REVIEWS

EDITED BY JOHN WILLIAM HARDY

Studies of bird hazards to aircraft.—V. E. F. Solman (Ed.). 1971. Canadian Wildlife Serv. Rept. Ser., No. 14. Available from Information Canada, Ottawa 1971, Cat. No. R65-8/14. 105 pp. Paper. $1.25.—Canada is probably the world leader in strong programs designed to study the problem of bird-aircraft collisions. In 1963 the National Research Council of Canada founded the Associate Committee on Bird Hazards to Aircraft, and since 1965 the committee has sponsored diverse research aimed at reducing the hazards that bird movements pose to aviation. This report documents the type and quality of the research being conducted. It contains seven papers concerned with the general nature of the habitat management techniques found useful in reducing bird hazards at airports, the radar techniques used to gather data for experiments in forecasting bird hazards aloft, and details of some types of bird movements revealed by radar.

The first paper entitled "Bird control and air safety" by V. E. F. Solman gives a brief history of the bird hazards problem, discusses some effective solutions, and makes projections for the future. The solutions seem effective (e.g., Air Canada's cost of repairing bird-strike damages declined by nearly 80 percent in a 10-year period from 1958 to 1969). W. W. H. Gunn and V. E. F. Solman contribute the second paper which appeared in slightly different form in "The problem of birds as pest" published by Academic Press in 1967. The paper outlines an early warning system to alert aircraft in flight to hazardous bird migrations. The system would utilize an extensive network of ground-based surveillance radars and a roster of biologists, organized in the same manner as duty meteorological forecasters. Forecasts would be issued every 6 hours and updated every 3 hours. The system hardly seems practical, but if established it would certainly inject new life into the sagging job market in the biological sciences.

Two papers in the report concern goose migrations. The first by M. T. Myres and S. R. Cannings is based on radar and direct visual observations and deals with Canada Goose movements in spring in British Columbia. The paper presents interesting data on the influence of weather on the quantity of migration and the height of movements over different topographical features. The finding that Canada Geese fly over the mountains of southern British Columbia at altitudes up to 15,000 feet should be of particular concern to aviation interests in the area. The second goose migration paper is by J. M. Speirs, J. J. C. Kanitz, and J. Novack. It pertains to the numbers, speeds, and directions of migrating geese from analysis of radar displays on 3 October 1965 at Fort William, Ontario. The authors present circumstantial but convincing evidence in support of their identification of the radar echoes as Blue, Snow, and Canada Geese. They found that the geese generally compensated for wind drift to a considerable extent, but some wind drift was suggested by a gradual change in direction as wind velocity slackened. Their data actually show that the spread in the average flight directions (tracks) exceeded the spread in computed headings of the birds, and this is usually interpreted as evidence that the birds are maintaining a preferred heading and are being drifted by the wind. Without sufficient knowledge of the intended destination of the flights neither stand is justifiable.

The longest (nearly ⅓ of the length of the report) and one of the most interesting papers is by W. John Richardson and W. W. H. Gunn. It is a radar view of migration from one site in east central Alberta and includes an analysis of correlation between migration volume and weather and the effects of wind direction on migration direction.

Their findings support the ideas about relationships between weather pressure patterns and intensity of migration. They find that birds respond primarily to wind direction and (at least for spring northwest movements) humidity. Pressure trends, temperature, wind speed, and cloud cover are not major cues used in the system that determines whether or not a bird flies on a given night. Although the data they present in the paper appear sound, the reader should exercise caution when reviewing their results. The Cold Lake radar that they used has circuits, for example, a moving target indicator (MTI) and a sensitivity time control (STC) circuit, that reduce the number of bird echoes registered. Because birds were rarely visible on the radar screen within a 30 nautical mile range, the authors were undoubtedly missing low-level migration, and their results are probably biased in favor of higher flying birds. Furthermore, all weather data, even wind direction and speed, were those recorded at ground level.

Two papers are contributed by Hans Blokpoel. One describes the use of the M33C (3-cm) tracking radar as a means of determining height distribution of night migrants and of estimating their numbers. The second presents preliminary results obtained with the radar on 15 nights during the fall of 1968 near Cold Lake, Alberta. The radar's ability to detect birds was determined by pointing the antenna to the moon and simultaneously moonwatching, and by tracking dead birds suspended from a balloon. The migration traffic rate (i.e. the number of birds crossing a mile of front per hour) computed from M33C data showed a crude but clear correlation with the densities of migration obtained from films of the scope of a surveillance radar (Richardson's and Gunn's?) near Cold Lake. Blokpoel found that on the six nights with heavy migration there was no consistent shift in the height distribution of migrants during the night. Cloud cover and wind direction were probably the main factors that influenced the height distribution. For the first 1,200 feet of altitude the radar was ineffective but was able to detect single small passerines flying across the center of the beam at altitudes up to 15,000 feet. Thus an undetermined number of birds below 1,200 feet were missed. Of the migrants detected, 50 percent were on the average below 3,500 feet and 90 percent below 5,000 feet. The ineffective range of the radar increased considerably at azimuths other than the one used for routine observation (180° or S, 87.7° elevation), but Blokpoel failed to mention this as a contributing factor in the discrepancy between radar and moon-watching data.

The format of the report is attractive, but a great amount of page space is wasted throughout. The numerous graphs and photographs are printed clearly, and I noted no typographical errors. The Canadian Wildlife Service should be congratulated for publishing such a work for such a price.—SIDNEY A. GAUTHREAUX, JR.

Structure and spectral reflectance of green and blue feathers of the Rose-faced Lovebird (*Agapornis roseicollis*).—J. Dyke. 1971. Biologiske Skrifter, 18: 1–67. **Structure and colour-production of the blue barbs of *Agapornis roseicollis* and *Cotinga maynana*.**—J. Dyke. 1971. Z. Zellforsch., 115: 17–29.—Both these papers, which essentially appeared simultaneously, report Dyke's rather extensive and stimulating work on the mechanism of noniridescent blue and green colors of feathers. It is justifiable that they be considered together as they represent a landmark in the application of modern techniques to a traditional problem. The techniques include transmission and scanning electron microscopy, microreflectance spectrometry as well as light and fluorescence microscopy combined with chemical studies. The work is important for both its technical and theoretical considerations.

The main contribution of these two papers is the presentation of a new model for the production of color based on the structure of the feather keratin itself. The evidence is from diverse sources and is discussed below. Rather than the generally accepted mechanism of Tyndall (Rayleigh) scattering for the production of blue schematochromes, Dyke suggests that an interference mechanism is involved. While he was not unique in taking this position (Raman, Proc. Indian Acad. Sci. Sect A1: 1–7, 1935, also suggested it on much less convincing evidence), he has presented a most thorough case. Using microspectrometric methods combined with a refined morphological study of feather parts, he shows that the production of color in barbs is not compatible with that predicted by Rayleigh optics. The evidence is impressive and Dyke goes to rather extensive lengths to present all possible interpretations of the data. As support for his position Dyke cites differences in dimension and shape of the internal keratin structure, shifts in maximum wavelength of reflectance spectra, observed colors as a function of the angle of incidence light, and color changes relative to the refractive index of feathers in liquids. One important observation was that the equations describing Rayleigh scattering assume spheres of uniform size, where the actual keratin structural elements appear as hollow rods and channels. Dyke then presents a model based on back-scattering from a substrate consisting of keratin cylinders with air-filled cores. This basically produces an interference phenomenon even though the iridescence normally associated with this process was absent. The reason for this resides in the relative random organization of melanin granules.

The feathers considered in the main study were the green belly and back feathers and the blue rump feathers of *Agapornis roseicollis*. The detailed descriptions include information on overall reflectance spectra, color, and menstral data on individual barbs and barbules, and detailed menstral and microscopic analysis of cross and transverse sections of these elements. One important conclusion was that in the intact plumage only the intensely colored terminal portions of the barbs are exposed and these contribute to the visual effects of the plumage.

Blue and green barbs differed in a variety of ways. Green barbs had a yellow pigmented cortex, denser spongy structure, and different reflectance spectra than the corresponding blue barb. This implies that green barbs are more than simply blue schematochromes with a yellow pigment added. The two yellow pigments, one fluorescent and one not, are not identified, but are characterized crudely. The pigments were examined both *in situ* and extracted in solution. There were some discrepancies in the data, in that the observed spectrum in solution did not contain the peaks theoretically present. However the general resemblance between theoretical and observed transmittance of pigment *in situ* are impressive enough to accept Dyke's explanation. Studies that attempt to relate pigment spectra *in situ* and in solution are difficult to perform and to interpret because of the large contribution of feather structure to the longer wavelength portions of the spectra (Brush and Johnson, in press). Dyke is aware of these problems and adroitly uses cross-sectional differences in the barbules to account for part of the difference in the reflectance spectra.

The feathers differ morphologically in the increased barb and reduced barbule size in blue feathers. The unpigmented glossy barbules in blue feathers are smaller and more oval than corresponding green pigmented ones. The cross-sectional profile of the barbules is such that scattering is increased in the blue feather relative to the green barbules. An important role of the barbules is their ability to modify the lightness in green plumage.

Dyke's interpretation of the role of melanins is controversial. He documents

carefully the location and arrangement of the granules, their shape, and internal consistency. The spatial organization, especially the distribution of melanins in the barbules, is noted and is not so complex as that in iridescent forms (Rutscke, Z. Zellforsch., 73: 432, 1966; Durrer and Villger, Z. Zellorsch., 109: 407, 1970). Dyke submits "the role of medullary melanin pigmentation to be absorption of light coming from an *upward* direction through the barb, i.e., light reflected from underlying feathers rather than absorption of transmitted red light coming in a downward direction through the barb." The distribution of the melanin granules supports the hypothesis but the evidence given is hardly overwhelming. It should be possible to observe spectral shifts that indicate the most effective direction for absorption by the melanins.

The major premise of these two papers was that the nature of the spongy substance in the medullary area of the feather was responsible for the difference in the observed reflectance spectrum and therefore for the visible color. This conclusion is based on elegant transmission and scanning electron microscopic work coupled with microreflectance spectrophotometry. One should take the opportunity to study the micrographs carefully. Based on these pictures Dyke developed a model involving an irregular three-dimensional network of connected, hollow keratin rods. The difference in the rod thickness to channel width ratio is thought to account for the difference in reflectance spectra of blue and green feathers. By a series of careful reasoned theses Dyke rejects the possibility that the blue color is produced by Tyndall (or more correctly Rayleigh) scattering. Especially convincing are the discrepancies between the theoretical and actual reflectance spectra. In addition to the spectral analysis and microscopical analysis, Dyke emphasizes the role the morphology of the barbules plays in color modification.

One must admire Dyke's work and fluency in English; the few flaws in the longer paper may be editorial. There are, however, occasional dogmatic statements interspersed with his open honesty. Dyke is well aware of, and discusses openly, the data that do not fit his hypothesis. His literature search is impeccable, but one might desire references to some peripheral, but not insignificant, studies related to this work. I consider the work a major contribution, despite some internal inconsistencies. It is recommended reading for anyone interested in the morphology of feathers, feather microstructure, color production, and perception.—ALAN H. BRUSH.

Families of birds.—Oliver L. Austin, Jr. 1971. New York, Golden Press. 200 pp., illus. in col. by Arthur Singer, 6 × 4⅛ in. Paper. $1.95.—The stated intent of the author is to provide thumbnail sketches of avian families and orders for those interested in and desiring more knowledge of birds. The book divides 8,700 living and 900 fossil bird species into 208 families (36 being extinct) and 34 orders (5 extinct), plus 3 subclasses (2 extinct). The classification is largely based on Wetmore and Brodkorb, but here and there one sees the influence of others. For most orders there are brief resumes of the number of families, overall ranges, general description, and comments on behavior. Family profiles include the number of species and general range, with other details under "characteristics" and "habits." Each family is illustrated in color with one or more figures, and for some families there are additional black-and-white drawings. Extinct forms are generally treated in less detail, with illustrations featuring line drawings and/or silhouettes only. Additional material includes a zoogeographic map of the world, a diagram of the fossil record of certain orders, the topography of a bird, separate family trees of nonpasserines and of passerines, and a very short glossary.

In general the taxonomic treatment in the work is conservative and will be an extension of that which the average reader has seen in field guides and other popular works. There are a number of changes (mainly with precedents in the older literature), but most of these can be followed by amateurs without undue confusion. Changes include the placement in their own orders of flamingos (Phoenicopteriformes) and hummingbirds (Trochiliformes), while touracos (Musophagiformes) are merged with the Cuculiformes. Several families are split, including Brachypteraciidae from Coraciidae, Climacteridae from Certhiidae, Chamaeidae and Panuridae from Timaliidae, Polioptilidae and Maluridae from Sylviidae, Pachycephalidae from Muscicapidae, and Carduelidae and Estrildidae from Fringillidae. Merged are Cochlearidae into Ardeidae, Jyngidae into Picidae, Conopophagidae into Tyrannidae and Formicariidae, Neosittidae into Sittidae, and Hypositidae into Vangidae. Notable shifts are placing the Trochiliformes between Piciformes and Passeriformes, Callaeidae between Corvidae and Grallinidae, Campephagidae between Timaliidae and Pycnonotidae, Zeledonidae between Parulidae and Icteridae, and in the early nonpasserine sequence (tinamou-ratite-penguin section).

While some of the above differences may confuse amateurs, more apt to do so are nomenclatural changes that depart from the "standard" literature. These include use of Oceanitidae for Hydrobatidae, Plataleidae for Threskiornithidae, Vulturidae for Cathartidae, and (for Malagasians) Mesitornithidae for Mesoenatidae. To these may be added *Erithacus* (instead of *Luscinia* or *Cyanosylvia*) *svecica* on p. 160, and *Dendroica* (instead of *Vermivora*) *chrysoptera* on p. 185. Such changes in names do little to help beginners understand the workings of science, and may interfere with their grasp of more important lessons. Also possibly confusing is the trinomial on p. 133 (i.e. *Pitta sordida cucullata*), as the concept of subspecies is not otherwise alluded to and all other names are bi- or mononomial.

In general the accounts of orders and families are satisfactory, although their required terseness contributes to over-simplification in many instances. Even remembering the audience for which the book is intended, I found no shortage of minutiae over which to quibble, plus several misstatements of fact. Examples of the latter (given as they should read): p. 22, Eared Grebe breeds south to Colombia; p. 66, there are only two (or one) New World jaçanas; p. 93, some owls are invertebrate feeders and several are highly migratory; p. 96, *Chlordeiles minor* breeds in the West Indies and Central America; p. 99, various palm-nesting swifts alight on branches; p. 100, colies (Coliidae) are said to have a reversible hind toe, but the drawing shows it to be the outer toe that is reversible; p. 128, the Rose-throated Becard is a migratory cotinga (in the north); p. 148, Paridae range to the Philippines; p. 162, the Nightingale is a thrush; p. 178, sunbirds occur in the lower Nile Valley. Admittedly, for the average reader such criticisms may be of little interest or importance, but misinformation is still misinformation. The book could be improved by more attention to detail, and even the substitution of a few more "weasel words" (e.g. "some," "rather," "often") would help.

As in any work there are spelling and related errors, including the following: 13, Hesperornithoformes = Hesperornithiformes; p. 14, *cinnamomius* = *cinnamomeus*; p. 34 (and p. 197), *Ajaja* = *Ajaia*; p. 46, Elaaiinae = Elaninae; p. 69, *domenica* = *dominica*; Charadiidae = Charadriidae; p. 76, *Allagis* = *attagis*; p. 82, Rhynchopidae = Rynchopidae; p. 88, *hyacinthus* = *hyacinthinus*; p. 94, *carioensis* = *caripensis*; p. 104, *Memotidae* = *Momotidae*; p. 129, *Atilla* = *Attila*. The hyphens should be removed from *novae-hollandiae* (p. 18) and *nigro-cinctus* (p. 188), and *ruppelli* (p. 162) has an umlaut and should be rendered *rueppelli* according to present rules. The latter appears in a caption which should be reversed

with that above it, i.e. *Lusciniola melanopogon*. The captions on p. 105 also are reversed, and *Merops persicus* is a race of *Merops superciliosus*. On p. 42–43, the captions of 2 and 3 are confused, the scientific name and range of 2 actually belonging with 3, while the range of 3 and the name *Olor columbianus* go with 2 (but is "Whistling Swan" appropriate for circumpolar populations?).

My overall impression of this book is that it does an acceptable job of introducing to beginners something of avian diversity and classification. I would like to see more incorporation of recent information on classification (e.g. for sandgrouse, hoatzin, Charadriiformes), improvements in the text, and perhaps an expanded glossary. Also appropriate would be a statement to the effect that concepts of relationships are under constant review, as amateurs (and some professionals) are under the impression that classifications should be frozen monoliths, rather than the best guesses of the time.—JOHN P. HUBBARD.

Classification of the ovenbirds (Furnariidae).—Charles Vaurie. 1971. H. F. & G. Witherby Ltd., London, 46 pp. £0.90.—The ovenbirds (Furnariidae), often lumped with the woodhewers (Dendrocolaptidae) as a single family, are with little doubt among the morphologically most diverse of passerine assemblages. Their variation is exceeded only by the taxonomic problems involved that prove confusing to students, especially those involved in nonsystematic studies of species. A new look at the classification of the ovenbirds therefore seems timely. Vaurie has given us just that.

This little 46 page, hardbound (!) volume is the first stage of Vaurie's study of the complex ovenbird assemblage. The "book" begins with a list of the subfamilies, genera, and species the author recognizes and there follows an annotated section that refers to footnotes in the listed classification, where discussion or explanation seems warranted. The major changes are a reduction of the genera to approximately half of those recognized currently, transfer of some from one subfamily to another, wide separation of groups previously placed close together, and combination or deletion of several current subfamilies.

To most ovenbird enthusiasts (including myself) lumping of some genera will be applauded, especially the merging of eight generic names in *Philydor*, although this is done in a somewhat subjective manner. In Vaurie's generic lumping data from external morphology and nesting behavior play an important role. In some of his determinations he considers plumage more important than nesting behavior, but in most cases he considers nesting behavior more important.

While I laud the new classification as a major step towards a complete study of the ovenbirds, its proposals are based almost exclusively on evidence from external morphology, nesting habits, and subjective, intuitive opinions. Therefore, drastic generic transfers may not be accepted until substantive data from anatomical and other characters are engendered to support them. My main criticism of this preliminary revision are enumerated below.

Vaurie's major restructuring comes first in the lumping of the subfamilies Margarornithinae, Philydorinae, and Sclerurinae into the Philydorinae. *Lochmias* and *Sclerurus* are dissociated, with *Lochmias* placed next to *"Margarornis."* Vaurie's *Margarornis* includes also *Premnoplex* and *Premnornis*, a lumping that I accept. However *Margarornis* with its now proximate *Lochmias* is transferred to the Philydorinae, as is *Pygarrhichas*.

The above-mentioned changes all seem unacceptable to me on the basis of the evidence Vaurie presents. First, I cannot see which cranial characters make *Margarornis* a philydorine rather than a synallaxine. I would find it preferable

on the basis of the presently available evidence to retain a subfamily Margarornithinae (as its forms are somewhat distinctive), or to have *Margarornis* (without *Lochmias*) transferred to the Synallaxinae (my intuitive opinion), near the end of the list. Also, lumping Sclerurinae into Philydorinae ignores the very distinctive plumage, behavior, and cranial morphology of *Sclerurus*. The subfamily *Sclerurinae* should be retained until reasonable evidence can be assembled to ally it elsewhere. I can find no cranial or postcranial characters through which to ally it more with the *Philydorinae* than with any other ovenbird subfamily. In addition I can see no way in which *Lochmias* can be considered as being closely related to *Margarornis*. Vaurie states (p. 31) that, "*Lochmias* differs from *Sclerurus* in every morphological character"! Such a statement simply cannot be made about *any* two birds. Recently I examined skulls of *Lochmias* and *Sclerurus* without finding substantial differences. *Lochmias* tunnels a hole in a bank for a nesting site (as does *Sclerurus*, most of the Philydorinae, and most of the Furnariinae), while *Margarornis* builds its nest in moss on the underside of limbs. However, Vaurie claims that the structure of the *Lochmias* nest at the end of the tunnel is like that of *Margarornis*, not of *Sclerurus*. So, to him the shape of the nest at the end of the tunnel is more important than the actual tunneling! In addition, Vaurie allies the two on the basis of breast spotting, an extremely variable character in this family. Lastly, though little is yet known of the systematic position of the very distinctive *Pygarrhichas*, I cannot accept its placement in Philydorinae. It might better be placed in a separate subfamily, or assigned the rank of "*incertae sedis*" so as not to bury an otherwise interesting problem.

In addition to the above, Vaurie gives no consideration to linear sequence within the Furnariidae. For example, his alignment begins with the terrestrial (specialized) Furnariinae, while the Synallaxinae (more generalized) follow. If there is some reason for this it is not mentioned in the text.

Possibly in the future I may adopt some of the generic limits imposed by Vaurie's classification, but for the present I shall continue to use the subfamily and generic sequence advocated by Hellmayr. I feel that we have reached the stage at which drastic generic transfers must be based on truly compelling evidence. For most of these advocated by Vaurie I find no such evidence.—ALAN FEDUCCIA.

Natural history of the King Rail.—Brooke Meanley. 1969. North Amer. Fauna, No. 67. 108 pp. Order from Division of Public Documents, U. S. Government Printing Office, Washington, D. C. $0.60.—In my personal classification of ornithologists there are two main types (although innumerable subtypes), the AW types and the AD types. The former have partially webbed feet while the latter insist on being dry shod. Brooke Meanley, following in the great Nelson and Goldman tradition of U.S. Fish and Wildlife Service biologists, is definitely web-footed. This volume summarizes Meanley's 17 years of studies, and the literature on the King Rail. In 108 pages it ranges from the original description and systematic position through geographic and ecological distribution and migration, detailed morphological description, breeding biology, foods and feeding behavior, development and behavior of captive rails, mortality factors and the King Rail as a game bird and ends up with an appendix on methods for capturing and banding! The sections entitled Ecological Relations and Breeding Biology contain most of Meanley's field data and are illustrated with his excellent photographs of habitat and nesting situations. Of particular interest to this reviewer are the discussions on relationships to the Clapper Rail, including a photograph of an interspecific pair and a mention of (unfortunately without measurements or weights) a population in Delaware with birds showing morphological gradations between the two forms! Sections

on growth of captive young and soft part colors and molt are especially valuable. Few criticisms can be levied. On page 13 one learns that King Rails are the first species to leave the Patuxent area in the fall, the last by late September, but 15 lines beyond a recovery from Patuxent dated 12 December is cited. One wishes the descriptions of plumages and molts, especially of the captive juveniles, were more complete and entirely *de novo*, rather than composed partly of quotations from earlier workers who did not have Meanley's vast experience. In brief, this summary of our knowledge of *Rallus elegans* is an excellent addition to the North American Fauna Series. We now need a comparable study of the salt marsh forms.—ROBERT W. DICKERMAN.

Natural history of the Swainson's Warbler.—Brooke Meanley. 1971. North Amer. Fauna, No. 69. 90 pp. Order from Division of Public Documents, U. S. Government Printing Office, Washington, D. C. $0.50.—This is a fine study of a species that may be as difficult to approach in the field as any songbird of North America. Because I annually attempt to investigate the southern Illinois population, my appreciation of Brooke Meanley's success in obtaining detailed observations on the bird elsewhere is unstinting. His report, based mainly on his own work and publications that go back over 35 years, covers most aspects of the distribution, migration, ecology, and breeding biology of this illusive warbler, omitting from discussion only such recondite considerations as the bird's phylogeny and taxonomic relationships. Surprisingly, Meanley seems not to have employed the recorded male song and the playback technique in this study.

In a section titled "Factors Affecting the Population," Meanley drives home some points of the greatest interest to conservationists. For example, "Some of the reasons for its low nesting success may be the vulnerability of the large, bulky nest that is poorly concealed, is located close to the ground and contains white eggs. Other species of warblers nesting in the same breeding range have better-concealed nests, most of which are much smaller, and all of which contain speckled eggs except the very rare Bachman's Warbler, which also has white eggs. Furthermore, most Swainson's Warbler nests are lined with dark material, so that the white eggs stand out against the dark background." Meanley then goes on to state, "Canebreaks, prime habitat of this species, have disappeared faster than any other bottomland plant community." And "if the Swainson's Warbler ever has to make a last stand it may well be in the Southern Appalachians, where many of them occur in national forests and national parks or in areas unsuitable for agricultural production."

My single criticism of this study is its failure to note the existence of what may be today the northernmost breeding population of Swainson's Warbler in the Mississippi Valley: namely, the one consisting of not more than three pairs that was discovered at Cave Creek, Union County, Illinois, by J. W. Hardy (Wilson Bull., 67: 60, 1955) and R. Brewer (Audubon Bull., 150: 9, 1958).—WILLIAM G. GEORGE.

ALSO RECEIVED

No further retreat/the fight to save Florida.—Raymond F. Dasmann. 1971. New York, Macmillan Co. xii + 244 pp. Vignettes drawn by Elizabeth Dasmann, also 32 photos and 12 maps. $6.95.—This book gives the reader a dreary and unfortunately factual picture of the exploitation and destruction of land, air, water, flora, and fauna in Florida. It is no different than similar destruction that has taken place all over our country, but it seems more dramatic because Florida contained the only subtropical wilderness regions in the continental United States. In

a few years because it contains the only subarctic wilderness, the destruction of Alaska will be equally horrifying. This book was not written for ornithologists but is excellent background material for anyone working in zoology, even though the bird material has many petty errors. Dr. Dasmann should have consulted reports in literature or ornithologists who knew Cattle Egrets in British Guiana in the 1930s before announcing that they arrived in 1940 and that nobody knows how they traveled. Also, he should not speak of "English sparrow and the common starling" as immigrants—if he wants to be anthropomorphic he should at least call them transportees. Tree Swallows in masses swooping down on the low bushes of Sanibel Island during a cold snap were indeed "natural" but hardly a "fantastic . . . phenomena." They were just hungry and feeding on myrtle berries. This book should be required reading for all politicians and all so-called developers, if it is possible that either of the above two subspecies of *Homo sapiens* know how to read.—ELIZABETH S. AUSTIN.

Grundriss der Vogelzugskunde [Outline of the science of bird migration].—Ernst Schüz, with chapters by Peter Berthold, Eberhard Gwinner, and Hans Oelke. 1971. Second ed., revised. Berlin, Germany, Paul Parey Publ. Co. Pp. xi + 390, 142 Illus., 9¾ × 7 in. Cloth. DM88.—The first edition of this comprehensive work was published in 1952. Since then many new techniques have been developed for use in migration and orientation research. These research tools, in addition to the time-proved methods, have resulted in significant contributions to our knowledge of why, when, and how birds migrate. A summary and brief evaluation of this methodology precedes approximately 250 pages devoted to a comprehensive analysis and interpretation of bird migration and 50 pages used to discuss avian orientation mechanisms.

As might be expected, contributions from the European literature are emphasized and this enhances the book's value to American readers. The authors have provided a reasonably complete and timely discussion of the migratory habits of a variety of European and non-European species (e.g. *Hirundo rustica*, *Lanius collurio*, *Sturnus vulgaris*), the patterns of migratory movements (e.g. diurnal and nocturnal flights, flight speed and altitude, direction and goals), bird invasions (nourishment-dependent factors), the effects of weather, and the physiology of migratory birds.

The section on orientation represents an adequate but not outstanding review of the subject. A brief discussion of the origin and evolution of bird migration is provided as are comments regarding the role of learning and tradition. In general, the content and format closely resemble that of Jean Dorst's "The migration of birds," the translated version of which was published in 1963. It represents, however, a somewhat updated version.—WILLIAM E. SOUTHERN.

Birds of New Guinea.—160 reproductions of plates by John Gould with text by A. Rutgers. 1971. New York, St. Martin's Press. 321 pp. $15.00—This is another in the series of books reproducing various of the Gould plates. While it is desirable that these beautiful plates be more accessible, several things detract from the usefulness of this volume. The title is misleading as 40 of the 152 species listed do not occur in New Guinea or on its satellite islands, including one family, the Pycnonotidae, which does not occur east of Wallace's Line. In addition several subspecies figured are not those that occur in New Guinea. The quality of the color reproduction is for the most part good, but the text is outdated, the scant recent information being almost entirely from the avicultural literature. In the review copy the binding has come loose, splitting the end papers.—MARY LECROY.