REVIEWS

EDITED BY JOHN WILLIAM HARDY

Die Mauser der Vögel.—Erwin Stresemann and Vesta Stresemann. 1966. J. Ornithol., 107, Sonderheft. Pp. 1–445. No price given.—Molting of feathers takes place on a definite schedule over a period of several weeks or longer. The timing, tempo, and sequence of molting and their significance in birds are the subjects of this monograph. Professor Stresemann has worked in this field throughout his career, having been introduced to it by Oskar Heinroth, to whom the volume is dedicated. In this monograph, he and his wife have distilled their findings from the examination of more than 50,000 specimens and the literature. In spite of this effort, the volume is narrower in scope than its title, "The molting of birds" suggests, being devoted almost entirely to replacement of the remiges and the rectrices. Replacement of the rest of the feathers is treated without detail as "body molt." This limitation stems from the authors' aim of investigating the order of replacement of the flight feathers as a possible clue to taxonomic affinity.

The volume is in two parts, a short general account of feather molting and a much longer specific account of molting in many orders of birds. The general section deals with the causes and regulation of molting, rate of feather growth, sequences in the replacement of flight feathers, duration of molt of the primaries, relationships of wing molt to migration and the breeding cycle, periodicity of molting, and taxonomic significance of sequence of feather replacement. This section ends with a long literature-cited section.

The discussion of the physiology of molting and feather growth is brief but highly informative, sufficiently so for the purpose of the volume. There is no mention, however, of the work of Frank R. Lillie and his associates, among the most important researchers in this field. In discussing the basis for regulated sequences of feather replacement, the Stresemanns mention briefly a hypothesis of Mary Rawles and then suggest one of their own. I find little difference between them. The authors do not seem to understand that in Rawles's view, the physiology of each feather papilla may fluctuate spontaneously and cyclically, *including* varying sensitivity to hormones that stimulate feather growth.

The terms used for molts and plumages are almost entirely German equivalents of those used by Dwight (Ann. New York Acad. Sci., 13: 73–360, 1900). For greater clarity, "nuptial molt" has been replaced with "postnuptial molt" and "non-nuptial molt" with "prenuptial molt." The concepts and terminology proposed by Humphrey and Parkes (Auk, 76: 1–31, 1959) are dismissed as impracticable in the experience of Alden Miller and Professor Stresemann himself. It is disappointing that this issue has been avoided, yet admittedly it is not essential for achieving the purpose of the monograph. At least the authors emphasize the growth of new feathers in molting rather than the loss of old ones, a cardinal point made by Humphrey and Parkes.

The General Section introduces and summarizes the Special Section, making it the portion of the volume that will be of chief interest to most readers. It brings together a great deal of information on patterns of wing and tail molting not readily found elsewhere. To no one's surprise, the Stresemanns show a vast knowledge of all kinds of birds, for they cite many examples of normal and special cases of molting. More importantly they treat molting not as a separate life process, but as one that must be carried out in conjunction with others. Various chronological relationships are

pointed out among cycles of molting, migration, and reproduction. Many of these are regarded as adaptations whereby temporary absence of functional flight feathers causes little or no impairment of locomotor ability or modifications for courtship.

In some cases the authors give explanations for the timing and sequence of molt as if they are proved, whereas they are only reasonable hypotheses. The period of retention of the primaries, for example, is said (p. 29) generally to correspond to the feathers' resistance to wear. There is no question that some feathers are abraded, but I know of no measurements of their wear-resistance. The diversity of habits and coloration among the many birds that molt on a 12-month cycle suggests that this period is *not* closely related to a need to replace worn feathers. More important factors may be the size of the primaries and the biological cost of replacing them.

The Special Section is a systematic presentation and discussion of data on the timing and order of molting the flight feathers. Birds of all orders are represented except the ratites, the trogons, and the coraciiforms. Certain piciform and most passeriform families are absent. The groups are arranged in a taxonomic system which is largely that proposed in Professor Stresemann's "Aves" (Handbuch der zoologie, vol. 7, part 2 (W. Kükenthal and T. Krumbach, Eds.), De Gruyter, Berlin, 1927–34). Although very different from the Wetmore classification, it should not hinder a reader's search for information on any particular group because there is an index to generic names.

Each chapter covers one order and usually begins with remarks on the affinities or composition of the group, its schedule of molting, and the state of knowledge about its molts. Literature cited is given at the close. The meat of the chapters consists of details on the timing of molt, migration, and breeding in the annual cycle, on the foci and order of feather replacement, and on differences in these respects between young and older birds. Organization of material varies among chapters but is always clear.

Concise descriptions of flight feathers in selected molting specimens are given as a way of documenting the accounts. Abbreviations are often used to record which generation the feathers belong to, and the feathers' actual or relative length. As a considerate touch, the key to the abbreviations has been printed both at the start of the Special Section and on a separate card which the reader can keep at hand. The use of "generation" in these accounts is good because it is a neutral term, i.e. without a link to the names of specific plumages. Unfortunately the same symbols are used for stages of a molt cycle and for generations of feathers on an adult bird, a confusion of two meanings of "plumage." It should also have been made clear in speaking of the feather generations of young birds that "first generation" and its symbol apparently refer to the first set of contour feathers (i.e. juvenal plumage), not to the natal downs.

I find it difficult to visualize the specimens from these descriptions and to extract their meaning. One must often keep in mind the conditions of molt reported in several specimens and then compare them in order to see the changes and thereby induce the order of feather replacement. Very few readers are likely to do this, hence the data as published are of little value. The problem arises, I think, from the number of bits of information that must be fitted together. It is compounded by the fact that the status of growing feathers is reported in various ways. Also, the fine discrimination of stages of growth, found in many descriptions, does not seem necessary for the purpose at hand. It is sufficient and clearer to record whether an incoming feather is in a young or an advanced stage of growth, as done by Haffer (Auk, 85: 633–638, 1968) in a sequel to the present work. I would like to suggest that authors of future papers along these lines attempt to present such data in small simple graphs.

As an experiment, I have designed such a graph and have found it easier to grasp than an abbreviated verbal description.

This study was undertaken in the hope that it would furnish evidence for judging phylogenetic relationships, even at the ordinal level. The authors admit that such was not forthcoming, as they never found a single mode of replacement of flight feathers that was common to two orders. At lower taxonomic levels, however, they demonstrate that the *mode* of wing molt is sometimes the same within an order or a group of families, and is almost always so in closely related species. The *timing* and *completeness* of molts, on the contrary, are shown in a number of cases to vary among closely related forms. These matters have been known in some degree, but more evidence has been assembled here than ever before.

This monograph is not as comprehensive as its title and size suggest. It will serve nevertheless as a very good review of many aspects of molting and as a source for data on modes and timing of the molts of flight feathers. Of perhaps more importance is the care the Stresemanns have taken to point out possible functional relationships between molting and locomotion, migration, and breeding. Their findings and hypotheses have made molt data less valuable for taxonomy but have increased their biological meaning. Finally, the work has rendered a service by pointing out gaps in our knowledge and stimulating other authors such as Haffer to fill them.—PETER STETTENHEIM.

(The general section and parts of the special section of this work have been translated in a project organized by Drs. Charles G. Sibley and N. Philip Ashmole, Peabody Museum of Natural History, Yale University. Copies of these translations are not available but may be borrowed by members of the Wilson Ornithological Society from the Society's Van Tyne Memorial Library (Museum of Zoology, University of Michigan). Persons who can give help in translating the remaining parts should communicate with Dr. Sibley.—ED.)

Seabirds of the tropical Atlantic Ocean.—George E. Watson. 1966. Washington, D. C., Smithsonian Press. Pp. liv + 120, illus., 10½ × 8 in. $3.75; **Preliminary identification manual: seabirds of the tropical Pacific Ocean.**—Warren B. King. 1967. Washington, D.C., Smithsonian Press. Pp. xlii + 126, illus., 10½ × 8 in. No price given.—These two books and others in this series fill an immense need in field ornithology. Anyone who has ever tried to do research or just merely to observe and record will know that Alexander's "Birds of the ocean" (New York, G. P. Putnam's Sons, 1928), the only other available field guide, is inadequate and outdated, and other books (while fine for reference purposes) are too regional or otherwise unsuitable for field use. Some practical work in this field has been long overdue.

To fill the void, the authors use a simple, practical format. First, a description of the pelagic environment is given, including a discussion of factors influencing bird distribution on the high seas. This is followed by some useful hints on birdwatching at sea and detailed instructions on how to preserve birds. The next section contains black-and-white plates illustrating all species treated in the books. Then follow identification keys and a detailed account of each species, including characters, flight, food, habitat and distribution. Finally, a regional breakdown of the breeding and nonbreeding avifauna is given, listing the status and seasonal occurrence of each species. The regions are chosen to correspond to the vicinity of the more conspicuous islands and island groups within the total area covered by each volume. The Pacific guide also has some very useful range maps for 48 of the 107 species it covers.

In general the text is well-written, factual, and uses mercifully few but well-chosen

words to help the observer accomplish the rather difficult task of identifying birds at sea. For the average individual, even if he is a good field man ashore, the task can be quite a problem until he becomes accustomed to the peculiarities of the marine environment and its birds. These birds are usually a considerable distance from the observer, moving, and constantly disappearing behind the waves. This, coupled with the fact that most oceanic birds are similar in general appearance, often lack conspicuous color markings, and are almost always silent, makes birdwatching at sea one of the most frustrating and unrewarding pastimes. Any field guide that hopes to be practical and useful for all must therefore be addressed to these problems and include a way to deal with them. To illustrate this with an example: one of the most important characters or field marks one can use is the pattern of flight of the respective pelagic species. This is a dynamic character and very difficult to illustrate with static drawings. Thus the writer has to rely on verbal descriptions, and he has to make them brief and such that the reader may easily visualize them and use them as tools of identification. The two books under review here do this very well. The more pedantic reader may object to such subjective words as "dashing" or "impetuous" for describing a flight pattern, but I find them well-chosen and just plain practical. This practical approach, supported by a thorough search of the literature and many hours of shipboard observations, makes these two guides well suited to fill the above-mentioned void. On the negative side, economy of words extends into economy of production, which becomes annoying at times. The mimeograph print of the Pacific guide in my copy is quite poor on many pages, and in both volumes the illustrations (which are a credit to Tina Clapp) are faded or of varying intensity. The paperbound Pacific guide is not likely to stay together long under field conditions. Other lesser faults are also present. The plate illustrating the silhouettes of major seabird types in the Atlantic guide is not numbered so that each figured type will correspond to the appropriate description on the opposite page. On this same page a swimming penguin could have been added to the assemblage. In this same volume, the illustrations of the individual species are duplicated on opposing pages, one high contrast, the other a faded replica, and the names are written over the faded images. I fail to see how this feature helps the book in any way and it is a waste of paper and ink. The map (pp. viii–ix) showing water circulation patterns in the Atlantic hardly clarifies the subject. The corresponding map in the Pacific guide is far superior. Outright errors in the text are few, and are probably the result of oversight, such as: "nutrients are taken up by microscopic planktonic animals" (Pacific guide, p. xiii) and "fulmars are heavy, sluggish scavengers" (a statement that appears in both volumes). I wish the authors had said something about binoculars for seabound birdwatchers (10 × 50's are best) and about telescopes (don't use them). A sample page of a typical seabird log might have been useful.

As the authors point out, these guides may not be the last word on the subject, but in my opinion they represent a very good beginning.—LASZLO J. SZIJJ.

The birds of the Republic of Panama. Part II. Columbidae (Pigeons) to Picidae (Woodpeckers).—Alexander Wetmore. 1968. Washington, D. C., Smithsonian Misc. Coll., 150. Pp. v + 605, 1 color plate, numerous line drawings. $15.00.—This volume is the second in a series of four volumes treating the birds of Panama and completes the species accounts through the nonpasserines. The format is the same as that for volume one, previously reviewed by Thomas R. Howell (Auk, 85: 150, 1968). However, in contrast to the first volume, the present one is bound, and I presume the forthcoming ones will be also. It is unfortunate that binding did not commence with

the entire run of the first volume, as many will experience difficulty in matching covers for uniformity; however, I understand that bound copies of volume one are now available for $12.50.

Accounts of families include a general discussion and an artificial key to the species occurring in Panama. I find this key extremely useful, as good keys for tropical American birds are few and far between (as are good field guides).

Species accounts commence with the scientific and vernacular names (latter in English and in Spanish), followed by a brief resumé of distinguishing characteristics, a detailed description, a section on measurements, and a detailed discussion of the species' occurrence in Panama, including notes or comments of interest pertaining to the life history of the bird. If more than one subspecies occurs in Panama, the general section of distinguishing characteristics appears under a species heading while the remainder of the account appears under separate headings for each geographic race. I find the headings for the subspecies accounts somewhat distracting, as they are in the same boldface type as those of the species; perhaps a different font or size of type would have enhanced the work by contrasting the species and subspecies accounts.

Taxonomically most of the usage of scientific names is on the conservative side, although a few of the more modern generic lumpings are adopted (*Columbigallina* in *Columbina*, *Phloeoceastes* in *Campephilus*).

This work is exceedingly thorough, virtually error-free typographically, and well organized. The superb quality of the book is reflected in the fact that my only critical comments concern the binding and type of account headings. I am looking forward with eager interest to the forthcoming volumes (and particularly the last, which will include gazetteer and general discussions) and to the completion of this project dealing with a most important region zoogeographically.—BURT L. MONROE, JR.

A sound guide to the birds of southern Europe, vol. 2 (of "A sound guide to the birds of Europe"). Thirteen 7-inch 33⅓ rpm vinyl discs (25½ sides) plus descriptive 32-page booklet of record contents in either French, German, or English language. **A sound guide to the birds of north-west Africa** (supplement to vol. 2 of "A sound guide to the birds of Europe"). Five 7-inch 33⅓ rpm vinyl discs (10 sides) plus 21-page descriptive booklet. Both sets compiled and annotated by Jean-Claude Roché, with English text translated by E. D. H. Johnson. From field recordings made by J. C. Roché, H. Roché, S. Taylor, and E. D. H. Johnson. ECHO (International Research Center for the Recording and Study of Bird Song), "La Malière," 83-Collobrieres (Var), France. Two sets in one cloth-bound box, plastic and paper sleeves. 180 ff ($34.20).—As they are not available through normal commercial sources, these records undoubtedly are unfamiliar to most American ornithologists. Forthcoming recording plans of ECHO call for an edition of discs treating the birds of northern Europe (20 discs, 150 species, 50 pages of text), from 1968–70. Previously (1965–66) vol. 1, "Birds of France" (Subtitle "Birds of western Europe") consisting of 27 discs and 256 species was issued.

ECHO's main purpose is to make available to scientists and interested laymen a recorded catalogue of the voices of birds of the European continent and selected adjacent geographic regions. A few species will be omitted from discs if the birds are normally silent and show little use of calls or songs in their lives. In this regard the author mentions such birds as the Bald Ibis (*Threskiornis aethiopicus*) and the Cream-colored Courser (*Cursorius cursor*). Other purposes of the institute are to accumulate a world sound library of birds, to conduct studies of behavior and language of birds, as well as to conduct musicological studies.

For the bioacoustician and field ornithologist, ECHO's project of recording is one of the most significant ever undertaken toward furthering the study of the voices of birds in relationship to their evolution, systematics, and ecology. The recordings are generally fine; an average of about 2 minutes of recording time is devoted to each species, and the text of the booklets accompanying the sets has been compiled with a view to including as much information as possible about the time and place of recording, the bird's behavior in relation to the sounds being uttered, the stage of its breeding cycle, its distribution, and other relevant scientific data that direct attention to the scientific significance of the vocalizations, also details on itineraries of the recordists and recording data. The booklet with the African recordings gives information on distribution of species within climatic zones, including the littoral zone, the Atlas Mountains, the Hauts Plateaus, and the desert, also on precipitation, ecological associations, range extensions and annual variations, and a summary of the expeditions. Each booklet also contains an annotated list by disc and side, of the species to be heard thereon, with scientific names and common names. The Latin nomenclature follows with occasional exceptions that of C. Vaurie (The birds of the Palearctic fauna, London, H. F. & G. Witherby Ltd., 1959, 1965).

As with all field recordings, some variation in the amount of uncontrollable environmental sounds is to be heard on all 13 discs, but with almost no exceptions, these are excellent recordings of the species in question, regardless of other sounds present. Roché has carefully chosen good examples of each species, and he has also devoted effort to exploring each form's vocabulary and its function. Profitable discussion is included of regional variation, dialects, associated displays, species' relationships, and other biologically useful and stimulating data. Many of the recordings are "firsts" and a few are of species so rare in Europe as to be considered in other works as casual or accidental in the region (although in each of these cases Roché points out that the recordings actually were of individuals in the defined area). These include recordings of *Emberiza cineracea* (Island of Mytilini, Greece) and *Falco eleonorae* (Crete) obtained by Susan Taylor. The biologist interested in comparing voices of closely related species will be interested to know that no less than 9 species (!) of *Oenanthe* are carefully treated as well as 8 species of *Sylvia*, and 4 species of *Pterocles*. Gull ethologists will find good recordings of *Larus melanocephalas*, *L. audouinii* (very unusual), and *L. genei*.

No attempt is made to maintain exact systematic order, doubtless in consideration of space and disc length, but closely related forms are always grouped and a general phylogenetic scheme is adhered to. For biologists not directly interested in the biology of these sounds, but having a general interest in bird voices, some intriguingly unusual and even bizarre voices are to be heard, although not nearly so many as might be heard on a disc covering neotropical forest birds, for example. Among the more unusual is the voice of the Trumpeter Bullfinch (*Rodopechys githaginea zedlitzi*) with a sound like a tiny multivoice auto-horn or trumpet, and the pure strained whistling of the Hoopoe Lark (*Alaemon a. alaudipes*).

Some criticism of these productions is I think justifiable and might be constructive for the future releases. First I believe most American listeners would prefer to have these recordings on 12-inch discs, that would take advantage more fully of long-play record size and speed. This is especially true as the 7-inch discs were rather obviously not prepared to be used conveniently on an automatic record changer. The outside spiral edge of each is narrow and slopes at its outer edge. This is the space that must accept the stylus, whether it be set down manually or automatically. I found that care must be taken with some tone arms to get the stylus to begin tracking. Secondly in

most of the 13 discs on southern Europe, the recording continues so close to the center of the record that any turntable equipped with an automatic shutoff mechanism or one that lifts the arm when it nears the end of the disc will consistently shut off or make a disc change before completion of the recorded material. These technical faults can be circumvented by use of a completely manual turntable and by close attention of the listener to record cueing and removal of tone arm at the close of the disc.

The sound and surface of the records are very good and little technical criticism of the production can otherwise be made. Misspellings and awkward sentence constructions always arise in language translations, and the booklets have their share of them. I could ask from the biologist's point of view that list of species should be grouped under family names somewhere in the descriptive matter for easier reference.

In summary, however, these recorded sound guides surpass in scientific accuracy, completeness, and potential usefulness anything so far made available in bird phonograph records.—JOHN WILLIAM HARDY.

Research on the ecology of the birds of Central and East Nepal.—Gerd Diesselhorst. 1968. *In* Khumbu Himal (Research Scheme Nepal Himalaya, organized by Prof. Walter Hellmich, Zoological Staatssammlung, Munich). Innsbruck, Munchen, Universitätsverlag Wagner Ges. M. B. H. 420 pp., 40 black and white photos, map slipped in. No price given.—This is a major work, in German, on the birds of the Himalayas. Nepal occupies a central position in the main axis of these mountains and provides a highly useful environment against which to set in focus the increasingly arid conditions to the west and the moist areas to the east. Dr. Diesselhorst has performed a comprehensive task in weaving together various pieces of evidence on climate, forest zones, and glaciation (or lack of it), as a background for information on altitudinal distribution, population distribution, breeding seasons. molts, and migrations derived from his specimen collection made in a 9-month stay in the country. The text covers nearly 400 species. Particularly valuable to me are his observations on the relatively impoverished alpine fauna.

Present evidence confirms earlier speculation and partial evidence that the Himalayas were not heavily glaciated during the Pleistocene and that the forest zone was not lowered more than perhaps 1,000 meters below the present level. At this rate the Himalayas could well have served as a refugium for certain alpine species during glacial maxima. It is curious that Diesselhorst's endemic "Himalayan" fauna (= "Palaearctic relicts," my own term, "Synopsis birds India and Pakistan," 1961, p. xxiii), is relatively limited in number of species, and frequently in population size of species. As he says: "Large parts of the country, in spite of favorable ecologic conditions, seemed to shelter no more birds than monotonous Scandanavian or alpine forests. Supply of food, nesting places, and other possible critical factors in these areas seem to be adequate or even abundant."

Diesselhorst's experience in viewing birds of the forest fauna parallels my own recollections of work in Nepal, where at midmontane altitudes patches of forest are severely limited and sometimes shrinking as one watches. Although Nepal has regulations against cutting large forest trees, nothing prevents the removal of individual branches. Thus forest patches on the outskirts of villages resemble lines of fearfully wounded walking people, holding up stumps of arms against the sky. The result is eventual death for each tree, with a constant and gradual attrition creeping into forest remnants. In this biotype small flocks of forest birds may be seen "on the run"

as it were, moving from patch to patch with great speed as if their lives depended on it, which perhaps they do. The impression is like that of the sheep in certain substandard grazing areas that are said to have to keep on the run in order to get enough to eat. However, Diesselhorst points out (pp. 84–85) that the anomaly of certain populations, his failure to come across them, or the evident rarity postulated by his observations of them, was not explained by any evidence he could discover. Certain species appear to be rare for other and unexplained reasons than availability of habitat or food supply. In the case of only a few species, such as *Phylloscopus trochiloides* or *Parus rubidiventris*, were there large and seeemingly prosperous populations in the subalpine zone, which seemed reminiscent of the situation in the arctic. Obviously work on montane alpine or subalpine populations of birds in an area such as the Himalayas might be very rewarding to a student of density-dependent phenomena in population studies.

The author's notes on migration and molt are very useful, particularly those of migrating species the study party encountered at high altitudes. Some of the observations on the fringillid species of the montane zone of the Himalayas are reminiscent of those of Ernst Schäfer's (1938) Tibetan account and are more comprehensive than any others I have read. Certain species of *Leucosticte* and *Carpodacus* in the high humid areas of the Himalayas are far too little known, and their life histories deserve careful comparison with those of arctic breeding species, or species breeding in the more xeric areas of northern Eurasia.

The photographic plates, all views of scenery, add greatly to the value of the book. A particularly striking panaromic photograph of the main sweep of the valleys leading up to Mount Everest (pp. 40–41), shows graphically the denudation of the hills at mid-elevations. This work will remain a most valuable compilation on the birds of the central Himalayan zone for many years.—S. Dillon Ripley.

Radar ornithology.—Eric Eastwood. 1967. London, Methuen & Co. 278 pp., 24 black and white pls., 116 text figs., 6¼ × 9½ in. $11.25.—It is fascinating for any ornithologist to sit in front of a radar screen and watch the appearance and movement of thousands of small dots of light that represent the echoes from migrating birds on a night favorable for migration. Immediately the old questions of why do they migrate or how do they find their heading come to mind. It is obvious that radar provides an excellent new method for the study of bird migration and bird flight in general. Radar ornithology is a young branch of science that deserves special attention by the ornithologists, and Eric Eastwood's book is an excellent introduction to it. Written by a competent radar engineer who is an ornithologist as well, it emphasizes the technical aspect and is therefore of great help to ornithologists like myself who are interested in radar studies but have received no special training in radar engineering. Eastwood first explains the principles of radar, the different kinds of equipment currently used, and the various ways in which radar information can be displayed. The author has a remarkable ability to explain complex physical phenomena in clear, simple terms, and a large number of diagrams facilitate the understanding.

Between the technical considerations, an interesting section is inserted on the history of the detection of bird echoes on radar during World War II. The long way from detection of echoes of unknown origin, referred to as "angels," to their identification as echoes from birds and insects is described. In the more ornithological part of the book the literature on radar patterns of bird migration in Europe and North America is reviewed and the flight behavior of migrants is discussed. Personally I think that the problem of orientation should have been treated more extensively. A special

chapter is devoted to the so called "ring angels" produced by birds dispersing from a roost. The methods for measuring altitudes of migratory flights and counting birds by radar are thoroughly discussed and the relevant literature is reviewed. The last chapter depicts the future of radar in ornithological research; it becomes clear that radar will be a powerful tool in studies of bird flight and migration, and that we have only started to exploit its ample possibilities.

The book appeals not only because of the text but also because it is carefully illustrated and the plates show a collection of remarkably clear radar pictures.—WALTER GEHRING.

Penguins.—John Sparks and Tony Soper. 1967. New York, Taplinger Pub. Co. 263 pp., 33 black and white photos, numerous drawings in text by Robert Gillmor. 6 × 8½ in. $8.95.—For many years the only available information on antarctic animals came from explorers, sealers and whalers, and a few organized scientific expeditions such as the ones led by James Cook in 1768 and 1772. Now several countries maintain permanent research stations in the Antarctic and there has recently been a great increase in information about the animals that live there. Probably no vertebrate and certainly no group of birds has been better studied in that part of the world than the penguins.

In their book Sparks and Soper have taken advantage of the great wealth of information now available on penguins and have formed much of it into an interesting and pleasing narrative about the life of penguins and the history of their association with man. There are chapters on physical characteristics, reproduction, behavior, food habits, predators, evolutionary history, and discovery and exploitation by man. There are also rather crude full-page illustrations of 17 "species" with accompanying notes.

This book has been written for a general audience but it is not biologically superficial. The penguin is presented as a bird beautifully adapted for life in an unusual environment and not as some freakish natural wonder. Whenever reasonable the characteristics of penguins are used to illustrate broad biological principles. The authors have drawn from a wide variety of sources, often to good effect. This is best seen in their discussion of penguin distribution as it is related to food supply and the currents of the southern oceans, and of the history of the association between this bird and man. Their sources of information are listed but they do not cite them systematically in the text. This reduces the value of the book as a reference, but it is still entirely suitable as a source for anyone to begin learning about penguins.—M. L. MORTON.

A field guide to the birds of New Zealand and outlying islands.—R. A. Falla, R. B. Sibson, and E. G. Turbott. 1967. Boston, Houghton Mifflin. 254 pp., 6 col. pls., 12 black and white pls. and numerous line drawings by Chloe Talbot-Kelly, 4¾ × 7½ inches. $6.95.—This field guide is so closely patterned after the familiar Peterson style that it may best be described in terms of its departures from that style. Color plates are disappointingly few. They depict: Penguin heads, parrots and kingfisher, eight species of ducks, a pigeon and seven species of native songbirds, eight other passerines and two cuckoos, and nine introduced songbirds (eight of which have been figured more expertly by Peterson in his European or Western guides).

The black and white plates, which did not suffer from reproduction as did the color plates, show two pages of flying albatrosses, three pages of heads of procellariids, two pages of shags (with identification lacking for one bird), and one page

each of herons, plover heads, waders, gulls, and terns. The 18 plates include a total of 128 species, of which 40 are represented only by heads. Line drawings depict an additional 45 species, but more than 100 other species are not illustrated. Some of the procellariids, of course, cannot be identified in the field, but it is regrettable that not one of the six prions is figured.

About 60 of the 275 species treated are A.O.U. Check-List birds, but some of the nomenclature (scientific names and especially common names) is sufficiently different to be confusing to Americans. Some of the A.O.U. species carry A.O.U. common names in parentheses, but a third of them do not.

Species accounts tend to be longer than those in the Peterson guides. This is partly because many species are not figured, and partly because of a greater emphasis on habitat, local range, voice (including song season), descriptions of nests and eggs, and the inclusion of incubation and fledging periods and number of clutches.

This book is an essential pocket companion of any naturalist traveling in New Zealand or through the waters of the Southwest Pacific south of the Tropic of Capricorn. The American field observer will also benefit from studying the descriptions and habits of many of the sea birds and waders, as there are identification aids here that cannot be found in any North American reference book.—CHANDLER S. ROBBINS.

Sportsman's guide to the Argentine game-birds (Guia del cazador de las aves de caza argentinas.—Claes Chr. Olrog. 1968. Buenos Aires, Argentina. Guillermo Kraft Ltd. Pages unnumbered (2 pp. introduction, 20 color plates with facing pages of text). Paper. 700 Argentine pesos or $2.00 U.S. Available from Mrs. C. C. Olrog, Lamadrid 1248, S. M. de Tucumán, Argentina.—The apparently tireless Dr. Olrog has produced a booklet that deserves wide distribution in Argentina and adjacent South American countries. It includes information on 15 tinamous, 36 waterfowl, 8 galliform birds, 9 shore birds, 4 seedsnipe, and 12 pigeons and doves. Each species is figured in color (both sexes of dimorphic species) and has a short paragraph of text. The introduction is printed in parallel Spanish and English columns, and the individual species accounts are also presented bilingually. The only difference between the Spanish and English versions is in the information on distribution, given only in the Spanish paragraph, but readily understandable to readers with little or no Spanish.

The emphasis throughout is on conservation and good sportsmanship. In his introduction, Dr. Olrog reminds his Argentine readers that grebes, cormorants, herons, coots, lapwings, parakeets, and "chimangos" [= *Milvago chimango*, a common small caracara] are not game birds. He recommends that "the modern and civilized sportsman ought to respect the Rhea as a historical ornament of the Argentine nature, leaving it completely at peace." He is frank in assessing the sporting qualities of game bird species, recommending some, but pointing out which are poor in flavor, or too tame or too scarce to be hunted by the discerning sportsman.

Those familiar with Dr. Olrog's "Las aves argentinas" (1959) will know that he does not, as an artist, pretend to compete with Sutton, Eckelberry, Clem, et al. The vignettes of each species in this "Sportsman's guide," however, will undoubtedly help in field identification, as do the drawings in the earlier book. The newer illustrations differ in the inclusion of a bit of background; it is amazing how well Dr. Olrog has succeeded in capturing the "feel" of the typical habitat of each species with a few strokes of his brush.—KENNETH C. PARKES.

Fuglene på Grønland (The birds of Greenland).—Finn Salomonsen. 1967. Copenhagen, Rhodos. 340 pp., 59 col. pls., 24 maps. (In Danish.) No price given.—This book places special emphasis on the problems of accidentals and bird-banding. Greenland is the only arctic region where birds have been banded consistently, and most of the material derives from the results of these activities during the past 20 years. About 100,000 banded birds have yielded 6,700 recoveries, some 6,000 of them from within Greenland's own borders. The information gained is proving to be an important aid in formulating hunting laws in a land where none hitherto existed, but which now must perforce be introduced, "for destiny knocks at the door also in these virgin areas, whose still world of beauty is threatened by man's insatiable expansion."

The annotated list covers 209 species. Possibly nowhere else are representatives of the Old and the New World avifauna so extensively intermixed. Thus 21 parulids are listed, among which the Yellow-breasted Chat (*Icteria virens virens*) is recorded three times; except for the Yellow-bellied Sapsucker (*Sphyrapicus varius varius*) found four times, none of the woodpeckers from either hemisphere has been recorded in this treeless land. The Snow Bunting (*Plectrophenax nivalis nivalis*), circumpolar in distribution, is Greenland's most common bird and found even on the bleak north coast. Extensive coverage is given many species for which banding has furnished new knowledge on movements and migration routes. For example the Brünnich's Murres (*Uria lomvia*) breeding in the Canadian arctic winter on the southwest coast of Greenland, whereas those breeding on Greenland's northwest coast winter around Newfoundland; the murres wintering on Greenland's southwest coast, however, come from places as distant as Spitsbergen, Novaja Zemlja, and the Kola Peninsula. The slaughter of the birds, which involves staggering figures, provides most of the recovery data. Much of the killing is carried out on the breeding grounds and causes wasteful destruction of abandoned chicks by starvation. Only speedily enacted adequate hunting laws can prevent the extinction of these exposed species and, incidentally, grave economic loss to the inhabitants.

With its wealth of important information, not only with reference to ornithology, but bearing also on conservation and the economy of arctic regions, a book of this kind and quality ought to be translated into other languages to gain deserved distribution.—Louise De K. Lawrence.

The Atlantic salmon/a vanishing species?—Anthony Netboy. 1968. Boston, Houghton Mifflin Co. 457 pp., 41 photos, 32 maps, charts, and drawings, 24 tables. $6.95.—When the editor unpacked the review copy of this book the publisher sent him he said, "Hmff," and put it on my desk. He was, I believe, wondering just as I was if some salmon had suddenly grown feathers and were vanishing into the bright blue yonder on wings, or had a Houghton Mifflin computer spewed out an ornithological mailing list when asked for an ichthyological one? I looked at "The Atlantic salmon" doubtfully, and then because an unread book on a natural history subject is overwhelming temptation, I read it.

I am not a technical or competent judge of a fish story, but this seems to me to be a very fine book. I have learned about Atlantic salmon from the days of cave dwellers to the convention signed by the Baltic nations in 1966. On page 35 I read about birds and salmon. "The Canadian biologist H. C. White in 1957 reported that of some 1,200 mergansers shot in a duck-control experiment on the Miramichi River, 86 per cent had been feasting on salmon at a rate mounting to 1,900,000 parr annually!" Trapping and drowning Belted Kingfishers on the Pollett River in New Brunswick

was another activity commended on page 35. Other birds singled out as salmon predators are cormorants, herons, shore birds, and gulls.

I heartily disapprove of killing birds to protect salmon, a practice bound to create an ecological unbalance. The governments of Canada and the United States spend millions of tax dollars to protect birds with one hand and with the other send biologists out to destroy them. It does not make sense. It is high time some organization whose right hand knows what its left hand is doing puts a stop to killing birds who are doing nothing worse than eating the food that their ancestors ate before man arrived on the scene.—ELIZABETH S. AUSTIN.

ALSO RECEIVED

Field book of wild birds and their music.—F. Schuyler Mathews. 1967. New York, Dover Publications, Inc. 325 pp., 70 pls., numerous text figs., 6 maps. Paper binding. 5½ × 8½ in. $2.75.—This is a reprint of the 1921 edition of Mathews' now classic work, with the single alteration that all plates are in black and white. The book is now mainly of historical interest, written with a nonbiological slant, in a highly anthropomorphic style, and restricted largely to treatment of bird vocalizations having "musical" character, by musical notation. Modern high fidelity phonograph recordings of birds with careful annotation largely replace this quaint work and others of its type for practical, esthetic, and scientific purposes. Donald Borror provides a gentle foreword.—J. W. H.

Birds of Hawaii.—George C. Munro. 1966. Rutland, Vermont and Tokyo, Japan, Charles E. Tuttle Co., Inc. 192 pp., 20 col. pls., numerous black and white photos, 9¼ × 6 in. $5.00.—Originally published in 1944 (and reviewed by Amadon, Auk, 51: 658, 1944), the present printing is slightly revised by the author, who has added a list of nomenclatural changes since 1944 and has replaced "certain illustrations." This is still a valuable general account of birds of the archipelago, including as it does notes on first-hand observations of even rare endemics. It is *not* a field guide. —J. W. H.

Curious naturalists.—Niko Tinbergen. 1968 (originally published 1958). Garden City, New York, Natural History Library, Doubleday & Co., Inc. 301 pp., 27 figs., 54 black and white photos, 4½ × 7 in. Paper. $1.75.—Addressed primarily to the lay naturalist and the beginning student of animal behavior, this attractively written little book sets forth in amiable style the essentials of some of the important ethological investigations by the author, his colleagues, and students. About half the book deals with birds, including Tinbergen's studies of gulls, snow buntings, eiders, jays, swifts, and hobby falcons. A biologist with budding interests in behavior should be stimulated by the enthusiasm and feeling of Tinbergen for his subject. The closing chapter offers a defense, if one need be given, for continuing the ethological approaches in behavioral studies.—J. W. H.

New Mexico birds and where to find them.—J. Stokley Ligon. 1961. Albuquerque, Univ. New Mexico Press, in cooperation with the New Mexico Dept. of Fish and Game. 360 pp., 34 col. pls. (149 different birds in color, 139 in black and white drawings and photos), 6¾ × 9¾ in. $8.50 (cloth), $4.95 (paper).—Reprinted 1968. See review by Gould (*Auk*, 79: 490, 1962).—J. W. H.