REVIEWS

EDITED BY M. ROSS LEIN

The following reviews express the opinions of the individual reviewers regarding the strengths, weaknesses, and value of the books they review. As such, they are subjective evaluations and do not necessarily reflect the opinions of the editors or any official policy of the A.O.U.—Eds.

The Florida Scrub Jay: demography of a cooperative-breeding bird.—Glen E. Woolfenden and John W. Fitzpatrick. 1984. Princeton, New Jersey, Princeton University Press. xiv + 406 pp., 1 color plate, many figures. ISBN 0-691-08366-5 (cloth), 0-691-08367-3 (paper). Cloth, $45.00; paper, $14.50.—For nearly two decades three long-term studies of communally breeding birds, well known to readers of this review, have been in progress. The behavioral ecology of these species is so complex that conclusions reached after only a few years of study can be quite misleading. Each new year of study not only enlarges sample sizes but also provides insights that require important reinterpretations of earlier findings. Commendably, Woolfenden and Fitzpatrick brought together in one convenient place some of the findings of the first 10 years of their study of Scrub Jays, demonstrating many benefits of a long-term study. Although it presents a wealth of information, however, this book falls short of accurately representing the prevalent views of 1984 (and especially 1987) with respect to the main issues. To understand why, I propose to examine the main issues critically.

One of the major contributions of evolutionary biology in the second half of this century is, in the opinion of many, the theory of inclusive fitness (Hamilton 1964). By generating testable predictions, this theory has stimulated many empirical studies of natural populations. The focus of interest is the relative importance of indirect fitness (Brown 1980) in the evolution of social systems.

One approach to this issue is to ask whether indirect fitness is really necessary as a component of an explanation of social behavior, such as helping behavior. This view is commonly associated with Woolfenden and Fitzpatrick (p. 6). Another approach, which I prefer, is to use the *method of alternative working hypotheses,* traditionally viewed as the heart of the scientific method. Using this procedure we set up alternative hypotheses, some employing indirect fitness and some not. Then the data are compared with the predictions of each hypothesis. Some hypotheses will be rejected; others will remain. The "is it necessary?" approach, if it is used at all, should be applied to *all* hypotheses, not selectively to those disapproved by the authors.

Before the process can even begin, we must know exactly what we are talking about. What precisely is a helper? A helper is an individual that assists the genetic parents in the care of young that are not offspring of the helpers. To establish that an individual is a helper, one must observe it caring for young that are known not to be its own. There is no evidence in the chapter on procedures that Woolfenden and Fitzpatrick employed this criterion, although they were aware of it (p. 4). Instead, throughout the book jays are divided into breeders and helpers, implying that if a bird is not a breeder it must be a helper ("Helpers are nonbreeders," p. 80). It is well known for other species that not all nonbreeders help, and that individual nonbreeders vary significantly in the amount or intensity of their helping efforts. These are also possibilities for the Scrub Jay. To remain strictly objective I recommend that readers substitute in their minds the term "nonbreeder" every time they see the word "helper" in this monograph because the operational criterion used in identifying presumed helpers seems to have been that they were not breeders.

The failure to distinguish clearly and consistently between the question of helping and that of nonbreeding can have far-reaching consequences. It may be one reason the authors and others have confused the main issues. The question, "Why help?" is distinctly different from the question, "Why delay breeding and dispersal?" Yet in this monograph these two questions have been confounded. Of course, the two questions are not independent. For example, the hypothesis that the authors reject may be stated as follows: Helpers give up chances to breed to gain indirect benefits from helping their parents. No other benefit to the helper is considered except the indirect benefit. A second hypothesis involving indirect selection is that some jays are prevented from breeding by territoriality and the resultant habitat saturation and that only then, having no opportunity to breed, do the birds become helpers for the indirect benefit. A rule of thumb for such birds might be stated as: "Breed if you can; but if you cannot, then stay home as a strategy for getting a territory and help your parents in the meantime." This is the basis for the theory I proposed in 1969 and 1974. Needless to say, I was dismayed that although I proposed the theory specifically for jays and had the Scrub Jay in mind, the authors did not even consider it.

Koenig, Mumme, and Pitelka (1983) extended the tendency to think of helpers as nonbreeders even further: they mistakenly defined helpers as non-

breeders. Quite possibly the rather widespread occurrence of such mistakes has contributed to the persistent confusion of issues by these five authors.

After nine chapters of competent presentation and analysis of data, Woolfenden and Fitzpatrick distill the main results in a final chapter that evaluates the data with respect to the question, "Why help?" In their case this means mainly, "Why stay home and delay breeding?" They conclude that the factor of greatest importance for a young bird is the difficulty of obtaining a breeding territory. In other words, the jays delay breeding ("help") simply because it is difficult to find a breeding opening. This is exactly the conclusion I reached (1978a) after a review of quantitative data on various species, including the Scrub Jay. Indeed, the authors postulate a variable, reflecting this difficulty, *D*, which corresponds to my variable *F*, which corresponds to Emlen's (1982) variable psi. It appears that on this point Woolfenden, Fitzpatrick, Emlen, and I are in perfect agreement. This monograph, however, gives the impression of disagreement. The authors refer to their "decoupling of kinship benefits and dispersal" as "our major departure from typical kin-selection models," and cite me incorrectly (p. 324). This uncoupling was, of course, the major point of the *K*-selection phase of my 3-phase theory, which "uncoupled" the explanation for delayed breeding and dispersal (habitat saturation) from kinship benefits.

Despite their hidden agreement, I am displeased with their conclusion, not for what it is but for how they arrived at it. Ideally, the method of multiple working hypotheses should have been used formally and explicitly. All hypotheses for delayed breeding should have been laid on the table. An effort to reject each of them should have been made. One of the oldest known hypotheses for delayed breeding, namely age-dependent lack of skill in foraging, was not even considered. Perhaps in a future publication they can present data with which the remaining hypotheses can be evaluated.

Now what about the main question, the evolution of helping in the true sense? The authors have little to say on this subject except for a few comments on the possibility that helping behavior is a neutral trait. In an earlier chapter, however, they present relevant evidence about relatedness. The most convincing way to *reject* hypotheses based on indirect selection is to demonstrate that donor and recipient are unrelated. The crucial data are the coefficients of relatedness between donor and recipient. Woolfenden and Fitzpatrick report that 94% of the helpers were related to the recipient young. If the authors are correct that helpers actually benefit parent-recipients, then these data are sufficient to demonstrate a measurable increase in indirect fitness of a magnitude that one might expect could be important in evolution. Most students of natural selection would accept 94% as important evidence in support of indirect selection. The authors, however, imply that their observations are *not* "consistent with strictly kin-selected helping behavior" (p. 88). It would have been interesting to see the data on actual helping at the nest by the unrelated 6%, compared with the corresponding data for the related 94%. These data were not presented. In my opinion, the data in this monograph are completely *consistent* with the theory I proposed in 1974. Further discussion of this point may be found in Brown (1987).

Are the data also consistent with *other* theories, not involving indirect selection? There is some discussion of the possibility that some males that help can improve their chances of gaining breeding status through territorial budding. Personally, I find the data unconvincing (see Brown 1987); but I am willing to allow, lacking the critical data, that interpretations could go either way. The experiments necessary to resolve the issue have not been done.

For females, on the other hand, no plausible theory is presented by the authors. Furthermore, the data are not consistent with any published theory for the evolution of helping that does not invoke indirect selection. For further discussion, see Brown (1987: chapter 14).

In my opinion the confusion in this monograph is the inevitable result of failure to distinguish carefully and consistently between two questions. First (Q1), Why do young remain with their parents in a nonbreeding role? Second (Q2), Given this role, why do they help?

The loudest claims that indirect kin selection is unimportant (i.e. this monograph, Koenig and Pitelka 1981) are based on Q1. But for Q1, where is the theoretical and empirical literature that invokes indirect kin selection formally and explicitly? If this is an important scientific issue, such literature should not be hard to find. I have searched in vain for such papers before 1984. My own papers have never invoked indirect kin selection for Q1, and I have explicitly rejected this hypothesis on the basis of a review of empirical data (Brown 1978a). Woolfenden and Fitzpatrick failed to find such references; and their earlier (1978) reference to Brown (1974) was an error (Brown 1978b). In fact, the principal alternative hypothesis to indirect kin selection for Q1 (habitat saturation) can be traced to Selander (1964) and to the very paper (Brown 1974) they previously cited incorrectly in support of indirect selection. Since then habitat saturation has been embraced by Woolfenden and Fitzpatrick, Emlen (1982), Koenig and Pitelka (1981), and others. In short, although it is the focus of this monograph, the role of indirect kin selection in Q1 never was an issue. To announce now that it has been rejected is like burning a straw man. The doubt cast on indirect kin selection recently by Woolfenden and Fitzpatrick refers to Q1. They do not seriously consider Q2 at all.

Q2 presents a different picture. Evidence that

strongly implicates indirect kin selection and rejects published rival hypotheses has been published for three studies (Clarke 1984, Reyer 1984, Rabenold 1985). Unpublished but similar results in two more studies have been presented at meetings (S. Emlen, M. Avery). It is for Q2 and not Q1 that I invoked indirect kin selection in 1969 and 1974. In the 1974 paper the distinction was especially clear.

The idea that helping is a neutral byproduct does not explain the high degree of selectivity by helpers in choosing close kin as recipients in these studies. The view that helping relatives is invariably associated with future direct-fitness benefits ("lifetime fitness") can also be rejected in some of these studies (Reyer 1984, Rabenold 1985).

Opinions that the debate over indirect kin selection has been settled by this book are based on a misunderstanding of the issues. With regard to Q1, there never was an issue. With regard to Q2, evidence supporting indirect kin selection and rejecting published rival hypotheses is available in several excellent studies. Authors who have used the term "helper" to refer to nonbreeders have almost necessarily confused Q1 and Q2.

In summary, the Scrub Jay volume is an important source of demographic data on a singular-breeding species with nonbreeding helpers. Its handling of the main scientific issues, however, such as delayed breeding, helping, and the roles of direct and indirect fitness in natural selection, literally cannot be taken at face value.—JERRAM L. BROWN.

LITERATURE CITED

BROWN, J. L. 1969. Territorial behavior and population regulation in birds. Wilson Bull. 81: 293–329.

———. 1974. Alternate routes to sociality in jays—with a theory for the evolution of altruism and communal breeding. Amer. Zool. 14: 63–80.

———. 1978a. Avian communal breeding systems. Ann. Rev. Ecol. Syst. 9: 123–155.

———. 1978b. Avian heirs of territory. BioScience 28: 750–752.

———. 1980. Fitness in complex avian social systems. Pp. 115–128 *in* Evolution of social behavior: hypotheses and empirical tests (H. Markl, Ed.). Weinheim, Verlag Chemie.

———. 1987. Helping and communal breeding in birds: ecology and evolution. Princeton, New Jersey, Princeton Univ. Press.

CLARKE, M. F. 1984. Co-operative breeding by the Australian Bell Miner *Manorina melanophrys* Latham: a test of kin selection theory. Behav. Ecol. Sociobiol. 14: 137–146.

EMLEN, S. T. 1982. The evolution of helping. I. An ecological constraints model. Amer. Natur. 119: 29–39.

HAMILTON, W. D. 1964. The genetical evolution of social behaviour. I. and II. J. Theor. Biol. 7: 1–52.

KOENIG, W. D., R. L. MUMME, & F. A. PITELKA. 1983. Female roles in cooperatively breeding Acorn Woodpeckers. Pp. 235–261 *in* Social behavior of female vertebrates (S. K. Wasser, Ed.). New York, Academic Press.

———, & F. A. PITELKA. 1981. Ecological factors and kin selection in the evolution of cooperative breeding in birds. Pp. 244–256 *in* Natural selection and social behavior: recent research and new theory (R. D. Alexander and D. W. Tinkle, Eds.). New York, Chiron Press.

RABENOLD, K. N. 1985. Cooperation in breeding by nonreproductive wrens: kinship, reciprocity, and demography. Behav. Ecol. Sociobiol. 17: 1–17.

REYER, H. U. 1984. Investment and relatedness: a cost/benefit analysis of breeding and helping in the Pied Kingfisher (*Ceryle rudis*). Anim. Behav. 32: 1163–1178.

SELANDER, R. K. 1964. Speciation in wrens of the genus *Campylorhynchus*. Univ. California Publ. Zool. 74: 1–224.

WOOLFENDEN, G. E., & J. W. FITZPATRICK. 1978. The inheritance of territory in group-breeding birds. BioScience 28: 104–108.

Avian physiology.—P. D. Sturkie (Ed.). 1986. Fourth ed. New York, Berlin, Heidelberg, Tokyo, Springer-Verlag. xii + 516 pp., 199 illustrations. ISBN 0-387-91695. $59.00. **Handbuch der Geflügelphysiologie.**—Alfred Mehner and Wilhelm Hartfiel (Eds.). 1983. Jena, VEB Gustav Fischer. Available in nonsocialist countries through S. Karger AG, Basel. 1,156 pp. in 2 parts, 307 illustrations. ISBN 3-8055-3738-7. Ca. DM 480.—Since the mid-18th century birds have played a modest but significant role in the development of experimental animal physiology. The importance of a few domesticated species for human nutrition induced an increasingly technical husbandry, which, in turn, generated a complementary interest in avian physiology. Understandably, however, a very significant orientation of this development was initially in the realm of applied physiology directed toward enhancement of flesh and egg production. Basic research on organs and systems developed more slowly through the first half of the 20th century. Moreover, the predominate early orientation of applied poultry physiology divorced it extensively from the evolution of animal physiology. A much slenderer stream of investigations of feral species, traceable to Aristotle, and enhanced by the philosophy and remarkably accurate observations of August Fredericus Secundus, has increased at a strikingly increasing rate during the current half century. Nevertheless, as well illustrated by "Handbuch der Geflügelphysiologie" (HGP) and "Avian Physiol-

ogy" (AP), the field is still dominated by investigations on a few domesticated species, which imposes regrettable biases and hiatuses, a matter to be borne in mind in the use of both treatises.

The original edition of AP, a volume of modest length written alone by Paul Sturkie and published in 1954, was the first treatise devoted exclusively to avian physiology. The fourth edition involves the efforts of 18 authors from the USA and 3 from the United Kingdom. A comparison between the two editions provides insight into the rapid progress and increased sophistication in avian physiology in three decades even though several exciting developments are omitted or scantily considered, presumably because of remoteness of bearing on poultry science.

HGP differs from AP, not only because it is an original effort by 28 authors from 6 countries, mostly from the Federal Republic of Germany, but also because of its greater length and more expansive coverage. Although there are some exceptions among the chapters, notably that on movements including flight, swimming, and diving, HGP, as the title indicates, has a generally greater orientation toward poultry physiology. This orientation is emphasized especially by chapters on the origin of domestic species and the processes of selection in their artificial evolution, and on artificial incubation, and by rather extensive, classical treatises on vitamins and minerals and effects of deficiencies thereof, especially in domestic fowl. It is unfortunate that the time elapsed between completion of manuscripts and publication appears generally to range from 3 to 7 years. I have borne this interval in mind in comparisons of corresponding chapters in the two treatises.

Among areas in which there have been exciting recent investigations, I find AP somewhat superior in renal function and osmoregulation because of consideration of the roles of nasal salt glands and absorption by the hindgut. Both AP (1 chapter) and HGP (2 chapters) present good contemporary accounts of the function of the lung-airsac system and respiration. In contemporary endocrinology of domestic species, AP is clearly superior except in the treatment of prostoglandins. In both treatises, however, the rapidly increasing volume of endocrine research on feral species is treated only incidentally.

Whereas the subject is treated somewhat incidentally in HGP, AP contains a brief but well-constructed chapter on immunophysiology of the domestic fowl, the only avian species in which significant contemporary investigations have been effected.

Both treatises contain chapters on energy metabolism and thermoregulation, each of which are sound and useful. The chapters in AP are of greater interest because they consider birds in general, whereas those in HGP are concerned almost exclusively with domestic forms. Nevertheless, the treatment of energy metabolism in the latter is useful because of its effective attention to the basic aspects.

Even with allowance for the earlier completion of the manuscript on sense organs in HGP, the treatments of these organs in AP is superior. But neither mention recent demonstrations of the use of information from Earth's magnetic field in orientation during migration.

In addition to the above-mentioned chapter on physiology of types of motion, HGP considers other aspects of avian physiology that are treated only incidentally or excluded from AP. An example is the extensive discussion of the skin and its derivatives. Although oriented exclusively toward domestic species, it is nevertheless useful beyond the realm of poultry physiology. Unfortunately, results of some recent research efforts, including those on comparative compositions of secretions of the uropygial gland and its production of pheromone, are lacking. Interestingly, the index of AP lists neither feathers nor uropygial gland, two of the most distinctive features of birds! Although somewhat more morphological than physiological, HGP contains a useful chapter on bones, cartilage, and calcium metabolism. This, and some other chapters, contain few references to research papers that appeared within a decade of publication of HGP.

Bearing in mind that manuscripts for several chapters in HGP were apparently completed by about 1976 or 1977, the treatments of nervous system, muscle, circulation, and digestive system are relatively comparable in the two treatises. Even allowing for this difference in time of completion of manuscripts, I found the treatment of control of reproduction in AP to be superior to that in HGP.

Because of differences in aspect from which comparable chapters were developed, the overlap in literature sources is less than one might envision. Not surprisingly, the coverage of non-English literature is more extensive in HGP. Indeed, the quality of some of the chapters in AP suffers somewhat from isolation from non-English literature. Citations of the extensive Russian literature are scanty in HGP and essentially nonexistent in AP.

Both treatises are deficient in several areas of avian physiology in which there have been exciting recent advances. Among these are the results of the plethora of sophisticated studies on energetics and respiration of embryos in relation to properties of eggshell and the adaptations of the latter to environmental conditions, including altitude. Recent investigations of the comparative physiology of incubation and of posthatching development are omitted in both volumes. Although birds have been used extensively in investigations of endogenous circadian and circannual rhythms, the former are mentioned only briefly or incidentally and the latter not at all. There are other conspicuous omissions.

In the comparison of two or more treatises on the same subject it should be expected that the reviewer express a recommendation or choice. Unfortunately,

I cannot do this unequivocally. Because of the more recent preparation of manuscripts for AP, the inclusion of more information on feral species of several orders, better quality of illustrations, and more favorable price, I am inclined to recommend it to individuals as the purchase of choice. Although AP through its editions has moved toward the status of a general avian physiology, such a treatise still remains to be produced. Because of its more extensive use of non-English literature, a generally greater attention to historical development of avian physiology, and inclusion of subjects not covered in AP, much can be said in favor of HGP. I strongly suspect that I will consult each frequently and with equal frequency. Certainly, both should be in good ornithological libraries.—DONALD S. FARNER.

Johann Friedrich von Brandt: Icones Avium Rossico-Americanarum, Tabulae VII, Ineditae, with comments on birds, expeditions and people involved.—Bernt Løppenthin. 1984. Copenhagen, Scandinavian fine Editions. 70 pp., 12 text figures, 7 color plates. ISBN 87-7312-000-6. Available from Scandinavian fine Editions, P.O. Box 1019, DK-1007 Copenhagen K, Denmark. 385 kroner plus postage and handling.—This book has all the marks of a labor of love. A fascinating blend of art, science, history, and bibliography, it is the work of Bernt Løppenthin (M.D., M.Sc.), the former chief librarian at the Scientific and Medical Department of the University Library, Copenhagen. In undertaking this complex project and in completing it so successfuly, Dr. Løppenthin has performed a service to many branches of scholarship. Ornithology is the most obvious beneficiary, but historians of science, anthropologists, students of bird portraiture, and those interested in scientific expeditions and voyages of discovery will also find much of value.

Brandt was born in 1802 in Brandenburg. His mother was a teacher and his father a medical practitioner who wanted his son to follow in his footsteps. Brandt qualified as a physician in 1826, but his clear preference for botanical and zoological studies and the influence of Alexander von Humboldt, an advisor to the Tsar on scientific matters, combined to secure Brandt the position of director of the zoological museum at the Academy of Sciences in St. Petersburg in 1831. He served for 39 years, 15 of them as professor of zoology at the main institution and 18 of them as professor of zoology and comparative anatomy at the medicosurgical academy. Brandt died in Russia in 1879; in almost 50 years there he published over 300 papers in various fields of zoology, paleontology, and geography. He led two major expeditions into Siberia and became the preeminent natural scientist in the land.

The primary purpose of Løppenthin's book is to bring to light seven heretofore unpublished plates that contain 49 lithographs depicting 44 species of "Russian-American" birds. Lithographed by J. Beggrow from drawings by W. G. Pape, the plates were made in St. Petersburg in about 1835 and were intended to illustrate Brandt's descriptions of birds of the Russian possessions in the northern Pacific. The secondary purpose, an obviously important one to the author, is to try to unravel the many mysteries surrounding the plates. To that end Dr. Løppenthin has provided a brief biography of Brandt, a thorough review of the literature relating to Brandt's work on Russian birds, a survey of establishments in Russian America and expeditions of importance to ornithological studies before 1835, and a plate-by-plate, species-by-species commentary on all of the birds pictured on the plates.

The localities of Brandt's specimens, mainly places throughout the Bering Sea and along the land bridge, evoke an age of high adventure. Kodiak Island, Unalaska, St. Lawrence, St. Paul, Sitka, Kamchatka, the Pribilofs, even the Kurils and California—all figure in the story. The scientists and explorers are similarly evocative: Vitus Bering (Second Expedition 1733–1742), James Cook (Third and Last Voyage 1776–1780), Joseph Billings (Expedition 1785–1794), A. J. von Krusenstern (Expedition) and G. H. von Langsdorff (Travels 1803–1808), Otto von Kotzebue (Expeditions 1815–1826), and F. H. von Kittlitz (Voyage on Board the Senyavin 1826–1829). As Løppenthin makes clear, each of these voyages or expeditions may have contributed in some way to the descriptions later produced by Brandt.

The remarks on the birds drawn by Pape for Brandt provide further detail about the probable origin of the specimens as well as commentary on the accuracy of the descriptions, taxonomy, nomenclature, etc. The species themselves are of an interesting variety, ranging from the albatrosses to the sparrows. The full list follows and is "in the systematic sequence given by Voous (1937–1977) under modern scientific names." Readers will note that recent changes in nomenclature and taxonomic order (e.g. the Rosy Finches) are not recognized. Species marked with an asterisk, eight in all, are thought to be type specimens figured by Pape from material under Brandt's supervision. The figured birds are:

Diomedea albatrus Pallas 1769, Short-tailed Albatross
Puffinus tenuirostris (Temminck 1835), Slender-billed Shearwater
Oceanodroma furcata (Gmelin 1789), Fork-tailed Storm Petrel
Oceanodroma leucorhoa beali Emerson 1906, Leach's Storm Petrel
Phalacrocorax perspicillatus (Pallas 1811), Pallas's Cormorant
Phalacrocorax urile (Gmelin 1789), Red-faced Cormorant
**Phalacrocorax penicillatus* (Brandt 1838), Brandt's Cormorant
**Phalacrocorax auritus cincinnatus* (Brandt 1838), Northwestern Double-crested Cormorant
Anser caerulescens (Linné 1758), Snow Goose
Anser canagicus (Sevastianov 1802), Emperor Goose
**Branta canadensis leucopareia* (Brandt 1836), Lesser Canada Goose
Anas falcata Georgi 1775, Falcated Teal

Polysticta stelleri (Pallas 1769), Steller's Eider
Dendragapus obscurus sitkensis Swart 1921, Sitka Blue Grouse
Haematopus bachmani Audubon 1838, American Black Oystercatcher
Larus argentatus vegae Palmén 1887, Vega Herring Gull
**Rissa brevirostris* (Bruch 1853), Red-legged Kittiwake
Cepphus carbo Pallas 1811, Spectacled Guillemot
Brachyramphus marmoratus (Gmelin 1789), Marbled Murrelet
Brachyramphus brevirostris (Vigors 1828), Kittlitz's Murrelet
Synthliboramphus antiquus (Gmelin 1789), Ancient Murrelet
Alle alle (Linné 1758), Little Auk or Dovekie
Ptychoramphus aleuticus (Pallas 1811), Cassin's Auklet
Aethia cristatella (Pallas 1769), Crested Auklet
Aethia pygmaea (Gmelin 1789), Whiskered Auklet
Aethia pusilla (Pallas 1811), Least Auklet
Cyclorrhynchus psittacula (Pallas 1769), Parakeet Auklet
Cerorhinca monocerata (Pallas 1811), Rhinoceros Auklet
Fratercula corniculata (Naumann 1821), Horned Puffin
Lunda cirrhata (Pallas 1769), Tufted Puffin
Selasphorus rufus (Gmelin 1788), Rufous Hummingbird
Ceryle alcyon caurina Grinnell 1910, Western Belted Kingfisher
Catharus fuscescens salicicola (Ridgway 1882), Veery
Parus rufescens rufescens Townsend 1837, Northern Chestnut-backed Chickadee
Cyanocitta stelleri stelleri (Gmelin 1788), Northern Steller's Jay
**Leucosticte arctoa brunneonucha* (Brandt 1842), White-winged Rosy Finch
**Leucosticte tephrocotis griseonucha* (Brandt 1842), Grey-crowned Rosy Finch
Vermivora celata (Say 1823), Orange-crowned Warbler
Dendroica townsendi (Townsend 1837), Townsend's Warbler
Wilsonia pusilla pileolata (Pallas 1811), Northern Wilson's Warbler
Ammodramus sandwichensis sandwichensis (Gmelin 1789), Aleutian Savannah Sparrow
Zonotrichia melodia sanaka (McGregor 1901), Aleutian Song Sparrow
**Zonotrichia melodia rufina* (Bonaparte 1850), Sooty Song Sparrow
**Zonotrichia lincolnii gracilis* (Kittlitz 1858), Northwestern Lincoln's Sparrow
Junco hyemalis oreganus (Townsend 1837), Northwestern Oregon Junco

Though most of Løppenthin's commentaries are brief, where questions arise concerning identification (e.g. Townsend's Warbler), location (e.g. Dovekie), or speciation (e.g. Sooty Song Sparrow) the commentary is extended and reflects a very close reading of the pertinent literature. There are interesting remarks, too, about species such as Pallas's Cormorant, already sliding toward extinction when Brandt was doing this work in the 1830's, and about Brandt's Cormorant, by means of which most of us first become acquainted with Brandt. Løppenthin notes, "Brandt's Cormorant is not an Alaskan bird . . . . The place of capture of the specimen drawn by Pape for Brandt's plates, which undoubtedly represents the type specimen, is unknown." It is about just such mysteries that Løppenthin speculates with an insight based on his familiarity with all of the important sources. His knowledge is impressive, and so is his book. Reading it is at once instructive and enjoyable.

Physically the book is well made. The page size is generous (about 28 × 31 cm), the paper is good, and the type is clear. The book is bound in a paper described by the publisher as "elephant skin." Without seeing the original plates the most one can say is that the reproductions appear to be good, as is the color work. There is a substantial list of references and an adequate index, both of which are indispensable. For a book costing about $50, the volume has an annoying number of typographical errors. Given the complexity of the text perhaps these typos are forgivable. On balance this is a book worth adding to any scholarly ornithological collection. We can be grateful to Bernt Løppenthin for the effort and intelligence that have gone into the book and to Scandinavian fine Editions for its production.—JOHN P. MCDONALD.

Birds, men and books: a literary history of ornithology.—Peter Tate. 1986. London, Henry Sotheran. 193 pp., 20 photographs. ISBN 0-9508219-1-8. £13.95.—As a long-time Britannophile ("Anglophile" is too restrictive), I never thought I would use the word "British" as a pejorative, but this was my inevitable reaction upon finishing this book. It is overwhelmingly insular in its coverage. Nothing in the title or subtitle, or even in the publisher's jacket blurb, warns the reader that the book's emphasis is on the history of ornithology *in Great Britain.*

The 11 chapter titles reflect the author's division of ornithological history into more-or-less discrete periods: The Primitives, First Scientific Approaches, The Birth of the Modern Bird Book, The First Popularisers, The Post War Period, etc. Most of the 20 illustrations are portraits of ornithologists. Four are of pages or covers of books, and there is one photograph each of a collection of British handbooks, from Witherby to Cramp et al., and of three bookshelves of field guides.

Documentation within the text is nonexistent. There is an unexplained and unannotated "Select bibliography" of 27 titles, plus a list of 6 journals. Oddly, only the name of the journal *British Birds* is enclosed in quotation marks, an unexplained singularity.

Consider the idiosyncracies of the text. In a "history" of this kind, Tate could hardly avoid mentioning Audubon, but "The Birds of America" was, let us not forget, produced in England. Audubon occupies about half of the pages of a chapter entitled "Audubon and Gould" (which has a page devoted to Prideaux John Selby inserted in the middle). Within the account of John Gould, no mention is made of the major portion of Gould's Australian collection (including 314 type specimens) now in the Academy of Natural Sciences of Phildelphia (Meyer de Schauensee 1957, Proc. Acad. Nat. Sci. Philadelphia 109: 124–130). In a later chapter entitled "Establishing US ornithology," the only 19th-century American ornithologists mentioned are Baird, Coues, Cassin, and Elliot. The British are constantly given credit for each advance in ornithological knowledge, whether or not such studies had been underway earlier in other countries. For example, Tate claims that "little serious work towards [the] amplification or verification [of the theory of migration] was carried out until the

1880s, when the British Association for the Advancement of Science appointed a special committee to study bird migration, a world pioneering effort in this field." He implies that the British Ornithologists' Club committee formed in 1904 "with the object of collecting records from around the country registering the arrival and departure dates of the summer visitors" was also a pioneering project. To anybody inclined to believe this, I recommend the examination of (for instance) the introductory pages of vol. 1 of E. H. Eaton's "Birds of New York" (publication date given as 1910 but manuscript submitted in 1908), in which arrival and departure dates are given for localities in 59 counties of New York; all of these data obviously were collected before 1908, and many of the migration dates were extracted from local lists published between 1844 and 1901. Two more of numerous possible examples of Tate's provincialism must suffice. He says of Wilfred Alexander (1885–1965), "He was one of the first to appreciate that in mountain areas different bird species occupy different altitudinal 'layers.' " Has Tate ever heard of C. Hart Merriam? Certainly. The name appears twice in Tate's index, once because Elliott Coues "became embroiled in arguments and quarrels with two other ornithologists, Clinton Hart Merriam and Leonard [= Leonhard] Stejneger" and once within a list of ornithologists that Alexander Wetmore met when he first went to Washington.

Perhaps the most incredible of Tate's statements is on page 172: "... early attempts by individuals at providing distribution maps go back at least to 1947, when James Fisher's 'Bird Recognition' appeared." The 1910 volume of Eaton's "Birds of New York" cited above contains excellent statewide distribution maps for 35 breeding species, maps that are invaluable for documenting historical range changes.

Tate's treatment of the ornithological literature from the European continent is equally perfunctory. On page 29 he states: "Although the achievements of Brisson, Buffon and Linnaeus lie outside the scope of this book [*why*?], some reference must be made to them because of their enormous influence upon the entire zoological world." The two Frenchmen are then disposed of in less than a page, and a full page is generously granted to Linnaeus.

Tate's subtitle is utterly inaccurate. Of the three nouns in his title, Tate's emphasis is overwhelmingly on the men, not the birds or the books. He appears to be more concerned with letting us know which of the colleges of Oxford or Cambridge an ornithologist "went up to" than in evaluating that author's contributions to science. Personalia (one could justifiably say "trivia") abound. In his discussion of Ernst Hartert he states, "His great work 'Die Vogel [= Vögel] der Palaarktischen [= Paläarktischen] Fauna' although written in German was largely the result of work done in England and was one of the most important taxonomic works yet to be published." There is no description of the contents of this landmark work, nor any explanation of its importance. But we are carefully informed that Hartert "was an interesting character, pedantic with an obsessive regard for detail, he never lost his thick German accent throughout the many years he lived in England. In his appearance too he was typically Prussian, with an egg shaped head covered with short bristly tan-coloured hair." This description is not only typical of Tate's Anglocentrism and obsession with personal characteristics, but also (in its first half) illustrates his frequent problems with sentence structure.

Sloppiness in details abounds in Tate's book. The Arthur A. Allen Award is correctly attributed to Cornell University on page 169, but to the American Ornithologists' Union on pages 164 and 172. On pages 130, 131, and 132 appear, in succession, "vertibrate" for vertebrate, "Sennet" for Sennett, and "Columbia" for Colombia (twice). On page 91 Lord Lilford is said to have died following a "stoke," and his magnum opus is called "The Poloured Figures of the Birds of the British Isles."

Tate indulges in several questionable value judgments. He states that "there was no justification whatsoever" for MacGillivray's calling the blackbird the black thrush (why not?). According to Tate, the same hapless MacGillivray "came very close to discovering the taxonomic importance of the musculature of the vocal organs, but instead veered off from this line of research in order to concoct a classification based upon the structure of the digestive organs, which was virtually useless." Hindsight is often clear but who knew, in the first half of the 19th century, that this system would prove to be "virtually useless"? Very British indeed is Tate's evaluation of the painter Archibald Thorburn: "Few have equalled and none surpassed his work." It would be interesting to know in what way Thorburn has never been surpassed. Tate peripherally mentions Louis Agassiz Fuertes, a contemporary of Thorburn, three times, but nowhere is there an evaluation of Fuertes's work (other than the application of the adjective "great") or mention of any of the books he illustrated.

Tate is apparently both guillible and zoologically naive, as he repeats without comment a story about Lord Lilford, one of whose pet armadillos is alleged to have "promptly escaped and ate one of his neighbor's cats."

In addition to innumerable biographies, autobiographies, and detailed obituaries of individual ornithologists, several serious historical works are available, such as Stresemann's "Ornithology from Aristotle to the Present" (1975) and Farber's "The Emergence of Ornithology as a Scientific Discipline: 1760–1850." I see no reason for anyone to bother reading, much less buying, Tate's parochial and carelessly executed "literary history."—KENNETH C. PARKES.

Galapagos, a natural history guide.—Michael H. Jackson. Figures and line drawings by Monica J. Jackson. 1985. Calgary, Alberta, University of Calgary Press. xiii + 283 pp., 16 pp. of color plates. ISBN 0-919813-10-0. Paper, $17.50.—As the numbers of visitors to the enchanting Galápagos Islands of Ecuador have swelled to over 20,000 a year, there has been a near-parallel blossoming of sober scientific treatises, colorful picture books, and authoritative field guides about this modern-day Mecca of naturalists. Michael Jackson (the name alone attracts the attention of a large popular audience) has written a modest-sized handbook for the layman and experienced field naturalist. He summarizes the historical background, environmental setting, natural histories of plants and animals, and management and conservation practices of the Galápagos National Park Service. This volume is undoubtedly the premier English-language field guide to the Galápagos! The author has made a judicious selection of information from the published works of hundreds of scientists, which he freely acknowledges.

Among the 13 chapters, several are noteworthy for their comprehensiveness and accuracy of information. The 37-page discussion of the problems of colonization by founding populations, biological evolution, and ecology is lucid and prepares the reader for an understanding of the special attractiveness of the Archipelago, especially the evolutionary processes bringing about species diversity. It is fitting that the avifauna, which dominates the biota of the Galápagos, should occupy three chapters covering 68 pages. The discussion is grouped into seabirds, coastal birds and migrants, and land birds. Although the natural-history information is adequate for the uninitiated observer, the more experienced birdwatcher will want to have a specialized handbook available for the identification of confusing species of seabirds, e.g. M. P. Harris's (1974) "A Field Guide to the Birds of the Galapagos" (London, Collins).

Darwin's finches are treated sensibly without the author becoming involved in such controversial matters as their specific mainland ancestors (which do not exist today) or the role of interspecific competition in their speciation and geographical variation. Unfortunately, the author perpetuates misinformation regarding the number of breeding species of finches on the remote northwestern island of Darwin (Culpepper). I am the only ornithologist to have spent time atop the tableland of this formidable volcanic remnant during the breeding season of the birds, where only the Warbler Finch and the Sharp-beaked Ground-Finch occur and breed. Reports of other species relate to vagrants foraging close to the intertidal region. This point is stressed because island modelers arrive at misleading conclusions about environmental factors regulating the number of species of birds on islands.

One of the great strengths of the Jackson volume is the 30-page treatment of the plant life of the Galápagos. Following a brief summary of the origins and adaptive radiations of the flora, there is a well-illustrated annotated list of the dominant plants according to vegetation zone. With this volume in hand the commonest species encountered along the roadways leading from the coast to the uplands of the larger islands can be identified easily.

Because a good deal of a tourist's time is spent in interisland travel, with plenty of opportunity to observe marine mammals, it is a pity more information on field identification about whales is not provided. Such information is readily available in figure and tabular form in "Guide to the Identification of Eastern Pacific Whales, Dolphins and Porpoises" (1982, NOAA Tech. Rept. 444, U.S. Dept. Commerce). For example, no mention is made about frequent sightings of Bryde's whale. However, this omission might be traceable to the fact that workers in Ecuador, Peru, and Chile only recently have distinguished Bryde's from the sei whale.

Over 160 black-and-white photographs are scattered throughout the text, although a few lack sufficient contrast or sharpness to make them useful. Whatever is lacking here, however, is more than compensated for in the 37 color photographs grouped before Chapter 1 and providing an eye-catching smorgasbord of Galápagania.

Overall, this compact guide makes for pleasant reading and easy learning. It should serve as a useful reference work for the first-time visitor to the Galápagos and as an introductory text worthy of a place in the stacks of public libraries and colleges. After giving this field guide a 6-week field trial in February–March 1986, I conclude: don't leave home without it!—ROBERT I. BOWMAN.

Immigrant killers: introduced predators and the conservation of birds in New Zealand.—Carolyn M. King. 1984. Auckland, New Zealand, Oxford University Press. 224 pp., 13 color plates, 57 black-and-white plates, 40 text figures. ISBN 0-19-558121-0. $35.00.—Since humans first arrived in New Zealand 1,000–1,200 years ago, 55 taxa of that country's native birds have become, or are nearly, extinct. The introduction of predators has frequently been blamed for most of these extinctions, but the evidence is not at all clear-cut. This uncertainty is due primarily to the inherent difficulty in separating the influences of predation and habitat destruction on New Zealand's native avifauna. In this book Carolyn King, who has studied the biology of New Zealand's introduced mustelids

for a number of years, traces the impact of predation on native birds and discusses what steps should be taken in the areas of predator control and habitat preservation to prevent further extinctions.

The book is divided into seven chapters. In Chapter 1 King describes New Zealand before the arrival of humans and argues that New Zealand's lack of terrestrial predators made native species particularly susceptible to predation by introduced predators. Human occupation of New Zealand is divided into three periods, the Polynesian period (8th–18th centuries A.D.), the early European period (1769–1884), and the later European period (1884–1984). The predators introduced during each period and their effects on the avifauna are presented in Chapters 2–4. In Chapter 5 the conservation of New Zealand birds is discussed, with descriptions of efforts to save several of the country's endangered species. In Chapter 6 the effect predators and habitat destruction have had on New Zealand birds is compared with the effect of these factors on birds of Lord Howe Island, the Hawaiian Islands, Australia, and Britain. The book concludes with a summary of King's ideas on the conservation of New Zealand birds and conservation in general.

Carolyn King's major thesis is that bird species that evolve on isolated predator-free islands, such as New Zealand, are highly vulnerable to predation by introduced predators. King cites examples of widespread extinction of island species from several locations besides New Zealand, including Lord Howe Island and the Hawaiian Islands. Not all species on predator-free islands are, however, equally vulnerable. The degree of vulnerability, King suggests, is due in part to the length of time an island population has been isolated from its original parental population. In New Zealand those species that exhibited the greatest degree of endemism were usually the first to become extinct when humans and predators arrived. The best-known example is the Moas, which are thought to have been isolated in New Zealand since the Cenozoic. Most species of Moas became extinct very soon after the arrival of humans. King suggests that those species of native birds that are not rare and endangered have adapted to predation pressure. In many cases these species are endemic only at the generic, specific, or subspecific level, suggesting that their isolation has not been for very long and that they may not have lost all adaptations against predators.

King argues effectively that predator control is not an economical method for conserving native New Zealand birds because, as stated above, many of the species that remain have adjusted to the predation pressure. Therefore, reduction of predator populations will have little if any effect on bird populations. Furthermore, it is not feasible to kill all predators in New Zealand, and thus one has the problem of immigration from outside the area of treatment. The author does point out, however, that in certain circumstances predator control may be possible. For example, the New Zealand Wildlife Service has eliminated predators on small offshore islands. Rare and endangered species from the mainland have been placed on these islands for protection. Predator control may also be advisable in situations where a species is extremely vulnerable to predation but cannot be transferred to an offshore predator-free island. An example of such a bird may be the Black Stilt (*Himantopus novaezealandiae*). Because attempts to control predator populations are futile, King advocates that conservation in New Zealand be concentrated on preserving the remaining native forest, which is being cut rapidly. In addition, conservationists should concern themselves with controlling populations of introduced browsing mammals such as the red deer (*Cervus elaphus*) and the brush-tailed possum (*Trichosurus vulpecula*), which are responsible for destroying large areas of native forest. Birds may be able to adapt to predation pressure, but no species can survive when its environment is rapidly destroyed.

"Immigrant Killers" was written primarily for the New Zealand public. The conclusions drawn, however, are applicable to other locations, and I therefore recommend the book to anyone interested in conservation in general and particularly to those interested in the conservation of island species. Professional biologists will find the list of references at the end of the book useful for obtaining more detailed information on examples in the text.—JAMES B. CUNNINGHAM.

A dictionary of neotropical wetlands.—Derek A. Scott and Montserrat Carbonel (Compilers). 1986. Cambridge, England, IUCN; and Slimbridge, England, IWRB. 684 pp., 8 octavos. Available in English and Spanish. ISBN 2-88032-504-8. Order from IUCN Conservation Monitoring Centre, 219c Huntingdon Road, Cambridge CB3 0DL, U.K. Paper, £30 (add £5 for airmail outside Europe).—This volume is the result of remarkable cooperation between scientists and wildlife managers throughout South and Central America and the Caribbean in compiling information on one of the world's most threatened habitats: wetlands. In the United States we have long been aware of the need to preserve, or at least regulate the use of, areas of wet soils and open water and the biotas they support. Conservation organizations such as Ducks Unlimited and the Audubon Society, along with state and federal governments, have been active in purchasing wetlands for waterfowl habitat (some would say "production"). In many countries of the Neotropics (with the exception of

the Caribbean and a few countries in Central America), the great values of wetland ecosystems have largely gone unrecognized because of low human population densities. Now that populations in the Southern Hemisphere are increasing, wetland values are coming to be appreciated.

In recent years biologists increasingly have become concerned over habitat destruction in the Northern Hemisphere. The vast expanses of untouched habitat once common in South America are now beginning to be eroded, and are threatened by forest clearing for roads, hydroelectric projects, "agroforestry" operations, and simple population expansion. As South America develops its economic potential over the next century, the same habitat destruction and developmental pressures on wetlands will occur. In an effort to catalogue basic information about these valuable Southern Hemisphere habitats, Scott and Carbonel obtained wetland-habitat information from their "national networks of contacts," individuals and institutions, and the recent literature. As an aside, the publishers are to be commended for making both English and Spanish editions of this volume available. Too often we in the Northern Hemisphere do not make our investigations available to our southern colleagues.

The major wetland sites in each of the 45 neotropical countries are listed. Each site is decribed by name, location, area, biogeographic province, habitat types, site descriptions, general vegetation, land-ownership status, degree of protection afforded the fauna, and land-use effects. An account of the use of the area by waterfowl, and other significant fauna dependent on the wetland habitat (and some not, especially if rare), threats to the area, research and conservation areas, recent literature citations, and names of individuals providing the information for the site are given. An outline map showing the locations of each site covered is provided for each country, and is keyed to the text.

Scott and Carbonel have chosen to focus on the values of wetlands that are of benefit to waterfowl, for waterfowl are good indicators of wetland habitat, and, further, waterfowl are the only group of higher fauna on the globe that may migrate between the wetlands of both hemispheres or migrate within hemispheres. For the purposes of the dictionary "the term [waterfowl] has been restricted to wetland species of the Gaviidae, Podicipedidae, Pelecanidae, Phalacrocoracidae, Anhingidae, Ciconiidae, Threskiornithidae, Phoenicopteridae, Anhimidae, Anatidae, Opisthocomidae, Gruidae, Aramidae, Rallidae, Heliornithidae, Eurypygidae, Jacanidae, Rostratulidae, Haematopodidae, Charadriidae, Scolopacidae, Recurvirostridae, Phalaropodidae, Laridae, and Rhynchopodidae." Species of pelicans, cormorants, and gulls confined solely to marine systems and Spheniscidae, Procellariiformes, Phaethontidae, Sulidae, Fregatidae, and Stercorariidae are excluded.

Full scientific names of bird species listed for each of the sites are given, but the short vegetation descriptions usually give only generic names of the plants; when specific names are given, they lack the authorities. This is especially important in botany, where there are over 250,000 species of flowering plants alone, and more important in the diverse and not often well-studied tropical floras, where the nomenclature has not reached the relative stability present in north-temperate European and American botany.

But that is mere niggling: the compilers have taken a vast amount of information, set it in order, and produced a work that is an excellent source of basic information on potential research areas, and a source book for more detailed information (respondent's addresses and an annotated checklist of the waterfowl species dealt with are included in appendices). Taken in its entirety, the volume is an excellent description of the present state of a vital portion of the environment of the Southern Hemisphere.—MICHAEL WM. LEFOR.

The Ring-billed Gull in Ontario: a review of a new problem species.—H. Blokpoel and G. D. Tessier. 1986. Occasional Paper No. 57, Canadian Wildlife Service, Ottawa, Ontario. 34 pp. ISBN 0-662-14302-7; ISSN 0576-6370. No price given.—This disturbing report begins with a current and accurate description of the breeding range of *Larus delawarensis* and a discussion of the population changes that have occurred in the Great Lakes region. This part of the report displays the scientific quality we have come to expect of Canadian Wildlife Service publications. Unfortunately, much of the document resembles a witch-hunt where the authors attempt unsuccessfully to prove the Ring-billed Gull is a serious pest that must be controlled range-wide, though they admit ". . . there are very few reports that adequately document" Ringbills as public enemy number one.

As the authors describe the types of problems Ringbills *might* cause, their enthusiasm about being the first to describe an "imminent plague" and fabricating a plan for saving the world from this threat almost convinces the reader that a problem has been *proved* to exist. Their approach is reminiscent of arguments presented by many state and federal predator-control specialists whose primary concern was keeping themselves employed by eliminating pest species. If you show a species *may* affect agriculture, human health, safety, or other human-related endeavors, the probabilities are increased that funds will be provided to study the problem.

The authors attempt to show that the "Ring-bill

problem" is far from peaking because the population is still exploding. They conclude erroneously that reproductive success is higher than in the 1950's because they include Fetterolf's figures (1983, Wilson Bull. 95: 23–41) in their calculations, which may be viewed with suspicion. Furthermore, most of the studies cited followed survival through only 21–23 days of nest life, not the >35 days required before first flight. The number of fledglings produced annually is perhaps more than 20% lower than they calculate. They also fail to cite and place in perspective published evidence showing the potentially devastating effects of predators and human disturbance on Ring-billed Gull reproductive success. Surprisingly, they fail to consider the effects of Great Lakes water levels, which have been rising for several years and are now at an all-time high. Some islands used by larids are now entirely underwater, and most others have been reduced in size. Blokpoel and Tessier ignore the possibility that some of the Ring-bills they report establishing new mainland colonies actually have moved from inundated islands and, therefore, should not be considered as new breeders resulting from the "ongoing population explosion." The importance of cyclic changes in water levels cannot be overlooked when estimating rates of population growth and plotting changes in distributional patterns.

Blokpoel and Tessier alert us to several problems concerning Ring-bills, but none of these are unique to this species. I will comment on four of these as I have experienced them.

Gulls as hazards to aircraft.—This is neither a recent problem nor one unique to Ring-billed Gulls. Gulls are the primary avian hazard to aircraft at most coastal airports. Procedures are available for dispersing gulls from airports and for making the airport environment less attractive to birds. For years, Blokpoel (see Blokpoel and Fetterolf 1978, Bird-Banding 49: 59–65) has studied the establishment of the large Ring-bill colony in Toronto Harbor, which is now suddenly recognized as a hazard to aircraft. Even though Blokpoel wrote a book entitled "Bird Hazards to Aircraft" (1976, Toronto, Clarke, Irwin and Co.) after this colony began in 1973, he made no published recommendation that it be destroyed until recently, nor was the Ring-bill identified as a special hazard until 1984 (paper presented at the 17th meeting of the Bird Strike Committee Europe, Rome, Italy). The gull problem at airports is not recent, and procedures are available to control it on a local basis. There is no need to elevate the issue to one requiring range-wide reduction in Ring-billed Gull population size.

Hazards to human health.—The potential exists for a health problem whenever wildlife and human populations overlap. Usually, the level of risk is low, as seems to be the case around gull concentrations. Blokpoel and Tessier appear to invoke sensationalism to generate sufficient fear among readers to justify action. Pet owners probably have far greater health risk from contact with their dogs and cats than the average person does because gulls might visit park lawns. The authors refer to Toronto beaches being closed because of high *Escherichia coli* counts even though this problem was traced to the sewer system, not the gulls (Fetterolf 1983, unpubl. rept., Metropolitan Toronto and Region Conservation Authority). They also refer to two serious outbreaks of histoplasmosis at Rogers City, Michigan, without giving details sufficient for evaluating the level of risk. My students and I have worked at this gull colony for 25 years, as have others. In the one class incident that Blokpoel and Tessier cite, one student out of six was diagnosed as having histoplasmosis, although the others had coldlike symptoms. The fungus *Histoplasma capsulatum* has been isolated from soils from this colony (see Southern 1986, Colonial Waterbirds 9: 121–123). With proper precautions it is not considered a threat to human health in this area, according to investigators from the Communicable Disease Center who visited the site following the second outbreak cited by Blokpoel and Tessier.

Ring-bills also are blamed by the authors for *destroying earthworm populations* in farm fields. The authors may be attempting to *identify* a problem, even where none now exists. They cite, and then ignore, a detailed study by Cuendet (1979, Ph.D. dissertation, Lausanne, Switzerland, Univ. Lausanne), who concluded that "If food is not limiting, yearly production of earthworms seems equal to biomass . . . and 100% of the biomass can be yearly destroyed without depleting earthworm populations." Farmers who voice concern about gulls eating worms probably give no thought to the numbers killed by their equipment or pesticides. The authors refer to other possible damage to agriculture but point out "it is not well documented."

There is something for everyone with a cause in this report. The authors also elude to Ring-billed Gull *conflicts with other bird species.* Without question, the Caspian Tern (*Sterna caspia*), Common Tern (*S. hirundo*), and Piping Plover (*Charadrius melodus*) are in low numbers in the Great Lakes region. All blame for this situation, however, should not be placed on the Ring-billed Gull. The Caspian Tern population was low before the Ring-bill population showed significant increases. To my knowledge, no cause-and-effect relationship has been shown. Caspian Terns are able to nest among Ring-bills without serious problems provided there is little or no human disturbance. As Blokpoel and Tessier point out, gulls may damage tern eggs when they are exposed when people are present. Because most Caspian Tern colonies are away from human settlements, the principal visitors probably are researchers. The solution in this case appears simple to me.

In the Midwest, most Common Tern colonies are

now restricted to Great Lakes sites, but in the past terns also nested on islands in some of the larger inland lakes. Plant succession and human habitation of such islands, however, forced a declining Common Tern population into direct competition for nesting space with a growing Ring-billed Gull population. Nest-site availability for Common Terns is also severely affected by high Great Lakes water levels. It is inaccurate, therefore, to place complete blame for the Common Tern's plight on the Ring-billed Gull. If sufficient concern exists for the Common Tern, why not create dredge spoil islands for them and obtain the necessary funds to manage sites specifically for this species (which might include local gull control)? The Piping Plover situation referred to by Blokpoel and Tessier is similar. Its predicament is related to increased rates of human recreation on beaches where it nests. The plover's breeding range was restricted in the 1950's before gull numbers increased. Plovers declined further as masses of people invaded the more remote beaches. Unless we are equally willing and capable of recognizing and controlling the impacts of our own species on these sensitive species, we are not in a position to recommend widespread population control for Ringbills. Addressing gull problems on a case-by-case basis and applying local control when necessary, as typically is done now, is preferable to an international effort ". . . to reduce the Ring-billed Gull population in the Great Lakes area (i.e. Great Lakes and the St. Lawrence River down to Trois-Rivières) to an acceptable level," as is advocated by Blokpoel and Tessier.

Blokpoel and Tessier appear perplexed by the lack of concern regarding the "Ring-billed Gull problems" they identify. They state (p. 27), "Unfortunately, there are very few reports that adequately document the hazards to flight safety and to public health, or the damage to agriculture, industry, and tourism." Reports are sure to appear in response to Blokpoel and Tessier's widely distributed report, and the resource agencies will have to show the public they are doing something. The only good news is that this fervid attitude about Ring-billed Gulls probably will lose favor, as did the widespread concerns about the "blackbird problem." It is time that we stop thinking in terms of conquest of nature instead of considering ourselves part of nature. Our fight against nature is, in many ways, a war against ourselves.—WILLIAM E. SOUTHERN.

Blackbirds of the Americas.—Gordon H. Orians. Illustrated by Tony Angell. 1985. Seattle, Washington, University of Washington Press. 164 pp., 101 figures, 12 tables, 2 appendices. ISBN 0-295-96253-4. $24.95.—Gordon Orians has studied New World blackbirds (Emberizidae, Icterinae) for over two decades and has played an important role in the development of many key theories in behavioral ecology. In this book, Orians describes the results of his own and others' studies of blackbirds for a general audience and shares with nonspecialists his insights into the causes of bird behavior. Orians's writing is relaxed and sometimes conversational as he conveys his enthusiasm for his research and its subjects. The text is complemented by 73 black-and-white drawings by Tony Angell of over 60 blackbird species, and by several maps, spectrograms, and photographs of habitats. One appendix gives the scientific names of species mentioned in the text, and a second tabulates information about the spacing patterns, sexual dimorphism, habitats, food, and breeding behavior of 94 blackbird species.

The illustrations are generally well reproduced. Angell's drawings illustrate a diversity of species, often in display postures or behavioral interactions. His style is particularly effective for illustrating birds with black plumages, and the result is pleasing to the eye and effective in conveying information. Occasionally, a species' "normal" body shape is lost because the artist selected a view of the dynamic nature of behavior rather than a standard field-guide posture. Black-and-white illustrations also obscure key differences among some species (e.g. most illustrations of Tricolored Blackbirds look identical to those of Red-winged Blackbirds). One must question the decision not to include color plates, particularly because the group includes some extraordinarily colorful members and an entire chapter is devoted to the functions of coloration. Overall, Angell's illustrations are accurate and add greatly to the text.

The 12 chapters sequentially examine the phylogeny of the group, and its foraging behavior, spacing patterns, nesting behavior, coloration, and display behavior. For most subjects, Orians first discusses current theoretical concepts and then uses a comparative approach to examine how particular patterns of social organization are related to different environmental variables. The final chapter is an epilogue giving Orians's philosphical perspectives on the goals of science, on aesthetics, and on the importance of preserving tropical habitats.

Blackbirds are ideal for comparative studies because they exhibit many different patterns of social organization and occupy a diversity of habitats. Indeed, the major strength of this book is Orians's comparative approach in evaluating competing hypotheses about the evolution of behavior. For example, he advances a convincing argument that the spacing patterns of blackbirds are related to the various habitats they exploit and to the potential that those habitats offer for food and nesting sites. Another example of Orians's use of the comparative method is his argument that the role each sex adopts in nesting is

a consequence of the temporal availability of food resources. He also presents a cogent discussion of the relationship between the degree of sexual size dimorphism of a species and its spacing pattern and mating system. In another interesting comparison, Orians argues that the acoustic properties of different species' songs are related to the sizes of territories that males defend.

Orians attempts to discuss most of the "hot" topics in behavioral ecology. In addition, he addresses subjects that are particularly pertinent to the study of blackbirds (e.g. the evolution of brood parasitism in cowbirds). A few important subjects such as interspecific variation in clutch size are not discussed. Although I did not find any major factual errors, a number of omissions and contradictions do exist. For example, Orians states (p. 133) that "Immature male plumages are prevalent among species with polygynous mating systems. . . ." The data in the appendix, however, show that immature male plumages are equally common in polygynous and in monogamous species. Orians also makes several perhaps overly broad generalizations, extrapolating from Red-winged Blackbirds and Yellow-headed Blackbirds to the whole group. Undoubtedly, specialists will question the usefulness of several of these generalizations. Moreover, I think actual data (if it were available) might refute some of them.

Some of my strongest criticisms of this book are probably the responsibility of the publisher. Orians's "free-flowing" style often results in sentences that are awkward and confusing. Moreover, I found the discussions of several theoretical topics (e.g. optimal foraging) so brief that they will probably cause confusion for a reader with little scientific training. A few inconsistencies in the use of species' common names exist, and several spelling mistakes and typographical errors occur. Finally, the index is too short. Certain key subjects, such as predation, are not included, although they are central to Orians's discussion of several topics.

Another major weakness of the book is the small bibliography. Only 130 references are included, many of which are highly theoretical works for specialists. Several key references to early work on North American species (e.g. Nero 1963, Wilson Bull. 75: 376–413; Orians and Christman 1968, Univ. California Publ. Zool. 84: 1–81) are omitted, as are some very readable articles in review journals (e.g. Searcy and Yasukawa 1983, Amer. Sci. 71: 166–174). References to field guides for many of the tropical blackbirds would be useful. Orians gives no sources for the information used in composing Appendix B. In all fairness, much of this information is probably from his personal observations of tropical blackbirds. However, the lack of sufficient documentation will affect the view specialists will have of this book. For example, in his brief discussion of blackbird phylogeny, Orians asks the reader to trust the opinions of experts. Nonetheless, he departs from the A.O.U. Check-list (supposedly based on the opinions of experts) in his references to certain species (e.g., "Baltimore" Orioles) and even the status of the group as the family Icteridae. Although many, including myself, might agree with this departure, I think a general reader would be interested in the evidence systematists used in reconstructing the evolution of blackbirds.

Overall, I think a general audience will enjoy the book and will value Orians's discussion of some of the questions currently being addressed in behavioral ecology. I fear, however, that a lay person may get the impression that we have many more of the answers to these questions than we actually do. The book also will be useful as a library source from which undergraduates can see how comparative studies are used to address hypotheses about the evolution of behavior. Specialists will be disappointed with the lack of documentation and thus may conclude that many of Orians's arguments are speculative.

My impression is that the publication of this book may be premature. As Orians frequently points out, the information required to answer particular questions is not yet available because so little is known about many tropical species. As yet there is no formal comparative study of blackbirds covering the range of species and the scope of topics dealt with in the book. I agree therefore with Orians's sentiment that, with tropical habitats disappearing rapidly, there is no time to waste if we are ever to know the secrets of evolutionary biology hidden in the natural histories of tropical blackbirds.—THOMAS E. DICKINSON.

Bird etchings. The illustrators and their books, 1655-1855.—Christine E. Jackson. 1985. Ithaca, New York, and London, Cornell University Press. 294 pp. ISBN 0-8014-1695-7. Cloth, $55.00.—In book manufacture and hence in "bird art," etching historically followed the woodcut and preceded the stone lithograph in printing multiple illustrations. In all of them coloring was done by hand, copy by copy. "Etching" in the sense of this book means any inked impression from a metal plate, whether engraved with a tool, etched by acid through lines drawn in a protective coat, or modified by such relatives of these processes as stipple and aquatint. These arts were priced to force all but the most affluent to self-instruction.

Although the title does not say so, all but one of the ornithologists and illustrators treated in this book are British. They are Francis Willughby and John Ray, Eleazar Albin, Mark Catesby, George Edwards, Thomas Pennant, William Hayes, John Latham, John Walcott, William Lewin, James Bolton, Edward Donovan, George Graves, Prideaux John Selby, and Sir William Jardine, with their various artists, etchers,

and colorists if different. Audubon is also treated, because of the unexcelled aquatints of the Robert Havells, Sr. and Jr., that distinguish his work.

But there is nothing here of the much larger body of work by the many continental ornithological writers and artists of the period, the Levaillants, Buffons, Daubentons, Audeberts, Brissons, Bechsteins, Naumanns, Susemihls, and so on.

After a brief background review of the artists, engravers and etchers, authors, patrons, specimens, and publication methods, with four appendices (one on methods of metal engraving is most relevant and instructive), come chapters on each of the authors mentioned above. Several are outstanding figures in ornithological history and others ought to be familiar to experienced American ornithologists. (Albin, Hayes, Walcott, Bolton, Graves, and Donovan might not be.)

The book is written as history and clearly rests on considerable scholarship, often including previously unexamined original sources. Yet it is pleasantly free of obtrusive pedantry and excessive documentation. Notes occur at the end, with selected general and chapter bibliographies. I found only one typographical error.

The author's choices of area and subject limit perspective. They preclude definitive evaluation of etched bird art for the period, much less of ornithology, and hamper her occasional efforts in these directions.

Within the area of reasonable expectations, she does very well. Interesting human portraits and piquant discoveries emerge. We learn, for instance, of Albin's quaint way of mixing vermilion (one of the ingredients being boys' urine), and of Hayes' heartbreaking efforts to rear 10 (of 21 "legitimate") offspring to maturity. We find John Latham, the most prolific systematic ornithologist of his or perhaps of any time, vigorous and working at 95; and William Lewin illustrating all 160 copies (there was complaint that he did not issue more) of his birds of Britain, with 271 *original* watercolor paintings each, and still living to etch most of them for a second edition. With the chapters on the gifted Selby and his extraordinarily entrepreneurial friend Jardine, Jackson provides an exciting view of a vibrant time in ornithological history.

While much of their graphic work (well illustrated by 4 color plates and 76 monochrome figures) is nearly primitive to mediocre to quaint, Jackson's subjects emerge as interesting members of what with attractive insight she terms a cottage industry (and I submit perhaps peculiarly British): people of often modest means and minimal training united by intense motivation and awesome stamina in producing illustrated bird books and related natural history.

Biologists avoid the phrase "birds and animals" consistently used by Jackson, nor, probably, would one call the index of bird names "avifaunal species." Thus, because no ornithological assistance is acknowledged, it was a pleasant surprise to find the identities and names of birds (based on the A.O.U. Check-list, 5th ed., latest B.O.U. list, etc.) in all but a few cases.

This book should be useful in research libraries with major ornithological content or comprehensive print collections. I recommend it also to serious students of the history of bird painting and of ornithology.—ROBERT M. MENGEL.

Catesby's birds of colonial America.—Alan Feduccia (Ed.). Chapel Hill, University of North Carolina Press. 176 pp., 16 color plates, 109 black-and-white illustrations, 1 map. ISBN 0-8078-1661-2. $29.95.—The first publication illustrating birds for a large region of the New World was Mark Catesby's "The Natural History of Carolina, Florida, and the Bahama Islands," published in 11 20-plate installments between 1731 and 1743. As a collector for his patrons in Britain, Catesby had studied the plants, insects, and vertebrates of this region. In 1974 the Beehive Press of Savannah, Georgia, produced a beautiful facsimile edition of this work. It is available now from the Johnson Reprint Corporation (111 Fifth Avenue, New York, New York 10003) at a cost of $575 for a boxed set.

In the present volume, editor Feduccia has included beautiful color reproductions of 20 plates and black-and-white reproductions of all 109 of Catesby's plates of birds; the latter are severely reduced in size. The original text has been lightly edited and set in modern type.

After Catesby's text describing each species of bird, its habits, and those of the plants depicted with the bird, Feduccia provides extra general information and historical notes that add perspective. He includes quotations from John Lawson's "New Voyage to Carolina" (1709), Alexander Wilson's "American Ornithology" (1808–1814), and John James Audubon's "Birds of America" (1827–1838). We learn, for instance, that Catesby took much information from Lawson and that seven plates (none of them birds) were plagiarized versions of illustrations made in the 16th century by John White. To help the reader, the sequence of the plates is mostly the modern order, and the current English and scientific names are provided. It is sobering to realize that Catesby's work preceded Carolus Linnaeus's 10th edition of the "Systema Naturae." Feduccia has made Catesby's contributions to 18th-century natural science available at a moderate cost to students of the history of ornithology and scientific illustration. I recommend the book highly.—FRANCES C. JAMES.

OTHER ITEMS OF INTEREST

Fauna CSSR: Ptaci, vol. 3(1-2).—Karel Hudec (Ed.). 1983. Prague, Academia. 1,234 pp., 29 color plates. Cloth, 180 Kcs.—The appearance in 1983 of vol. 3 in 2 parts completes this momentous handbook of Czechoslovak birds. Volume 1, published in 1972, covered Gaviidae through Pandionidae; vol. 2, published in 1977, dealt with Falconidae through Columbidae. This volume follows the format of earlier volumes, with the addition of maps depicting the breeding and wintering distribution of all species treated. The text follows a standard handbook format with paragraphs on characterization of species and subspecies in Czechoslovakia, measurements of Czech specimens, behavior and vocalization, distribution in the CSSR, habitat requirements, movements, breeding biology, and food. The volume concludes with 19 color plates of the species covered in vol. 3, including females and immatures where different, and 10 color photographs of the eggs of these same species. A summary in German makes some of the information in this volume available to non-Czech linguists.—WARREN B. KING.

Madárökológia [Bird ecology].—Lajos Sasvári. 1986. Budapest, Hungary, Academic Publisher. 2 volumes, 167 + 162 pp., 21 + 26 figures. ISBN 963-05-3919-5. No price given.—A surge of interest in nature conservation, birding, bird banding, and scientific ornithology, foremost among the younger generation of Hungarians, has created a need to interpret the elements of bird ecology for the educated public. Dr. Sasvári's books fill this need. The first of the pocket-size softback volumes deals with distributional ecology and the methods used to census and assess bird populations. Energetics at the autecological level, food and feeding strategies, and finally, defense mechanisms of avian prey are discussed. The second volume deals with the biology of reproduction, population dynamics (including *r* and *K* selection), and basic synecological topics such as predator-prey relations, competition, symbiosis, niche, and habitat relations. All chapters are presented with a rendering of the concepts and paradigms of modern evolutionary ecology and ethology as we knew them in the 1970's and early 1980's. Most examples and many of the conclusions are taken from the European literature, but some 30% of the references are from the United States. Much of the contemporary ecological terminology is presented in its original (English or Latin) form, while others are supplanted by well-chosen Hungarian expressions. We hope the author continues this valuable work with further volumes on ecology and ethology of migration, the methods and results of which are not yet covered but are equally important to be made available for readers of the Hungarian language.—M. D. F. UDVARDY.

Dinamica si migratia pasarilor [Movements and migrations of birds].—Victor Ciochia. 1984. Bucharest, Rumania, Editura Stiintifica si Enciclopedica. 346 pp., 200 figures. Price 19 lei.—A hardcover, pocket-size handbook for banders. The introductory chapter relates the history of bird banding, worldwide as well as in Rumania, and its importance for faunistics, population dynamics, and conservation is stressed. Next, the technicalities of banding are described in great detail: where, when, and how to catch the subjects of banding. Good drawings illustrate the mist net, the Heligoland trap, various baited traps, catcher nets, and the bands used in Rumania. Linear and other measurements, fatness scale, deparasitizing, and safe release methods highlight the methodological chapter. The bulk of the book is a checklist with identification keys for terrestrial and wetland birds (waterfowl and upland birds are excluded) important in the banding program. Each species is described briefly with measurements and distinguishing marks (difficult species or their key characteristics are often illustrated with adequate line drawings). A few words describe characteristic habits and habitats.

The book is written in Rumanian, which is relatively easy to follow if the reader knows some elementary French, Italian, or Spanish. Thus, birding visitors to the Danube Delta, or to the rugged, beautiful Transylvanian Alps, might make good use of this nice book. It certainly enhances banding in Rumania, so important for our international science.—M. D. F. UDVARDY.

The fall of a sparrow.—Sálim Ali. 1985. Delhi, India, Oxford University Press. xv + 265 pp. ISBN 0-19-561837-8. Cloth, $16.95.—No one has contributed more to our knowledge of the birds of India and Pakistan, as well as to their protection, than has Sálim Ali. Now 90 years old, he was persuaded by his friends to publish some reminiscences, and the present volume proves what a splendid idea this was.

Sálim Ali, the youngest of nine children, grew up in a well-to-do, closely knit, liberal Mohammedan family in Bombay. Although destined for a business, his love for birds resulted, after some trials and errors, in an ornithological career. By an act of fate the unknown and inexperienced 34-yr-old Sálim decided in 1929 to get his ornithological training in Berlin under Stresemann, and this priceless experience changed his life. In October 1931 Sálim Ali started his first ornithological survey of a poorly known region of the Indian peninsula and has continued such surveys of the Indian subcontinent almost to the present. They

led him from the deserts of Sind, to Afghanistan, Tibet, and the jungles of Assam, and resulted in his unrivaled knowledge of the birds of the region. In due time this knowledge was made available in a series of articles and books, culminating in the 10-volume "Handbook of the Birds of India and Pakistan," for which Dillon Ripley did the systematic part and Sálim Ali did the descriptions of ecology and life histories.

"The Fall of a Sparrow" is not a well-organized biography but a fascinating set of reminiscences. In the course of his long life Sálim Ali encountered most of the ornithological greats of his period, including Stresemann, Meinertzhagen, Whistler, J. B. S. Haldane, and David Lack, and he describes them with humor, frankness, and psychological perceptiveness. Those who knew the unforgettable Lok Wan Tho will appreciate the sensitive account of this wonderful person. Mary and Dillon Ripley are among his closest friends, and on many expeditions shared the camp life with him. Most of the work was under the auspices of the Bombay Natural History Society, an organization that has done much for the knowledge and protection of Indian wildlife. Eventually Sálim Ali's merits were duly recognized and he was awarded numerous medals, honorary degrees, and other honors, including the J. Paul Getty International Prize for Wildlife Conservation. Deservedly so, because it was surely he, more than anyone else, who made India conscious of wildlife conservation. Even a non-ornithologist can enjoy this volume, with its vivid descriptions of the Indian landscape and people.—ERNST MAYR.

A natural history of the ducks.—John C. Phillips. 1986. New York, Dover Publications, Inc. 1,920 pp. in 4 volumes, bound as 2; 176 plates. ISBN 0-486-25141-1 and 0-486-25142-X. $100.00 for the set.—A reprint facsimile edition of Phillips's classic (reviewed 1923, Auk 40: 356). Unlike Bent (1923), Johnsgard (1975), and Palmer (1976: vols. 2, 3), coverage is worldwide, but limited to the Anatidae.

The reproduction is complete and unabridged, but the numbering sequence of the color plates is changed. Illustrations include works by Brooks, Fuertes, and Benson. The systematics is often outdated, but Phillips foresaw many changes in numbers because of environmental changes, hunting pressure, and human interference. For some extinct or nearly extinct forms much of the natural-history data are irreplaceable. Other material includes descriptions of plumage for all age classes, distributions, and a broad variety of general habits. For many species the "food value," behavior in captivity, and hybrids are included. A considerable proportion of the text is anecdotal. Numerous quotes are accepted uncritically, and Phillips is exceedingly free with observations, rebuttals, and remarks of his own. This makes for very colorful reading in various passages.

The volumes are something of a classic, but clearly from another era. There is a charm in their datedness, a considerable amount of information, and a tremendous reservoir of historical detail in these pages.—A.H.B.

The distribution of the birds of California.—Joseph Grinnell and Alden H. Miller. 1944 (reprinted 1986). Cooper Ornithol. Soc., Pacific Coast Avifauna No. 27. 615 pp., 57 maps. Order from Artemisia Press, P.O. Box 119, Lee Vining, California 93541. ISBN 0-932347-01-0. Cloth, $25.00; paper, $18.00.—A reprint of a legendary volume. This volume is still a benchmark for studies of the distribution and occurrence of the birds of California. A single plate, reproduced in black and white, illustrates 8 subspecies of Song Sparrows in the state. The text epitomizes the use of trinomials, a speciality of the "Berkeley School." Habitat descriptions are unmatched (a Miller speciality) and provide a baseline for studies on environmental change in our most populous state.—A.H.B.

Fraser Darling's islands.—John Morton Boyd. 1986. New York, Columbia University Press (for Edinburgh University Press). vii + 252 pp., 32 photos, numerous small maps. ISBN 0-85224-514-9. $25.00.—This volume, in the words of the author, "is not intended to be a biography." Instead it is a "portrait" told in great part by quotations from Fraser Darling's books, journals, and letters. The author's words provide continuity and perspective.

Fraser Darling was a widely known conservationist and returned to Scotland frequently. This book records a time when he was happy there and concerned vitally with its preservation. He influenced strongly the efforts to understand and preserve the natural history of this portion of the world.—A.H.B.

Birds of South Africa 1: Kruger National Park.—Kenneth Newman. 1981. Johannesburg, South Africa, Macmillan. xii + 242 pp., 106 color plates. ISBN 0-86954-103-X. Available from ISBS, Inc., 5602 NE Hassalo Street, Portland, Oregon 97213 USA. $14.50.—This is a reissue of a volume first published in 1980 and reprinted in 1981. It illustrates 438 species in a series of plates, plus the Ostrich on the back dustcover. The species accounts are accompanied by small distributional maps, and there are two larger maps with place names and major vegetation areas. The accounts include status and range, a brief description of each bird and its habitat, possibly confusing species, and voice.

The plates often are crowded, but include scales for size comparisons. Color morphs, immature plumages, sexual dimorphisms, some display postures, and flight patterns are shown for many species. A small glossary and index of common names are included.

This would be a handy guide for visitors to this large park.—A.H.B.

Crows of the world.—Derek Goodwin. Illustrations by Robert Gillmor. 1986. Second ed. London, British Museum Natural History. 229 pp., 6 color plates, numerous unnumbered text figures and maps. ISBN 0-565-00979-6. Cloth, $30.00.—This is a new edition of a classic volume on the world's corvids (reviewed in 1978, Auk 95: 210–211). It is noticeably shorter (150 pp.) because of the introduction of a double-column format. There are a variety of other style changes: references to authors' names are in boldface, subheadings are in lightface. The new format reduces considerably the blankness around figures. The text of the species accounts is essentially descriptive, and there are only minor changes from the first edition.The print quality of Gillmor's black-and-white renditions is improved markedly.

There are three new color plates, but precious little update of the references. The numbered figures, mostly entitled "Presumed relationships of . . . ," are essentially unchanged. Goodwin does not indicate how these diagrams were derived; presumably they are pictorial representations of his opinions and experience. The indices of common and scientific names are retained.

The strength of this volume is still its broad and even-handed covering of a difficult family. There is no better single source of information on crows.—A.H.B.

DATE OF ISSUE (Vol. 104, No. 2): 20 April 1987