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.

Diving Birds of North America.—Paul A. Johnsgard. 1987. Bloomington, Indiana, Indiana Univ. Press. xii + 292 pp., 32 color plates, 56 text figures, 28 maps. ISBN 0-8032-2566-0. $45.00.—The format and style of a Johnsgard book have become so well known that it seems almost superfluous to review them. This volume differs somewhat from previous ones, though, in that it deals with three separate phyletic groups of birds: the loons (Gaviidae), grebes (Podicipedidae), and auks (Alcidae). The title is somewhat misleading. Several major groups of diving birds such as cormorants and diving ducks are not covered, but the alternative title, "The Loons, Grebes, and Auks of North America," seems unduly cumbersome. Indeed one wonders why these particular groups have been lumped under one title.

Johnsgard anticipates this question in his preface: "... I began to think in terms of dealing collectively with all the North American "diving birds," in spite of the artificial 'lumping' this approach would require. As I considered it further, it seemed that such coverage would emphasize the impact of convergent and parallel evolution better than would dealing with the patterns of adaptive radiation within a single phyletic group as has been the typical approach of my earlier books."

As in his previous books, Johnsgard aims to "walk the line between scientists and laymen without being patronizing to one or the other." This is a badly needed but probably impossible task that amounts to trying to "please all the people all the time." The outcome is inevitably a compromise that will displease many members of both groups. As attested to by his popularity, Johnsgard succeeds better than most.

Johnsgard divides this volume into two sections: I. Comparative Biology, and II. Species Accounts. The first section comprises about one-third of the book, and relies heavily on tables and figures to synthesize the comparisons. The section includes 36 tables and 29 figures that draw together information from a wide variety of sources.

I like this approach very much and find many of the comparisons informative and innovative. Where else can you look at a single range map (Map 3) to find out to which state you should consider moving in order to have the highest breeding species density of grebes in your neighborhood? (The answer is North Dakota.) Or, for those who fancy grebes only as a weekend hobby, Appendix 4 gives you the relative abundance and breeding status of grebes on our National Wildlife Refuges. For alcid enthusiasts, Appendix 5 lists the size and location of the major alcid colonies in North America.

There are also tables that summarize at a glance available information on flight speeds, wingbeat rates, wing loading, foot loading, diving durations, diving depths, food habits, courtship displays, life history data, clutch sizes, breeding densities, and breeding success rates of this diverse group of birds. Although such tables oversimplify because they do not allow inclusion of the innumerable caveats and exceptions that need be presented in more thorough reviews of such subjects, Johnsgard cites the original sources so that they can be examined by less casual readers.

In the second section, Johnsgard provides species accounts that include: subspecies distribution, detailed descriptions, measurements and weights, identification in the field and hand, ecology and habits, general biology, social behavior, reproductive biology, evolutionary relationships, and population status and conservation. These divisions make it easy to use the book as a reference. This logical framework has been well received in previous volumes.

A full-page distribution map for each species allows much more detail than in field guide maps. This is true particularly for the alcids, where individual colony sizes and locations are shown, and provide a clearer picture of the highly-clumped distribution of these colonial species. Unfortunately, two of the auk range maps (Maps 27 and 28) have been switched, giving the Atlantic Puffin (*Fratercula arctica*) a breeding distribution in the northern Pacific and the Horned Puffin (*F. corniculata*) a north Atlantic distribution.

In the preface, Johnsgard characterizes himself as a diving bird enthusiast rather than an expert on these groups. His desire was to provide a book that would update A. C. Bent's (1919) classic "Life Histories of North American Diving Birds." In this respect, it is unfortunate that he did not incorporate the Thirty-fifth supplement to the A.O.U. Check-list of North American Birds (1985, Auk 102: 680–686), which included recognition of two new species in these groups: the Pacific Loon (*Gavia pacifica*) and Clark's Grebe (*Aechmophorus clarkii*). Although he cites the revision in a footnote, the omission of these two species as separate entries in the table of contents and in the species accounts is particularly noticeable because of the small numbers of North American species in these two groups. The footnote approach was taken for obvious practical reasons. It avoided revision of a large

number of the tables and figures, yet this dates the book as pre-1985 despite its 1987 publication date.

The color plates are of variable quality. Certainly it was unnecessary to use a photograph (Plate 5) of a Pied-billed Grebe (*Podilymbus podiceps*) standing on a footmat. Because my interests lie with the grebes, I read that portion in greatest detail, looking for the types of errors that seem inevitably to find their way into reviews of this sort. The most serious one I found was a reversal of the legends for two composite figures (Figs. 34 and 35) that describe the elaborate courtship ceremonies of the Horned Grebe (*Podiceps auritus*). Unfortunately, since many of the postures appear to nearly fit the descriptions, this reversal may not be obvious to readers not intimately familiar with the group. Because each figure contains 10–11 separate diagrams this simple reversal results in 21 display postures being mislabeled. Persons interested in wing loading of diving birds also may be confused somewhat by Table 8, where the wing area and weight measurements for the Giant Pied-billed Grebe (*Podilymbus gigas*) are reversed.

In a composite drawing (Fig. 38) of Western Grebes (*Aechmophorus occidentalis*) display behavior, there is an extraneous press-on letter "E" that appears to label the grebe's reflection in the water. Though this causes little damage, the author's diagram of how a Western Grebe spears fish (Fig. 17A) is more serious. This is a purely imaginary diagram, based on Lawrence's (1950, Condor 52: 3–16) observations of spear holes in the sides of bluegills (*Lepomis macrochirus*) taken from Western Grebes' stomachs. As far as I know, the behavior itself has never been observed or filmed, but Fig. 17A shows that it is done with the fish skewered on the closed bill, anhinga-style (*Anhinga anhinga*). The text suggests this is typical of Western Grebes as compared with most other grebes which "capture their prey by grasping it between the upper and lower mandibles." Most likely, only exceptionally broad-bodied fish such as sunfish may end up being "speared," and then probably by an open rather than closed bill. Yet pictures are highly persuasive, and readers will remember that this figure "proves" otherwise.

Although persons more familiar with each of the groups might better evaluate and synthesize rather than just review the available literature of these groups, Johnsgard does the latter admirably. The number of typographical problems is aggravating, but his basic goals are accomplished. Overall, I found the book both useful and entertaining, and would recommend that it be a part of any library or personal collection that includes reviews of major bird taxa.—GARY L. NUECHTERLEIN.

Current Ornithology, Vol. 4.—Richard F. Johnston (Ed.). 1986. New York and London, Plenum Press. xiii + 324 pp. $45.00.—With four successful volumes on the shelf, "Current Ornithology" is a solid member of the ornithological literature. A tendency towards topics in ecology, behavior, evolution, and systematics, plus a greater emphasis on constructive self criticism and conceptual provocation, distinguish this new series from "Avian Biology," the other compendium of ornithological reviews.

The contents of Volume 4 are as varied in style as they are in content. They range from an unusual bibliography to iconoclastic essays. In the first case, Douglas Siegel-Causey and Janet Hinshaw team together to prevent redundant translation efforts, after an unfortunate experience of their own. Using their special language skills and knowledge of the foreign literature, they summarize the available English translations of a large body of ornithological literature. This unusual review consists of one page of introductory text, seven pages of subject indexes and a bibliography of 1,030 worthy papers we should all consult.

In a decidedly critical essay, Jack Hailman addresses the recent flurry of applications of the heritability concept to evolutionary studies of wild birds. A student of the ontogeny of gull behavior, Hailman has a long-standing interest in the nature vs. nurture debate among ethologists. The same issue of genes vs. environment lies at the heart of the measurement of the proportion of phenotypic variance that is due to additive genetic control, and, hence, is responsive to natural selection. Estimates of trait heritability in wild birds, he asserts, are seriously flawed by sample sizes inadequate when compared to those required by theory. These estimates also may be seriously inflated by biases inherent in field studies. (I suspect we soon will hear the other side of this argument.) Hailman concludes that low to moderate values of heritability are more prevalent in wild birds than current studies suggest, and that rearing environment may strongly influence morphological and behavioral traits. The growth trajectories of nestling Red-winged Blackbirds, recently highlighted by Frances James, thus have something in common with the pecking behavior of hatchling Laughing Gulls.

Also iconoclastic, as well as one of the most refreshing and well-written contributions to this volume, is T. E. Martin's review of competition in breeding birds. He criticizes the prevailing population view of competition, which, he asserts, rests on erroneous assumptions of equilibrium populations at carrying capacity. Martin suggests that we look closely at behavioral responses of individual birds to competition. Time limitation, he stresses, often mediates effects of resource depression on individual fitness. This is not a new idea (it was my favorite theme, once upon a time), but here Martin makes one of the most effective presentations I have seen. I hope it will have a major influence on future studies of competition in bird communities.

Two contributions illustrate contrasting approaches to problems of population dynamics. In the

first, Stephen Fretwell considers the state of his favorite species, the Dickcissel. Seventeen years ago, Fretwell and Lucas predicted that Dickcissels might go extinct; but, happily, the population decline appears to have stabilized (and maybe even reversed). Of interest are the global population dynamics of Dickcissels, particularly their winter survival in South America and their summer breeding success in different parts of North America. Fretwell tests, and tentatively confirms, predictions from hypotheses about population regulation, hypotheses that integrate the roles of body size, sex dimorphism, cowbird parasitism, sex ratios, and variable habitat quality. He concludes that: 1) the quantity of winter food limits numbers, 2) the quality of winter food sets sex ratios, 3) sex ratios favoring males depress production, and 4) cowbird parasitism coupled with variable rainfall in south Texas drives erratic fluctuations of the species in Wisconsin.

The tight reductionist studies of clutch size in nidicolous birds (reviewed here by Ed Murphy and Erkki Haukioja) contrast with Fretwell's lucid, but loose, MacArthurian prediction-of-trends approach. Although there is a voluminous well-reviewed literature, field studies devoted to testing and illuminating Lack's hypothesis about optimal clutch size continue unabated. This rather heavy review summarizes the growing number of experimental studies that attempt to determine the adaptive significance of within-population variations in clutch size. Some experiments are noteworthy, especially Ekman and Askenmo's demonstration of a predicted tradeoff between reproductive effort and parental survival of adult Willow and Crested tits (1986, Evolution 40: 119). This review of a notoriously complex subject would have benefitted, I think, from a longer gestation period and a stronger editorial hand. As an outsider, I also wonder whether future research would benefit from a revolutionary change in perspective, perhaps even a rephrasing of Lack's hypothesis. In any case, we certainly need more truly elegant experiments to clear the murky waters.

Two contributions concern topics in systematics. Both are reviews of the state of the art, but that is their only similarity. The first is a review of the history of the Australian avifauna by Pat Rich and Robert Baird. Fossils of Australian birds receive much less attention in the ornithological literature than those from North America or from Eurasia. The known Australian fossil record is not nearly as rich as that of the northern hemisphere. Palaeornithology also is a decidedly young discipline "down under." This review begins with a candid discussion of the limitations of the fossil record. The pre-Quaternary record is weak, but the Quaternary cave record is quite rich. Despite some caveats, the Australian fossil record contains much information about evolutionary directions and about changes in distributions that have accompanied changes in climate. Among the special features are good historical records of: 1) dromornithids, which were large ratite-like birds of uncertain affinities; 2) emus, which evolved from forest-adapted cassowary-like forms to open country cursorial forms; 3) flamingos, which are now extinct on the continent; and 4) a primitive owlet-nightjar, which was more like an aerial caprimulgid than is any modern species of aeogothelid.

Each reader will find one contribution of greatest personal interest. I favored Zink and Remsen's review of evolutionary processes and patterns of geographic variation in birds. Personal biases aside, this review is a real tour de force and prime example of the kind of contribution that distinguishes "Current Ornithology." It is an encompassing, thoughtful, critical, provocative, and visionary review of a well-worn ornithological subject. Geographic variation, subspecies, and speciation have been central topics in the ornithological literature for nearly a century. This powerful review speaks to a new era of intellectual vitality. It stresses how little we really know about the patterns and adaptive significance of geographic variation in North American birds. It reviews how blindly we may have promulgated the significance of ecogeographic rules and the relationship of speciation to patterns of geographic variation. It considers the strengths and weaknesses of allozyme studies and of the phylogenetic species concept. It chides ornithologists to keep an open mind to both new and historically rejected perspectives, including Goldschmidt's views of speciation. A blueprint for future research, it outlines the methods of choice and some of the priorities for modern studies of geographic variation. It is an article that should influence the way we do things in systematics for years to come.

Each of the contributions to "Current Ornithology" has been carefully chosen by the editorial board to nudge us forward and to widen our specialized horizons. Although the reviews vary greatly in content, style, quality, and potential influence, the editors have chosen wisely. Volume 4 of "Current Ornithology" merits careful reading, reflection, and future reference.—FRANK B. GILL.

Breeding and Management in Birds of Prey.—D. J. Hill. 1987. Bristol, England, Department of Extra-Mural Studies, University of Bristol. viii + 187 pp. ISBN 0-86292-277-1. £10.—Captive breeding was originally an emergency conservation measure to save certain species of birds of prey from extinction. Perhaps the most famous example is the effort to release enough young Peregrine Falcons (*Falco peregrinus*) in eastern North America to restore a virtually extinct population. This program of captive propagation and release has been heralded as a success. It has been adopted as the only salvation for the remaining 27 California Condors (*Gymnogyps californianus*) currently held in captivity.

While captive breeding of raptors still remains largely a conservation tool, it has sparked a great deal of interest among those involved in the ancient sport of falconry. Captive breeding has traditionally provided a readily available source of birds for falconers. By relieving pressure on wild populations, breeders minimize public outcry about the sport in general.

If your interests fall into either of the above categories, take note of the proceedings of a conference held at the University of Bristol 24–26 January 1987. According to D. J. Hill, "the purpose of the conference was to bring together people from very different walks of life, in particular practising falconers, breeders, veterinary surgeons, ecologists and those concerned with nature conservation." Having said that, Hill noted that among the 17 papers included, there is "a variety of style." In my opinion as editor of two proceedings on birds of prey, this is a gross understatement. I applaud Hill's success at getting the proceedings into print in record time, but the cost was dear in terms of style and content.

There is absolutely no stylistic consistency whatsoever to the papers which range from excellent (e.g. R. E. Kenward's opening article) to poor (or should I say, non-existent), (e.g. C. Bibby's rather brief and unusual paper). A number of the papers, including the preface, are rife with poor grammar and several read like a tape-recording of a spontaneous verbal presentation (e.g. J. Parry-Jones, P. J. Robinson). Figures are missing captions in some cases, e.g. pp. 72, 119. The caption for the figure on p. 83 is missing some symbols, and some papers contain abstracts while others do not. In several places, the California Condor has been renamed "Californian Condor" (pp. iii, 23), while the name of L. H. Hurrell, a pioneer in captive breeding of raptors, was misspelled as "Hurral" on p. 52. Indexes are always useful, but I question the inclusion of some of the subjects.

I could go on and on with examples of poor editing, but perhaps the biggest flaw with these proceedings is the obvious lack of peer review. Unfortunately, this allows the authors to make bold, sweeping statements without giving consideration to previously published literature. For example, three different authors, Parry-Jones, Haigh, and Forbes, discuss whether day-old chicks constituted a sound or a poor diet for captive raptors, but make no reference to the published literature on the subject. To their credit, they did make some useful points. Another example is Parry-Jones's discussion of cross-fostering as a tool for raising captive raptors. There was no reference whatsoever to published literature detailing pros and cons on the subject. Moreover, Forbes (p. 78) makes a blanket statement without any support whatsoever that imprinting in raptors generally takes place between 12 and 15 days of age. It makes me wonder whether it is even worthwhile publishing one's scientific findings if those who come after simply choose to ignore them.

The book does have good points; Kenward's lead article ought to be required reading for conservation-minded individuals and organizations involved in the law-making process anywhere in the world. D. Houston makes an eloquent argument for better protection and management of vultures. And breeders are finally talking about the "quality" of young they produce. Haigh hinted at it, but Parry-Jones came right out with it. I also liked the latter's philosophy about breeding birds only for a "responsible market" (p. 39).

The majority of papers in the proceedings are indeed useful, including those on legal aspects, veterinary problems, and genetic fingerprinting. Without doubt, breeders will gain valuable knowledge from those papers focusing on propagation and husbandry because they were written by highly experienced individuals.

To summarize, I am clearly disappointed in the style and content of many of the papers. They suffered from poor editing and lack of peer review. With the advent of desktop-publishing, it is surprising that the proceedings are little more than photocopies of typewritten pages.

Due to a ridiculously high price and such a specialized topic, I hesitate to recommend this book for college, museum or community libraries. However, it does make a highly useful addition to the libraries of falconers, captive breeders, or, for that matter, anyone interested in the conservation of birds of prey.—DAVID M. BIRD.

The Mute Swan.—Mike Birkhead and Christopher Perrins. 1986. London, Croom Helm. xiv + 157 pp. ISBN 0-7099-3259-6. $36.95.—This monograph provides an excellent and highly readable summary of what has been learned about the life history and ecology of the Mute Swan in recent years. Although most aspects of the biology of the species are mentioned, the main emphasis is on swan numbers in Britain and the factors that have influenced them. Many new findings have come from separate studies of individually marked birds in four different areas: the English Midlands, the Upper and Lower Thames, Abbotsbury in Dorset, and the Hebrides. The book is intended for "the keen naturalist as well as both amateur and professional ornithologists" and the style is similar to that of David Lack's classic "The Life of the Robin." Data are presented in simple tables and figures, and references to the literature are kept to a minimum in the text. Key sources are given in a 5-page bibliography. Most of the important points are illustrated by the authors' own excellent photographs or by line drawings by David Quinn.

The book is packed with interesting information about swan biology. Being long-lived and sedentary birds, long-term studies of marked populations have produced many surprises. For example, a high pro-

portion (20–30%) of pairs on territory have been shown to be non-breeders. This may be related to differences between mates in age at first breeding (3, 4, or older), a tendency for widowed birds to delay breeding for a year after forming a new pairbond, and poor condition of birds after a severe winter. Important differences in productivity and survival have been found between populations in different habitats. This means that key factors maintaining population levels are not the same throughout Britain, and local populations pose different management problems.

Human influences on swan habitats have been complex. While creation of gravel-pits has produced a new breeding habitat, collisions with power cables and other man-made objects are major sources of adult mortality. The main cause of the dramatic recent decline in swan numbers is lead poisoning due to ingestion of lead weights lost or discarded by anglers. Birkhead and Perrins played leading roles in the research that established this source of mortality, and they recommend a ban on the use of lead weights. Although the future of the species in Britain remains uncertain, the research reviewed in this book provides a sound basis for management policies. A big factor is likely to be public awareness of the problem, and I expect that this attractive and authoritative book will be widely read by people who value the Mute Swan for its unique history as Britain's Royal Bird. I recommend the book to ornithologists everywhere for the fascinating story it tells and for the admirable way it is told.—FRANK MCKINNEY.

History of the Nuttall Ornithological Club, 1873-1986.—William E. Davis Jr. 1987. Cambridge, Massachusetts, Memoirs of the Nuttall Ornithological Club, No. 11. 179 pp., 27 black and white photographs, 3 charts, Appendices.—William E. Davis's account of the first 113 years of the Nuttall Ornithological Club's history takes up just 103 pages of this volume. It is based largely upon Club records and on interviews and discussions with past and present members, some of whose recollections extend back seventy years. There are no footnotes, nor is there an index. It will, therefore, be difficult for future historians to further pursue some of the subjects covered.

Davis's discussion of events until 1919 draws upon Charles F. Batchelder's history of the Club's early years, which was published over fifty years ago. The author's informal narrative is concerned primarily with some of the colorful personalities who have dominated the Club's activities, with administrative history, and with related organizations involving NOC members.

During the first 79 years, the Club had only four presidents: William Brewster (1873–1875; 1876–1919), also a founder and president of the AOU; Henry A. Purdie (1875–1876); Glover M. Allen (1919–1942), a distinguished Harvard biologist; and James L. Peters (1942–1952), who contributed much to the literature of international ornithology. Batchelder was treasurer for half a century. A founder of both the NOC and the AOU, he was elected president of the NOC when 86 years of age, but declined the office. He was the last living founder of both organizations at his death in 1954.

The NOC was, in many respects, a small Victorian gentlemen's club for many decades. As Davis notes, its membership list today is a veritable "Who's Who in North American Ornithology." Women were admitted to corresponding membership in the early years, but this class of membership was abolished in 1930. Efforts to admit women as resident members in 1936 were squelched with bylaws amended to change the rules of eligibility from "persons interested in ornithology" to "men interested in ornithology." No ladies appear to have attended meetings as official guests of the Club until 1970. When the question of changing the bylaws to admit women again came up in the early 1970s, the subject was hotly debated. When women were first elected in 1974, a few male members refused to be reconciled to this innovation. A woman was soon elected secretary of the NOC and later vice-president. Another was elected councillor.

The book contains several dozen photographs of members, many taken at meetings. The practice of meeting at the private homes of members, initiated in Brewster's time, was evidently abandoned by about 1950. Some of the conviviality of an earlier time was lost as a result. Charts trace the numbers of members, guests, guest speakers, and financial assets of the NOC. A 45-page appendix contains biographical sketches of all living resident members as of 1973, when the last such compilation was published, and adds those since elected to membership. There are separate listings of all Club members from 1873 through 1986, a list of Club publications, and the current bylaws.

There are several typographical errors in the membership lists, notably Joel A. Allen's last name (p. 155) and Gerrit S. Miller Jr.'s first name (p. 165). C. Hart Merriam was admitted to corresponding membership in 1875, and is discussed at several points in the text, but is not listed. The author may have confused C. Hart Merriam with Charles Merriam (no relation) who is included. The "Mousley" listed with no first name (p. 158) was undoubtedly William Henry Mousely, a distinguished Canadian ornithologist. This book will be a welcome addition to the shelves of NOC members and others interested in the oldest regional ornithological organization in North America.—KEIR B. STERLING.

Foraging Theory.—D. W. Stephens and J. R. Krebs. 1986. Princeton, New Jersey, Princeton University Press. xiv + 247 pp. ISBN 0-691-08441-6. Cloth, $40.00. ISBN 0-691-08442-4 Paper, $14.50.—Foraging theory comprises sets of assumptions that attempt to predict

the foraging behavior of animals under different environmental conditions. The title of this volume should have been "Optimal Foraging Theory," as evidenced by a not-so-cryptic allegory which opens the final chapter. It seems that a colleague of the authors found that giving a seminar on optimal foraging theory resulted in a much more negative response than if he entitled the same talk simply "Foraging Theory." Why? Optimization is a controversial topic in behavioral ecology. To address this controversy, this text seeks to review and synthesize the major foraging models and their empirical tests; and, then, to answer the criticisms of the optimality approach. Both goals are fulfilled admirably.

The book is organized logically into ten chapters. Chapter 1 introduces the basic concepts of optimization modeling: decision (what is the question or goal?), currency (what is to be maximized or minimized to reach the goal?), and constraint (what limits the ability of the animal to reach the goal?). Chapter 2 presents the earliest models of diet choice (which prey to eat?) and exploitation of food patches (how long to stay?), models which maximize the long-term average rate of energy gain. The models are overly simplistic in their paucity of realistic constraints, especially the assumed omniscience of the forager. These shortcomings have fueled much of the criticism of optimization theory. Unfortunately, few critics seem to be aware of the more realistic approaches taken by subsequent models, which are summarized in the next six chapters with many examples from avian literature.

In chapter 3 the effects of adding various constraints on the predictions of the original models are examined. These include simultaneous and overlapping encounters (what if the predator sees more than one prey or patch at a time?), encounter-to-encounter dependencies (what if prey or patches occur in loose clumps?), central-place foraging (what if the forager has to carry prey back to its "home"?), prey nutrients and toxins (what if the chemical composition of the prey is important?), and recognition of prey (what if the sensory capabilities of the forager are limited?). Chapter 4 explores the constraint of incomplete information (what if the animal is not omniscient about its prey and must learn as it forages?). Chapter 5 briefly considers trade-offs between foraging and other essential activities, such as territorial defense and predator avoidance, and the effects of nutrient constraints and plant toxins on diet choice in herbivores. I personally was disappointed at the rather terse treatment of feeding territoriality, studies of which have contributed substantially to foraging theory. Chapter 6 introduces the concept of "risk-sensitive" foraging: choosing between known probability distributions of reward, selecting either certainty ("risk aversion") or variability ("risk proneness"). The jargon in such models is unnecessarily tedious. Basically, this approach incorporates the fact that foraging preferences by animals depend on random variation in food reward as well as on the mean food reward; foragers become more risk-prone as the chance of starvation increases. Chapter 7 explores dynamic optimization, where future decisions of the forager depend upon present decisions; and chapter 8 examines "rules of thumb," simple rules of behavior utilized by foragers which approximate more complex decision processes.

The contribution of recent foraging models is that they incorporate more realistic assumptions than their predecessors. This progression has brought optimization theory more closely in line with the problems faced by animals, although the authors admit that there is a long way yet to go. The authors do an exemplary job of describing the rationale, structure, and outcome of each model at a level understandable by advanced undergraduate or early graduate students who have a reasonable grasp of algebra and some calculus. Particularly useful in following the development of these models are "boxes" scattered throughout the text which detail key concepts or particular cases.

Chapter 9 is an attempt to summarize all empirical tests of the early diet choice, patch utilization, and central place models. It includes a useful table which describes 125 studies (40 of birds, mostly insectivorous species), including the predictions tested, how well each test system fit the assumptions of the model, and the results of the test. The authors forthrightly admit that "obviously, there is ambiguity in interpreting some studies" (p. 198), yet they do a reasonable job overall, especially for the studies of birds (which have been the focus of much of their own research). The major lessons from this exercise are that, first, most tests have been qualitatively rather than quantitatively supportive of the models, and second, many "tests" have not met the assumptions of the models. It should be emphasized that both these lessons must be considered in the future if optimization theory is to become more widely acknowledged as a legitimate endeavor (see also: Hixon 1987, Am. Zool. 27: 229; Stearns and Schmid-Hempel 1987, Oikos 49: 118). The first lesson is important because a behavioral parameter can respond to a manipulation only three ways qualitatively: it can increase, decrease, or remain unchanged in magnitude. Thus, the probability of a model making the right qualitative prediction for the wrong reason is high. Clearly, more quantitative predictions and tests are in order. The second point could be resolved if theorists would explicitly list every testable assumption of their models and empiricists would test these assumptions for their particular systems *before* they attempt to test the predictions of the models.

The final chapter summarizes the criticisms of optimization theory and meets them head-on. It seems that part of the controversy involves the unfortunate use of the word "optimal," which naive critics interpret as an assumption that foragers are perfect. Ste-

phens and Krebs argue convincingly that various other criticisms "amount to reasons why optimization models might be wrong but not why they are bound to be wrong" (p. 215). A major problem lies in critics simply not understanding the optimality approach and the structure of the more recent models. With the publication of this volume, this problem will hopefully disappear. I recommend this book highly as an early graduate-level text or for anyone interested in behavioral ecology, especially ornithologists.—MARK A. HIXON.

The Animal Smugglers.—John Nichol. 1987. New York, Facts on File, Inc. x + 198 pp., 4 Appendices, 14 color plates and numerous black and white photographs. ISBN 0-8160-18934-0. $23.95.—This chatty narrative, based on the author's experiences, observations and "considerable research," is about the trade in wildlife and wildlife products. Four chapters deal with illegal and legal trade. Other chapters discuss cruelty in the trade, the exotic food trade, the people who perpetuate the trade, the trapping of wild animals, etc. Despite the fact that nearly 100 nations have ratified the provisions of the "Convention on International Trade in Endangered Species" (CITES), the concluding chapters are: "What Does It Really Matter Anyway?," "The Final Solution" and "The Show Goes On."

One wonders if the world will ever "ring down the curtain" on this "show." According to the author, the trade has lessened. But, as long as individuals want something badly enough to pay any price, there will be those ready to supply their wants. Imagine, "there is hardly a live animal that cannot be obtained" (p. 160)! The very listing of a species as endangered, increases demand for it. Furthermore, despite the many nations ratifying the provisions of CITES, what can be done if a country fails to honor its commitments? At each level of officialdom, there is an impossibility of pinning down profiteering civil servants, let alone recognizing much of the subterfuge. Finally, it is difficult in the West for people to realize that their way of thinking about animals is "totally alien" to the views of much of the world (p. 100).

Education, the author says, is the only way to stop this abuse of animals, if indeed there is a way. Yet he writes (p. 150) that "those who are wrecking the world are the rich and powerful." I assume these people are not exactly uneducated. Nichol identifies Germany, Holland and especially Belgium as major European wholesalers. These countries receive legal or questionable shipments of animals from Third World countries, and traffic them onward. Two of these countries are parties to CITES; all three have educated citizens.

I suspect that most readers of *The Auk* are, to some degree, knowledgeable about this subject. This book, however, will surely open new lines of thought. Consider the description (p. 65) of Hong Kong gourmets relishing a feast which features opening the skulls and spooning out the brains of immobilized and, for a time at least, conscious monkeys! Or contemplate the traffic in eel skins from South Korea where some 3,000,000 eels are skinned *alive* each year (p. 35) because skins are too tough if removed after death. Much in this book is unpleasant, which is probably good for those who may have become jaded about this subject. The book is especially recommended for municipal, high school and college libraries with readerships interested in conservation. Personal libraries? You may not wish to read this informative book a second time.—OSCAR T. OWRE.

The Eagle's Nest: Natural History and American Ideas, 1812-1842.—Charlotte M. Porter. 1986. University, Alabama, University of Alabama Press. xii + 251 pp., 9 text figures. ISBN 0-8173-0280-8. $25.95.—Philadelphia was once the intellectual center of the United States. From 1786 until 1849, Charles Willson Peale's remarkable museum was located there. Seventy-one of the birds described by Alexander Wilson between 1808 and 1814 were among Peale's catalogued specimens. The dust cover of this book claims that it "focuses upon the development of biological thought in the intellectual climate of Philadelphia after the War of 1812."

As examples of the Philadelphia area's "considerable intellectual resources," Porter lists William Bartram, Benjamin Smith Barton and George Ord, as well as Alexander Lawson, Wilson's engraver. When the Academy of Natural Sciences was formed in Philadelphia in 1812, it offered valuable contacts among authors, artists, engravers, editors, and booksellers. Porter discusses these men, including Richard Harlan, Charles Lucien Bonaparte, Thomas Say, Titian Peale, and the foreign-born naturalists who gravitated to Philadelphia, Thomas Nuttall, C. S. Rafinesque, C. A. Lesueur, and William Maclure.

Maclure, a wealthy businessman, funded field trips for many of his fellow members, established a valuable reference library, and procured a printing press. However, by 1828 Philadelphia was no longer the acknowledged center for the leaders of natural science. Maclure had become deeply involved in the utopian, atheistic New Harmony settlement in Indiana, where Thomas Say had become one of the teachers. The reputations of the naturalists associated with Maclure began to suffer.

These early ornithologists, ichthyologists, entomologists, and others are still of great interest and of historical importance. They forged new paths in an emerging nation, though plagued by cited examples of inconsistency, incompetence, rivalry and a stultifying bureaucracy (what's new?). Sometimes publication of their important scientific and artistic con-

tributions was suppressed. These men deserve more careful treatment than Porter has given them.

Porter deals in a rather disorganized way with a difficult mixture of topics, including sociology, philosophy, theology and art, and jumps backwards and forwards in time. These substantial digressions, where both author and reader get bogged down in minutiae, make this book more a history of ideas than a history of natural history. Although she lists 27 manuscript collections which she consulted, her footnotes refer to relatively few of these original documents, most of these in Chapter 11, "The Business of Science."

Porter has not always chosen wisely from her long list of secondary sources to give the reader a better understanding of her chosen topic. For example, she accepts George Ord's opinion that Audubon was wrong in claiming to have observed a rattlesnake climbing a tree. She implies that Thomas Nuttall returned to England because he was disgusted by the way he was treated in the United States. Actually he left reluctantly because he was short of funds and because acceptance of his uncle's estate in England was conditional upon his moving there. She gives conspiratorial overtones to the shift from field collectors to "closet naturalists," as in the Peale-Cassin controversy. She fails to inform the reader about trends in Europe and British North America during this period.

Porter acknowledges that she obtained helpful insights from Ernst Mayr and Raymond Paynter of Harvard University. One wishes that either or both had been allowed to criticize the final manuscript, to give it more direction and cohesion and to eliminate unwarranted exaggerations, misrepresentations and generalizations. I am afraid this opening volume in the "History of American Science and Technology Series," although it contains much of interest, will be a disappointment to most naturalists, and especially to ornithologists.—C. STUART HOUSTON.

Birds of New Guinea.—B. M. Beehler, T. K. Pratt, and D. A. Zimmerman. 1986. Princeton, New Jersey, Princeton University Press. xiii + 293 pp., 55 plates (49 colored), 21 figures and maps. ISBN 0-691-02394-8. Paper, $37.50. Cloth, $65.00. ISBN 0-691-08385-1.—The great mountainous island of New Guinea holds one of the richest and most distinctive bird faunas in the world. Over 700 species span the range, from cassowaries, megapodes, crowned pigeons, parrots and cockatoos, kingfishers, honeyeaters to birds-of-paradise and bowerbirds. Despite this, the present compendium is only the fifth reference work to cover the island's species comprehensively since John Gould's posthumously published "Birds of New Guinea" in the 1870s. All five were tailored to the need of their time. Thus the first (Salvadori's monumental, multivolumed "Ornitologia della Papuasia e delle Molucche" in the 1880s) laid the foundation for the island's ornithology with its meticulous descriptions, thorough synonymies, keys, and detailed specimen citations. Mayr's much more concise "List of New Birds" in 1941 next rationalized the island's species down to subspecies with the polytypic species concept. It was followed by two handbook-style monographs. One was Iredale's "Birds of New Guinea" (1956), which illustrated most species, but was incoherent in text and idiosyncratic in taxonomy. The other was Rand and Gilliard's "Handbook of New Guinea Birds" (1976). Giving less than it promised, it provided synopses and keys to genera and species plus adequate descriptions of species and most subspecies but it illustrated only a fraction of the species and gave the sketchiest of biological information. Now, in the era of international bird watching, comes the present volume with its uninformative title. It is, in fact, New Guinean ornithology's first field guide. (See p. 827 of this issue for a review of Coates' volume of photographs—Ed.)

So it fills a significant gap in global ornithology; how well does it fill that gap and how well does it function as a field guide? The best guides are those that describe and illustrate the diagnostic traits of all regional species—morphological, behavioral and ecological—in an organized accessible sequence based on a conventional taxonomy and with familiar simple names. Although not quite as polished as the best guides to the better known avifaunas of Europe, North America, or Australia, this work passes with flying colors.

Condensed but informative accounts of species form the core of the book. These cover diagnostic morphological traits; significant variation in age, sex and geography; the differential traits of similar-looking species; and principal behaviors, voice, habitat and distribution including altitudinal range. Consistency, accuracy and comprehensiveness here are one of the book's two great strengths. For the first time, behavioral traits and voice are described in some detail for all New Guinean birds. Reading through I found little to quibble with and few typographical errors in a well-written, easily read text. The size differences quoted between Swinhoe's and Latham's snipes are the wrong way round, a common error in southwest Pacific ornithological literature. To its credit, the text corrects a seriously misleading error in the illustration of Wallace's Fairy-wren, that of a cocked tail.

Species are grouped in families arranged according to the sequence in Peters' world checklist slightly modified by current sequences in Australia for regional uniformity. It is a sensible, easily understood and used compromise. Each family is introduced by a summary of its characteristics which nevertheless varies from reasonably comprehensive (e.g. Acanthizidae and Dicaeidae) to skimped (e.g. Meliphagidae and Orthonychidae). All too often particular traits of individual members are stressed to the exclusion of general details of identification and morphology. This

detracts from the book's facility to place species in their family, particularly in the more perplexing and unfamiliar groups of small passerines.

Generic and specific taxonomy is conservative, as it should be for the ornithological public, and is substantiated by an annotated checklist produced specially as its base (Beehler and Finch 1985, Species-Checklist of the Birds of New Guinea, Melbourne, Royal Australasian Ornithologists Union). Again there can be few quibbles, and all that I found confusing was the treatment of the *Pachycephala monacha* complex. The lowland representative, which is known to hybridize and intergrade with montane populations in southeast New Guinea, is nonetheless lumped instead with allospecific, rufous-bellied *P. rufiventris* in Australia. The confusion is compounded by the lowland female illustrated on plate 41 which lacks breast streaking as in montane populations.

English nomenclature is simple and matched to prevailing world usage in general and to that of the sister Australian avifauna in particular. Without the clumsy quinquenomials of Rand and Gilliard's handbook and Iredale's eccentric coinings, it offers the most acceptable English nomenclature yet published for New Guinean birds. Choices out-of-step with international trends, such as Crested Hawk for *Aviceda cristata*, are few. Nevertheless I was disappointed at many pedestrian and anglicized generic names for the birds-of-paradise. These magnificent birds fare much more poorly than the New World trochlids and deserve better. Honeyeaters (Meliphagidae) also suffer an overuse of generic names, "*Melidectes*" and "*Meliphaga*" being the main offenders. The latter conflicts with Australian usage.

Introducing the text to the species are a series of scene-setting chapters to explain the scope of the book, its taxonomic and nomenclatural base, and to describe the size of the avifauna. The literature, environment and geography, ornithological exploration, ornithogeography including regions, land island effects and altitudinal zoning are summarized. The authors then discuss the biological attributes of the avifauna, in which competition and niche-partitioning, movements and migration, territoriality, nesting, molt and plumage, and patterns of geographical variation are summarized. Concluding sections cover conservation, equipment for field study, local sources of information and authority, health and hygiene, etiquette, and modes of transport and communication. All are handled competently and are comprehensive without being overly detailed. The prospective ornithological visitor from overseas is given all the basic information needed for fieldwork. Misconceptions or over-simplifications, such as the idea that the whole forest flora is prevailingly Malaysian in origin and that breeding is linked proximately to rainy seasons, are few and in any case arguable. It is a pity that the only model put forward for speciation in montane birds is Diamond's scheme of ecological "drop-outs" when others requiring fewer assumptions have been published. At least one of its examples quoted, in the Alpine Mannikins, is ill-chosen because of the possibility that the presumed allotaxa arose independently from lower altitude species.

The other special strength of this volume is its illustrations. It is only the second book to figure all, or almost all, species of New Guinean birds. The work, by two artists with compatible styles, is an immeasurable improvement over the caricatures in the only competitor, Iredale's "Birds of New Guinea." In general, the figures are well-planned and faithfully executed if without quite the finesse of the best illustrators. In particular, the flight patterns of raptors and waders, and consistent illustration of distinctive geographical, sexual, and immature plumages, are a boon to identification. Occasionally the plates are crammed with figures too small for clear delineation of diagnostic traits, as in some of the parrots (plate 20), the nocturnal birds (plate 26), the cuckoo-shrikes (plate 32), gerygones (plate 35) and scrubwrens (plate 36) where differentiating wing, tail and face patterns are obscured. These are counterbalanced by the excellent figuring of head patterns in difficult-to-identify honeyeaters (plates 46 and 47).

The few unequivocal errors need mention. The casques on the two left Northern Cassowaries are carinate instead of triangular, and the adult and immature plumages of the Swamp Harrier are reversed. The White-bellied Sea-Eagle is the smallest, not largest, of the top three eagles on plate 7, which creates a misconception paralleled in the depiction of the huge crowned pigeons, *Goura*, as smaller than other columbids (plate 15). The wing tips of the sitting Oriental Hobby should reach at least to the tip of the tail or beyond (cf. Australian Hobby). The sexual plumages of the Double-eyed Fig-Parrot (9a) are reversed; the immature Rainbow Bee-eater is dull gray-green, not bluish breasted. The differences in the iris color of the Rufous Babbler are age-related. The male Papuan Treecreeper illustrated is in juvenile ventral plumage; the crown in both sexes is streaked instead of scalloped; and the rump and upper tail of the flying figure is the gray of Australian allotaxa, and not brown as it should be. The tail tip in the male Stephanie's Astrapia is incorrectly everted, and the Australian Magpie is identifiable as a short-billed, black-backed male from eastern Australia. It is only partly excusable that several insular or rarely seen endemic species (e.g. Obscure Berrypecker and Tagula Meliphaga) are not figured when erratic but well-known Eurasian vagrants are (e.g. Eurasian Wigeon and Common Black-headed Gull).

But these blemishes are comparatively minor. Through this important, practical and well-printed treatise, the avifauna of New Guinea has become readily accessible to ornithologists at all levels for the first time. It is the biggest step forward in the island's ornithology since Mayr's "List" in 1941. There is only

one serious drawback: cost. The paperbound edition, without maps at end papers, retails at over $60 (Australian) plus postage in Australia, where a considerable portion of its market lies. Compared to its price in the U.S., this not only exceeds the current differential in exchange rates, but is also three times the cost of the two current Australian field guides, which are just as large and well-printed, just as copiously illustrated, and cover an avifauna of much the same size as New Guinea's.—RICHARD SCHODDE.

Avian Genetics: A Population and Ecological Approach.—F. Cooke and P. A. Buckley (Eds.). London, Academic Press. xvi + 488 pp., ISBN 0-12-187570-9. $72.00.—Several aspects of avian biology compromise the study of the inheritance and maintenance of genetic variation in natural populations. Birds have somewhat small clutch sizes, relatively long generation times, and it is difficult to mark and follow large numbers of individuals over many generations. For most species, except economically important ones, captive breeding programs are prohibitively time- and labor-intensive. For wild birds, there are relatively few phenotypic traits for which the genetic basis of variation is known. Also, with the advent of indirect methods of assaying genetic variation in natural populations, such as protein electrophoresis, birds were reported to have relatively few detectable genetic differences among conspecific populations. Consequently, ornithologists were slow to adopt methods of molecular systematics for analysis of populations and species. In sum, classical and molecular genetic studies of avian populations have not advanced our knowledge of population and evolutionary genetics to the degree that has been achieved by analyses of other, more easily manipulated organisms (e.g. drosophilids). In contrast, bird ecology and behavior are reasonably well-studied. Thus, an understanding of the evolution of avian populations awaits data from genetic analyses.

The important book edited by Cooke and Buckley reveals an active interest in understanding the evolutionary genetics of avian populations. It contains chapters on: (1) genetic principles, such as "Mendelian" (i.e. single-locus traits) and quantitative genetics (traits encoded by more than one locus); (2) methods of studying genetic variation (karyology, protein electrophoresis, restriction endonuclease analyses of mitochondrial DNA [mtDNA], restriction fragment length polymorphisms [RFLPs] in nuclear DNA); (3) factors that shape genetic variation (inbreeding, gene flow, mating systems, natural selection, geographic isolation); and (4) four case studies. A few chapters stand out. Rockwell and Barrowclough provide an especially useful guide to the analysis of gene flow and genetic population structure. The chapters by Boag and van Noordwijk and Quinn and White are well-written, informative, and will introduce ornithologists to quantitative genetics and RFLP analysis, respectively. Although Quinn and White discuss mtDNA, more recent summaries (e.g. Avise 1986, Phil. Trans. R. Soc. London B312: 325) cover the topic more thoroughly, especially as regards the problem that maternal transmission of mtDNA "clones" imparts to speciation analysis (see Neigel and Avise 1986, p. 515 *in* Nevo and Karlin [Eds.], Evolutionary Processes and Theory, New York, Academic). Price and Boag, and Findlay contribute interesting chapters with critical appraisals of current knowledge on natural selection and mating systems, respectively. All of the chapters contain information and ideas worthy of consideration. The editors did a fine job in selecting topics.

The book is not without weaknesses or problems. The coverage of topics is uneven; not all authors provide examples of how data should be gathered, analyzed and interpreted in an objective theoretical context. Some chapters seem incomplete or excessively biased by the authors' worldview; one case study (by O'Donald) is more a defense of past criticisms than a review of the problem. The section summaries by the editors sometimes misrepresent the chapters. Buckley (p. 455) states that there is little genetic variation at enzyme loci in avian populations. However, it is the lack of differentiation among populations (low *Fst*) that typifies birds, not an absence of within-population genetic variation (measured by heterozygosity). In some cases, significant papers have appeared since the manuscripts were submitted for publication (early 1984?), obviously well before the (late) 1987 publication date. Researchers interested in paternity analysis will wish to explore DNA "fingerprinting" (Wetton et al. 1987, Nature 327: 147; Burke and Bruford 1987, Nature 327: 149). There is some overlap in the chapters on protein electrophoresis, or allozyme analysis, by Evans and Corbin. The chapter by Evans is rather out of date and attempts to do too much. It contains many suggestions and ideas, presented as though they were established, with which I strongly disagreed; a recent book (Richardson et al. 1986, Allozyme Electrophoresis, New York, Academic) and paper (Johnson et al. 1984, Wilson Bull. 96: 543) should be consulted. His review of genetic variation by locus across species is interesting. Evans' statement that it is not possible to test for neutrality conflicts with Barrowclough et al.'s (1985, Current Ornithology, vol. 2, New York, Plenum) analysis (mistakenly cited by Buckley on pp. 459 and 472 as "Johnson et al."). I found the section on the adaptive value of enzyme polymorphism, namely an association between an esterase genotype and timing of egg-laying in starlings, lacking in credibility (Zink and Watt [1987, Auk 104: 1] discuss interpretation of associations between enzyme traits and phenotypic characteristics). In Evans' chapter, and several others, various formulae for genetic distance and heterozygosity are given. They do not belong in a book published in 1987.

Corbin's discussion of speciation draws heavily on

an analysis that seems to suffer a fatal flaw (Barrowclough 1984, J. Field Ornithol. 55: 509). Corbin plots two measures of genetic differentiation derived from the same data sets: genetic distance and Fst. Corbin finds that the slopes of lines that pass through points corresponding to conspecific populations and species differ, and from this he infers that there is a genetic revolution at speciation. However, as Barrowclough (1984) noted, and Buckley (p. 467) repeats, mathematically one expects tangents to different points on a curvilinear relationship (D vs. Fst) to have different slopes. Another interpretation of the same data is that avian congeners, presumably sister-taxa, differ on average at 2–4 of 40 (5–10%) loci; not a genetic revolution. If allozymic differences accrue as a function of time since gene pools fragmented, then all we know is that speciation occurs in the time it takes for fixation of different alleles at 5–10% of protein loci; we do not know which factors allow this (geographic isolation is a requisite in my opinion), how long it takes, or whether it is gradual. If Corbin's interesting attempt to use genetic distances to document speciation is to be accepted, he should address Barrowclough's (1984) criticisms, as called for by Buckley.

A troublesome aspect of the book is the *a priori* assumption by many authors that natural selection alone is the exclusive cause of genetic differentiation. Perhaps one of the more beneficial aspects of allozyme analysis is that it has helped evolutionary biologists consider nonadaptive modes of evolution, particularly genetic drift (Barrowclough et al. 1985; Corbin's chapter). Buckley (p. 26) states clearly why it is difficult to test the adaptive maintenance of a polymorphism: "It is a tedious, time- and labour-intensive process that requires detailed data on gene frequencies, on mate preferences, on survival rates or reproductive success of different morphs and genotypes at different stages in the species' life cycle (arrival on breeding ground; clutch size; laying dates; hatching success; fledging success; survival over first and subsequent winters to first reproduction; morph mate-choice and where it occurs), and on measures of gene flow through the population." Of course, no study has been this thorough, but Buckley's reminder will hopefully usher in an era of experimentation and cross-fostering, instead of *a posteriori* adaptive interpretations of correlations between phenotypes and genotypes and environmental parameters. Even in one of the best studied cases of natural selection (Price and Boag's chapter), the Galápagos finches, the long-term significance of year-to-year changes in morphological traits is unclear to me; speciation and the evolution of morphological (for example) differences between species may have a larger random, nonadaptive component than currently acknowledged.

The book highlights two important directions in the study of avian population genetics and geographic variation: quantitative genetics and molecular systematics. Quantitative genetic studies, with marked individuals observed over generations, allow estimation of the genetic components of phenotypic variation. Of importance to analyses of geographic variation is the opportunity to determine the degree to which geographic differences in many traits, especially those of external morphology, have a genetic basis. Ornithologists have assumed uncritically that geographic differences had a genetic basis and that morphological traits are genetically uncorrelated. Furthermore, some (e.g. Rising 1988, Auk 105: 217) misunderstand the significance of traits having significant within-population heritability. As Boag and van Noordwijk note "One thing it [traits being heritable within populations] does *not* mean is that average differences in heritable characters *between* populations of the same species necessarily indicate genetic differences" (p. 67; italics theirs).

The lack of protein differences among conspecific populations limits historical inferences of the pattern of population fragmentation (one can estimate the magnitude of gene flow, as shown in Rockwell and Barrowclough's chapter). Although Parkin attempts to calibrate protein genetic distances of 0.003 and propose historical scenarios, values of this magnitude are probably not significantly different from zero (e.g. sampling error). The possibility that mtDNA or RFLPs will detect interpopulation differences, and therefore facilitate historical inferences, must be pursued. Thus, quantitative genetics and modern molecular techniques should receive increasing attention in studies of avian population genetics. I suspect that a future synthesis of results from these two fields will answer many important questions about the evolution of populations and species. Perhaps in the near future a symposium should be devoted to exploring the interface of these two research areas.

In general this book is a very good introduction for those unfamiliar with this literature, as well as a good review for those who are. There are a number of chapters that will be useful for years to come. This book would make an excellent choice for a graduate seminar in evolutionary genetics. Few readers would be unsatisfied if they purchased it (if Academic Press would print books like these in paperback they would be of much wider appeal); no library should be without it.—ROBERT M. ZINK.

Raptor Conservation: The Next 50 Years.—S. E. Senner, C. M. White, and J. R. Parrish (Eds.). 1986. Raptor Research Rep. No. 5. Hastings, Minnesota, The Raptor Research Foundation. viii + 87 pp., 27 figures, 10 tables, 1 Appendix. $4.50.—In October 1984, a conference was held at Hawk Mountain Sanctuary, Pennsylvania, to celebrate the reserve's 50th anniversary. The stated goal was to lay out the actions necessary to conserve birds of prey for the next 50 years. The results included analyses of recent conservation and

research efforts, predictions about the future of raptor populations, and a few suggested solutions for anticipated problems.

In an introductory paper, Mark Fuller attempted to place the conference in the context of conservation biology, and suggested that raptors will continue to receive substantial conservation attention because of their presumed importance in communities, their vulnerability to extirpation, their sensitivity to contaminants, and their aesthetic value. Several papers covered the decline and future prospects of raptors in specific geographic or ecological areas. Ian Newton covered Europe, Yossi Leshem discussed the Middle East, and Robert Kennedy reviewed the situation in the Tropics. Chandler Robbins reported the results of raptor banding in North America in 1931–1980. John Haugh discussed the characteristics of raptor migration and factors that affect the scientific utility of raptor counts. Richard Olendorff commented on the problems that raptors in the United States face over the next 50 years and suggested some land management approaches to help offset these difficulties. James Brett discussed the role of education in raptor conservation. Noel Snyder described the California Condor management program and Tom Cade reviewed the history and future of reintroductions in raptor management. Dean Amadon provided a conference synthesis.

Although several bright spots were noted (e.g. the recovery of the Peregrine Falcon (*Falco peregrinus*) in Britain, the remarkable change of attitudes toward raptors in Israel, the decline in shooting mortality in North America and Europe), the main message of this slim volume is that the prospects for survival are grim for many raptor populations and species. The burgeoning human population, habitat destruction, wasteful agricultural practices, persecution, and tropical deforestation will continue to take their toll.

Problems in the Tropics are particularly severe. Some 91% of the world's raptors occur in the Tropics; 47% in the rapidly disappearing tropical forests. Seventy-six percent of the raptors listed in the ICBP Red Data Book live in the Tropics. Yet these lands are also inhabited by people facing severe economic hardships which can be partially or temporarily allayed by the destruction of raptor habitat.

The raptor populations that survive the next 50 years will do so in increasingly artificial environments. Some may require artificial nest platforms and boxes; others may depend on feeding stations. The extensive range of some species, such as the California Condor (*Gymnogyps californianus*) and the Griffin Vulture (*Gyps fulvus*) may be artificially reduced by careful distribution of food, in order to keep the birds safely within the confines of preserves. Because many raptors are sparsely distributed, and have large territories, most preserves will not be large enough to maintain viable populations. Where preserves do not adjoin suitable habitat, genetic viability may be maintained by frequent restocking, and chance extirpations corrected by repeated reintroductions.

Except for Snyder's detailed analysis of the California Condor problem, suggested solutions were vague and general: preserve habitat, educate the public, make it profitable to conserve raptors, improve land-use planning, coordination and zoning. This generality was probably inevitable given the intractable nature of the problem, the number of species, cultures and situations involved, and the inherent limitations of the format. The lesson may be that large scale conservation blueprints or projections cannot easily be "spun off" of the activities of professionals whose primary responsibilities require substantial attention to narrower (or different) problems. We need to assign more people, full time, to the crucially important task of preventing extinctions and local extirpations.

This book is not a reference book or a text. Indeed, five of the authors cited fewer than seven other papers. It is, however, a thought-provoking look at the tenuous future of a very interesting group of birds. The volume's greatest contribution may be as a secular version of the divine admonition cited by Leshem: "See my works, how beautiful and perfect they are, and all I created, I created for you! Beware lest you spoil and destroy my world, for if you do, there is no one to repair it after you . . . ."—JAMES D. FRASER.

Conservation of Cameroon Montane Forests.—S. N. Stuart (Ed.). 1986. Cambridge, England, International Council for Bird Preservation. iii + 263 pp., figures, tables, 7 maps. ISBN 0-946888-07-8. Paper, £10. **The Endemic Birds of Madagascar.**—T. J. Dee. 1986. Cambridge, England, International Council for Bird Preservation. vi + 173 pp., 3 figures, 23 maps. ISBN 0-946888-09-4. Paper, £8.—These books are the first two published by ICBP in an undesignated series of occasional reports that deal with pressing bird conservation topics at greater length than in their Study Report series. Both summarize in considerable detail the extent of ornithological knowledge of specific regions of Africa. The latter deals only with status and distribution. The former assembles additional information on life history and ecology, and presents unpublished data gathered in the course of the 9-person ICBP Cameroon Montane Forest Survey which visited Cameroon between November 1983 and April 1984.

While the greater part of the Cameroon volume deals with montane birds, chapters cover the geology, climate, vegetation, bats, small and larger terrestrial mammals, and herpetofauna of the region. The bird chapters treat origin and evolution, status and ecology of montane birds, records of other birds, and summarize the biometric and breeding phenology data obtained from extensive mist-netting studies.

Fifty-three montane forest bird species occur in the Cameroon highlands; 20 are endemic. The status and

ecology of each of these is presented in a lengthy chapter by S. N. Stuart and F. P. Jenson. The ICBP team compiled 44 new location records, more than half of which came from Mount Nlonako, an isolated outlying mountain south of the Bamenda Highlands, previously unexplored by ornithologists.

The need for biological study of this extensive mountain area of West Africa arose from a realization that recommendations by the International Union for the Conservation of Nature and Natural Resources for national parks in Cameroon covered only lowland sites and neglected completely this important center of endemism. The authors focus attention on the uniqueness of the biota of the montane forests of western Cameroon at a time when efforts to protect portions of the area can still be entertained. The area faces increasing deforestation due to pressure from expanding human population. In fact, high human densities on the Bamenda Highlands have already resulted in the near total elimination of forest there except on biologically important Mount Oku. National park status is recommended for Mounts Cameroon, Kupe and Oku. These recommendations take into account not only birds but all biota.

The Madagascar volume presents no previously unpublished data. It draws together information from a broad range of sources on the birds of an area of deep concern to conservation. Of 197 native breeding species, 106 (53%) are endemic, 133 (66%) of the nearby Comoro Islands are included. Five avian families and a subfamily are endemic to the region. N. J. Collar and S. N. Stuart (1985, Threatened Birds of Africa and Related Islands, Cambridge, ICBP and IUCN), list 26% of these native bird species as threatened and an additional 14% as near-threatened. The present study was an outgrowth of literature review for the threatened birds volume.

Following an introduction that summarizes the significance and precarious status of the Madagascar avifauna, species accounts treat exhaustively the status, distribution and habitat requirements of each species. Four appendices give a summary of the status of nonendemic bird species, a gazetteer of place names (a particularly important feature, for confusion has arisen in the literature from changed, misspelled, and inadequately identified names), a summary of legislation to protect birds, the areas legally protected, additional conservation measures proposed, and, finally, a list of French names for endemic birds. The 23 maps indicate the locations of records of 51 endemic birds, mostly 2 species per map. The maps show only the island outline and, presumably, Antananarivo, the capital, making it difficult to relate records to place names or other geographic features, no map of which is provided. The 3 "figures" use the same map outline, again with the unidentified capitol, to show distributions of (1) the island's four distinct phytogeographic regions, (2) the 26 threatened species, and (3) 12 areas that are protected and 5 areas that contain 22 threatened species (appallingly, these areas coincide only twice).

These volumes are the most convenient, most comprehensive and only up-to-date summaries of information on the African regions they cover. They offer a good value to conservationist and ornithologist alike. Errors are very few. Researchers of African birds will want to have a copy of each.—WARREN B. KING.

Ian Sinclair's Field Guide to the Birds of Southern Africa.—J. C. Sinclair. 1987. Lexington, Massachusetts, The Stephen Greene Press, distributed by Viking Penguin Inc., 40 West 23rd Street, New York, NY 10010. 368 pp., more than 900 text figures. ISBN 0-8289-0621-1. $14.95.—Ian Sinclair's colorful photographic guide to birds, first published in 1984 in South Africa (C. Struik) and reprinted in 1985 in the UK (Collins), is the most complete set available of photos of African birds. Photos of nearly all 907 species recognized in southern Africa (south of the Cunene and Zambezi rivers) are included, plus some species of the Southern Ocean and the land birds of Gough Island and the Tristan de Cunha. The photos give an excellent look at many species of African birds. Nearly all were taken in southern Africa; a few (including shearwaters at their nesting burrows) were extralimital. Most successful are the photos of albatross, petrels, large wading birds, hawks, bustards, owls (including Pel's Fishing Owl, *Scotopelia peli*) and bee-eaters; the ducks, doves, and finches are attractive also, but are commonly photographed. The section on seabirds is of special interest for the photos, and these birds seem to have inspired the book. Sinclair began to write it while he was staying on Marion Island during an expedition of the FitzPatrick Institute of African Ornithology, University of Cape Town. The passerines of remote Gough and the Tristan island group, and the tiny flightless Inaccessible Island Rail, *Atlantisia rogersi*, all unknown to so many birders, are special treats.

The clarity and color of the photographs varies considerably; most are very good bird photos. On average the standard is not up to that of the Australians as shown in their four recent books that draw upon the National Photographic Index of Australian Wildlife. Some are flash shots with unnatural greenish colors (Scalythroated Honeyguide, *Indicator variegatus*), of dense saturation (Lesser Honeyguide, *Indicator minor*), out of focus or grainy (Red Lark, *Certhilauda burra*; Terrestrial Bulbul, *Phyllastrephis terrestris*; Carp's Black Tit, *Parus carpi*), or swiftly flying by (some swifts), but, for birds with small ranges and seldom seen, these are far better than no image of their lives. Most small songbirds are perched in classic field-guide pose, and happily few have an insect in the bill and the distressed look often seen in a bird disturbed at its nest while feeding young. A few photos have intrinsic biological interest, such as the two species of giant

petrels with the different bill colors (tip yellow in Northern Giant Petrel, *Macronectes halli;* green in Southern Giant Petrel, *M. giganteus*) seen in adjacent photos, and both color-phases (brown and white) of Southern Giant Petrel. Also of interest are a Bald Ibis (*Geronticus calvus*) at a nest with its young, and a Cape Batis (*Batis capensis*) feeding an unidentified nestling (a feathered Klaas's Cuckoo, *Chrysococcyx klaasi*). Several species, mainly songbirds from areas in forested or border regions, are illustrated only with color paintings; these are not very attractive or useful for identification, and perhaps photographs will become available for a future revision.

The book is a photographic field guide, with text and distribution map, a representative photo of the species on facing pages, and four to eight species on facing pages. The text includes common and scientific names, a description or comparison of the appearance of the species with similar species, brief notes on habitat and distribution within the region, and brief notes on call. The information given is generally accurate. The single photograph for a species is useful for identification in the field mainly for species that look alike in all ages and sexes or where the observer has a good look at a male in breeding plumage. The text descriptions include females and some off-season males or juveniles, but often not in sufficient detail to allow the observer to distinguish species, and it would not be possible to identify many female weavers, whydahs, sunbirds, or many phases of raptors from this guide alone.

For this reason, I regard the role of the book to show often-inspiring photos of birds in southern Africa and to introduce new students to the variety of African birds. For many identifications it will be sufficient, but other guides would be advised to direct an observer through their more difficult identification problems in the field. In size and weight, the book falls between the "National Geographic Society Field Guide to the Birds of North America" (1983, smaller) and Maclean's "Roberts' Birds of Southern Africa" (1984, larger) which is much more informative about the biology of each species, illustrates females and some immature plumages, gives enough information about songs and calls to be useful in field identification, and illustrates more species in comparable poses together on the same page. As an all-purpose guide to birds, Maclean is more useful and thorough than Sinclair. Anyone with a visual interest in the birds of southern Africa will surely want a copy of the good bird photos in Ian Sinclair's Field Guide.—ROBERT B. PAYNE.

OTHER ITEMS OF INTEREST

Voices of All the Mockingbirds, Thrashers and Their Allies – Family Mimidae.—John William Hardy, Jon C. Barlow, and Ben B. Coffey Jr. 1987. Gainesville, Florida, ARA Records. Cassette tape and pamphlet. Order from ARA Records, P.O. Box 12347, Gainesville, FL 32604-0347. $10.00.—This 75-minute cassette tape provides examples of all 33 species of Mimidae singing in all their glory, providing us with the unbelievable variety of sounds for which they are renowned. Determining which vocalizations in this never-ending stream of sounds are imitations of other species can be challenging and entertaining. The songs of all species are well-represented with, on average, nearly 2 min being devoted to each species. In fact, only four species are represented by less than one minute of singing. Included on this tape is the only known recording for one species, *Mimodes graysoni,* and possibly that for a second, *Mimus magnirostris.*

The authors should be commended not only for locating recordings of all species but also for the overall quality of these recordings. As expected of field recordings, the quality of the cuts varies; some segments are excellent while a few include distracting background noises. However, in the few cases where vocalizations of other species could be confused with those of the mimid, the authors mention the other species in the pamphlet. In addition to songs, the calls of 13 of the 33 species are presented. These cuts are not generally of as high a quality as those for songs, and they are short. But, once again, the authors should be commended for including them because it makes this recording a potential research source. Likewise, I appreciate the inclusion of naturally-occurring pauses even though, for a few species, it results in some blank tape. To be used as a research source a tape needs to be fully annotated. In one case, when a portion of a segment is repeated, this is noted on the tape. The authors do not mention this on the cut of *Melanoptila glabrirostris,* in which a 13-second segment is repeated four times. Finally, there are a few minor errors in sound editing on the tape and a couple of minor discrepancies between the tape and pamphlet.

The short pamphlet is extremely informative and up-to-date. The discussion of phylogenetic relationships among mimids contains the most recent information and accurately reflects current confusion. The scientific and common names listed in the Table of Contents differ from the A.O.U. check-list (1983) in a few cases, but these discrepancies are minor, produce no confusion, and, in the case of Crissal Thrasher (*Toxostoma dorsale*), may be ahead of their time. The "notes on vocalizations" is helpful in pointing out similarities and differences among species. Further, the pamphlet introduces the characteristic for which this family is especially known, vocal mimicry. Imitations of novel sounds (such as a neighing horse, a human-whistled tune, and a dog barking) are included along with imitations of many avian species. The authors correctly point out that, in order to determine accurately the extent of mimicry, it is necessary to be familiar with all the sounds to which the singer is exposed. This includes *all* the calls and songs of *all* the species in the vicinity, vocalizations of migrants,

and even possibly vocalizations uttered by other species while learning their song. Thus, I especially encourage anyone who can pick out familiar sounds on this tape to contact the authors, as they request. The authors' notes on the extent of mimicry among the different species and among individuals within a species appear accurate, but more study is required.

I have enjoyed listening to this tape several times. In fact, I have listened to it while commuting. It is certainly nice to transport oneself all over the New World, if only through sound, as the interstate turns into a parking lot.—KIM C. DERRICKSON.

Galápagos: Discovery on Darwin's Islands.—David W. Steadman and Steven Zousmer. 1988. Washington, D.C., Smithsonian Institution Press. 208 pp., 106 color plates, 45 black & white illustrations. ISBN 0-87474-882-8H. $24.95.—The authors, who have used film as their medium in previous collaborations, have produced an enjoyable book for the general reader. Much of the text and over 80% of the illustrations deal with ornithological subjects. The accounts of the history and conservation efforts on the Galápagos archipelago are written from the viewpoint of an evolutionary biologist and are enthusiastic, entertaining and accurate. The illustrations (which total over one-half of the book) include some nice photographs, but consist mostly of fine reproductions of Lee Steadman's watercolors; these vary in quality.

S. Dillon Ripley introduces the book recounting some of his own experiences in the islands and his conservation efforts on their behalf. The rest of the text is divided into two sections. Part I (90 pp. divided into 5 chapters) gives an overview of the early history of the archipelago, its natural history, and some of the changes which have occurred since man reached the islands. One chapter draws on Charles Darwin's visit to the Enchanted Isles and subsequent development of his evolutionary hypothesis. The next chapter deals with Dave Steadman's work in the islands as the first scientist to study the fossil record deposited in lava tubes. Comparing his fossil finds with the specimens collected by Darwin 150 years previously, Steadman helps clarify some of the confusion arising from their mislabeling and also presents some of his own ideas on a possible ancestor of the famous finches (see also p. 663 of this issue—Ed.). The last chapter covers the history of various conservation projects implemented through the Charles Darwin Research Station and the Galápagos National Park Service, and also clearly defines some of the problems that confront conservation in the archipelago at the present time.

Part II, consists of plates and species accounts of reptiles, mammals, and birds of the Galápagos, with an Introduction by the artist, Lee Steadman. Each figure is accompanied by a species description, its distribution in the archipelago, fossil record, possible continental relatives, and the authors' approximation of time since its colonization. The classification of several of the birds in this section may be viewed as iconoclastic; in a few of these cases Steadman justifies his nomenclature on the basis of morphological differences or similarities, and in general the usage is consistent with his ideas on the probable origins of these insular populations.

This is a well written, perceptive, and innovative look at the Galápagos Islands and their conservation. I recommend it for individuals interested in a lively and personal view of the scientist at work.—JUSTINE B. CRUZ.

Birds of the Middle East and North Africa. A Companion Guide.—P. A. D. Hollom, R. F. Porter, S. Christensen, and Ian Willis. 1988. Vermillion, South Dakota, Buteo Books. 280 pp., 40 color plates, over 100 line drawings. ISBN 0-931130-15-8. $32.50.—This authoritative field guide by Hollom et al. is a welcome addition to the literature on the southwestern Palearctic region. It covers the countries that border the southern Mediterranean from Morocco through Egypt, extends to the east throughout the Arabian Peninsula and all of Iran, and includes Cyprus, Turkey, and the other Middle Eastern countries. The land area covered is greater than that of the combined 50 states of the USA. More than 700 species are included, and 350 appear in the attractive color plates.

The phrase "companion guide" in the title indicates the intent that the book be used with "A Field Guide to the Birds of Britain and Europe" by Peterson, Mountford, and Hollom. Those species described in Peterson et al. are usually treated only briefly for distribution and habitat in the companion guide. For species not included in Peterson et al., Hollom et al. cover identification, including age, sex, and geographic variation where applicable, and differences from similar species. Voice and other behavioral characters are included. Under "Status," Hollom et al. designate range and time of occurrence and small maps indicate known breeding localities. Habitats are briefly noted in a separate section. Hollom et al. clearly designate occasional points of uncertainty of taxonomy, identification, and distribution, and thereby should stimulate further studies. The illustrations by Willis and Christensen are of a high quality commensurate with the text.

Relative to another guide, "The Birds of Britain and Europe with North Africa and the Middle East" by Heinzel, Fitter, and Parslow, the guide by Hollom et al. covers much more geographic area to the south and east, and provides greater detail about those species and distinct subspecies not found in Europe. More than 150 species in Hollom et al. are not treated by Heinzel et al.

This first-rate guide by Hollom et al. should be in comprehensive ornithological libraries. Anyone

studying birds in that region will want a personal copy.—GEORGE A. CLARK JR.

Voices of the New World Cuckoos and Trogons. Cuculidae and Trogonidae.—J. W. Hardy, G. B. Reynard, and B. B. Coffey Jr. 1987. Gainesville, Florida, ARA Records #11, cassette. No price given.—So why are the New World cuckoos and trogons combined on this tape? Although no explanation is given, it is presumed that since Hardy et al. already have productions on the taxonomic intervening owls and nightjars, and for a number of reasons recordings of hummingbirds and swifts will be a long time in coming, the cuckoos and trogons have been united here.

Regardless of this unnatural arrangement, the quality of the recordings are generally excellent. Hardy et al. have done a superb job of editing, as these recordings are pleasantly free of hisses, "pops," and other annoying background noises. The detailed liner notes give an overview of each group, and also point out taxonomic questions where vocalizations may help shed some light. For each species, the English and scientific names, date and locality of recording, the recordist, and whether the cut (number of cuts range from 1–5/species) consists of songs or call notes are given. In the few cuts where background voices of other species are prevalent, they are identified also.

Side one contains vocal examples of the New World cuckoos. Notably missing are the Ash-colored Cuckoo (*Coccyzus cinereus*), the Black-bellied Cuckoo (*Piaya melanogaster*), and not surprisingly, the vocalizations of all the ground-cuckoos (*Neomorphus*). Hardy et al. have included the enigmatic Hoatzin, based on Sibley and Alquist's DNA work. This side will be especially useful to Neotropical workers, as it contains voices of a number of species that are difficult to observe or entirely overlooked as a result of their secretive nature. In particular, even the most seasoned field person may not fully appreciate the extensive vocal repertoire of the common and widespread Squirrel Cuckoo (*Piaya cayana*).

Side two includes the trogons. Generally the recordings of this group are superior to those of the cuckoos—a reflection of the trogons being easier subjects. An exception is the weak, truncated, or unnatural recordings of the spectacular and much-revered Resplendent Queztal (*Pharomachrus mocinno*). The only known recordings for three species are presented. The importance of vocalizations for highlighting taxonomic problems is underscored with this group (see the liner notes).

This cassette is essential to Neotropical aficionados whether they are permanent residents, seasonal residents or vagrants there. It will not only be immensely useful for the first time visitor, who is attempting to sort out the myriad calls, but the veteran will find it most helpful to distinguish those unfamiliar cuckoo or all too similar trogon vocalizations. It will be enjoyable to even those people who may never step foot in the Neotropics, but appreciate the avifauna from afar.—MARK B. ROBBINS.

Wisconsin Birds: A Seasonal and Geographical Guide.—Stanley A. Temple and John R. Cary. 1987. Madison, Wisconsin, University of Wisconsin Press. 364 pp. ISBN 0-299-11430-9, $27.50 (cloth); ISBN 0-299-11434-1, $9.95 (paper).—A principle function of a state bird book is to provide interested amateurs and professionals with the basic information on birds that occur in the state (i.e. what species occur where, when, and in what abundance). Traditionally, the data for this information is derived from many years' accumulation of data from a mix of informal and formal reporting schemes in which mostly amateur, but also some professional, ornithologists participate. Also, there is usually a historical component to such books that is of real interest and value, especially if care is exercised to insure that it does not interfere with the ready determination of a species' current status within the state.

"Wisconsin Birds" is a decidedly different sort of state bird book. It is based on 22,829 weekly checklists provided by participating members of the Wisconsin Society for Ornithology (431 total, of whom 257 were regular contributors) during the years 1982–1986. Thus, it contains no historical information but it is as current a summary of the status of birds in Wisconsin for which one could reasonably hope. There are 265 species accounts for birds commonly found during these years. Each account is a single page with (1) a relative abundance graph that represents the average percentage of participants who reported the species at least once during the year; (2) one or two range maps (depending on whether or not there are seasonal differences) of distribution and abundance patterns in 43 regions, and (3) graphs showing how reporting frequency changed throughout the year in northern and southern Wisconsin. Thus, at a glance one can get a feel for the chances of finding a given species at any particular time at any locale in the state.

Following the species accounts for the commonly occurring species is a listing of the 1975–1985 records of 98 "rare" species by county and month. Rare species are those for which there were never more than 10 reports per year (presumably meaning 1982–1986) and in most years no reports at all.

No information on nesting records is given but users can probably assume with reasonable confidence that species present in numbers anywhere in the state during their usual breeding period are breeding birds. The lack of information on breeding records, as well as historical information on Wisconsin birds, does not detract significantly from the book's potential usefulness to either the amateur or the professional. (There is a forthcoming book on Wis-

consin birds that presumably will provide this information.)

Errors, other than typos, on the species account pages would be impossible to detect without having access to the original data. However, the overall quality of the study and the book gives me confidence that errors are few. The only one I noted was a typo on the bottom of p. 17: 4.8% should read 48%.

Resident and visiting birders should find this convenient pocket-sized volume extremely useful. The quantitative nature of the data on which species accounts are based will also surely prove to be useful to persons interested in population ecology and conservation. The Wisconsin checklist project (described in an appendix) is apparently continuing and will provide a solid data base for tracking avifaunal changes that may occur (or be occurring now). Ornithologists elsewhere would be well advised to consider utilizing the skill and energy of amateurs by beginning such a program in their own home territories.—NORMAN L. FORD.

Birds in Minnesota.—Robert B. Janssen. 1987. Minneapolis, Minnesota, University of Minnesota Press. xv + 352 pp., 22 photos. ISBN 0-8166-1568-3, $35.00 (cloth); ISBN 0-8166-1569-1, $14.95 (paper).—This new book is essentially an updated version of the 1975 book by Janet C. Green and Robert B. Janssen ("Minnesota Birds," Minneapolis, Univ. Minn. Press). Like its predecessor, it presents individual species accounts with information on distribution, abundance, seasonal variation in occurrence, and breeding status. Differences from the earlier book include: (1) range maps that show the breeding distribution of each species for which there are confirmed breeding records since 1970 (the earlier book had range maps only for those species having a continental range boundary within the state), (2) a completely new and very well-written chapter by Kim R. Eckert on Minnesota geography, seasons, and habitats, (3) some changes in definition of terms (such as "regular" and "accidental"), and (4) the lack (unfortunately) of a bibliography.

Owing to the establishment (1974) of a Minnesota Ornithological Records Committee that passes on the acceptability of unusual sightings and defines the status of each species, the updated information in Janssen is possibly more reliable than the information in the 1975 book. However, standards of verification for the latter were hardly lax, and the data were certainly as reliable as that of any state bird book published up to that time. Even under the careful scrutiny of the records committee, 31 species have been added to the state list since 1975. Five species were dropped (lumpings, escaped cage birds, extirpation of an introduced species), giving a net gain of 26 and a grand total of 400 species for the state.

The addition of many more maps of breeding ranges is a decided improvement over the 1975 book. Maps are given for all species for which there are confirmed breeding records since 1970 and dots are placed in each country where records exist. For all except rare breeders, the approximate breeding range is shown as a shaded area determined by both the breeding records and by reports of occurrence in June and July. Thus, the maps apparently represent the current breeding range of each species. Breeding records prior to 1970 are usually mentioned in the text of the species accounts and, of course, additional historical information on breeding distribution can be obtained from the 1975 book.

"Birds in Minnesota" is generally free of conspicuous errors (a notable exception is the transposition of legends for photos of the Prairie Chicken and the Sharp-tailed Grouse), but there is some lack of agreement between the maps and text that may, or may not, represent errors. For example, on p. 83 for the Short-eared Owl "Recent breeding has been confirmed as far east as Hubbard and Aitkin Counties . . . ," but there is no dot in Aitkin County on the map for this species. There is a similar question about the lack of a dot in Marshall County on the map for the Long-eared Owl. It is not possible to tell if these are errors on the maps or confusion created by commingling of pre- and post-1970 breeding records in the text.

Overall, "Birds in Minnesota" is a well done, authoritative, and attractive book (mine is the hard cover) and no one interested in Minnesota birds can afford to be without a copy.—NORMAN L. FORD.

Birds of the Transvaal.—W. R. Tarboton, M. I. Kemp, and A. C. Kemp. 1987. Pretoria, Transvaal Museum; available from Transvaal Museum Bookshop, P.O. Box 413, Pretoria 0001, Transvaal, South Africa. 294 pp., paperback, text maps and figures. ISBN 0-620-10006-0. No price given.—The book is a distributional atlas of all birds known to occur in the Transvaal, a subtropical inland area of 286,000 km^2 and the only Province of South Africa that extends into the Tropics. The book represents 10 years of inventory including information from early publications, museum collections, banding schedules, regional nest records, and local atlas projects.

The Transvaal has 639 species of birds. Of these, 496 species are known to have bred, 31 others probably breed, 64 are regular non-breeding visitors from the Palaearctic or from elsewhere in Africa; the others are based on old records, vagrants, or escaped captives with no feral populations. The records are up to date; two species included (Franklin's Gull [*Larus pipixcan*] and Lesser Cuckoo [*Cuculus poliocephalus*]) were first seen during 1986. Population numbers are included where known (2,250 Bald Ibis [*Geronticus calvus*], fewer than half of them breeding; ca. 4,800–5,000 pairs Cape Vultures [*Gyps coprotheres*]). For each species the

authors characterize the habitat, range, status, and breeding (34,000 breeding records, summarized by month of laying). The distribution and known breeding locations are summarized for each species in a map with symbols in the 456 quarter-degree squares. The text includes 600 references; these are incomplete and do not include some publications in nonlocal sources. A few questionable records are indicated and the sight observations of indigobirds (*Vidua* spp.) and cuckoos (*Cuculus canorus* and *C. gularis*) were not always distinguished by the observers, though in many cases the authors qualify these records. The book provides useful details of the distribution of birds of the Transvaal and it should be useful for all libraries in museums and universities where anyone is interested in the current status and distribution of African birds.—ROBERT B. PAYNE.

A Birder's Guide to Japan.—Jane Washburn Robinson. 1988. Santa Monica, California, Ibis Publishing Company. 358 pp., 57 maps. Distributed by Cornell University Press, Ithaca, New York. ISBN 0-934797-02-1. Paper, $14.95.—Another in a string of books intended to guide birders, rather than a guide to the birds. Unlike others of the genre (review Auk 104: 807–808, 1987), this one is absolutely necessary. As is expected, it tells you where to go for birding. About 50 sites are included. Along with each site are details on *how* to get there (no easy trick), food, accommodations, and where to procure maps and other relevant information. The maps in the book are detailed, accurate and necessary expressions in kanji are included.

Of equal importance is Robinson's "Essential Information." Japan is an extremely difficult country for travel. The language barrier often feels insurmountable. Cultural differences can be immense. Robinson gives valuable details on how to travel and, more to the point, tips on personal interactions, clues to public transportation, what to expect regarding food and accommodations, even how to deal with the police. Take this book when you go.—A.H.B.

Hawks in Flight.—Pete Dunn, David Sibley, and Clay Sutton. 1988. Boston, Massachusetts, Houghton Mifflin Company. xvii + 254 pp., 92 line drawings, 173 black-and-white photographs. ISBN 0-395-42388-0. $17.95. **On Watching Birds.**—Lawrence Kilham. 1988. Chelsea, Vermont, Chelsea Green Publishing Company. xvii + 187 pp., ISBN 0-930031-14-8. $17.95. **The Complete Birder.**—Jack Conner. 1988. Boston, Houghton Mifflin Company. xiii + 285 pp., ISBN 0-395-46807-8. $8.95 (paper).—The dust jacket on "Hawks in Flight" touts this as the first "holistic" bird book. Welcome to the New Age. In case you've been away, New Age is the rage. Mellow, repetitive music, sparse cuisine, everything a matter of introspection. New Age often dabbles in astrology, channeling, belief in the power of crystals, and a selective acceptance of paranormal phenomena. A holistic method bespeaks respect for the whole individual. Indeed, these three books share a curious attractiveness, in large part because of how they were written. Each had a different topic, but they are light, highly readable and different from ordinary books on birds.

"Hawks in Flight," subtitled "The Flight Identification of North American Migrant Raptors," covers 23 species. "It was produced to be entertaining as well as instructional." Its goal is to facilitate identification of the common migratory raptors, but it is biased towards the east. The authors attempt to bridge large distances, accommodate variable viewing conditions, and sort out birds with confusing plumages. The text, by Dunn, makes marvelous use of images and analogies in the descriptions of the birds, their habits and behavior. His writing is witty, irreverent, and informative. Sibley's line drawings detail the characteristics of shape and age-or-sex difference of each species from both dorsal and ventral views. The photographs, mostly by Sutton, are realistic: mostly small images, murky or backlit, blurred from speed and everything else that makes field identification difficult.

The major chapters (Buteos: The Wind Masters; Eagles and Vultures: Big Black Birds, etc.) provide basic descriptive material. Details of appearance, range, and behavior for each species is supplemented by detailed description of field marks. What sets this book apart are the details on how an observer might separate similar or otherwise confusing species. Readers will find this useful.

We are continually reminded that Larry Kilham, in the real world, is a first-class virologist. He is, of course, also a fine ornithologist. I guess if you are a keen observer, it makes little difference on which scale you work. Kilham's book contains many reminiscences and personal observations. He masterfully describes his enjoyment of nature, shares what he has learned, and mixes in reflections about the world in general. Kilham writes elegantly about bird behavior, animal intelligence and communication. One may not agree with all he says, but his book reinforces the value of careful observation and thinking about what is seen and heard.

Connor's volume, subtitled "A Guide to Better Birding," is of yet another stripe. The first group of chapters (The Sporting Science; Optics; Acoustics) present the nuts and bolts. The next three (Migration; Winter; Summer) try to describe and explain what goes on in the bird's world. The writing is homey and full of details, anecdotes, and tidbits. The next set (Warblers; Hawks; Shorebirds, Terns and Gulls) deals with all the problems of field identification—for both beginners and experts. Conner provides information on how and where to look, problems with similar appearances, and marvelous tips on how to eliminate possibilities based on season, location, etc. His advice

is conservative and constrained. The final chapter, "The inner game," isn't quite what the title implies. It deals with actions in the field, list-keeping, note-taking, and rarity-reporting. The mechanisms used are in the details of people's experience, tales from the great birders, and a chatty presentation.

Each of these books is aimed at some segment of the estimated 7 million folks who are considered birders, or think of themselves as such. The Dunn and Connor volumes offer the possibility of mastering difficult groups of birds or at least improving skills. Kilham's reflects on the simple pleasures of being outdoors and enjoying animals in their natural state. All three have their place, and are especially good examples of books by birders who enjoy sharing their pleasures and addictions with others.—A.H.B.

The Birds of Papua New Guinea.—Brian J. Coates. 1985. Alderley, Australia, Dove Press. 464 pp., 493 color photographs, 44 line drawings, 363 maps. ISBN 0-9590257-0-7. $65.00.—This is a large (21.5 × 30 cm page size), lavish (the 493 color photographs include 7 double-page spreads) production. It is the third book on Papua New Guinea birds by Coates, and the first of two volumes in this sequence. It covers the non-passerine birds of Papua New Guinea, including the Bismarck archipelago and Bougainville. The second volume will cover the Passeriformes and summarize the avifauna of Irian Jaya and the Solomon Islands. Ultimately, the plan is to cover in equal detail the rest of the 740 or so species in this interesting area of the world.

The introductory material covers the biogeography of the birds plus the physical, climatic, and vegetational features of the island. Approximately 25 distinguishable habitat types are illustrated by photographs. They are defined by the vegetation, but typical bird species are mentioned. The range of habitats, from the open ocean to rain forest at several altitudes, is spectacular.

The main element of the book is the species accounts. The accounts cover 377 species and vary in length from 2 or 3 short paragraphs to 5 or more text pages and several large color photographs (e.g. Masked Lapwing). This is more than a picture book. The species accounts include a general description, flight characteristics, and sometimes a note about plumages. The adjacent map gives localities, and there is a paragraph on preferred habitat, numbers and distribution, vocalizations, seasonal movements, and, where known, breeding and nesting behavior. It is no surprise that basic details for many species are unavailable. But Coates adds a considerable number of personal observations and anecdotal information on the behavior of many species.

The classic "Handbook of New Guinea Birds" (Rand and Gillard 1968, New York, Nat. Hist. Press) had a much greater emphasis on taxonomy. Rand and Gillard covered the entire avifauna in a single volume with extensive keys and subspecies descriptions. It lacked the visual impact of the Coates volume. The current "Birds of New Guinea" (Beehler et al. 1986, Princeton, New Jersey, Princeton Univ. Press; reviewed pg. 816 in this issue of *The Auk*) is a field guide and has a different function. Coates includes more natural history than Rand and Gillard and has a different intent than Beehler et al. Given the size and complexity of the avifauna, there is a need for all this information. The basic biology of many species is only poorly known, and much remains to be learned about the interactions among species and between the birds and their environment.

The color plates are a major feature of this book. Almost all the photographs, and all the drawings and maps, are by the author. The quality of the photographs ranges from below average in usefulness to magnificent. Coates uses illustrations of plumage variation to discuss problems in field identification. The use of the photographs in combination with a thorough and apparently accurate text makes this a major contribution to the ornithological literature of Papua New Guinea.—A.H.B.

A Synopsis of the Avifauna of China.—Cheng Tso-hsin. 1987. Science Press, Beijing (available from Paul Parey Publishers, Spitalerstr. 12, Postfach 106304, D-2000 Hamburg, BRD), xvi + 1222 pp., 829 maps. ISBN 3-490-12518-5. $165.00.—The Chinese avifauna comprises 1,186 species with 953 subspecies. All 2,139 forms are treated in this massive (2.7 kg) volume. Species accounts include the nomenclature, breeding habitat, range (all the C.P.R. and Taiwan) and current status. There is a large (63 pp.) table devoted to distributions, a Gazetteer, bibliographies in both Chinese and English, and indices to the Chinese, English, and scientific names. A single map is used throughout. They are marked for breeding and winter ranges, and migratory movements. Specific localities are indicated by a series of symbols. Political boundaries are omitted, but major rivers are shown. the scale of the maps renders them most useful only with constant consulting of the distribution table and the Gazetteer.

This volume is an updated and revised version of the earlier "Distributional List of Chinese Birds" (1976). This is the first English edition. The data are taken from the literature, citing work through 1982. It includes "all the new subspecies discovered by Chinese ornithologists since the founding of New China." Cheng acted essentially as a compiler. No criteria are mentioned for the acceptance of records; and, while his job was monumental, it was presumably noncritical. Chen Jia-jian, his wife, prepared the tables, bibliography, and indices.

The book is an important ornithological resource. It is the only source in English for important information on a vast geographic area. Unfortunately, the

production is relatively poor. The binding on the review copy quickly broke. Common names are given in English and Russian, and each taxon at all levels has a Chinese ideogram. In many cases the ideograms are over-inked and illegible. This affects the use of the index, which may be important if you are interested in the original literature. There are some English misspellings; I did not check the Chinese or Cyrillic.—A.H.B.