

ORNITHOLOGICAL LITERATURE

EAGLES, HAWKS AND FALCONS OF THE WORLD. By Leslie Brown and Dean Amadon. McGraw-Hill Book Co., New York. 1968: 2 vols. (boxed), $8\frac{3}{4} \times 11\frac{1}{4}$ in., 945 pp., 165 pl. (125 in color), plus 15 under-wing pl., 94 range maps, 33 text figs. \$59.50.

Confronted with a book listing at \$59.50, the reader of a review of that book is interested *primarily* in the answer to one question: "Is it worth it?" In the case of "Eagles, hawks and falcons of the world," this reviewer must reluctantly answer "No." At the same time, I must also say that it is an important and valuable book, and that my library would be incomplete without it. This is not the paradox it may seem. Remember that the initial question dealt with the *price*. I was fortunate enough to receive a *gratis* review copy. Had I paid about sixty dollars for it, I would, after having examined it for any length of time, have felt that I had been cheated. This is a strong statement, and will, of course, be explained.

Documentation of the faults of the book will, of necessity, occupy most of the space devoted to this review, simply because a reviewer is seldom challenged for documentation to support a *favorable* statement, whereas the basis for *negative* criticism must be demonstrated. Therefore let me reiterate at the outset that this is a very important book. Both authors have devoted long hours of field work to the study of the diurnal birds of prey; the senior author has virtually made this study his career. The junior author has had at hand the superb collections in the American Museum of Natural History, supplemented with material from other museums; the detailed descriptions show how carefully these specimens have been studied. A tremendous body of literature has been consulted and, in general, successfully summarized. The illustrations, descriptions, and range maps will be extremely useful to anyone wishing to identify the often difficult species in this group. The museum curator can use the book in his office but it is far too massive to use in the field. The organization of the book, however, will permit a traveler to study in advance the species he is likely to see wherever he goes; a synopsis of field characters of genera, for example, is grouped into major geographic regions. The first several chapters (through p. 150) constitute a good general introduction to the birds of prey and their biology. Unfortunately the long delay in publication did not permit inclusion of some of the more recent findings on the effects of pesticides on birds of prey. A conservationist in 1970 will probably consider this topic underemphasized in the book. In the chapter entitled "Longevity, mortality and enemies," about 50 per cent more space is allotted to the hazards of motor cars than to those of pesticides.

Throughout the book the authors have made a special effort to point out gaps in our knowledge, and have suggested specific projects worthy of study. These include such widely disparate subjects as the aerodynamics of the Bateleur and the eye anatomy of snake-eagles. For a potential graduate student interested in the birds of prey, the present book is a treasurehouse of possible thesis problems.

Finally, thanks to the set of plates in this book, the Falconiformes can rank near the Anatidae among the most thoroughly illustrated of major groups of birds. Every species, many subspecies, and many age, sex, and color-phase variants are shown either in color or half-tone. Subject to the qualifications to be mentioned beyond, these plates will be exceedingly useful.

It must be stated immediately that many of the faults of the book are as disturbing to the authors as they are to a reader. During the production of the book Brown worked in Africa, Amadon in the United States. Country Life, the English publisher with which the

original contract had been signed, was purchased by the Hamlyn Publishing group mid-way in the project, and the authors found themselves dealing with a completely changed editorial personnel. The book's actual publication after completion of the manuscript was long delayed during negotiations with American publishers, and a trip to England Brown made specifically to be on hand when the book went to press failed of its objective. The plate captions, the legends for the maps, the terminal bibliography, and the index were all printed without proofs having been submitted to either author. These portions of the book are riddled with errors.

For the facts in the preceding paragraph, I am indebted to a four-page errata supplement; this is available upon request from Dr. Amadon's office at the American Museum of Natural History.

Even a spot-check of the plate captions indicates that all of the errors and discrepancies were not listed on the errata sheets. In some species described in the text as sexually dimorphic, the plate figure is simply labeled "adult" (cf. *Aviceda cuculoides*, pl. 6). On the other hand, no sexual dimorphism is described for the Osprey, yet two very different-looking birds are captioned "adult male" and "adult female" of *Pandion h. haliaetus* in pl. 5. From its characters, I suspect that the "adult male" was intended to portray the North American subspecies, *P. h. carolinensis*. Judging from the text descriptions (see especially the number of tail bars), the captions have been reversed for the adult and immature of *Aviceda madagascariensis* on pl. 6. And so on.

The main text is by no means free of typographical errors: "Columbia" (twice) for Colombia on p. 192; "*Harpiopsis*" for *Harpyopsis* on p. 24; "G. S. Sutton" for G. M. Sutton on pp. 255 and 258, etc. Most such misprints are obvious and harmless (unless there are similar misprints in numbers, such as measurements or literature citations; I have not checked these), but the errors in captioning can be serious and misleading. As mentioned earlier, the authors were unable to proofread these.

Also beyond the control of the authors is the one flaw of the book that does the most to justify my statement that it is not worth the price. I refer to the reproduction of the color plates. I thought of several extremely vivid deprecatory adjectives to apply to the color reproduction in this book, but settled on "inexcusable." When a publisher asks sixty dollars for a book, and then delivers plates that are travesties of the original paintings, one might almost invoke the word "fraud." A potential purchaser *might* be able to thumb through several copies, if available at his bookstore, and pick the "least worst" of the plates; there is inconsistency from copy to copy. One belonging to a colleague has been compared with the review copy; the latter averages much worse.

What the plates *could* have, and *should* have, looked like may be ascertained by examining the issues of *Audubon* magazine for September-October and November-December 1968. Seven of the book's color plates were reproduced in the first issue, and eight (all of vultures) in the second. I do not know the size of the press run of *Audubon*, but it is certainly mass-produced. Les Line, the magazine's editor, has assured me that the plates in the magazine were printed from the same engravings as used in the book. Two of the eight artists have told me that the color *proofs* they received were excellent, and up to the quality of the plates reproduced in *Audubon*. That the publishers permitted this book, obviously a luxury item, to be sold with the quality of color reproduction found in the "finished" version is thus all the more inexcusable. It is not primarily a matter of register, a common fault in color reproduction; none of the plates in my copy is *grossly* off register (as, for example, are some of the plates in another recent expensive book, "Birds of Colorado" by Bailey and Niedrach, 1965). The problem is in the colors them-

selves. When compared with their counterparts in *Audubon*, the plates in the book are seen to be muddy, uncrisp, and inaccurate—generally washed over with reddish tones. The pale buff underparts of the Laughing Falcon (p. 134), for example, have become a sort of sickly orange brown. Roger Peterson's vulture plates, which several people have told me they consider to be among his finest work (I disagree, but that is a subjective judgment), have perhaps suffered the worst. One *must* look at the reproductions in *Audubon* to see what Peterson was really trying to do in these paintings.

Under such circumstances, a reviewer usually expresses the hope that a second printing or second edition will have better color reproduction. For a potential buyer of the book who is chiefly interested in the plates, it can only be hoped that the first printing will sell out to readers who need to have the textual material available, and for whom the plates are of secondary importance. Otherwise there probably won't be a second printing.

While on the subject of the plates, a word on the artists is in order. Three are British: J. C. Harrison, represented by 70 plates; C. E. Talbot Kelly, with 15; and David Reid-Henry, with 10. The five Americans are Don R. Eckelberry (29 plates), Albert E. Gilbert (21), Roger T. Peterson (10), Guy Coheleach (7), and Lloyd Sandford (3)—these are hasty plate counts of my own, and I do not guarantee their accuracy! Several distinct painting styles are represented, and tastes will certainly differ as to their aesthetic qualities as well as their success in portraying a given species of bird. I am sure, however, that few will deny that Reid-Henry's plates (especially the falcons) and those of Eckelberry represent these superior bird-painters at their finest, or that Gilbert is rapidly proving himself to be a worthy apprentice to the masters.

At the end of the first volume, 15 field-guide style "under-wing" plates are grouped geographically, a useful arrangement. The field observer who wishes to identify a soaring hawk, however, had best be sure to take good notes or make his own sketches, as he is not likely to want to carry the book with him. Volume 1 alone weighs five pounds two ounces, and both volumes plus slipcase weigh twelve pounds six ounces (weights courtesy of our local postmistress).

One matter remains to be mentioned in connection with the illustrations. The introduction (p. 12) states: "A problem with many birds of prey is the sub-adult plumage or plumages. We have not attempted to illustrate these, as they are little understood and, in all but a few instances, are more or less obviously intermediate between the first immature and the adult dress." This seems to me to be a little defeatist, especially as birds in such plumages are rather frequently encountered in the field, and may present puzzling problems in identification. Obviously space would not permit the illustration of all or even most transitional plumages. But whether or not their sequence is "understood," at least these plumages are identifiable as to species, and could be portrayed. It does seem somewhat arbitrary, for example, to illustrate *one* "immature" plumage for birds such as the California Condor or the Bald Eagle, in which as many as five to seven age-classes may be distinguishable. In the plate of the King Vulture (pl. 2), the plumage shown is allegedly that of the "first immature," but the figure as painted combines the plumage of a first-year bird with the head colors of a bird at least two years old. Only adults of *Circus cyaneus*, *macrourus* and *pygargus* are figured, although young birds are by no means identical in appearance to the adult females. Pl. 11 shows the "immature" of *Henicopernis infuscata* as radically different from the adult, but the text (p. 219) simply describes the adult of this species and then states "Immature probably little different."

Turning now to the text, throughout the book and especially in the species accounts the reader is gratifyingly conscious of the fact that this is no mere compilation. Page

after page is filled with information, often hitherto unpublished, based on the authors' own field experience with birds of prey all over the world. One need only contrast the perfunctory accounts of some of the little known (even if widely distributed) species, such as *Leucopternis* sp., with the lively and detailed first-hand accounts of, say, *Buteo galapagoensis* or *Aquila wahlbergi*, to appreciate the value of so much of this book.

The writing is generally readable, although marred by occasional grammatical lapses irritating chiefly to pedants like the reviewer. The authors are addicted to long sentences formed of a string of comma-bordered phrases. On p. 148, for example, I found a 62-word sentence immediately followed by a 57-word sentence. The reader may be pardoned if he occasionally gets lost in such labyrinths.

One sentence on p. 63 is truly of *Auklet* quality: Bald Eagles in Florida "begin nesting not merely early in the year, but in the autumn of the preceding year. . ." In other words, they don't nest this year, they nest last year. Shades of Lewis Carroll!

The subject matter of the introductory chapters naturally duplicates to some extent that in the species accounts, and even in the introductory chapters themselves there is overlap (feeding habits and adaptations are mentioned, for example, in most of these chapters). Some repetition is therefore inevitable, but it does seem a bit redundant to find a peculiar habit of the New Zealand Harrier (discontinuing incubation while there are still fertile unhatched eggs in the nest) mentioned on pp. 108, 109, 111, 127, and in the species account on p. 386.

I have generally understood "fledging" to mean the acquiring of flight feathers and consequently of flight in young birds. Brown and Amadon consistently use "fledging period" to mean the time commencing at hatching for which most authors tend to use "nestling period."

In a compendium of this size, any specialist can find what he would consider errors, both of omission and commission. This could hardly be avoided without asking the authors to devote a lifetime to writing the book, and to correspond with everybody who has ever looked seriously at birds of prey. Such points can be called to the attention of the authors for possible use in a new edition or supplement; in the errata pages mentioned above, there are already several corrections submitted by readers (Eisenmann on soft-part colors of *Cathartes* sp., for example). As a sample of the kind of thing I mean, I noted that the descriptions of the subspecies of the Osprey are rather misleading. The head of the Australian forms is not "pure white," as the broad dark band is present on the sides of the face, scarcely less prominently than in the North American race *carolinensis*. On the other hand, the Caribbean race *ridgwayi* (which is erroneously stated on p. 153 to be confined as a breeding bird to the Bahamas), characterized by Brown and Amadon by its smaller size and white breast only, is *truly* white-headed; the traces of brown on the crown and ear coverts are, at most, barely visible in the field.

As an example of omission, I was surprised to find no bibliographic mention of the article "Falconry, the sport of kings," superbly written and illustrated (in color and black-and-white) by Louis Agassiz Fuytes, in the December 1920 *National Geographic Magazine*. I have seen no finer paintings of birds *in action* than those by Fuytes.

Much of the above criticism of the text is of relatively little moment in proportion to the overall importance of the book. There is one aspect of the text, however, that I would score as a serious fault. I refer to the documentation, both with respect to the presence and absence of references, and to the nature and placement of these when present. Bibliographic citations in this book are of several kinds. So-called "references" are placed at the ends of some (but not all) of the introductory chapters. These generally represent

the documentation for some (but again, not all) of the statements credited by name to other authors in that particular chapter. The "supplementary bibliography" at the end of volume 2 is arranged by chapters, and *some* of the papers or books referred to in the text but not listed at the end of the chapter are listed in this bibliography. Nevertheless, I constantly came across authors mentioned by name whose papers or books were listed in *neither* bibliography; examples are Tinbergen (p. 27), Cade (p. 39), Munro (p. 49), etc. Similarly, references are given at the ends of species accounts to some but not all of the authors cited by name. This is frustrating to the reader who may wish to pursue a subject in more detail. All of the book with the exception of that part based on the authors' own studies may be considered to be a compilation from earlier literature, and the authors themselves have stated that they cannot possibly document every statement. The use of authors' names without references to their works, therefore, becomes a space-consuming "pseudo-documentation."

In what is apparently a misguided attempt to be concise, most of the literature citations at the ends of chapters have been greatly truncated, although utterly inconsistently and to the detriment of their usefulness. Thus, in the references at the end of chapter 6, two papers in *The Ibis* are cited with volume number, year, full title of paper, and inclusive page numbers. For one paper in the *Journal für Ornithologie* the title of the paper is omitted; for one in *The Wilson Bulletin* the volume number and pagination are omitted. This has not accomplished much in the way of space-saving, as virtually all of the chapters (including 6) end with about half a page of blank space.

Throughout the book I found intriguing statements with *no* documentation, statements whose origin I would have liked to know, such as the suggestion on p. 47 that small birds "may show much more concern about the presence of a lean and hungry hawk than a well-fed one." Sometimes a little patience and a little detective work helps. On p. 17 we learn that "new anatomical findings indicate that the owls may be related after all, though distantly, to the diurnal birds of prey, or at least to the falcons." Since this statement is in disagreement with what we have always been taught, we are immediately interested. However, there is no indication at this point as to what, or whose anatomical findings are involved. On p. 23 we learn of the work of Starck and Barnikol, who have shown "that the musculature of the head of a falcon is more like that of an owl than a hawk." Would it have taken much more space to say *which* falcon, owl and hawk? In this instance, the title of the paper happens to be cited in the references at the end of the chapter, and we see that the paper by Starck and Barnikol deals only with "Morphologie der Trigemini-muskulatur. . ." One might have expected that the generalization about "new anatomical findings" and relationships given on p. 17 would be somewhat more broadly based, but apparently it is not.

On p. 35 there is a parenthetical reference to "(Brown, *Eagles*)" in a discussion of immature plumages. One looks in vain for a more complete bibliographic citation of Mr. Brown's book either at the end of chapter 3 (where there are *no* references) or in the portion of the terminal bibliography devoted to references pertaining to chapter 3. Again, a little patient detective work pays off, and we find the citation in the second portion of this bibliography, which is arranged by groups of birds, under "eagles." The allocation of references in the bibliography is often unpredictable and detracts from its potential usefulness. For example, as there is no general chapter on anatomy, one might expect to find Berger's paper on the appendicular myology of the Pygmy Falcon listed under "falcons, caracaras," but it is not; it is listed among the references for chapter 1, "classification and distribution" (as are, also, specialized papers on the systematic position of

Gampsonyx and of *Heterospizias*). A paper by Clay on "protective coloration" in *Falco sparverius* is not listed among the references at the end of the species account, nor among the papers in the bibliography pertaining to falcons, but under chapter 3, "plumages and moults." In short, although the number of books and papers cited in one way or another in all parts of the book combined is phenomenal, the usefulness of the documentation is severely impaired by its incompleteness and difficulty of access.

In a book review by a taxonomist, the reader expects to find at least a few remarks on the taxonomy of the authors. Their approach to classification is, by and large, quite "middle-of-the-road." They acknowledge having been influenced by an unpublished manuscript prepared by Erwin Stresemann for a proposed revision of volume 1 of Peters' "Check-list" and loaned by him to Brown and Amadon. As the latter admit, full evaluation of Stresemann's classification (and departures from it made by Brown and Amadon) is not possible until the list has been published. The authors are outspoken in their dislike of name changes for purely nomenclatorial reasons, and have therefore retained certain names, such as *Polyborus* and *Circus buffoni*, that have been altered in some recent publications. Any taxonomist is bound to disagree with at least an occasional taxonomic decision made by Brown and Amadon. For example, in view of some other "lumpings" I cannot see the justification for admitting four rather than two species of *Elanus* (see Parkes, *Condor*, 60: 139-140, 1958 and Husain, *Condor*, 61: 153-154, 1959); Brown and Amadon's "discussion" on this point is confined to a statement (p. 236) that *E. leucurus*, *caeruleus*, and *notatus* are "usually and probably correctly considered to comprise three species."

But some such disagreements are, as I say, inevitable, and I roundly applaud the care with which Brown and Amadon have acknowledged (especially in a series of tables on pp. 160-162) taxonomic and nomenclatorial usages other than those they have elected to follow in their book.

In summary, "Eagles, hawks and falcons of the world" is a major accomplishment, and a book that belongs in all institutional libraries. Purchase by individuals out of their own pockets must depend upon the significance to the potential purchaser of the book's several serious flaws (many the fault of neither the authors nor the artists) in relation to the very high price.—KENNETH C. PARKES.

BIRD SONG: ACOUSTICS AND PHYSIOLOGY. By Crawford H. Greenewalt. Smithsonian Institution Press, Washington, D.C. 1968: 8 × 11 in., 194 pp., 168 figs., 23 tables, 2 7-in. records, 33½ r.p.m. \$12.50.

HOW BIRDS SING. By Crawford H. Greenewalt. *Scientific American*, 221: No. 5, Nov. 1969: pp. 126-139, 7 plates, 14 figs., 9 bl. and wh. illus.

How do birds sing? Why is it that for so long no firm bridge has been found across the gap from the anatomist's precise description of the avian syrinx to a lucid interpretation of how it functions in the production of sound?

Crawford Greenewalt's study seems to make this point: the answer to how birds sing is a complex one to be reached only through an interdisciplinary approach that includes elements of animal behavior, anatomy, physiology, physics, and acoustical, electrical, and mechanical engineering.

Dr. Greenewalt's distinguished career is in chemical engineering, and therefore not precisely in any of the above fields. Once motivated to tackle the problem, however, he was able to muster an impressive array of resources: a sharply analytical mind, the training and background of scientific research, ready access to the best technical advice and tech-

nical equipment, and, not least, an abiding interest in the behavior and physiological functioning of birds.

He chose not to use laboratory research with the living bird; instead, he has based his case on deductive reasoning derived from an examination of the amplitudes and frequencies of bird sounds, as measured and portrayed by the oscilloscope, sound spectrograph, wave analyzer, and a range of frequency filters. He has then interpreted these results in the light of the best available descriptions in the literature of the avian syrinx, trachea, and associated structures.

His conclusions are stated as succinctly as possible in one paragraph of the article in *Scientific American*, which I quote:

"Let me summarize. The physiology and acoustics of bird vocalization are unique in the animal kingdom. Sound is produced at the syrinx in an air stream modulated by an elastic membrane vibrating in a restricted passage bounded by the walls of the bronchus. This source-generated acoustical disturbance appears not to be modified in its passage through the trachea. The syrinx contains two independently controllable sources, one in each bronchus, enabling the bird to produce two notes or phrases simultaneously. Harmonics arise below a threshold frequency by mechanical constraints on the vibrating membrane, forcing a departure from a purely sinusoidal wave form. The source-generated sounds can be modulated in frequency or in amplitude or (more usually) in both with extraordinary rapidity, so rapidly that human ears cannot perceive the modulators as such, receiving instead impressions of notes of varying quality or timbre."

Each of these conclusions has a chapter devoted to it in the book. Preliminary chapters deal with instrumentation (particularly valuable for anyone contemplating electronic analysis of bird sounds) and the anatomy of the syrinx. Chapter 4, entitled "A Portfolio of Whistled Song," is primarily a series of plates showing examples of oscillograms and corresponding sonograms of sounds of 60 species chosen mostly at random. The text includes provocative definitions of both "whistled" and "song" that nevertheless seem logical and acceptable. Sonograms are lacking for Great Gray Owl, Horned Lark, Carolina Chickadee, and a portion of the Red-winged Blackbird—perhaps because they failed to print. Two records in the back of the book illustrate these recordings and other plates in subsequent chapters. Their primary value is in the slowed-down versions that enable the sonograms to be followed note for note; they also illustrate the components of "the two acoustical sources" (chap. 5). Among the plates in this chapter, I expected to find examples from that exceptionally talented singer, the Hermit Thrush. Alas, although the Wood Thrush has four plates and the Gray-cheeked Thrush one, there are none for the Hermit.

Undoubtedly the most surprising conclusion in the book is that the trachea does not modify sound produced by the syrinx. If not, then how can one explain the intricate development of the trachea in the Trumpeter Swan or Whooping Crane, for instance?

The author postulates that if the ratio of the cross-sectional area of the trachea to that of the syrinx is in the general order of ten to one, then resonance is dampened and harmonics rarely occur in the trachea. He believes that in fact this ratio does exist in most birds, though supporting evidence is rather thin. However, convolution in the trachea of the Trumpeter Swan remains unexplained in the evolutionary sense of contributing to survival value. Perhaps the most telling support for a non-resonating trachea is that the dual sound sources thereby maintain their individuality instead of being subject to modification in a combined form.

Two other general conclusions reached by the author are worthy of note: (a) there seems to be no consistent relationship between sound frequency in the song and the size

of the bird; (b) songs show no strong simplicity relationship in the evolutionary trend from loon to longspur.

The general style of prose is clear and concise, but the reader is required to exercise his brain at a fairly high level of intensity and he is assumed to have a well-based scientific and mathematical background.

The article in *Scientific American* is composed largely of sizeable extracts of key portions of the book. There are of course many fewer illustrations, but those which are reproduced are more clearly labelled and easier to comprehend. A schematic diagram of the relevant air sacs of a bird makes a worthwhile addition. The article is recommended for those who are interested in the subject but have only an hour or so to devote to it. Those with a more compelling interest will find the book challenging but rewarding. It is an important contribution to ornithology that perhaps only the author could have made. He is the first to say that he may not have the final answers, but he is to be congratulated on having established a solid edifice that may only be challenged or extended through actual laboratory experimentation on birds.—WILLIAM W. H. GUNN.

PHYSIOLOGICAL SYSTEMS IN SEMIARID ENVIRONMENTS. Edited by C. Clayton Hoff and Marvin L. Riedesel. University of New Mexico Press, Albuquerque, 1969: 6 × 9½ in., xi + 293 pp., many figs. \$9.00.

This publication deals with an ambitious seminar conceived and organized by Marvin L. Riedesel. The seminar suffered from the compromise funding which has characterized so much of recent NSF decisions—not enough money to really do it right, but just enough to keep it going. The title is somewhat misleading in that the various reports deal with both desert and semidesert environments. Some of the reports are obviously inappropriate, e.g., “Multiple Hypothermic Experiences in Infant Albino Rats” or “Oxygen Consumption by Fluoride-inhibited Bat and Rat Heart Homogenates.” They may serve to illustrate the stated objectives of demonstrating the importance of conducting studies at various levels of organization, but they are inappropriate examples for a seminar on desert and semi-desert adaptations. The papers have not been subjected to the rigorous editing found in most scientific journals. As a result, procedures such as the use of Schultheis thermometers to obtain rectal body temperatures on 3.5 gram bats, a technique inappropriate for accurate determination of deep body temperature, are tolerated.

The seminar carries a strange mixture of regional, continental, and world-wide approach to the study of physiological systems. No doubt this is a consequence of limited funding and the extent to which cooperation from established investigators could be obtained.

A number of papers are without scholarly documentation and include such statements as “In years with abundant seed production rodent and ant populations increase very much, but decline again in poor seed years.” This sort of statement has profound ecological implications and should either be documented or properly referenced. Statements such as “Well integrated research may reveal a number of unknown relationships between man or other animals and the atmospheric environment of arid and semiarid regions” sound impressive, but are meaningless.

Some of the review papers fell far short of their mark and might better have been left out because they are poor examples of scholarship. The failure of some of the participants to provide more than an abstract detracts seriously from the value of this publication. On the other hand, the editors are to be commended for having avoided unnecessary delay in the publication of this seminar in by-passing laggards.

In the overall evaluation of this publication it is necessary to note with care what it was

intended to be, *viz.*, (1) a device for stimulating research, (2) to further integration of research and teaching programs in colleges located in and near semiarid areas, and (3) to facilitate communication among investigators and students located within the southwestern region. These objectives are obviously regional in perspective and were fairly well achieved. As an authoritative source of information about arid environments, the publication is inadequate. However, if it is used eclectically and with some prior insights, there is much useful and stimulating information contained in it.—J. W. HUDSON.

FRANK M. CHAPMAN IN FLORIDA: HIS JOURNALS AND LETTERS. Compiled and edited by Elizabeth S. Austin. University of Florida Press, Gainesville, 1967: 6 × 9¼ in., x + 228 pp., 6 photos. \$7.95.

Frank Michler Chapman spent a part of almost every winter in Florida, beginning in 1886 when he was 22 years old. In the early years he worked in the Gainesville area; later he ventured farther afield—to the Suwannee River, the Dry Tortugas, and the Everglades—always collecting birds for the American Museum of Natural History. After 1932 he lived quietly on the shore of Biscayne Bay where “. . . he did not go exploring in the wild country and bring new birds and mammals to his beloved museum. . . .” Rather, “. . . he planned a season of discovery among familiar creatures in his own back yard.” While in Florida he kept a journal of his daily activities and, in the earlier years, frequently reported to his superior at the American Museum, Joel Asaph Allen, in long informal letters.

Elizabeth Austin deserves high praise for assembling the material and weaving it into a delightful story of this little-known segment of Frank Chapman's life. Dr. Chapman never neglected the people he met and the places he visited and neither does she. Historians will thank her for the revealing picture of Gainesville in the 80's. Probably no better record exists. Although the collecting, reading, and selecting of passages must have been time-consuming and often tedious, the finished work gives no hint. The writing is lively, its spirit as enthusiastic as was the man himself—even in his later years.

Each ornithologist will have his own reaction: Graybeards will try to relate the 22-year-old, who gave up banking for birds, to the vivacious old gentleman attending his last A.O.U. meeting: those in the middle years will remember *Bird-Lore*, founded, edited, and often illustrated with photographs by Chapman; the young, to whom the name means essentially a grant from the American Museum, may be surprised to learn that Chapman was an ecologist and ethologist long before they were born. The bibliography of his work, complete except for book reviews, notes, and editorials in *Bird-Lore*, includes 19 books and over 300 articles, staggering in both length and variety—from “Birds and Bonnets” (*Field and Stream*, 1886) to “Description of the Nestling Plumage of *Falco islandus*” (*Auk*, 1900), and from “Hunting with a Camera” (*World's Work*, 1903) to “Everglade Islet” (*Audubon Magazine*, 1943). The fact that he accomplished so much in an era when communication and traveling were far more difficult than at present should cause each of us to wonder what we do with our time.

The last chapter, “Birds of the Gainesville Region, Then and Now,” by Oliver L. Austin, Jr., reveals the changes in birdlife following the cutting of vegetation and draining of swamps to make room for the growing town. The addition of 93 species to Dr. Chapman's original list of 149 species for Alachua County shows that the spark provided by Chapman continues to flourish in Florida today.

Frank M. Chapman recognized no boundaries between professional and amateur ornithologists and neither does this book. All will enjoy it.—ELEANOR RICE PETTINGILL.

THE WORLD OF THE CANADA GOOSE. By Joe Van Wormer. J. B. Lippincott Company, Philadelphia, 1968: 7¾ × 10¼ in., 1922 pp., illus. \$5.95.

This would appear to be just another book on the Canada Goose except that it was written for the layman instead of the ornithologist or the wildlife manager. It is similar to "Honker" by C. S. Williams (D. Van Nostrand, 1967) in subject and content, but is less scholarly. "The World of the Canada Goose" is the 15th book in the Living World Books series edited by John K. Terres. It is the third dealing with a bird species, and the fourth in the series by this author. It is not the best in the series. The author has done his homework in researching this book but does not show a broad familiarity with birds or with this species.

Some of his information borders on the inaccurate. The Canada Goose does not have red flight muscles because of the large number of blood vessels (p. 30) so much as because of the great quantity of myoglobin in the tissue. The supposition that there is much loss of very young goslings to internal parasites (p. 146) belies the time necessary to develop heavy infections of most parasites. I doubt if the author really meant to refer to ducks and geese as "two species" (p. 105), or to three races of the Canada Goose as species (p. 172). He appears unsure of the present and historic status of the Canada Goose when the reader compares statements on page 108 with those on pages 129 and 157.

While it may improve readability, it does not increase my confidence to be informed that since . . . "the Canada is an eminently practical bird it does not expend energy foolishly" (p. 121). I fail to understand how the preference of older geese for a previously occupied territory "induces territorialism" (p. 46), or how one would recognize a goose that is "happy in the knowledge" that it has exerted dominance over a resident pair (p. 47).

The book is illustrated with many pictures by the author, most of them excellent, but I do not understand why a picture of a flock of Sandhill Cranes appears on page 122 when there is no mention of the species anywhere that I could find.—JAMES TATE, JR.

PUBLICATION NOTES AND NOTICES

BANKERS, BONES, AND BEETLES: The First Century of the American Museum of Natural History. By Geoffrey Hellman. Natural History Press, Garden City, New York, 1969: 5½ × 8½ in., 275 pp., 18 photos. \$5.95.

From the book's jacket: "Written with wit and affectionate irreverence by Geoffrey Hellman, this book is an anecdotal history of the remarkable men—financiers, scientists, philanthropists, and eccentrics—who have been associated with the greatest natural history museum in the world. But, chiefly, it is a celebration of the growth of a renowned institution, repository for 16,000,000 mammals, minerals, meteorites, fossils, fish, insects and birds, and lodestar to 3,000,000 visitors a year."

COLLECTED PAPERS IN HONOR OF LYNDON LANE HARGRAVE. Edited by Albert H. Schroeder. Museum of New Mexico Press, Santa Fe, 1968: 6 × 9 in., paper covered, 169 pp. No price given.

Among the ten papers are the following four of ornithological import:

Birds and Feathers in Documents Relating to Indians of the Southwest (pp. 95-114).
Albert H. Schroeder.