co-occurring assemblages or communities of birds have been especially vigorous and fashionable during the past decade or so. Recently these studies have emphasized theory, painting mathematical pictures of how avian communities should be organized, or have pursued observation and description in ever-increasing detail. Martin Cody's book attempts a rigorous reconciliation of observation and theory, and thus merits close attention and study. Cody's aims are to evaluate the patterns of organization of avian communities through quantitative determinations of niche relationships and to evaluate the degree to which coexisting species limit one another, leading to divergences or convergences in their ecological adaptations. The chapters deal with coexistence mechanisms, with patterns of niche breadth and overlap among coexisting bird species as determined by resources, with various manifestations of "competitive release" that follow changes in the competitive environment within the community, with convergences between communities exposed to similar environmental circumstances, and with several seeming "exceptions" to normal patterns of ecological isolation among species. Happily Cody has relatively little to say about species diversity, and thus avoids the "nonconcept" morass that dominates a good deal of current community ecology. The book is essentially a review of Cody's own field work and thought, and makes no claim to review the relevant work of others. Field observations, primarily from scrub, grassland, pine-oak-juniper woodland, and marine habitats in North and South America, provide general substantiation for the semiquantitative models of community structure which Cody advances. Everything fits together quite neatly.

But this neatness is more apparent than real, and begins to erode with a close reading. Cody's arguments, I think, show two major weaknesses: an almost dogmatic view of the role of competition in shaping community patterns, and a rather cavalier attitude toward the collection and interpretation of information from the real world.

Cody's view of nature is one in which interspecific competition alone determines the niche patterns of coexisting species, and thus community structure. Individuals that deviate from the species' mean (the "optimum") in their patterns of resource utilization are exposed to competition with other species having different optima along the resource span; selection for the development of "displacement patterns" or "coexistence mechanisms" is continuous and intense. This leads to the evolution of niche differences, which permit species coexistence. Cody suggests that consideration of a small set of niche dimensions (he uses habitat, vertical foraging height, feeding behavior, and food types) is sufficient to document coexistence mechanisms and community patterns (i.e. adequate to demonstrate that different species do differ ecologically). The important dimensions are those "which are already identified with environmental variables for which competition takes place, as indicated by resultant

displacement pattern" (p. 54). In other words, one determines the ways in which coexisting species differ, infers that competition is the force driving these differences, and then uses these as dimensions to analyze patterns of niche breadth and overlap within communities. Cody's analyses indicate that these patterns appear to vary in predictable fashions in different environments. Recognition of these patterns may be one of the major contributions of this book, despite the underlying circularity.

Causal association of these niche displacement patterns with competition, however, rests upon several critical assumptions, none of which Cody addresses adequately. First if competition is to mold these finely-tuned displacement patterns, the resources, if not constant in supply, must be at least constantly limiting (or, alternatively, "interference" be continuous). In unpredictably varying environments, such as many arid or semiarid habitats or locations with short but productive growing seasons, resource conditions may vary much more than avian population densities, creating erratic fluctuations between resource limitation and superabundance. Under conditions of superabundance, competitive pressures are relaxed, and species displacement patterns may become blurred by substantial individual variation. Further, the maintenance of species differences under such conditions may be related to selective factors other than competition. Cody admits that with superabundant resources, displacement patterns cannot evolve, but devotes little attention to this prospect. Varying environments are seen as exposing species to a variable set of competitors and to varying resource conditions; the predicted response is a broadening of food-related niche dimensions and a reduction in habitat overlap between species. The displacement patterns, while different, are still dictated by competition. The critical question, of course, is how frequently conditions of resource superabundance actually occur in the real world—I suspect far more often than Cody admits.

The assumption that resources are constantly limiting also implies that population densities are at or very close to environmental carrying capacities (K). This leads to the assumption that suitable habitat is spatially fully occupied by a species. This is a critical assumption, for Cody derives his measure of habitat niche overlap between species (and thence a "competition coefficient") directly from measures of the spatial co-occurrence of the species. If habitats are not fully occupied, and especially if they are not occupied as a direct function of their suitability (both of which are likely if resources are superabundant), then inferences drawn from measures of habitat occupancy may be incorrect. Most particularly, the observed patterns of spatial distribution may have little to do with direct competition. If measures from populations at different levels in relation to carrying capacity are compared, errors in interpretation may be amplified. Again Cody is not unaware of this problem (e.g. p. 228), but feels that his methods somehow circumvent it.

Cody also appears to assume that little variation exists among individuals of a species in the niche dimensions he selected for analysis. Not only do his models generally treat all individuals of a species as identical (perhaps a necessary "simplifying assumption" of his models), but few variance measures are associated with any of the field data presented. Again if competition is not incessant in its effects and resources are at times superabundant, individual variation may change through time. Individual variation, in addition to representing a fundamental attribute of populations, may be a measure of the "tightness" of community structuring, and cannot be routinely ignored.

Cody thus errs, I think, in overemphasizing the role of competition in structuring avian communities to the exclusion of other factors or consideration of environmental variability. No less critical is the loose attitude he displays toward the collection and

interpretation of field data. One of the attractive features of this book is the attempt to couple field data to theory, and as the data superficially do appear to conform to much of the theory, probably many readers may consider the theory "tested" by the data. Thus it is crucial that the data be properly collected and responsibly interpreted. Unfortunately, this is not the case. Cody seems unconcerned that the validity of field data is determined to a large degree by the methods used to gather them. For example, data on community structure are obtained from census plots of 3.6–16.4 acres (1.5–6.6 ha). Cody's justification for using such small plots is that larger ones may be vegetationally more heterogeneous, and thus include a larger number of species, rendering less precise correlations. But small plots may be subject to substantial sampling bias, especially if there are local variations in the distributions of individuals unrelated to vegetation. My own studies in grassland and shrub habitats suggest that this is frequently the case. Much has been written on the difficulty of obtaining accurate census data even within plots of adequate size (e.g. Pinowski and Williamson 1974, Acta Ornithol. 14: 152–461; Emlen 1971, Auk 88: 323–342), yet Cody gives little indication of how his censuses were conducted. "Density" values are occasionally tabulated, with no units of density specified; in one place (p. 153), "density" apparently refers to the proportion of the study plot occupied by a species.

Cody rarely indicates sample sizes or the time durations over which his observations were made, but apparently most were limited to a short time within a single year. Our studies of grassland and shrubsteppe census plots over several years indicate considerable annual variation in population levels and species occurrences; Cody's comparisons of habitats censused in different years, in which populations may have been at different levels in relation to carrying capacities, must be considered equivocal. Similarly, much of his analysis of marine bird community structure (p. 172 ff.) is based upon measures of foraging distances from breeding sites. His data were collected over a very short time interval, and do not portray adequately the considerable variation in foraging distances exhibited by a species over several weeks, or between different years. In many North Pacific coastal seabirds, foraging is closely related to local oceanographic conditions such as upwelling, and varies as these conditions vary. The statement that "the habitat exploited by marine birds might be expected to show little variation from coast to coast" (p. 172) demonstrates an insensitivity to important regional variations in oceanographic characteristics.

Cody's assumption of resource constancy thus appears to influence his approach to data collection as well as his theories. If environments vary in unpredictable fashions and populations are not continuously at carrying capacity and under competitive selective pressures, then short-term, single season samplings of resource utilization and community structure are unlikely to provide adequate "tests" of theory.

Cody is also guilty at times of using excessively simple or inaccurate measures of variables that are difficult to measure directly. Dietary niche relationships, for example, are measured by bill sizes, following the assumptions that bill size is in fact closely correlated with diet and that variations in bill size are responses to competition and little else. Both of these assumptions are suspect. He suggests using territory size as a measure of fitness (p. 64), or the proportion of the study tract occupied by a species as a measure of "success," because an alternate measure, the number of pairs per unit area, is subject to variation with body size differences (p. 117). In fact the proportional occupancy of a given area is also influenced by body size. Further, using territory size or spatial occupancy as success measures rests on the assumption that population densities are in equilibrium in relation to resource levels, that habitats are fully packed. To me this seems unlikely. And in attempting

to demonstrate that Song Sparrow territories are larger when more competitors are present (p. 144), all other passerine species present in the territory are considered to be "competitors"; surely this is an exaggeration!

This rather informal approach to data extends to their interpretation. Thus, evidence on hawk foraging ranges is presented (p. 218) to support the argument that, in uniform habitat, territories should be rounded rather than elongate, thereby minimizing travel time during foraging. But by my count only a third of the data points denote circular to "short elliptical" (length less than two times width) territories, while two-thirds appear to be more than twice as long as they are wide. The geographic ranges of several sparrows breeding in low scrub habitat (*Spizella pallida*, *S. breweri*, *Aimophila cassini*, *Amphispiza belli*) are offered in support of the generalization that species' ranges overlap to the extent that the species involved are taxonomically unrelated (p. 15). But several other sparrows occupying these habitats that are members of the same genera and the same ecological guild (*Spizella atrogularis*, *Amphispiza bilineata*, and at times *Aimophila ruficeps*) are ignored; their inclusion weakens the generalization. Elsewhere (p. 92 ff.), Cody suggests employing cluster analyses based upon matrices of niche overlap values to define groups of ecologically similar species within which competition is likely to be intense. Cluster analysis techniques group entries regardless of whether or not "natural" groupings exist, and this can produce some strange relationships. In Wyoming willow communities, for example, Calliope Hummingbirds and Cliff Swallows are suggested to show closer ecological affinities to White-crowned Sparrows than do Fox Sparrows. The niche overlap matrix can also lead to overinterpretations, such as the conclusion (p. 97) that the Calliope Hummingbird, with a mean community niche overlap value of 0.441, "easily qualifies as a specialist," as it is "well below" the community-wide average overlap of 0.458.

Thus the philosophical and methodological foundations of this work contain major difficulties. In addition careful editing would have corrected a variety of relatively minor flaws. On p. 246, for example, spectrograms of wren vocalizations are presented with different time axes, so that substantial differences in timing between supposedly convergent species are not apparent. Figure 9 is said to summarize Figure 8, but includes one species not given in Figure 8 and plots several other curves incorrectly. Several figures contain code designations that are not explained, or use axes without defining the units of measurement (e.g. vegetation density in Figure 28). Others (e.g. Figs. 26, 51) present complex material without explanation, and are virtually unintelligible without referring to the original publications. The text and tables often present mixtures of English and metric measures, sometimes in the same sentence. Figures 13 and 45 were obviously reproduced from poor xerox copies, and the community dendrograms (Figures 32 and 33) are hand-drawn, typewritten, and replete with misspellings and typographical errors.

These criticisms should not leave the impression that Cody's book contains nothing of value. On the contrary I believe the approach he has suggested to unravelling the complexity of avian community structure is innovative and important, and should define new directions for future research. His analytic techniques, especially those dealing with the dissection of major dimensions of niche relationships, are basically sound and at times reveal substantial insights. Cody is enough of a naturalist to know that organisms may view environmental features in different ways, using different scales or "units" than we do, and his discussion of these "scaling" problems in assessing niche dimensionality (p. 70 ff.) is excellent. His considerations of field data, despite their shortcomings, do produce intriguing generalizations. He suggests, for

example, that many grassland-brushland finches may be restricted to specific habitats, within which they are food generalists, while woodland warblers appear to have much wider habitat tolerances and subdivide food resources, chiefly by foraging site specialization (p. 66), and that these patterns may be characteristic of uncertain versus predictable environments (p. 122). Resident species in predictable habitats may be expected to show greater niche overlap than migrants, especially in habitat selection, as their prolonged contact has led to resolution of competition by subtle behavioral differentiation rather than gross habitat separation (p. 211 ff.). He predicts that individuals of ecologically extremely similar species may not tolerate spatial overlap in territories, while individuals of different but ecologically similar species may overlap territorially but be separated in some other dimension, such as vertical separation of feeding zones; individuals of quite dissimilar species may overlap in space both horizontally and vertically, but feed on different food items, employing different foraging techniques (p. 215). While testing such generalizations may not be easy, they are fundamental to our understanding of avian communities, and demand careful investigation.

I think this is an important book, and the largely critical nature of my comments stems from a concern that the book may be taken by some as a prototype of *the* approach to avian community ecology. Cody's approach contains much of value, but it must be tempered with a greater concern for the collection and interpretation of "facts" and a more flexible view of the role of competition in the real world.—JOHN A. WIENS.

The birds of Seychelles and the outlying islands.—Malcolm Penny. 1974. New York, Taplinger Publishing Company. 160 pp. Illustrated. $11.95.—While numerous accounts of Seychelles birds have appeared over the years, this is the first proper field guide of that miniature avifauna. Also included are birds of the Aldabra group and of selected small islands (Amirantes, Providence, Farquhar, St. Pierre) in the same part of the Indian Ocean. The Seychelles group boasts 11 endemic species (and two more on Aldabra) and a number of endemic races. All these, together with the resident land birds, are illustrated in color while the seabirds are adequately treated in the black-and-white plates.

Although most visitors will use this book purely as a field guide, it is intended to be more than that. The introductory chapters cover a wide range of subjects, including ornithological history, extinctions, introductions, habitat descriptions, ecology, and evolution of island birds. The author is also rightfully concerned with the conservation of the islands' rare and endangered endemic forms. The conservation movement has recently made good progress in Seychelles, a noteworthy event being the purchase of Cousin Island by the International Council for Bird Preservation in order to preserve the Seychelles Brush Warbler (*"Bebrornis" seychellensis*), found only on Cousin.

The species accounts, while beginning with descriptions and field notes, go on to cover life history, distribution, relationships, and other subjects. There are no distribution maps, but a map of the region inside the end covers will be adequate for most people. The names of Cousin and Cousine have been transposed.

The book has a number of annonying features, most notable of which is the arbitrary division of the species list into five different categories: land and shore birds; seabirds; rarer seabirds—skua and gulls; migrant shorebirds; and migrants and vagrants other than shorebirds. As this is effectively a checklist of the birds of the

region, one would expect the birds to appear in systematic order. It is likewise unclear why the migrant shorebirds, always an integral part of any avifauna and in winter among the most conspicuous of Seychelles birds, should be demoted to an appendix. The bibliography is similarly broken up under seven different headings.

Happily for both author and artist, Seychelles birds pose few identification problems, as neither is particularly adept at showing how birds may be differentiated in the field. The plates are adequate but not noteworthy. Land birds are more successful than seabirds, the Gull-billed Tern being almost unrecognizable. The use of illustration space has many anomalies. Adults of both races of *Butorides striatus* are shown, but the most often seen streaky juvenile is not. Both male and female *Dryolimnas*, though virtually identical, are both shown in color, as is the unmistakable young Sacred Ibis. On the other hand, not a single shorebird is illustrated. While it is true that the shorebirds are all illustrated elsewhere, so are all the seabirds on the last four plates. Judicious culling of birds doubly pictured would have left space for one plate of the commoner shorebirds, thus making the book more interesting to the local inhabitants, for whom Ruddy Turnstones, Whimbrels, and Black-bellied Plovers are an everyday sight. On the other hand, as a good use of space, I commend the illustration of three races of *Streptopelia picturata* and a useful discussion in the text. The labels of the two kestrels have been switched.

Size is nowhere given, a curious omission, compounded by the fact that the birds on the plates are not drawn to scale. The author is not too good at rendering calls. The voice of *Caprimulgus madagascariensis aldabrensis* is described as "a rattling sound, rather like a knife being thrown into a board." If so, it must be a good species, as the voice of the nominate race could never be described in this way.

The above defects, however, do not detract from the overall usefulness of the book. As the first in its field, and with a commendable emphasis on conservation, I recommend its purchase.—STUART KEITH.

Ocean wanderers/the migratory seabirds of the world.—R. M. Lockley. 1974. Newton Abbot, England, David and Charles. 1973. Harrisburg, Pennsylvania Stackpole Books. 168 pp., 9 col. photos, 12 black-and-white drawings by Robert Gilmour, 27 black-and-white photos, 22 distribution maps and drawings. Cloth. $15.00.—When I saw R. M. Lockley's name as author and the striking dust jacket of *Ocean Wanderers*, I asked to review it. Now I am sorry. The book, although handsome and well illustrated, is loaded with errors of omission and commission. The publisher and editor should be ashamed of themselves, and the author should have checked the published works of his colleagues more carefully.

Lockley is well known for his studies of Manx Shearwater and Puffin breeding biology on the Outer Hebrides, and in particular for his demonstration of the shearwater's remarkable navigational ability. He has authored papers and books on these studies and with the late James Fisher coauthored the classic *Seabirds* in 1954, concentrating on the Atlantic populations, many of which he knew firsthand.

In this book, which is intended to cover all the groups of seabirds, the introduction and first six chapters are general discussions of "origin and evolution," "adaptations to sea-going," "behaviour," "ocean feeding grounds," "expert navigators," and "man and seabirds." The next seven chapters treat in detail the migrations of penguins; albatrosses; fulmars, shearwaters, and other petrels; tropic and frigatebirds, gannets and boobies; skuas, gulls, and terns; auks; and phalaropes.

Lockley has read widely on seabirds and presents a vast array of well-organized

information about diverse species from all over the world. His writing is clear and easy to read. Although he mentions scientists' and authors' names he gives no formal references. The bibliography has 55 brief entries; some of the titles are shortened or even omitted and only the author, title and date are given for books. Lockley apologizes, stating "This is not the complete list of the works consulted while preparing this work—that would have occupied perhaps 50 pages and greatly added to its cost."

Unfortunately, he has been equally cavalier with some of the information presented in the book. Anyone wanting to cite work he discusses ought to refer to the original sources (if he can find them) for I found numerous errors in just browsing. For instance, in the section on antarctic birds, pages 57–58: Thirteen species of birds are said to breed on the continent and its off-shore islands. He has overlooked at least three species, a second skua, a gull, a tern and, if the South Shetlands were included, another penguin and a recently added prion. The subantarctic King Penguin is listed in error. The genders of two generic names are wrong and the generic name of three penguins is misspelled. In the same section he condemns the sheathbill as a cannibal that eats all but one of its brood of chicks "before or soon after hatching," but I have seen several sheathbill broods with three nearly grown chicks in the South Shetland Islands and the Antarctic Peninsula. The Giant Petrel, *Macronectes giganteus*, is said to breed on Tristan da Cunha Island. Actually the Northern Giant Fulmar, *M. halli* breeds sparingly on Gough Island and has been extirpated for many years from the main Tristan da Cunha Islands. I noted many other similar errors in other sections, including the last entry in the index, which is misspelled *Zema sabini*.

I can recommend the book visually or as light instructive reading, but it certainly should not be used as a serious reference.—GEORGE E. WATSON.

A field guide to birds' nests in the United States east of the Mississippi River.—Hal H. Harrison. 1975. Boston, Houghton Mifflin Co. xxx + 257 pp. $8.95.—Seventy-three years ago Elliott Coues mentioned that "the science of oology has not progressed to the point of determining from the nests and eggs to what bird they belong." This is still partially true today, since, as Harrison notes in this guide, nests of a species often vary considerably in site and materials, especially in different parts of its breeding range. A definitive identification of breeding species based on nests or eggs alone is difficult, and in some cases impossible. This guide's lack of a thorough, rigorous, diagnostic, comparative treatment of nests and eggs results in its not being a reliable identification reference of the quality we have come to expect of volumes of the Peterson Field Guide Series, of which this is number 21, the thinnest and most recently published.

Harrison treats the nests of 285 species in this book; color photos illustrate the nests of 222 species, arranged in standard taxonomic sequence. All but 9 photos show complete clutches of eggs in the nests, providing a guide to eggs as well as to nests. Below each photo a text gives breeding range, nesting habitat, nest description (site, composition, and usually size), egg data (clutch and egg sizes, shape, texture, and color), and miscellaneous breeding notes. Although much, if not most, of these data are admittedly taken from Bent's life histories, errors do occur; so serious workers are advised to consult more reliable sources in critical cases or studies.

Despite its errors and limitations as an identification guide, Harrison's book advances field study of birds' nests and eggs in eastern United States beyond that of any previously published work. It is an attractive and handy compendium of nest and egg

data, and would be worth its modest price for the color photos alone. The appearance of this volume is opportune: with the energy and economic crises discouraging exotic birding excursions, this guide hopefully will stimulate bird students to discover and study the nesting of that pair of Indigo Buntings long assumed to breed in the weedy field down the road.—HENRY W. PELZL.

Checklist of the birds of Australia. Part 1, Non-passerines.—H. T. Condon (S. Marchant, Ed.). 1975. Melbourne, Royal Australasian Ornithol. Union. Pp. xx + 311. A $10.50 (available from A. F. Stewart, 23 Central Avenue, Moorabin, Victoria 3189, Australia).—The long-awaited Australian checklist, replacing the second "official" checklist of 1926, reaches partial completion with the appearance of this volume, which treats 393 extant species, plus 43 fossil species and 10 introduced species. These figures compare with 349 nonpasserine species treated in the last checklist, which reflected much splitting at the species level (of course, many migrants and casual records, e.g., 10 instead of only 5 penguins, have greatly expanded the number of species treated in the new checklist).

The soft cloth-on-paper cover will stand some wear, but users will find it advantageous to have it bound, as the cover paper does tend to separate at the edges. An Australian map as the front endsheet lacks many important localities that could have been included (e.g. Canberra, Oodnadatta in South Australia, Alice Springs in Northern Territory). The back endsheet depicts a South Polar map extending north to southern Australia—I found a repetition of this same map (two endsheets) in my copy, as if to emphasize the recent and as yet far from proved view of the origin of a substantial part of the Australian avifauna from the south (a major theme at the 1974 International Ornithological Congress in Canberra). As usual with such checklists, the reader is not informed of *how* decisions were made on the taxonomic status of various forms. The "author" of this checklist was the "Convenor" of the Checklist Committee from 1952 to 1967, at which time Condon commenced writing it. We are told that (p. ix) "the scope and plan of the book are the outcome of deliberations" of the Committee, but how much these influenced taxonomic decisions of the Convenor is uncertain from the information provided in the checklist—Australian friends assure me, however, that the checklist essentially reflects Mr. Condon's views. For the first time subspecies are treated in an Australian checklist. Generally a Wetmorean sequence is used. A synonymy is provided for each genus, species, and subspecies. Taxonomic reports are mentioned that were important in reaching a decision on the status of a taxon or name. For each species the world range is given briefly, then the Australian range, and the number of subspecies recognized. Details of the Australian range are presented under the subspecies, if there are such. Following the systematic list is a list of important references, and of previous checklists and supplements. A very useful gazetteer (16 pages, perhaps 1350 entries) of type localities and other localities mentioned in the text precedes the indices of common and scientific names. Errors are few (I note the misspelling of Pelecaniformes on p. 43), a tribute not only to the author, but to careful editing by S. Marchant. After reading of the author's concern about use of hyphens (p. x) I was amused to note wide variation in usage, as "bronze-cuckoo," but "checklist," and an inconsistency in using both "worldwide" (p. 76) and "world wide" (p. 217).

This list is an important contribution, and that main point noted, it might be appropriate to suggest ways in which it might have been improved. The author

was reluctant to use tribes (he used subfamilies extensively), which could have helped prevent some inconsistencies. For example, the noddy group of terns is treated as a subfamily, Megalopterinae, of Laridae, unfortunately equating it with Sterninae, Larinae, and Rynchopinae. The various anatid tribes are all subfamilies, from Anseranatinae to Cereopsinae and Cairininae. The parrots are split at the family level (six families, including Polytelidae as separate from Platycercidae), the subfamily level (Lathaminae for the Swift Parrot, *Lathamus*), and the generic level (*Northiella* used for *Psephotus haematogaster*, *Geopsittacus* maintained apart from *Pezoporus*), whereas the species level shows both splitting (*"Barnardius" barnardi* and *zonarius*, *Psephotus chrysopterygius* and *dissimilis*) and lumping (*Platycerus elegans* includes *adelaidae* and *flaveolus*). Of course such cases are matters of controversy, but I find sterile the splitting of taxa based on the fact that differences can be discerned (after all, there are differences between any two *individuals*). When will it be realized that higher taxa are groups of subordinate taxa that are related (the higher grouping being monophyletic), but not at all equivalent in their divergence, and when will effort be expended to evaluate the taxonomic valence of differences that are encountered?

Although the use of ordinal and familial names is not subject to the rule of priority nomenclaturally, this checklist is one of few publications that insists upon priority in such cases, despite long established usage. We find Accipitriformes for Falconiformes, Plataleidae for Threskiornithidae, and Ardeiformes employed instead of Ciconiiformes. Surely it is contrary to the interest of nontaxonomists to change usage when it is unnecessary—can we not avoid instability at this level?

The items I have criticized generally are minor, except for inconsistency in taxonomic treatment, and the checklist by and large is a sound compilation, especially in regard to its two main functions, those of providing an up-to-date listing of Australian species and a detailed account of their distribution in the Australasian region. Hopefully, the second part of the checklist will appear shortly.—LESTER L. SHORT.

Naturalist's color guide: Part I, the color guide; Part II, the color guide supplement.—Frank B. Smithe. 1975. New York, the American Museum of Natural History. Part I, pp. 23 unnumbered including 8 pp. of explanatory material, 86 color swatches on 15 pp.; Part II, pp. xiii + 229. Part I, $9.00; Part II, $5.00.—We must state at the outset that both of us are artists as well as zoologists, but that neither of us has formal art training. Our ideas about colors and color nomenclature have been gained from work with birds and mammals in the field and the museum and work with a variety of commercially prepared artists' media.

Anyone who has written taxonomic descriptions involving the comparison of colors has felt the need of a standard of reference and may well have consulted Ridgway's 1912 edition of *Color Standards and Color Nomenclature*. That volume contains examples of 1115 colors, many of them first named by Ridgway. Although it has been the color reference most widely used by biologists, it is not readily available to most researchers. Its enormous number of colors can overwhelm those employing it. But the greatest drawback is that many of Ridgway's color chips have changed with the passage of time and no longer match Ridgway's original color concepts or even each other. Smithe has developed this color guide to provide a standard less cumbersome and less subject to fading with time. The first part is in a compact loose-leaf binder with a pocket containing a neutral gray card with cut-outs for isolating colors and is

readily usable in the field. The second part is a paperbound supplement with descriptive and comparative data essential to the proper use of the first.

Although Smithe discusses several color references, he bases his comparisons mainly on Ridgway's work. His guide thus maintains traditional color nomenclature to a great degree, but each of his numbered colors is given a notation from the Munsell color system to avoid confusion. This notation, obtained from computerized spectrophotometer data, allows any color to be defined in terms of its hue (spectral color), value (degree of lightness or darkness), and chroma (intensity or saturation). Persons familiar with Munsell notation can actually visualize a color so defined. Smithe discusses each of his chosen colors and the other Ridgway colors related to it. He further cites Ridgway's uses of each color in descriptions of birds, and includes a master list of all Ridgway colors with their scientific notations. An appendix updates Ridgway's often outmoded scientific names. The color citations are perhaps the single greatest contribution of Smithe's work, because they will enable anyone without access to a copy of *Color Standards* to understand its terminology by reference to specimens.

Close adherence to Ridgway's color nomenclature creates many problems for persons using the new guide for making color notations such as those of soft parts on specimen labels. We find that the color swatches, as expected with such a small selection, seldom match an actual color exactly, and many colors are not close enough to any of the swatches to be designated clearly without circumlocution. We do not object to modifiers such as "light" and "dark," but if one is forced to employ actual color modifiers such as "reddish" or "yellowish," the standard's usefulness is destroyed. Sometimes a color can be acceptably defined as "between" two of the numbered colors, but too often we are left with no recourse other than a color modifier. The "browns" are particularly inadequate, despite a selection of 22 such colors. We find no color close enough to the term "burnt sienna," widely used by artists, and we believe the lack of a color standard for such a frequent color name as "rufous" is especially unfortunate despite Ridgway's neglect of the term.

Many colors with familiar names differ from widely held concepts. Hazel (35) seems too pink, Citrine (51) too dark, Cinnamon (39) too pale, Salmon Color (6) too yellow, and Ruby (10) so pink as to be unacceptable. We presented the page of "red" swatches, with the names covered, to ten individuals at random and asked each to point out Ruby; all chose either Carmine (8) or Spectrum Red (11). "Coral" would have been a better name for color 10. This situation is unfortunate as Ruby appears in so many bird names. Other colors will be confusing to artists because they differ from commercial pigments of the same name. Raw Umber (23) is too red, Burnt Umber (22) is too pale. Amber (36) would be better called Amber Brown, as it was by Ridgway, or better still Raw Sienna, an artist's pigment that matches it almost exactly.

Other colors are given unfamiliar one-word names that give no indication of the color group. Campanula (71) would be better called Campanula Blue, Cobalt (68) Cobalt Blue, and Geranium (12) Geranium Red (especially since Geranium Pink appears as 13). Glaucous (79 and 80) is used for two slightly yellowish grays, but Ridgway's Glaucous, as well as most dictionaries', is a type of green. In birds we have always thought of glaucous as a quality rather than a color, and as lexicographers support this view, it should thus be avoided as a color name. And finally we believe the time has come to suppress the name Flesh Color (5) as only a minority of the world's people have skin of that color, let alone flesh.

Despite these criticisms, the basic concept of Smithe's color guide is sound, and the loose-leaf binding will facilitate supplementation. Indeed, the author has already

begun the task of adding colors and revising nomenclature as evidenced by a form letter he has sent to various interested parties. Apparently he plans to add 14 colors to make an even 100, but we do not think that will be sufficient. The number of colors could be doubled without creating confusion. Among projected additions are the basic colors used in printing and in various artists' pigments. We would also like to see additions of colors useful to naturalists other than ornithologists, including botanists, herpetologists, and ichthyologists. We suspect that many of Ridgway's colors that he seldom used would be useful to scientists studying groups of organisms other than birds.

We regard this color guide in its present form as a definite step in the right direction. With proper revision and additions, it could become a widely used standard in zoological and botanical literature. As the guide is in its developmental infancy, we caution against its immediate widespread use without careful citation. We hope that all interested parties will communicate their opinions to the author to enable him to arrive at some consensus. The author's industry and receptivity to constructive criticism are commendable and we wish him success in this project.

The two volumes are well manufactured, but the color swatches have a tendency to chip at the edges. The price seems quite reasonable. We are happy to report that we have yet to find a typographical error!—H. DOUGLAS PRATT and JOHN P. O'NEILL.

Ornithology from Aristotle to the present.—Erwin Stresemann. Translated by Hans J. and Cathleen Epstein. Edited by G. William Cottrell with a forward and an epilogue on American Ornithology by Ernst Mayr. 1975. Cambridge, Harvard University Press. xii + 432 pp. $20.00.—This long hoped for translation of Stresemann's 1951 book "Die entwicklung der ornithologie von Aristoteles bis zur gegenwart" is a most welcome addition to the literature of ornithology. Not only does it succeed in transposing into another language the verve, the wide and accurate knowledge, and the sympathetic understanding of persons and events that the late author so markedly brought to bear on his history of ornithology, but thanks to the editor, the book has been given the documentation that it lacked in its original version. It has also been supplied with an extra chapter, or epilogue "Materials for a history of American ornithology" by Ernst Mayr.

Stresemann's volume gives a comprehensive account of the growth of knowledge about birds and of the development of ornithology as a science on a worldwide basis and over the whole of its existence as a biological discipline. His account is oriented to, and organized around, major problems, theories, and approaches, which has the great advantage of putting the work of our predecessors in proper perspective, and thereby enlivens the history of ornithology into a continuing narrative of an ever expanding and deepening intellectual enterprise, a story far more interesting to read than a series of names and dates, inescapable as these must be in any historical survey.

The book is divided into three parts, a short section dealing with the "foundations of ornithology," and two longer ones on the "development of systematics and the study of evolution," and one on the "development of biology (of birds)." The first begins with Aristotle and the other classical writers down to those of the Renaissance (Gesner, Aldrovandus, and others), all of whose accounts and speculations were necessarily limited to European birds (including Mediterranean Africa and Asia), as the rest of the world was then still unknown to them. It then goes on to discuss the beginnings of "exotic" ornithology, the rapid growth of knowledge about the bird life of distant realms brought back to Europe by the early exploring expeditions.

The second part gives much, and fascinating, consideration to the more important descriptive ornithologists of the eighteenth and nineteenth centuries, the men who, by their studies of the results of collecting expeditions to many parts of the globe, literally "made known" the world's avifauna. To the present day student of birds, who no longer needs to consult their writings to any extent, the names of such of their forerunners as Levaillant, Illiger, Temminck, Bonaparte, Hartlaub, and Schlegel, among others here take on their proper human attributes and proportions; their competitions and rivalries, their experiences and their points of view are here made accessible with a discernment and understanding and empathy that only a scholar of Stresemann's stature could make possible. This section ends with a discussion of the interpretive reorientation brought about by the theory of evolution, with its far-reaching implications, leading, in systematics, to an interest in local and minor variations, and eventually, to the acceptance of trinomial nomenclature.

The third section deals with the increase of knowledge of birds as living organisms, with their habits, migrations, distribution, and behavior, as contrasted with the earlier need merely to describe and "classify" the discrete members of the world's avifauna. The early theoretical approaches (teleological *versus* mechanical) to bird study are described for what they were—stages in the development of a better and more reliable understanding of birds, and then the author proceeds to the writings of the "Naumann Period" with their understandable mixture of anecdotal and interpretive contents. As the evolutionary concept of species changed from one of rigid fixity to a responsive evolvement, a flood of speculative literature came into being, a spate of words and ideas that eventually necessitated drastic corrective methods, what Stresemann terms "the return to empiricism." This led to much needed reforms in mode of thinking and evaluating the data of ornithology, and also led to the use of new methods, one of the chief of which was bird-banding. (Stresemann's volume closes before the advent of other recent techniques, such as bioenergetical studies and protein analyses.) The section then goes on to discuss changes in the ways of expressing and interpreting avian behavior, and ends with a critical appreciation of the work of ethologists, such as Lorenz and Koehler, and with a discussion of the current interplay of many special disciplines and techniques, of the "ramification and interconnection" they have brought to bear on the study of birds, no longer the "scientia amabilis" of earlier times, but a serious and well developed branch of biology.

Impressive as is Stresemann's coverage of the history and background of ornithology there are some serious gaps, or at least, lack of adequate emphasis in his presentation. More extensive treatment could have been afforded to the study of plumages and molts—Dwight's name and work are not even mentioned. Similarly, the study of avian paleontology would seem to merit more adequate presentation. Still, one should be grateful to the author for what he has given us, and not complain that he has not given more.

Mayr's epilogue is a valuable assemblage of what he rightly terms "materials for a history of American ornithology." It differs from the rest of the volume in being regional, not worldwide, but within its self-determined limits it provides a comprehensive coverage, greatly expanding upon Stresemann's necessarily brief and selective mention of nineteenth century aspects of bird study in North America.

This is a book that will give great pleasure and information to its readers. Ornithologists will be the better as specialists in their own field for having read it.—HERBERT FRIEDMANN.

ALSO RECEIVED

Another penguin summer.—Olin Sewall Pettingill, Jr. 1975. New York, Charles Scribner's Sons. 80 pp., 107 plates, many of them in full color. $10.00.—The short preface acknowledging the assistance and hospitality of Falkland Islanders is followed by 23 pages of introduction to the penguins of these islands. The concise life histories of Gentoo, Rockhopper, Magellanic, Macaroni, and King Penguins is beautiful writing and sound science. While Dr. Pettingill's pictures are a major part of the body of the book and tell a story all by themselves, his text is as informative and charming as the products of his cameras. I only wish he had published this some years ago. He would have saved me from grueling hours of research before I wrote my penguin book. This book is a must for ornithologists and also an ideal gift for nonprofessionals—young and old.—ELIZABETH S. AUSTIN.

The life and lore of the bird/In nature, art, myth, and literature.—Edward A. Armstrong. 1975. New York, Crown Publ., Inc. Pp. 250 + 22 unnumbered. More than 250 illustrations, black-and-white and colored from various sources, none original. $15.95.—This is undoubtedly Mr. Armstrong's most glamorous book and will be a decorative touch on many a coffee table, but it is by no means his best. Much of the material has come from his earlier and very sound but unglamorous "Folklore of birds," but his text does not encompass the subject matter of its title. He is a little too insular, or perhaps too Old World. The wealth of bird mythology in the life of North and South American Indians, of Eskimos, and of island cultures of the South Pacific are almost untouched. The tern cult that became the religion of the natives on Easter Island is ignored, as are the pelicans trained to fish by Indians in Central America and the penguins that furnished the only clothing worn by the Indians on Tierra del Fuego. The selected extracts of writings of other authors at the end of the book are interesting and well written but cannot make this volume a necessary tool for a professional ornithologist—nor can the book be acclaimed as definite work on its subject matter. It will remain on the coffee table.—ELIZABETH S. AUSTIN.

Pine Crossbills.—Desmond Nethersole-Thompson. 1975. Berkhamsted, England. T. & A.D. Poyser Ltd. Pp. 256. 1 color plate by George Lodge + 16 black and white photographs from various sources, chapter headings and other small drawings by Donald Watson, + 17 tables + 21 sound spectrograms + 3 distributional maps, British Isles, Scotland and Worldwide, £5.00 net.—This is a meticulous and well written account of a meticulous study of Scottish Pine Crossbills, with some mention of Common Crossbills, Two-barred (White-winged) Crossbills, other crossbills, other finches and a few birds such as Greenshanks that breed side by side with them in the northern woods of Scotland. It is a most interesting book even to one who is not devoted to Crossbills. Mr. Nethersole-Thompson watched the crossbills many years, starting in the 1930's and carrying on whenever possible through the 1960's, and tries to cover all aspects of crossbill life. He includes an interesting and broad bibliography, a chapter on the tangled crossbill taxonomy by Alan G. Knox, a day-to-day, minute-to-minute nest diary for 11 days in 1952, and amply detailed data in tabular form in the Appendix.—ELIZABETH S. AUSTIN.