

ORNITHOLOGICAL LITERATURE

AVIAN BIOLOGY. Volume I. Edited by Donald S. Farner and James R. King. Academic Press, Inc., New York, N. Y., 1971: xx + 1-586 pp., many charts, drawings, and photographs. \$30.00.—This is the first of a projected four volumes compiled to “provide a reasonable assessment of selected aspects of avian biology” in the early 1970’s. The series is stated to be a direct descendant of the late A. J. Marshall’s two volumes, *Biology and Comparative Physiology of Birds* (1960), and the expansion of knowledge and development of new perspectives are given as justification for the proliferation of topics in this series.

The emphasis in this volume is broadly evolutionary and ecological. The ten authors represent not only competence in their specialties, but, collectively, a world view of avian biology in terms of their national origins, training, and field experience. An innovation for a work of this sort is the designation of a Taxonomic Editor, Kenneth C. Parkes, to monitor problems of uniformity in the designation of species.

In the initial chapter, Robert W. Storer reviews the problems of classification and discusses recent developments in the allocation of selected groups. He presents a classification of birds that is more or less traditional, departing from the Wetmore order where new evidence has accumulated (e. g., transfer of the sandgrouse to the Charadriiformes). A superordinal segregation of the penguins is abandoned, and *Ichthyornis* transferred to a list of forms of uncertain taxonomic status. The list is synoptic in form, and includes 97 non-passerine and 58 passerine families, in comparison to 100 and 61, respectively, in his 1960 list. Six songbird groups recognized as families have been demoted and five other passerine groups elevated to family level. More important than these numbers in providing clues to activity in classification in the preceding decade is the wholesale change in the order of listing of passerine families. The corvine assemblage is shifted nearer the end, and the Icteridae is listed last. A divergence of views is evident when Storer’s treatment of Mesozoic fossil groups is compared to that of Pierce Brodkorb (Chap. 2). Storer is more cautious about linking fossil groups to extant taxa.

Brodkorb reviews reptilian predecessors of birds and presents a detailed analysis of the structure of *Archaeopteryx*, in which he recognizes two species. He compares limb proportions to those of a touraco, a chachalaca, and the hoatzin, in an effort to deduce the locomotor patterns of the earliest known bird. His conclusion that *Archaeopteryx* “probably ran agilely along the branches” seems uncontested, but the statement that flight included flapping is at variance with deBeer’s interpretation (pp. 58-62 in A. L. Thomson, *A New Dictionary of Birds*. 1964). Brodkorb attempts to reconstruct avifaunal composition in time; his table reflects the major radiation of families in early Tertiary, but, surprisingly, suggests the presence of passerine families in later Cretaceous when the number of contemporaneous species is estimated at fewer than 1000.

The chapter on Adaptive Radiation in Birds (also by R. W. Storer) has stood the test of time, being little modified from the 1960 version. Details concerning groups known only as fossils have been reassigned to Brodkorb, and a section on radiation in the Charadriiformes has been added. Several of the photographs were much sharper in the 1960 version, owing, perhaps, to the better quality of paper used in that volume.

Robert K. Selander presents a comprehensive and perceptive review in “Systematics and Speciation in Birds,” distinguishing throughout between systematics (“the study of the kinds and diversity of organisms and the relationships among them”) and taxonomy (“the theory and practice of classifying organisms.”). He comments critically on the

references cited, and emphasizes the advances to be gained through the use of newer techniques and concepts, such as the weighting of hybrid indices. With reference to the acquisition of isolating mechanisms, he urges "a strongly statistical approach to the problem of the degree to which interactions of semi-species and species affect the evolution of [those] species differences that promote genetic isolation and ecological compatibility." I found certain of the figures in this chapter difficult to read. Shading of land areas in maps of archipelagoes and the expansion of legends in other instances (figure 31) would have facilitated the reading of this otherwise lucid account.

The late R. H. MacArthur, in "Patterns in Terrestrial Bird Communities," considers spatial and temporal organization and interspecific associations. He covers the requirements for coexistence, and demonstrates that theoretical approaches can direct the observer to the appropriate correlated measurements to make in studies of niche overlap.

Two chapters that follow deal with the responses of birds to environments that are challenging to birds and present great diversity on a global scale: N. P. Ashmole's "Sea Bird Ecology and the Marine Environment" and D. L. Serventy's "Biology of Desert Birds." Ashmole incorporates recent oceanographic advances, considering the influences of surface temperatures, salinity, cycling of nutrients, and convergences of masses of unlike waters on primary production and bird distribution. He classifies foraging methods of sea birds, relating the geographic differences to latitudinal and seasonal contrasts in the richness of the areas. He observes that in polar and subpolar waters most sea birds feed on rather passive prey taken at or near the surface, although fishes are important prey over the continental shelves. In low latitudes pelagic and offshore feeders forage by dipping and plunging; vertical migrations of prey organisms (chiefly flying fishes and squid) are important in such waters. A picture that emerges from his account is one of a shelterless environment in which certain tropical sea birds are forced to modify their foraging methods (dipping rather than plunging) while over the schools of predaceous fishes upon which they rely to drive their prey to the surface.

In contrast to the highly synchronized and seasonally restricted breeding schedules of higher latitudes, Ashmole suggests that the onset of breeding in many tropical sea birds is regulated by the individual acquisition of sufficient energy reserves. The high rates of adult survival of marine birds are examined, and a variety of mechanisms for the regulation of numbers postulated. Geographic (latitudinal) replacement of related forms is attributed to the difficulty of establishing reproductive isolation rather than to competitive effects in achieving sympatry.

Serventy presents a comparative study of deserts, defining them by the moisture index of Thornthwaite. He concludes that the questions of geologic age and persistence of deserts are still to be resolved, and he rejects the view that North American deserts are younger than those of the Old World. Avian desert specialists (defined by distributional criteria) make up only a small percentage of any of the continental avifaunas, and the evolution of desert adaptations is judged to have been retarded by climatic fluctuations that may have eliminated some aridity refuges. Both the pallid and black coloration of desert birds are attributed to selection for crypticity, the black coloration contributing to the elimination of shadow and conferring a metabolic advantage under cool temperatures.

Serventy points out that breeding seasons are least regular in the Australian deserts (a highly erratic environment), fostering not only opportunistic breeding but nomadism that is little evident on other continents. Some Australian desert birds are notable for the extent of overlap in breeding and molt. The chapter concludes with comprehensive

reviews of behavioral and physiological responses to the distribution of water and of heat regulation in desert birds.

Certain of these topics are expanded in Klaus Immelman's "Ecological Aspects of Periodic Reproduction." This author observes that reproductive seasons must be timed to periods of minimum stress on adults, as well as to optimal conditions for the offspring, and he provides a wealth of data on breeding cycles other than those that recur on an annual basis in the life of the individual. In his discussion of ultimate factors, Immelman documents pressures other than the availability of food that influence the onset of breeding; included are interspecific competition (*contra* Slud, *Auk* 81:444-446, 1964), nesting conditions, predation pressure and climatic factors. Apart from the Short-tailed Shearwater, endogenous controls of breeding cycles remain to be demonstrated. The precise mechanism of the stimulus of rainfall in the initiation breeding activity has not been ascertained. The responsiveness to several kinds of controls, and the "safety mechanism" of postnuptial refractoriness are considered to have evolved independently in different groups. The lack of experimental evidence is cited repeatedly by Immelman.

Lars von Haartman deals with, in "Population Dynamics," a wealth of experience in long-term field investigations in northern Europe, where the impact of winter temperatures on bird numbers is more noticeable than in Britain or Germany. His search for factors other than food in elucidating habitat selection, carrying capacity and functions of territory is refreshing. His view of bird numbers in forests and lakes is enriched by many citations from European journals, and he concludes that population levels in a number of species discussed fluctuate within limits characteristic for those species. Von Haartman reiterates his earlier view that non-breeding can act as a density dependent check on increase in numbers (a thesis supported by Ashmole, p. 267), and he develops the attitude that population dynamics consists of more than a balance between natality and mortality. He concludes that factors regulating clutch size still are unexplained, and demonstrates density dependence in the mortality of both independent juveniles and adults.

In contrast to von Haartman's empirical approach, Martin L. Cody uses demographic theory in examining "influences of environmental factors on the various life-history parameters that determine reproductive rates." Cody develops the concept of reproductive commitment ("the sum of efforts put directly into production of offspring"). In the early stages of population growth or when the prospects of an individual's surviving to breed again are low, commitment is expected to be large and to begin at an early age. Such a pattern characterizes many land birds of the temperate zone. A shift in strategies should occur as the growth phase ends, i.e., when a greater premium is to be placed upon defense of resources and the spread of the commitment over a longer time span becomes advantageous. Such a pattern often is found in marine birds and tropical (land) species.

Cody interprets the association of smaller clutch size and lower latitudes as a case of reduced reproductive commitment in response to a greater predictability of the environment. He argues that, since the population is merely replacing itself under such conditions, survival of adults will be enhanced, whereas fewer of their offspring will survive to enter the breeding population and will do so at a later age. Large losses of eggs and young to predators will further contribute to reduced size of commitment (= clutch). Thus, where adult survival is high and breeding success low, small clutches will be repeated through a longer life span. In his review of reproduction in other geographical gradients and of reproductive patterns on islands, Cody finds little support for Lack's food-scarcity hypothesis. Although the relationship in his Figure 4 ("breeding success

verus (*sic*) adult survival") would not be altered, Cody is in error in stating (p. 490) "in Song Sparrows and parids over 70% of the adults die each year." The reference paper cited as "R. E. Johnson, 1960" (p. 495) can be located by the volume number of the journal cited.

In his brief "Ecological Aspects of Behavior," Gordon Orians applies optimality theory to problems such as foraging behavior, habitat selection, patterns of spacing, and the evolution of polygyny. He analyzes territorial behavior in economic terms, and points to the quantification of the relationship between territory size in different habitats and food availability and its assessment by the birds as a direction for future research.

Some of the topics considered in this volume lend themselves to more than an up-to-date summary, and Selander, Immelman, Cody and Orians are to be commended for emphasizing specific subjects that demand further study. The volume is indexed separately by author, bird names and subject. An expansion of the last would have been helpful in view of the unavoidable overlap in certain topics. For example, there is one entry for "body size," a subject dealt with in a substantial way in three other chapters. Although the standards of editing and production are high, the price of this volume impresses me as excessive. Because of its importance, the active investigator or teacher has no recourse, but he can avail himself of a modest saving in the subscription rate for the four volumes.—KEITH L. DIXON.

THE BIRDS OF BRITAIN AND EUROPE WITH NORTH AFRICA AND THE MIDDLE EAST. Illustrations by Hermann Heinzel, text by Richard Fitter, maps by John Parslow. J. B. Lippincott Co., Philadelphia, 1972: 336 pp. \$7.50. THE OXFORD BOOK OF BIRDS, POCKET EDITION. Text by Bruce Campbell, illustrations by Donald Watson. Oxford University Press, New York, 1972: xvi + 207 pp. \$5.00.—I was incredulous on hearing that two new field guides to British and European birds had just been published. Could it really be true that some of Europe's top artistic and writing talent had been siphoned off into putting out yet *another* European bird guide? Come on! It is indeed true, but the books are not as redundant as they seemed. One covers other areas besides Europe, while the second is only new in the sense that it is a smaller edition of an already published work. Nevertheless, the question must occur to the owner of one of the many extant guides to British and European birds—"why should I buy them?"

My first reaction when I started reviewing these books was that I developed a case of eyestrain. The print in the Lippincott book is so small that I had to pause frequently to rest my eyes. Hoping for relief, I turned to the Oxford book, only to find that its print was even smaller; I literally had to use a magnifying glass to read it. The idea of a pocket field guide is great, but not at the cost of ruined eyesight.

The original *Oxford Book of Birds* was published in 1964 and was reviewed long ago (e.g. *Ibis* 107:552, 1965) so I will only mention its principal features here. Only British birds are covered; 320 species are illustrated in color by Donald Watson, whose paintings are first class. This is more than a field guide—the species accounts often run to 30 lines and are packed with information on life history. There are introductory sections on the classification of British birds, an introduction to the orders and families, special features of a birds' anatomy, flight, behavior, and breeding. Bruce Campbell's text is interesting, informative, and well-written. It is a pity that such an excellent book, in its reduction to pocket size, has developed the glaring flaw of miniscule print. A British

birder might still find it worthwhile to have this book in his pocket just for the plates, which are well reproduced and present a large enough image of the birds to provide a useful reference. American birders will want a more comprehensive European guide.

The Lippincott book was published in England by Collins and is the latest in the series of Collins field guides. Its appearance marks the debut of a young German artist, Hermann Heinzel, onto the stage of the world's bird painters—and I think he deserves a standing ovation. A field guide stands or falls on its illustrations, and there is little doubt that this one will stand. Color reproduction is good and the paintings are lifelike, accurate, and there are plenty of them. The wealth of illustrations is amazing, extending beyond the illustration pages onto the text, in margins, in the introduction, even into the table of contents where every family heading is accompanied by a miniature member of the family. Coverage is about the best I have ever seen; in addition to the usual flight pictures and immature plumages, most of the well-marked races are shown. There is a two-page spread of all wagtails of the *Motacilla flava* and *M. alba* complexes, for instance, and space is devoted to the races of the Jay, Coal Tit, Chaffinch, and others which exhibit considerable geographic variation within the area. Also pictured are some of the commoner escapes and introduced birds (chiefly anatids and phasianids) which frequently confuse the beginner who cannot find them in the average bird book. Another nice feature is the drawing of wing formulas for certain critical species pairs, such as the Reed and Marsh Warblers, and Willow Warbler and Chiffchaff.

Here and there a few soft spots appear—no artist is perfect; Mr. Heinzel needs more practice and probably more field experience with some groups to get the poses better. Shorebirds are one of his least successful groups; I would not have recognized the fat little bird on the rock on page 133 as the slim and dainty Common Sandpiper. He does not understand the soul of a cormorant—some of his are duck-like, while the flying Shag has a curiously-shaped neck, as if it were a plasticene model that someone had grasped with one hand while pulling the head with the other, stretching the neck thin. The Reef Heron has an unnatural-looking kink in its neck; it has been bent while remaining stiff, thus resembling a contorted pipe-cleaner. Its white-phase companion should not be perched in a tree, either. It is well that the Pied-billed Grebe is labelled—it might be anything. The Garden Warbler has turned out poorly; an all-brown bird should not have an olive-gray head and mantle. All this means only that Mr. Heinzel has flubbed a few lines—he has still put on a star performance, and I hope we will see many more paintings from his brush.

Richard Fitter is an experienced writer with many bird books to his credit, and he has done an outstanding job on the text. Tight, compact, without a line of padding, it complements the illustrations with additional field notes and descriptions of plumage, voice, and habitat. Unlike the Oxford book, this one is purely a field guide, and so contains nothing on life history. Although the text is businesslike and not discursive, Mr. Fitter still found room for an occasional light touch, as when he describes the flight outline of the Griffon Vulture as "like a teatray in the sky." Also, he notes that the Sacred Ibis is the emblem of the British Ornithologists' Union, which is presumably not intended to be a good field mark. Thanks to Mr. Fitter's efficient writing, the book is the same size as the standard European field guides even though it treats more species. This additional coverage has, however, necessitated the use of smaller print; while not unreadable, it is still hard on the eyes.

The format is that which has recently become popular for field guides—text and maps on the left-hand page, illustrations on the right. John Parslow has done an excellent job

on the maps, which in general remain clear and readable although prone to all the defects inherent in miniature size (one inch square). The maps of the Brown Booby and Red-billed Tropicbird appear blank at first glance, until one's trusty magnifying glass shows them to occur in the two little prongs of the Red Sea which just show on the lower edge of the map. These are exceptions; the colors (blue for winter range, green for resident, yellow for breeding) stand out fairly well from each other, although on narrow coastal strips it is hard to see the boundary between blue and green.

Discussion of maps brings me to perhaps the most important feature of the book—its range of coverage. The maps cover Europe, Iceland, Russia and the Middle East east to Long. 60° East, and North Africa south to Lat. 28° North. All the birds of North Africa and the Middle East are illustrated and covered as fully as the European birds; so whether you are bound for Morocco or the Atlas Mountains, Iceland, or Lebanon, this one book covers their birds. An attractive page of babblers from the deserts rubs shoulders with a page of vagrant thrushes from Siberia. This feature alone would make the book worth buying.

A reviewer is duty bound to find some faults, however good the book he is reviewing, and inevitably writers are kind enough to come up with some errors to make his job easier. The book has a few taxonomic curiosities—*Tachybaptus* for the genus of the Little Grebe and *Calonectris* for the genus of Cory's Shearwater. Bean Goose and Pink-footed Goose are treated as separate species, although they have been considered conspecific at least as far back as Delacour and Scott (1954. *The Waterfowl of the World*). "Bustards are placed between cranes and rails, a novel approach even in so controversial an order as the Gruiformes"—this is a direct quote from my review (*Wilson Bull.* 83: 449, 1971) of the "Hamlyn Guide to Birds of Britain and Europe," which adopted the same order; the error has here been repeated.

English names follow the standard practice of using no modifier for birds which are represented by only one member of a family or group in Britain, e.g. "the" Teal, "the" Swallow, etc. But in this guide horizons have broadened considerably. While "the" Wren may be admissible since there is no other wren in the region, I think "the" Wheatear is a bit unimaginative for *Oenanthe oenanthe* when no less than 12 other wheatears are covered by this book. On the other hand, "Andalusian Hemipode" as the name for the local *Turnix* is always good for a giggle—I'm glad they left it in.

The Bar-headed Goose is wrongly stated to be a native of India; it is a native of north-central Asia, visiting India only in the winter. No range is given for the Pied Stonechat, either as a map or in the text. The labels under the illustrations of the See-See Partridge and the Sand Partridge have been transposed. An odd typo has crept in to provide us with a little amusement—the immature Steppe Eagle is described as being "sometimes with white ump patch" (mature birds are presumably over the ump).

I find occasional exceptions to the generally very high quality of field identification notes. The best way to tell a Lesser Kestrel from a Kestrel is by the very pale, almost white underside to the wing; this is neither mentioned nor is either bird shown in flight from below. I would find it hard to tell the skuas (jaegers) apart by the clues given in this book; Arctic (Parasitic) is compared with Pomarine rather than with Long-tailed, while of the latter it is said: "immature distinguishable from other immature skuas by small size!! (exclamation marks mine), smaller bill (!!!) and much less white in wings." Sounds easy, doesn't it? Until you try it. Of the Shorelark (= Horned Lark, *Eremophila alpestris*) it is said: "Song recalls Skylark's but is briefer." If this is true, which I doubt, then the European bird must be a good species, since the song of our

Horned Lark bears no resemblance at all to that of a Skylark. Finally, the most striking character of Upcher's Warbler in the field is its habit of cocking its tail constantly. This has not been mentioned although it is the best way to tell Upcher's from Olivaceous Warbler, from which it is stated to be "hardly identifiable in field."

These are all small points. This remains a really excellent book, one that has earned itself a place in the field guide hall of fame. It comes with the additional bonus of a sturdy cloth binding, in contrast to certain recent guides. Artist, writer, and cartographer are all deserving of the highest praise. Even if you already own other European bird books, this one is a must for your collection.—STUART KEITH.

HAWAIIAN BIRDLIFE. By Andrew J. Berger. Univ. Press of Hawaii, Honolulu, 1972: 270 pp., maps, 123 photos, 59 col. pls. \$15.00.—This is a state bird book of a different and significant type. It thoroughly documents the ornithological history of the whole Hawaiian archipelago (all the way to Kure beyond Midway) and summarizes most of the studies and current knowledge of all Hawaiian birds whether native or introduced. It also takes repeated documented conservation stands for the preservation of native habitats and halting introduction of alien birds or mammals. The survival of many of the remaining fascinating birds endemic to Hawaii, mostly in the unique family Drepanididae, now hangs in the balance, with discouragingly little progress being made to assure their continued existence. It is to be hoped that Berger's book, giving the tragic history of the extinction of many Hawaiian species and the current plights of many survivors, will be a powerful force in helping save native Hawaiian birds.

The four chapters of the book are detailed treatments of: the habitats, habitat changes wrought by man, and evolution of Hawaiian birds; the indigenous species—namely breeding sea birds; the endemic species—chiefly the native land, marsh, or water birds; and the numerous introduced birds, except for gallinaceous species. In the last three of these chapters the Hawaiian literature on most species has been thoroughly covered, and often much information is given on breeding biology, behavior, adaptive physiology, and other subjects. The author's and his co-worker C. R. Eddinger's exciting first discoveries of nests and eggs of several endemic birds and their studies of the nestlings, some raised and even bred in captivity, are recounted rather fully. Some of the old authors, especially Perkins, from the turn of the century are quoted extensively in trying to give all that is known (and, too often, all that ever will be known) about the endemic birds. Appendices complete the thoroughness of the book in giving annotated lists of Hawaii's several hundred species of migrants and stragglers, as well as species introduced without known establishment. The bibliography of about 300 cited references will be especially valuable for anyone studying Hawaiian birds.

In spite of the overall excellence of Berger's book, even to near-perfect proofreading, some lesser adverse criticisms arise. The numerous photographs, although mostly of high quality, including the several remarkably fine ones taken by W. K. Fisher in 1902, include an inordinate number of pictures of nests, eggs, and nestlings. Some of these are notable "firsts" but many do not convey enough information to justify so much space. The numerous Hawaiian birds shown in twelve new paintings are, unfortunately, rather rough and unlikelike, although the detailed botanical backgrounds are fine. The paintings do not reflect the availability of many distinguished bird artists in this country, and they also stand in poor contrast to the seven, 80-year-old, masterly colored lithographs reproduced from Rothschild.

Vernacular names of Hawaiian birds are bound to lead to confusion and Berger has met some of the problems by using some subspecific common names or by including (but not consistently enough) Hawaiian language names. Newell's Shearwater (*Puffinus puffinus newelli*), for instance, is not given its Hawaiian name nor acknowledged as a race of Manx Shearwater. Some confusion also results in the attempted major separation of indigenous and endemic birds, with the endemic races of Dark-rumped Petrel and Manx Shearwater put in the indigenous section, but endemic races of other wide-ranging species (Short-eared Owl, Black-necked Stilt, etc.) grouped with endemics. Curiously, too, the introduced Jungle Fowl is put under endemic birds!

Adverse comments notwithstanding, "Hawaiian Birdlife" is an important book, very reasonably priced, and a rich source of information and pleasure. There is no other book to compare with it.—FRANK RICHARDSON.

THE WORLD OF THE WILD TURKEY. By James C. Lewis. J. B. Lippincott Co. Philadelphia, 1973: 158 pp., photos. \$5.95.—Another book on the Wild Turkey might seem premature with such works still available as Hewitt (The Wild Turkey and its Management. The Wildlife Soc., 1967) and Schorger (The Wild Turkey. Its History and Domestication. Univ. Okla. Press, 1968). Roger Latham's *A Complete Book of the Wild Turkey* (Stackpole, 1956), long the only good book available, is now out of print.

James C. Lewis's book is well written and beautifully illustrated, filling the niche left by Latham. He has included much of the new information obtained through better means of capture and radio-tracking. The Wild Turkey is one of seven birds, 20 mammals, and four other animals so far treated in Lippincott's Living World series, which explores "the living world of these animals." This biography is excellently suited for high school students or general readers. Lewis's selection of photographs is good, but unfortunately some are poorly reproduced, such as the strutting tom (p. 36) which is used to much better advantage on the glossy dust cover. If the bird shown on page 50 is a Common Raven, the picture would have been best left out, the bird being more crow-like than raven-like.

The book is accurate on the whole, but suffers from several errors and lapses. The northeastern populations of turkeys from West Virginia, Pennsylvania, and New York receive little attention while perhaps too much attention is given to Missouri and Florida birds. Lewis repeats Schorger's mistaken idea that the beard is intermediate between filoplumes and contour feathers; Lucas and Stettenheim (Agr. Handbook 362, 1972) have shown that these structures are not feathers but solid horny fibers. In giving weights (p. 28), the author seems to juggle numbers with average weights of hens—9.2 pounds for West Virginia hens as compared with 11.5 pounds for Missouri hens, yet he doesn't indicate what time of year his samples were taken. Further on, he rightly states that there is a 15% variation in weight throughout the year.

The freeze position of the poults is nowhere well described or illustrated. In truly wild birds, poults will, on signal from the hen, crouch flat and extend the head and neck and remain thus until released by another call from the hen. Poults can be picked up in this position, toe punched, and returned to the ground without changing their position. I can't believe what is currently accepted by many, that the Great Horned Owl "is the most effective night predator." I have never read a description of an actual attack by an owl on a Wild Turkey, and it seems to me that owl feathers near the kill, or bones or feath-

ers of poults in pellets would be better evidence than "talon marks on neck and base of wings." An account Lewis repeats of two Golden Eagles cooperating in an attack on turkeys could be counterbalanced by an account in Texas of two hens cooperating in driving off an attacking Zone-tailed Hawk (Johnson, *Auk*, 78:646, 1961).

Lewis reports that "Most states with gobbler-only hunting laws consider a bearded hen legal game, because hunters rely heavily on the beard to identify gobblers, especially in the fall." This statement may be partially true but it deserves comment. With a tom approaching, who looks for a beard? Turkeys are mad or sexually aroused depending on the season, so in hunting, the best character for sexing a turkey is behavior, then color, then size, and finally the beard. In our studies of New York turkeys, nine percent of 98 hens banded in the fall were bearded, so they would have been legal game in the spring gobbler hunt. This mistake in management should be corrected rapidly as there is little need to use the beard in sexing turkeys, and a hen, particularly in the spring, is an important member of the turkey world.

I recommend this book highly to advanced high school students, college students, and to any general readers interested in being introduced to our uniquely North American bird.—STEPHEN W. EATON.

LES OISEAUX DU QUÉBEC. By Raymond Cayouette and Jean-Luc Grondin. La Société zoologique de Québec, Inc., Orsainville, Québec, 1972: paper covered, 117 pp., many drawings. Price not given.—This book on birds of the Province of Quebec is intended to supplement field guides for identification, and is not a scientific treatise for skilled ornithologists. Grondin, an artist, has illustrated some 243 of the 350 bird species of the province. His beautiful black-and-white drawings are both artistic and accurate in portraying the shape, silhouette, proportions, and morphological features of each species. The species have been mostly arranged in taxonomic order, but the sequence has been altered in some cases for the sake of the artistic presentation of the drawings.

Compared to Godfrey's *Les Oiseaux du Canada* (Natl. Mus. Canada, Bull. 203, 1967) and *Encyclopédie des oiseaux du Québec* (Editions de l'Homme, Montréal, 1972), the present book is a more popular work. The authors concisely treat the general life history of each species, habitats, vocalizations, migration, wintering grounds, and breeding range in Quebec. The appearance of each species is described briefly, but only insofar as is necessary to complement its illustration. The illustrations do not show colors nor the plumage variations according to sexes and age; except where otherwise indicated, the drawings represent males in spring feather.

Three indexes conclude the book: the first gives the French name of each species, followed by English and scientific names; the second gives English names followed by corresponding French names; and the third one lists some 175 vernacular or folkloric names.

This book will appeal to nature lovers, particularly those interested in a better knowledge of birds, if for nothing more than its beautiful drawings.—RAYMOND McNEIL.