

REVIEWS

EDITED BY WALTER BOCK

Fundamentals of ornithology (2nd ed.).—J. Van Tyne and A. J. Berger. 1976. New York, John Wiley. xviii + 808 pp. \$22.50. **The life of birds** (2nd ed.).—J. C. Welty. 1975. Philadelphia, W. B. Saunders. xii + 623 pp. \$18.50. **An introduction to ornithology** (3rd ed.).—G. J. Wallace and H. D. Mahan. 1975. New York, Macmillan. xiv + 546 pp. \$14.95.—New editions of these three widely used ornithology textbooks are now available. This review attempts to compare their appropriateness and value for the classroom, as well as for practicing ornithologists and laymen. Each text is organized in a somewhat different fashion, but Table 1 presents an approximate breakdown by major topics. Asterisks indicate which books, in my opinion, give better treatments to various subject areas. This approach may not be entirely fair in all cases, as the authors did not have identical goals. Van Tyne and Berger make it clear (p. viii) that their book is intended primarily for graduate courses and as a reference work. Wallace and Mahan and Welty have written books appropriate for beginning as well as for advanced classwork, and also for readers with less than a B. A. in zoology. In awarding an asterisk (Table 1), about equal weight was given to 1) clarity of writing and illustration, 2) completeness and accuracy of information, and 3) citation of useful references.

Publication of the five-volume series "Avian biology," edited by D. S. Farner and J. R. King (New York, Academic Press, 1971–1975), should have facilitated the revision of these three textbooks. Unfortunately, in all cases either the authors or their editors were unable to wait. Publication dates notwithstanding, Wallace and Mahan make not a single reference to this monumental work. Van Tyne and Berger refer only to volume 1, while Welty appears to have consulted volumes 1 and 2 extensively. An aspiring writer should not be discouraged from working on an ornithology textbook that taps the Farner and King treasures more effectively. This service would be doubly valuable, as the price of a complete Farner and King series puts it nearly out of reach for the average graduate student.

Van Tyne and Berger is the only one of the three books that treats the living orders and families in any detail, and devotes some 55 pages largely to discussing the sorts of characteristics by which ornithologists attempt to classify birds. The treatment is quite extensive and includes a long list of references. There follows a one-page description for each of the families of living birds. These consist of a pen-and-ink drawing by Sutton of a representative species, a physical description of members of the family, information on range, habits, food, etc., and a list of references. Berger writes in his preface that Van Tyne considered these pages the heart of their book, and, indeed, it represents a monumental effort. Sadly, a beginning student will get relatively little from it—especially in gaining any appreciation for the passerine birds. This undoubtedly is less a reflection of any failing on the part of the authors than it is of the questionable "reality" of so many songbird families. The student will read (p. 771) that the Fringillidae range in length from 95 to 273 mm, have "wings short and rounded to long and rather pointed, . . . tail short to long," and vary in color "from brown and gray in cryptic patterns to combinations of yellow,

TABLE 1
COMPARATIVE EMPHASES, BY PERCENT OF CONTENTS, OF THE THREE TEXTS

Subject area	Wallace and Mahan	Van Tyne and Berger	Welty
Classification	3	23*	2
Taxonomic characters	1	7*	1
Paleontology	1	4*	2
Speciation	1	0	3*
Ecology and biogeography	8	7	15*
Behavior	7	6*	7*
Vocalizations	(included in behavior)		6
Migration and orientation	7	6	6
Life history	21	14	24*
Locomotion	4	2	4*
Foods and feeding	4	3	3
Plumage and molt	6	7*	5
Anatomy and physiology	12	13	18*
Conservation and man	14*	0	4
History of ornithology	5*	0	0

* Asterisks indicate the book or books that I consider present superior treatment of a particular subject.

red, purple, blue, green, black, white, in bold patterns." On p. 763 the Ploceidae are shown to range in length from 76 to 648 mm, to have "wings short and rounded to long and pointed; tail very short to extremely long," and to vary in color "from brown and gray in cryptic patterns to yellow, red, purple, blue, green, black in bold patterns." Will any grasp of passerine relationships emerge from these pages for the beginning student? For that matter, will the advanced student learn much more than he or she already knows?

My concern with the family-by-family review in Van Tyne and Berger is that these 169 pages, in an already expensive book, might better have included an in-depth discussion about the actual relationships (phylogeny?) among bird families, with plenty of space left over for something as valuable as a thorough glossary of ornithological terms. A glossary appears in none of the three texts under consideration, and its inclusion would have made the purchase of any one of them worthwhile by itself.

Van Tyne and Berger's writing style is crisp and direct, with plenty of in-text citations and illustrations, and an extensive list of references at the end of each chapter. This is a good format, and when it is working well this book is better than the other texts for bringing a reader quickly to the sides of an issue and to the pertinent literature. The chapter on paleontology is very good. In contrast to Wallace and Mahan and Welty, Van Tyne and Berger include a discussion of the possible origin of *Archaeopteryx* from theropod as well as thecodont reptiles, and give space to both the cursorial and arboreal theories on the origin of flight. A chapter on plumage and molt is lengthy and especially well-written and illustrated, leaving the reader with a solid grasp of feather structure, arrangement and growth, and patterns of molt. The behavior chapter is heavy, with much terminology dropped on the reader in short space, but most important concepts (e.g. innate releasing mechanisms, ritualization, imprinting) are covered accurately if briefly, with access to literature. One important concept not discussed is that of search-image formation.

The chapter on migration and orientation illustrates one of the major problems of the Van Tyne and Berger text. The information content (except for lacking a discussion on eruptive species) is very good, but the quality of the presentation is weakened by a series of marginally useful illustrations. On page 351 a full-page map shows the migratory route of the House Swallow in southeast Asia. The numbers 1, 2, 3, 4, 7, 9 and 13 appear in various places on the map. Presumably these numbers had some significance in the original article from which the figure was taken, but here they are presented without comment. Figures 17 and 18 are taken from an article by Bellrose and appear to show the number of birds censused along a migratory pathway in the midwestern United States. Yet, when cited in the text, the authors are discussing the altitude at which birds are known to migrate. In fact, this sort of strange, almost unconsidered use of borrowed figures is widespread in Van Tyne and Berger and greatly weakens the whole book. For example, on p. 480 we read: "Two eggs form the clutch for many Central American tyrant flycatchers, troupials, tanagers, and fringillids, whereas members of these families breeding in the United States usually lay 4 to 6 eggs (Fig. 9)." Figure 9 proves to be a photograph of an Eastern Wood Pewee nest—containing 3 eggs.

All three texts provide good descriptive accounts of the breeding cycles of birds. The reader of any will gain an understanding and appreciation of bird courtship, nest construction, eggs and nestlings, with numerous examples of different avian life histories. My comments and evaluation are directed toward the treatment of various aspects of life history strategy. Such fascinating and important topics as clutch size determination, mating systems, and brood parasitism do not receive equal treatment. Van Tyne and Berger begin with a chapter on courtship and nest building, which includes a discussion of territoriality. Presumed causes of the evolution of territoriality are not considered in sufficient detail. Polygamy is described, but factors leading to the evolution of different types of mating systems are not discussed. A second chapter on eggs and young does a good job with brood parasitism, but gives too brief an account of various theories on clutch-size determination.

This book will be expensive for many readers. In the preface Berger notes that (p. viii) "... some important subjects had to be mentioned very briefly where pertinent in several chapters, and still other subjects ... not at all," presumably to hold down the size of the book. Yet I count about 80 photographs of birds, taking from one-half to a full page each, that have no direct relevance to the text discussion. Some pictures are desirable, but this is excessive.

Two of the subjects receiving very brief treatment are physiology and ecology. This is most unfortunate, as few topics are more interesting to students today or more at the forefront of ornithological research. Of 18 pages devoted to physiology, about 8 are wasted on photographs of birds and tables of breathing rates, heart rates, and body temperatures for various bird groups. There is no discussion of temperature-metabolism curves, thermal neutral point, energy dynamics, or metabolic rate in relation to body mass. Hibernation and torpor are mentioned but never defined.

A chapter in Van Tyne and Berger on bird distribution includes a good if somewhat brief account of

avian biogeography and ecology. Coverage of island biogeography, the niche concept, and diversity, is adequate and provides good access to the literature. One thing missing is the historic factor, with no discussion of evolution or examples of speciation in particular groups. In fact, the words evolution and speciation are not in the book's index.

One would expect Van Tyne and Berger to give excellent treatment to structure and function in birds. Perhaps because of such high expectations, the book is a disappointment. The chapter on locomotion is very strange. It is well-written and illustrated on subjects such as wing slotting, wing shape, hummingbird flight, diving, and flightlessness, but disregards the actual mechanics of basic flapping flight by quoting Greenewalt to the effect that it is too complex to study. The chapter on general avian anatomy is of limited value. It presupposes a working knowledge of vertebrate anatomy. Terms literally are poured on the reader. Most disappointing are the illustrations, which range from fair to terrible. Most are gleaned from other sources and contain many terms never mentioned in the text. The chapter will be useful only to advanced students, and only then as a literature source. Even this function is crippled by absence of reference to the Farner and King volumes.

"The life of birds" is written in eloquent, often rather flowery, prose. Welty warns us to expect anthropomorphism, and indeed we get it. "Like a man who claims he sings his best while taking a bath, most birds are definitely influenced in their song by environmental conditions" (p. 213). "At first glance, it seems unlikely that birds . . . could possibly have descended from the lethargic, cold-blooded, earth-grubbing reptiles" (p. 498). "Another substitution for the usual pattern of incubation, and one much lazier than that of incubator birds, is brood parasitism" (p. 323). The information content per page is much lower in Welty than it is in Van Tyne and Berger. At the same time, Welty is a gifted writer, and he has given his work a true style. It is by far the most enjoyable of the three books to sit down and read.

Perhaps to improve the flow of the text, literature citations are often too few; bold-face type and italics are used only sparingly for the introduction of new terms. Tables and figures are placed in the text near discussions upon which they bear, but reference to those tables and figures rarely occurs in the text itself. These features may help the text to read smoothly, but they also make it more difficult to use as a reference work. The advanced student will find this especially frustrating.

Welty's talent as a writer serves him best in describing the structure and function of birds. An exception is the section on plumage and molt; the text lacks a good illustration of external anatomy—both Van Tyne and Berger, and Wallace and Mahan are better on this subject. The chapter on flight is excellent. Welty is at his finest here, with careful and detailed descriptions of how birds fly—or how we think they fly. The behavior section is good. There is a highly readable introduction to the nature/nurture question, and a good account, with examples, of basic terminology. Displacement behaviors are not adequately defined, and ritualization deserves more emphasis than it gets. In a separate chapter on social behavior, imprinting receives exhaustive treatment. Unfortunately the subject of mixed species flocking—a fascinating one—receives only brief mention. In fairness, the other texts have the same failing.

Welty devotes all or most of five chapters to avian internal anatomy and physiology. The material is presented carefully and will be understandable to a student with any sort of general biology background. The first chapter, "bones and muscles," is well-illustrated except for a much-needed drawing of a skull. As elsewhere, the advanced student will want more in-text literature citations. A chapter entitled "blood, air, and heat" is excellent, giving by far the best treatment of any of these works to subjects such as avian lung function, thermoregulation, hibernation and torpor, and diving physiology. Another solid chapter describes excretion, reproduction, and photoperiodism. Ultimate versus proximate factors that might determine the timing of breeding are clearly distinguished.

Welty devotes much of his book to evolutionary ecology, with chapters on biogeography, ecology, population regulation, and evolution. An extensive treatment of life history strategies includes 6 chapters on the breeding cycle. Many good references are provided, and it appears that Welty has made a serious and often successful attempt to keep abreast of developments in these active areas of ornithological research.

A major weakness—perhaps *the* major weakness in Welty—is the inclusion of statements likely to confuse the reader about the ways in which natural selection does and does not work. In many cases Welty seems to be invoking group selection as a major factor in evolution. Yet this term is never used, and one begins to suspect that instead these are instances of faulty evolutionary logic. In a discussion on the functions of territoriality we read that (p. 226) "territorial spread . . . works to create a standby population of birds ready to take over in times of emergency and to keep optimum habitats producing birds." A section on clutch size observes that (p. 304) "nature seems rarely to push a species' reproductive performance much beyond a comfortable 'live and let live' level." It is fortunate that Darwin read Malthus and not Welty on this subject.

In terms of space, Welty's book contains by far the most pages on ecology and biogeography (Table 1). The first chapter on population regulation is highly readable, with numerous examples of the sorts of factors that can and evidently do regulate density, but the material is largely descriptive, and deals less with the theories of population dynamics (e.g. the role of territoriality, over-winter survival, density-dependent versus independent regulation, etc.). This is unfortunate, as ornithologists have figured heavily in these debates. The chapter on community ecology contains much solid descriptive information, including sections on environmental factors influencing avian community structure, the niche concept and competition, succession, and descriptions of major habitat types. Once again, many interesting but more theoretical aspects are not discussed—e.g. patterns of diversity, succession and diversity, species packing. Curiously, the competitive exclusion principle is well discussed, not here but in a later chapter on evolution and speciation.

The chapter on the geography of birds includes careful descriptions of biogeographic realms. A good discussion of island biogeography is included, although the mathematical aspects of the MacArthur-Wilson model are missing. Welty minimizes the possible importance of continental drift more than he should. The chapter contains a number of platitudes such as (p. 433): "Races of birds living in cooler climates are more likely to be migratory than warm-climate relatives." These seem unnecessary even for an introductory text.

Wallace and Mahan's "An introduction to ornithology," now in its third edition, is well written and contains much interesting descriptive material. It is the only book that covers the history of ornithology and the techniques for making a bird skin. The section on conservation is extensive and useful. Unfortunately this book falls short in most attempts at analysis and synthesis, and in leading the reader to the literature in areas of current research. One need not believe in the infallibility of the late R. H. MacArthur to be shocked that not a single one of his works is cited anywhere in this text. Hard-working researchers whose important studies are passed over will be chagrined to find that Wallace cites his own 1939 study on the Gray-cheeked Thrush at least 13 times.

New chapters on behavior and ecology by the junior author contain no mention of such things as displacement behavior, redirection, vacuum activity, ritualization, species diversity, population regulation, or species packing. The chapter on biogeography contains good descriptions of faunal realms, life zones, and biotic provinces of North America. Neither island biogeography nor geographic pattern in species diversity is discussed. The following statement gives a very misleading impression of continental drift (p. 336): "One aspect of the theory is that a tropical or subtropical Antarctica (Gondwanaland) was the place of origin of animal life, which subsequently spread northward into South America, Australia, and Africa. . . ."

Like Welty, Wallace and Mahan use the group selection argument without letting the reader know it. Thus (p. 326) the "presumed function" of eruptive dispersal in Bobwhites "is periodic reduction . . . of rapidly breeding herbivorous forms that might otherwise devegetate their range." One function of territoriality is (p. 232) "assuring an even distribution of birds over available habitats, so that their carrying capacity is not exceeded."

The section on structure and function does a good job with basic avian anatomy, but the physiology section is weak. For example, the discussion of thermoregulation makes no reference to temperature-metabolism curves, thermal neutral point, or the countercurrent exchange principle. An account of torpidity fails to define the phenomenon in physiological terms, nor is its adaptive value made clear. A short section on vocalizations makes no reference to the study of song dialects, or to the question of learned versus innate song components.

In this review I have attempted to point out the relative strengths and weaknesses of three new editions of popular ornithology textbooks. All will make good reading for anyone interested in learning about the natural history of birds. Welty appears to have produced the best volume for a beginning ornithology class and for the general-interest reader who is interested but not experienced in avian anatomy, physiology, ecology, etc. With more extensive coverage of the literature, critical and careful use of the language of natural selection, and more thorough analysis of mathematical/theoretical aspects of evolutionary ecology, this book would graduate from very good to excellent. Advanced students and other researchers will find some parts of Van Tyne and Berger extremely valuable. For those topics adequately covered, this book provides superior access to the literature. Certainly it is the only one of the texts suitable for a survey course on birds of the world. It is most unfortunate that revision of Van Tyne and Berger did not include a distillation of the volumes edited by Farner and King. Other flaws are an uncritical and over-use of illustrative material, and inadequate treatment of ecology, physiology, and evolution.—CARL E. BOCK

The avian brain.—Ronald Pearson. 1972. London and New York, Academic Press. xi + 658 pp. \$35.75; **Birds. Brain and behavior.**—I. J. Goodman and Martin W. Schein, Eds. 1974. London and New York, Academic Press. xiv + 273 pp. \$16.00.—One of the systems that failed to be included (although not the fault of the editor) in "Avian biology" was the central nervous system. This gap is largely closed by these two volumes, especially the excellent book on "The avian brain." Pearson discusses all aspects of the avian brain from morphology and development of the brain to the vascular system and the biochemistry of the brain. Large sections of the book are devoted to experimental studies, and a chapter each covers the eye and the ear. Pearson includes excellent comparative summaries of work done on all species of birds and full bibliographies; this is not just a book on a few laboratory species of birds. The major shortcoming of this book is insufficient illustrations of the basic morphology of the brain and of the tract connections within the brain; Pearson does provide an excellent diagram of the tracts in the brain and overall flow chart of input and output in his final illustrations.

"Birds. Brain and behavior" is the published proceedings of a symposium held in 1971 and provides an excellent overview of the experimental work being done in avian physiological psychology. A brief description of the morphology of the avian brain by Cohen and Karten provides a good summary for workers not needing the detail in Pearson. Other chapters deal with hearing, vocalization, sleep, operant training, and discrimination, among other subjects. These two volumes would be valuable additions to any ornithological library; "The avian brain" is a must for any interested in avian morphology, physiology, or behavior.—WALTER J. BOCK.

Behavior as an ecological factor.—David E. Davis, Ed. 1974. Benchmark papers in ecology. Stroudsburg, Pennsylvania, Dowden, Hutchinson and Ross. xv + 390 pp. \$24.00; **External construction by animals.**—N. C. Collias and E. C. Collias, Eds. 1976. Benchmark papers in behavior. Stroudsburg, Pennsylvania, Dowden, Hutchinson and Ross. xv + 413 pp. \$27.00.—Both of these volumes of collected essays are important to ornithologists as the first contains 18 of 27 and the second 7 of 21 papers dealing directly with birds plus other topics of interest. Most of the nonavian papers in the volume on "External construction. . ." deal with insects or spiders. The papers are reproduced directly from the originals and preserve the original pagination.

Although behavior is now widely recognized as an important ecological factor, scarcely any behavioral concepts are of generally accepted definition for the aims of such studies. Therefore, it is especially difficult for the editor to select appropriate papers and for the reviewer to evaluate them. D. E. Davis narrowed the range of possibilities for selecting literature by explicitly not considering insects, migratory behavior, or purely physiological papers. He also believes that predation, obviously including all feeding behavior, is only an example for a simple linkage between behavior and ecology. Habitat selection was apparently not considered as a topic belonging to the theme of this volume. What is left are papers that were influential to the compiler; all but one were published before 1961! The consequence is an "old" book for an area of ecology and behavior that has become increasingly more important over the past decade. Part one contains "Behavioral adjustment," the classic paper of L. von Haartman on territory in the Pied Flycatcher. Part two, "Reproductive behavior," presents selections from F. F. Darling's "Bird flocks and the breeding cycle" in which the data for and the cautious interpretation of the "Darling-effect" can be found. Social behavior naturally yields many interesting questions, and basic studies such as Whitman's on pigeons, Nice's on the Song Sparrow, Davis' on the Crotophaginae are presented. I wish the part "behavior of populations" had been omitted and papers devoted to feeding behavior or habitat selection were reprinted instead. Among the papers selected for the part "Applied behavior" is that of Murton, Isaacson, and Westwood on Wood-Pigeons and their clover food supply, although only a part of the discussion without the figures to which it refers is printed. Among the papers not dealing with birds are studies on small mammals, King's investigation of prairie dogs, and Koford's on the Vicuña.

The more restricted field of the second volume permitted the editors to compile a representative series of papers. Moreover, they provide a classification of external constructions by animals which, together with a good introduction, outlines the limits, contents, and problems of the field. The 21 papers are arranged in four parts; each has a brief introduction and a list of references. The avian papers deal only with nest building and related topics; bowers are not included. This restriction makes the avian studies better comparable with the nest constructions of insects. The evolution of nests and nest building in birds is outlined in a paper of the editors, control of the habitat is exemplified in Frith's study of temperature regulation in the nesting mounds of the Mallee-Fowl; incubation and temperature regime in nests of sociable weavers is dealt with in the work of White and coworkers. Lehman's paper describes the control

of the reproductive cycle of the Ring Dove, and the study of nest-building behavior of *Textor* (= *Ploceus cucullatus*) by the editors concludes the series of ornithological papers in this collection.

Both books are worth reading and once again underscore the leading role of ornithology in many areas of biology. The ornithologist is also able to glance beyond the borders of his own study objects, and therefore these books serve as a good orientation in their respective fields. I do hope that a companion volume will be published in the near future dealing with more of the interesting, modern aspects of the interaction between behavior and ecology not covered in the Davis volume.—HANS WINKLER.

The Ipswich Sparrow.—W. T. Stobo and I. A. McLaren. 1975. Halifax, Nova Scotian Institute of Science (c/o Dalhousie University Science Library). 105 pp. \$5.00.—Perhaps the last distinct "species" of birds discovered in eastern North America is the Ipswich Sparrow, a bird restricted to the outer beaches during its entire life. The entire population breeds on Sable Island, Nova Scotia, a sandbar island about 150 km southeast of the mainland. This monograph describes quantitatively the main features of territoriality, breeding biology (including population dynamics), migration, and distribution of this little-known bird. A color plate of an adult male is presented as a frontispiece. The total population is estimated at about 2,100–3,300 birds at the beginning and 7,500–14,750 at the end of breeding seasons in 1967–74; the total population count was 2,424 individuals in June 1974. Nesting success is high—85% eggs hatched and 92% of hatched young leave the nest; recruitment is between 1.4 and 4.7 young per adult. Overwinter mortality ranged from 69 to 85% and is higher in young; it may be slightly density-dependent in the specialized, restricted winter habitat. No evidence of long-term population trends exists for the period 1935–1972. The authors conclude that long term preservation of the Ipswich Sparrow will depend upon repair and maintenance of its Sable Island habitat. Present population size may depend upon the availability of beach-grass habitat along the east coast of Canada and the United States which must also be preserved.

A careful comparison of external morphological, behavioral, and life-history characteristics of the Ipswich and Savannah Sparrows (specimens inhabiting the dune beaches of Halifax County) is presented. Little difference exists in general behavior and song, but considerable difference exists in life history and demography. Twelve measurements of body dimensions and feather reflectances show significant mean differences except for weight; Ipswich Sparrows have relatively shorter tails. A few cases of Savannah-Ipswich Sparrow mated pairs were found on Sable Island and also on the mainland; flying young resulted from these interbreedings, which are inconsequential for gene flow between island and mainland birds. The authors agree that the Ipswich Sparrow should be treated as a subspecies of the Savannah Sparrow, but note that it is an exceptionally well differentiated race by any standards and recommend that the vernacular name be kept and that ornithologists continue to seek out this unusual sparrow.

Drs. Stobo and McLaren are to be congratulated for their excellent monograph on the Ipswich Sparrow which is of value for its contribution to our knowledge of avian ecology as well as to the biology of a little-known race.—WALTER J. BOCK.

Portraits of Mexican birds, fifty selected paintings.—George Miksch Sutton. 1975. Norman, Oklahoma, University of Oklahoma Press. xiv + 106 pp. 50 color pls. \$35.00.—How does a nonartist approach a review of a magnificent tome of colored plates by the dean of living American artists whose subjects are birds? With pleasure, hesitation, and in this case a sense of almost sadness. How much more important this book would have been if it had been published 25 years ago prior to the explosion of bird art books and of the bird art print phenomenon. It would then have provided a needed and available standard of excellence.

First, the facts necessary for a review. The 50 plates are from selected paintings Dr. Sutton made between 1939 and 1975, but mostly before 1947. Each plate is of one to three individuals of a species painted in the field, usually with a branch of vegetation. Occasionally there is a full background, occasionally nothing. Facing each plate is a one-page anecdotal account, in Dr. Sutton's inimitable style, of field observations, or about places, times and (not incidentally) people, relating to that species or painting. A foreword in English and Spanish was written by Dr. Enrique Beltran appropriately extolling Dr. Sutton's contributions to Mexican ornithology. The book ends with a short "word from the author" adding notes on the history of works. Additional paintings from the same expeditions but published elsewhere are cited. Six plates were earlier included in Sutton's "At a Bend in a Mexican River" (1972, New York, Paul S. Erikson, Inc.) and some have been published in black and white (1942, Nat. Hist. and 1944, Audubon). Three of the paintings (Ferruginous Pygmy Owl, White-eared Hummingbird, and Gray Silky Flycatcher)

and one painting oddly omitted (Brown-backed Solitaire) were published (Foundation of Neotropical Research) as full-size limited edition prints in the late 1940's. Those were pioneers in the avian art-print field and still are among the finest ever published.

The ornithological and the art worlds now have in this volume, in Sutton's earlier "Mexican Birds, First Impressions" (1951, Univ. of Oklahoma Press) in the River Bend book, and in paintings from the same time period contributed for publication in the "Birds of Arizona" (1964, Univ. of Arizona Press), the body of his works that has had and is having an influence in American bird art second only to that of his mentor, Louis Agassiz Fuertes. Sutton is (as Fuertes was) an artist in love with the art of painting, an artist who sketches and paints in the field as much as possible. There, time is critical; if one brush stroke renders a feather why use ten? Thus these works have spontaneity, a freshness of the artist's impression of the bird. This has led occasionally to a drawing or position that might not have been retained had these paintings been redone in the studio. One has the impression that "Doc" enjoyed arranging and painting the vegetational setting of his birds as much as he did painting the birds themselves, and some surpass the birds in quality.

The only outstandingly poor color reproduction is the plate of *Piculus aeruginosus* where the back and ventral barring are deep green instead of dull olive green and the crown is deep blue instead of gray (see Plate III in "Mexican Birds First Impressions"). Also I would guess that in general the greens in several plates are more intense than in the originals. To artists' universal anguish, reproductions frequently vary from the originals, but without the originals for comparison, these plates appear to have been well published.

All of us, ornithologists, bibliophiles, artists, or art historians, as well as those who enjoy good nature writing and lovely paintings can be thankful to have this beautiful and important collection available.—
ROBERT W. DICKERMAN.

Geographic and climatic relationships of avifaunas with special reference to comparative distribution in the neotropics.—Paul Slud. 1976. Washington, D.C., Smithsonian Contributions to Zoology. No. 212. 149 pp.—The penchant of ornithologists for compiling lists of birds known to occur in areas ranging in size from a backyard to a continent (and in recent years the world) has resulted in the production of hundreds of bird lists. Slud has undertaken the monumental task of collecting and organizing the information contained in such lists to extract "geographic and climatic relationships of avifaunas." Clearly a massive amount of work is required for such an effort, not the least of which is handling the large data sets involved. Unfortunately, Slud has been only partially successful.

After a brief introduction Slud considers some problems inherent in comparing species lists. Inevitably many species categorizations are inadequate because of lack of information. Furthermore, it is difficult to compare lists, especially those from remote areas, because they are often incomplete. The importance of considering areas of similar size and environmental complexity, and making faunas comparable by excluding aquatic groups and distinguishing migrants and residents is also discussed. But here is where some problems first appear. In a discussion of the role of migrants Slud asks if migrants benefit or detract from the economy of a natural environment. Such anthropomorphisms seem out of place as does the conclusion that migrants "play a constructive ecological role."

The second major section explores the "passerine-nonpasserine relationship." The analysis produces some interesting conclusions: Arid areas have low passerine/nonpasserine ratios; recently isolated continental islands have ratios near or slightly below those of the nearby mainland; tropical areas have slightly lower ratios than extratropical areas; ratios increase as altitude increases; forested areas have higher ratios than nonforest areas; island patterns are more variable depending on complexes of such factors as size, age, physiognomy, and climate. The paper could have been significantly improved if, after identifying these patterns, Slud explored in more detail the ecological and biogeographic "whys?" of the patterns. Very low turnover rates on Cocos Island are especially interesting in light of the current controversy on turnover rates (Diamond 1969, Proc. Nat. Acad. Sci. 64: 57–63; Lynch and Johnson 1974, Condor 76: 370–384; Lack 1976, Island biology, Univ. California Press).

A section on the relative densities of oscines and suboscines concentrates on the neotropical region, where suboscine densities decline from 60% of the fauna in South America to only 20% of the fauna in Mexico. As expected suboscine/oscine ratios are low in dry regions and in highland areas. Sometimes Slud's correlations are clear, but in other cases the relationships are obscured by interactions of several factors. Problems arise because politically rather than biologically defined areas are the basis for comparisons. In other circumstances recent history of human disturbance or incomplete faunal lists blur relationships.

Slud then produces a scattergram plotting suboscine (or oscine) percentage of passerines versus passerine (or nonpasserine) percentage of the avifauna for neotropical countries. This yields a distorted map of South and Central America with each country's position similar to that found in a map of the continent. Consideration of ecologically defined areas shows that patterns among and between areas are determined by a complex interaction of geographic location and ecological pattern (climatic factors and habitat types and their distribution). Use of the ratio of two ratios (P:NP/O:SO) strains the value of the approach as several possible combinations of four values could produce the same compound ratio. By this point one wonders if more precise conclusions could be developed by less complex ratio constructions combined with geographic units defined on ecological grounds. Clearly the taxonomic and geographic information is at best a first approximation to the ecological and biogeographic information which seems to be Slud's objective.

A final text section entitled "Requirements for Future Research" outlines some of the problems of developing and using species lists, drawing on Slud's extensive experience in the neotropics.

The monograph ends with a valuable bibliographic key for about 600 geographic units and a series of tables outlining the data used throughout the monograph. The 44 pages of tables include a wealth of information. Here again the reader might have hoped for a more useful presentation. Species densities are given per 100 mi², a logical format when equal-sized areas are compared, but Table 1 includes areas as small as 125 mi² (Cozumel Island, Mexico) and as large as the world (52,410,000 mi²). In addition the areas vary considerably in ecological complexity.

In summary, the monograph would benefit from a crisper, more tightly constructed presentation. An effort to examine specific and rigorously defined hypotheses would be more productive. Attempts to show broad correlations often break down because a large complex of factors are responsible for patterns, and little or no effort is made to sort out rigorously the factors responsible. An exception is the intriguing patterns illustrated by the four islands of the Gulf of Guinea. Despite the problems outlined above, the bibliographic key and summary tables alone make the monograph a worthwhile addition to an ornithologist's library.—JAMES R. KARR.

Birds/Their life, their ways, their world.—Christopher Perrins, illustrated by Ad Cameron. 1976. New York, Abrams, Inc. 160 pp., numerous color paintings, index. Cloth, 23.5 × 31.5 cm. \$25.00.—Abrams considers this to be an "Artbook," which it is not. It is well illustrated with technically accurate, biologically informative, and highly detailed paintings, for which the painter deserves praise. His graphics are intended to illustrate the excellent text. Dr. Christopher Perrins, the author, former student of and assistant to the late David Lack and now himself Director of the Edward Grey Institute, has produced, to my knowledge, a different kind of "coffee table" bird book. It is organized within the biological concept of evolutionary ecology, rather than taxonomically like Austin's "Birds of the world" (1960), Gilliard's "Living birds of the world" (1958), and other such volumes. As such it is more like a text book of avian biology—more like Welty's "The life of birds" (1963)—although at once less formal, without citations to the technical literature, and without (regrettably) a chapter giving a basic annotated classification of birds. Following a preface and introduction, the chapters are: evolution and classification, anatomy, locomotion and behavior, feeding, habitats, social behavior, breeding, migration, bird populations, and bird study. There is an index only to English and scientific names.

I know Chris Perrins as an accomplished, serious, avian ecologist and am delighted to report that he is adroit at putting some rather new concepts into lay terms, clearly and painlessly. For example in the chapter on "Feeding," niche partitioning of seed eating birds is treated as is the evolution of survival strategies by plants to seed "predation" by birds. Similarly, density and resource dependent variations in reproductive success are dealt with briefly but in clear fashion. Sometimes an illustration and its legend in one chapter deal with a subject that is covered in the text of another chapter, as with helper systems, in which the text discusses the subject under "Social Behavior" and the drawing of a communal group of Hoatzins with explanatory legend are in the chapter on "Breeding." A comprehensive subject index would have made this sort of thing less of a problem.

There is a nice balance between New and Old World forms in the species chosen to illustrate particular points, and all the paintings are functional in biological explanation. Some are also instilled with the artist's or author's humor. For example: a Steller's Sea Eagle dining on a Steller's Eider, and a wren feeding its fledgling European Cuckoo parasite while perched on its head. The illustrations on p. 27 of various kinds of feather care include two, numbers 3 and 6, of which the first is of a Ruby-crowned Kinglet scratching indirectly (over the wing) and the second of a bird of the same species scratching directly (under the wing). The legend for each is the same, "scratching in the Ruby-crowned Kinglet,

Regulus calendula." There is no cross reference, nor could I find the subject treated in the text. I believe kinglets characteristically scratch indirectly and as Simmons points out in the Ibis (1961) birds that normally do this are never known to scratch directly (the opposite is not true). Perhaps illustration number 6 was a reject that didn't get rejected!

If I were teaching an undergraduate course in avian biology these days, I would ask each student to buy Welty and then ask the institution to supply 1 or 2 copies of this book for the reference shelf.

This book is virtually free of typographic errors and is sturdily bound.—JOHN WILLIAM HARDY.

Evolution and the diversity of life. Selected essays.—Ernst Mayr. 1976. Cambridge, Massachusetts, Harvard Univ. Press. ix + 721 pp. \$20.00.—This volume contains 47 essays by Ernst Mayr arranged in 9 categories covering evolution, speciation, history of biology, philosophy of biology, theory of speciation, the species, man, biogeography, and behavior. Each section is introduced with a short historical statement, usually containing additional references and for the sections on biogeography and on behavior, citations to other papers by Mayr in these areas. These essays are all taken from previously published papers, but they are not simply reprinted. Many are revised, shortened, or otherwise adapted from the originals. Thus one may find references to papers that appeared after the date of original publication. Most of these essays were taken from papers published after 1955; only the sections on speciation, the species, and biogeography (especially the last two) contain papers originally published in the 1940's, reflecting Mayr's early interests in these areas of systematics and evolution. The original citation is given for each essay, but these should be cited as reprinted essays not as the original because of changes in the text and change in the pagination.

Almost all of Mayr's important papers in these nine areas of evolutionary biology are included in this volume. One will find his papers discussing the concepts of "beanbag" genetics and of the founder principle, his papers on "accident or design" in biology, cause and effect in biology, explanatory models, sympatric speciation, and evolutionary classification. I miss a few such as his "Numerical phenetics and taxonomic theory" *Syst. Zool.*, 1965; "Isolation as an evolutionary factor," *Proc. Amer. Phil. Soc.*, 1959; "Ecological factors in speciation," *Evolution*, 1947; "Speciation and systematics," in *Genetics, paleontology and evolution*, 1949; "Speciation phenomena in birds," *Amer. Naturalist*, 1940, or "Speciation in birds," *Proc. 10th Intern. Ornithol. Congr.*, 1951. However, even good things must have an end, and an anthology of Mayr's papers must be cut off somewhere if the volume is to be kept within sensible bounds. I mention these papers to stress that one cannot rely simply upon this volume as a source of all Mayr's general papers. A complete bibliography of Mayr's general papers in these subject areas would have been a useful addition to this volume and well worth the additional pages.

"Evolution and the diversity of life" is of value to most of us because it brings together in a single volume a number of Ernst Mayr's most important papers that are widely scattered in the literature and hence not readily available to most of us. It is of special value to ornithologists because most of the original research on which these essays are based was done on birds. Harvard University Press is to be congratulated for fulfilling the function of a university press by publishing a scholarly book at a reasonable price. And Ernst Mayr is to be congratulated for revising his earlier papers rather than simply reprinting them. I can recommend this volume to all ornithologists.—WALTER J. BOCK.

Save these birds.—Yoshimaro Yamashina (Ed.). 1975. Published by the Kasumikaikan (Peers' Club) on its 100th anniversary. Obtainable from the Yamashina Institute for Ornithology, 49 Nampeidai-machi, Shibuya-ku, Tokyo, Japan. 285 pp., 92 plates and many color photographs. Price ¥ 12,000 (about \$50).—This handsome volume is the Japanese red data book, presenting the latest and most reliable information on the life histories and present status of the 93 species and subspecies recently extinct or threatened with extinction by habitat changes in Japan and its satellite islands, including Sado, Tsushima, Quelpart, and the Izu, Ryukyu, and Bonins. The individual accounts (all in Japanese) were prepared by a number of the younger Japanese ornithologists and the excellent plates were painted by a new young artist, Masayaki Yabuchi, whose work shows great promise. I was delighted with the close-up color photograph of a pair of Short-tailed Albatrosses at their nest and another showing 37 of them on their nesting ground on the lava slopes of Torishima. I was also surprised to find a picture of myself inspecting a mist-netted catch of Dusky Thrushes on its way to market before I abolished the practice 30 years ago—one of the few Occupation-imposed reforms that the Japanese continued after the Americans left, thanks to the concerted efforts of Yamashina, the Kurodas, and other members of the Ornithological Society of Japan.—O. L. AUSTIN, JR.