

ORNITHOLOGICAL LITERATURE

BIRDS OF PREY OF THE WORLD. By Mary Louise Grossman and John Hamlet. Clarkson N. Potter, Inc., New York, 1964: $9\frac{1}{2} \times 12\frac{3}{4}$ in., 496 pp., 70 col. photos. by Shelly Grossman, many other illus. \$25.00.

The birds of prey are among the most awesome, superb, and misunderstood creatures of nature, and nearly all students of birds count them among their most esteemed objects of study. I have often been impressed by the large number of ornithologists—amateur and professional alike—who name the Peregrine Falcon as their favorite bird, a sad commentary in this day of its rapid disappearance in the more polluted parts of the world. Indeed, as this book by Grossman and Hamlet documents very well, man's emotional, intellectual, artistic, and recreational involvement with the birds of prey pervades all cultures and undoubtedly had its origin in the remote ancestry of the human intellect.

This large, sumptuous volume, which attempts to cover every living species of Falconiformes and Strigiformes, is well designed to excite the interest and acquisitiveness of all devotees of the raptors. One reads on the jacket that: "This is the most complete, authoritative and exciting book ever produced on the world's most dramatic birds—the two orders of raptors, the hawklike birds and the owls . . . This work, of vast scope, contains 70 full-color photographs illustrating 45 species of birds, and 283 photographs in duotone. In addition, there are 425 range maps of the individual species, 646 flight silhouettes of the hawklike birds, and several other special features, including line drawings of species never before figured, and a unique color chart which is the key to the color names used in all descriptions of the birds."

Such a comprehensive treatment has been needed for a long time. Unfortunately, this 25-dollar book sometimes gives the impression of having been put together more for the enrichment of the authors and publisher than for the edification of its readers.

Judged by the old Chinese criterion, the illustrations in this lavishly pictorial volume should be worth more than a million and a half works—seemingly a rare value at the price—but I question how many of the thousand words evoked by the color photograph of a disheveled and awkwardly posed Lesser Kestrel (opposite p. 64) add up to esthetic or intellectual satisfaction for the viewer. I wonder even more about the thousand words called forth by the same picture printed in reverse in black and white on page 403. This egregious sort of duplication occurs all too often in the book and undoubtedly added considerably to the cost of publication.

Most of the photographs, by Shelly Grossman, are of captive birds—either caged specimens in zoo collections or individuals kept tethered to outdoor perches at John Hamlet's former exhibition of living raptors near Ocala, Florida, where at one time he had assembled more than a hundred species. Although these photographs are executed with a fair degree of technical skill, the esthetic quality of many of the pictures is marred by the appearance of broken wing and tail feathers, overgrown beaks and talons, and scarred ceres and tarsi, defects all too often associated with raptors kept in captivity. Even when the birds are in good physical condition, they often appear unkempt and unnaturally awkward—almost stuffed—because they were evidently still rather wild when handled and were not permitted to relax and shake out their feathers before being photographed. Typical examples are the Lesser Kestrel referred to above, the Plumbeous Kite opposite page 161, and the Screech Owls opposite page 182.

The head and shoulder portraits are by far the best efforts among the color plates. Some are really outstanding representations of bird photography, such as the African

White-headed Vulture (following p. 112), the Barn Owl (following p. 144), the King Vulture (following p. 160), and the Pondicherry Vulture (preceding p. 183). A discriminating publisher might well have restricted the costly, full-page color plates to include only these portraits of high quality.

Incidentally, some of the best black-and-white photographs were taken by Eric Hosking and Heinz Meng.

For the most part, the "action shots" are highly informative, and entirely appropriate advantage has been taken of the opportunity to use Hamlet's trained birds for many of these pictures. Each shows some functional aspect of birds in general or of raptors in particular, as for instance, in the excellent sequences depicting a Red-tailed Hawk taking off from a perch, flying, and attacking a pheasant, and the African Brown Harrier-Eagle attacking, killing, and eating a snake. But some of the pictures showing acts of predation border on the bizarre and depict events barely possible in nature; for instance, the series on a Great Horned Owl attacking an oversized snake, the Red-tailed Hawk attacking and killing a full-grown opossum, and the American Kestrel attacking a woodrat. More typical quarries could have been used with equally dramatic effects.

At best, the birds of prey are difficult subjects for portrayal by camera or by brush and paint. The only two bird artists ever to achieve real success with the falconiforms, in my opinion, were Louis Agassiz Fuertes and George E. Lodge. The now classic photograph by Arthur A. Allen of the old Peregrine Falcon at Taughannock Falls represents the height which can be reached with the camera. With a few exceptions, the illustrations in this book fall far short of the standards set by these predecessors.

The text is divided into two parts. The first section consists of five chapters entitled, Prehistory, Birds of Prey and Men, Ecology and Habits, Designs for Survival, and Conservation. The level of presentation and general quality of these chapters range from elementary and sophomoric (ecology and habits) to sophisticated and scholarly (birds of prey and men). The chapter on prehistory briefly summarizes what is known about the evolution of birds, with special attention given to fossil representatives of the Falconiformes and Strigiformes. Chapter 2 on the relations between raptors and man is excellent. Man's superstitious, religious, artistic, literary, recreational, and nationalistic preoccupations with raptors are surveyed from earliest history to modern times and from primitive cultures through advanced civilizations. The photographic copies of various art objects, paintings, artifacts, and coins depicting birds of prey complement the text of this chapter in a most effective and informative way. The chapter on ecology and habits is rather disappointing, because of its oversimplified and uncritical generalizations. The adaptive specializations of raptors for predatory modes of existence are described in simple but interesting language in the chapter on designs for survival. The final chapter on conservation is timely—including a presentation of the current problem of pesticide effects on raptors such as the Bald Eagle, Golden Eagle, Osprey, and Peregrine Falcon—in good taste, and to the point.

The second half of the book takes up a systematic treatment of 289 species of Falconiformes and 133 species of Strigiformes. Each genus is described in non-technical language, and at least one representative of each is depicted either by a black-and-white photograph or by a linedrawing by Jo McManus. The latter were drawn from museum specimens and bear little resemblance to lifelike forms. In addition, there is usually a short description of each species within a genus, and in the case of the falconiforms there are one or more small flight silhouettes of each species. The utility of this type of illustration for field books on identification is indisputable, but silhouettes add little

of value to a book of this scope. Moreover, many of them are badly proportioned and show little similarity to the silhouettes of living birds in flight.

There is also a distribution map for each species, showing the "approximate breeding range." The reader is left uninformed, however, about the sources of information used in mapping breeding ranges, and consequently there is no way to judge their accuracy. Some of those with which I am personally familiar, like that of the Gyrfalcon in Alaska, are not correctly indicated. A section on "habits" under each genus summarizes salient details about the life histories of the included species.

The list of acknowledgments indicates that the manuscript for the book must have been subjected to the scrutiny of a rather formidable array of consultants, and consequently there are relatively few gross errors of fact. Some misstatements which caught my attention follow. Being the westernmost representatives of the Pueblo group, the Hopi Indians referred to on page 45 live in Arizona not, as stated, in New Mexico. On page 122, Niko Tinbergen is given credit for the classic Dutch work on predation by the European Sparrowhawk, whereas it was actually done by L. Tinbergen; nor is the reference cited in the bibliography. The gist of R. W. Storer's hypothesis to explain sexual dimorphism in size among falconiforms involves intraspecific rather than interspecific competition, as stated on page 239. On page 270, the upper silhouette of *Buteo lagopus* represents the immature plumage and not the "common phase" of the adult as stated in the caption. Two pounds is given as the approximate weight of the Gyrfalcon on page 388, but in fact females typically weigh more than 3 pounds, and some individuals exceed 4.

By and large this book is a sympathetic attempt to portray the birds of prey of the world in ecological perspective. One encounters few of the grotesque or sensational statements so often associated with "popular" accounts of these birds. The only blatant one which I came across is on page 134 where one reads in a section on the Great Horned Owl that "Forest Service personnel wearing muskrat hats are in peril of being attacked, and in one or two instances a ranger has been blinded or killed by the sharp and deeply penetrating talons of *Bubo*." Surely such a statement demands the most scrupulous documentation before it is included in a book which is bound to be widely accepted and quoted as authoritative.

The most serious reservation I have about this book relates to the authors' extreme laxity in citing the sources of their information. Although it would perhaps be difficult to draw a sharp distinction between creative scholarship and plagiarism in an ostensibly popular treatment of a body of scientific knowledge, the authors of this book have certainly shown too casual a regard for acknowledging the work of others. It is not enough to say in the introduction that thousands of references have been consulted. At the least, the authors should have included in their bibliography all references from which they took specific, substantive information. Not only is this the minimum demand of ethics and courtesy among scholars, it is also a definite aid to the interested reader who may wish to pursue the subject to its original source. For instance, on page 257 one reads in connection with nest-building that, "The Gabar Goshawk transports spiders along with their webs, and the spiders continue to weave gossamer around the small structure of sticks and twigs." Now, that is a most interesting piece of information, and any curious reader might wish to know the original source. On page 13, the reader is told that, "If a reference cannot be traced to one of the standard bird guides, it may be found in an article or manuscript under the scientific name (Latinized binomial) of the species." Aside from the obvious inconvenience of having to search through all possibly pertinent references listed, the real catch is in the words "may be." It may be

found, but it also may not be found at all. The authors say (p. 13) that they "have supplied as complete a Bibliography on the birds of prey as possible," and yet there are numerous cases in which they failed to include references from which they obtained information. Since the bibliography contains only about 450 citations, the potentialities inherent in the existing literature on raptors were not even broached. I am tempted to ask how many pages of bibliography could have been published for the cost of the eight unnecessary color plates of the Horned Owl following page 31.

Again on page 13 the authors "caution the reader that, in a broad synthesis such as this, footnotes, and with few exceptions, in-text references must be sacrificed to continuity." In any work which summarizes technical literature, the continuity which may be lost by proper citation is more than compensated by the increased confidence instilled in the critical reader when he knows the sources which have been used.

Still needed in the subject area covered by this book is an authoritative review of the families, genera, and species of Falconiformes, presented within the scope of modern phylogenetic principles, with an up-to-date technical diagnosis of each taxon and a discussion of the presently accepted limits of each, and a well-documented summary of the known biology of each species. The authors and publisher of such a book might well consider including only those illustrations which have utility in imparting information about functional and comparative morphology, phylogeny, habitat, behavior, or other pertinent biological details, instead of decorating their pages with "pretty pictures of birds" and incidentally doubling or tripling the cost of publication.—TOM J. CADE.

THE WATERFOWL OF THE WORLD. Volume Four. By Jean Delacour, with contributions by Hildegard Howard, Milton W. Weller, Philip S. Humphrey, and George A. Clark, Jr. Country Life Limited, London, 1964: 8 × 10 in., 364 pp., 6 col. pls. by Peter Scott, figs., maps. 6 guineas.

When publication of this series began in 1954, the author anticipated that the full set would consist of three volumes, and he stated in his introduction to the first volume: "A general account of the family *Anatidae* will be given at the end of the last volume. It will include chapters on morphological, anatomical, and biological characters; on history, sport, conservation, acclimatization, care and breeding, and a bibliography." It became apparent as the project progressed that the species accounts would fill the originally proposed three volumes, and that a fourth, supplemental volume would be needed for the "general account of the family." Reviewers who were disappointed at the superficiality of treatment of some aspects of the waterfowl in the first three volumes had to hedge their statements, as nobody knew just what the fourth volume would be like. It has now appeared, and, as we had hoped, greatly augments the usefulness of the work as a whole.

Although few living ornithologists share Delacour's familiarity with waterfowl in general, his interest in and knowledge of the group have nevertheless been somewhat specialized. Reviewers of the first three volumes commented on the emphasis (considered undue by some) on aviculture, and Delacour has also paid much attention to taxonomy, especially at the generic and higher levels. For the fourth volume of his work, he called upon a group of specialists to write chapters supplementing his own on aviculture, domestic waterfowl, and additions and corrections to the first three volumes. The first six chapters were written by Milton W. Weller; these are entitled General Habits, The Reproductive Cycle, Ecology, Distribution and Species Relationships, Fowling, and Conservation and Management. Philip S. Humphrey and George A. Clark, Jr. contributed

a chapter on the Anatomy of Waterfowl, and Hildegard Howard one on Fossil Anseriformes. It has become a cliché of reviewing to say that such multiplicity of authorship leads to unevenness of treatment, and the present volume is no exception.

Delacour's introduction states "A list of corrections and additions terminates this volume, bringing up to date our present knowledge of the Family *Anatidae* at the beginning of 1963." In view of the size of the annual increment of literature on the waterfowl, it would have been desirable for authors of the individual chapters (which have separate bibliographies) to indicate their closing dates. Delacour's statement obviously applies only to his supplementary chapter; Dr. Howard, for example, mentions Woolfenden's important paper on postcranial osteology of waterfowl (1961. *Bull. Florida State Mus., Biol. Sci.*, 6:1-129), but states: "Unfortunately Dr. Woolfenden's thesis was not completed when most of the work involved in the present chapter on fossils was under way." The bibliographies of Chapters 1 and 2 list no paper later than 1960, except for a single 1962 reference in Chapter 1 which may well have been added in proof. Similarly, the chapter on anatomy was obviously completed before "the beginning of 1963," as Johnsgard's paper on the taxonomic significance of tracheal anatomy (1961. *12th Ann. Rept. Wildfowl Trust*, pp. 58-69) is not cited. Even Delacour's chapter does not pretend to be a guide to the major literature of the waterfowl subsequent to the appearance of the earlier volumes of his work. The emphasis is on aviculture, on new evidence pertaining to classification, and newly published life history material on a few poorly known species. Many major papers on waterfowl published prior to 1963 have not been utilized at all.

Weller's chapters are, by and large, workmanlike and useful summaries, well documented with references to excellent bibliographies. Proofreading of these chapters, however, was not as thorough as in other parts of the volume. For example, the name Witschi appears as "Witchie" on page 39, and as "Wischi" in the bibliography of Chapter 2 (p. 79). *Sarkidiornis* becomes "Sarkiornis" on page 111, and *octosetaceus* "octosetaceous" on the facing page. Ridgway's name is misspelled on page 80, and Crissey's on page 135.

Reviewers of the earlier volumes (cf. Elder, 1955. *Wilson Bull.*, 67:314-317; Storer, 1956. *Auk*, 73:298-299) were disappointed in the lack of descriptions of displays of individual species in spite of the abundant literature on this subject and the importance placed on behavioral characters in classification by Delacour himself. Weller has cited many important papers, but because of severe space limitations, was able to give descriptions of the displays of only five "representative species." These paragraphs are, rather inconsistently, headed "*Branta canadensis*," "*Anas platyrhynchos*," "*Aythya vallisneria* [*sic*]," "Goldeneye," and "North American Ruddy Duck." Storer's hope for "a series of sketches and descriptions of the characteristic displays of each group of species. . . [in] one of the remaining volumes" has not been fulfilled.

Chapter 4, Distribution and Species Relationships, is a short (13 pages) and, in this reviewer's opinion, largely superfluous treatment of a miscellany of subjects. There are eight world maps showing distribution of five tribes and three major genera, and four tables summarizing distributional information. It must be re-emphasized that such summaries (and, indeed, the maps) can only be approximations because of genuine disagreement among taxonomists as to species and genus limits, and tribal placement of certain species. All too often such maps and tables are presented as if the underlying taxonomy were the last word. Table I, for example, listing the distribution of the *Anatidae* by faunal regions, would display a radically different set of figures for endemic genera and species had it been based on the work of an author less of a "lumper" than Delacour.

In Chapter 5, Weller presents a brief and useful history of fowling methods, and, in Chapter 6, an authoritative survey of conservation and management of waterfowl. It is somewhat surprising in the latter to find no mention of that currently flourishing phenomenon, the controlled private shooting preserve, where the urge to kill can, for a fee, be expended on what the preserve owners themselves insist are "domestic" Mallards.

Delacour's chapters on aviculture and domestic waterfowl are, as we might expect, thorough and authoritative. The former chapter might well have included information on sources for obtaining waterfowl; absent from the list of periodicals, for instance, are such publications as the *Game Bird Breeders*, *Pheasant Fanciers and Aviculturalists' Gazette*, which regularly carry advertisements of waterfowl for sale or exchange. Also missing is mention of legal or licensing aspects of the transportation and keeping of wild species of waterfowl, certainly important in the United States.

By far the most scholarly contributions in this volume are the chapters on anatomy by Humphrey and Clark, and on fossil waterfowl by Howard. In the former, one finds the refreshing and all-too-rare admission that "limits of time, space, and knowledge have led us to present a rather uneven review which is necessarily incomplete and reflects to a great extent our own particular areas of study (pterylosis, trachea, molts)." Nevertheless, this 66-page chapter should be highly useful; it is well documented with citations to a bibliography condensed from one of over 1,000 titles compiled by the authors. References in the present work are arranged conveniently by organ system. Special attention should be called to the excellence of the illustrations in this chapter, all drawn (or redrawn from previously published figures) by Shirley Hartman.

Hildegard Howard's chapter on fossil Anseriformes contains probably the greatest proportion of original work in the book. It is by no means a mere compilation from the literature; Dr. Howard re-evaluated the entire classification of fossil waterfowl, including re-examination of much type material unstudied since the 19th Century. The chapter begins with a nominal list of waterfowl, both extinct and living species, known as fossils. Then comes a summary of the geologic history of the group, with species lists for each epoch. This is followed by a complete account of every extinct species known at the time of writing (complete with synonymy, diagnosis, measurements, etc.), and a brief discussion of each extant species known from the fossil record. This chapter is also excellently illustrated, with both line drawings and halftones of bones. Several points of classification differ from the treatment in Brodkorb's catalogue of fossil birds (part 2, 1964. *Bull. Florida State Mus., Biol. Sci.*, 8:195-335), but these merely reflect differences in taxonomic viewpoint. On one point of nomenclature, Brodkorb appears to be correct: a subfamily name based on the generic name *Romainvillia* should be spelled Romainvilliinae, rather than "Romainvillinae" as Howard has spelled it.

The final chapter, by Delacour, covers "corrections and additions" to the first three volumes. As mentioned above, this is by no means a synopsis of the important recent literature on waterfowl, but is weighted heavily toward new avicultural information and new data affecting taxonomy. Unlike the other chapters, there is no separate bibliography, all citations being in the text. This is somewhat annoying, as the reader is forced to trace "*loc. cit.*" back to the first citation, in one case 27 pages earlier. The citations themselves are sometimes inaccurate or incomplete; on page 327 some information is attributed to "A. Hoogerserf [error for Hoogerwerf], 1959, pp. 192-199," but there is no further reference and no bibliography for the reader who wishes to consult Hoogerwerf firsthand. Banko's monograph on the Trumpeter Swan is cited (p. 331) as "North Am. Wild. Found., 63, Washington"; it is, of course, *North American Fauna* No. 63, published by the U.S. Fish and Wildlife Service.

Delacour cites the work of Woolfenden, Johnsgard, and others who have recommended changes in classification based on their detailed studies of certain aspects of the waterfowl. While acknowledging the importance of their work, Delacour in most cases does not accept their findings, often offering no contrary evidence other than a statement such as "However important these differences are, they do not seem to be sufficient; and we prefer to keep this species in the genus *Branta*" (p. 333). This is all the more irritating in that there is no indication as to the identity of "we"; the chapter is signed by Delacour alone. It might be thought that Peter Scott was included in the "we," as Scott has often (wrongly) been listed as co-author of "The Waterfowl of the World." Evidence against this theory lies in Delacour's refusal to admit the subspecies *Anas discors orphna* Stewart and Aldrich (p. 342), while Scott (1961, "A Coloured Key to the Wildfowl of the World," pp. 56-57) both accepts and figures this subspecies. If the taxonomic opinions presented in Delacour's "addenda" chapter were jointly arrived at, the reader has a right to learn the identity of the collaborator. If not, the use of "we" is, to say the least, misleading.

Peter Scott has contributed six color plates to this final volume of the series. The frontispiece is an impressionistic treatment of "Shovelers at Dusk" in Scott's well-known style. There are four plates illustrating domestic breeds of ducks and geese. Finally, there is a plate correcting errors in the color plates of previous volumes. A few of these corrections are explained in the text of the final chapter; most are not.

I ended my review of Volume 3 of this series (1960, *Wilson Bull.*, 72: 413) by mentioning that "the promised fourth volume is to remedy some of the shortcomings of the first three," and went on to say "Although the text thus far contains much of interest and usefulness, viewed in the light of Captain Delacour's international reputation as an authority on waterfowl it can only be characterized as disappointing." The material in Volume 4 on the waterfowl as a whole adds immeasurably to the value of this set as a reference work, but criticisms of the text of the first three volumes, insofar as the individual species accounts are concerned, have been alleviated scarcely at all by anything in Volume 4.—KENNETH C. PARKES.

THOREAU ON BIRDS. By Helen Cruickshank. McGraw-Hill Book Company, New York, 1964: 10 × 7 in., 331 pp., 17 illus. \$7.95.

Surely the time is past when a serious critic, be he scientist or nonscientist, can dismiss Henry Thoreau's nature writings as lightly as John Burroughs did in *Century Magazine* (1882): "To the last his ornithology was not quite sure, not quite trustworthy." Or disparage him as Havelock Ellis did in *The New Spirit* (1890) where he maintained that Thoreau's science "is that of a fairly intelligent school boy—a counting of birds' eggs and a running after squirrels." Charles D. Stewart answered Burroughs' charges in *Atlantic* (1935): "Thoreau had a faculty, which Burroughs does not seem to admire or understand, of the modern research worker." And Mark Van Doren in "Thoreau" (1916) remarked that "Mr. Burroughs has never been quite able to understand what Thoreau was doing."

After the publication in 1904 of Bradford Torrey's edition of Thoreau's "Journal," critical opinion underwent a significant change. McAtee in *Scientific Monthly* (1939), for all his reservations, found that, in ideas of protective adaptation, Thoreau preceded Belt, Wallace, and Darwin. Deevey in *Quarterly Review of Biology* (1942) suggests that Thoreau is "the first American limnologist." Adams in *Scientific Monthly* (1945)

regards him as an ecologist, Leopold and Jones in *Ecological Monographs* (1947) call him the "father of phenology," and Oehser in *Nature Magazine* (1945), recalling that, along with George Catlin, Thoreau was one of the first to suggest the establishment of a wilderness area as we think of it today, is convinced that "perhaps Thoreau was America's first real conservationist." What is noteworthy is that the recognition of these broad horizons of Thoreau's thinking appears not in the literary journals but in the scientific.

One of the early accounts of Thoreau and birds was Francis H. Allen's edition of Thoreau's "Notes on New England Birds" (1910); the latest to appear and perhaps the best is Helen Cruickshank's "Thoreau on Birds." It is a most attractive volume, illustrated with facsimiles from Wilson's "American Ornithology" and Nuttall's "Manual." The major portion of the volume, "Some Species of Birds from Thoreau's Journal," deals with Thoreau's notes on 103 species in the Concord vicinity. For each species there is an introductory section and excerpts from the Journal arranged in diary fashion as to month, day, and year. The selections are annotated with transitional passages set off in brackets. By and large, the transitions are judiciously executed. Occasionally they contain images which have their own integrity. Many of the Journal entries are put into the context of what seems to be Thoreau's knowledge of the species—an important addition. Useful too are the cross-references to many species in volumes other than the Journal. Nevertheless, these transitional commentaries sometimes lean toward the cumbersome, impeding the reader's progress and encouraging him to leap over the transitions to rejoin Thoreau's own lively flow of observation. Perhaps such information as range, distribution, and certain descriptive features might be left to the handbooks. Along with Journal excerpts are descriptions of birds in such volumes as "Walden" and "A Week on the Concord." A list of Thoreau's birds with the most recent designations clarifies such popular names as "Yorrick," "Belcher-squelcher" (for the American Bittern), and "Election-bird." This is by far the most comprehensive annotated compilation of Thoreau's birds available today. It naturally does not consider Thoreau's writing on birds in terms of zoological significance or contributions to ornithology as Deevy does for Thoreau's notes on limnology, Leopold and Jones for his phenological observations, or Adams for his ecological notations. Such a study would appear to be in order. As Roger Tory Peterson observes in a perceptive Foreword, "The measure of a man is his durability."

Mrs. Cruickshank has chosen the selections with a sure and discriminative taste. They illustrate Thoreau's careful recording of the behavior of birds. More than that, they underscore his passion for collecting and journalizing his data, his endless quest for facts. It is a pity to mention typographical errors, those skulkers in the blindspots of the proofreader's eye: "orystivorous" (p. 170), "gentillis" (p. 315), "Progna" (p. 316), "Toxostroma" and "pyrhonta" (p. 320), "Philchela," and "cictotherus" (p. 321).

This compilation seems to derive entirely from Torrey's edition of the Journal. It might have been useful to examine the original manuscript notebooks. Excellent as Torrey's edition is, the Journal now probably requires a more scrupulous and definitive treatment with the variant revisions. As Philip and Kathryn Whitford pointed out in *Scientific Monthly* (1951), Torrey omitted important sections, such as the physiography of the Concord River. And Perry Miller in "Consciousness in Concord" (1958) adds that Torrey did not always use the most felicitous revisions found in Thoreau's notebooks for the 14-volume edition of the Journal. In fact, Miller calls some of Torrey's choices "a bit capricious."

All in all, Mrs. Cruickshank's book comes pretty close to being the definitive gathering

of Thoreau's observations on birds. One puts it down with a sense of agreement with the Whitfords (*ibid.*) that "modern scientists have gradually come to claim Thoreau as one of themselves."—HERBERT KRAUSE.

THE BIRDS OF COSTA RICA: DISTRIBUTION AND ECOLOGY. By Paul Slud. Bulletin of the American Museum of Natural History, New York, Vol. 128, 1964: 7 $\frac{5}{8}$ × 10 $\frac{5}{8}$ in., 3 maps. \$10.00.

This volume is the first major work on the birds of Costa Rica since Carriker's "List of the Birds of Costa Rica" (*Ann. Carnegie Mus.*, 6:314-915), published in 1910. Though the country is small (slightly larger than San Bernardino County, California, and slightly smaller than West Virginia), it has a coastline on both the Pacific Ocean and the Caribbean Sea, elevations in excess of 12,000 feet, and regions receiving over 200 inches of rainfall annually. Even in view of favorable geography and topography, its list of 758 species is impressive. Dr. Slud summarizes distributional data on an ecological basis, and adds much information on the activities of the birds gained through his personal contact with most species recorded in the country.

The work is not an annotated list of specimens collected in Costa Rica, although sizable collections have been assembled from that country; nor is it even oriented along the lines of conventional taxonomic reports, although the author utilized existing specimen collections in preparing it. Instead, emphasis is on ecological preferences of living birds, based on the author's 7 years of field studies (between 1950 and 1962) in all areas of the country.

Most of the eight-page introductory section consists of lists of birds: 79 species added to the total compiled by Carriker in 1910, over 50 species unrecorded but possible, and six species and an additional 32 races endemic to Costa Rica. On the basis of "geography, climate, and geological history," Slud divides the country into four main avifaunal zones: the northwestern Pacific slope or "Guanacaste" area (relatively dry), the southern portion of the Pacific slope and the Caribbean slope (both are regions of high rainfall and humidity), and the Costa Rica-Chiriquí highlands. Species characteristic of each zone are listed; the Guanacaste zone shares many species with Mexico and Central America, whereas the other zones have affinities with South America. Several pages are devoted to descriptions of the life zones present in Costa Rica. The life-zone concept utilized in this report follows the Holdridge scheme of classifying vegetation by temperature and precipitation.

Most (363 pages) of the book is devoted to the accounts of species. Each begins with the scientific name, the common English vernacular name, and range of the species. Then follow names and ranges of subspecies occurring at least partly in Costa Rica. Distribution is described on the basis of the life zones and avifaunal zones occupied by the species, and by the races if more than one is present. In order to determine distribution, Dr. Slud attempted to locate on a life-zone map of Costa Rica every locality at which a species had been observed or collected. He then considered these points of record in preparing the distributional descriptions. Usually only major physiographic features are used in this treatment; specific localities are mentioned only in the case of rarely recorded species. Frequently comment is made on areas presumed suitable but not occupied by the species. Then follow remarks on preferred habitats, activities, and vocalizations as derived in most cases entirely upon the personal observations of the author. A foldout life-zone map of Costa Rica (including all sites where birds have been observed or collected) and an index to localities on the map are provided. An

annotated list of locality names requiring explanation (including ones that the author could not find on any map) provides supplementary information. References and an index complete the work.

I am particularly impressed by the skill with which Dr. Slud has succeeded in describing birds' habitats and their routine activities. For many of the 620 breeding species, these descriptions are the only ones ever published. Observations of habitats and behavior of North American species occurring as transients or winter visitants in Costa Rica provide much information not available elsewhere. Considerable space is devoted to phonetic interpretations of vocalizations and comparisons of the similar calls and songs of different species. In reading the species accounts, I repeatedly felt that the author must have run out of space before completing them. This impression was my major disappointment with the book. It seemed to me that, following such vivid descriptions of daily actions and elaborate representations of songs and calls, something certainly should have been included on breeding biology. I cannot find a statement describing the duration of the nesting season, or mention of nests or young birds.

For anyone working with neotropical birds, English names have been and will continue to be a major problem. Recent authors are in agreement only to the extent that new common names are very rarely conceived. Dr. Slud does not state the policy he followed in selecting English names, but it is evident that he has employed names from a variety of sources, seemingly preferring to utilize patronyms after the practice of Ridgway, Cory, and Hellmayr. For example, of the 54 species of hummingbirds discussed by Slud, English names of 13 were used by both Eisenmann ("The Species of Middle American Birds") and Cory ("Catalogue of Birds of the Americas," Part 2, No. 1), 13 follow Eisenmann, 27 were used by Cory but not Eisenmann, and one is a Ridgway name utilized by neither Cory nor Eisenmann. Local Costa Rican names are infrequently mentioned in the accounts.

Although Dr. Slud has taken care to explain (p. 22) that his report viewed distribution from ecological aspects, considerable attention to systematics was nevertheless necessary. The reader cannot always determine to what extent Dr. Slud personally examined specimen collections in order to verify identifications. Only about five per cent of the species accounts contain references to specific specimens in named collections. Presumably many specimens collected by Carriker are in the Carnegie Museum, yet none is cited in this work. A statement summarizing the present locations of the major collections of birds from Costa Rica and the extent to which Slud actually examined these collections would have answered many questions. The reader is referred to Carriker (loc. cit.) for a résumé of collecting activities up to 1910, but Charles H. Lankester, Austin Paul Smith, and Slud are the only collectors mentioned as following Carriker. Their collecting activities are not detailed. The treatment of many taxonomic questions is perfectly adequate, but not in all cases. For example, it is not good practice to speculate on subspecific identities on the basis of birds seen in the field but not collected (as Slud did with *Laterallus ruber*).

Dr. Slud mentions (p. 23) that many more species of birds than are generally realized undergo seasonal altitudinal migration. Further discussion of this topic would have been worthwhile; only by reading all species accounts is it possible to find out which birds are involved and to what extent.

"Birds of Costa Rica" is relatively free of inconsistencies and typographical errors. Brackets are used around accounts of species not substantiated by a specimen or other tangible evidence, but the Western Kingbird and Parula Warbler are not enclosed, whereas the Cave Swallow is within brackets; each is represented by a specimen collected

by Austin Smith that Slud was unable to find. Terms expressing relative abundance (such as numerous, common, rare, etc.) are used throughout the report but are not defined. The work does not contain the intriguing considerations of historical and zoogeographical problems that were in the author's "Birds of Finca 'La Selva'" (*Bull. Amer. Mus. Nat. Hist.*, 121:49-148, 1960). Although a "dry season" is characteristic of many areas in Costa Rica, the months involved are not listed.

Individuals working with neotropical species will find this report on Costa Rican birds indispensable. Systematists may wish for more details on taxonomy and ethologists may desire more data on behavior, but everyone who uses it will appreciate its wealth of information.—STEPHEN M. RUSSELL.