

## ORNITHOLOGICAL LITERATURE

FUNDAMENTALS OF ORNITHOLOGY. By Josselyn Van Tyne and Andrew J. Berger. John Wiley & Sons, Inc., New York, 1959: 6 × 9¼ in., xii + 624 pp., 252 illus. \$11.75.

Josselyn Van Tyne had been disturbed for many years about the lack of a good English-language *Ornithology*. The available texts, although each had certain virtues, were either out of date, too much devoted to applied biology (at the expense of the "science of birds"), too superficial, or, worse yet, full of mistakes. There was not a single volume one could recommend with good conscience to a student without warning him of these shortcomings. This gap in our literature he set out to fill. When Van Tyne resigned as Editor of *The Wilson Bulletin* in 1948 he already had extensive notes, and from then on he worked on the text with that painstaking attention to detail so characteristic of him. Alas, at the time of his death in January, 1957, the manuscript was not even half completed. American ornithology owes a tremendous debt of gratitude to A. J. Berger for putting aside all of his own projects in order to complete the work. Van Tyne could not have made a better choice in his collaborator, for Berger has an interest in and understanding of many diverse branches of ornithology, ranging from anatomy to behavior. The result of the collaboration is a volume of which a pre-publication reviewer has said, "I have little doubt that Van Tyne and Berger will be adopted for practically all college courses in ornithology and will also be a most useful reference for both amateur and professional ornithologists." I fully endorse this evaluation. This is a far superior volume to anything else available in the English language.

Josselyn Van Tyne was always a severe critic and of nothing more critical than of his own efforts. In a critical analysis of "Fundamentals" which the editors of *The Wilson Bulletin* asked me to undertake, I have been trying to live up to the standards set by Van Tyne. I will first give a chapter-by-chapter analysis, to be followed by a more general summary.

Chapter one is an excellent and thoroughly up-to-date treatment of fossil birds. The essential characters of the extinct types are recorded, their ecology and possible relation to modern types are discussed, but it is not mentioned how little paleornithology has added to our knowledge of avian relationships.

Chapter two, devoted to avian anatomy, is a competent presentation of the major anatomical features, thoroughly incorporating the modern literature. It contains a wealth of detail on the anatomical variation found in the various groups of birds. The treatment, on the whole, is static and descriptive and only rarely is an effort made to indicate the meaning of the differences from mammals and reptiles and the functional significance of the differences between the various families and orders of birds. A few more illustrations in this chapter would have been useful, as, for instance, one indicating the circulation of air through lungs and air sacs. There is a helpful survey of the characters generally used in avian classification. The definitions of these characters are widely scattered in the literature, and it is convenient to have them in one place. This is true, even though, as Van Tyne and Berger realized, most of these characters have far less phyletic value than claimed in the literature. Indeed, most of them may be quite valueless as indicators of relationship.

The chapter on plumage and molt is, on the whole, excellent and very informative. I myself have learned quite a few new facts from this chapter. The theorizing is, however, often shaky. The phylogenetic sequence of feather types (page 71) is certainly not generally accepted. Personally, I find very persuasive the arguments of those who, like Portmann, demonstrate that all downy feathers are secondary derivations. The dogmatic

statement of a steady reduction in the number of flight feathers (page 84) is rather questionable. Actually, the high number of secondaries in albatrosses and condors appears as much of an evolutionary advance as the reduction in the primaries among the nine-primaried birds. Having so many secondaries does not make condors and albatrosses particularly primitive. The section on bird pigments is rather poor. The interesting, unanalyzed pigments of parrots, one of which is fluorescent, are not mentioned. The section on structural colors is disorganized. What do erythrism and schizochroism do in this section? The cited explanation for iridescence is obsolete (Schmidt, Dorst).

The chapter on senses and behavior must have been the hardest chapter to write. There are so many conflicting theories and methods of approach that a synthesis would have been difficult; it was not attempted. The part on the sense organs is straightforward, but stresses anatomy too much at the expense of the senses which these organs serve. No clear picture of avian vision or hearing emerges. In the behavior part, I thought that the restricted definition of intelligence was most vulnerable.

The chapter on voice and sound production is perhaps the most original one of the volume. It is written with an evident love for the subject and brings together much scattered and hard-to-get-at information. It will surely stimulate work in this area.

Chapter six on the distribution of birds, by contrast, lacks originality and homogeneity. Zoogeography is a controversial field, and continuity of thought and consistency is lost if one wants to do right by everybody. The result is an uneven treatment. Griscom's obsolete idea that the composition of the Guatemalan birdlife is essentially a matter of glacial and post-glacial migrations is quoted approvingly (page 166), while the effects of the late Pliocene closing of the Panama gap are not mentioned. Some of the most interesting zoogeographic phenomena, such as rapid range expansions and the mixing of the North and South American fauna in Central America, are not adequately treated, while the cyclical irruptions of northern birds are treated in this chapter rather than under migrations.

An adequate treatment of the large and complex subject of bird migration in a single chapter is virtually impossible. The authors have done very well in the available space. In the section on the causes of migration, I would have liked to see a clearer separation of ultimate (selective) and proximate (physiological mechanisms) factors. In the physiology of migration, more stress should have been placed on the differences in the control mechanisms among species. Witness the difference in the control of the annual cycle of the juncos, the Emperor Penguin, and the Australian Mutton-bird. The failure in bringing previously completed chapters up to date has marred this chapter more than any other. Neither Sutter's radar observations nor Sauer's stellar navigation nor Kramer's rebuttal of Matthews' theory of homing are even mentioned. Instead, much space is given to some thoroughly discredited work. Stresemann's unique work on an annual calendar of migration is not mentioned.

Since this chapter cannot possibly give an anywhere near complete account of migration, it would have been useful to recommend a few books on the subject, for additional reading, in addition to the detailed bibliography of specialized literature.

I found chapter eight, on bird flight, rather chaotic. No clear picture of the aerodynamics of flight emerges. Important aspects, such as landing, starting, and dynamic soaring, are hardly mentioned. The emphasis in the chapter is on the equipment rather than on flight.

The chapter on food and feeding habits is informative and original. The choice from the enormous potential literature is well done. There is no excuse, however, for not incorporating into the text Schmidt-Nielsen's recent discovery of the salt glands.

Chapter 10 on breeding behavior is a well-balanced survey of this enormous field. The treatment in some areas is one-sided, such as the neglect of hole-nesting birds (with respect to territory and nest site selection), age at breeding (*Zosterops*, *Coturnix*, *Streptopelia*), size of eggs, special adaptation of tropical birds, etc. In the discussion of the "initiation of the breeding season," the treatment suffers, as in migration, from a failure of separating proximate and ultimate factors. Though numerous facts are presented, they do not lead to any generalizations.

Chapter 11 deals with social relations, a subject usually neglected by ornithologists. It is a useful survey of this subject, even though one could quibble over some of the details of treatment. Sladen's finding that adult penguins continue to recognize their young in the creches should have been mentioned.

Chapter 12 is a good summary of modern taxonomic ideas. Even controversial subjects are presented objectively and with good taste. There are some minor errors. For instance, *Dicrurus hottentottus* (page 363) is not an example of individual but of geographic variation.

Chapter 13 (with 177 pages) is by far the largest chapter of the book. It attempts to give the most important information on every one of the families of birds as recognized by the authors. The essential information on physical characteristics, geographic range, habits, food, and breeding habits are presented in about 20 lines. A single page is devoted to each family. The resulting consistency and ease of reference is bought at a price. Families with 328, 365, 375, and 398 species get no more space than the more than 20 families with a single species each. There is remarkably little consistency as to the recognition of families. Monotypic genera, such as *Leptosoma*, *Cochlearius*, *Oxyruncus*, *Zeledonia*, *Dulus*, *Tersina*, and *Catamblyrhynchus*, are recognized as families (as well as the *Cyclarhidae* and *Vireolaniidae*), a procedure which, although definitely defensible, would indicate a standard of fine splitting; and yet *Rupicola* is included in the *Cotingidae*; the *Panuridae*, *Paradoxornithidae*, *Chamaeidae*, and *Cinclosomatidae* are combined with the *Timaliidae*; the *Pachycephalidae* and *Monarchinae* are combined with the *Muscicapidae*; and worst of all, the *Carduelidae* are lumped with the *Ploceidae*; the *Estrildidae* are not even mentioned. All this indicates extreme lumping. Such unequal standards of family recognition must be confusing to the student. The literature references under the families are on the whole well chosen and cover the world literature, although the selection could have been better in a few families (e.g., *Strigidae*).

The extreme shortness of the accounts forced the authors to ignore some of the most interesting attributes of these families, particularly those concerning biology and physiology. Nothing is said on the metabolism of hummingbirds, torpidity in the *Caprimulgidae*, variation in parasitic habits in cuckoos, display patterns and parental care in ducks, etc. The technical diagnosis is copied from the standard literature.

Some of the special features of the volume should be pointed out. The bibliography is an extremely good introduction to the modern ornithological literature. The chapter bibliographies total 46 pages, listing about 1,300 titles. In addition, there are six pages dealing with encyclopedic and bibliographic sources, which will facilitate a further access to the literature. To be sure, the student in a small college may find only a fraction of this available to him, but at least he knows that there is more and where he can find it. Much of the literature listed at the conclusion of chapters is not utilized in the preceding text of the chapters.

There is an extensive glossary (28 pages) which could have been shorter, if some rather self-evident terms had been omitted, as, for instance, under *A*: aberrant, acute, anomalous, anterior, aquatic, arboreal, etc. Some of the terms (e.g., biome) are defined

incorrectly. The definition of the arm as the "region between the shoulder and the elbow" is peculiar to anatomists.

The proofreading has been outstandingly good. I have found only a single evident misprint. Some minor errors, e.g., misspellings for *Phonygammus*, *Stingelin*, *Bathmocercus*, *Regenruf*, *Xenophon*, *Lavauden*, etc., seem to be rather slips of the pen. It is a pity that the scientific names were not scrutinized by a specialist. Such inconsistencies could have been avoided as *Tchitrea* (295) for *Terpsiphone* (366, 526), *Totanus* (204, 268, 366) for *Tringa* (135), *Capella* (86, 133, 336) for *Gallinago* (112), *Charadrius* (207) for *Pluvialis* (193, 284), *Dissemurus* (304) for *Dicrurus* (505), *Grallina picata* (509) for *G. cyanoleuca* (135), *Graucalus* (504) for *Coracina* (504), *Laiscopus* (527) for *Prunella* (527), and *Gennaeus* (86) for *Lophura* (73, 421). *Muscadivores* (239) is now called *Ducula*, and *Pygoscelis adeliae* (258) is the correct spelling. The index is full and has guided me quickly to all items I was looking for. I find the absence of authors' names in the index no handicap.

Having completed the consideration of all this detail, we can now weigh the virtues and deficiencies of "Fundamentals of Ornithology." It is a volume of great competence and good balance. Containing but few outright errors, it is a volume one can rely on. It is written simply and clearly with a minimum of jargon except for descriptive anatomical terms. There is a consistent endeavor to lead the student from the very beginning to more advanced topics. Styling, typography, and proofreading are excellent. The illustrations are well chosen, and George M. Sutton's black and white drawings of representatives of 168 families of birds greatly add to the attractiveness of the volume. The world literature is made available to the student to an unusual degree.

I have two major criticisms. One is that the volume attempts to cover too broad an area in a single volume. We know so much about birds, with thousands of workers everywhere writing monographs and research papers, that a truly up-to-date treatment of almost any subject would have to go far beyond what is included in "Fundamentals." This is particularly true for chapter 13 where the treatment is quite sketchy for most families. I wonder whether it would not be better, in a revision, to eliminate the survey of the avian families, publish it separately, and use the 177 pages gained thereby to permit a fuller treatment in the remaining 12 chapters. Van Tyne had planned the volume for the graduate student, but as it is now before us, it would seem to be closer to the undergraduate level, as also remarked by Friedmann in his review in *Science*.

My other criticism concerns the treatment as such. It is very competent, very scholarly, yet it is largely descriptive. The study of birds has to touch on so many intensely exciting things in avian biology, such as flight adaptations, control of the annual cycle, orientation, but these topics are treated in the volume with the same dryness and aloofness as the details of the skeleton. Nor is the student being made aware sufficiently of the numerous interrelations between function, habit, and structure. The biology of the bird almost invariably takes second place to the description of its structure. Little advantage has been taken of controversial subjects to excite the student. Objectivity is prized above all. Its very value as a reference work diminishes its usefulness as an exciting introduction into the life of birds.

A reviewer once said that a book could be looked at in two ways, what it is and what it could have been. It should be evident from my review that I have full praise for "Fundamentals" for what it is. It is by a considerable margin the best English-language college text in ornithology; indeed it is the best Ornithology in any language (excluding the handbooks of Stresemann and Grassé). Yet as a conscientious reviewer, I cannot conceal my feeling that there is still abundant room for improvement.—ERNST MAYR.

THE BIRDS OF ALASKA. By Ira N. Gabrielson and Frederick C. Lincoln. The Stackpole Company, Harrisburg, Pennsylvania, and the Wildlife Management Institute, Washington, D. C., 1959: xiv + 922 pp., 13 colored plates by Olaus J. Murie and Edwin R. Kalmbach, 1 fig., 1 map. \$15.00.

Publication of this volume, appropriately coinciding with Alaska's rise to statehood, provides ornithologists with one of the most useful regional works on any section of North America. A great amount of distributional material has been collated by the authors. Previously published records are nicely summarized and many heretofore unpublished data are made available. The book undoubtedly will stimulate further ornithological activity in the new state.

The first 30 pages are devoted to an informative discussion of Alaskan ornithological history, beginning with the early Russian period and continuing through the "Modern Period" to 1958. This section is followed by "Some Interesting Aspects of Alaskan Ornithology" (seven pages), dealing in part with a brief analysis of the avifauna. Here we are informed that the state list consists of 321 species (or 414 species and subspecies), of which only 162 species (233 forms) are "land birds." Nine species included in the book are not discussed in field guides or other works dealing with North American birds. Three of these, the Common Crane (*Grus grus*), Gray-spotted Flycatcher (*Hemichelidon griseisticta*), and Gray-headed Thrush (*Turdus obscurus*) are recent additions not included in the fifth edition of the A.O.U. Check-List. Casual or accidental forms total 104, and 56 of these are Old World birds. Of the 13 forms termed "regular migrants" (not known to nest in Alaska), the authors list only one land bird, *Acanthis flammea holboellii*. They consider 174 forms to be permanent residents. The list of summer residents, including "a few species whose nests have not been actually found but which are almost certain to be breeders—consist[s] of 132 forms of water birds and 189 forms of land birds." However, the next statement tells us that the "total reported in this book is 306 forms of summer resident birds." The number of summer resident *species* is not given, and I find no statement of the number of forms or species positively known to breed in the state. Addition of the figures for these four categories (permanent residents, summer residents, regular migrants, and accidentals) results in 597 forms—183 more than the state's total as previously given in the text (and also in Tables I and II)!

A discussion of the highly plastic Rock Ptarmigan, Winter Wren, Fox Sparrow, and Song Sparrow terminates this section. This provides a concise summary of the trends of variation within these species, but the treatment of possible causative factors is very superficial. Some material is later dealt with in the species accounts and its repetition seems unnecessary.

The next few pages deal with Alaskan bird migration in terms of Lincoln's flyway theory. Alaska is considered to be the "northern terminus of routes that belong to all four of the major systems" insofar as migratory waterfowl are concerned. Also treated in some detail are four "more or less unique" Alaskan migration routes: (1) an Arctic route from the Alaska Peninsula and Bering Sea islands north along the coast past Point Barrow to the breeding grounds near the Arctic Ocean, (2) an inland route from Norton Sound northeast to the Colville River and the arctic coast, (3) the Asiatic route, presumably along the Siberian coast and across Bering Strait to the Seward Peninsula (used by "North American" birds such as Sandhill Cranes and Gray-cheeked Thrushes which breed in Siberia, and by the Rufous-necked Sandpiper, Bluethroat, Yellow Wagtail, Kennicott's Arctic Warbler, and other "Asiatic" birds nesting in northern Alaska), (4) the Pacific oceanic route, traversed by certain shorebirds that breed in Alaska and winter in Hawaii and other South Pacific islands.

Alaskan ecological zones then are discussed in terms of Merriam's "life zones," of which three occur in Alaska: Arctic-Alpine (coinciding with distribution of Arctic tundra—largely north of the Brooks Range and along the Bering Sea), the Hudsonian (occupying the interior valleys plus "narrow belts around all mountains"), and the Canadian Zone (restricted to a narrow coastal strip in southeastern Alaska). More space is devoted to Nelson's concept of "faunal districts," namely the Sitkan (corresponding to Merriam's Canadian Zone), the Aleutian (southwestern Kodiak Island, the Aleutians, and Pribilofs), the Alaskan (a strip from the Alaska Peninsula along Bristol Bay, Bering Sea, and the Arctic Ocean and including all islands north of the Pribilofs), and the Alaskan-Canadian (coinciding with the Hudsonian Zone of Merriam).

Nearly 800 of the 922 pages in this heavy volume are devoted to the species accounts. The detailed descriptions of birds are "adapted or taken verbatim" from various standard works—Alexander's *Birds of the Ocean*, Bailey's *Handbook of Birds of the Western United States*, Bent's "Life History" series, Ridgway's and Friedmann's *Birds of North and Middle America*, and others. They will be useful to workers who lack extensive libraries or who prefer not to carry several bulky volumes into the field. There is no section on field recognition although this topic is occasionally dealt with under other headings. The General Range paragraphs have been condensed from the fifth edition of the A.O.U. Check-list of North American Birds. The important Alaskan Range accounts (for each species or, in the case of a polytypic species, each race) have been based on numerous sources, particularly the card files maintained by the U.S. Fish and Wildlife Service and unpublished reports from hundreds of observers.

Some of the Haunts and Habits sections contain much useful information—particularly the accounts of species with which Gabrielson has had extensive Alaskan experience. Considerable material is taken from Bent's works and other publications. At times the reader is startled upon encountering anthropomorphic phrases or sentences which are out of place and contribute nothing worth while. There are too many careless statements, some of which require re-reading before their meaning is evident. Others are not clear even then. For example, under *Sylviidae*, on page 676, appears the statement, "Six species or subspecies have been recorded in Alaska." One must himself count the forms, page by page, to learn that four species and two additional subspecies of this family are on the state list. Numerous paragraphs are unnecessarily long owing to poorly worded sentences and repetition of details already discussed in the descriptions. There is a separate hypothetical list at the end of the book but the same information is given in footnotes for some of these species near their regular taxonomic position. Better organization and more careful editing of the Haunts and Habits material surely would have reduced the number of pages in the volume.

Nomenclature generally follows that of the A.O.U. Check-list, but notable departures include recognition of *Riparia riparia maximilliani* (Stejneger), *Leucosticte tephrocotis kadiaka* (McGregor), and *Passerculus sandwichensis crassus* Peters and Griscom. The authors have assigned all Alaskan Gray Jays to *Perisoreus canadensis arcus*, rather than to *P. c. pacificus*, with no comment or apparent reason for their action. They also consider *Anas carolinensis* conspecific with *A. crecca*.

Vernacular names are applied to subspecies throughout the book, and no overall specific name is provided for polytypic species. This surely will confuse the already befuddled amateur who has tolerated too many haphazard changes in "common" names during the past decade. In the introductory sections one notes such names as Thayer's Gull, Green-throated Loon, and Lapland Longspur which do not appear again in the book. Some of these, listed later on as Thayer's Herring Gull or Green-throated Arctic Loon cause only temporary difficulty, but the reader cannot determine from this book that the Alaska and Lapland

Longspurs are one and the same. There are numerous other examples. *Anas crecca*, here including *A. carolinensis*, is called European Teal on page 31, Common Teal on page 159, and Green-winged Teal on page 285. The main account of *Hylocichla ustulata* is under the name of Swainson's Thrush, but there are at least two references to "Olivebacked" Thrush (pages 285 and 537). Names of this type sometimes are hyphenated on one page but not on another. A lack of consistency is likewise noted in use of the possessive in numerous vernaculars formed from men's names, e.g., Sabine Gull on page 23 but Sabine's Gull on page 462. Even the use of capital letters in bird names is not uniform.

If one considers the total number of words, there are few typographical errors in the book. However, I noted at least 13, two of which have resulted in the misspelling of ornithologists' names. In addition, several bird names are incorrectly spelled: *Picoïdes* appears without the umlaut mark, the race *articola* of the Horned Lark is spelled "*articola*," and *Oporornis* appears as "*Oporonis*." Holboell's Redpoll is misspelled "Holbell's" (on page 30) and MacGillivray's Warbler is incorrectly written with a lower case "g." On the poorly labelled "topography of a bird" drawing (page 52) the tail feathers are called "retrices"; the crown, pileum, and occiput are evidently considered synonymous as are bill and culmen! One would further assume from this picture that *nares* is a singular word, and that the term *scapulars* includes all of the upper wing coverts.

The other illustrations are not in keeping with the scope and importance of the book. There are no photographs and the single small map is inadequate. The color plates, depicting 52 species, are poorly reproduced—a trait seemingly characteristic of many recently published American bird books. In my copy three plates are badly out of register and others are lacking in clarity. Such careless work is inexcusable in a publication of this sort—and at this price. The text description of McKay's Bunting does not agree very well with the birds figured on plate 13—strangely situated facing page 338, among the shorebirds.

Two outstanding features of the book are the gazetteer (compiled by Myra A. Putnam) and the admirable bibliographic list. The authors endeavored to "compile a bibliography of Alaskan Ornithology that would be as complete as possible." The result is 55 pages and approximately 1,010 titles, suggesting that they have at least come close to their objective. I noted only one minor discrepancy between a text reference and the corresponding title in the bibliography.

The tremendous amount of work involved in the preparation of this volume probably never can be fully appreciated by anyone but the authors, for whom the project was entirely a "labor of love" undertaken in spare hours at home for several years until more time became available. It is a major contribution to regional North American ornithology, and most of my criticisms deal with points which will not seriously limit the usefulness of the volume to ornithologists. But it is a pity that a work of this magnitude, one surely to be used by scores of workers for years to come, must be marred by inferior illustrations, and by minor errors, confusing vernacular nomenclature, and loose statements which could have been easily corrected.—DALE A. ZIMMERMAN.

LIVING BIRDS OF THE WORLD. By E. Thomas Gilliard. Doubleday and Co., Inc., Garden City, New York, 1958: 8½ × 11 in., 400 pp., approx. 400 photographs, 217 in color. \$12.50.

Mr. Gilliard, of the American Museum of Natural History, and his publishers have produced a book of which they may be proud. The text is an impressive summary of the general biology of the birds of the world, reflecting the wide experience, in the field and in the literature, of the author. Equally valuable is the array of photographs—over half in color—illustrating most (but not all) of the families of birds. The photographs are mostly good, many are excellent, few are poor. To Americans, who have become accustomed to mediocre

or poor color reproductions in recent picture books on birds, Gilliard's volume provides a refreshing change. The fidelity of color and register are better, in my opinion, than in any comparable American bird book of recent years.

The book opens with a brief introductory chapter describing some accomplishments of modern ornithology. Then follows a chapter on fossil birds which, while interesting, leans to the sensational approach and fails to do justice to the known fossil record. Most of this chapter deals with Jurassic, Cretaceous, and sub-Recent birds, the entire Tertiary being disposed of in one inadequate paragraph.

Starting then on page 17 is the family-by-family account of the living birds of the world. This is the important part of the book and here Gilliard has done an outstanding job. For each family the following topics are usually treated, in a narrative fashion: distribution, number of species, general description, methods of flight and feeding, habitat, behavior, and breeding biology. In small families all species are usually mentioned by common and scientific name and briefly described, with geographic range. In larger families, well-known species, "typical" species, and unusual species are often singled out for discussion. Any book as packed with information as this one is sure to have some inconsistencies and errors. These errors and misleading statements are especially frequent in the part of the family accounts mentioning descriptive or biological particulars of various species. I have the feeling that many individual species are mentioned in a superficial attempt to give the appearance of broad coverage (and perhaps to back up the dust jacket's unjustifiable claim that "1500 species [are] described"). It would be misleading to dwell on these numerous and mostly trivial errors because for the most part the family accounts are both readable and reliable.

Major taxonomic problems at family level are usually mentioned, in lay terms, and the classification used follows Amadon's "sparrows-last" sequence for the Passeriformes, and Wetmore's classification, with some modifications, for other orders. Gilliard lists 12 subfamilies in the table of contents. Eight of them (Cochleariinae, Pedionominae, Oxyruncinae, Pseudochelidoninae, Regulinae, Hyposittinae, Cyclarhinae, and Vireolaniinae) have previously been regarded by some authors as full families and are given the same treatment in text as families. The remaining four subfamilies belong to Fringillidae, and no special heading or format distinguishes them in the general discussion of the family. The subfamilies Cyclarhinae and Vireolaniinae are listed in the table of contents as subheadings after the family Nectariniidae and the accounts in text follow this family. This is confusing, to say the least, because Gilliard really considers them to be subfamilies of the Vireonidae, the next family in the sequence, as is clear on reading the text.

Many copies of this book will be sold for the pictures it contains. As already mentioned, these are of good quality. Many show behaviorisms not usually pictured. Happily, many depict birds in flight, often at a distance, and are a refreshing change from the standard short-range portrait. I notice two color photographs that are misleadingly labeled—the "Yellow-shafted Flicker" female lacks the red nuchal collar of that species; it apparently is a hybrid between that species and the Red-shafted Flicker. The "male" European Blackbird, if indeed a male, is certainly much browner even than ordinary year-old males. Some figures are poorly reproduced. In my copy these are Pygmy Nuthatch (shown as green and blue); Silver-beaked Tanager, Crested Tanager, and Blue-gray Tanager (out of register); female Pyrrhuloxia and Saffron Finch (fuzzy). For the most part, however, the figures are well chosen and faithfully reproduced. As examples, I think that the Common Tern, the Roadrunner, the Short-billed Marsh Wren, and the Painted Buntings in flight are as good as one could hope for. Illustrations are lacking for some three dozen of the 164 families recognized. Probably no photographs are available for many of these families. Surely, however, this is the most comprehensive photographic coverage of world birds yet produced. It irritates me



not to be told which pictures represent captive birds; it seems unfair to the photographers whose pictures were taken in the wild. Most of the in-captivity photographs can be identified as such by close study. Also, most of them are fairly good and probably often represent species not otherwise photographed. One notable failure, however, is the full-page black and white photograph devoted to two frazzled, cage-worn Quetzals, which scarcely live up to the text's justifiable billing of this species as "as gorgeous as a bird of paradise." The color photos by H. Ruhe and T. Roth all seem to be of captive, often disheveled, birds. North American and European birds are represented, as one would expect, by usually excellent photographs taken by several dozen skilled photographers. On the other hand, the numerous good pictures of wild birds from South America, Africa, Australia, and Asia are pleasant surprises.

All in all, Gilliard's book is one which amateur and professional bird students will find useful and authoritative.

Many persons still feel that any book costing over \$5.00 is expensive. Gradually, however, it is becoming inescapably clear that *all* printing is now expensive, and colored plates especially so. Viewed this way, the price of \$12.50 for this lavishly illustrated, handsomely produced book seems reasonable. There is also a British edition, printed in the United States and published by Hamish Hamilton Ltd., London, which is identical in text and plates to the Doubleday book but has a cheaper, less sturdy binding. The price of the British edition is £3 10s., or \$9.80.—HARRISON B. TORDOFF.

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## INDEX TO VOLUME 71, 1959

This index includes, in addition to names of species and authors, references to the following topics: behavior, food habits, fossils, hybrids, measurements, migration, molts and plumages, nesting, parasitism, physiology, populations, predation, taxonomy, voice, and weights. Also included are references of biological significance to mammals, reptiles and amphibians. Names of new forms described in this volume are printed in **boldface** type.

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