

Reviews



EDITED BY ROBERT M. ZINK

The following critiques express the opinions of the individual evaluators regarding the strengths, weaknesses, and value of the books they review. As such, the appraisals are subjective assessments and do not necessarily reflect the opinions of the editors or any official policy of the American Ornithologists' Union.

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Avian Biochemistry and Molecular Biology.—Lewis Stevens. 1996. Cambridge University Press, Cambridge, United Kingdom. xiv + 272 pp., numerous black-and-white diagrams. ISBN 0-521-45510-3. Cloth, \$79.95.—This slim volume would be a boon for any program in comparative physiology and biochemistry and points out new directions in ornithology. No other comparable volume is available. The breadth of topics covered and the level at which they are treated is remarkable. The content unquestionably is about birds, but from a nontraditional viewpoint. It sets new directions in our thinking about birds. In some ways it is a contemporary *Chemical Zoology* or *Avian Biology*, both of which were multiauthored series. Stevens is direct, selective, and thoughtful in his coverage, and he packages an impressive amount into just over 250 pages. As a result of his approach, this effort will be of interest to anyone interested in how birds are designed and work, especially at the molecular level.

The book is divided broadly into two main parts: "Metabolism" and "The Avian Genome and its Expression." It is not simply a "current topics" approach. Stevens assumes the reader has a fundamental background in general biochemistry and biology and is interested in the specific ways in which birds are constructed and regulated, especially at the molecular and cellular levels. The copy is not flashy. A direct and well documented text, rather than the multicolored graphics typical of many textbooks, is used effectively to present ideas and the arguments surrounding them. Nothing is missing here. Introductory paragraphs include some historical material, and the main matter is precise, thorough, and informative.

In some fashion this is the ornithology of the future. It is essential that the reader have a fluency in molecular and cellular biology. Stevens' presentation of topics such as lipolysis or protein turnover, for example, are detailed, discussed from an experimental (rather than purely descriptive) viewpoint, and well documented. He considers why k_1 and k_2 must be measured and how it was accomplished in birds.

He considers the consequences of various processes (e.g. how an endogenous AA pool is generated) and then how it may be applied to understand specific observations such as selection for rapid growth or low fat content. This approach is stimulating and frames interesting questions (e.g. is there a functional urea cycle in the avian liver?) that lead to an appreciation of much of the work in nutrition and the historical value of birds as experimental animals.

In the first section my particular biases led me to Chapter 6 "Metabolic Adaptation in Avian Species," which covers topics such as the metabolic demands of flight, transport of O_2 and CO_2 , adaptation for high-altitude respiration and for diving, metabolic adaptations associated with migration, seasonal acclimatization and adjustment to cold, metabolic changes during fasting (think of a penguin overwintering on a nest in the Antarctic) and molt, and adaptations for egg-laying. Coverage ranges from molecular mechanisms through cellular processes, to metabolic reorganization and whole body responses. The wide range of species used to illustrate the various points is equally impressive. Birds are capable of meeting some extraordinary environmental challenges. The mechanisms are presented here and their regulation is discussed in the following chapter on hormones.

Stevens devotes the second half of the book to "The Avian Genome and its Expression." Genome size and microscopic and macroscopic organization are presented in an up-to-date review that includes experimental evidence for each of the features involved. Stevens moves smoothly from C values through banding patterns, isochores, and molecular organization to structural genes and organizer regions. The mitochondrial genome is included as are applications of DNA fingerprints. This approach is extended smoothly into the evolution and function of multigene families in birds. This chapter is one of the best efforts to date to compile and interpret this material and understand its implications. In addition to the keratins (my particular favorite), avian histones, globins, contractile proteins, collagen, and various egg-white proteins are included. An evolutionary approach works extremely well in this section. The broadness of coverage is a major strength; another is the author's

ability to present complex ideas clearly, document his arguments, and relate molecular data to process. There is an exemplary presentation of the situation in lens proteins (crystallins), a family of molecules that not only fulfills an extraordinary functional role as the refractive components of the lens, but also has secondary enzymic functions. It now turns out that sequences of some crystallines are similar to the small and large heat-shock proteins that act as molecular chaperones!

A separate chapter is devoted to the control of gene expression by avian steroid hormones. Stevens takes advantage of our understanding of receptor proteins (that confer cell specificity) and the resultant cellular changes (cascade mechanisms) that afford gene expression to regulate various processes. Further on he treats control of the cell-cycles and molecular mechanisms of cell transformations. This allows discussion of avian retroviruses and oncogenes, topics not usually covered in standard ornithology texts.

Consideration of both spatial and temporal control of gene expression leads smoothly to discussion of the molecular basis of development. This is an extremely active area of research, especially in the nervous system and limb formation. New classes of molecules, e.g. cell adhesion molecules, have been discovered and are crucial to understanding even what appear to be simple processes in birds. One example is the distribution of feather follicles across the skin surface. We are approaching full descriptions of many molecular changes in development and are beginning to account for many of the observed classical sequences and to understand causal events.

It is difficult not to be enthusiastic about the contents of this book. There are some typos, including "Archaeopterix" and the super-annoying misspelling of Jon Ahlquist's surname! However, when work at the molecular level is coupled with the "Three Fundamental Contributions of Molecular Genetics to Avian Ecology and Evolution" (i.e. mating systems, geographic population structure and gene flow, and phylogenetic relationships among species and higher taxa; see *Avis*, *Ibis* 138:16-25, 1996), it marks the rapid maturation of disciplines that will influence ornithology for generations to come.—ALAN H. BRUSH, Department of Physiology and Neurobiology, U-156, University of Connecticut, Storrs, Connecticut 06269, USA.

pp., 61 text figures. ISBN 0-19-508440-3. Cloth, \$65.00; Paper, \$35.00.—This book is envisioned as a *Current Ornithology* whose goal is to provide researchers and managers with a synthesis of the latest information on Neotropical migrant birds, to help in their conservation. This is an excellent idea because long-distance migrant birds deserve special attention, immediately, if there is to be any chance of maintaining present populations. Organizations such as Partners in Flight and the Smithsonian Migratory Bird Center should encourage continuation of a periodic review of this field. The editors' wished also to have each chapter authored by people with differing ideas, so as to provide a balanced view (I will mention some chapters only by number because it is impossible to tell who is responsible for particular ideas or parts of them). The goal of balance was achieved in few of the 16 chapters, even though all are multiauthored. The result is a series of views that can be found in other volumes on migratory birds, such as the recent *Ecology and Conservation of Neotropical Migrant Landbirds* (Hagan and Johnston, 1992). Nearly the same digestion can be found in a 68-page Special Feature on migratory birds published in *Ecology* (vol. 77, 1996) and featuring many of the same authors that contributed to the present volume. The dilemma of conserving existing populations of Neotropical migratory birds (termed NTMBs in Chapter 7) is particularly well presented in the chapters on management (nos. 7-9 and 10-16), this book's major new contribution.

The problems and solutions to the survival of Neotropical migratory birds as we know them, however, are not presented adequately. This is not the fault of the editors or of the contributors to the volume. The fault lies within the limitations in the field of community ecology to successfully outline and deal with real world problems that have roots in avian behavior and uncontrollable human population growth. That this field dominates NTMB conservation is exemplified by every chapter in this book. These limitations include assumptions taken as facts, levels of focus, and a lack of working hypotheses.

Here is a succinct summary of community ecology assumptions as reflected in this book: (1) the Breeding Bird Survey (BBS) provides an adequate census of bird populations and their trends; (2) forest fragmentation causes "forest interior" NTMBs to decline; and (3) we can enhance NTMB populations by management of breeding habitat. Furthermore, the effects of tropical landscape changes on carrying capacity are controversial because NTMBs largely are immune to forest fragmentation there, NTMBs are opportunists relative to resident tropical species, and, anyway, they reach highest abundances away from mature forested landscapes. The idea that the numbers of tropical residents and Nearctic migrants in the Neotropics can be compared and contrasted in a meaningful way persists, even though this view was shown to be invalid 16 years ago in the volume edited by Keast and

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Ecology and Management of Neotropical Migratory Birds: A Synthesis and Review of Critical Issues.—Thomas E. Martin and Deborah M. Finch (Eds.). 1995. Oxford University Press, New York. xvi + 489

Morton (*Migrant Birds in the Neotropics: Ecology, Behavior, Distribution, and Conservation*).

Let's view these assumptions in order. Some limitations of the BBS data are outlined in Chapter 1: the BBS is a count of birds at roadside stops, observers have improved in quality over the years, different observers may use different stops on the same route, etc. I would add that observers, being serious birders, listen particularly well for "that redstart that was at stop 2 last year" and that birds heard (and not seen) dominate the census (unpaired males sing more). There are weightings and other adjustments, like emphasizing routes in the center of a species' range. These weightings are designed to eliminate "false positive" declines (B. R. Noon pers. comm.). The bottom line is that if the BBS shows declines, they are likely to be serious and persistent indeed. But, okay, it has limitations but it is the best shot we have at a broad-scale census of singing males. It could be much better if funds were allocated to assess habitats along routes. Long-term censuses of woodland tracts, criticized for being too restricted in scale, showed consistent declines in NTMBs from the early 1960s in all 13 sites with high-quality data (Hagan and Johnston 1992), before the BBS had started.

Forest fragmentation as the cause of declines in NTMBs pervades this book and the efforts to manage populations of migratory birds. This assumption of causality is unproven and probably wrong. Forest fragmentation coupled with overall population declines causes many species of migratory birds to settle in the way they have been described: they eschew small woodlots in favor of large tracts of forest because of their extrapair breeding systems. Chapter 4 reviews classic density-dependent forces: excess birds occupy low-quality habitat after high-quality habitats are saturated. When "quality" includes the crucial opportunity for extrapair matings (by both sexes), it is easily seen that population limitation in the restricted and decreasing tropical habitat is expressed in breeding distributions. Larger forest patches maintain traditions because they afford better extrapair breeding opportunities than do smaller tracts. Population limitation off the breeding grounds is reflected in this because smaller-sized populations will spill into low-quality habitat (smaller patches of forest) less often.

Managers traditionally believe that science is not entirely relevant to their work—all one needs is an assessment of habitat requirements and management towards those needs will be sufficient. Managers are interested in behavior more often than community ecologists are interested in population regulation. Practical reasons exist for this fact, especially in re-introduction schemes. None of the chapters really did anything to bring management and science together, or to place science back into the management efforts of state wildlife agencies.

There was an opportunity to incorporate the recent and exciting findings about the significance of extra-

pair mating systems to management goals. Extrapair mating systems dominate in temperate zone passerines, and in many other groups too, particularly migrants (Stutchbury and Morton, *Behaviour* 132:675–690, 1995). This breeding system selects for the semi-colonial distribution that, when populations drop, results in the "area effects" championed by community ecology. Perhaps if I use an extreme term the point will be made: Compared with species that breed in the tropics, the breeding system of temperate zone migrants is more like a lek system than the traditional territorial system of social monogamy would suggest (Wagner, *Journal of Theoretical Biology* 163:333–346, 1993). The locations of these "leks" are traditional, and, like the success managers had in forming new breeding traditions in Canada Geese (*Branta canadensis*), managers could do the same for many species of migratory birds, using different methods. Central to forming these new traditions is not simply to increase forest patch size, but to take advantage of the late-summer assessment that fledglings undergo when "deciding" where they will breed the next year. Roth and Johnson (*Auk* 110:37–48, 1993) describe the system of tradition for breeding Wood Thrushes (*Hylocichla mustelina*). This may be the general system for these traditional lek breeders lumped incorrectly in this book as NTMBs, or incorrectly lumped into "guilds," as nicely explained in Chapter 16.

Extrapair breeding systems produce the only real ecological generality tying NTMBs together, an aspect not mentioned at all in this book. Attempts to artificially generalize about these species are associated with terms such as "forest interior," "area sensitive," and such and such guild. These terms, useless and misleading for conservation, still are being reified in community ecology. Where populations are not self-sustaining, such as those described by Robinson et al. (*Science* 267:1987–1990, 1995) for Illinois woodlots, emigrants are recruited annually through traditions established by breeding birds that successfully fledged young, whether their "own" or a cowbird. At a study site in northwestern Pennsylvania, Hooded Warbler (*Wilsonia citrina*) fledglings from off-site (all young produced there are banded) flood the 150-ha forest in August and become the new recruits the following breeding season (Stutchbury, Neudorf, Evans-Ogden, and Tarof unpubl. data). Adult males that bred remain on territories until early September, providing the attraction to newcomers that maintains a stable breeding population. As a management strategy in the near future, luring remnant individuals from declining populations might become quite a competition, both for the dollars of the birdwatchers who come to see them and for the studies of their value as devourers of folivorous caterpillars.

Will this book help the conservation of Neotropical migrants? Unfortunately, the answer is no. This is the crucial question for this book that comes at a crucial time for conserving these birds. Human population

growth and needs are converting Latin America to "Manscapes" with low carrying capacity for forest-related species of migratory birds. At the same time, North America has recovered somewhat from its forest destruction phase of the late 1800s and early 1900s, when "stumping the trail" described the habit of politicians delivering speeches from ever-present tree stumps. The best sources of information on NTMBs are still the recent books such as *Ecology and Conservation of Neotropical Migrant Landbirds* and the action-oriented popular approach in *Bring Back the Birds* (Greenberg and Reaser, 1995).

I urge that anyone interested in the conservation and management of migratory songbirds and other passerines read this book and assess its faults too. I also hope the "annual review" idea continues and will immediately incorporate a focal-species approach, with broad geographical comparisons of intraspecific variation in breeding habitat and extrapair behavior, nesting success, and return and recruitment rates. Tropical data needed are outlined well in Chapters 4–6. Hopefully, in the near future new methods of tracking large numbers of individuals over the distances and time periods required will produce studies of the dispersal and recruitment processes necessary for effective conservation and management, and for good basic science. Community ecology is badly in need of such experimental tools.—EUGENE S. MORTON, *National Zoological Park, Washington, D.C. 20008, USA.*

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The Taxonomy and Species of Birds of Australia and its Territories.—Leslie Christidis and Walter E. Boles. 1994. Royal Australasian Ornithologists' Union Monograph No. 2. iv + 112 pp. ISBN 1-875122-06-0. Paper, \$18.00.—Species lists are important parts of documenting a nation's biodiversity. They provide a summation of that country's biological patrimony and a framework for further inventory effort. They also are one step—albeit a simple one—toward placing biological research within a larger geographic or taxonomic context and for supporting sustainable-use activities such as tourism. Species lists, finally, provide a basis for examining the systematics of the included species.

This small volume by two of the more active systematic ornithologists in Australia is an attempt to update the avian species list of Australia and its territories (including Christmas, Lord Howe, and Norfolk islands, among others). It has a short Introduction that discusses taxonomic methods and species limits;

this is followed by the species list itself arranged at the ordinal and family levels, along with common names. The bulk of the book (about 46 pages) comprises a discussion and review of the systematics of these groups from species-level to that of orders; the volume ends with an extensive and useful compilation of references.

Given that this is a species list, one might expect the authors to adopt a particular species definition. They really don't do this. In the Introduction they discuss the competing species concepts—biological versus phylogenetic—at some length, but make no operational decision about which they will apply. Unfortunately, their discussion of the phylogenetic species concept (PSC) is muddled inasmuch as they take it to be a cladistic, lineage concept. From this perspective they conclude that "To avoid potential instability in classifications, it may be premature to fully adopt a species concept based on phylogeny when robust phylogenies for Australian birds are scant" (p. 3). That certainly would be true if, in fact, the PSC were based on phylogeny. It isn't. As has been pointed out by many, the PSC is not inherently cladistic; it just so happens some cladists, but not all, promote it. The PSC, like the BSC, is simply a definition used to partition character variation into taxonomic entities called species. Those entities, in turn, are hypotheses about how nature is divided, and the resulting units can be used to explore other biological questions, such as those associated with taxonomic differentiation, biogeography, ecology, and the like. It would have been relatively straightforward to have applied the PSC to the Australasian avifauna. It is one thing not to apply a concept with which one disagrees, but not because one misunderstands it.

The musings of Christidis and Boles about species concepts really had little empirical effect on how they arrived at their list because they were fairly eclectic, applying the BSC here (by accepting previous opinions) or the PSC there (by accepting evidence that two former subspecies were actually quite distinct). This is a weakness of this book: They do not discuss subspecies, so it often is difficult to know just how they see species limits. If one accepts a BSC, then that will only be useful to future research if diagnosable versus nondiagnosable subspecies are identified. The authors choose not to do this, and although they do discuss the status of many subspecies, they don't do it for all. In the end, they take a conservative approach that, while neither innovative nor a stimulus for other workers to face the issues presented by alternative species concepts, will probably not get them in much trouble either. For those interested in debates surrounding the AOU Check-list, it is *deja vu* all over again. Another obvious gap in this volume is that distributions are not discussed, although it could be argued that the distributions of the specific and subspecific taxa of Australia are so well known and mapped that this is not a serious omission.

The Discussion is a very good summary of current opinions regarding ordinal and familial relationships. To their credit, they do not accept the results of DNA hybridization without corroboration from other data. Again, they remain conservative and generally accept traditional groupings (e.g. among *Pelecaniformes*). They are not dogmatic and prefer to await better data before rearranging the higher taxa. Bully for them.

A major strength of this work is that the Discussion identifies future research needs. One of the most wrong-headed views among many biodiversity scientists and conservationists is that the systematics of some groups—read birds—is largely settled, so we should move on to other questions. This small volume demonstrates otherwise. Christidis and Boles point out countless questions that need to be addressed. The systematics of birds is a bottomless pit of interesting questions, and they give us a good compendium for this magnificent avifauna.

This is a significant contribution to Australian ornithology if only because it shows how much remains to be done. The next step, it seems to me, is to recruit more young systematists to undertake many of these research questions and to develop a better understanding of the diagnosable taxa present in Australia and their interrelationships.—JOEL CRACRAFT, *American Museum of Natural History, Central Park West at 79th Street, New York, New York 10024, USA.*

biased in favor of the five species found in Eurasia, which are represented by from 31 to 112 individuals each, whereas the remaining 11 species are represented by from 1 to 7 (mean 3.5) individuals. The work is especially valuable in achieving the first goal. As the author points out, there is little available literature for this purpose. Murray's detailed description of differences in the skeleton elements of *Aechmophorus*, *Podiceps*, and *Podilymbus* (Condor 69:277–288, 1967) is not mentioned.

Eight of the 35 characters used in the principal components analyses are lengths of bones, and the projection of the taxa on a graph of the three principal components shows evidence of the influence of size on the results. One need look no further than the geese to see that size is not a good character for defining genera or species. Therefore, it can be misleading in the identification of unknown fossils, especially if sexual dimorphism and geographic variation are not considered. In attempting to reconstruct phylogenies, the use of information from as many character sets as possible is important, and Bocheński wisely takes this into consideration in most instances in which his data are not in agreement with the phylogenies based on other information.

The author reaches two major taxonomic conclusions. The first concerns the species *major*, which he places in a new monotypic genus *Podicephorus*. Erecting the new genus is well founded and has been suggested by several authors on the basis of behavior, pattern of the downy young, and the myology and osteology of the wing and pectoral girdle. The new name is constructed from parts of the names *Podiceps* and *Aechmophorus*, combining the Latin root for "rump" with the Greek root for "bearer." Such linguistic mixtures are contrary to the recommendations of the International Commission on Zoological Nomenclature, and this name is singularly inappropriate for a pursuit diver that is particularly streamlined behind.

The second conclusion is the separation of the Old and New World forms of the Red-necked Grebe (*Podiceps grisegena*) into two species. This is based on Bocheński's evidence that the former lacks sexual dimorphism whereas the latter is dimorphic. Sexual dimorphism, particularly in bill measurements, is probably universal in grebes. I have never failed to find it in study skins of forms for which sufficient material from the breeding grounds was available, and in the field, one can often distinguish the sexes of the members of a pair when the birds are together. Skeletons of at least *Aechmophorus* and *Podilymbus* readily can be sexed by examination of the skull and bill. Bocheński's conclusion is based on his sample of the Eurasian birds, which he describes only as most coming "from Europe, some from W. Asia." Fjeldså (*Ornis Fennica* 50:84–98, 1982) has shown that in the parts of northern Europe where the Great Crested Grebe (*Podiceps cristatus*) did not occur, Red-necked Grebes were larg-

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The Comparative Osteology of Grebes (Aves: Podicipediformes) and its Systematic Implications.—Zbigniew M. Bocheński. 1994. *Acta Zoolgica Cracoviensia* 37:191–346, 86 text figures, numerous tables. ISSN 0065-1710.—This paper presents a large amount of information in clearly written English on the form and size of many individual skeletal elements of grebes. The vertebrae and toe bones are not included. It is based on 392 skeletons representing all the living genera, 16 of the known species plus 4 additional subspecies. Fifty-five characters based on the configuration and measurements of the elements studied were recorded. The StatSoft CSS: Statistica package and NTSYS-pc Numerical Taxonomy Analysis System were used in analyzing the characters. The purposes of the paper were to present information that can be used in studies of fossil grebes and to add information potentially useful in tracing the evolutionary history and phylogeny of the family. The sample is strongly

er and longer billed than those sympatric with the Great Crested Grebe. He also found that both forms occurred together on parts of the wintering grounds. It is probable that Bocheński's sample included examples of both populations and that geographic variation masked sexual dimorphism. The higher coefficients of variation in the lengths of many of the long bones of the Old World than the New World form may be the result of such a mixed sample. (The recent explosion of Great Crested Grebes as breeding birds in northern Scandinavia where they were rare or did not occur may have altered the situation between the two species there today.)

Material of Red-necked Grebes from the breeding grounds in Eurasia is scarce. I am grateful to Jon Fjeldsø for kindly providing me with the following culmen measurements (in mm), which he took from specimens in various European collections, as well as for commenting on an earlier draft of this review.

Kazakhstan and Ob lowlands of western Siberia:

Females: 35.1, 35.8, 36.1, 36.2, 37.2;

Males: 40.2, 41.6, 41.6, 43.5;

Denmark:

Females: 31.5, 33.3, 35, 35.9, 35.9, 36, 36.1, 36.4, 36.8, 36.8, 37.1, 37.2, 38.2, 38.5, 38.6;

Males: 38, 38, 39, 39.2, 39.5, 40, 40.2, 40.2, 40.2, 40.3, 40.6, 41.5, 42, 42.1, 43.2;

Arkhangelsk and Kola:

Females: 38.1, 40.1, 40.1, 40.3;

Males: 40.2, 41.5, 41.6, 43.2, 44.2.

These raw data alone are sufficient to demonstrate clearly sexual dimorphism in three European and western Siberian populations for which there is adequate material, and it negates Bocheński's principal reason for separating the Old and New World races of the Red-necked Grebe into two species. The unspecified color differences that he mentions are presumably the darker back, cheeks, and neck of the Old World form. Such differences usually are considered significant at only the subspecific level. The restriction of the yellow on the bill, which is largely black in the breeding season, can be explained as a result of sympatry with the yellow-billed Great Crested Grebe.

The failure to find sexual dimorphism illustrates some of the problems in using material from old collections, much of which was found in winter, away from the breeding grounds, and was too deteriorated to prepare as study skins. This results in samples of mixed origins and many unsexed or missexed individuals (99 [25.2%] of Bocheński's specimens were unsexed).

The inclusion of vertebrae in the analysis would have shown at least two things. First, that the number of fused thoracic vertebrae in grebes is quite variable within species and genera (Storer, *Journal of the Yamashina Institute for Ornithology* 14:86-95, 1982) and is therefore of limited use in defining genera, and sec-

ond, that the conspicuous chevron-shaped processes on some of the posterior cervical vertebrae and other features associated with the heron- or anhinga-like spearing mechanism in the neck are diagnostic of the genus *Aechmophorus*.

The considerable differences in the shape of the spread foot between individuals of *Podilymbus* and of *Podiceps* (Storer, Pages 694-707 in *Proceedings of the XII International Ornithological Congress, 1960*) have not been studied and merit analysis. A comparative study of the toe bones of all grebes might well provide new characters useful for defining grebe genera.

Some of these criticisms are minor and probably result from the difficulty in obtaining literature from foreign journals. Bocheński's work is important in filling a large gap in the basic information needed by paleontologists for use in determining the genera of fossil grebes, and he is to be commended for pointing out where his phylogenetic analysis differs from results of other studies and therefore may be incorrect. What should be done next is to expand the data base of the poorly represented genera and species and to analyze the combined data by a program better suited for assessing phylogenies.—ROBERT W. STORER, *Museum of Zoology, University of Michigan, Ann Arbor, Michigan 48109, USA.*

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A Guide to the Birds of Mexico and Northern Central America.—Steve N. G. Howell and Sophie Webb. 1995. Oxford University Press, Oxford. xvi + 851 pp., 71 color plates. ISBN 0-19-854013-2. Cloth, \$75.00; Paper, \$39.95.—After years of using outdated field guides in Mexico and Central America, we awaited the arrival of the *Guide to the Birds of Mexico* with great anticipation. The guide is lengthy, totaling 851 pages and 71 plates full of illustrations. Its 87-page introductory section presents brief but useful treatments of geography, climate, habitats, migration, ornithological history, conservation, birding, taxonomy, molts and plumages, structure of the species accounts, and a glossary of important terms. Species accounts include separate sections on identification, voice, habits and habitats, similar species, status and distribution within Mexico, general range, and range maps. Most, but not all, species are illustrated in the color plates, which are made more useful by brief notes regarding distribution, habitats, and field marks on the facing pages. We found much material deserving of comment regarding the *Guide*, which falls into three general categories: as a field guide, a taxonomic treatment, and a distributional summary.

Field guide.—Although not so titled, we assume that the primary purpose of the *Guide* is as a field guide; as such, it performs quite well. The level of detail ranks with Stiles and Skutch (*A Guide to the Birds of Costa Rica*) and Hilty and Brown (*A Guide to the Birds of Colombia*), making it a rich store of information regarding field marks, habits, and vocalizations. The information presented is especially abundant regarding field marks, with somewhat less detail regarding habits and ecology, especially in comparison with Stiles and Skutch. Still, the *Guide* is replete with new tidbits and observations that make it indispensable for any birder in the northern Neotropics. One criticism is that the very length of the species descriptions makes extracting particular details in field situations difficult. The authors attempted to remedy this problem by italicizing important phrases and points. However, so many points are italicized that critical field marks are often obscured, making the detail provided less useful.

The authors' treatment of intraspecific variation and potentially unrecognized species is quite useful (see below); however, their citation of subspecies for species not showing geographic variation is not. This practice, in most cases, serves only to cloud the picture with still more names, which may have little biological reality and will be of no use or importance to the average user of the book.

The plates accompanying the text are variable, certainly not living up to the glowing description on the back cover. To list a few problems, groups such as trogons and ground-doves are outlined with a dark line, making them appear artificial; the *Claravis* ground-doves are too robust, and the back of *C. mondetoura* is painted far too dark in color; the *Columba* pigeons are shown all of the same size and posture, obscuring the marked differences between, for example, *C. fasciata* and *C. nigristrostris*; the wings of most of the swifts are too broad; trogons are depicted as overly humpbacked; and the gorget color of the *margaritae* form of *Lampornis amethystinus* is too purple, and not sufficiently blue. The brief text accompanying the plates suffers from overly liberal use of the word "unmistakable," which is too like the phrase "You can't miss it" in directions to prime birding spots. In general, then, although the plates are not great works of art, generally they do a good job of communicating important field marks.

Taxonomy.—Although the book is not presented as a taxonomic treatment, Howell and Webb make numerous changes to generally accepted taxonomies, many of which will be used in future work by the authors and others in the region. It may be a bit unfair to judge the *Guide* as a taxonomic work, however, because the authors are evidently not well versed in avian systematics. For example, they state on page 73, "All passerines in the taxonomic sequence from larks to finches are oscines; other landbirds from pigeons through tyrant-flycatchers are known as suboscines."

On more subtle notes, on pages 61–62, "The PSC [phylogenetic species concept] often relies on trivial differences in morphology or plumage and overlooks important biological information; such an approach seems to derive from the inability of persons to understand a complex natural world. . . ." Or, on page 63, "While we recognize that biochemistry can, and should, contribute another facet to understanding taxonomic relationships, such techniques are still in their infancy and most results have yet to be widely accepted." Thus, although based on extensive field experience, the authors have little theoretical basis for revising Mexican bird taxonomy.

Above the species level, the book generally follows the established "phylogenetic" sequence of the 6th edition of the AOU Check-list, making no major changes in sequences. Several quandaries as to higher-level relationships, such as that concerning the relationships of the Rosy Thrush-Tanager (*Rhodocichla rosea*), are not mentioned. The authors make at least 22 changes in generic allocations, ranging from simple recognition of monotypic genera, such as *Phlogothraupis* (which may cause paraphyly in genera from which distinctive species were removed), to dangerous moves that imply knowledge of phylogenetic relationships. For example, merging *Stellula* and *Calypte* into *Archilochus*, apart from a united *Atthis* and *Selasphorus*; submerging *Pardirallus* in *Rallus*, *Melanoptila* in *Dumetella*, *Limnotherapia* in *Helmitheros*, *Euthlypis* in *Basileuterus*, and *Xenospiza* in *Ammodramus*; and transferring *Thryomanes* *sissonii* to *Troglodytes* and *Parula* *superciliosa* to *Vermivora* all imply relationships not presently supported by phylogenetic studies or other scientific evidence.

At the species level, the authors' field experience served them well in detecting differences in many cases overlooked by ornithologists. In all, they make over 100 actual changes or suggestions regarding possible species-level breaks. Many of these adjustments are important distinctions that were long in coming, such as the rearrangements of *Aratinga*, *Glaucidium*, and *Chlorostilbon*. Other equally distinctive forms, however, were missed entirely, such as the Lamb's Screech-Owl (*Otus* [cooperi] *lambi*), three forms of Scaled Antpitta (*Grallaria* *guatemalensis*), and the Baja California Sur form of the Acorn Woodpecker (*Melanerpes* *formicivorus*). Decisions as to whether to recognize taxa fully appear somewhat haphazard, as seen in full recognition of allopatric taxa such as *Accipiter* *chionogaster*, but treatment of the distinctive toucanet *Aulacorhynchus* *wagleri* as a subspecies of *A. prasinus*. Thus, although full of important ideas and insights regarding species-level taxonomy, the *Guide* is based on an eclectic understanding and should not be considered an authoritative taxonomy. Many of our complaints regarding taxonomic changes could have been avoided by including an Appendix summarizing taxonomic changes and their bases. To avoid augmenting the size of the book further, an Appendix could easily be

abbreviated, or even printed in small type. As it stands, however, the book presents a great number of taxonomic changes with little or no justification.

The authors make a number of changes in common names. Some of these adjustments are very reasonable, such as Eared Quetzal (*Euptilotis neoxenus*) in place of Eared Trogon. Spanish names given, however, too often are mere translations of English names, with no acceptance among Spanish speakers. Worse still, names not translated often are erroneous. For example, the term "chara" for jays is used nowhere in Mexico south to at least Chiapas (names used are "urraca," "pajaro azul," or "azulejo"); "bolsero" is given for orioles, which in Mexico are referred to as "calandria," but not for oropendolas, which do usually take that name. Because the purpose of common names should be to facilitate communication with persons lacking access to field guides or scientific literature, Howell and Webb's Spanish names are best disregarded.

Distributional summary.—The purpose of the range maps and distributional summaries in the *Guide* lies somewhere between that of providing general distributional data to accompany the field guide, and constituting a new distributional summary of the Mexican avifauna. Different levels of detail in different maps make comparisons difficult. See, for example, the detailed map for Brown-backed Solitaire (*Myadestes occidentalis*), as compared to the general outline provided for Slaty Vireo (*Vireo brevipennis*). In general, the maps could have been improved substantially by illustrating ranges of different subspecies groups to show the geographic situations of potential splits. Inclusion of extralimital records immediately adjacent to continuous ranges of species is not useful and only makes the maps harder to read. Finally, using dots to indicate breeding colonies, but asterisks to indicate extralimital records, crowds the map with symbols that are not readily interpretable.

Focusing on the details of bird distributions presented in the *Guide*, some errors are apparent. For example, Yellow Rails (*Coturnicops noveboracensis*) still occur in the Transvolcanic Belt, as do Military Macaws (*Ara militaris*) in the southern portion of their Mexican range, and Scarlet Macaws (*Ara macao*) in the Isthmus region of southern Mexico. The breeding ranges of the Flammulated (*Otus flammeolus*) and Elf (*Micrathene whitneyi*) owls are more extensive than shown on the maps, and Azure-hooded Jays (*Cyanolyca cucullata*) are present in the Chimalapas region of eastern Oaxaca. Published distributional records such as those of Arctic Terns (*Sterna paradisaea*) in coastal Michoacan (Villaseñor, *Wilson Bulletin* 105:364–365, 1993) were missed. Therefore, whereas the *Guide's* distributional maps include much new and important information, distinguishing what is new and what was missed can at times be difficult.

Howell and Webb were appropriately cautious regarding acceptance of sight records (see their Appendix B). However, their caution did not extend to their

own sightings, as evidenced by the acceptance of their own record of an Arctic Warbler (*Phylloscopus borealis*) from Baja California based on a sketch, and winter records of Purple Martins (*Progne subis*) in western Mexico when the species is otherwise known only from South America in that season. Also based on observations only were Broad-billed Hummingbirds (*Cynanthus latirostris*) in coastal western Guerrero that were noted not to show signs of intergradation with nearby Doubleday's Hummingbird (*C. doubledayi*). All of these records would have benefitted enormously from limited scientific collecting, providing reliable documentation available for study and examination.

Conclusions.—Howell and Webb have produced an attractive book that will serve a great number of users in a wide variety of ways. The book is attractively and tastefully composed, and seems to hold up reasonably well to the abuse that accompanies field work. Typographical errors are fairly scarce (notwithstanding the unfortunate *Atlappetes gutturalis* [sic]), making reading relatively pleasant.

Some of the authors' attitudes are irksome. The contributions of systematic ornithology are undervalued, and the vast store of information in systematic collections was in many cases not tapped. For example, the authors stated that records of the kingfisher *Chloroceryle aenea* in San Luis Potosi need confirmation. Had they contacted the Louisiana State University Museum of Natural Science, they would have found 10 well-documented specimens! In like manner, the important contributions of Mexican scientists to our understanding of Mexican ornithology (see Escalante-Pliego et al., pp. 281–307 in *Biological Diversity of Mexico*, 1993) are all but ignored in the historical summary, as are recent contributions by other Mexican scientists (e.g. Arizmendi et al., *Avifauna de la Región de Chamela, Jalisco*, 1990; Navarro et al., *Listados Faunísticos de México. IV. Las Aves del Estado de Querétaro, México*, 1993; and Morales and Navarro, *Anales del Instituto de Biología, UNAM* 62:497–510, 1991).

It is important, however, to bear in mind the uses for which such a work is appropriate. The book provides an enormously useful aid in the study and identification of the birds of Mexico and northern Central America. As discussed above, however, it should not be taken as an authoritative systematic treatment or distributional summary; many problems could have been avoided had the book been reviewed critically by a systematic ornithologist. Nevertheless, this book belongs on the shelf and in the field pack of each and every ornithologist working in the northern Neotropics. It is by far the best field guide and summary of bird diversity available anywhere in the region.—A. TOWNSEND PETERSON AND ADOLFO G. NAVARRO-SIGUENZA, *Natural History Museum, University of Kansas, Lawrence, Kansas 66045, USA*; and (A.G.N.-S.) *Museo de Zoología, Facultad de Ciencias Universidad Nacional Autónoma de México, Apartado Postal 70-399, México, D.F. 04510, México*.

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The Summer Atlas of North American Birds.—Jeff Price, Sam Droege, and Amy Price. 1995. Academic Press, London. x + 364 pp., 6 figures, 457 maps. ISBN 0-12-564660-7. Cloth, \$29.95.—Field guides traditionally are accompanied with a range map of each species to aid in determining if a particular species is likely to be in a certain geographic region. Such maps, at least for North America, typically include information from the Breeding Bird Survey (BBS). Until now, no one has systematically used data from the BBS to obtain what I like to call "abundance maps." Abundance maps are maps that indicate the relative abundance of a species within its geographic range boundaries. Price et al. undertook the monumental task of producing abundance maps for North American birds during the breeding season.

In this review, I view *Summer Atlas* from two perspectives. First, the stated goal of the book is to provide information to amateur birders (most professional ornithologists are also amateur birders!) on where to go to have the highest probability of seeing particular species of birds. Second, the authors have a more modest goal of providing scientific information on avian distributions. I consider each of these goals separately.

As an aid to locating areas to go to maximize the chance of seeing particular species of birds, this volume has much promise. The body of the text is composed of maps that identify regions in the lower 48 states and southern regions of Canada that have the highest concentrations of relative abundances for 450 species of North American birds. Relative abundance is determined as the average number of birds detected on a BBS route per year. Each map has contours representing each of four abundance classes. From these contours, the reader can identify places that he or she might go where a particular species is relatively common. The maps are attractively produced, with just the right amount of detail and a pleasing color scheme done in shades of a brownish orange. Outlines of states are provided, and most birders will be able to recognize whether or not they are within a region of high abundance for a particular species covered by the atlas. If one's goal is to maximize the chances of seeing a desired species, then the authors included an extensive table that gives the locality of the three BBS routes with the highest recorded abundances for each species. A brief description of the species' habitat is followed by the locality list, complete with latitude-longitude coordinates and an indication of how far the BBS route is located from the nearest town. For example, to see Olive Sparrows (*Arremonops rufivirgatus*), your best chance is 6 miles northeast of Bayview, Texas. They are not very common in the region (on average, eight were seen or heard along a 25-mile route), but if you go to Kingsville, Texas (the BBS route with the second highest count for Olive Sparrows), they are even less common.

Price et al. also intended their book to provide some scientifically useful information. They include a large table describing overall population trends for most species estimated by the National Biological Survey. A brief commentary on these trends is included. Although this discussion provides an introduction to the problem of detecting population trends across large geographic areas, those interested in the topic will need to consult the research literature to gain an appreciation for the methods and limitations inherent in trying to determine whether human activities are affecting bird populations. The maps themselves document a general pattern—abundance is highest in one or a few central regions in a species' geographic range and declines relatively smoothly away from this region. This general pattern is seen not only in birds, but in many different kinds of organisms. Although early ecologists were aware of the pattern, we have only just begun to develop explanations for it.

The scientific value of *Summer Atlas* would have been improved had the authors included a few more details regarding their methods of constructing the maps. The method used to produce surfaces is called "kriging." It involves estimating the pattern of correlations between sites separated by specific distances, and using this pattern to predict sites not sampled. The discussion of how this was done is too short to allow one to replicate the analyses. Interested readers will need to consult additional references. Kriging produces a series of grid cells, each with an estimate of abundance contained within. To produce the maps in the text, the authors drew contour lines across this grid. No mention of the algorithm used to draw contour lines was given, so again, interested readers will need to do additional reading.

The overall impression, then, is that *Summer Atlas* will become a very useful tool for finding particular locations in which to see a bird. It is a useful addition to the study of bird geography mainly in that it documents for each species where its abundance is concentrated in the United States and the lower part of Canada. Those interested in a deeper understanding of bird geography will need to seek out other works. For the rest of us, the bottom line is that if you consider yourself to be a serious birder, then you definitely will need to add this work to your library.—BRIAN A. MAURER, *Department of Zoology, Brigham Young University, Provo, Utah 84602, USA.*

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Our Living Resources: A Report to the Nation on the Distribution, Abundance, and Health of U. S. Plants, Animals, and Ecosystems.—E. T. LaRoe, G. S. Farris, C. E. Puckett, P. D. Doran, and M. J. Mac (Eds.). 1995. U. S. Department of the Interior, National Bi-

ological Service, Washington, D.C. 530 pp, numerous color illustrations. Available for \$44 (postpaid) from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Stock No. 024-010-00708-7).—This large, attractive volume is the first publication of the National Biological Service (NBS) Status and Trends Program. It is a collection of nearly 200 articles from a wide variety of sources, including many state and federal agencies, academia, and non-governmental organizations. Much of this "partnership style" reflects the work of Cooperative Fish and Wildlife Research Units, which historically have been an important part of what is now NBS. The stated goal of the book is to provide "valuable information about causes for the decline of some species and habitats" and "insights into successful management strategies that have resulted in recovery of others."

An introductory section discusses biodiversity ("a new challenge") and the history of NBS. This is followed by the meat of the book, the section on "Distribution, Abundance, and Health." This adopts a levels of integration approach, from species (divided into taxonomic groups) to ecosystems (terrestrial, aquatic, coastal and marine, and riparian) to ecoregions (Great Plains, Interior West, Alaska, and Hawaii). Part 3 covers "Special Issues," including global climate change, non-native species, habitat assessments, and human influences. All of the articles are short, usually just two to four pages; most have multicolored graphics and color photographs.

Articles about birds are a major part of this volume, with specific papers scattered throughout. In the species accounts, there are 27 bird articles, more than for any taxonomic group. Not surprisingly, given the history of NBS, these focus on gamebirds and endangered species, with only single articles on the Breeding Bird Survey, winter population trends, and demographic studies in nongame birds. Articles dealing with birds also occur in the Ecoregions section (8 articles) and the Special Issues section (3 articles). As a whole, the articles are quite good and to the point. Most have tabular material, and most are accompanied by color figures or photographs. Enough references accompany each article to guide someone into the primary literature on that topic.

Although this is an impressive collection of papers, I would not suggest that everyone run out and buy it. Researchers will find the relevant article or articles on their topic superficial and will want to use the primary literature. Teachers of wildlife or environmental biology courses might find this an excellent additional reading for such a course, and they may want to borrow some of the figures and photos to use with lectures. Certainly, the book belongs in every university or community library and the reading rooms of fisheries, wildlife, conservation biology, and environmental biology departments.—JOHN FAABORG, *Division of Biological Sciences, University of Missouri, Columbia, Missouri 65211, USA.*