

ORNITHOLOGICAL LITERATURE

POPULATION ECOLOGY OF RAPTORS. By Ian Newton. Buteo Books, Vermillion, South Dakota and T. & A. D. Poyser Ltd., Hertfordshire, England, 1979:399 pp., 32 black-and-white photographs, 50 figs., 68 tables at end of text, bibliography, index. \$35.00.—This book was especially enjoyable to review because I associated with Dr. Newton as he gathered data for it. With great enthusiasm he took meticulous and voluminous notes during conversations on raptors. Authors of papers that caught his attention at meetings were interviewed, questioned and quizzed about their findings. I vividly remember how intense he became as he hurriedly jotted down and chronicled information in his notebook during a meeting we both attended in South Africa on African predatory birds. As a result of this zeal, there is some heretofore unpublished and considerable contemporary material in the book.

The author was among the last students of David Lack, by whom he was greatly influenced. Consequently, there is considerable reliance on food relationships throughout the text in explaining the data.

Although this book is published in the U.S. and Britain, the text is decidedly British in style, flavor, spelling and sentence structure. For example, "the last but one" for "next to last," "in fine weather," and "Gyr Falcon" instead of "Gyrfalcon" are typically used. In organization the text runs in a reasonable sequence. The sexes of raptors are discussed in chapter 1, followed by a series of chapters on breeding biology: chapter 3 breeding density, chapter 5 nest-sites, chapter 7 breeding strategies, chapter 10 fidelity to breeding areas, etc. This is followed by chapters on movements and mortality. Here, it seems, would have been a better place to put his chapter 2 on dispersion and chapter 4 on winter density. His final 5 chapters cover management oriented topics and contemporary problems such as chapters 14 and 15 on chemical pollutants and chapter 17 on breeding in captivity. He is extremely current on his treatment of these latter chapters, especially in light of the recent and often serious declines of raptors directly caused by humans and synthetic chemicals. The chapter on captive propagation evidences the recency of his data. Seemingly chapter 14 on DDT and other organo-chlorines, and chapter 15 on other pollutants and pesticides could have been combined and perhaps shortened, although only about 12% of the text was spent on the pollutant problem. The bibliography is excellent with over 800 citations and in itself is a good compendium and summary on raptor biology.

To develop support for some of the concepts, he uses carefully selected case history studies. For example, in a discussion of increasingly rare birds, he gives a blow-by-blow account of the studies on Lesser Spotted (*Aquila pomarina*) and Black (*A. verreauxi*) eagles wherein mortality of the young has been experimentally reduced. Rather than rely totally on work gathered from the literature, however, there are ideas seemingly expressed for the first time by Newton. For example, in his treatment of the reversed sexual dimorphism phenomenon in raptors, he offers a fresh new way to view the data (p. 23) and thus provides yet another explanation. I particularly appreciated Newton's insight in posing questions for fruitful future research with raptors. Many such questions, e.g., "Are populations of raptors so limited in winter as are some passerines that they cannot fully occupy the available breeding territories in spring and summer?" are, however, the very ones that are in need of work on most groups of birds. Some insight is suggested to that question by Newton's own research on the Sparrowhawk (*Accipiter nisus*) and he persuasively argues that raptor densities are directly correlated with food supply, which in turn is related to productivity of the land. This relationship appears to operate during all seasons.

The book is relatively error-free. I found only 3 typographical errors but they are minor, eg., Richlefs in place of Ricklefs (p. 126). In the text he gives the citation, Fyfe 1978 (p. 264)

while the closest to that in the literature cited is Fyfe 1976. The printing is nicely done, but in my copy p. 237 is poor because of heavy print, especially noticeable where double letters occur, as in egg. The citation of Belon (1555) (p. 199) on migration represents a fantastic bit of detective work in the literature.

There are some inconsistencies in the format of the text. Some of the chapters have discussions as special topics, and some do not. Rather than a summary at the end of each chapter, I would like to have seen a discussion of the material wherein Newton could have used his own insight and his keen inductive reasoning. Throughout the text he seems to resist speculating about concepts that are not clear and on some occasions, Newton even seems to apologize for having theorized or speculated.

I have mixed feelings about placing all the tables together in the back. When readers want to find a particular bit of data dealing with, for example, mortality from chapter 9, they must thumb through the graphs until they happen upon the data, unless they know the precise table number. I prefer the placement of tables in the chapter adjacent to the introduction and discussion of the data.

In his discussions of migration, there is a rather lengthy bit of data on North American migration, and I was surprised to see the omission of the very significant paper by Haugh (Search 2:1-60, 1972) that discusses the effects of the Great Lakes on migration. Newton even uses a figure to show migration along the Great Lakes (p. 197). It would also have been helpful to have the citation for Haldane's "incomplete data" methods as footnoted on p. 203.

Some observations that were generated during the reading of this book seem in order. Perhaps most salient is the virtual lack of data from the neotropics. It is not that Newton has neglected literature from there, but rather that there is little if any literature on neotropical raptor biology. It is one of the most diverse and interesting raptor faunas (primitive falconidae, the sub-buteos, etc.) and yet it remains so little known. There is a fruitful geographic area of research for the upcoming raptor biologists. It is clear from reading Newton that most of our knowledge about raptor biology pertains to holarctic areas, although considerable data are also available from Africa. Newton has been careful to explain particular methodologies used in the study of raptors. Few other books do this. He briefly explains how radio telemetry is being used and the mechanical basis of the techniques as pertains to raptors. He also cautions the reader (p. 231) to be careful in comparing data on ppm expressions of synthetic chemical residues in birds or their eggs by pointing out that some data are given as dry weight, some as wet weight and some as lipid weight. Each method gives a considerably different numerical value. It is unfortunate that his book came on the tails of Walter's book on the Eleonora's Falcon (*Falco eleonora*) (1979, Univ. Chicago Press). Newton's discussion of the colonial species would have been more complete had he had access to Walter's book.

There is a wealth of data on breeding biology that can be implied by a use of morphological expressions of birds. These data are largely ignored. For example, further support for the concept of fidelity to breeding areas can come from the study of geographic variation, locations of recognizable demes, etc., as well as from actual banding data. Many raptors are noted for the occurrence of recognizable demes based on external morphology (presumably this will be corroborated by blood protein morphology once that technique has been sufficiently tried on birds). Biologically this recognition is perceptible when members of a given deme return to the general region to breed and selection pressure intensity for a given trait far exceeds the rate of dispersal to another area or immigration rate of new genetic expressions. Such morphological traits are potent evidence of the lack of panmixis on a level larger than the local population or deme.

The overall wealth of material and Newton's manner of presenting it make this a valuable book for those who not only want to learn about raptors but also for those who are interested

in the biology of bird populations in general. I hope that the price is not too restrictive for those young biologists who can profit most from such a book.—CLAYTON M. WHITE.

THE FORAGING BEHAVIOR OF MOUNTAIN BLUEBIRDS WITH EMPHASIS ON SEXUAL FORAGING DIFFERENCES. By Harry W. Power. Ornithological Monographs No. 28, American Ornithologists' Union, 1980:ix + 72 pp. \$8.50.—This is a very stimulating monograph, which is a tactful way of saying that it makes many debatable points. Power first reviews the theory of how sexual differences in foraging might come about. He then demonstrates that female Mountain Bluebirds (*Sialia currucoides*) tend to use more energetically expensive methods of foraging than males, and recalls his theoretical review in order to understand why this difference exists. He sets up a series of experiments adjusting brood sizes, removing parents and manipulating habitats, all designed to discriminate between the theoretical alternatives. He concludes that none of the alternatives are well supported, but leans toward a "division of labor" interpretation. He does discover, however, that both males and females have a common tendency to use more expensive foraging tactics when their work load increases, and that females are more inclined to make this increase than males, at least when the work load increase is in terms of young to feed per adult.

The detailed biology in the midst of theoretical boldness and experimental ingenuity in the field makes this work a major contribution to modern ornithology. I make this claim in spite of the fact that I would have interpreted the data rather differently.

Power presents himself as an evolutionary biologist, and writes with a measure of arrogant dogmatism. But the writing is so clear and Power himself so thoughtful of his readers, that one is willing to overlook his confidence in his own reasoning (and in the naïveté of those he disagrees with). The net effect is exciting, and I suspect that Mountain Bluebirds are destined to become a "classic" or textbook species for discussions of avian foraging strategies.—STEPHEN D. FRETWELL.

POPULATION DYNAMICS: THE 20TH SYMPOSIUM OF THE BRITISH ECOLOGICAL SOCIETY. By R. M. Anderson, B. D. Turner and L. R. Taylor (eds.). Blackwell Scientific Publications, Oxford, England; distributed in the U.S.A. by Halstead Press of John Wiley & Sons, Inc., New York, New York, 1979:434 pp. \$69.95.—An exciting component of ecology as a discipline is the constant challenge provided by theoretical and empirical advances. The breadth and vitality of recent advances in population ecology are well represented in this volume. A total of 18 chapters with 27 authors surveys a variety of subjects: the influence of behavior and genetics as determinants of population dynamics; the importance of mosaics in determining population size in space and time; the role of life history strategies in determining population characteristics; the existence of multiple stable states in ecological communities; and the influence of trophic structure on community dynamics. The foundations of many of the dogmas of the past two decades are weakened by these presentations.

In the only strictly avian chapter, Diamond examines the now familiar question of randomness vs competition in the evolution of island faunas—neither extreme represents truth. Avian examples are involved in two other chapters. Cowie and Krebs use foraging patterns in insects and birds to explore optimal foraging in patchy environments. They, like other authors, emphasize the importance of integrating the behavior (Taylor and Taylor) and genetics (Berry, Law) of individuals in understanding population dynamics. Both Berry and Law note that life histories—rates of reproduction and risks of death—are evolving under forces imposed by prevailing environments. Since they may be doing so at a pace that is within the time scale of ecological studies, they cannot be ignored. In an analysis of spruce budworm populations, Peterman, Clark and Holling conclude that birds may play a primary

role in determining the lower stable population attractor and thus, equilibrium densities, of spruce budworm.

Although only one chapter concentrates on birds, there is much to be learned here by ornithologists willing to make the effort. Many of the chapters are dominated by mathematical models. Typically, these are coupled with analysis of the details of an intriguing biological system. The merger of theory with observations often yields insights that either alone is incapable of producing. Overall, cogent arguments are presented for avoidance of simplistic models dependent on average populations and their rates of change. More realistic models will deal with the spatial and temporal variability in populations.

Many of the chapters in this volume are integrative combinations of observation, theory and application. There are few typographical errors, and extensive cross referencing among chapters attests to the efforts of the editors to increase the value of the volume. Speaking of value, its \$69.95 price tag will encourage use of library copies. It is worth the effort to search out a copy and read.—JAMES R. KARR.

THE ISLAND WATERFOWL. By Milton W. Weller. Iowa State University Press, Ames, Iowa, 1980: x + 121 pp., 27 numbered figs., 12 tables. \$10.95.—The island waterfowl this book treats are the distinctive species or races of ducks and geese (Anatidae) that have evolved in isolation following earlier colonization of oceanic islands or archipelagos, largely in the tropics and the southern oceans. The lure of remote islands and scarce animal forms is probably sufficient to ensure that this book will find readers, despite the rather high price of such a slim volume. Nevertheless, my initial scepticism as to the need for such a book remained after 2 readings. Weller had already published the results of his field studies on 5 island groups—Tierra del Fuego, Falklands, South Georgia, New Zealand and Auckland Islands—and his wish to synthesize the results of those and other work on island waterfowl could have been done as effectively in a review article for a journal. The objectives of the book, which emerge only gradually, seem to be to define the characteristics of successful island waterfowl and to predict whether vacant niches exist for future colonizations of specific archipelagos, while encouraging further research on these birds to fill gaps in existing knowledge. The book is thus addressed to fellow-scientists rather than to the general public.

One may carp at the questionable need for this book, but its standards of scholarship are as high as one would expect from a scientist of Weller's calibre. The individual forms are described and located geographically, the factors influencing colonization of islands and the subsequent responses to constraints posed by island situations are described, and the development of the waterfowl faunas of the island groups Weller had studied is analysed. A brief chapter considers conservation measures for scarce species. There are 8½ pages of references (in fine print) and an index. The text is easily read and adequately proofed (I noted only 2 or 3 typos), and the diagrams and illustrations are clear and informative. My chief difficulty with the make-up of the book was its lack of an introduction, the first chapter plunging straight into lists and descriptions of island forms. The Preface covers some of the introductory material needed, but how many readers will think to read the Preface first?

Weller repeatedly emphasizes the need for adaptability in successful colonizers, most of which stemmed from the dabbling ducks (*Anas*). Adaptations to islands include the ability to use marine and shoreline environments for part or all of the year, resistance to cold on the part of the young and even more so for the adults, and so on. He seems not to have remarked that such characteristics exist in several of the largely north temperate and sub-arctic species of diving ducks (tribes Somateriini and Mergini), which thus may be preadapted for colonization of cold south temperate or subantarctic islands. The extinct Auckland Merganser (*Mergus australis*), and the steamer ducks (*Tachyeres*), which latter resemble and fill

the niches occupied by the eiders (*Somateria*) in the north, presumably have evolved from representatives of such northern groups. The same adaptations allow those northern diving ducks to winter farther north, so trans-equatorial migrations that could lead to colonization of southern islands are not regular among those groups; those individuals that do reach remote islands may be as promising colonists as are *Anas* ducks.

The discussion of habitat use and resource partitioning might be read to advantage by waterfowl biologists concerned with carrying capacity and introductions, though these, as well as biology of island waterfowl, need more quantitative data. Study of the island microcosm also reminds one of its vulnerability, and the extent to which man has affected the numbers and distribution of continental waterfowl in the past and present. Some species of waterfowl, as well as other game birds, were nearly eliminated from eastern North America by unregulated hunting in the 1800's, and when populations began to recover they found eastern habitats transformed from forest to largely open landscapes. Thus, we have "prairie" ducks moving in to breed all over northeast America, even into artificial impoundments that simulate prairie sloughs in largely forested regions. If Weller's book stimulates more thought and research on such topics, its spinoff value will go a long way to justify its publication.—ANTHONY J. ERSKINE.

WOODLAND GROUSE SYMPOSIUM. By T. W. I. Lovel (ed.). World Pheasant Association, Daws Hall, Lamarsh, Bures, Suffolk, United Kingdom, 1979:180 pp., 3 photographs, 18 maps, 40 text figs. and 32 tables. £8.—This report of a symposium held in Scotland in December 1978 contains papers and notes on 2 species of capercaillie, the Black, Hazel, Ruffed, Blue and Spruce grouse, and briefly Willow and Rock ptarmigan. Participants came from most of the northern countries of Europe, USSR, Iran, China, Japan, Canada and U.S. Sessions were devoted to the present status of woodland grouse species in 7 countries; the ecology of woodland grouse (7 papers), field and analytical techniques (3 papers), behavior of woodland grouse (3 papers) and management of woodland grouse (5 papers).

Marcström briefly reviews the literature on population fluctuations of European woodland grouse. Synchrony in population changes of different species within an area, and variability in periodicities, are features of the Scandinavian stocks.

Reports from Norway, Sweden, Finland, Denmark and Poland suggest a general decline in numbers of most grouse species, which are attributed to changes in forest exploitation practices, habitat loss, changes in weather patterns and acid rain pollution.

In France, Capercaillie (*Tetrao urogallus*) survive in 4 isolated mountain chains. They are widespread and hunted only in the Pyrenees. A relic population of Black Grouse (*Lyrurus tetrix*) remains on lowland moorland in the Ardennes. In alpine habitat, the species is still found in 9 departments adjacent to Switzerland and Italy. They were never found in the Pyrenees. Ellison reviews his work on hunted and unhunted Black Grouse populations in the French Alps. Fall hunting removed about 57% of the males. An unbalanced sex ratio and few old males does not seem to have affected productivity.

Tso-Hsin Cheng outlines the status of grouse in China. Hazel Grouse (*Tetrastes bonasia*) are found in the Northern Region and a closely related species (*Tetrastes sewerzowi*), in the Southwest Region. Black Grouse of 3 subspecies are found in extreme northeastern and northwestern China, and the Black-billed Capercaillie (*Tetrao parvirostris*) in the northern part of the Great Khingan Mountains, and perhaps the northern part of the Altai Range.

The Black-billed Capercaillie is confined to upland forest dominated by larch (*Larix gmelini*). Food is largely shoots and buds of white birch and larch. In summer they eat blueberries, huckleberries (*Vaccinium* sp.) and bird cherries (*Craetagus* sp.). Spring display begins in late March and mating from mid-April to early May.

Andreev reports on the reproductive behavior of the Black-billed Capercaillie in Siberia.

His description suggests some differences from the displays of the Chinese birds. In China, display is largely arboreal and starts at 2:00–3:00, lek behavior has not been recorded. In Siberia, males display in groups of 6–10 on the ground, usually on snow. They perform all night, starting at sunset, with a lull around midnight. Their lek activity may persist for an extraordinarily long period, exceeding 12 h.

In China, the birds migrate to river valleys for the winter. Their numbers may be declining because of changes in habitat due to intense land use. Tso-Hsin Cheng's account of the Black Grouse includes the old folk-lore story of males spitting saliva on the ground and females following to pick it up.

The winter ecology of woodland grouse is discussed in papers by Andreev on bioenergetics, Pulliainen on composition and nutrient content of fall and winter food of Capercaillie, and Glutz von Blotzheim and students on the winter behavior and food of Black Grouse and food of the Hazel Grouse.

Angelstam reports on reproductive success and survival of Black Grouse in relation to population fluctuations of small mammals. Data from 1977 and 1978 suggest that survival of eggs, chicks and adults were higher when small mammals were abundant. Little information is given on methods used to judge density of small mammals and no data on the species present, only the bank vole (*Clethrionomys glareolus*) is mentioned.

The only paper on North American woodland grouse is given by Bendell and Zwickel. North American biologists will be familiar with the variety of papers by these authors, in the case on Bendell, extending for over 25 years. Their paper describes the characteristics of Spruce (*Canachites canadensis*), Blue (*Dendragapus obscurus*) and Ruffed (*Bonasa umbellus*) grouse. They briefly review what is known about population regulation, causes of levels of density, management and distribution of these species.

Porkert, in an important paper, discusses the influence of human factors on the populations of tetraonids in north-eastern Bohemia and northern Moravia. In addition to the often recognized factors of human disturbance and habitat changes, there is also the impact of air pollution and acid rain.

Isolated and now endangered populations of Capercaillie, Black Grouse and Hazel Hens live in the Orlické hory Mountains, which rise to 1115 m. The prevailing winds that flow over the Bohemian industrial basin impinge at right angles to this range. The foothills are narrow and do not intercept the precipitation carried by air masses from the west. The geological structure is poorly buffered schist. At 870 m precipitation averages 126.5 cm per annum and is 2–3 times higher than in the neighboring foothills. Fog and ice storms are frequent. The average annual value of acid precipitation is estimated at about 4.2. Spring thaw is accompanied by a sharp drop in pH amounting to about 1 unit.

The most heavily polluted sites are those under the crowns of old trees, mainly spruce, under which there was almost complete destruction of *Vaccinium myrtillus* in the winter of 1975–76, which had a particularly acute episode of pollution. In open sites, *V. myrtillus* were less heavily damaged and regenerated better. This species is an important grouse food, particularly for Capercaillie.

Decline of Capercaillie and Black Grouse numbers might not be due entirely to air pollution because other factors are also influential. However, these species have also declined rapidly in the east-Sudeten area. There, and in the Krkonoše and Beskydy Mountains, changes in forest management were introduced much later than in the Orlické hory Mountains, but the decline occurred at the same time as the development of heavy chemical industry and construction of large thermal power plants.

Recommendations for harvest management of Capercaillie in Scotland are made by Moss, Weir and Jones. After consideration of a variety of field studies, they conclude that under the shooting methods (driving) employed in open natural forest, 16% would be a safe harvest.

In the areas studied about 15% of the birds seen were killed on the first shoot of the year. This safe harvest rate is much lower than for other forest species of grouse for which data are available.

In planted forest, densities of Capercaillie were similar to those recorded in Finland and were lighter than in natural forests. The proposals made by Bancik for the conservation of Capercaillie in Slovakia, in contrast, seem naive and contain many of the outworn panaceas of an earlier age. There is no presentation and analysis of field data, only proposals to regulate certain logging practices to specific times of the year to minimize disturbance to the birds, but nothing about regulating logging so as to create or maintain suitable habitat.

Potts, in an all too brief paper, stresses the value of modeling as an aid to studies of game bird populations, using his experience with the Grey Partridge (*Perdix perdix*) as an example.

This symposium gives a good overview of the work on tetraonids in Europe and Asia. Over most of Europe, Capercaillie and Black Grouse are declining. The view of the participants is that in the future, priority should be given to intensive studies of population dynamics.—HARRY G. LUMSDEN.

PROCEEDINGS OF THE WORKSHOP MANAGEMENT OF SOUTHERN FORESTS FOR NONGAME BIRDS. Richard M. DeGraff (Tech. Coord.). U.S.D.A. For. Serv. Gen. Tech. Rept. SE-14., Southeastern Forest Experiment Station, Asheville, North Carolina, 1978:176 pp., 53 figs., 29 tables. No price given.—This is another in the Forest Service sponsored series on the regional management of nongame birds. The term “nongame” is well defined, easy to understand and has management meaning, but as of late has fallen from grace with certain editors and its use in print may be diminishing. Nevertheless, almost every paper in this workshop uses the term to denote non-“harvested” wildlife species. Although concern for nongame wildlife is not new, only recently has there been any action taken. The main reason for this has been lack of funding, both in the failure of conservation groups to raise enough money and the reluctance of state and federal agencies to use “hunting and fishing” funds to look at songbirds, as well as the absence of any key legislation to provide monies for nongame research. Michael Zagata of the National Audubon Society outlines the history of such problems in the keynote address. In sum, he cites the rise in interest in nongame management and documents recent legislation such as the Missouri nongame act designed to benefit nongame wildlife, which raised about \$26 million in 1978. He concludes by calling for increased amounts of funding at the federal level, and justifies this call by documenting the current widespread public interest in nongame wildlife.

The workshop is divided into 4 sections: Forest Ecosystem Structure and Function and Effects on Birdlife, with the keynote address and 2 additional papers; Effects of Management Practices on Nongame Birds, with 6 papers; Specialized Bird Habitats and Management, with 4 papers; and a concluding paper on future research plans. Like all workshops there are many “nonpapers” in this one and many of the papers could have been written for any of the other regional workshops by simply changing the names of the bird species and leaving most of the text unchanged. Moreover, there is much interpaper redundancy in these particular workshop proceedings. However, some of the papers are of great interest and practical use. Chandler Robbins provides a very useful paper on census techniques for forest birds, a topic on which there is probably none better qualified to speak than he. He compares spot mapping (or plot census), transect methods, point counts (the IPA method) and the Breeding Bird Survey (BBS), as well as covering banding, nest finding, tape recordings and techniques for winter and other nonbreeding season surveys. He concludes that, although all methods have some level of imprecision, the spot-mapping method is generally best; but other techniques such as transect lines are most effective when many plots are being compared. Another interesting paper is by Noon and Able, “A Comparison of Avian Community Structure in

the Northern and Southern Appalachian Mountains." Not only is the methodology in this paper of interest, but useful data and interesting results are provided. They compare bird data from Mount Mansfield in Vermont with the Great Smoky Mountains, plotting birds on elevational and other environmental gradients. It is unfortunate that they do not have data for the central Appalachians, such as West Virginia, to add to their comparisons.

This workshop, like most others, is loaded with material that apparently could not make it in a refereed journal. Yet if one is successful at sifting the wheat from the chaff, new information and knowledge can be gleaned from its pages.—ROBERT C. WHITMORE.

AUDUBON BIRDS OF AMERICA. Introduction and Commentaries by Roger Tory Peterson. Crown Publishers, Inc., New York, New York, 1979 (? no date): 160 pp., 72 full-page plates (color), 30 much-reduced illustrations (color) on 4 pp. \$17.95. AUDUBON. A BIOGRAPHY. By John Chancellor. The Viking Press, New York, New York, 1978: 224 pp., 116 illustrations (16 color). \$17.95. THE DOUBLE ELEPHANT FOLIO. THE STORY OF AUDUBON'S BIRDS OF AMERICA. By Waldemar Fries. American Library Association, Chicago, Illinois, 1973: xxii + 501 pp., frontispiece (color), 45 test-figs. \$45.00.—John James Audubon (1785–1851) was unusual in various ways, as in being an ornithologist who made money. Indeed, he has continued to do so for those with the enterprise to market his evidently inexhaustible appeal. The rather large number of these now includes Roger Tory Peterson, another ornithologist of financial acumen, and Crown Publishers, Inc.

If there is additional reason for the present book, it would appear to be whatever interest attaches to Peterson's choice of "102 favorite" (a phrase from the dust jacket) Audubon pictures. Some years ago I ventured (*Scientific American* 216:156, 1967) to nominate a minimum of 17, all but 2 of which have made it onto Peterson's list. So much for taste. This is not a work of criticism or interpretation. The brief biographical introduction provides nothing new, but perpetuates the myth laid to rest, one would have thought, by Alice Ford (John James Audubon, Univ. Oklahoma Press, Norman, Oklahoma, 1964) that Audubon studied under Jaques Louis David. The often amusing commentary which accompanies the pictures is about birds, not art, and has no clear *raison d'être* except to fill space. On p. 44, discussing the immature Bald Eagle (*Haliaeetus leucocephalus*) (the "Bird of Washington," as Audubon called it), Peterson perpetrates a howler in saying that Florida has more of this species than any other state, while on p. 54, discussing the adult, he correctly notes that Alaska has more than all other states combined. The plates are well reproduced, but the color is more intense than in any elephant "folio" that I have seen. They provide an instructive sampling, however, for any one without ready access to Audubon's birds. The legends of the Leach's Petrel and Trumpeter Swan are transposed on p. 159.

Biographies of Audubon are numerous and continue to appear along with the pictures. Chancellor's is refreshing in presenting a rarely unbiased picture of Audubon's complex and not altogether adorable personality. The highly readable but nonetheless scholarly text, with numerous figures of contemporary scenes and events, does a good job of placing Audubon in context. There are occasional perplexities, as on p. 172, where Chancellor observes that the California Condor was "the subject of an Audubon controversy" not otherwise mentioned, nor known to me. Could he mean the one over the sense of smell in Turkey Vultures? Anent this, on p. 41 he has Audubon contending that the latter have a well developed sense of smell (as K. Stager has shown that they do), while on p. 187 he has Audubon contending (as he did) that they do not. These small matters notwithstanding, this is probably the best brief biography of Audubon to date.

The chief of Audubon's several works, the so-called double elephant "folio" (actually broadsheet) stands as the most ambitious effort at bookmaking in history, and is exceeded in physical size only by the Napoleonic atlases of Egypt. It is itself the subject of an ex-

haustive monograph by Waldemar Fries, the third of the items in hand. This, which shows every evidence of relentless and careful scholarship, is an indispensable reference for the serious student of Auduboniana, containing not only the details of the undertaking: history, subscribers, costs, sets and censuses thereof, but also appendices covering related editions, reproductions, prospectuses, fates of copper plates, chronology of engraving variants, and related miscellany.

This notice will complete the record in drawing the last work to the attention of Wilson Bulletin readers. That it did not appear as a contemporary review owes to one of the present writer's occasional lapses into terminal procrastination. Having now partially made amends, I shall cease avoiding review editor Raikow at professional meetings.—ROBERT M. MENGEL.

THE WARBLERS OF AMERICA. Edited by Ludlow Griscom and Alexander Sprunt, Jr. Revised and updated by Edgar M. Reilly, Jr. Illus. by John Henry Dick. Doubleday and Co., Inc., Garden City, New York, 1979: xv + 302 pp., 35 color plates. \$19.95.—The first edition of this book (1957) was apparently a hastily gathered and loosely organized work assembled as a frame of reference for John Henry Dick's color plates. Several chapters treated general matters such as parulid taxonomy, methods of study and song. Then followed brief accounts of the plumage and aspects of the life history of all species covered by the A.O.U. Checklist. Next, a series of chapters dealt with the warblers of geographic regions lying outside the contiguous United States. Dick's plates depicted adults and, in many cases, sub-adults of all parulid species recognized in 1957. Finally, brief appendices gave further attention to systematics and described certain migration routes. The manuscript of that edition had been read by various reviewers and authorities; their comments and additions, instead of being integrated into the text, were incorporated as bracketed annotations.

Although this second edition is said to be both revised and updated, nothing has been done to integrate the original hodgepodge. The revisions are exceedingly limited and deal principally with taxonomic changes, and the updating consequently ignores much of the work of the last 20 years. I see no justification for republishing the book. Compared to other recent volumes that summarize knowledge of entire families, e.g., Nelson on the sulids or Hancock and Elliott on the herons, it falls woefully short.

Two early chapters on song still describe vocalizations in the old-fashioned way, reporting such qualities as hoarseness, wiriness, etc., and endeavoring to spell songs out in the letters of the alphabet. This was acceptable in 1957, but it is not acceptable today, when even field guides present sound spectrograms. (W. W. H. Gunn, co-author of one of the song chapters, informs me he was given no opportunity to revise his chapter and indeed was not told that it was to be republished.) Ludlow Griscom's chapter entitled "The techniques of warbler study" is particularly unfortunate. The novice consulting it will almost surely conclude that the study of warblers consists largely of learning what they look like, counting them and recording locations and dates of observation. Nor will he or she be encouraged to attempt even these limited tasks after reading Griscom's statement that expertise calls for talents "completely beyond the natural capacity of most individuals." Those with sufficient hardihood to continue in the face of such odds are instructed in heavily pontifical language which too often has little substance. "I list below the various stages by which expertness in warbler study may be attained: I. Clearly the first step is to acquire an awareness of warblers."

Most of the species accounts are by Sprunt, who is inclined to tell the reader less about a species than about how he feels toward it. Some warblers are clowns, other sprites or animated jewels; they are petite, dainty, breathtaking, enchanting; their haunting melodies are as played on the pipes of Pan. Sprunt at times reports as fact points for which it is hard to imagine the supporting data. Can he have had evidence for Orange-crowned Warblers

(*Vermivora celata*) that "even normal migrational hazards [do] not seem . . . to affect them as much as many other species," and what other species had he in mind? On the other hand, when facts are available, he sometimes appears either to ignore them or to write so loosely as to mislead. For example, he states that Prairie Warblers (*Dendroica discolor*) in the north are victimized by cowbirds (*Molothrus* sp.) and that in the south, where cowbirds are absent, raccoons and snakes sometimes take a toll, as though these threats to nest success replace each other. Those species reports contributed by other authors, e.g., Van Tyne on Kirtland's Warbler (*D. kirtlandii*), are often more factual and informative.

Considering that the book has color plates of all species and that even the most casually interested person can be expected to have a field guide, a great deal of space in the species narratives could have been saved had the rather superficial plumage descriptions been eliminated. Range maps (breeding ranges only) are presented with each account and are said in the preface to have been revised for this edition. I feel qualified to comment on only 1 map: that for the Prairie Warbler was not accurate in 1957, and the revised version has not corrected the errors.

The most useful chapters in the book are those summarizing the warblers of Mexico, Central America, the West Indies, Panama and South America. I found Bond's contribution on Central America and Eisenmann's on Panama particularly well organized and helpful. In contrast, the chapters on Alaska, British Columbia, the prairie provinces of Canada and eastern Canada overlap a good deal. And since they deal with the species covered by the A.O.U. Check-list, they contain much material that either duplicates the species accounts or that probably would have been more effectively presented in good, factual species accounts. This is not the fault of the contributors of these chapters, who wrote to fulfill their assignments from the editors of the first edition.

If the foregoing is largely critical of what the book originally contained, I find even more fault with the editorial policy that preserved the earlier work at the expense of most of the recent (and not so recent) studies of warblers. Omitted, for example, are findings of Mayfield on Kirtland's Warbler, of M. Ficken on the American Redstart (*Setophaga ruticilla*), of Foster on the Orange-crowned Warbler, of various students on the Blue- (*V. pinus*) and Golden-winged (*V. chrysoptera*) warblers and their hybrids, and of work on the Prairie Warbler. Meanley's study of Swainson's Warbler (*Limnothlypis swainsonii*) is mentioned only in a bracketed 1-sentence interpolation. Other warbler research of importance is also ignored, e.g., MacArthur on population ecology, Morse on foraging and on song, Mengel on speciation, the Fickens on comparative ethology. Van Tyne refers to banding and some of the results produced by that method of studying Kirtland's Warbler, but I recall no other reference to banding; the significant population data that it has generated are not discussed anywhere.

I am not competent to evaluate Dick's plates. Those interested in that feature of the book may want to refer to George Sutton's critical analysis in his review of the first edition (Auk 75:226-228, 1958).—VAL NOLAN, JR.

TO A YOUNG BIRD ARTIST: LETTERS FROM LOUIS AGASSIZ FUERTES TO GEORGE MIKSCH SUTTON. Commentary by George Miksch Sutton. Univ. Oklahoma Press, Norman, Oklahoma, 1979:147 pp., 4 color plates, 5 details of Fuertes' letters. \$9.95.—A tragic accident in August of 1927 cut short the very abundant career of perhaps the greatest bird painter of all time—Louis Agassiz Fuertes. There is a resultant sense of loss not only for the man, but also for the work never produced due to his untimely death. Consequently, any new work dealing with Fuertes merits celebration and a book such as this, which deals so intimately with Fuertes as an individual, as a painter and as the genius he was, deserves special attention.

This book consists of the letters Louis Agassiz Fuertes wrote to George Miksch Sutton between the years of 1915 and 1927, interspersed with Sutton's commentary on those letters, on Fuertes and on their collective influence on him. The correspondence took place while Fuertes was at the height of his career and while Sutton was struggling through the early stages of his development. The correspondence ended with Fuertes' death. Through the letters and narrative, the reader gains insight into the lives of both Fuertes and Sutton and their special relationship. But this book offers more than that. If the reader will endeavor to truly understand the principles presented, he will have gained an awareness and knowledge enabling him to better understand not only Fuertes and Sutton, but all of bird art. In this sense, the book is a primer on bird art which is valuable not just to those interested in painting but to anyone who is interested in birds—for birds and bird art are inseparable. Interest in birds is highly dependent upon our visual sense and it is in the visual sense that this book has its one fault. For a book dealing with bird art and bird artists, it does not seem to fully realize its potential in terms of illustration. But this fault is acceptable in that the book is intended to give the reader an understanding of bird art and this it does successfully.—LARRY BARTH.

PARROTS, THEIR CARE AND BREEDING. By Rosemary Low. Blandford Press Ltd., Poole, Dorset, United Kingdom. Distributed in the U.S.A. by Sterling Publishing, Inc., New York, New York, 1980:654 pp., 91 color photos. \$55.00.—Until recently, parrot aviculture has been mainly restricted to the maintenance of non-breeding exhibit collections, or household pets. The parrot was regarded as a household fixture, like the lap dog, or the fern. Since it was soon discovered to be noisy, messy and sometimes destructive, the bird was probably kept in some out-of-the-way corner of the house, permanently confined to a small cage, and fed an unvarying diet of hard seed. Similarly, with few exceptions, zoos maintained collections to satisfy the curiosity of the public, and made no effort to provide conditions that might promote breeding. During the last 50 years the increasing awareness of ecology, and the application of scientific techniques to animal care has caused a change in approach. Parrots are now more often provided with diets suited to their specific needs, and circumstances that promote a better psychological outlook. Increasing import restrictions and depletion of wild populations have stimulated more and more parrot fanciers to become parrot breeders.

Whether one is interested in the proper maintenance of a single pet, or in a large-scale breeding program, this book will, by itself, supply the necessary information. Low has produced the most comprehensive and scientifically based work on parrot-keeping to date. The book is largely a compilation of her own and other aviculturists' experiences, tempered with biological explanations. The result is a large amount of information presented in a very readable manner.

The book is divided into 2 parts. In part one, topics pertinent to the care of any type of parrot are considered. The problems of choosing, housing and feeding are discussed in detail. A constant theme of these chapters is that prospective parrot-keepers be practical in their choice of birds. The means and life-style of the keepers must be matched with the needs of their parrots. For example, Low would abhor the thought of a tame Blue and Yellow Macaw (*Ara ararauna*) living in a small apartment whose owner was away at work 10 h a day.

Specific directions for aviary construction are given, along with suggestions for accommodations in colder climates. In a section on aviary management, both daily and long-range tasks, as well as emergency measures, are discussed. One of the strongest points of the book is the detailed coverage of feeding requirements. Commonly encountered seeds, vegetables and fruits are analyzed for food value and vitamin content. Low dispenses with the commonly-held and harmful notions that: (1) all parrots, other than lorries and lorikeets, eat about the same thing—hard seeds of one size or another, and (2) parrot diets should be conservative

and unvaried. Most species of the genus *Amazona*, she feels, could do very well on the diet of their keepers.

The chapters related to breeding give excellent, up-to-date summaries on all aspects of the subject. Low's discussion of pair-bonding points out a much neglected area in parrot-keeping. Some species bond, and some do not, and an awareness of this is essential for proper aviary management, as well as understanding the behavior of a tame pet. Methods of sexing, appropriate nesting materials and special dietary needs of breeding parrots are discussed. Low advocates hand-rearing not just as an emergency measure, or a means of creating pets, but because she has found that it increases breeding success. Guidelines for construction of incubators and preparation of formulae are provided.

Although there is no doubt that Low's primary interest is in breeding parrots, the chapter on maintaining pets is exceptional. The over-riding point here is that pet parrots should be regarded as amusing and time-consuming companions, not merely as mimics or household adornments. Accordingly, as many suggestions are given for their psychological as for their physical well-being.

Part one is concluded with a chapter on sick birds. Anyone who has been subjected to a sick parrot can understand why this is a relatively neglected area in aviculture. Sick birds deteriorate very rapidly, and even if proper diagnosis can be made, treatment is often uncertain and more traumatic than the ailment. Low, nevertheless, competently summarizes what is known about sick parrots in general, along with methods of prevention, diagnosis and treatment of specific illnesses. Much of the information is certainly based on her own extensive experience.

The remainder of the book, part two, is devoted to the care and breeding of particular species. All genera and most species of parrots encountered in aviculture are discussed individually. Each chapter covers a general category of birds such as Australian parakeets, macaws, or hanging parrots, based on traditional taxonomic opinions. Following general comments on each group, there is a subsection devoted to each genus and species that includes range, habitat, description, avicultural history, feeding, accommodation and breeding in sufficient detail to prepare any prospective aviculturist for maintenance of the bird. Comments on natural history are brief, the reader being referred elsewhere for this matter. Although the descriptions are excellent, the book would be enhanced by more color plates. Those plates that are included are of good quality, and seem to have been selected to represent both typical and aberrant examples of the various parrot groups.

In addition to her obvious delight in aviculture, Rosemary Low has an objective that is both openly expressed and implied throughout her book—the elimination of the necessity of importing birds from their natural habitats. Aviculture can still be a hobby, but it should be refined so that it is possible to acquire any bird, whether for breeding or as a pet, from domestic stocks. Low has certainly done her part toward making this a reality.

I recommend this book highly for anyone interested in parrots, and for general, as well as, scientific libraries. The price is a bit high, but the thorough and up-to-date coverage makes acquisition of other books on parrot aviculture unnecessary.—SUSAN L. BERMAN.

LOVEBIRDS AND THEIR COLOR MUTATIONS. By Jim Hayward. Blandford Press, Ltd., Poole, Dorset, United Kingdom. Distributed in the U.S.A. by Sterling Publishing, Inc., New York, New York, 1980:108 pp., 32 color photos, numerous black-and-white photos and drawings. \$14.95.—This pleasant little book covers everything one needs to know about breeding lovebirds (*Agapornis* spp.), from the maintenance of a simple aviary to the production of the rare and fancy color mutations. Because of their beauty, small size and willingness to breed in captivity, lovebirds have long been popular among aviculturists. The increasing variety of color mutations in recent years has been an added incentive for breeding them.

In spite of these features, lovebirds have never attained the avicultural status of the Budgerigar, probably because of their shortcomings as pets. Even tame lovebirds can be pugnacious toward their keepers at times, and their nesting habits cause them to be destructive when left free and unsupervised in a household. Accordingly, the book contains no charming anecdotes about favorite pets. Hayward discusses only topics related to their breeding.

The style is chatty and agreeable if one can overlook the occasional misuse of words. Hayward's approach is that of a hobbyist, not a scientist, emphasizing the "how-to," but seldom the "why."

There are 4 chapters on subjects of a general nature. Aviary construction and management is covered briefly, and adds nothing not found in most standard parrot books. The chapter on feeding, although brief, is of value in being based on Hayward's extensive experience as a lovebird breeder. The best source of information on feeding any bird is one who has bred them, as most birds won't breed unless they are maintained on an appropriate diet.

Likewise, Hayward's experience is evident in the 2 chapters on problems related to breeding and health. In a concise but thorough manner, he summarizes the common difficulties, their prevention and treatment. Brand names of medication and precise dosages are given. Hayward is particularly helpful in providing directions for administering the appropriate treatment. All too often in avicultural literature one is not told how to get that antibiotic or worming medication into the bird. Hayward accomplishes this verbally and with the aid of photographs.

The major portion of the book is devoted to descriptions of the various lovebird species and their color mutations. The reader is prepared for the emphasis on the latter area by a short and very elementary chapter on bird genetics. Following this, a description of each species, along with its distribution and avicultural status, is given. Hayward comments on specific food and housing problems, and advises which species are more likely to breed in cold, damp climates. For species commonly yielding color mutations, Hayward provides "recipes" for producing them—a handy guide for the beginner. The color plates are of good quality and exhibit the variety and beauty of these little parrots.

Although the book is unscientific in its approach, and would not be helpful for one interested in the behavior or natural history of lovebirds, I think anyone inclined to breed them would find this a useful manual.—SUSAN L. BERMAN.

ARCTIC SUMMER: BIRDS IN NORTH NORWAY. By Richard Vaughan. Anthony Nelson Ltd., Salop, England, 1979:152 pp., 7 color plates, 96 black-and-white plates with captions, 2 maps, 1 table. £6.25. Available in the U.S.A. from Buteo Books, P.O. Box 481, Vermillion, South Dakota 57069.—This interesting little book describes the author's 38-day bird-watching and photography adventure on the Varanger Peninsula of Norway's most northerly county, Finnmark. The book is written as a naturalist's account and travelog of ornithological events in Finnmark during the exceptionally dry spring and early summer (6 June–19 July) of 1972. The author's photographs are excellent and comprise over half the book. The narrative is personal and describes the immediate events surrounding his trip; however, Vaughan, an historian at England's Hull University, also contributes a number of interesting historical anecdotes, and provides insights into the life histories of many birds in the area. The annotated "Systematic list of the birds of the Varanger Peninsula" at the end of the book is current up to the end of 1978.

In some parts, complicated sentences and overpunctuation make for slow reading. However, the assets of the book outweigh its minor liabilities. The annotated list, along with the names of local ornithologists and descriptions of the best camping locations, make Arctic Summer a valuable companion for bird enthusiasts visiting northern Norway.—STEPHEN R. JOHNSON.

ICELAND SUMMER: ADVENTURES OF A BIRD PAINTER. By George Miksch Sutton. Univ. Oklahoma Press, Norman, Oklahoma, 1980 (1961):253 pp., 7 color plates, numerous monochrome sketches and photographs. \$5.95.—This is a reprinting in paper covers of a book first published in 1961. An account of the author's travels in search of birdlife, it received the John Burroughs Medal in 1962.—R.J.R.

THE COMPLETE BIRDS OF THE WORLD. By Michael Walters. David & Charles, Inc., North Pomfret, Vermont, 1980:340 pp. \$35.50.—This book consists of an annotated list of all extant and recently extinct species of birds of the world. They are listed by family (but not by order), and the basic classification followed is that of the Peters Check-List, modified in a few cases by reference to more recent works. Although it was published in 1980, work on the manuscript ceased in 1977, so some recent references, including Vol. 8 and the revised Vol. 1 of Peters, were not consulted. For each species there are a few sentences summarizing data on distribution, habitat, food, nest-site, clutch-size, sexes that incubate and period of incubation, and fledging period. This is a reference work that aims for breadth of coverage rather than depth. Misspellings are numerous.

Of what use is such a book? The intended purpose is not explained. It could be helpful if one wanted to know the taxonomic composition of a particular family, or for a very sketchy outline of its biological features. The book could have been made much more useful by providing an index to genera, species and English common names, instead of only to families. One could then have used it, for instance, to identify unfamiliar forms encountered in reading. As it stands, however, to do this one must first know the family and then search for the form in question. In a large family this can be very tedious. In short, this volume represents a good idea whose potential was not fully developed.—ROBERT J. RAIKOW.

A MANUAL FOR BIRD WATCHING IN THE AMERICAS. By Donald S. Heintzelman. Universe Books, New York, New York, 1979:255 pp., 8 color plates, numerous black-and-white photos. \$17.95.—In this book Heintzelman combines a potpourri of practical information on bird-watching with extensive discussions of birding throughout the Americas based on his own travels. The first part deals with equipment and literature, especially field guides, and includes names and addresses of birding organizations. There are also chapters on group activities such as Christmas bird counts and Big Day counts, nest record programs, feeders and the like. Much of this will be familiar to experienced birders, but beginners should find some useful information. The rest of the book gives accounts of birding trips in various areas of North and South America, as well as Arctic and Antarctic regions. There are also chapters on watching particular groups of birds, such as waterfowl, hawks, owls, shorebirds and warblers. The color photos are of good quality, but many of the black-and-white photos lack sharpness and contrast.—R.J.R.

CALL COLLECT, ASK FOR BIRDMAN. By James M. Vardaman. St. Martin's Press, New York, New York, 1980:256 pp., 8 pp. of black-and-white photos, 2 appendices, charts, sighting ledger, map. \$10.95.—In 1 year, 1979, the author attempted to see 700 of the 800-plus North American bird species. This book recounts that effort, for which he spent \$44,000, traveled 161,000 miles and fell 1 bird short of his goal. The book is not about birds, but rather about the strategy and logistics of finding them. Vardaman's approach to bird-watching brings out one aspect of "ABA-ism" at its worst—the appreciation of birds only as an offshoot in the quest for a longer life-list (year-list, in this case). He includes copious details about the "super-birders" who found most of the birds for him, but practically no information is given about key field marks, plumages, or behavior of the birds themselves. Other organized

attempts to set high-count birding records have generated money for conservation causes. Vardaman apparently made no effort to grace his well-publicized "Big Year" by soliciting such donations. Buyers of this book are reimbursing the author's forestry consulting firm for the cost of the Big Year attempt. Birders may find interesting the locations of hard-to-find species; biologists will find the book of no value.—MARK HOLMGREN.

THE BIRDS OF BREVARD COUNTY. By Allan D. Cruickshank, edited by Helen G. Cruickshank. Florida Press, Inc., Orlando, Florida, 1980? (undated):xv + 204 pp., 1 map, 1 black-and-white photo, hard cover. \$12.00.—This is a collection of records of birds occurring in Brevard County, Florida, as compiled from 1950–1974 by the late Allan D. Cruickshank, with contributions by other observers, and added records (1974–1978) by Robert D. Barber. The book includes a map of Brevard County, an introduction by Helen G. Cruickshank and a brief biography of the author. The bulk of the book is devoted to the records, which include the following information, where appropriate, for each species: common and scientific names, arrival dates, dates of maximum abundance, winter visitants, departure dates, breeding status, egg dates and status as a resident or migrant. This work should be a useful aid to birders on the east coast of Florida.—R.J.R.

BIRD FINDING IN TENNESSEE. By Michael Lee Bierly. Published by and available from the author at 3825 Bedford Ave., Nashville, Tennessee 37215, 1980:255 pp., numerous maps, paper cover. \$8.00 postpaid.—One hundred-twelve birding areas in Tennessee are discussed with remarks on habitat, travel information and expected species. Several large-scale and numerous local maps pinpoint birding areas. In addition, there are brief comments on status and abundance of the 342 species recorded from the state, a list of birders in various areas who can be contacted for local information and a compilation of local chapters of the Tennessee Ornithological Society.—R.J.R.

WELCOME THE BIRDS TO YOUR HOME. By Jane and Will Curtis. The Stephen Greene Press, Brattleboro, Vermont, 1980:154 pp., paper cover. \$5.95.—Chatty advice on attracting and studying birds, and a bit of painless natural science are the features of this little book aimed at the beginning amateur ornithologist.—R.J.R.