

ORNITHOLOGICAL LITERATURE

OKLAHOMA BIRDS. Their Ecology and Distribution, with Comments on the Avifauna of the Southern Great Plains. By George Miksch Sutton. University of Oklahoma Press, Norman, 1967: $6\frac{1}{4} \times 9\frac{1}{2}$ in., xlvii + 674 pp., 1 col. pl., 28 drawings, 2 maps. \$9.95.

Professionals afar will pick up "Oklahoma Birds" to see how a distinguished ornithologist of cosmopolitan interests will treat the birds of his own (and well-known) region; and indeed they will find that Sutton's attention ranges far beyond the boundaries of the state. Students of the birds of the southern Great Plains will find here a meticulous account of the present and historical status of species. Admirers of Sutton as a person and a writer will relish the anecdotal flavor they have come to expect of him, a style that would infuse warmth and zest into a telephone directory. Only the people who think of Sutton primarily as an artist will be disappointed; the work is illustrated attractively with drawings of birds, but it is not a picture book. The one color plate, a frontispiece used also on the dust jacket, is a head portrait of a Harlan's Hawk with the gleam of life in its eye.

A feature of more than regional interest is Sutton's broad but brief treatment of each order and family of birds represented in Oklahoma. A chapter is devoted to each order and within it each family is introduced by a general discussion. It is here that Sutton expresses some taxonomic views dissenting from the Check-list of North American Birds. He separates the Ralliformes from the Gruiformes; places the Shoveler in the genus *Anas*; the Tree Swallow in *Tachycineta*; the Hermit, Swainson's, and Gray-checked thrushes and Veery in *Catharus*; and the Cardinal in *Pyrhuloxia*. I will admit to being startled to see the Passeriformes designated "Sparrowlike Birds." This term is fully justified by derivation but it is with effort that I stretch the connotations of "sparrow" to cover all members of the perching order.

It is always debatable whether a regional report ought to restrict itself to political or ecological boundaries. Intuitively, many of us lean toward the ecological, but close study often reveals practical difficulties, such as the uncertainty of the limits of many ecological regions and the paucity of information on some parts. Sutton's way of dealing with this dilemma was to address himself primarily to the precise limits and subdivisions of a state, and then to comment in passing about other nearby areas when the information was available and when he deemed it pertinent. This treatment reminds us who think of Oklahoma as a Plains state that it actually contains a wide variety of habitats, ranging from desert through prairie to bottomland forest and comprising perhaps as many as 12 different kinds of areas.

Generally, the work is remarkably free of typographical errors, but Sutton has called my attention to two errors in the names of birds (not Oklahoma birds): the common name of the Short-toed Eagle (not Short-tailed) on page 94 and the generic name *Sarothrura* of the White-spotted Crake on page 159.

This scholarly work will be a landmark not only for Oklahoma but also for the southern mid-continent.—HAROLD MAYFIELD.

THE BOOK OF THE AMERICAN WOODCOCK. By William G. Sheldon. University of Massachusetts Press, Amherst, 1967: $7 \times 10\frac{1}{4}$ in., xx + 227 pp., 58 figs., 30 tables. \$8.50.

Oystercatchers, stilts, avocets, plovers, turnstones, sandpipers, phalaropes—practically all the shorebirds—are abroad by day and readily observed in open habitats. Not so the

woodcock whose unorthodoxy in selecting the twilight for its principal activities and the daytime for seclusion in wooded habitats makes it observable only under the most difficult conditions.

I speak from personal experience because I elected to study the life history of the American Woodcock for my doctoral dissertation. One learns about the species, I realized eventually, by piecemeal observations. Anything like continuously watching the daily movements of individual woodcock through a breeding season is impossible.

Since the publication in 1936 of my three-year effort, many expert field men have investigated the American Woodcock, but none more intensively than William G. Sheldon who devoted 15 years to the species on its breeding grounds in Massachusetts and other New England states. In this book he has drawn upon the results of his own studies together with those of many fellow investigators including Howard L. Mendall and Clarence M. Aldous whose "The Ecology and Management of the American Woodcock" (1943. University of Maine, Orono) has constituted the only major publication on the species since 1936. Essentially the book is a compendium for it brings between two covers in concise yet readable form all the significant information gathered to date on the physical characteristics, breeding biology, feeding habits, populations, distribution, and migration of the American Woodcock. The wealth of data assembled on so elusive a species is most impressive.

In reading the book I could not help noting the extent to which my original, comparatively meager findings were later confirmed by ample evidence from many field workers through direct observations, banding, and the application of newer techniques. For example, I called attention to the greater abundance of wintering woodcock in Louisiana than anywhere else. Now we are shown conclusively that east-central Louisiana and extreme southwestern Mississippi actually have the greatest wintering density and that the population comes in part from all the northeastern states as well as from the states directly north. I guessed the maximum altitude of the woodcock's spiraling ascent in flight-singing to average 225 feet. Dr. Sheldon, using a precise method developed for measuring altitude of migrating hawks, found that three consecutive flights reached 275 feet. I discovered that two or more females may be attracted to a male's singing field and thus suggested that the woodcock is polygamous. Although Mendall and Aldous still considered the species monogamous, Dr. Sheldon and others have confirmed polygamy as a common trait. All the investigators, like myself, never once observed woodcock carrying young. Dr. Sheldon feels as I did that the several instances of this feat long ago reported in the literature were the result of a chick being accidentally caught between the legs of the brooding female when it flushed in alarm at the approach of the observer.

Some of the most important contributions to new knowledge of the species appear in the chapter on population dynamics. On the basis of hunter-kills, Dr. Sheldon makes the assumption that the continental population of woodcock totals approximately 5,000,000 birds. Banding recoveries continue to build evidence that female woodcock live longer than males. Discovering that it was possible to determine the difference between sexes by the width of the three outer primaries and the difference between juveniles and adults by the wear of these same feathers, Dr. Sheldon and other workers proceeded to examine thousands of wings donated by woodcock hunters. This yielded a rich variety of data and some tentative conclusions. Woodcock can sustain an annual loss of all sex and age groups of 52 percent and "still maintain a stable breeding population." The continental sex ratio was found to be 82 males to 100 females, while among adults only,

the ratio was even more unbalanced, being 63 males to 100 females. In accounting for this discrepancy, Dr. Sheldon speculates that males reach their northern breeding grounds earlier than females when the weather is unfavorable. Being smaller and "in poor flesh" when they arrive, they are more vulnerable to severe freezes and other weather hazards. Also, on their breeding grounds where they advertise their presence so conspicuously, they are more easily subject to predation. Banding recoveries suggest that most woodcock die of causes other than the gun. Adverse weather, obstructions in the migratory flight path, predation, nest destruction from fires, changes in habitat effected by man, and diseases—all are causes of mortality but none seems to be any greater than the others. As to the use of chemicals, which many of us have thought might be particularly detrimental to woodcock, "there is no evidence to date that aerial spraying is causing a decimation of the continental woodcock population. But results should be accepted with caution. Insufficient time has elapsed to be complacent about the status of woodcock. The harmful effects of chemicals may be accumulative over several years and may not be immediately apparent."

The final chapter is a comparative summary of the known information about European Woodcock. What emerges sharply from this is the paucity of data available for satisfactorily determining the extent to which the European and American species have diverged in habits. There are no precise descriptions of courtship flights or other breeding activities. The question of whether the species is normally single-brooded, like the American, or double-brooded has not been resolved. Reports on the European bird carrying its young are rare and conflicting—and tend to force the conclusion that the trait is more likely accidental, as in the American bird, than a behavioral adaptation. The only recent report on woodcock populations is from Denmark, in 1959.

"The Book of the American Woodcock" leaves me with only one wish, namely, that the author had systematically summarized his principal findings, either at the ends of the chapters or at the end of the book. In too many instances the main points and results of his endeavors and of others remain in the body of the text and are in a sense lost to anyone lacking the time to ferret them out. Otherwise I have nothing but high praise for the entire work, its format, the quality of the illustrations, and the excellent index, as well as the text itself.—OLIN SEWALL PETTINGILL, JR.

AVIAN MYOLOGY. By J. C. George and A. J. Berger. Academic Press, London and New York, 1966: $6\frac{1}{4} \times 9\frac{1}{4}$ in., xii + 500 pp., 248 text-figs. \$18.00.

Muscles constitute one of the most-studied organ systems in birds. This book attempts to give an overall summary of what is now known about them. Its first half deals with their histology, physiology, and biochemistry, concentrating on the chief muscles of flight, the pectoralis and the supracoracoideus. The morphological and cytochemical properties of the three types of fibers that have been found in avian skeletal muscles are discussed in detail. They are shown to determine the nature of contraction of a muscle fiber. On a wider scale, the types and relative abundance of fibers in a given flight muscle are seen to be related to a bird's manner of flying. An important chapter deals with the source and control of energy for sustained muscular activity such as migratory flight. It explains that at least certain muscles can synthesize their own fat and use it as fuel.

Much of this information has come from the research of George and his associates and students, performed mostly within the past ten years. It is astonishing to recall that in 1956 a study by Yapp (*Wilson Bull.*, 68:312-319) on the energetics of bird migration

had to be largely theoretical because very little was then known about the muscular physiology of birds. Today, however, one of the best known of all skeletal muscles with respect to biochemistry and physiology, is the pectoralis muscle of the Common Pigeon (*Columba livia*).

By compiling and synthesizing findings in this new field, the first half of the book makes a notable contribution. Data are not only reported, but also their significance in muscular metabolism and locomotion is pointed out. This approach is commendably broad, but in places it suffers from too simple an evaluation of a bird's mode of flight. To characterize a species merely as a good or a poor flier does not go very far in giving meaning to biochemical data on its flight muscles.

Histological and histochemical features of muscles are illustrated with many photomicrographs of tissue sections. Material from several different muscles and from many species is shown, demonstrating that muscles are diverse in their properties. The pictures are much less valuable than they could be, however, because they are scarcely discussed in the text. Several of them are blurry and inadequately captioned or labeled. These illustrations will probably have little meaning for readers not familiar with cytology.

The second half of the book is largely a catalog of all the skeletal muscles in a bird. To the best of my knowledge it is the only such list that is complete and up-to-date. Non-skeletal muscles such as feather muscles are not mentioned. Gross morphology of every muscle is described and terminology is reviewed, often at length. The condition of specific muscles as found in various birds is reported in many cases. These statements are based on Berger's observations and the literature, though their source is sometimes not made clear. Several of the descriptions are very inadequate or contain errors. The accounts of the wing and the leg muscles are fuller than the rest because they also include detailed descriptions of these muscles in the Common Pigeon and the Red-winged Blackbird (*Agelaius phoeniceus*). This material is generally reliable and it will be a convenient reference for anyone seeking to identify the muscles of a dissected bird.

The many references to the literature of avian gross myology given in this chapter are a valuable introduction to the subject. As a matter of fact, readers will often have to turn to the literature because here the authors do not seem to have understood some of the papers they cite. Many studies on the musculature of the jaws and the neck, for example, are mentioned yet nothing has been passed on from them about the movements of these parts. Another example is the incredible statement (on p. 313) that there is little specific information in the literature on the supracoracoideus muscle; several important works dealing with this muscle are included in the list of references.

Nothing is said about the innervation or gross blood supply of muscles. The arrangement of muscular fibers in relation to tendons and aponeuroses is not discussed. Virtually nothing is said about the functions of any muscles. Inclusion of these topics would have helped to integrate the chapter on gross morphology with those on histochemistry and physiology. Also, the topics named have been subjects of much study. The fact that they have been omitted means that the book significantly fails to achieve the comprehensiveness for which it aims.

The accounts of gross myology give much attention to the use of muscles as indicators of phylogenetic affinities. It is hence ironic that without explanation of muscular functions, the comparative descriptive data have little meaning, either in themselves or as taxonomic clues. Muscles seem to be regarded here as blocks of tissue that have evolved without adaptation in birds.

Curiosity led me to compare the chapter on gross myology with its equivalent in A. J. Marshall's "Biology and Comparative Physiology of Birds" (1960. 1:301-344. Academic Press, New York and London) because the latter had been written by Berger. Choosing at random, I was surprised to find several paragraphs and shorter passages that were identical or almost so in the two chapters. The newer work offers more description than the older work, especially in regard to the non-appendicular muscles, and details of more birds, but no new insights on the study of avian gross myology.

The catalog of muscles is illustrated with many drawings of gross muscular anatomy. These are well suited for identifying and comparing muscles as they are found in dissection. There are no illustrations, however, that show details of attachment or the movements produced by muscular actions.

Virtually all the drawings have been taken from the literature. Jaw muscles, for example, are depicted from studies of certain species, syringeal muscles from studies of various other species, and limb muscles from still others. This treatment shows diversity among birds, but it fails to give an integrated picture of the entire skeletal musculature of any single species. I would like to see a revised edition of this book that includes drawings of all the muscles in either the Common Pigeon or the Red-winged Blackbird. These would complement both the descriptions of the muscles in these birds and the illustrations of those in other birds.

The labels and captions for many illustrations of gross myology have been seriously neglected. The abbreviations used for labels in drawings by Hudson and Lanzillotti (1955. *Amer. Midl. Nat.*, 61:1-67) and Sullivan (1962. *Australian J. Zool.*, 10:458-518) are not explained in any key. Sometimes the same muscle is designated by different names in illustrations by different authors. The digits in the wing tip are numbered 2-3-4 by Sullivan instead of 1-2-3 as done by many other anatomists. On seeing Sullivan's pictures here, a reader must recall that this topic was discussed 100 pages previously. I decry not these differences in terminology but the fact that they have not been pointed out in the captions.

One of Berger's contributions to avian anatomy has been his investigation of *M. expansor secundariorum*, a non-striated muscle in the upper arm. I am nevertheless puzzled by full-page photomicrographs of this muscle in three different species. Neither the text nor the captions make any comparisons among them. If there are no histological differences worth mentioning, I can see no purpose in showing all three, particularly at such size. Finally, the pictures lack labels and an indication of their scale.

The closing chapter deals with the origin of birds and the evolution of their capacity for sustained flight from a physiological standpoint. Its chief contribution is a review of adaptive radiation in the fiber composition of the pectoralis muscle from a reptilian pattern to diverse avian and mammalian patterns. Although presented too briefly, this is stimulating because it approaches the study of avian evolution at a new level, that of histophysiology.

Throughout the book one finds peevish criticism of avian anatomists and taxonomists. This is not only distasteful and unnecessary, but also it cuts with a double edge. The authors are guilty of some of the faults they find in others, such as misunderstanding anatomical evidence and overlooking important references. Their warning to beginners about reliance on Shufeldt's "Myology of the Raven" (1890) is, I believe, overdone. The true information in this pioneer work far outweighs the errors. Considering that it was written while Shufeldt was stationed at a remote army camp, it is a remarkably good book.

This book is far from being a complete reference on avian myology. It fails to portray muscles, singly or collectively, as dynamic parts of a living bird. Nevertheless, it is clearly the best single work in its field. Research workers will find it valuable as a compilation of information and an entrance to the literature. Students will find ideas in the many topics it suggests for future studies.—PETER STETTENHEIM.

THE BIRDS OF TIKAL. By Frank B. Smithe. Natural History Press, Garden City, New York, 1966: $4\frac{3}{4} \times 7\frac{3}{4}$ in., xxix + 350 pp., 30 col. pls. by H. Wayne Trimm, 9 additional pls. (2 col.); 2 foldout maps. \$7.50.

Frank Smithe has produced in this book an attractive guide to the identification and natural history of the birds at Tikal, a well-known archeological site in the Petén of northern Guatemala, Central America. Included are the 276 species recorded at Tikal (three known only from bones found in the debris and ceremonial caches about the Mayan temples), five others that have been found at nearby Uaxactun, and, listed in the appendix and mentioned occasionally in the text, 52 species that have been seen elsewhere in the Petén. Some of the non-Tikal birds are illustrated, including two, in fact, that have not even been recorded in Guatemala. With these inclusions the guide gives useful coverage of the birdlife of the Gulf and Caribbean Lowlands from southern Vera Cruz, Mexico, through Guatemala and British Honduras to at least northern Honduras.

The introductory pages in the book are brief but serve to locate Tikal and familiarize the reader with the climate, physiography, and vegetation of the area. A few paragraphs are devoted to the historical importance of Tikal as one of the major sites of Mayan Indian activity over a millennium ago and a summary is given of the ornithological work of the author and his co-worker, Raymond A. Paynter, Jr., and others starting in 1956. In 1963, Smithe and Paynter published an annotated list of the birds of Tikal (*Bull. Mus. Comp. Zool.*, 128(5)); see review in *The Wilson Bulletin* (1963. 75:467). Some additional records are included in the new book, most dating from the autumn of 1962. Since this season had not previously been studied at Tikal, many locality records and new migration dates are added, including a mass migration of Eastern Kingbirds (*Tyrannus tyrannus*) and three species new for the country, the White-rumped Sandpiper (*Calidris fuscicollis*), Veery (*Catharus fuscescens*), and Bobolink (*Dolichonyx oryzivorus*).

The species accounts are well thought out and interestingly presented. In addition to a brief but adequate description, information is given on the habitat, behavior, voice, nest, and eggs. In many cases useful syllables or symbols are used to represent the calls of the bird. Over half a page is devoted to the calls of the Common Potoo (*Nyctibius griseus*). An indication of relative abundance of each species is given. The terms used are generally meaningful, although I am not sure what distinction was intended by the expression, "Common and numerous," in reference to the Plain Antvireo (*Dysithamnus mentalis*). Specific data are included for some species on just where the bird might be seen at Tikal, mentioning perhaps a certain trail or *aguada* (pond). A valuable addition to each account is a list of references giving the location of illustrations, life-history studies, nesting data, and sound recordings. Cited frequently in the last category are the recordings of L. Irby Davis. Special notes are included at various places in the text, mostly where identification problems might arise with groups of similar species.

The sequence of species and the scientific and common naming are up-to-date, although some might question the retention of the family Coerebidae, which was probably done on

the advice of Eugene Eisenmann. A second common or scientific name is given for some species. It is an interesting commentary of the state of flux of Middle American scientific nomenclature that Smithe lists 31 duplicate technical names and only 17 common ones. Since the new AOU Check-list Committee, headed by Eisenmann, has extended its coverage through Middle America, greater stability should be forthcoming. Spanish names, worked out with the help of Jorge Ibarra of the Guatemalan National Museum, and Mayan names are also included. Subspecific names are used where specimens have been collected and identified, although the nominate form of the Northern Waterthrush is included even though all collected specimens have been identified as *Seiurus noveboracensis notabilis*. Where more than one form occurs at Tikal each is given separate and full treatment, contrary to modern practice.

Thirty color plates depicting 107 species of birds are included. The species illustrated are reasonably well chosen, though the hawks, with 16 species on seven plates, might be overemphasized. On some of the plates, if the drawings were made a little smaller, many more species could have been included. Plate 6, the Black Hawk-Eagle (*Spizaetus tyrannus*), Plate 15, the Ocellated Turkey (*Meleagris ocellata*), and Plate 17, the Blue-crowned Motmot (*Momotus momota*) depict a single species. Two other plates, numbers 2 and 29, show only two species, one of which in each case has yet to be recorded in Guatemala. These plates are attractive and useful but uneconomical on space. By contrast Plate 22 shows six species of forest birds in nine poses and includes as well a good habitat background. Plate 13 includes eight species of hummingbirds in 11 poses with two extra tails added to show the dorsal surface. If all the plates had been handled this way—and I see no reduction in quality or loss of identification characters in the smaller drawings—all of the resident forms at Tikal could have been illustrated. Also, many of the forms depicted are rare at Tikal and unlikely to be observed by the casual visitor, further reducing the usefulness of the plates.

Mr. Trimm has done a good job with the illustrations though in a few the drawing is a little awkward and the placement and size of the feet do not seem correct. A few of the birds appear ready to fall one way or another. The colors are generally good although on Plate 19 the blue-backed kingfishers appear too blue and the green-backed forms too green. The artist has avoided one common error: he has counted the number of bones in a bird's foot and not put in the extra joint often depicted in the hind toe. Included on each plate is a scale line marked in inches and centimeters, a useful method of indicating the size of each bird. In a few cases, however, the markings are as much as 20 to 30 per cent off, as in Plate 8 where the adult female Double-toothed Kite (*Harpagus bidentatus*) measures less than 10 inches, using the scale on the plate, whereas a length of 13 inches is given in the text.

Plate 16 is a two-page color painting depicting the Great Plaza at Tikal as it might have appeared on a ceremonial day a thousand years ago. This striking illustration, painted by Alton S. Tobey and appearing originally in *Life* magazine, serves to maintain the mood and feeling of respect for the Mayan that Smithe builds throughout the book. Eight photographic plates in the closing pages show the ruins today, some of the buildings and habitats at Tikal, and the author at work on some specimens.

Seven appendices add data on climate, other Petén species, relationships with the Yucatán Peninsula as a whole, pensile nests, a check-list of Tikal birds, new Petén records, and a list of species accepted on the basis of sight records. The climatic data, which include rainfall and minimum and maximum temperatures for nearly every day over a four-year period, seem unnecessarily detailed for a work of this sort. The material on

pensile nests could very well have been published as a separate study. An excellent bibliography, an index, and two maps complete the book.

In summary, Frank Smithe has produced a readable book that is far more than just a guide to the birds at Tikal. With his considerable field experience in the area he is able to give us many interesting behavioral notes, such as a Melodious Blackbird (*Dives dives*) "dancing" in sequence with the calls of a Laughing Falcon (*Herpetotheres cachinnans*). The author has avoided the deplorable modern tendency to remove all the minor but interesting details that make for enjoyable reading. This is a book that should prove useful to any student of Middle American ornithology, especially if he plans to be in the field in the Gulf or Caribbean Lowlands.—HUGH C. LAND.

THE PLAINS OF CAMDEBOO. By Eve Palmer. Illustrations by John Pimlott. Viking Press, New York, 1966: 5¼ × 8⅝ in., 320 pp., numerous line drawings. \$6.00.

The author writes in the foreword to her book: "This is not the story of the Palmer family—although they impinge upon it at times. It is the story of Cranemere, a farm—to some a ranch—twenty thousand acres in area on a great plain toward the southern tip of Africa. This is a countryside either completely overlooked or greatly slandered—few people visit it—and none has ever written of it." We can be grateful that she realized her childhood dream to write of this land—her Plains of Camdeboo—a Hottentot word meaning "thirst-land."

Eve Palmer seems to hold in her hands this eastern corner of the Great Karoo—a wide upland world 2,500 feet above the sea—with mountains rising steeply to the north, and like a blue rim to the east and west. From the free-drawn maps on the endpapers of the book, the reader quickly identifies the "dam" where in 1880 young George and Fanny Palmer, traveling the road between Pearston on the east to Graaff-Reinet on the west, stopped and said "this is it." The dam was to govern their lives and everything depended on it. The farm was named Cranemere for the blue cranes by the thousands and for the water they flocked to in the dusk. Here is one of their last strongholds in the world today. Two centuries ago along the old highway to the north traveled the first explorers, hunters, missionaries, botanists, ornithologists, and paleontologists. They were to know the bushmen who later disappeared with the coming south of the Bantu. The author writes vividly, with fine perception, of the excitement of discovery of the Bushmen paintings in the caves, of the plants, birds, animals, insects, snakes, and the fossils, such as the little lizard of 180 million years ago when "the Karoo was once a vast lake fed by a huge river, possibly larger than the Nile, which meandered across the country from the north, spreading a great sea of mud over the land." This is a captivating book, packed with scientific knowledge, stimulating and heart-warming, the story of a land where rain, however rare, makes life possible. "Within hours—it seems—the dust-dry soil is engulfed in succulence, every bare twig covered with leaves, the plains enamelled with flowers, the air filled with scents. The mountains cascade water, the rivers and pools brim over, frogs bellow, birds fill the trees and bees make honey all over the countryside. The great intricate web of Karoo life begins to function once again. Firm flesh covers the bones of the starving animals; and men, women and children cry, sing, and say their prayers."

The author has included a reference list of well over a hundred books. John Pimlott has done the charming line drawings and endpaper maps.—MARIAN MCCHESENEY.