

REVIEWS

EDITED BY WALTER BOCK

The Question of Animal Awareness: Evolutionary Continuity of Mental Experience.—Donald R. Griffin. 1976. New York, Rockefeller University Press, viii + 135 pp. \$8.95.—Somerset Maugham said that people ask for criticism but want only praise. Surely Donald Griffin never expected empty praise of a book that *is* criticism and hence invites reply in kind. The text anticipates criticism of the major theme that animals can be consciously aware of what they do, but that theme is not the problem.

The general thread of the polemical essay is as follows. "Every normal person thinks about objects and events that are remote in time and space from the immediate flux of sensations, and this is what I mean by mental experiences." Griffin then reviews some complexities in communication among honey bees and between chimpanzee and man, thus establishing the chief empirical basis for argument. He then tries to refute the notions that man's mental processes are completely tied to language and that animal communication is fundamentally different from human linguistic communication. The fourth chapter reviews the *Zeitgeist* that has supposedly made the subject of animal awareness taboo, and the next deals with objections to animal consciousness and the like. The essay ends with a case for the evolutionary advantages of, if not the necessity for, mental awareness and a proposal for the scientific study of the problem.

Do animals have mental experiences? I suspect that every pet owner "knows" they do and could offer anecdotes like mine about a cat inherited from my mother. Declawed and desexed in preparation for an apartment life, Khali found himself in our suburban home upon the death of his mistress. He discovered and took readily to the outdoor life, but rain and cold weather turned him around at the front door at first meeting. After having sat in the living room for a few minutes, he tried the back door, only to find the same weather there, at which point he avoided all doors for the better part of an hour. After several experiences with inclement weather over ensuing months, Khali now tries one door and waits for an hour or two before trying again. He has constructed some crude mental image of the weather being the same everywhere at a given time, but changing with the passing of time: Khali is aware of "events that are remote in time and space."

If not the pet owner, then, whom is Griffin trying to convince? The lack of clear answer is perhaps a root of troubles in this essay. One accepts with less argument than provided that some philosophers and others try naively to preserve man's uniqueness by denying all forms of animal consciousness. The text, however, is unconvincing in arguing guilt by association: "few psychologists or even ethologists have yet moved away from an essentially behavioristic position" (p. 49), or "Virtually all comparative psychologists—and ethologists, as well—are at least *de facto* behaviorists" (p. 63). When Griffin argues that students of animal behavior shelved the complexities of higher mental processes because they could not yet deal adequately with them (the "agnostic" position), he is convincing. When he extends the argument to say that psychologists and ethologists generally dismissed the problem entirely, Griffin forgets the learning sets of Harlow, the hierarchical organization of Tinbergen and Dawkins, the sequential and temporal approaches to behavioral organization by a whole generation of ethologists, and especially their inadequacies as explained by Fentress, Nelson, and others.

The book uses the word "ethology" frequently, so it is useful to inquire why almost no ethological studies are cited. The probable reason is that the philosophers whom Griffin seems most anxious to convince have themselves focused on communication as the key issue. By replying directly to them, Griffin has forgotten a storehouse of evidence that could be marshalled to support his major point. Griffin knows that ethologists are struggling to deal with higher mental processes—he cites Konrad Lorenz and William Thorpe in support—but he is preoccupied with strictly communicational phenomena.

Deeper delving into animal communication would have strengthened Griffin's argument. The shifting meaning of "symbol" and other difficulties with semiotic concepts might have been avoided by returning to Charles Sanders Peirce instead of relying on C. W. Morris, who changed some of Peirce's notions. Especially Peirce's distinctions among icons, indexes and symbols would have been useful in discussing the elegant work of Griffin's student James Gould on communication of honey bees. Stephenson's study showing that the same physical signal is used differently in different troops of Japanese macaques would have been relevant to the discussion of communicational arbitrariness. Indeed, the very notion of arbitrariness, like the notion of randomness, requires clearer specification before it becomes useful in a comparison between human and animal communication. Furthermore, to have treated the notion of discreteness of animal signals without reference to categorical perception (Marler, Gerhardt, Snowdon, etc.) denied Griffin a strong foundation. And it is not true that W. John Smith "has argued that the waggle dances of honeybees convey to other bees not information about distances and direction, but only

...” (p. 53). Smith would agree that such information is *conveyed* (the “meaning” of his framework); what Griffin wants to say is that Smith does not attribute conscious intent to convey on the bee’s part. However, Smith’s formal framework does not *deny* the possibility of conscious intent, although that could be his personal view; rather, his framework just attempts to deal with communicational phenomena operationally.

The mention of operationalism strikes to the heart of the book’s problem. In his zeal to overcome resistance to notions of animal awareness, Griffin does not pause long enough to tease apart the roles of introspection and operationalism in science. There is no comfortable place for the ethologist who says: yes, introspection gives me a crude idea of how my fellow men and fellow animals organize their sensory experiences in a mental world apart from immediate sensation—but in analyzing such phenomena I want to build my theories and constructs from observable phenomena of behavior. Griffin attacks reluctance to accept introspective data in the corpus of science with the same enthusiasm that he attacks reluctance to accept animal consciousness. This enthusiasm inadvertently binds the two in a logical tangle: if you accept introspection, you must accept consciousness, so if you do not accept the former you are rejecting the latter. This is, of course, the familiar fallacy of denying the antecedent.

Only those who have actually written a book can understand the difficult decision facing an author: When to stop revising and perfecting in order to get the message before the readers. Aphoristic thinking might phrase it thus: Haste makes waste, but messages too long delayed are messages denied. I think I would have preferred a more leisurely book, one argued more closely, more widely and more deeply to reflect more accurately the author’s marvelous scientific intellect. Griffin must have felt, probably correctly, that the important thing was to get the theme into current discussion—that timeliness was the crucial factor in this case. Despite its difficulties, the book delivers two useful messages sufficiently clearly. To those who deny animal awareness, Griffin says: Look into the evidence yourself and you will reach my conclusion that animal awareness exists. To the ethologist and psychologist, Griffin says: Stop studying only those things easily measured and devote more effort to difficult and important problems of animal awareness. With those messages I can have no quarrel.—JACK P. HAILMAN.

Handbuch der Vögel Mitteleuropas. Volume 7. Charadriiformes (Part 2).—Urs Glutz von Blotzheim, Kurt M. Bauer, and Einhard Bezzel. 1977. Wiesbaden, Akademische Verlagsgesellschaft, 895 pp., 138 text figures (inc. maps), 61 tables, and 3 color plates. 185 DM.—With the publication of volume 7, this central Europe handbook has reached the midway mark of its planned set of 14 volumes (see Bock 1968, *Auk* 85: 522–524, for a review of the first volume). This volume, the second on the waders (Limicolae), completes this group and includes the Glareolidae and the Pteroclididae, following the conclusion of some recent systematists that the sand grouse are members of the Charadriiformes, not the Columbiformes. It treats 36 species of which 6 are vagrants from North America and 7 are vagrants from Asia and the Mediterranean. Species accounts for central European forms range from 12 to 63 pages with the average being 25–30 pages; 7 species have accounts of 40 or more pages. Because of the significance of this handbook series and because of the recent publication of the Handbook of Birds of the Western Palearctic, we present here an English translation of a review of the *Handbuch der Vögel Mitteleuropas* by Ernst Mayr published in the *Journal für Ornithologie*.—W. J. B.

The publication of a new volume of the “*Handbuch der Vögel Mitteleuropas*” is a noteworthy event for ornithology. Volume 7 appeared 2 years after volume 6 and deals with the second part of the Charadriiformes, thus maintaining the unparalleled rapid publication of these volumes (7 in 12 years). This astonishing punctuality of each volume has the danger that ornithologists will take the “*Handbuch*” for granted. Therefore it is necessary to keep in mind the infinite amount of dedicated work and organization that lies ahead for this team of authors and editors. The ornithologists of the whole world, not only those from central Europe, who use this volume owe very much to the whole staff and especially to the three authors-editors, Urs Glutz von Blotzheim, Kurt Bauer, and Einhard Bezzel.

There is no doubt that the “*Handbuch*” will remain for decades the most important source of information for the active ornithologist interested in the birds of central Europe. Who is still able nowadays to survey the endless amount of articles in periodical journals? And who has mastered all the languages of Europe to be able to read the original articles when one realizes that much of the faunistic, distributional, and migratory studies are published in the language of each country. The “*Handbuch*” is not only a teamwork in the proper sense but also an international effort with co-workers from Switzerland and Austria to Scandinavia, Latvia, and the Balkans. It should be noted that the “*Handbuch*” is one of the important projects bringing together ornithologists of eastern and western Europe. Thus the “*Handbuch*” has the advantage of a thorough recording of not only the German literature, but also that of many other

languages not readily accessible to most ornithologists. [It should be noted that the editors of the "Handbuch" decided as a general policy to include all of the essential factual information, rather than simply cite the reference, because most users of these volumes do not have access to the original literature or if they did, could not read the papers. It was felt that the value of this information to amateurs and other workers not having access to a major library greatly outweighs the cost of these volumes.—W. J. B.]

Volume 7 deals with the species of the Scolopacidae (including the phalaropes) not treated in volume 6, the Recurvirostridae, the Burhinidae, the Glareolidae, and the Pteroclididae. The skuas, gulls, terns, and alcids will be covered in the next volume. With an average of 25–30 pages devoted to each central European species, the "Handbuch" is a collection of small monographs with, for example, 53 pages for the Woodcock, 54 pages for the Curlew, and 63 pages for the Redshank.

The arrangement of subject material corresponds basically to that in the earlier volumes. After the overall distribution of the species is given, the division into subspecies is presented including the major diagnostic characters of each subspecies and always with clear reference to unanswered problems. The field characteristics are described exactly and sometimes illustrated with sketches. A detailed description of the plumage follows with emphasis on the different plumages beginning with the downy plumage. Generally several different sets of measurements are given, not only because small geographical variation exists, but mainly because of the different methods of measurements used by various authors and because it is practically impossible to reach complete unity in standardization of measurement.

Vocalizations are described in detail and in most cases are illustrated with sonograms. After a short description of the total breeding range, an extensive detailed description of the distribution in central Europe is given, often thoroughly documented with maps. In this way it is not only possible to have an exact insight into the distribution throughout the different biotic regions of central Europe, but also to trace the changes within the populations during the past 20 to 30 years. The results of exact counts are given for species which show population oscillations.

Migration is described in great detail for each species. This is especially important for those species (especially northern ones) which occur in central Europe only during migration. Although one must admit that the occurrence of a species during migration is especially interesting for the field worker, I think that this section would have gained much by condensation in order to save space. Given the amount of presented material, the conscientious cataloguing of pages of single dates seems hardly justified; e.g. pages 272–279 for the Whimbrel, *Numenius phaeopus*. [It should be noted that special attention was given to migratory data of the waders in Europe such as the coast of Friesland and wetlands in general. No plans exist to include migratory data of this detail in future volumes.—W. J. B.]

An especially valuable part of the description of the biotope is characterization of the geographical variation of the preferred habitat. Reproductive biology is treated extensively with information from the most recent literature. Pair formation, territory use, nest location and structure, eggs (color, form, and measurements), clutch size and variation, onset of egg laying, duration of incubation, and length of parental care are documented. Social behavior and other aspects of behavior are also considered. Whenever known, an analysis of the major components of the diet is given.

As today every ornithologist owns a "Peterson" or other field guide, if not several, it is absolutely superfluous (and it would unnecessarily raise the cost of these volumes) to include a color picture of each species. The three color plates in this volume illustrate downy young, details of feathers needed for identification of similar *Tringa* species, and the polymorphic plumages of the phalaropes. The numerous text figures illustrate courtship display, flight appearance, markings of downy young, and distributional and migratory maps, providing maximum information for the space and cost of the illustrations.

The main value of the "Handbuch" lies obviously in serving as an extensive reference work. But to me, it seems that its value lies even more in being a guide for planning of future research. If someone has the opportunity to devote his time to the study of one of the rarer or locally distributed species, he will find an astonishingly complete and reliable synopsis of the literature in the "Handbuch." This is an invaluable help if one considers the huge amount of ornithological publications, many of which are quite inaccessible for the average field observer. It is quite clear from these volumes which aspects of the biology of each species are still inadequately known and deserve further attention.

A comparison of the "Handbuch" with earlier works of a similar nature shows clearly the directions of change in research interest. Pure phenology is not as important by far as in former times. Tape recordings are relatively new and their exploitation could be pushed forward even more. Bird banding obviously no longer represents the center of activity as it had between the two world wars. The introduction of mist nets shifted the stress from banding of nestlings to that of adults (or birds with fully developed flight skills). The most important contribution obtained from bird banding is knowledge about the age structure of populations and about the annual reconstitution of populations.

A comparison with other handbooks seems appropriate. None of them reach the completeness of detail of the "Handbuch." Volume 5 (1941) of the Handbook of British Birds deals with 59 species on 254 pages, or 4.3 pages per species. Volume 2 (1938) of Niethammer (the forerunner of the present handbook) deals with 126 species on 534 pages, or 4.24 pages per species. Volume 7 of the new "Handbuch" dedicates 24.4 pages to each species, or almost 6 times as many pages as in these earlier manuals. Even the recently announced "Handbook of the Birds of the Western Palearctic" will have to treat each species in a much sketchier way because of scarcity of space.

Nevertheless, the steadily growing number of pages in the "Handbuch" is not an untroubled advantage. It has not only the implication of a continued rise in price, but also poses a greater and greater problem of ensuring a rapid succession of future volumes. As the amount of information about each species becomes more and more limitless, the editors will probably be forced to compromise between completeness of presentation and various practical considerations. One must remember that the remaining volumes must cover the remaining Charadriiformes and all the landbirds, including the Passeriformes. The editors will also have to think about what should perhaps be left out, i.e. condensed, in future volumes. As the "Handbuch" is on the birds of central Europe, information which is not concerned with central Europe in the proper sense should be shortened. Why, for example, should the migration of eastern Siberian populations of the Turnstone (*Arenaria interpres*) be described, or the distant recovery of birds banded on the Pribilof Islands be mentioned? My personal impression is that phenological material could be strongly condensed, a procedure which may have the advantage that the total picture would be clearer.

If volume 1 of the "Handbuch" is compared with volume 7, many improvements and many changes in the method of treatment can be found. Hopefully the editors will continue to have the courage to introduce change if it seems appropriate. Species which breed in central Europe and those which occur there only accidentally should be given quite different proportions in the number of pages dedicated to breeding biology and migration. Why devote 13 (Spotted Sandpiper) or 17 (Wilson's Phalarope) pages to species that are rare vagrants or accidentals in central Europe? My personal belief is that it is hardly justified to devote this number of pages to the breeding biology of a bird which has appeared less than half of dozen times in central Europe. The main goal of this important tool for the central European ornithologist, i.e. to finish it as soon as possible, should never be out of sight.

Finally I would like to add some details which occurred to me as I read through this volume. The extremely detailed treatment makes the "Handbuch" highly valuable for ornithologists in other parts of Europe and even in other continents. Therefore it would be a great help to give the English and French names in small print following the name of the species. And the convention of using Linnaeus, not Linné, is almost completely accepted internationally as the great Swedish naturalist published almost all of his works under this name.

One does not like to write in superlatives, but they can hardly be avoided with respect to the "Handbuch." It is a work which is absolutely unique in its coverage of the literature and in its profound and lucid treatment. The co-workers of this team effort can be proud of the result of their dedication. And it is to be hoped that it will be possible to continue to recruit new associates among the younger ornithologists. The "Handbuch" is a work which is of value to every ornithologist and to which each should contribute whatever he can. Lastly a special word of acknowledgment and appreciation should be given to Glutz von Blotzheim, who has been the driving force behind the "Handbuch" ever since its conception.—ERNST MAYR.

The birds of Malawi.—C. W. Benson and F. M. Benson. 1977. Limbe, Malawi, Montfort Press. 263 pp., 1 color plate, 1 map. Soft (but sturdy) cover. Obtainable from National Fauna Preservation Society of Malawi, P. O. Box 5135, Limbe, Malawi, at a cost of 5 Kwachas (about \$5.90) postpaid, surface mail, or 7 Kwachas (about \$8.25) air mail.—Among those who have contributed to our knowledge of African birds in the past four decades the name of Con Benson stands among the foremost. He and his wife have put together in the meticulous manner so typical of all Benson's endeavors a small but full and useful book on Malawi's birds. The production of the book was fully supported by D. W. K. Macpherson of Malawi; all proceeds of the sale of the book go to Malawi's National Fauna Preservation Society.

The color plate by Mrs. Benson depicts the distinctive *Apalis chariessa macphersoni*, and is adequately rendered. The book's contents include a forward (by Mr. Macpherson), an introduction, a section on habitats, a main section treating species accounts (Systematic List, 185 pages), an excellent gazeteer of localities, a 12-page section supplementary to the main list (giving further details on locality records for some taxa, and systematic comments), a list of recoveries of banded birds, a five-page addenda and

corrigenda, indices to family, generic, and English names, and references. The last are in two sections, one covering the introduction and habitat sections, and the other, a bibliography to the systematic list. The bibliography contains more than 860 citations, and is followed by an accounting of the locations of collections from Malaŵi; specimens from there number more than 16,000 (7,500 are in the British Museum (Natural History)). A fold-out map shows the district boundaries and regional and district headquarters, but no vegetation or topography.

The book closely follows the style of the *Zambian book* (Benson et al. 1971, *The birds of Zambia*, London, Collins). The authors know Malaŵi well, and show great understanding of African birds, which places Malaŵi birds in perspective. They have worked in close contact with both museum curators having Malaŵi specimens under their care, and with all those conducting field work in Malaŵi in recent years. Information in the book is current to 1 January 1975, with some important additions made through 1976. Overall the book is well-executed, with very few errors. It provides up-to-date, detailed information about the distribution of Malaŵi birds, habitat and elevational data, and reports of nesting that are summarized to present a picture of the seasonality of breeding. One must go over the introductory material carefully including especially the various symbols and abbreviations, if one is to use the book effectively.

Particularly noteworthy in the book are the many lucid comments relating to the distribution of congeneric species, especially those replacing one another in different habitats, or different altitudes, or utilizing different foods. There is a wealth of data and experience evident in all aspects of the book; we wish we could multiply the Bensons and distribute them in many critical areas, especially in the neotropics, where such endeavors as theirs are much needed.

In the systematic section (which follows the classification used in Benson et al. 1971, cited above) each family or subfamily is preceded by an account which compares various species, especially in regard to their feeding and habitat requirements, and in some cases their breeding. These discussions are excellent and useful beyond the scope of the main thrust of the book. Malaŵi, formerly Nyasaland, is of course not a clear-cut entity in any but a political sense; except for its extensive Lake Malaŵi frontage it is partly an eastern extension of Zambia in the north, and the south is surrounded by Mozambique. Anyone interested in south-central Africa will find this book useful, as its habitats and birds largely extend into surrounding areas.—LESTER L. SHORT AND JENNIFER F. M. HORNE.

Manual of Neotropical Birds, Vol. 1. Spheniscidae (Penguins) to Laridae (Gulls and Allies).—Emmet R. Blake. 1971. Chicago, Illinois, Univ. Chicago Press. xlix + 674 pp., 4 color and 8 black and white plates by G. Tudor and R. V. Keane, 67 wash drawings, 237 maps. \$50.00.—This is the first volume of a monumental project. The author describes the *Manual* as “essentially a faunal synopsis written primarily for the taxonomist, vertebrate zoologist, ecologist, and zoogeographer. The virologist and parasitologist, as well, will find it of practical use in the field . . .” It provides information for the identification of species and subspecies, geographic ranges of each, and relevant references. Color plates and monochromes give the book some utility as a giant-sized field guide, but it is primarily designed for the identification of birds in the hand or of museum specimens. For practical purposes Blake makes some important geographical exclusions—Mexico, the West Indies, the Galapagos and Falkland islands. There are up-to-date field guides and/or check-lists for the latter three regions and most subspecies in archipelagos can be tentatively identified by locality. Mexico is covered by field guides and a check-list, but there is no single modern source for subspecific identifications. Blake produced in 1953 the first Mexican field guide (which has received renewed praise) and in the *Manual* there are many parenthetical notes dealing with Mexican forms; he doubtless decided from experience not to attempt the sweeping review that would be needed for meaningful inclusion of the avifauna of that geographically complex country in the present work.

If I interpret the author's intentions correctly, he is seeking to provide an updated synthesis, at once condensed and expanded, that combines some of the most useful features of the multi-volume works of Ridgway (and Friedmann) and Hellmayr (and Cory and Conover). As in Ridgway, there are identification keys and descriptions of species and subspecies, including measurements and geographic ranges; as in Hellmayr, there is coverage of all of the Neotropical region with the exceptions noted above. Not included are the exhaustive synonymies, literature citations, and detailed technical descriptions of all levels of taxa which Ridgway apparently considered true science (see vol. 1, p. 1, 1901). Instead, families are characterized for identification purposes with brief non-technical descriptions and line drawings in an introductory synopsis. Genera are not characterized at all (except in the Tinamidae) nor are there keys to the genera. There are “artificial” keys to species only (not to subspecies). In the species accounts each form

is first described generally in a few words, such as "Uniform brown uppersurface, and white ventral stripes." Then follows a more detailed but relatively simple non-technical description including differences due to sex or age; then measurements (wing, tail, exposed culmen, tarsus); then an ecological range (e.g. lower subtropical zone in heavy forest) and a fairly detailed geographic range; then (often) a few recent references to the taxonomy or general biology of the species. Subspecies, if any, are then diagnosed and described, with measurements and distribution. There are small scale maps—up to six per page—showing species ranges in Central and South America. End papers have larger maps of the vegetation zones of the Neotropics (after Hershkovitz) and of national boundaries and major rivers. The index includes both scientific and vernacular names; the latter are primarily those of Eisenmann and Meyer de Schauensee.

Does the Manual succeed in its objectives? Faced with over 700 pages, a reviewer can only spot-check on those taxa with which he is most familiar and elsewhere at random. My conclusion is, in general, yes. Why "in general"? First, no one author could produce flawlessly a manual of this size and scope and there are many typographical errors and some *lapsi*; second, there are some self-imposed limitations. I selected for one test the relatively nondescript, widespread, polytypic species *Buteo magnirostris*. Without cheating, I keyed it out to species—starting with one of seven general categories, then within that category through four dichotomies. There is no key to subspecies, but using localities as a clue I found that the descriptions accurately characterized the four different subspecies available to me. But a trivial flaw, a misplaced comma, creates a confusing ambiguity in the description of the subspecies *petulans*. The self-imposed limitation is that the key does not include most of the difficult immature and intermediate plumages of this or other species. Such plumages are, however, described briefly in the species accounts. The same problem is encountered among the gulls and in similar groups. It is obviously not possible to deal fully with difficult age variations in a book of this kind, and the reader should not expect to find answers to everything. I found the maps less useful than I had expected for two main reasons. First, there are no distinctions between breeding range and winter range, which is unfortunate in some cases. Second, an entire country or major subdivision is sometimes "hatched in" even though a species' occurrence there may be extremely restricted—for example, the range of the flamingo is mapped as covering the entire Yucatan Peninsula. It would also be helpful to have page references to the maps, which are usually far away from the species accounts. On the positive side, the bird illustrations are good and useful and the plates by Tudor are outstanding.

I find Blake's taxonomic judgment to be commendably reasonable throughout. In keeping with contemporary trends he generally favors broad genera—all the included gull species are placed in *Larus*, for example—but there is no eccentric lumping or splitting. The author does not explain or justify his generic decisions but is careful to mention that this or that species is often placed in a different genus. In some cases one or more subspecies are synonymized, without comment; this is especially noticeable in the Cracidae. Difficult cases involving species-subspecies limits are discussed in a balanced manner with alternative treatments mentioned.

The manual will indeed be useful to the groups for whom the author has intended it. The taxonomist working within the designated area will find, in updated form, the species-subspecies characterizations for which Ridgway has been the only single source and will also find these extended over most of the Neotropical region covered by Hellmayr. The geographic ranges are well done and will benefit the zoogeographer; Meyer de Schauensee's (1966) work on South American species is of undiminished value as a complete one-volume distributional list but it does not include subspecies ranges. Blake has been favored by illustrations that are mostly far better than those included in Meyer de Schauensee's (1970) guide to South American birds. The ecologist will find only minimal information about habitats occupied, but what is given is useful. The non-ornithologist vertebrate zoologist will find the Manual much handier and current than earlier works, and virologists-parasitologists, especially in South America, will be similarly benefitted. Blake has wisely avoided attempting either to rediagnose genera in modern terms or merely to repeat previous inadequate characterizations; had he decided to make any such attempt, the first volume would surely still be in manuscript. I have one special regret to express, and that is that the form and structure of this work allows for so little direct expression of Blake's first-hand experience with the behavior and ecology of so many of the species included. Perhaps he will give us more of this in some other context.

About the price (\$50.00); if you can afford to visit South America at your own expense, you can presumably afford this book.—THOMAS R. HOWELL.

The Pheasants of the World.—Jean Delacour. 1977. second ed. Hindhead, England, Spur Publications. 395 pp., 17 color plates, 16 black and white plates, 20 maps. 18£ (about \$35.00).—This book, one of Delacour's three major monographs on avian families (the others being the Anatidae and, with Dean Amadon, The Cracidae), was originally published in 1951 but went out of print in the late 1960s, when it quickly became a collector's item. At the request of the World Pheasant Association, an avicultural organization concerned with galliform conservation, Delacour undertook a revision of the book, and a new colored plate has been prepared by R. David Digby. That Delacour, now in his late 80's, should undertake such a project at all is a testimony to the amazing vigor and enthusiasm of this remarkable man. (He has just completed translation of the book into French!)

Inasmuch as the earlier edition was never reviewed by *The Auk*, it is appropriate to discuss the general organization of the work in addition to mentioning the major changes brought about by the new edition.

Prior to the major body of the book, dealing with individual species, a "general account" of the Phasianidae is presented, about 90% of which relates to avicultural concerns. Those parts dealing with systematics and "life habits" are brief at best, in spite of the fact that Delacour is an astute taxonomist. His classification differs from that of Peters primarily in providing a somewhat greater lumping of genera, but regrettably he does not deal with the interesting question of how the Phasianidae may be related to the typical partridges on the one hand, or to the grouse on the other. Although the significance of hybridization and cytological studies to taxonomy is mentioned in passing, none of the more recent studies (Sandnes, Knoder) in this area is specifically cited, nor is the taxonomic importance of behavioral studies such as those of Schenkel mentioned. The avicultural portion of the general account is much more complete, and in the new edition there are discussions of feeding methods, aviary design, disease control, and incubation that are of value to aviculturalists.

As to the organization of the taxonomic accounts, a standardized format is followed. Following a generic diagnosis, a key to the species and subspecies is provided and a section on "general habits and captivity" follows. Next, a description of each form is provided, including plumages of both sexes, immatures, and downy young, as well as of eggs and their incubation periods. The associated distribution maps are probably as good as any that are available for the birds of eastern and southeastern Asia, but that of *Phasianus colchicus* ignores all of the areas of the world where it has been introduced successfully. Only half of J. C. Harrison's paintings of the adults and downy young have been reproduced in color; two of the plates that would have been especially desirable to have available in color are those of the downy plumages. Harrison's paintings are generally attractive and are well reproduced; in my copies the plates in the new edition are if anything slightly brighter than those in my copy (4th printing) of the original edition. Probably the most interesting plate of all is the new painting by R. David Digby; his impression of a male Blood Pheasant (*Ithaginus cruentus*) on a lichen-covered rocky slope in the Himalayas not only portrays the bleakness of the environment and the probable protective coloration adaptations of the plumage, but also strongly shows the partridge-like features of this interesting genus. In an interesting addendum to the account on the blood pheasants, Delacour quotes Iain Grahame's recent observations on the species in the wild and in captivity, which support the view that a partridge-like covey life and relatively monogamous pair-bonding may be the blood pheasant's normal social system. Excepting the monogamous eared pheasants, the typical reproductive strategy of the pheasants is that of polygyny or promiscuity, which is of course a key to an understanding of the biological and taxonomic significance of sexual dimorphism in the group.

Complementary notes added to the text provide additional avicultural information on such species as the Bulwer's Pheasant, Rothschild's and Bornean Peacock Pheasants, and the Congo Peacock, and an initial description of the female of *Tragopan blythi molesworthi*. There is also a description of a new subspecies of *Lophura nycthemera*, which was collected in Szechwan in 1932, but not described until 1962.

Apart from aviculturalists, the book should have a high degree of appeal to curators of zoos, and the average ornithologist will find the plates a convenient method of learning to recognize the often similar-appearing species of pheasants. The taxonomic arrangement is no doubt as good as or better than that of any earlier systems, although the only evolutionary "tree" presented is one for the species and subspecies of *Phasianus*. Game managers will probably find little information of direct value to them relative to Ring-necked Pheasants or other potential exotic introductions.

There are slightly over 100 references cited at the end of the text, in addition to numerous in-text references, but only two of the former are more recent than 1949. This fact provides some insight into the Delacourian approach to avian monographs, which is to be in total command of the taxonomic and avicultural literature of the early 1900s, during the golden years of exploration and expeditions in search of rare pheasants, but to pay little attention to more recent studies in evolutionary biology, ethology, and

ecology. It would be unkind and grossly unfair to seriously criticize the book on that account; Delacour is a giant among living ornithologists, and perhaps more than any other person has been responsible for forcing the rest of us to look at such families as the Anatidae and Phasianidae on a world-wide basis, rather than be content to have our own vision limited by regional or political boundaries. Books such as this set the stage and lay the groundwork for other studies; the maps provide many opportunities to estimate areas of sympatry or infer distributional origins, the data on clutch-sizes and incubation periods offer clear invitations for ecological analyses, and the color plates of the incredible male plumages of pheasants excite the limbic system of any ethologist with an iota of enthusiasm for possible research topics.

In view of the fact that about a third of the world's pheasants are now considered endangered, and their habitats in Asia are deteriorating at an alarming rate, the updated publication of this book should go a long way toward aiding with conservation efforts and encouraging the captive propagation of the rarer species. With that in mind, the strong avicultural flavor of the monograph may be one of its strong points rather than a liability. Whether anyone with the richness of Delacour's background may ever undertake a modern monograph on the pheasants and their relatives remains to be seen, but until such time arrives the present work will certainly be the primary reference for the group. We can do no less than enthusiastically applaud Jean Delacour for his willingness to share his knowledge of and concern for pheasants by providing ornithologists with this book.—PAUL A. JOHNSGARD.

The Evolution of National Wildlife Law.—Michael J. Bean. 1977. Washington, D.C., U.S. Government Printing Office. ix + 485 pp. \$4.20.—This is not a book on conservation or an enumeration of wildlife conservation laws and regulations, but a history of these laws, their background and litigation. It is a report of the Environmental Law Institute commissioned by the Council on Environmental Quality in the hopes of encouraging a broader understanding of our national wildlife program. The need for such a report is clear when one considers the "over 100 treaties, international agreements, federal statutes, executive orders and federal regulations [that] provide a complex array of interrelated and sometimes overlapping requirements." Responsibility for interpreting and enforcing these laws is fragmented among many public agencies. The result as noted in the preface is that "it is difficult, if not impossible, to fashion and implement a comprehensive and consistent national program for the protection and conservation of wildlife."

The report makes most interesting reading with a good balance between legal technical documentation and general prose that is readily understood by any layperson. It fulfills, I believe, the basic goal of the project. I read the work with real profit and had a number of important aspects of wildlife conservation laws clarified for me. A few of the most interesting points deserve mention. The basic decision was made in an 1842 ruling by the U.S. Supreme Court (Martin vs. Waddell) that the legal foundation for wildlife regulation, and hence conservation, was taken over from English law—i.e. "the powers of sovereignty, the prerogatives and regalities which before belonged either to the crown or the parliament, become immediately and rightfully vested in the state." This decision established the legal foundation to regulate taking of wildlife but led to a long conflict between the states and the federal government—the conflict between the "State Ownership Doctrine" and "Federal Wildlife Law." The second important decision supporting the state ownership doctrine was reached by the U.S. Supreme Court in 1896 (Geer vs. Connecticut) in which the majority opinion concluded that "states had the 'right to control and regulate the common property in game,' which right was to be exercised 'as a trust for the benefit of the people.'" Thus wildlife is held in trust for the people and no person or group can claim any special or prior rights to the use of wildlife. Any such rights must be granted by the government within the provision that wildlife is held in trust for the people. Thus hunters cannot claim a special right, nor can the scientist claim a right to availability of wildlife for research, nor can the conservationist, bird watcher or "Friend of Wildlife." Of special interest is the slow but steady development of Federal Wildlife Laws in the face of the strong state ownership doctrine. Yet none of the federal laws came into direct conflict with the legal concepts embodied in these two decisions, but incorporated them into federal law. The two major means of developing federal wildlife laws have been interstate commerce and federal treaty making powers.

The author points out that Section 7 of the 1973 Endangered Species Act which provides for protection of the ecosystem (habitat) on which endangered and threatened species depend may prove ultimately to be the most potent weapon of this act. This observation is, I believe, correct and perhaps should be the portion of this law to which conservationists should devote their efforts.

The last point of major importance that should be mentioned is "Ultimately the 'law' of populational

control may be the final determinant of the fate of much of the world's wildlife." The author does not discuss this "law" nor many legal laws such as those regulating zoning, pollution, pesticides, and many other factors that affect the status of wildlife. Mr. Bean is well aware that the status of wildlife depends upon biological laws and that the real foundation for wildlife conservation depends on an understanding and wise application of these biological laws. Hopefully the Council on Environmental Quality will commission a second study to summarize the biological foundations for the conservation and proper use of wildlife.

All people interested in the conservation and wise exploitation of wildlife owe a debt to Mr. Bean and the Environmental Law Institute for the preparation of an excellent book. I would urge all ornithologists to obtain a copy and spend some time reading it.—WALTER J. BOCK.

British Birds of Prey.—Leslie Brown. 1976. London, William Collins Sons & Co., Ltd. xiii + 400 pp., 16 plates, 25 tables, 11 figures, 34 maps. \$17.50 from Taplinger Publishing Company, U.S. distributor.—Upon reading this work, one appreciates Leslie Brown's abilities to write for both the disciplined scientist and the general reader. Brown and Amadon's "Hawks, Eagles, and Falcons of the World" (1968) and Brown's "African Birds of Prey" (1971) are indispensable technical references. Brown's book, "Eagles" (1970), in the World of Animals series is a colorfully illustrated, easily read work for the enjoyment of everyone.

Both of these qualities—science and entertainment—are combined to a degree in "British Birds of Prey." The author does not assume that the reader has an in-depth ornithological background. Chapter 1, page 1, begins with a definition of the term, "birds of prey," and proceeds to a discussion of the numerous adaptations of raptors. Sight, smell, wing and foot design, styles of flight, and methods of pursuit and killing are illustrated and discussed in an informative yet easily understood manner.

Chapters 2 and 3 briefly describe all 24 species of diurnal birds of prey that occur in Britain, including their classification and field identification. Fourteen of the 24 species currently breed in Great Britain, but 4 of these—the Osprey, Honey-Buzzard, Marsh Harrier, and Northern Goshawk—are represented by less than 10 pairs. Only three of the breeders exceed 500 pairs, the European Sparrow-hawk, Common Buzzard, and Common Kestrel.

One might criticize the almost verbatim repetition in Chapter 26 on breeding behavior of several paragraphs from the opening chapters of the book. However, by then the reader could use some review after studying the 24 detailed species accounts that constitute the middle 210 pages of this small print and, therefore, voluminous source of information.

The manuscript for "British Birds of Prey" was finished in December 1972. The status of some species has changed since then (e.g. Peregrine Falcon populations have increased remarkably). Nonetheless, most of the information is still current, and the historical facts and figures that Brown has ferreted out and documented will be used from now on. A summarizing chapter on changes in habitat and status of British raptors is particularly valuable.

The closing chapters of the book are treatises—in the true sense of the word (i.e. argumentative, methodical discussions of facts and principles)—on food habits, the effects of predation, territoriality, population dynamics, breeding behavior, pesticides, and numerous other burning conservation issues. There is a switch from the detail of the middle chapters back to general information for everyone.

I know of no advocate of raptor protection who is better armed with the facts or is more convincingly articulate than Leslie Brown. You are invited to join in the conservation of Brown's favored species, the birds of prey, using as a foundation the tenets and extensive knowledge presented in "British Birds of Prey."—RICHARD R. OLENDORFF.

Anatomy of the Domestic Birds.—R. Nickel, A. Schummer, E. Seiferle, W. G. Siller, and P. A. L. Wight. 1977. Berlin and Hamburg, Verlag Paul Parey, and New York, Heidelberg, and Berlin, Springer Verlag. xii + 202 pp., 141 figs. \$42.30.—In this latest book on avian anatomy, the gross structure of domestic birds (mainly the chicken) is carefully described verbally with references to many illustrations of high quality. Descriptions include brief functional explanations and touch upon the microscopic level. But too few illustrations accompany the microscopic descriptions and some inconsistencies are noticeable, e.g. the glands and their topography are described carefully for the esophagus and the stomach, but not for the intestine. Special attention is given to the topographical relationships to neighboring structures of the organ being described, e.g. blood vessels, nerves, skeleton, muscles, and body cavities. An extensive index facilitates the location of anatomical terms in the text and illustrations.

This volume is a direct translation of the original German text, published in 1973, of Schummer's

"Anatomie der Hausvögel," which is Volume V of Nickel, Schummer, and Seiferle's "Lehrbuch der Anatomie der Haustiere," the leading textbook of veterinary anatomy in the German language. Siller and Wight are responsible for the translation, which is excellent although a few misprintings and distortions of meaning due to translation occur. The literature has been covered up to 1971; no attempt was made to include later significant works. The bibliography (31 pages) contains a large number of references in German and a lesser number in French and Italian, of which many may be unknown to the avian biologist in English-speaking countries. This may balance the omission of some important English and even German publications which are better known among ornithologists and zoologists.

The domesticated birds are given specific rank, e.g. *Columba domestica*, instead of *Columba livia* forma *domestica*, the domesticated form being neither a species nor a subspecies distinct from the ancestral wild species (see Herre and Röhrs 1972, *Haustiere—zoologisch gesehen*. Fischer Verlag).

The chapter on the muscular system appears to be the weakest part of the volume. It is almost exclusively confined to the name of the muscle, origin, insertion, "function," and innervation. The whole chapter consists of 12½ pages and contains only 4 illustrations (!) compared to the chapter on the skeletal system with 23 pages and 28 illustrations. The skeleton is described under the peculiar heading "Passive locomotor apparatus." Some of the major articulations are described briefly, but the ligaments are not described at all.

The question arises, whether and to what extent this book meets the needs of a zoologist dealing directly or indirectly with avian anatomy. It must be kept in mind that this book has been written by a veterinarian anatomist addressing students in veterinary medicine in German-speaking countries, which has several implications for any evaluation, namely:

1) Comparisons are made, if at all, with domesticated mammals, which represent the bulk of the patients of a veterinarian. For zoologists, however, a comparison with reptiles would have been incomparably more sensible. Moreover, a broader comparison within birds would have been valuable.

2) The Latin nomenclature of the structures is derived predominantly from the anatomy of the domesticated mammals, which itself is derived from human anatomy. Hence many of the terms employed in this volume do not correspond to the names commonly used in zoological publications as, for example, the terms used for the muscular system.

3) The Latin terminology has an important place in veterinary anatomy. Up to the last few years, a knowledge of Latin has been compulsory for students of medical sciences in Central Europe. The translators, following the wishes of the author, retained it, although "... the Latin name is given the first time it occurs, but subsequently English is generally used." Unfortunately this policy has a very unsatisfying result. For the clavicle, for example, five different names are given, the connection between them not always being clear; these are collar bone, clavicle, furcula, wishbone, and calvicula (misspelled for Clavicula, p. 13). Moreover, the use of italics appears to be inconsistent; it is not only used for Latin names, but also for emphasis of English names. And sometimes Latin names appear in roman type. For some unknown reason, the Latin nouns are not capitalized. As the English and the Latin names appear only occasionally in a clear connection to one another, the student who does not know Latin will often be in trouble. How can he know, for example (p. 47), that "Ostium" itself has neither the meaning of "system of folds" nor of "open communication"? An extensive glossary is absolutely necessary; its lack is a serious weakness.

With respect to the depth and breadth of the treatment of the subject and to the quality and quantity of the illustrations, this volume appears to represent the best approach to a comprehensive description of the complete gross anatomy of a bird available today. But considering the high price and the above-mentioned drawbacks, this book seems to be less suited as a dissection guide than as a valuable source of additional and complementary data for the interested student in general anatomy and for the teacher preparing his lectures. For the specialist of vertebrate anatomy, however, this book does not contain enough detailed information to be used as a basis for his research. A good atlas of avian anatomy still does not exist; the general zoologist and the specialized avian anatomist must rely on works such as "Avian Biology" and on papers in the primary literature.—DOMINIQUE HOMBERGER.

ALSO RECEIVED

Birds of New Guinea and Tropical Australia.—William S. Peckover and L. W. C. Filewood. 1976. Sydney, A. H. and A. W. Reed. 160 pp. \$A 14.95.—This attractive book provides excellent color illustrations and informative text for 96 species of birds, mostly from New Guinea. The well-reproduced photographs support the senior author's contention that "Color photography portrays nature with clarity and accuracy." These are portraits of birds made under controlled conditions in the field and the results are, for the most part, excellent. Many species never before photographed and seldom painted are here illustrated; for example, the Wattled Ploughbill (*Eulacestoma nigropectus*) and the Papuan Hawkowl (*Uroglaux dimorpha*). The text is concise but contains much information never before published. This book fills a real need for an illustrated book on New Guinea birds. I hope the authors will soon produce a second volume.

In an appendix there is a list of scientific and common names of the birds of Papua New Guinea, Irian Jaya, and the Solomon Islands with some idea of the distribution, migration, and breeding habits indicated. The authors adopt many of the taxonomic changes suggested in a number of recent works. The vernacular names suggested in the Appendix are in many cases different from those used in recent publications on New Guinea birds. The authors state that they are attempting to produce "a list of vernacular names for the Papuan area that does not seriously conflict with current usage in Australia." Such a list is needed. I might add that the authors have currently in press an article listing sources for their scientific names where these differ from the ones used in the *Handbook of New Guinea birds* (A. L. Rand and E. T. Gilliard, 1967, Weidenfeld and Nicolson).

Anyone interested in birds of the Australasian area or in bird photography will find this book a most welcome addition to his library.—MARY LECROY.

Breeding Biology of the Gray Gull *Larus modestus*.—T. H. Howell, B. Araya, and W. R. Millie. 1974. Berkeley and Los Angeles, University of California Publications in Zoology, vol. 104. 57 pp., 21 plates. \$2.50.—Although the Gray Gull is an abundant gull along most of the Pacific coast of South America, its breeding was unknown to Murphy when he published his work on oceanic birds of South America (1936). Yet a nesting colony had been discovered by A. W. Johnson in the desert of northern Chile in 1919; a second colony found in 1943. Curiosity about the behavioral and/or physiological adaptations that would permit a gull to nest successfully 30 km away from the ocean in one of the most barren deserts of the world prompted Howell and his coworkers to study the breeding biology of this bird. The results presented in this monograph are fascinating.

Most interesting are the adaptations to avoid heat stress by the adults and especially the chicks having to cope with a substrate temperature that reaches well over 50°C when unshaded and 50°C when shaded. Temperature inside of shaded eggs can reach 45°C and chicks can reach a body temperature of 45°C and still survive. Adults reduce heat stress by standing and shading their feet; nonincubating adults stand on rocks which are cooler than the ground. Strong winds start each early afternoon and reduce ambient temperatures from dangerously high levels. Chicks are shaded under any nearby adult; adults will accept any chick that gets under them. Chicks of all ages can lose sufficient heat in the afternoon winds to avoid fatal body temperatures even if unshaded.

An unresolved problem is why these birds are gray in color when dark feathers would be expected to absorb more heat from the sun than light-colored feathers. This has been studied by Walsberg, a student of Howell, and King, who have found some most unexpected results supporting observations made by Howell and coworkers. But that is a story Walsberg and King will have to tell. Howell, Araya, and Millie must be congratulated for a delightful and superb field study that should be read by all ornithologists interested in the details of avian adaptations.—W.J.B.

The Hen Harrier.—Donald Watson. 1977. Berkhamsted, England, T. & A. D. Poyser. 307 pp., 4 color plates, numerous field sketches, 15 figs. (maps and graphs), 30 tables. Obtainable from Buteo Books, P.O. Box 481, Vermillion, S. D. 57069. \$20.00—This, I would say, is the best volume I have seen on the general natural history of any species of diurnal raptor. The first $\frac{3}{5}$ of the text, a very detailed presentation of all aspects of the general biology of the Hen Harrier, including molt and development, makes full use of the American literature (where the resident race has been known as the Marsh Hawk) as well as much data, published and unpublished, from European students, especially the recent works of Schipper and Nieboer in Holland, and the unpublished findings of the late E. Balfour on the Orkney

Islands. Nearly exterminated for a time in Britain, the Hen Harrier persisted in the Orkneys, and has since made somewhat of a comeback in Scotland and elsewhere. The second part of the book recounts Mr. Watson's careful and long continued studies of this harrier in southern Scotland where it reappeared in the late 1950's, first in moorland and later in young pine plantations. The author's affection for his subject is always apparent and is reflected in his delicate sketches of the moorland and the harriers and other wildlife that dwell there.—DEAN AMADON.

Golden Eagle Country.—Richard R. Olendorff. 1975. New York, Knopf. Illustrated by Robert Katona, 202 pp. \$12.95.—A sound, yet popular account of the Golden Eagle (*Aquila chrysaetos*), its ecology, life history and management, and that of its wildlife neighbors on the grasslands and mesas of western North America. The illustrations are superior.—DEAN AMADON.

The Biological and Taxonomic Status of the Mexican Duck.—John P. Hubbard. 1977. Bulletin of New Mexico Department of Game and Fish, No. 16, Albuquerque, New Mexico, 56 pp., 4 figs., 7 tables.—The Mexican Duck, *Anas diazi*, is one of three essentially sexually monomorphic (there are minor sexual differences) populations generally agreed to be very closely allied to the Mallard (*Anas platyrhynchos*), the others being the Mottled Duck (*A. fulvigula*) and American Black Duck (*A. rubripes*). This report assesses the population of Mexican Duck, estimated at 16,000 to 40,000 birds in Mexico and fewer than 1,000 in the United States (Texas, New Mexico, Arizona), and treats the taxonomic status of the form. The analysis, involving color and other plumage features (hybrid index technique) and mensural studies, is thorough, and the conclusion is reached that there is extensive hybridization between the Mexican and Mallard ducks, such that they should be treated as conspecific. Essentially all United States individuals of "Mexican Ducks" are hybrids (including introgressants and backcross products) with Mallards, as are many Mexican birds from Durango and Chihuahua northward. An important point off the main thrust of the report is documentation of the Mottled Duck occupying parts of the southern Great Plains, where it too appears to be hybridizing with the Mallard.

The report is well-produced, and of interest to taxonomists, evolutionary biologists, waterfowl biologists, and conservationists. There is no indication of the price or the place of publication, or instructions as to ordering it, other than mention of the New Mexico Department of Fish and Game. As a systematist I am critical of the author's garbling of taxonomy and evolutionary biology, especially as these relate to matters of interest and concern to conservation. The fact is that the Mexican Duck is a form of Mallard. It follows from this that efforts and funding to preserve the "Mexican Duck" and to protect it from interbreeding with Mallards cannot be justified in light of the many, urgent, high priority conservation problems presently demanding our attention and financing. Of course there are many valid reasons for preserving wetlands in the Southwest, and it is wise (in the sense of long-term preservation) to maintain as much as possible of the genetic diversity of all avian species. But the author's recommendations that relate to fostering management efforts to minimize natural hybridization of Mallards and Mexican Ducks lack merit and encourage waste of energy and money. Given that these ducks seem not to discriminate in their mating, it is futile to worry about "saving" the Mexican Duck from introgressant hybridization!—LESTER L. SHORT.

Ökophysiologische Problem in der Ornithologie.—P. Gerthold and G. Zink, eds. 1977. Special Issue, Die Vogelwarte, volume 29. 171 pp. 32DM.—This special issue of Die Vogelwarte is a symposium of 18 papers presented at the 75th anniversary celebration of the Vogelwarte Rossitten/Radolfzell held in Möggingen, Germany in October 1976. The topics—yearly cycle, banding, the role of the amateur in ornithology, banding studies, orientation, population dynamics, ecological morphology, and song—all represent research areas at the Vogelwarte. The papers are an interesting cross-section of current ornithological research in these areas with citation to the recent literature. Of special interest is the review of the avian magnetic compass and the consideration of endogenous control of migration. The major lack, in my opinion, is a history of the Vogelwarte Rossitten/Radolfzell and an overview of its current program. Most unfortunate was the decision not to publish the talks from the general opening session which included excellent presentations by D. Farner on the need to unite field and laboratory studies and by K. Immelmann on the value of birds not only as research subjects but also for education, conservation, and recreation. I can strongly recommend this symposium for all ornithologists.—W. J. B.

Avian Physiology.—Malcolm Peaker (Ed.). 1975. New York and London, Academic Press, Symp. Zool. Soc. London, No. 35. xix + 377 pp. \$25.50.—This volume is the proceedings of a symposium, "Advances in Avian Physiology," held at the Zoological Society of London in November 1973. The contributors are mainly British workers and the papers are almost all summaries of laboratory investigations of the domestic fowl and a few standard experimental species. They are excellent reviews with extensive literature citations and provide the ornithologist with the needed background for field and comparative studies of wild birds. Topics covered are digestive physiology, cardiovascular system, respiration, flight energetics, thermal control, osmotic balance including the salt gland, and several chapters on reproduction including considerations of environmental control and adaptation. Donald Farner provided a few closing remarks in which he stresses the distinctiveness of avian physiology compared to that of mammals and the need of physiological analysis of a diversity of avian species. This symposium has much of interest to all ornithologists.—W.J.B.

Avian Physiology.—P. D. Sturkie (Ed.). 1976. Third edition, New York, Heidelberg, Berlin, Springer Verlag. xiii + 400 pp. \$23.80.—Sturkie's "Avian Physiology" has been one of the standard texts in avian biology. This edition brings the second edition of 1965 up to date with the assistance of 11 coworkers. The subject matter of this book is laboratory physiology with emphasis on digestion and metabolism, the nervous and sensory system, the circulatory-respiratory system, excretion, reproduction, and endocrines. It does not cover muscle physiology, moult, daily and yearly cycles, and physiological ecology except as parts of other headings. Most data are from chickens and other laboratory birds, but there is a surprising amount of comparative material from wild species in some chapters (e.g., regulation of body temperature). Each chapter has a list of references. Many volumes on avian physiology have appeared in the last decade, yet Sturkie's text is still a very useful single volume reference on many aspects of laboratory physiology and deserves a place on the bookshelf of all serious ornithologists.—W.J.B.

The world of Roger Tory Peterson. An authorized biography.—John C. Devlin and Grace Naismith. 1977. New York, NY Times Books. xxi + 266 pp., illustrated by R. T. Peterson. \$14.95.—Roger Tory Peterson needs no introduction to readers of *The Auk*. This book provides a picture of Peterson as a person and a summary of his work as a bird artist, author, and conservationist. Most disappointing is an almost complete lack of the development of concepts and the interaction with other ornithologists that led to the writing of Peterson's first field guide. Nor is there any discussion of the development of Peterson's subsequent editions of the eastern bird guide and his other field guides; the first guide is very primitive compared to later ones. And almost nothing is included on Peterson's contributions to scientific ornithology. In view of the tremendous rise of ecological and other field studies in ornithology over the past four decades, in which rapid and accurate identification of birds is essential and for which the Peterson field guides played a central role, a full discussion of these points would be important for any history of American ornithology. These gaps should be filled in the next edition of this work. These desiderata notwithstanding, this book presents an interesting portrait of the man behind the Peterson field guides.—W.J.B.

Geographic Variation, Speciation, and Clines.—John A. Endler. Princeton, New Jersey, Monographs in Population Biology No. 10, Princeton Univ. Press. ix + 246 pp. \$16.00 (\$6.95).—The roles of geographic isolation and gene flow in facilitating variation within and among populations and in prompting speciation have been debated for decades. Endler approaches this issue by briefly examining examples, describing his own experiments, and (mostly) developing models of the genetic structure of populations along clines. There is much of interest in this book, and those interested in the speciation process or in population genetics should read it. But be careful: there are many assumptions lurking about, and the unwary reader may be easily taken in.—J.A.W.

Wild birds of the Americas.—Terence Michael Shortt. 1977. Boston, Houghton Mifflin. 272 pp., plus many illustrations by the author. \$14.95.—This attractive book has short accounts on most families of birds found in the New World, together with some personal observations and illustrations by the author. It is a book for the amateur and for the lay public and as such succeeds in introducing the diversity of American bird life in a pleasant, uncomplicated way.—W.J.B.

A bird watcher's adventures in Tropical America.—Alexander F. Skutch. 1977. Austin, University of Texas Press. x + 327 pp. \$13.95.—Alexander Skutch is known to all ornithologists for his

painstaking observations on the life history of neotropical birds, made mostly in Costa Rica. This volume provides 13 different accounts, most of which do not take place in Costa Rica. Three chapters deal with groups of birds—hummingbirds, contingas, and woodhewers—and one chapter deals with the interrelationships between birds and ants. The book is addressed to the lay public and is written in a simple and easy-to-read style. It presents a good introduction to the complexities of birds and their environment in the tropics.—W.J.B.

Fåglar över Land och Hav (Birds over Land and Sea).—Kai Curry-Lindahl. Stockholm, Albert Bonniers Förlag. 243 pp., richly illustrated with color photographs and line diagrams. No price given. In Swedish.—This book deals with bird migration, emphasizing movement patterns rather than underlying mechanisms. Judging by the many diagrams, the treatment is fairly deep. An English translation would have considerable appeal.—J.A.W.

Never enough of nature.—Lawrence Kilham. 1977. Foster, R. I., Droll Yankees Inc. vii + 273 pp. No price given.—Lawrence Kilham is a professional microbiologist and amateur ornithologist known for his many studies of woodpecker behavior. This book is a collection of his observations on nature made mainly in New England, but also in Panama and East Africa. It contains many interesting observations, is written in an amiable style, and makes pleasant reading for anyone interested in natural history.—W.J.B.

Birds in peril.—John P. S. Mackenzie. 1977. Boston, Houghton Mifflin Co. 191 pp., illustrated by T. M. Shortt. \$14.95.—This book presents accounts of 20 species and subspecies of North American birds that are endangered. It discusses the life history of each form, the reasons for the decline, current status, and what can be done. The accounts are sound and provide a useful summary of information on the status and conservation of these endangered birds. The illustrations are attractive but serve to increase the cost of this book. It would have been a greater contribution to avian conservation if the illustrations were omitted, a smaller type was used, and the book issued in a soft-backed form at a lower cost so that it would be available to many more individuals and institutions.—W.J.B.

How birds fly.—Russell Freedman. 1977. New York, Holiday House. 64 pp., profusely illustrated with pencil drawings by L. F. Bjorklund. \$6.95. This greatly simplified explanation of bird flight, based admittedly on J. H. Storer's "The flight of birds" (1948) and C. H. Greenewalt's "Hummingbirds" (1960), is written for 8- to 12-year-olds, who should have no trouble understanding it.—O.L.A., JR.

Laboratory animal management: Wild birds.—James R. King et al. 1977. Washington, D.C., National Academy of Sciences. v + 116 pp. \$7.75.—This volume on the husbandry of wild-caught birds was written by the Committee on Birds (T. J. Cade, W. G. Conway, M. R. Fedde, J. P. Hailman, and W. O. Wilson, under the chairmanship of J. R. King) of the Institute of Laboratory Animal Resources of the National Research Council. Their purpose was to provide a summary of information on obtaining, housing, care, and use of birds in captivity as research subjects without formulating rigid standards and guidelines. The committee stresses that "there is no substitute for a thorough knowledge of the species under consideration in its natural environment, for good sense, or for a humane respect for wild animals." A summary of federal statutes governing the obtaining, importation, and use of birds in captivity, references to the pertinent laws, and addresses of state and federal agencies are included. Appendices of diets, methods used to capture wild birds alive, and anesthetic agents are especially valuable. One of the most useful aspects of this volume is the bibliography. All sections of this work are extensively referenced. An annotated list of major references on avian diseases and parasites is included. This volume is an absolute must for any ornithologist who keeps wild birds in captivity. King and the other members of the Committee on Birds deserve the appreciation of all ornithologists for their careful and valuable work in producing this handbook on the care of captive birds.—W.J.B.

Cruikshank's photographs of birds of America.—Alan D. Cruikshank. 1977. New York, Dover Publications. 182 pp., with 177 photographs by the author. \$6.00.—This collection of superb photographs of birds is a greatly enlarged and revised version of Cruikshank's "Wings in the Wilderness." All photographs are in black and white, which loses the element of color but gains much in clarity, expression, and artistic content of the photograph. An excellent appreciation of the particular *Gestalt* of each species can be gained from these photographs, which include the famous picture of the "Gannet

three-point landing" taken at Bonaventure Island. This inexpensive volume makes a pleasant addition to the library of any ornithologist.—W.J.B.

Colored canaries.—G. B. R. Walker. 1977. New York, Arco Publishing Co. 139 pp., 28 color illustrations. \$9.95.—A guide designed for the fanciers and breeders of colored canaries, with fine color photographs of 65 varieties. Chapters describe breeding techniques, basic genetics, and include a useful glossary of terms and nomenclature as used in Great Britain.—O.L.A., JR.

Identification guide to cage and aviary birds.—Michael Stringer. 1977. New York, Arco Publishing Co. 61 pp., most of colored sketches. No price given.—Pictures about 100 of the most common birds available in the pet shops of England, from parakeets (mostly Australian) though fringillids and waxbills to starlings, jays, and doves. Of interest is the inclusion of our protected Cardinal and Painted, Indigo, and Lazuli buntings.—O.L.A., JR.

Index to U.S. Federal Wildlife Regulations.—Thomas J. Berger and John D. Phillips, compilers. 1977, Lawrence, Kansas, Association Systematic Collections. \$10.00.—This index is a very useful compilation of federal laws and regulations governing and shipping wildlife specimens—an almost impossible task. Not everything is clearly explained, such as the symbols used for the status of endangered species. Moreover, this compilation does not appear to cover all regulations. Nothing is said about the importation of live birds and the need to quarantine under the regulations associated with Newcastle virus. Nor does this compilation appear to deal with all of the regulations associated with exportation or importation of existing museum specimens. It would be far more useful if it contained an index to regulations arranged according to the general procedures of collectors and museums in obtaining and shipping (including returning) specimens. These points are minor compared to the outstanding job done by Berger and Phillips and the Association of Systematics Collections in compiling and making available this index. I would urge all ornithologists whose work requires obtaining and using specimens of birds to obtain a copy.—W.J.B.

Zoological Illustration. An Essay towards a History of Printed Zoological Pictures.—David Knight. Hamden, Connecticut, Archon Books. xii + 204 pp, 103 black-and-white illus. \$17.50.—A scholarly, historical treatment of the development of style and technique in scientific illustrations of animals from the 13th century to early in the present century. Overpriced, even in view of its specialized nature.—J.A.W.

The Zoological Record: Aves.—1976. London, Zoological Society of London. Volume 109 (for 1972), xix + 487 pp. £22.00.—The Zoological Record, long the major bibliography source in zoological sciences, changed its system of indexing and format several years ago and became much more expensive, pricing itself out of the reach of most individuals. Several months ago I went through the systematic section with a friend to count the new species of birds described each year; we looked at the Aves section of volumes 107, 108, and 109. In doing so we noted the obvious errors, basically genera placed in the wrong family-level groups; our survey was not complete as we caught only those genera we could recognize quickly. Volume 107 had 4 errors, 108 had 17, and 109 had 62! This does not include multiple entries under the same generic name. The most serious error was the inclusion of some entries for *Zosterops* under the Anatidae.

A disadvantage of the current system used is that a major review paper would appear again and again under the headings for each species included in the study. Thus over one page was devoted to multiple entries for Simpson's paper on fossil penguins from New Zealand, over one page was devoted to several papers by Kahl on behavior and relationships of storks, and about one and a half pages to Ziswiler's revision of the mannikin genus *Erythrura*. This system requires considerable space without any real advantage to the user of the Zoological Record.

The compilers of the Zoological Record are aware of the errors that creep into the publication and publish a list of corrections in the following volume. The purpose of this review is to warn users of the Zoological Record of the number of errors which are hard to catch (someone looking for information on *Zosterops* will not find the papers indexed under the Anatidae) and to urge them to inform the Zoological Society of errors discovered so that these can be corrected.—W.J.B.