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ORNITHOLOGICAL LITERATURE

THE BREEDING BIRD SURVEY: ITS FIRST FIFTEEN YEARS, 1965–1979. By C. S. Robbins, D. Bystrak, and P. H. Geissler. U.S. Fish and Wildlife Service, Resource Publication 157, Washington, D.C., 1986:196 pp., 77 numbered figures (including 27 maps and 366 graphs), 5 tables, and 8 appendices. No price given (paper). (Order from Publications Unit, U.S. Fish and Wildlife Service, Washington, D.C. 20240.)—Collectively, the authors have already contributed some 20 publications relating to the Breeding Bird Survey (BBS) and uses of its data, and are to be commended for their continuing efforts on behalf of this program. Almost certainly, the present work is intended as a broad overview that (1) condenses a large portion of the voluminous BBS data file, (2) advertises the BBS as a source of baseline data for population and other studies, (3) encourages interest and participation in the BBS, and (4) acknowledges the assistance of thousands of volunteers, without whom the BBS could not have progressed so far. For some readers, the authors' success in meeting these objectives will be overshadowed by their failure to satisfactorily "discuss the more important population trends detected by the survey in its first 15 years."

After a lengthy abstract, the book begins with short sections on "Field Procedures," "Data Processing and Analysis," "Bias Evaluation," and "Improvements in Editing and Analysis Techniques." The body of the work is a species by species account of observed regional trends gleaned from 12 to 15 years of BBS data. Information for over 240 species, recognizable subspecies, and groups of related species is presented, in most cases both textually and graphically. Following these accounts are brief sections on "Mapping of Relative Abundance," "Other Uses of BBS Data," and "Conclusions." Tables list the total number of individuals of all species and the number of routes on which they were found in 1977; the mean number of birds of a given species detected per route in all states and provinces from 1965 to 1979, and the total number of routes, total species, individuals per route, and species diversity index (H′) for each of 62 physiographic regions sampled by the BBS. Appendix F provides an index to published maps of the relative abundance of 240 species based on BBS and Christmas Bird Count data.

Although superficially thorough and admirable in scope, the publication is disappointing and frustrating in a number of respects:

(1) The work is inconsistent with respect to avian nomenclature and taxonomic order. Species in the text, and those listed in all but one of the tables and appendices, are named and sequenced according to the fifth edition of "The A.O.U. Check-list of North American Birds" and its 32nd and 33rd supplements. Appendix A ("Common and Scientific Names of Avian Species Mentioned") uses sixth edition scientific nomenclature and English name changes (the latter in brackets), but orders the species according to the fifth edition. It is difficult to dismiss this potentially confusing inconsistency, given that sixth edition nomenclature has been accessible since July 1982 (Auk 99 [supplement]:1CC–16CC).

(2) The authors fracture their data into too many geographic subsets. Species accounts are riddled with trend and other information for the entire continent and for any of three BBS regions, seven geographic subregions, 62 physiographic regions or strata, and 60 states and provinces. The latter division seems unwarranted in light of the authors' comment (p. 14) that "For any species, knowledge of the preferred strata gives more insight into the requirements of the species than does a comparison of relative abundance among States and Provinces." Also, one of the authors (Bystrak; Sialia 1:74–79, 87; 1979) has noted that "Better measurement of change can be obtained by the use of ecological regions than by combining data on a state or province basis . . . ." On the other end of the geographic scale, the authors might well have refrained from continent-wide analyses and concentrated only

on subregional and/or physiographic information. Still frustrating, however, would be the fact that a map on p. 12, showing the boundaries of the 62 physiographic regions referred to by name throughout the text, has these regions identified by number only and must be repeatedly keyed to Table 5 (pp. 158–159) which provides the name of each stratum.

(3) Analyses are attempted for too many species, including those that the BBS arguably, and even admittedly, does not sample well or without substantial bias (e.g., many nonpasserines, species with suboptimal sample sizes, birds that are difficult to identify or easy to misidentify, late nesters, species for which nonbreeding individuals may be more obvious than those breeding, and species for which the roadside populations sampled by the BBS may not be representative of larger populations that nest away from roads). Too often the authors ignore these and other sources of bias and present analyses anyway. On p. 14 we are given trends for native colonial herons, despite the fact that "Colonial nesting herons are not easily monitored by the BBS"; on p. 30, similar information is given for owls and goatsuckers, although "These nocturnal birds are poorly sampled . . . ." Several combined analyses are presented in an attempt to provide information about species with smaller sample sizes (pp. 16, 18, 23, 36, and 92), despite the admission that the more common species in these groups have an "undue influence" or "overriding effect" on the observed trends. For these and other reasons, perhaps a third of the species included in the book should have been omitted.

(4) By choosing a species by species format, the authors have missed several opportunities for interspecific comparison and have made a less meaningful biological and biogeographical contribution than they might have. The few group analyses provided (e.g., for native colonial herons, waterfowl [4 spp.], non-Killdeer shorebirds, western hummingbirds, non-flicker woodpeckers, flycatchers, vireos, and the genera *Vermivora* and *Dendroica*) combine species that are not comparable in many respects. A statement on p. 6 that ". . . analyses are performed for certain key habitats by combining data for several species that are typical of a particular habitat . . . ," finds no support in the body of the work. Nowhere do we find detailed comparative or summary analyses for species with shared breeding or wintering habitats or ranges, or with similar migratory habits; for species apparently displacing or being displaced by other species; or for the several species that the authors suggest exhibit winter-kill effects. While some of this information can be distilled from the work, the authors would have made a better case for the usefulness of their data had they taken this task on themselves.

Although the authors attempt a few direct comparisons between species, not enough was made of one such comparison, and too much was made of another. In the latter case (p. 67), they point to a "*close parallel*" [italics mine] between the eastern trends for the Carolina Wren (*Thryothorus ludovicianus*) and the Gray Catbird (*Dumetella carolinensis*), hinting that the unusually severe winters of 1976 and 1977 affected the species similarly. In what can only be described as an understatement, they qualify this with the remark, ". . . except that the population changes for the Gray Catbird were not nearly so severe, probably because this species winters several hundred kilometers farther south and therefore is not exposed to prolonged, severe cold." In the other case, although I looked forward to a detailed comparison of Blue-winged (*Vermivora pinus*) and Golden-winged (*V. chrysoptera*) warblers, the authors wrote simply (p. 92), "Despite reports that the Golden-winged Warbler is losing ground in competition with the Blue-winged Warbler, the Golden-winged Warbler population appears to be stable across the continent." Fortunately, they provide details, which although unintegrated, are more telling. The Golden-wing showed a significant decline only in the Great Lakes subregion and Wisconsin, but Wisconsin is the only state in which Golden-wings were more than twice as numerous as Blue-wings. The Blue-winged Warbler account, just two sentences long, indicates that this species increased in West Virginia, the

state with the highest average count of Golden-winged Warblers. Thus, Golden-winged Warblers seem to be losing ground in areas where they are most numerous; a fact arguably of greater biogeographical interest than the vague notion that the Golden-wing population is stable across the continent.

An undue concern for the continent-wide stability of a species or other taxon is expressed throughout the text. On p. 36 we learn that "Although some species of flycatchers have been decreasing, . . . data show that there is no continent-wide problem affecting the flycatcher family." Details given frequently provide a clearer picture, but such general statements can be misleading and may have an overriding effect on the conclusions drawn by all but the more careful readers and those experienced in bird study.

(5) Many of the causal relationships proposed by the authors between various phenomena and observed population trends for select species, constitute incomplete, speculative, or conflicting explanations that are unsatisfactory or unconvincing. On p. 98, a declining House Sparrow (*Passer domesticus*) population in the East over the past 60 years is attributed in part to the replacement of horses with automobiles, and to a ". . . continuing trend toward cleanliness in dairy barns, and to a lesser extent in other farming operations." But on p. 104, the authors partly account for an increase in Common Grackles (*Quiscalus quiscula*) with ". . . the trend toward mechanical harvesting of crops which leaves *more* [italics mine] waste grain . . . permit[ting] increased winter survival. . . ." In the case of the House Sparrow, might not this, as well as the trend toward more backyard bird feeding, balance the purported trend toward cleaner barns?

The authors point to the severe winters of 1976 and 1977 in their explanations for declines in several species. While these probably do account for coincident sharp drops in the mean annual counts of a number of less hardy species, it is an unlikely explanation (although the authors suggest it on p. 63) for a pronounced downward trend, since 1972, for the Bewick's Wren (*Thryomanes bewickii*) in the Central and Eastern regions. I was surprised, given the considerable speculation since before the turn of the century, to find no discussion of the influence of the House Wren (*Troglodytes aedon*) on eastern Bewick's Wren populations.

Still other analyses seem incomplete. On pp. 53–54, in their analysis of Black-capped Chickadee (*Parus atricapillus*), the authors ". . . found no correlation between the breeding populations anywhere in the Northeast and the years in which autumnal irruptions were detected along the coast of Massachusetts . . . ." But their published analysis, at least, does not include information for Maine, a state that has twice proved to be the origin of fall migrant chickadees captured at Powdermill Nature Reserve, a banding station in the mountains of southwestern Pennsylvania.

Sometimes data given do not support the authors' contentions. Their statements on pp. 1 and 123, respectively, that "Effects of urban and suburban expansion are often reflected in the loss of forest interior birds," and ". . . those species dependent on forest interior habitats . . . are disappearing from many areas," are contradicted by their data, which show that only a few woodland species registered significant declines. On p. 96, the authors point out that "Despite loss of habitat through fragmentation of forests, the Ovenbird [*Seiurus aurocapillus*] has continued to show an increase . . . ." Oddly enough, they implicate habitat loss only in their explanations for declines of species characteristic of early successional or scrub habitats (e.g., Prairie Warbler [*Dendroica discolor*], Yellow-breasted Chat [*Icteria virens*], Field Sparrow [*Spizella pusilla*], and Loggerhead Shrike [*Lanius ludovicianus*]). Those who believe that these species are declining even where such habitats are artificially or naturally maintained (e.g., power line rights-of-way and fire-prone scrub), may not be convinced.

The authors have largely ignored or overlooked factors "south of the border" which might have influenced trends in North American breeding bird populations during the period

considered. In their explanation for only one trend, that of the Scissor-tailed Flycatcher (*Tyrannus forficatus*) (p. 36), do the authors suggest that ". . . for a possible explanation we should perhaps look to southern Mexico and Central America where [the] species winters." On p. 3, they state that it might take another decade's worth of data to ". . . enable the . . . measurement of effects of changing land use on avian populations both here and on the tropical wintering grounds . . . ." Even so, the reader must consider that the apparent population increases of so many species that are woodland nesters, neotropical migrants, or both, may be symptomatic of certain biases inherent in the BBS. In any case, a thoughtful discussion of this surprising result would seem to have been in order.

The above criticisms notwithstanding, the value of long-term studies such as the BBS cannot be overstated. And while probably the best information given (e.g., on relative abundance and species composition and diversity) is the most briefly considered, the present work nonetheless validates the BBS as a productive data source. At the same time, and perhaps inadvertently, it highlights the need for extreme care in the interpretation of these data and the need to know what it is that the BBS most reliably measures.—ROBERT S. MULVIHILL.

HANDBOOK OF THE BIRDS OF EUROPE, THE MIDDLE EAST, AND NORTH AFRICA. THE BIRDS OF THE WESTERN PALEARCTIC. Vol. IV, Terns to Woodpeckers. By Stanley Cramp (chief ed.), Duncan J. Brooks, Euan Dunn, Robert Gillmor, P. A. D. Hollom, Robert Hudson, E. M. Nicholson, M. A. Ogilvie, P. J. S. Olney, C. S. Roselaar, K. E. L. Simmons, K. H. Voous, D. I. M. Wallace, Jan Wattel and M. G. Wilson. Illustrated by Norman Arlott, C. J. F. Coombs, N. W. Cusa, H. Delin, Robert Gillmor, C. E. Talbot Kelly, and D. I. M. Wallace. Oxford Univ. Press, New York, New York, 1985: 960 pp., 98 color plates, numerous range maps, line drawings, sonagrams and diagrams. $98.00.—Volume IV of this magnificent work is every bit as good as its predecessors. The same high standard of scholarship prevails, and the art work is lavish, accurate, and a pleasure to behold. One hundred and thirteen species are covered, completing the nonpasserines; 3 passerine volumes will complete the series. The scope and format remain the same; these are described in detail in my review of Volumes I and II (Wilson Bull. 93:430–432, 1981). The "Field Characters" section seems to be even longer than in previous volumes, sometimes occupying a full page in difficult cases like that of Common Cuckoo (*Cuculus canorus*) and Oriental Cuckoo (*C. saturatus*). Species accounts average about 8 pages, though varying considerably according to degree of knowledge; lengthier treatment is accorded well-known birds like Common Tern (*Sterna hirundo*) (16 pp.), Woodpigeon (*Columba palumbus*) (18 pp.), and Tawny Owl (*Strix aluco*) (21 pp.); but even vagrants like Aleutian Tern (*Sterna aleutica*) (one record, Britain), Yellow-eyed Stock Dove (*Columba eversmanni*) (accidental, U.S.S.R.), and Jacobin Cuckoo (*Clamator jacobinus*) (1 record, Chad) are given 1½–2½ pages and a complete if abbreviated treatment, with field characters, habitat, distribution, movements, voice, etc. The amount of information packed into these volumes is absolutely astounding; nearly 8 pages are devoted solely to the food of the Tawny Owl! The wealth of illustrations of birds in flight, from both above and below, is an extremely valuable feature of this work. As a rule not many races of each species are shown, doubtless for space reasons, exceptions being some of the owls, and I did enjoy finding, tucked in among the variants of the Rock Dove (*Columba livia*), the race *C. l. dakhlae,* endemic to the Dakhla and Kharga oases of Egypt. I continue to find the plate keys somewhat difficult to read, partly because the information is scrunched in so tightly that the eye is easily confused. The problem becomes worse when there are a lot of figures on the plate, and they are not numbered sequentially from top to bottom. I eventually found my way through the maze of swifts on Plate 63 and found what I was

looking for, a Pallid Swift (*Apus pallidus*) drawn from above, correctly showing the contrastingly pale secondaries, and tertials which help to distinguish it from the Common Swift (*A. apus*), conveniently placed next to it on the plate.

A few errors inevitably creep into a work of this size. On Plate 26 there are 28 sandgrouse figures but the plate key only lists the first 12, and on p. 813 we find "*Colaptes auratus,* the Yellow-shafted"—someone forgot to add Flicker. The dotted line showing the regular southern limit in winter of the Snowy Owl (*Nyctea scandiaca*) in North America in noninvasion years is somewhat unambitious, omitting as it does nearly all of New England and much of Alberta. My pet peeve with this work is the complete lack of interest in English names. Whether this is due to inattention, benign neglect, or simply lack of any policy, the attempts to standardize the English names of birds of the world being made in Australia, Africa, North America, and elsewhere have passed completely by the authors of "Birds of the Western Palearctic." In these pages "The" cuckoo, "The" Nightjar, "The" Swift, "The" Kingfisher, and "The" Bee-eater still fly in unmodified splendor, sole proprietors of the family name. The western Palearctic, it would seem, is very resistant to change.

Enough said. Those who own the first 3 volumes of this series will be equally delighted with this one; and those who don't had better buy all 4 volumes quickly before inflation pushes the price even higher.—STUART KEITH.

A CODED WORKBOOK OF BIRDS OF THE WORLD. Vol. 2: Passerines. Second edition. By Ernest P. Edwards. 1986:x + 170 pp., 10 maps. $15.00. (paper cover, plastic binding). (Available from the author, Box AQ, Sweet Briar, Virginia 24595.)—Of lists of the world's birds there seems to be no end. Ernest Edwards who was the author of one of the first (and best) of these lists, has now brought forth a revised (and improved) second edition in two volumes. The first edition of this work, as well as Volume 1 of the second edition, were apparently never reviewed in "The Wilson Bulletin." I will therefore describe the present work in some detail.

The aim of this publication is twofold, to supply a list of names of the world's birds and to devise an alphanumeric code for representing the classification. It is the author's hope that this coding system will be useful for computer entry and other purposes. Besides the list of names, an abbreviated statement about the range is given.

The coding system in the second volume is not the same as the one in the first edition, but represents a distinct improvement of alternating letters and numbers. Quite conveniently Edwards recognizes only 25 orders which are represented by upper-case letters, omitting the letter "O." Hence all the birds in this volume come in order "Z," the Passeriformes. The families are given a number denoting their place in the classification and arrangement that Edwards has adopted. Thus the number 65 represents the family Emberizidae, the 65th in the list. A lower case letter follows, representing the subfamily. The subfamily Emberizinae is letter "c" of this family. This is followed by a number representing the species. Thus as an example, the White-throated Sparrow (*Zonotrichia albicollis*) is listed as "Z65c-56." With a little practice the system is easy to grasp, but I wonder about its eventual adoption by many workers.

The distributional information is also coded. For the White-throated Sparrow the distribution is given as "Hn:c.Can-ne. US/Mex.," which translates to North America (Hn): central Canada to Northeastern U.S./with migrants as far south as Mexico. Such a system obviously works best for nonmigratory species with limited ranges. A set of maps and a list of abbreviations explaining the regional codes are included.

The classification used is that proposed by Cracraft (1981) with some modifications. This

is unfortunate as Cracraft's treatment of the passerines was rather cursory and was admittedly only a hypothesis to be tested. Edwards recognizes 69 families. The enormous family Muscicapidae (of the A.O.U. Check-list) is dismantled into 10 families, restoring amongst others the thrushes and old world warblers to full familial status. The new world warblers, tanagers and icterids are also restored to full family rank. The Carduelinae are considered part of the Emberizidae, which is the old Fringillidae minus *Fringilla.* Most of these changes are defensible, and the dismantling of the Muscicapidae has been carried out in the last volume of the Peters Checklist. However, the results so far published of the DNA hybridization work indicate that many of our present families should be down-graded to subfamilies or even tribes. The last word on classification has yet to be heard.

A comparison with the 1983 A.O.U. Check-list is in order. I count six species recognized by the A.O.U. and not by Edwards, and three recognized by Edwards but not by the A.O.U. In all cases these involved disagreement about the status of geographical variants, subspecies vs species. I counted 37 differences in the scientific names, mostly in generic assignment, and 157 differences in English names, mostly of a trivial nature. These involve Edwards' well-known use of "creeper" rather than treecreeper for the Dendrocolaptidae. Not many readers will be concerned as to whether the members of the genus *Phylidor* are leafgleaners (Edwards) or foliage-gleaners (A.O.U.).

There is also a full discussion of differing taxonomic opinions given in a series of footnotes for each family. But here too the reader must understand a code. Thus typical footnote entry is "Z65b-36 -s.a.b.t. *P. amoena* i.o.m.b.p.o. *P. cyanea* Z65b-35," which tells us that "Some authorities believe the "*P. amoena*" is or may be a part of *P. cyanea.* This information appears to be quite thorough, and to my knowledge no other world list gives any such discussion.

There are four indices: "Genera," "Important Sub-specific Units," "Scientific Names," and "English Names."

In summary, the "Workbook" presents a very workable and usable list of the World's passerine species, together with abbreviated but useful distributional information. Edwards has a reputation of being a careful worker, and the reader can have confidence in the accuracy of the information given. It remains to be seen if the Code for representing the species and their hierarchical arrangement is ultimately used by any number of workers.—GEORGE A. HALL.

THE KNOWN BIRDS OF NORTH AND MIDDLE AMERICA. Part 1. By Allan R. Phillips. Privately published, Denver, Colorado. 1986:1xi + 259 pp., 2 color plates, 9 black and white figs. $60.00. (Obtainable from Dept. Zoology, Denver Museum of Natural History, City Park, Denver, Colorado 80205.)—There are those who complain that present-day scientific writing is "dry as dust" and generally lacks any personality. The volume at hand is certainly an antidote to that accusation. As might have been expected from Allan Phillips the present work is idiosyncratic, peppery, not to say polemical, but for all of that a contribution worth examining. The work represents the first part of Phillips' personal "Check-list" giving, according to the subtitle, "Distributions and Variation, Migrations, Changes, Hybrids, etc." of the "known" birds. The "known" emphasizes Phillips' well-taken point that a title such as "The Birds of Ruritania" implies that nothing more is to be learned about the avifauna of that area. Phillips feels that there is much yet to learned about the birds of North and Middle America, and indeed claims to have seen briefly several birds not known to be described anywhere.

This book covers only the first few families in the Oscine list as given by the Wetmore order: Hirundinidae, Corvidae, Laniidae, Paridae, Aegithalidae, Remizidae, Sittidae, Trog-

lodytidae, Cinclidae, Pycnonotidae, Timaliidae, Mimidae, and Certhiidae. The area covered differs somewhat from that covered in the Sixth Edition of the A.O.U. Check-list in that Phillips includes Greenland and Cuba (but not the rest of the West Indies), along with the North American continent south to Panama, while the A.O.U. omits Greenland, but includes the Indies and Hawaii. I have compared carefully the two lists for the area they both include and find that Phillips recognizes 145 species in this area while the A.O.U. recognizes 143 (including additions made in the 1985 supplement). I will take up the differences later.

The list cannot be appreciated fully without an understanding of Phillips' strongly held opinions, his prejudices, and his *bêtes noires,* of which the reader will soon be well-aware after reading the 61-page Introduction. There are too many to enumerate them all here, but I mention three of his most prominent ones. He has no use for the A.O.U. Committee on Classification and Nomenclature, which he refers to simply as the "AOU" or often as the "Eisenmann/AOU." In particular he is vociferous and caustic about some of the changes in English names made in the recent list, a view shared by countless "birders." The International Commission on Zoological Nomenclature is constantly taken to task for its abandonment of strict priority in its use of *nomina oblita.* Finally it seems that nothing that emerges from Berkeley's Museum of Vertebrate Zoology can have any scientific merit whatsoever. The transgressions of these groups, and others, are pointed out and discussed at great length, repeatedly, and frequently to the point of boredom on the part of the reader.

Phillips does not recognize *Progne cryptoleuca, P. sinaloae, Calocitta colliei, Pica nuttalli,* and *Mimus gilvus* accepted by the A.O.U. Check-list. On the other side he grants specific status to *Stelgidopteryx ridgwayi, Corvus sinaloae, Troglodytes beani, Thryothorus albinucha,* and *Mimus magnirostris,* all considered to be subspecies by the Check-list Committee. Besides these Phillips sinks *Aphelocoma coerulescens,* dividing it into three species, *A. floridana, A. californica* (which includes the *woodhouseii* group of the A.O.U.), and *A. insularis.* None of these differences is very radical, as in all cases the A.O.U. Committee discusses these possibilities in the "Notes" section of the various species.

There are several differences in scientific names, the most variant being the assignment of the Gray Catbird (*Dumetella carolinensis*) to the genus *Lucar,* and the use of the specific names *albifrons* for the Cliff Swallow (*Hirundo pyrrhonota*) and *domesticus* for the House Wren (*Troglodytes aedon*). The other differences come largely from the different criteria for generic recognition. In the matter of English names Phillips is a traditionalist and generally prefers the names that date from the 1931 Check-list, even when these were applicable to only one subspecies.

One advantage the "Known Birds" has over the Check-list is the extent of the documentation. In the Check-list it is often difficult to determine why the Committee made such and such a taxonomic decision, but Phillips has been assiduous in giving references, although his system is not the easiest to use and there is no terminal bibliography.

The major contributions of this work are two. Phillips has presented some detailed distributional data that in some cases disagrees with the material in the A.O.U. Check-list. The disagreement is particularly noticeable in the Middle American species which have occupied Phillips for so many years. These differences deserve careful attention, an in many cases Phillips points out where good knowledge is lacking. The other contribution comes from the careful attention to geographic variation and the description of subspecies. The 1983 Check-list omitted the discussion of subspecies, but we are told that the Committee on Classification and Nomenclature is working on a full-scale treatment of these. This Committee will certainly have to take Phillips' material into consideration. Subspecies are now considered to be *passé* by many ornithologists, and one of the continuing sermons in Phillips' book takes to task those of such persuasion. Phillips has enlisted the help of Robert W. Dickerman, Amadeo M. Rea, and J. Dan Webster for taxonomic treatment of certain

species or parts of species. Indeed, an appendix gives a detailed and exemplary review of *Certhia americana* by Webster. Phillips places the family Certhiidae as *incertae sedis.* Three other appendices by Rea present basic data on *Corvus* and *Lanius.*

The long introduction deserves reading by all ornithologists. Of course one must accept and allow for the polemics, but the message is valuable. Much of this introduction is devoted to an advocacy of further collection of specimens. Of special interest are his remarks about the absurdity of the claim by permit granting agencies that collecting must be controlled for the conservation of birds. Phillips discusses in detail (sometimes too much detail) the fact that existing museum collections have in many cases deteriorated too much to be useful for studies of color variation. The sections on "Why we can *not* trust our eyes in science" and "Problems in the use of museum specimens" should be required reading for all those who feel that the collecting of specimens is no longer needed either for assuring proper identification of rarities or for adding to museum series.

The text would have benefited from tighter editing. Phillips sometimes goes out of his way to castigate someone who disagrees with him, and while many of his fulminations are interesting, they are often repeated too many times and in too many irrelevant places. He frequently calls an opinion or statement unscientific, but it seems to me that Phillips himself is unscientific in arbitrarily rejecting all results of modern techniques of studying avian classification.

The book is handsomely published and is apparently free of typographical errors. The map labeled "Distribution of American *Corvus corax*" omits all of the eastern occurrences.

The work is graced by two colorplates by Anne Pulich, showing the *Stelgidopteryx* swallows and the *Microcerculus* wrens.—GEORGE A. HALL.

THE ENCYCLOPEDIA OF BIRDS. By Christopher M. Perrins and Alex L. A. Middleton (eds.). Facts on File Publications, New York, New York, 1985:xxxi + 447 pp., heavily illustrated with color artwork panels and photos, small range maps. $35.00.—This sort of general compendium has been done repeatedly over the last few decades, but seldom so well. The reasonable price is a bonus. The title is a little misleading for the book is more an encyclopedia of bird *groups*—usually families or orders. The text is written by 88 expert contributors: 46 from Great Britain; 19 from the U.S. and Canada; 14 from Australia and New Zealand; and 9 variously from Europe, South Africa, Costa Rica, and Malaysia. Curiously, Alex Middleton does not appear in the list of contributors, although he is co-editor with Perrins.

The book begins with a short "Preface" and "Notes on Classification" by Perrins. As is appropriate in a work for the general reader, there are no taxonomic breakthroughs here, with the classification based "with few exceptions, on the so-called Wetmore order which is used in [Peters' *Check-List*]"! The number of species in each family is that of Gruson's "Checklist." One could raise an eyebrow at the editorial discretion here, but that might be quibbling, in view of the general excellence of the text.

The body of the book is introduced by a general chapter on avian biology by Perrins—14 pages outlining bird evolution, the fossil record, physiology, anatomy (including plumage and with an emphasis on flight adaptations), breeding biology, and behavior. The main text is arranged in taxonomic order and blocked out in three parts of approximately equal length: ostriches to button quails, plovers to woodpeckers, and passerines. Each of the 66 group entries is organized into a general text discussion of physical features, distribution, evolutionary history, classification, breeding biology, diet and feeding behavior, social dynamics and spatial organization, conservation problems, and relationships with man (with modifications of this format, as appropriate). Each group (usually a family but occasionally orders, suborders, or subfamilies, depending on their size) is given an information panel or side

bar that provides a factual condensation of the formal classification, the number of genera and species, the main distribution (also shown on a small outline map of the world), the habitat in which the birds are found, their body dimensions (including weights and a system of silhouettes of the largest and smallest species scaled against a human figure—entire, legs, head, or foot), plumage, voice, nests, eggs, diet, and a list of representative species with both English and scientific names. On some pages are special boxes for discussions of particular features of a group such as the courtship displays of bustards, lead poisoning of waterfowl, hornbills in human cultures, and cooperative breeding in babblers. These special boxes offer some of the most interesting reading in the book.

In addition to their fine assembly of authors, the editors have enlisted the talents of 10 excellent artists, including one of my personal favorites, Robert Gillmor. Each entry is well illustrated with a variety of color artwork, usually showing the range of types found in the group, and many also have black-and-white drawings of behavioral specialties such as a blackbird "gaping" for food in vegetation, various courtship sequences, pelicans diving for food, and the changes in dry vs soaked belly feathers in sandgrouse. There are also many color photographs: most are excellent, some are magnificent, a few are just adequate. The color reproduction is superb and the page design both pleasing to the eye and well organized as to content.

The only serious negative aspect I found in this book was the short shrift given to certain, especially New World, groups: The tinamous (46 spp.) are allotted only 1 page of text (and a full-page photo of the front end of a crouched *Crypturellus* that adds little), but the next order, penguins (16 spp.), receives 10 pages; the pigeons (300 spp.) get only 4 pages, whereas auks (22 spp.) get 8. Some very large groups are also skimped: the (mostly) New World "suboscines" (1065 spp.) are granted just 20 pages (in 4 groups), the Muscicapidae (1394 spp.) have 18 pages, and the starlings-orioles-drongos (154 spp.) get only 4, while the Falconiformes (286 spp.) have 24 pages. Granted, more is known about some birds than others, but much is available that could have been included—I'm sure that John Fitzpatrick and David Snow could have written a great deal more than 1½ and 2 pages, respectively, on tyrant flycatchers and manakins-cotingas, given the space by the editors. Unfortunately, this sort of bias is common in books of this nature, but I was disappointed to see it in an otherwise fine book. On the other hand, I was pleased by the clear effort not to overemphasize European species—a tendency common in books produced by European companies (this one is credited to Equinox [Oxford] Ltd.). The availability of high quality photographs must make it very tempting to use the output of local photographers rather than make the effort to find less commonly illustrated species.

I found no statement that this title was designed for publication in several countries but it almost surely was. In any case, American readers will find only a few "Britishisms" that made it into the American edition: "darters" rather than "anhingas," and an American Whip-poor-will (*Caprimulgus vociferus*) was "ringed" rather than "banded" (p. 248), but Gaviidae are "loons" *or* "divers."

The book concludes with 2 pages of bibliography and art and picture credits, a 2-page glossary, and a 12-page index (the last printed in vanishingly small type, a tendency I've noticed lately in large-format British publications). The proofreading was meticulous (I noticed only one error and that probably was editorial rather than typographical—"Motmotidae" (p. 270, twice) but, correctly, *Momotus*. In no case did I find a vernacular name that was not accompanied, somewhere in the account, by its scientific equivalent.

Although it is the duty of a reviewer to point out the shortcomings of a book, none of my criticisms should alter the conclusion that this is a *superb* book for its type, and the price makes it a bargain addition to any library—professional or otherwise.—MARY H. CLENCH.

A FIELD GUIDE TO THE BIRDS OF COLOMBIA. By Steven L. Hilty and William L. Brown, illus. by Guy Tudor, H. Wayne Trimm, John Gwynne, Larry McQueen, John Yrizarry, P. Prall, and Michael Kleinbaum. Princeton Univ. Press, Princeton, New Jersey, 1986:836 pp., 56 color plates, 13 half-tone plates, 100 line drawings, 11 photos, 1 table and 1475 range maps. $45.00 (paper), $95.00 (cloth).—This monumental book is the latest in a series of field guides that reflect the extent to which our knowledge of South American birds has increased since the publication in 1964 of Meyer de Schauensee's landmark "The Birds of Colombia" (Livingston Press, Narberth, Pennsylvania). Hilty and Brown have compiled an extraordinary amount of information on each species including their field identification, vocalizations, behavior, and breeding in addition to the more typical information on plumage, status, habitat, and range. There are also 1475 range maps and a guide to finding birds in Colombia. These details set this guide apart from all other South American guides; clearly, it was written by and for field-oriented ornithologists and bird-watchers.

The plates, including 47 by Guy Tudor, are superb, and line drawings fill many of the gaps in coverage. The majority of the paintings are borrowed from two other Princeton Univ. Press field guides, "A Guide to the Birds of Venezuela" (Meyer de Schauensee and Phelps 1978) and "A Guide to the Birds of Panama" (Ridgely 1976). There are, however, several new plates, and Colombian species not found in Panama and Venezuela have been added to the older plates. The result is that nearly all resident birds are illustrated. The two new tanager plates by Guy Tudor (Nos. 48 and 50) are especially beautiful. As usual, most Nearctic migrants are not shown.

Range maps at the end of the book are extraordinarily detailed and will be useful for ornithologists and birders visiting Colombia and also for biogeographers. Hilty and Brown have been especially careful in showing the ranges of species with narrow elevational distributions.

The text of the book is well planned and executed. The introductory section includes clear definitions of terms, an explanation of the complex topography and climate of Colombia, descriptions of the major habitats, a section on migrants, a brief discussion of conservation problems, and the history of Colombian ornithology. I found the habitat descriptions to be especially useful—few previous field guides have presented such detailed information on bird habitats. Hilty and Brown clearly appreciate the important distinctions between *varzea* (seasonally flooded) and *terra firme* (above flood level) forest in the Amazonian section of Colombia.

Species accounts contain a wealth of detail that facilitates identification while at the same time providing information of use to researchers. I found the "similar species" section to be quite useful in the field. The addition of this section as well as the more extensive use of italics for diagnostic characteristics represent a major advancement over the other South American field guides. The details on voice and behavior show how carefully Hilty and Brown researched each species. In addition to references to the published literature, there are many unpublished observations by the authors and by other field workers such as Ted Parker, Van Remsen, Tom Schulenberg, John Fitzpatrick, and Robert Ridgely among others. The authors also made extensive use of their own recordings and those of the Laboratory of Ornithology's Library of Natural Sounds, including many by the late Paul Schwartz. As a result, a great deal of natural history information is presented in this book for the first time. I was amazed, for example, to find a detailed account of the behavior and voice of the Black Bushbird (*Neoctantes niger*), a bird I had always thought was essentially unknown outside of a few scattered specimens. Hilty and Brown state that Black Bushbirds "often peck and chisel fallen rotting logs somewhat like a piculet" and are found "inside or at the edge of humid *terra firme* and *varzea* forest, esp. in log-scattered swamps or creek borders

. . . ." Details such as these make for fascinating reading and clearly demonstrate the authors' vast field experience with even the most obscure and secretive species.

The field guide is large, which makes it rather cumbersome to use in the field, but large size is unavoidable when dealing with a fauna of 1700 species. Unlike "A Guide to the Birds of Venezuela," which tends to fall apart after a few months in the field, this guide is well bound. All three paperback copies we took to Peru last fall survived intact 4 months of nearly continuous use. Apparently, Princeton Univ. Press has learned from their previous experiences and greatly improved the binding to withstand field conditions. The hardback, which is also unusually expensive, is printed on acid-free paper, which should increase durability. The reproduction of the color plates in the copies I have seen has been excellent. I hope that funds can be found to translate the guide into Spanish.

"A Field Guide to The Birds of Colombia" incorporates the best features of the publisher's two other Neotropical field guides. It combines the best of the artwork of "A Guide to The Birds of Venezuela" with the detailed field-oriented text of "A Guide to The Birds of Panama." This book is and will continue to be essential for everyone visiting the Neotropics and for collectors of bird books. I feel that this book is worth the money, which is high praise indeed for such an expensive book.—SCOTT K. ROBINSON.

THE ATLAS OF AUSTRALIAN BIRDS. By M. Blakers, S. J. H. F. Davies, and P. N. Reilly (eds.). Melbourne Univ. Press and the Royal Australian Ornithologists' Union, Melbourne, Australia, 1984:738 pp., 782 distributional maps, 648 vignettes of birds. $54.00 (Australian).—This comprehensive distributional atlas (page measurements 11 × 8 in., range maps of 6 × 6 in.) is the result of a cooperative project involving 300 field workers (90% of them amateurs). It is the result of four years of concentrated work which involved both repeated assessments in better known areas and the mounting of a series of expeditions to remote places to fill in the gaps. There is a Bibliography of 1929 titles. Breeding and nonbreeding distributions are shown separately. An endeavour is made to get data on historic changes in bird distributions and abundances by treating the data at three levels: (1) records prior to 1901 (plotted on smaller maps at the back), (2) 1901–1950, and (3) 1951–1976. The first is obviously much less complete than desired. Already, by the turn of the century rabbits and sheep had greatly modified Australian habitats. We have good data prior to 1900 for only for a few select areas. But these, the 1901–1950 data, and recent work does confirm considerable distributional and numerical changes, with many of the more interesting species becoming rare and others (that thrive with clearing) both increasing their ranges and becoming much more abundant. Documentation of this is one of the great achievements of the Australian atlas. The second achievement is the provision of a series of modern distribution maps of all the Australian bird species. The third is to bring out the occurrence of a range of previously unsuspected seasonal shifts in distribution in many species (i.e., differences in breeding and nonbreeding areas of concentration).

In developing the atlas the following procedures were followed. Data were plotted on maps of the continent with 1° grids (giving a total of 885 blocks). For insular Tasmania the blocks were 10 min. For better-known areas several dozen sheets were compiled compared to one or two for remote places. Bias was minimized by adjusting for such differences in reporting rates.

The atlas is enlivened with a 400–500 page account of the biology of each bird species, and with a series of small black-and-white vignettes. Hence in more ways than one it is an invaluable document. One can only wish the R.A.O.U. luck with their follow-up project, developing data on abundances of the various bird species in different areas.—ALLEN KEAST.

THREATENED BIRDS OF AFRICA AND RELATED ISLANDS. By N. J. Collar and S. N. Stuart. Int. Council for Bird Preserv. and Int. Union for Conserv. Nature and Nat. Resources, Cambridge, England, 1985:xxxiv + 761 pp., 12 color plates. £24 ($45.00 from Buteo Books, Vermillion, South Dakota).—Listed on its cover as "The ICBP/IUCN Red Data Book Part 1," this volume treats in comprehensive, if summary, detail the endangered, threatened, and possibly threatened birds of Africa and such outlying islands as Madagascar! Discussed fully are 172 "threatened" species (plus 1 "Out-of-Danger" and 4 "Of Special Concern"), more briefly 93 "near-threatened" species, 16 "threatened" or "near-threatened" incipient species, and 23 or 24 species whose main range falls outside the region and will be covered more fully in subsequent "parts" (on the Americas, Eurasia, Australasia, and the Pacific, etc.). For each threatened species there are these sections: "Summary," "Distribution," "Population," "Ecology," "Threats," "Conservation Measures Taken," "Conservation Measures Proposed," and sometimes, "Remarks," as well as references. Most accounts are several pages in length, but there are 35 pages on the Northern Bald Ibis (*Geronticus eremita*), which really is a Mediterranean species. The accounts are generally excellent, and provide in capsule form a host of information on the biology of these species, with extensive, up-to-date references. The book is a tribute to the many contacts within (and outside) Africa made by I.C.B.P., I.U.C.N., and the authors.

Where evidence is indicated, no holds are barred in calling attention to the sources of threats. In one sense the book is too up-to-date, for between the lines are indicted some governments and agencies in Africa which are continuing or expanding upon some faulty colonial programs. Most "threats" have a long history of development initiated in colonial times. It is no wonder that we cannot and must not urge preservation upon African nations for abstruse, philosophical, or long-term practical reasons—preservation simply has to make sense economically, in the short term.

Naturally a great proportion (44%) of threatened species are on islands, usually relatively small in area and having faced a long history of human interference with ecosystems. Some 28 such species are on Madagascar and 20 in the Mascarenes, Seychelles, and Aldabra. Although two species have not been seen in 50–100 years, there is as yet no documented extinction in recent times on the African mainland. Don't hold your breath, though—65% of the tropical African or Afrotropical threatened species are dependent upon forests, and it is the forests that are disappearing and changing most rapidly, involving the very avifaunas most susceptible to subtle let alone massive changes. The authors pinpoint five areas of special concern that involve 92% of the threatened forest species: the Upper Guinea Forest, the montane and lowland forests of western and southern Cameroun (both an area of endemism and a faunal exchange area), the western scarp of troubled Angola, lowland and mountain forests from southwestern Uganda and Rwanda to adjacent Zaire ("Albertine Rift"), and the pitiful remnant of eastern Kenyan and Tanzanian forests. Some of these forests, of which little is left, are going fast (e.g., Mount Nimba's forests in West Africa and Sokoke Forest in eastern Kenya). Yet I suspect that when more data are available, nonforest avifaunas will be shown increasingly and severely threatened by the kinds of changes (desertification, firewood gathering, grazing in marginal lands) now taking place wholesale. The problems of some nonforest birds are masked by apparently wide distributions, but habitat fragmentation and degradation could make many such species threatened soon.

One can question some inclusions of material, and page space given to species that have been studied extensively (on islands especially), and are covered in prior I.C.B.P. reports. Some of these species (e.g., Mauritius Kestrel, [*Falco punctatus*]) are represented by tiny populations and have relatively little chance of increase in the wild, given human activities and lack of habitat. Norman Arlott's usually good paintings grace the book—but they increase

its price, and thus directly cut into its distribution among African wildlife workers who need just this sort of book. (It is even expensive for those inevitably underpaid expatriot ornithologists trying so hard to help in the African countries.)

I could quibble philosophically about conservation's impingement upon science in the case of the broadened biological species concept the authors favor. By excluding megasubspecies from consideration, they are prone, as they state in the Introduction, to raise to species status some such forms and very questionable species (one frequently sees threatened species noted as "often considered subspecies of "). We should educate about what species are, how they evolve, and how important to their long-term survival are genetically distinct populations (subspecies or not!). But I don't want to belabor the authors for the fine job they have done, in a limited time (a bit over 3 years). They have set a high standard for the other "parts" of the Red Data Book, the next of which (on the Americas) is due out soon.

I recommend this book highly to all concerned amateur and professional ornithologists (all of whom *ought* to be "concerned"), for it well attests to the variety and severity of the threats to birds (and ultimately to our science, which depends upon them, and even to us) the world over, but especially in the tropics, where there are the most birds to lose.—LESTER L. SHORT.

ECOLOGY AND MANAGEMENT OF THE SPOTTED OWL IN THE PACIFIC NORTHWEST. By Ralph J. Gutierrez and Andrew B. Carey (eds.). U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station, General Technical Report PNW-185, Portland, Oregon, 1984: 119 pp., 8 numbered text figs., 18 tables. No charge.—The Spotted Owl (*Strix occidentalis*) has become a controversial species in the Pacific Northwest because of its association with old-growth Douglas-fir (*Pseudotsuga menziesii*) forests—forests which are the focus of considerable lumbering activities. Prior to 1970, the owl was thought to be "rare" or "uncommon." In the late sixties Eric Forsman began studies of the owl in Oregon (I had the pleasure of participating in those studies), and by 1970 it was clear that populations of the owl were being decimated by tree harvests, and indeed, that old-growth Douglas-fir forests were themselves threatened. Numerous attempts to bring the plight of the owl to the attention of forest and wildlife management agencies generated enough interest to initiate Gordon Gould's survey of Spotted Owls in California in 1973. Forsman's and Gould's findings resulted in a rapid expansion of studies of the owl throughout most of its range. Many of these studies are included in this book, which is the proceedings of the Symposium on the Ecology and Management of the Spotted Owl in the Pacific Northwest, held at the 54th Annual Meeting of the Cooper Ornithological Society in Arcata, California (1984). The stated purpose of the symposium was to bring concerns about Spotted Owls before public and scientific scrutiny. Papers in the book are grouped into three sections: (1) "Management" (8 papers)—consisting of contributions by various agency personnel specifying the history of their concerns for the owl, the laws and regulations which govern management activities, and the status and specifics of various Spotted Owl management programs; (2) "Research" (7 papers)—including two overviews of Spotted Owl research, and others on the owl's diet, the sizes of their home ranges and composition of forests within ranges, juvenile dispersal, and winter migration; and (c) "Theoretical" (2 papers)—one on the demography and population genetics of the owl and another on its meta-population and conservation.

In the management section readers get a fair understanding of how the resource agencies (U.S. Forest Service, Washington Department of Game, Oregon Department of Fish and Game, California Department of Fish and Game—missing was a contribution from the Bureau of Land Management) are dealing with the Spotted Owl. The principal concern

among agencies is locating habitats, either occupied or presumed suitable for supporting a pair of owls, and to exclude some acceptable number and distribution of these from tree harvest. A shortcoming of the management plans described is the emphasis on the enumeration of habitat rather than on the actual numbers of owls. Although several papers in this section are difficult to read because of inconsistent use of terms and abundant jargon, several papers, notably those by Gould and Beckstead, are quite informative in that they contain considerable data on the distribution of owls in California and Washington—these authors obviously spent a great deal of time in the woods.

The research section begins with Gutierrez's overview of research on the owl and the extent of knowledge of its natural history, ecology, and demography. Also discussed are five hypotheses as to the owl's affinity for old-growth forests. Cameron Barrows presents limited data on the diets of owls in California, and suggests that the irregular nesting of Spotted Owls (a trait of the owl throughout its range) is related to the availability of large mammalian prey e.g., *Glaucomys* and *Neotoma*). Allen and Brewer review the current owl research in the state of Washington (all of which is in early stages) and give preliminary data on habitat and juvenile dispersal. Forsman and Meslow present the acreage of old-growth forest within the home ranges of six pairs of radio-tagged owls in Oregon. Gutierrez et al. present data on natal dispersal in California, showing that dispersing owlets move rapidly (8 km/day) and that mortality during dispersal is high. Miller and Meslow also report low survival among dispersing owlets in Oregon. In the final research paper, Laymon reports that adult Spotted Owls in the Sierra Nevada migrate downslope to winter in foothill habitat, a fact that will certainly complicate the management of the owl in California.

In the theoretical section, Barrowclough and Coats use the meager life-history data available on the owl to estimate the effects of habitat depletion (and loss of owls) on the owl's effective population size. Shaffer introduces the concept of the meta-population (populations of populations) for understanding the extinction-persistence dynamics of species that are patchily distributed and whose patchwork of habitat is being altered. In this endeavor he considers the number, size, and distribution of Spotted Owl management areas (preserved old-growth Douglas-fir stands presumed suitable for one or more pairs), the proportion of these areas occupied by owls, and the proportion receiving dispersants and losing owls through extinction. In addition, the theoretical effects of demographic, environmental, and genetic stochasticity, with respect to decreasing population size, are analyzed. The important contribution of the theoretical papers is the identification of empirical and theoretical areas of research needed to refine models of the owl's population dynamics. In the penultimate paper, the concepts, information needs, and management options identified during the symposium are nicely reviewed by Carey. Why the last paper, another review of the symposium by Gutierrez, is included is not clear as it is mostly a reiteration of Carey's.

This book contains most of the up-to-date information on the ecology and management of Spotted Owls. Many of the papers, however, give results that are incomplete or that are based on small samples. As a result, the reader is left with the disheartening feeling that management of the owl is predicated on critically little knowledge of its life history. The book will primarily be used by resource managers and students of Spotted Owls, although ornithologists interested in other strigiforms will also find some useful information in the book.—RICHARD T. REYNOLDS.

THE LINGUAL APPARATUS OF THE AFRICAN GREY PARROT, *PSITTACUS ERITHACUS* LINNE (AVES: PSITTACIDAE): DESCRIPTION AND THEORETICAL MECHANICAL ANALYSIS. By Dominique G. Homberger. Ornithol. Monogr. 39, American Ornithologists' Union, Washington, D.C., 1986:xi + 233 pp., 64 black-and-white figs., 20 tables, 2 appendices. $25.00 ($20.00 for

A.O.U. members).—The fleshy, manipulative tongue of parrots is much more complex than that of most birds. In this monograph Homberger shows that it is even more complicated than previously believed, providing a thorough analysis of the lingual mechanism in a single species, which is intended to serve as the basis for further comparative studies. The work is divided into two major sections, descriptive and analytical. The first part is a very detailed description of the anatomy of the lingual apparatus in the African Grey Parrot, (*Psittacus erithacus*). Emphasis is placed on the hyoid skeleton, including its articulations, ligaments and fasciae, musculature, synovial bursae, surface features of the tongue, and salivary glands. Neural and vascular structures are examined less critically because they do not contribute to the mobility of the system, except for certain expansible cavernous vascular tissues. These descriptions are long and detailed, and only committed anatomists will want to read them closely. Nevertheless they constitute the necessary data base for this and future studies, and the publication of such material in extended form fulfills an important archival function of series like the Ornithological Monographs. The descriptive text is augmented and illuminated by many excellent halftones and line drawings that illustrate structural details from a variety of views.

The specializations of the parrot tongue include an unusually massive hyoid skeleton with highly complex articular surfaces. Muscles that are simple in most birds become split into separate divisions, sometimes distinct enough to constitute new muscles. Functional versatility is further enhanced by unique hydraulic structures in the salivary glands and corpora cavernosa.

The second part of the study is a functional analysis of the lingual apparatus based upon the descriptive material. The approach taken is to construct conceptual models of the functioning of several subsystems and to integrate these into a theory of the overall activity. The various movements within the apparatus (e.g., "back-and-forth movement of the hyoid," "up-and-down movement of the paraglossale," "movements of the epithelial surfaces of the tip of the tongue," etc.) are inferred from the descriptive material of the first section. This analysis is carried out within the framework of a "Theoretical Mechanical Model" synthesized from (1) the physical and physiological properties of various tissues and (2) general biomechanical principles. The model is developed before the specific analysis of *Psittacus* is presented. It provides rigor and constraint to the process of functional speculation, holding it within the bounds of the known properties of supporting and connective tissues, muscles, epithelia, and hydraulic structures. On the other hand, the possibility of oversimplification must also be considered; as Homberger states, the model is not quantitative and cannot make quantitative predictions about movements and forces.

Within the limits of this approach Homberger's functional analysis involves a detailed series of hypotheses about how the movements of the tongue, including its changes in shape, are brought about through the actions of the mechanisms first described and then interpreted under the Theoretical Model. These are presented, perhaps, in more confidently declarative fashion then their speculative nature warrants, but this is a criticism more of style than of substance.

This study was intended to serve (1) as a basis for future anatomical investigation of the avian feeding apparatus, (2) as a foundation for future evolutionary analyses of parrot feeding, and (3) as an example of a certain approach to functional analysis. Its reference value for the first point is assured. The ultimate success of the approach will depend on how effectively the program proposed in the second point is carried out. Fundamentally, it will succeed or fail on the degree to which its predictions are corroborated by experimental analyses of the system by such techniques as electromyography and cineradiography. Homberger stresses this testable nature of her approach. In addition, the value of the method will rest in part on the extent to which it can provide an insight into the phylogeny and adaptive radiation

of the parrots and other groups. The application of functional methods to phylogenetic analysis is a controversial area, and it will be of interest to see how the analysis of biomechanical systems might be applied to the determination of evolutionary directionality.

Thus, Homberger's monograph may be taken to be (1) a valuable descriptive study of the lingual apparatus in a representative species of parrot, (2) an example of a method of functional analysis whose purported strengths require and are amenable to empirical verification, and (3) the possible basis for a broader evolutionary study whose methods and premises are as yet largely undefined. Anatomists and systematists will look forward with interest to the future development of this ambitious research program.—ROBERT J. RAIKOW.

CROWS OF THE WORLD. 2nd ed. By Derek Goodwin, illus. by Robert Gillmor. St. Edmundsbury Press Ltd., Bury St., Edmunds, Suffolk, England 1986:299 pp., 6 color plates, numerous line drawings and range maps. £30.—The first edition of this book, published in 1976, appeared appropriately during a renewed wave of interest in the study of the Corvidae, particularly in Australia, Europe, and North America. Basic biology and an understanding of the ecological underpinnings of various exploitation systems formed the main substance of these studies. Goodwin's first book together with Coomb's "The Crows, a Study of the Corvids of Europe" (1978), provided a stimulus to further study. A perusal of the recent literature shows that the wave of interest in the study of this fascinating group of birds has by no means reached its crest.

The book is divided into 9 chapters, of which the first 8 provide a brief (47 pages, printed in double columns) but sufficiently detailed overview of corvid biology. The first 3 chapters deal with nomenclature and relationships within this diverse group of birds, adaptive radiation and adaptive characters, and plumage and coloration. The 6 color plates show 30 species and subspecies, and they add much to the attractiveness of the book and to an appreciation of the inter- and intraspecific diversity of the Corvidae. In the chapter on maintenance behavior, Goodwin deals with feeding habits (not food), food storage, and maintenance of the feathers. Chapter 5, on social behavior and display, takes up 14 pages and provides a good general review of, among others, flocking, territory, roosting, pairbond, and communication. Relatively little space is devoted to nesting and parental care in Chapter 6 and proportionally much space in Chapter 7 to voice and vocal mimicry, which reveals Goodwin's own interests. The last overview chapter deals with escape, mobbing, and some other kinds of antipredator behavior, and it brings out many interesting facts. Each of these first 8 chapters has a brief list of references (a few up to 1984, some rather ancient). Many of us will look in vain for our own contributions to the corvid literature. To those who may be wounded by this, I should add that a more complete review of the literature was beyond the scope of this book. Throughout these first 8 chapters Goodwin relies on his considerable personal knowledge of wild and captive species of corvids which gives the book an authoritative ring.

The remaining 239 pages of the book are devoted to species accounts of all the corvid species in the world. Each major group of species, such as "The typical crows" and "The American jays" is preceded by a general discussion dealing with taxonomy, ecology, and behavior of the group. In reading these accounts, it soon becomes apparent that much is known about some species and little to nothing about most others. Many of the species are depicted in perceptive pen and ink drawings, and for all species very rough range maps are shown, which have some species occurring rather far out at sea! This sloppiness could have been avoided. The map of the Steller's Jay (*Cyanocitta stelleri*) is clearly wrong. When available, each species account closes with one or more references.

The value of this book is twofold. It brings together enough of the corvid literature to

serve as a source book of the behavior and ecology of this group of birds and it points out the gaps in our knowledge, particularly obvious in the species accounts. Our lack of knowledge pertains particularly to species in remote parts of the world. However, it may be useful to mention that close to home the breeding biology information provided for the Gray Jay (*Perisoreus canadensis*), Steller's Jay, American Crow (*Corvus brachyrhynchos*), Fish Crow (*C. ossifragus*), and Chihuahuan Raven (*C. cryptoleucus*), is largely based on Bent's "Life Histories of North American Jays, Crows and Magpies" (1946)! Lots of potential thesis material here.

Rather than dwell on the imperfections of this book, some of which have been pointed out, and which collectively are a minor blemish, I would like to stress that this is a well written, authoritative book. A real thorough synthesis of corvid biology will have to wait to a later date. If you do own the 1st edition you may not want to buy the 2nd one as it does not include that much new information. If you do not own the 1st edition, the 2nd one is certainly well worth having.—NICOLAAS A. M. VERBEEK.

A WORLD OF WATCHERS. By Joseph Kastner. Alfred A. Knopf, New York, New York, 1986:241 pp., 8 color plates. $25.00.—This is an anecdotal history of American ornithology, tracing the roots of the modern boom in birding through the lives of people who contributed significantly to it from Alexander Wilson and John James Audubon and their predecessors down to Roger Tory Peterson.

Kastner is a good story teller, and the emphasis is on details of human interest rather than the sweep of history. Nevertheless, he sees American bird watching, as distinct from scientific ornithology, falling into three periods: first, the time of Spencer Fullerton Baird and William Brewster in the 19th century and spilling over into this one when watchers' efforts were coordinated for the first time; second, the early years of this century when the Audubon Societies popularized birds and spread the gospel of bird protection; and third, the present time, which he designated the era of the bird guide.

Along the way he brings back nearly forgotten controversies that now seem amusing but at the time generated considerable heat. One was the debate over the villainy of the House Sparrow (*Passer domesticus*). The sparrow lost, and bounties were put on it in some places. Another was the argument about taking scientific specimens, with old-timers who formerly collected now arguing that the younger generation should be curbed. The protectionists won a partial victory, and collecting was sharply curtailed by law. Ironically, although Kastner does not note it, this debate occurred just about the time there was an increasing need for study specimens in schools and museums, spurred in part by new statistical methods and the pursuit of subspecies calling for large series of specimens. Lately, new biochemical approaches to taxonomy require the gathering of fresh material.

There is, I believe, a distinction that can be drawn between people who look at birds to discover truths about them, and those who are simply chasing rarities and looking merely to be entertained. Also there is a distinction between professionals who earn livings through their study and amateurs whose work with birds is outside their regular occupations, but these classifications become tenuous, as nearly all scientists in ornithology began as bird watchers. However, Kastner does not concern himself with these distinctions, and he gives attention to all types—the giants of American ornithology like Baird and Elliott Coues; the celebrities who were in the public eye for other reasons like the two Roosevelts, Henry Ford, and Nathan Leopold; and obscure individuals whose influence scarcely reached beyond their own communities.

The major focus is on the last century, and Kastner does not dwell on famous scientific figures of our time except for Margaret Morse Nice. He does, however, treat the principal

ornithological societies (American Ornithologists' Union, Wilson Ornithological Society, and Cooper Ornithological Society) with particular attention to long-forgotten squabbles of the early days. Having held office in all three over several decades, I can speak as an insider and say I have not sensed any of the resentment of the Eastern establishment that Kastner highlights. It is true than in the beginning the A.O.U. was in the hands of men attached to the great museums of the Washington-Philadelphia-New York-Boston axis, but for a long time now the "New York dominance" Kastner mentions has not been apparent in the leadership, papers published, attendance at meetings, nor published biographies of members.

In discussing these societies, Kastner, I believe, plays up regionalism, which is largely past history. Today all the distinctions are minor, with the A.O.U. perhaps favored by museum workers but attempting universal coverage of ornithology, the Wilson Society still favoring field studies of the living bird, and the Cooper Society particularly represented by laboratory experimenters and by field workers in Latin America and Alaska. The influential "Journal of Field Ornithology" (formerly "Bird-Banding") is not mentioned in this book although it has been in existence more than half a century. Perhaps it was omitted because its leaders were not involved in any colorful fracases. Also it is worthy of note that many of the state ornithological societies match the national organizations in attendance at meetings and approach them in quality of programs.

Some readers may be disappointed not to find their local or regional heroes in this book. A few may be reminded of "The New Yorker's" map of the United States, with not much west of the Hudson River but California. But it surely was not just xenophobia that caused Midwesterners in the early days to point out that Easterners in the publishing centers might have been more accurate about the ranges and habits of birds if they had been more attentive to the pages of "The Wilson Bulletin." It was Maurice Brooks of West Virginia, not quoted by Kastner, who noted that the literary skills of New Englanders had captured the public mind with provincial impressions that were not accurate elsewhere. For example, Southerners do not recognize their Yellow-breasted Chat (*Icteria virens*) in the descriptions of it as shy and elusive in most bird books. Many birds at the periphery of their ranges are quite different from their fellows in their heartlands. Michigan people are surprised to read in the classic accounts that the Hermit Thrush (*Catharus guttatus*) is the songster of the swamps, when they know it as an inhabitant of dry sandy uplands.

Many ornithologists who learned birds decades ago in the parks, cemeteries, garbage dumps, and reservoirs of cities will be astonished to learn that urban bird watching was transformed by a small group of boys in New York City. The Bronx County Bird Club looks big from Manhattan, but it was not unique for its time. Its story could be matched in a score of other cities. I am reminded of a group of distinguished scientists who in their youth at Columbus, Ohio, put Green Lawn Cemetery and Buckeye Lake on the ornithological map.

This book, as noted, is about people, and as such understandably it may credit a few prominent individuals with undue influence on the sweep of events. Whether such people created the tide or just rode with it is a difficult historical question. Certainly some of the forces that led to the "world of watchers" were scattered and obscure. An underlying factor was the rise in leisure and literacy, not only in America but around the industrialized world. Today the new urban population has awakened to nature's beauties that were often taken for granted back on the farm.

Even for specific forces, the real authors are sometimes lost in history. Who originated the Boy Scout merit badge on birds or the colored pictures distributed nationwide in boxes of Arm and Hammer baking soda? The teachers who inspired their students are legion, and they often came from colleges like Oberlin, in Ohio, which offered the first ornithological course in America. The modern field guides are great and they have helped to popularize

bird watching, but something else inspired the millions of people with backyard feeders but not guides.

This is a handsome book, with elegant typography. All the chapters begin with Louis Agassiz Fuertes field sketches, and the center of the book holds eight unnumbered color plates of Fuertes' paintings. The volume is admirably free of typographical errors, and I saw only two worthy of mention, the names of friends of mine, Oscar McKinley Bryens on p. 144 and Miklos D. F. Udvardy on p. 230.

This book is lively reading and factually accurate. It is embellished with an excellent index and complete bibliography. Everyone interested in the personalities and events leading up to the present vogue in bird watching will enjoy it.—HAROLD F. MAYFIELD.

WILDERNESS AND NATURAL AREAS IN THE EASTERN UNITED STATES: A MANAGEMENT CHALLENGE. by David L. Kulhavy and Richard N. Conner (eds.). Proceedings of the Symposium (1985), published by School of Forestry, Stephen F. Austin State Univ., Nacogdoches, Texas, 1986:416 pp. $30.00.—This attractive, hard-backed book contains 69 papers that were presented at a symposium held May 1985. The book is organized into 8 sections: "Introduction" (6 papers), "Wildlife" (14 papers), "Forest Protection" (7 papers), "Management Issues" (12 papers), "Visitor Needs and Issues" (11 papers), "Vegetation" (9 papers), "Grasslands and Savannahs" (9 papers), and "Summary" (1 paper). All papers contain a brief abstract plus a list of key words. Positive features which greatly increase the usefulness of this book are the "Taxonomic Index" (366 entries) and "Subject Index" (504 entries). The former includes the scientific names of 12 birds, most of which are mentioned in the 3 papers dealing directly with birds. These papers are: "The Effects of Wilderness on the Endangered Red-cockaded Woodpecker," "Raptors and Eastern Wilderness," and "Wilderness as Wild Turkey Habitat in the Eastern United States." Unfortunately, the index lists only those scientific names mentioned in the text narrative and not those listed in tables or figures. The "Subject Index" has 45 listings of bird names, including common names of species and scientific names of families.

A variety of topics is covered, ranging from single species and specific wilderness sites to broad issues and policies for the entire eastern United States. Line drawings and photographs (both black-and-white and color) are used judiciously to illustrate the text. Typographical and classification errors are scattered throughout, but are more annoying than misleading. For example, marten is listed in the Subject Index under birds, while prairie chicken is listed under mammals.

All major wilderness and natural areas within the eastern United States are well represented in most sections. One exception is the "Vegetation" section, in which 8 of the 9 papers involved only areas in east Texas. Eastern wilderness areas have a higher value than do western areas because of their scarcity, small size, and proximity to heavily populated eastern cities. These same attributes result in eastern wilderness areas being more difficult to manage than western ones. Thus, the discussions of management strategies and policies, which comprise a major portion of this book, will play an important role in the future of these eastern areas. This book should be consulted by anyone interested in research or management of eastern wilderness or natural areas.—E. D. MICHAEL.

THE WILD PALISADES OF THE HUDSON. By John Serrao. Lind Publications, Westwood, New Jersey, 1986:169 pp., 24 color illus., numerous black-and-white illus., maps, and tables. $28.00.—The Palisades Interstate Park of New Jersey-New York is one of the most visited natural areas in America, with more than 6 million users annually. This noteworthy area

along the Hudson River has been called the "finest, most scenic and accessible urban park in the nation," and its natural history is now well reviewed in one volume.

This attractive volume provides a detailed introduction to the geology, flora, and fauna of the Palisades, and a comprehensive guide to recreational locations (from nature centers and sanctuaries to county parks). The author has been in environmental education here for years, and is intimately familiar with the Palisades. The book's chapters include: "Geology," "Early History," "Habitats," "Flora," "Fauna," and "Convervation." The review of birdlife (about 275 species) includes summaries with data of birding areas and activities from local Christmas counts, breeding bird censuses, autumn hawk counts (Hook Mountain), and the like. Serrao himself has made a study of the decline in migrant woodland birds breeding here (dramatic population reductions of the neotropical migrants since the 1950s). For all such topics there is a thorough bibliography and list of readings.

The second half of the book is a guide, with specific site descriptions and comments on the natural history highlights (e.g., a rocky cliff for skinks, etc.). For many of the sites detailed trail maps are included, and some of the areas have a long ornithological history such as Piermont Marsh and Hook Mountain.—CHARLES F. LECK.

BIRDS: A GUIDE TO THE LITERATURE. By Melanie Ann Miller. Garland, New York, New York, 1986:887 pp. $100.00.—This book was written to facilitate accessibility to information on birds and to promote wildlife conservation and environmental awareness of the general public. There are 1942 citations. well annotated with a description of the book, its coverage, list of key words and phrases, illustrations, and additional features such as bibliographies, species lists, and historical information. Most of the recent major domestic and foreign books are included, up to about 1983. The coverage of books published prior to the 1950s seems uneven. The citations are arranged in the following categories (number of citations in each follows in parentheses): "Guide to general works": "Dictionaries, encyclopedias and glossaries" [17], "Bibliographies, catalogs and indexes" (8); "Guide to subjects" (625), with 16 subheadings, including "Art," "Behavior," "Classification," "Evolution," "Song," and others; "Species and group studies" (343), arranged alphabetically by the species or group name as it appears in the title of the book; "Area studies" (539), alphabetically by geographic regions, continents, countries, and states; "Field guides" (90), arranged as in previous sections; "Children's literature" (296), arranged under same subheadings as in "Guide to subjects"; "Biographies" (14), alphabetically; and "Fiction" (5). An Appendix follows, listing 50 journals and periodicals, and the names and addresses of the organizations that publish them. Last, and unfortunately least, is the Index. There is no listing of the subheadings used, except under the "Subject" heading.

The author is not an ornithologist, and appears to be unfamiliar with the literature; some valuable and standard books are omitted. For example, under Kirtland's Warbler (*Dendroica kirtlandii*), the only listing is for "Kirtland's Warbler," (Walkinshaw, 1983), while Mayfield's (1960) excellent "The Kirtland's Warbler" and Huber's (1982) comprehensive "The Kirtland's Warbler (*Dendroica kirtlandii*): An Annotated Bibliography 1852–1980" are not included. Under Peru, "Bird Islands of Peru." (Murphy 1925) and "An Annotated Checklist of Peruvian Birds" (Parker et al. 1982) are listed, while "The Birds of the Dept. of Lima, Peru" (Koepcke 1970) and "Gazetteer of Peru" (Stephens and Traylor 1983) are not. The Biographies section is very limited.

The author's lack of knowledge of taxonomy causes some problems: North American blackbirds and the European blackbird are listed together, while the American Robin (*Turdus migratorius*) and European Robin (*Erithacus rubecula*) are separated. From the annotations

one cannot always tell which species groups are included, and many species actually covered are not listed: chickadee, turkey, and nighthawk, for example.

Access to the citations contained in the book is rather difficult. There is very little cross-referencing from one heading or subheading to another. This is especially apparent in the species listings, where cross-referencing would have been very useful for the layman. Each book is found under the name of the particular group or species as it appears in the title, not grouped taxonomically. Thus, a student interested in reading about waterfowl would find books listed under the following subheadings: "Black Brant," "Black Duck," "Blue-winged Teal," "Canada Goose," "Canvasback," "Ducks," "Geese," "Giant Canada Goose," "Greylag Goose," "Hawaiian Goose," "Mallard," "Shelduck," "Pinkfoot Goose," "Snow Goose," "Swans," "Trumpeter Swan," "Water birds," "Waterfowl," "Whistling Swan," and "Wild Fowl." No student would know to look under all of these, and there is no way to find these headings other than paging through the entire Species section of 152 pages. Either the books should have been grouped under taxonomic headings, or purely alphabetically with a decent title and subject index provided. This is not so much of a problem in the other sections, which are generally shorter, or arranged alphabetically by geographic region.

The Index consists almost entirely of a listing of authors with a few general texts by title. The addition of title, subject, and general taxonomic headings in the index would have made this book a valuable bibliographic tool, and worth its price. As it is, this is a good collection of references, but the average student or public librarian will not have access to them.

It seems a shame that Ms. Miller took the considerable time and effort to produce a book which she genuinely hoped would promote the public's access to and awareness of ornithological literature, and yet because of the lack of an adequate index instead provides only incomplete access and a frustrating experience for the user.—JANET G. HINSHAW.

BEYOND BIRDING. By Thomas C. Grubb, Jr. Boxwood Press, Pacific Grove, California, 1986:195 pp., 16 numbered figs., 67 tables, numerous in-text sketches. $9.95.—In North America at least, birdwatching is more sport than science. But although many of us have bemoaned this fact for some time, few of us have attempted to do anything about it. "Beyond birding" attempts to right this wrong by bringing "the basics of analytical ornithology and scientific method within the reach and interest of the amateur student of birds." The book, which is not so much an introductory text as it is a compilation of field exercises, includes 2 introductory chapters (one on ornithology as a science and another on "analytical [i.e., hypothetico-deductive] ornithology"), 20 chapters that described projects in analytical ornithology, a concluding chapter entitled "What to do when you know this book," 2 appendixes on statistical analysis, and one that lists the scientific names of birds mentioned in the text. Although both the book's title and its "how to" format indicate that the intended readers of the text are independent amateur birders, many of the projects outlined in the book are probably more appropriate for students enrolled in high-school and college level courses in biology.

The heart of the book is its 20 "project" chapters, each of which begins with a question (e.g., Why do Osprey [*Pandion haliaetus*] hover? Can Turkey Vultures [*Cathartes aura*] smell their way to food? Can birds divide energy by seconds?), which Grubb challenges the reader to answer using the scientific method. Although all of the projects appear doable—it is unclear that all were field tested—some will be considerably easier to carry out than others. None requires capturing birds. Most of the projects fall within the confines of mainstream behavioral ecology, most deal with foraging behavior, and most can be accomplished in a few days to several weeks. All of the chapters include suggestions for statistical analysis of the data. Only one of the projects is directed at a "long-term" question (Do populations

of Black-capped [*Parus atricapillus*] and Carolina [*P. carolinensis*] chickadees ebb and flow?). Given the value and necessity of such studies (e.g., Likens, Bull. Ecol. Soc. Am. 64:234–243, 1983), and the proved ability of amateur ornithologists to collect these kinds of data, it is unfortunate that a greater portion of the text is not devoted to such studies.

The introductory chapters are fine as far as they go, but I suspect these brief (<12 pages of 5½ × 8½ text), telegraphic outlines of hypothetico-deductive reasoning and both descriptive *and* analytical statistics will prove too challenging for the amateur ornithologist, especially with regard to the statistics. (It seems a pity that so many excellent birders are afraid of numbers—except, of course, those in their life lists.) High-school and college students, however, are another group entirely, and I suspect the book will be fertile ground for those in search of science-fair projects and subjects for term papers. "Beyond Birding" will also be useful to those of us who teach college ornithology and are in need of ideas for field "labs."

Grubb's effort is a laudable one, but it only begins to fill a niche that has been vacant far too long. I hope it finds itself in competition soon.—K.L.B.

THE 1984 FIELD ORNITHOLOGY INDEX. By John Kennington (ed.). Puffin Publications, Box 581862, Tulsa, Oklahoma 74158, 1986:v + 126 pp. $22.00.—The task of keeping up with the expanding literature of ornithology is a difficult one, and this book represents a modest attempt to make the job easier. It is subtitled "A key word index to journals referencing North American birding and field ornithology." The heart of the system is the "Kwic Index" in which titles are arranged alphabetically by key words, including species, location, and general subject. On finding the title of interest, one consults a code designation that leads one to the proper citation in the Bibliography list. The procedure worked very well for the several test topics I tried to find.

An appendix lists the 48 journals, including three non-North American ones, whose papers are indexed. The majority are state publications but several of these are not included. The subtitle accurately defines the limits of coverage.This "index" covers the literature for 1984, and 1985 and 1986 are promised for delivery by May 1987, with annual publication in May thereafter.—GEORGE A. HALL.

PROCEEDINGS OF HAWK MIGRATION CONFERENCE IV. By Michael Harwood (ed.). Hawk Migration Association of North America, 1986:xi + 393 pp., many black-and-white maps and figs. $29.95. (Obtainable from: HMANA, % Richard Morton, 604 Windsor Place, Moorestown, New Jersey 08057.)—At hand is a collection of 33 papers delivered in 1983 at Rochester, New York, at the Fourth Hawk Migration Conference. The monitoring of the raptor migrations, particularly in the autumn, has attracted the efforts of many amateur, as well as professional ornithologists, and the Hawk Migration Association of North America (HMANA) has been very successful in coordinating much of this effort. Eighteen of these papers are descriptions of events at specific sites, some summarizing several years of activities but others giving data for only a single year. Eight of the papers deal with techniques of analyzing the data or improving the collection of them. Five papers give reviews of broad topics and 7 might be called theoretical papers. As is usual with symposium collections the quality and interest of the papers is highly variable, and a reader might wish some of the theoretical papers were longer and more detailed. Dedicated hawk watchers will consider this a "must" book, and other students of migration will find much of interest.—GEORGE A. HALL.

EIDER DUCKS IN CANADA. By Austin Reed (ed.). Canadian Wildlife Service Report Series No. 47, Ottawa, Canada, 1986:177 pp., many black-and-white photos and maps. $19.50 (Canadian) in Canada, $23.40 in other countries.—This is a collection of 18 papers detailing all aspects of the biology and management of the Common Eider (*Somateria mollissima*). The papers are grouped under the headings: "Distribution and Abundance"; "Races of the Common Eider"; "Distribution in Winter"; "Ecology"; "Use by People"; and "Conclusions." Twelve of the papers are in English, and 5 are in French, with the final paper in both languages. Each paper has an abstract in the other language and those papers of special interest to the Inuit (11) have abstracts in Inuktitut.—GEORGE A. HALL.