REVIEWS

EDITED BY JOHN WILLIAM HARDY

Handbook of the birds of India and Pakistan together with those of Nepal, Sikkim, Bhutan and Ceylon. Volume 1, Divers to Hawks.—Salim Ali and S. Dillon Ripley. 1968. Oxford University Press, Bombay, London, New York. Pp. lviii + 380, 18 col. pls., 1 col. map of vegetation types, numerous sketches and range maps. $13.90.—This ambitious work, intended to comprise 10 volumes of 400 pages each, carries on the tradition of E. C. Stuart Baker's "Fauna of British India, birds, 2nd ed." (1922–31, 8 volumes), referred to henceforth (as it is by Dr. Ali!) as the FBI. We gather from a historical summary and acknowledgments that Dr. Ali has written the text, that it is based on Dr. Ripley's "A synopsis of the birds of India and Pakistan" (Bombay Nat. Hist. Soc., 1961), that the keys are the work of Dr. Ripley assisted by Gorman Bond, that the color plates by Coombs, Cowan, Harle, Henry, and A. M. Hughes are from other books published or in press (Birds of Burma, Birds of Kerala, Birds of Sikkim), that the line drawings are from the FBI, 1st edition (used also in 2nd ed.), as well as some from "Handbook of British birds," and that many of the distribution maps, usually showing the entire Old World, rely upon "Atlas of European birds" by Voous, "Waterfowl of the world" by Delacour, and "Birds of the Soviet Union" by Dementiev *et al.*: It is this kind of outside help and cooperation, as well as grants-in-aid, that have cut costs, cut time, and have made such a book possible.

A "general" section sets forth the taxonomic sequence of Dr. Ripley's "Synopsis," which is the reverse of the FBI. Measurements are explained and Stuart Baker is credited for the information on nests and eggs. A chapter on migration summarizes the latest information from banding studies, especially rich in results for ducks, as shown on a full page map. A lengthy and thorough chapter on zoogeography follows: Darlington's principles are enumerated, the geologic history is traced, vegetation zones are characterized and illustrated by a detailed vegetation map in color. Examples from the avifauna illuminate the zoogeographic concepts and climatic types of vegetation described. There follows an exposition of systematics and evolutionary theory designed to make the reader love subspecies. And sure enough the basic taxa of the book are subspecies, each numbered consecutively from Dr. Ripley's "Synopsis." A glossary of Indian ecologic terms, diagram of plumage (with a novel or perhaps misprinted system for labeling wing coverts), and a list of abbreviations complete the introductory material.

For the orders Gaviiformes through Ciconiiformes the main text gives us the name of the order, the name of the family, a description of the family, then a key to Indian forms that goes straightaway to species and includes color phases, adult *vs.* juvenal, and breeding *vs.* non-breeding. Genera are not keyed, but are given a paragraph of description in the text. Most of the accounts are for full species or the one race occurring in India, and consist of 1–3 pages of the following information: the number from the "Synopsis"; common name; scientific name; original citation; page in Baker's FBI; page for the color plate in the present volume; local names; size; field characters including brief descriptions of adult, young, and chick; status, distribution, habitat and extralimital range; a long section on general habits; food; another lengthy account of breeding; museum diagnosis and measurements from the FBI; colors of bare parts.

The remaining three families, Anatidae, Accipitridae, and Falconidae, are treated similarly but are keyed to genera, and a key to species follows the text characterization

of the genus. If a species has more than one race in India it appears as a Latin binomial only, followed directly by a key to subspecies. Usually one of the subspecies accounts grapples with distinctions from closely similar species, and the rest deal merely with differences from the other subspecies.

What is the relation between the Handbook and the FBI? In the introduction Dr. Ali says "In view of the coloured illustrations, feather by feather descriptions of plumages, as in the Fauna, were considered redundant. The pictures, supplemented by the Keys and the paragraphs on Field Characters and Museum Diagnosis, should suffice to identify a bird in the field as well as in the hand." Thus the lengthy plumage descriptions of Stuart Baker are replaced with color plates and the equally lengthy but worthwhile natural history observations of Salim Ali. But do not hasten therefore to throw away your volumes of the FBI! Those "feather-by-feather descriptions" of each sex, age, and polymorphic category will prove their immense value time and time again. Furthermore the FBI covers Burma, which makes it applicable to almost all of Asia and Southeast Asia as well as India. Dr. Ali must share this view, or why does he give us the FBI reference page at the head of each species account?

I was asked by the review editor to try out the book's identification aides in the field. This amounts to asking if it works for herons and hawks (storks and ducks now being virtually absent from Southeast Asia) which is pretty unfair to Dr. Ali inasmuch as hawks, with all their polymorphic and age differences, are the hardest of all birds to identify. Someone needs to make a special study of immature hawks, relaxing and spreading the wings of museum specimens, so that flight characters can be discerned. Meanwhile I can truthfully say that the Handbook works admirably for those Indian adult hawks and immatures of common species that I have seen in Thailand—maybe all that a field observer should attempt anyway. Sometimes in attempting to identify immature hawks from the Handbook you run into a dead end within the subspecies comparisons and never arrive at a diagnosis on the species level. It is refreshing to find three forthright disclaimers: nonbreeding *Egretta intermedia* are "often indistinguishable" from *E. alba*; the immature *Gyps bengalensis* is "impossible to distinguish with certainty in the field" from *G. indicus*; and for *Buteo buteo* "Field identification unreliable" and status "Unsatisfactorily known owing to chaos in nomenclature, confusion in field identifications, and lack of better collected material."

At times the author describes the voice or a habit of one species by reference to another, thus perhaps losing the reader in unfamiliar comparisons. Two comparisons we doubt ever got compared are the "jostlings" of "rabbles" of *Phalacrocorax niger* in "communal hunts" to "manoeuvres reminiscent of starlings at a swarm of grasshopper nymphs," and a nocturnal call credited with some plausibility to *Spizaetus cirrhatus* "a wailing *hoo-hoo* immediately preceded by a 'harsh cough'—as of a woman being strangled." Perhaps ornithologists are not the meek crew we supposed them to be and we should ask the Cornell library of natural sounds for a tape of the unfortunate female, in order to solve the mystery of the Indian devil-bird!

Dr. Ali's animated literary style is enriched by words not often applied to the *Vogelvelt*, such as the nouns festoon, singleton, aerobatics, fosterer, facies, water-spread, scrimmage, gobbet, press, river barrage, coign, ossuaries, let; the adjectives shingly, squelchy, whity; and the verbs jinking, flighting, and chivvied.

Some of the best descriptions are of the Open-billed Stork plunging to its nest, the same bird opening *Pila* snails, the hovering of *Elanus*, and cooperative hunting by the pair of *Hieraetus pennatus*. We learn that a cormorant brakes with its tail against

the water in alighting, that the darter transfixes its prey upon the upper mandible, that it squirts water in jets into the mouth of the nestling, that the powder-down is a sort of dry shampoo for degreasing soiled feathers, that herons impale fish, that *Milvus*' foraging includes taking golf balls from the links. The Brahminy Kite can ride on the water like a gull, *Haliaeetus leucoryphus* has been seen apparently attempting to drown its victim in shallow water, and the Lämmergeier drops bones on rocks to break out the marrow. The peculiar foot of *Ictinaetus* is thought to be adapted for nest-snatching. This eagle grabs the entire nest of small birds and has been seen "examining the contents while sailing lazily away." We are told that the Golden Eagle stoops and splits its prey open with its huge hind claw, and that *Microhierax*, *Falco biarmicus*, and *F. peregrinus* also strike or rake their prey with this claw. This arouses curiosity as to how the large hind claw of the passerines will be justified, near the end of volume 4.

On Indian coasts is a reef heron (*Egretta gularis*) geographically complementary and with similar ecology to *Egretta sacra*, yet which is morphologically indistinguishable from *E. garzetta*! Some good banding recoveries of young Open-billed Storks are mentioned, including one involving a 1500-km trip from near Bangkok to East Pakistan. Large eagles have been found dead on the North Col of Everest at 26,000 feet in 1952 (1) and May 1960 (3). One of the latter three was brought down and identified as *Aquila nipalensis*. This difficult pass seems therefore to lie on one of the regular migration routes of the Steppe Eagle. The falconet, *Microhierax caerulescens*, is apparently able to discriminate between unsavoury species of butterflies and their palatable mimics (*Papilio*), "avoiding the former and capturing the latter!" The inland fisherfolk of Sind used to culture egrets most profitably and humanely for their aigrettes. They could obtain 4 or 5 broods per pair in one season.

These are but excerpts to show that the Handbook is useful as well as interesting and enjoyable to read. To me, the most impressive revelation is that there are in India no fewer than 12 species of eagles, just counting those with winglength from 500–600 mm. Six of these are in *Aquila*. Pray that these splendid birds, together with the equally magnificent storks, will survive in India to be identified by future users of this Handbook of the birds of India and Pakistan.—JOE MARSHALL.

Catalogus faunae Graecae, pars II, Aves.—Willy Bauer, Otto von Helverson, Max Hodge, Jochen Martens and Wolfgang Makatsch. 1969. Thessaloniki, Anton Kanellis. 213 pp., 2 maps, 4¾ × 9½ in., paper. In the United States, order from Max E. Hodge, 6345 Western Avenue, Washington, D. C. 20015; $4.75.—The lure of a Mediterranean climate coupled with "The field guide to the birds of Britain and Europe" and "A specific check list of the birds of Greece" published in 1957 brought a great influx of amateur and professional ornithologists to Greece after the end of the civil war in 1952. The result has been an impressive increase in knowledge of the distribution of birds in the country. Many papers have been published, some reporting on collections or systematic studies, and others on the results of observations. The authors of this checklist of Greek birds have been most active in the latter category, either as residents in the country (Hodge) or as nearly annual migrants from the north. In addition to their own observations (none is a collector), they have drawn on published reports and unpublished data from more than 120 colleagues for this checklist. The information in the main text is carried through mid-1967, a separate added section continues to the end of 1968, and some of the authors' papers published in 1969 are included in the bibliography.

Although the first language of the checklist is German, the 10-page introduction is translated fully into English, giving equivalents for all the German terms of distribution and abundance used in the text and explaining methodology. The formula is simple enough that anyone with a smattering of German can follow all but the longer systematic footnotes.

The bulk of the volume (142 pages) consists of a species section in simple telegraphic style presenting regional distribution, status, and abundance for each of the 380 species occurring in the country. Latin names with author and date are given, as well as German and English names. The Latin nomenclature and sequence follows Vaurie's "Birds of the Palearctic fauna," except in a few cases noted and fully documented in footnotes in the text; German names are from Makatsch's "Wir bestimmen die Vögel Europas;" and English names are from Peterson, Hollom and Mountfort's "Field guide to the birds of Britain and Europe."

In their discussion of distribution, the authors divide Greece into a number of natural geographic subunits, and these they define in the introduction and illustrate on a map. For each species they give details of distribution by area with special documentation and references for rare and local occurrence and for breeding.

All species mentioned in the literature as occurring in Greece are included, although the authors have given serial numbers only to those actually proved by specimens and to sight records corroborated by two independent authors, or "where no confusion is possible" on the basis of a single record. Species that are difficult to identify and that have been listed by only one observer are included as "unconfirmed." This results in a large number of sight records, many of them unpublished and cited merely as in litt. I would have preferred further documentation with dates and an indication where one could consult the original data. I recommend to the authors that they bind copies of all correspondence mentioned in the Catalogue and deposit them permanently in a library, such as the Gennadion in Athens.

Status is expressed as "breeding," "resident," "summer visitor," "passage migrant," and "winter visitor," but there is no indication of breeding or migration phenology nor of habitat preference, although this information is promised in a forthcoming "comprehensive work on the Birds of Greece." Abundance is covered in a variety of subjectively defined terms and these are qualified in the case of local or irregular occurrence. The authors also include a map of previous ornithological coverage of the country to indicate gaps in present knowledge. Very little of the country is "well investigated," and about one half is considered "insufficiently investigated."

The 14-page bibliography, intended to be exhaustive for the birds of Greece, is divided into the following sections: general references to Palearctic birds or those of nearby countries; references cited to document records in the Catalogue; and other references to the birds of Greece not cited in the text.

Of the 380 species of birds occurring in the country, 228 are currently known to breed, with 12 of them first published in this Catalogue. Five species that formerly bred in Greece no longer do so; 16 species probably breed but further proof is needed. The remaining 131 are passage migrants, winter visitors, or vagrants, of which 11 are mentioned for the first time in the Catalogue. The new records in the Catalogue are documented in an article by the authors and their coworkers in J. Ornithol., 110: 79, 1969.

A 2-page table of equivalent place names for identifying localities in older ornithological works precedes alphabetical indices to Latin, German, and English generic and specific names and concordances to Latin names in the earlier standard references by Lindermayer 1860, Reiser 1905, and Stresemann 1920, where they differ

from those of Vaurie used in the Catalogue. To the list of place names I might add "Astipaläa" and "Stampalia," both of which are used for the Greek Astypalaia. In fact, there is a tendency to use German names for all localities, even when these are based on classical Greek names rather than those in common use in Greece today, e.g. Lesbos (rather than Lesvos) for modern Greek Mytilene.

The printing is clear and the text is as relatively free from typographical errors as one can expect of a technical and typographically complicated book in German and English that was printed in Greece (A 21-entry errata sheet is bound at the end of the volume). The paper binding is sturdy, although anyone using the Catalogue frequently will want to have it hardbound.

This carefully executed and well-documented work is an indispensible tool for both professional scientist and amateur birdwatcher in Greece. Its publication makes the birds of Greece relatively well-known and certainly facilitates bibliographic background work for all interested in the avifauna. We can only look forward with high hopes to the "comprehensive work on the Birds of Greece" that the authors promise us "somewhat later."—GEORGE E. WATSON.

Peregrine Falcon populations: their biology and decline.—Joseph J. Hickey (Ed.). 1969. Madison, Univ. Wisconsin Press. 595 pp., 61 pls., numerous figs. and tables. $10.00.—Anyone who reads this book from cover to cover is certain to be impressed by the diversity of statements and hypotheses expounded on the history and biology of the Peregrine (*Falco peregrinus*). He will read, for example, that Peregrine populations have been declining since the turn of the century (Chapter 11), that they have not declined (Chapter 22), that they have declined since the 1930s (Chapter 12), since the 1950s (Chapter 9), especially since 1959 (Chapter 18), and that the decline was caused by a change in climate (Chapter 4), by competition with Prairie Falcons (Chapter 4), by insecticides (Chapter 21), not by insecticides (Chapter 4), by hunters (Chapter 19), not by hunters (Chapter 21), by falconers and egg collectors (Chapter 12), not by falconers or egg collectors (Chapter 4), possibly by diseases (Chapter 37), not by diseases (Chapter 40), by shortage of food, possibly related to the extinction of the Passenger Pigeon (Chapter 14), but on the other hand, not by food shortages (Chapter 14). With regard to the food, we read that pigeons are the primary food of Peregrines (Chapter 17), and that pigeons are not a common food of Peregrines (Chapter 38).

The great diversity of these statements and many more in the book should not be construed as a fault of the work, but as a virtue. We should also hasten to add that all these various hypotheses are not necessarily contradictory, for the volume is, or at least tries to be, worldwide in scope. In what it attempts and in what it tells us, the volume is an exemplary object lesson for every student of wild populations. No living population is monolithic; even Peregrines on adjacent eyries may face very different problems, and within a distance of a hundred miles the behavior of a species may change abruptly. Thus Peregrines in the south of Germany are strictly cliff nesters, while to the north they are just as strictly tree nesters, and in Scandinavia they are both, together.

This work must be something of a landmark in ornithology, as it strives honestly to see a species and its problems throughout a vast geographic and ecological range. If it does not succeed in solving those problems, it does an amazingly good job of pointing to at least some of them. The more than 50 authors and participants drawing data not only from their own experiences, but from hundreds of cooperators present an

immense amount of interesting detailed information on the falcon. Even so the book is not easy to read. Inevitably it seems repetitious in places, though strictly speaking it is not repetitious, for though similar observations are made by different authors, they nearly always refer to different populations of birds. In general the chapters are clearly written and understandable, but a few sound like direct transcriptions of poorly organized field notes. The title of the volume is misleading, for though the bulk of the work deals with the Peregrine Falcon, it contains a large amount of interesting information in other birds of prey. Though much of this information may be pertinent to the problems of the Peregrine, this extra faunal coverage is a distraction from an otherwise well-focused and well-planned project. There is also the danger that some excellent papers, e.g. Chapter 31 on the Marsh Hawk (*Circus cyaneus*), will not come to the attention of students who need them. The inclusion of chapters on other species may have been an inevitable consequence of the tremendous breadth of the approach to the main subject, and this broadness of view is the characteristic that gives this work such great importance to all students of biology. Some chapters that present little data on the Peregrine are, nonetheless, very pertinent to its problems and at the same time valuable references for a wide audience of biologists. Especially noteworthy here are chapters on diseases of birds, pesticides research, and a fascinating analysis by Young that shows how relatively subtle annual changes in mortality or productivity in a population may have drastic effects in just a few years.

There are frequent, wholesome admissions of ignorance by the authors, and for the most part the hypotheses are realistically presented. Weak data are so labeled. In a few cases, alas, sweeping statements are made without benefit of data. Thus, we are told (p. 67) that Peregrines are far more sensitive than either Prairie Falcons or Gyrfalcons to heat and cold, and (p. 70) that the number of shorebirds in Idaho has dropped. The reader wonders in such instances: where are the data? Another shortcoming of the work was virtually beyond the control of the participants, yet of vital concern to the project. It is the age-old problem for biologists—the problem of adequate census data. When the reader looks at a map of several states or a whole country, printed on a 6- by 9-inch page, he may tend to forget what vast distances and complexities of terrain are involved. Yet often in this work only a few observers, perhaps even only one, attempted to cover such areas. The old census data, so essential to the population picture of the Peregrine, are particularly weak, and it does little for the reader's confidence to see a historical record of 386 Finnish Peregrine eyries swelled to 1,000 by some unknown and seemingly offhand procedure. Yet the problems of estimating the old populations are understandably difficult, and, overall, the amount of historical data on this species is very impressive.

The population measurements have been getting better, and the data for the past 30–40 years are particularly good in many parts of the world. There can be no doubt about the sharp population decline of the Peregrine in the 1950s, or about the falcon's amazing long-standing ability to withstand outlandish punishment from the human animal in its various societies. The near obliteration of the Peregrine population by the military in Britain to protect carrier pigeons, the bounties paid on Peregrine feet by pigeon fanciers, and the killing of young Peregrines by representatives of the American Society for the Prevention of Cruelty to Animals were only a few of the many "humanitarian" onslaughts directed at the bird. How ironic it is that the falcon could withstand the malicious, purposeful destructiveness of man, only to fall by accident to his thoughtlessness. There are some brighter chapters in the bird's history: the payment of rewards to German foresters who have successful eyries in their districts,

the placement of basket nesting platforms in regions where a shortage of nesting sites is suspected, and of course the concern of the men who contributed to the project under discussion.

In general this is not a book to read for pleasure, but some parts of it are delightful, for instance the word picture of a Peregrine, apparently at play, picking daisies in a field with its feet, and the section of photographs that give the reader a special feeling for the bird, showing among other things, a portrait of the female Peregrine who nested on the Sun Times building in Montreal for 16 years, appreciated alike by her landlord, her public, and the press.

In this book, the approaches to the problems of the Peregrine Falcon are well balanced. The participants were not trying to prove a particular case. They were asking questions, looking for answers, formulating hypotheses. Of all the worthy ideas put forth, none is proved or nearly proved. These investigators, as all who study natural phenomena, deal with an unknown number of factors, most of which are never measured. By such circumstances the possibility of landing squarely on the truth seems remote. Yet, as this volume shows, the truth can be approached, and the effort is most worthwhile.—RICHARD R. GRABER and JEAN W. GRABER.

Saskatoon wetlands seminar.—Report Series No. 6, 1969. Ottawa, Canadian Wildlife Service. 262 pp., 8½ × 11 in. $5.25 Canadian.—This is another of the modern, colorful report series by the Canadian Wildlife Service. It is the text of a symposium held 20–22 February 1967 at the official opening of the Prairie Migratory Bird Research Centre in Saskatoon. Wetlands seem a suitable focal point for both the seminar and the location.

The format and printing are modern, with distinctive gray and white charts that are very readible. Misprints and misspellings are minimal. Contributions are divided into four sections—presumably reflecting the organization of the seminar. Each of the first three sections is summarized by L. R. Jahn, who has become a prominent summarizer on conferences dealing with applied vertebrate ecology. Readers of the entire report will find these reviews somewhat long; "skimmers" will welcome them as good summaries supplemented with interpretive comments; all will find them thorough and perceptive.

Space does not permit lengthy reviews of each paper but a few comments may provide some insight into the scope of the seminar. Papers represent the work of some well-known biologists—some of whom rarely publish—and that of young biologists still working toward degrees. The representation of the Canadian Wildlife Service is noteworthy. Contributions by persons concerned primarily with agriculture and water provide a contrast of needs and desires.

After a brief statement of concern for wetlands by D. A. Munro, F. G. Cooch starts the section on "The significance of small wetlands" by outlining quantitatively both the needs and potentials of Canadian wetlands for producing ducks. He points out that some 2⅓ million duck hunters desire an average of 6 ducks per year, and show a strong preference that 3 of the 6 be Mallards (*Anas platyrhynchos*). Hunter interest in Mallards is intense and papers throughout this seminar reflect this preference. Cooch discusses the importance of numbers of wetlands and their variability with water cycles, stressing the fact that stability of water levels probably is not good for production in wetlands.

R. W. Lodge makes it clear that the same area that produces 5 of every 8 ducks shot in North America produces 98 of every 100 bushels of wheat grown in Canada; hence

conflict is inherent and will increase. Increased land and production costs continue to bring economics into the farmer–wetland relationship, with the inevitable result that drainage or modification of uplands reduces water quality and stability. He poses the key problem when he says (p. 15): "Against this economic pressure those who wish to retain small water areas will need to develop concepts which will provide an alternate source of income, or at least will reduce the depressing effect of small water areas on the economic returns to farming."

Representing provincial water interests, M. N. La Rose notes that "dugouts" for farmers have numerically replaced potholes that have been drained (without mentioning quality), that drainage has not been a major activity to date, but that both drainage and water use for irrigation and sprinkler systems will reach proportions comparable to those in the United States. G. C. Mitchell reviews pertinent legal aspects of water use for wildlife, but the bright spots are tarnished by the provisions that permit "higher priority" uses to take water from wildlife during drought years.

In considering economic values of small wetlands, R. Hedlin reiterates the need to aid land owners in replacing losses resulting from *not* draining. Admitting that most drain-oriented organizations tend to exaggerate gains from such efforts, he faces problems squarely and the reader can only be distressed at the legal and esthetic backgrounds that leave wetlands and similar wild lands under control of the landowner.

Jahn's interpretive summary closing Part I adds that preservation of wetlands is not only for hunters but for students of natural history as well.

Part II focuses on present knowledge of water areas. W. S. Eisenlohr discusses hydrology of wetlands in North Dakota. This basic approach to understanding fluctuations in water levels has long been ignored. J. G. Ellis reports on prairie soils and soil maps, but makes little effort to correlate this with wetlands dynamics or preservation.

A good general review of the ecology of marsh vegetation is presented by J. B. Millar. One of the major contributions of the book follows—a detailed pothole classification system developed by R. E. Stewart and H. A. Kantrud. Several aspects of marsh ecology are considered: water stability or permanence, water chemistry, plant species composition, and plant cover. The system reflects excellent insight into the dynamic aspects of marsh productivity, and has a quantitative base easily adapted to computer analysis.

Jahn's summary of Part II emphasizes that many of the research needs will not be resolved for many years and that wetlands must be preserved now, even though we lack all the knowledge desirable to appraise which wetlands are best.

Part III on "Waterfowl and small water areas" implies a duck–water relationship that is obvious in all but the first paper by Millar, an excellent descriptive work on vegetation and hydrology of Saskatchewan wetland areas that seems to fit more logically in Part II.

The contribution by R. C. Drewien and P. F. Springer on relationships of Blue-winged Teal (*Anas discors*) to prairie potholes at Waubay, South Dakota is a good treatise on both pothole and teal ecology. The work stresses the importance of local water conditions from late April to mid-May when teal are returning and establishing territories, as well as the need for many small water areas (always the first to be drained or filled) to provide pair isolation.

A. G. Smith's comments on the more arid land potholes of Alberta are both interesting and thought-provoking, and form one of the best statements on nonbreeding during drought years. Among them (page 118) is: "Carrying capacity in pothole habitat is a questionable thing because of the rapidly changing quality of the environment. In fact, pothole habitat is probably so much sought after by ducks *because of its changing nature*, not in spite of it."

Relationships of waterfowl and water areas on the Redvers Area in Saskatchewan is reviewed by J. Stoudt. This is one of the few long-term (1952–1966), on-the-ground studies of waterfowl nesting habitat and behavior. Correlations between waterfowl pairs, water levels, and broods are excellent. A brief report on Shovelers (*Anas cypleata*) in relation to habitat by H. J. Poston is one of few papers published anywhere on that species.

A. Dzubin's paper is perhaps the most outstanding in the symposium in both content and originality. This report summarizes data on Mallard production and relates density-controlling mechanisms to carrying capacity of wetland habitats. The paper emphasizes pond quality as well as abundance.

Further waterfowl population–pothole relationships are summarized in an integrating and analytical paper by W. Crissey. This paper forms one of the best available statements on the current status and methods of waterfowl population management now in practice. He concludes that wetland preservation is essential to continued hunting, but that such extensive land acquisition is not necessary for preservation of the species alone.

Jahn's summary of this section emphasizes the need for long-term research on these interrelationships with the incorporation of experimental research. With this I agree strongly, but hasten to warn potential researchers that such efforts are destined to trials and tribulations not common to experimental work in other disciplines. Climatic variations and population changes disrupt the continuity, and the results rarely are clear-cut.

Part "4" is a single long contribution by A. Dzubin on census methods of breeding populations by ground counts. It is less well-fitted into the whole than are other papers and its origin and purpose undoubtedly were different. Some explanatory notes would have helped and it is even more confusing to find in the appendix an equally valuable piece of methodology by M. C. Hammond called: "Notes on conducting waterfowl breeding population survey in the North Central States."

Dzubin's paper then is followed by a compilation of statements—ideas rather than quotes—made during the discussion. This section seems anticlimatic. Most readers will expect a final interpretive statement but this was done in Jahn's comments at the end of Part III.

Perhaps one should not expect any reorganization of a seminar to fit a book format, but some explanations and readjustments would have aided the reader. Nevertheless, considering that this is the text of a series of papers, it is remarkably well-integrated. It is more than a review of wetlands; it is good statement of current thought, objectives, needs and problems of waterfowl management today. It brings together work by many authorities and provides a valuable and usable summary on wetlands in relation to waterfowl. It deserves a more impressive title.—MILTON W. WELLER.

Population studies of birds.—David Lack. 1969. Oxford, Clarendon Press. Pp. v + 341, illus. by Robert Gillmor, 9¼ × 6 in. Paperback. $2.50.—David Lack's "Population studies of birds," first published in 1966, is now available in paperback. The price is unbelievable for a book of this size so well-produced.

I have read reviews of the hardbound edition by G. C. V. (Ibis, 109: 127, 1967), C. B. Kepler (Wilson Bull., 79: 469, 1967), and D. Chitty (Ecology, 48: 698, 1967). I strongly recommend the last review to all students of avian population ecology for its critique not only of the book but of some of the problems of studying populations. For others, a few remarks might be helpful.

The book consists of 17 chapters relating the results of the 12 long-term (at least 4

years) population studies underway since the publication of Lack's 1954 book, "The natural regulation of animal numbers." Several additional studies are included. Luckily, these species represent a variety of families and of life histories, including polygamous species and monogamous species, and seabirds and "dickey-birds." These chapters provide a useful summary of recent work on well-studied populations, and they give Lack the opportunity to reinterpret data that conflict with his ideas.

The book's *raison d'être* seems to be the 32-page appendix: "The theoretical controversies concerning animal populations," in which Lack summarizes the views he presented in his 1954 book (out-of-print in 1966), devotes nine pages to countering Andrewartha and Birch's views of population ecology ("The distribution and abundance of animals," Chicago Univ. Press, 1954), and in 12½ pages continues his debate with V. C. Wynne-Edwards ("Animal dispersion in relation to social behaviour," New York, Hafner, 1962) on group selection. The appendix is well worth reading, for one can get a taste for the quality of the evidence for the various theories. Lack's argument (p. 291) that "[Andrewartha and Birch] were correct in thinking that the absence of field evidence does not, and will not, make the advocates of density-dependent regulation change their minds . . . because, given certain assumptions about the persistence of natural populations, the existence of density-dependent regulation becomes a logical necessity" is delicious. One can almost hear Ptolemy stating that given certain assumptions about the circularity of celestial motions, the eccentrics, epicycles, and equants of his model become logical necessities.

Technically this book suffers in the same ways that his later book, "Ecological adaptations for breeding in birds," does (see my review in Auk, 86: 774, 1969): lack of crucial data, typographical errors, missing references, etc. In addition, this book is filled with "perhaps," "probably," and "presumably" (Lack's "epicycles"). Examples: "The density of breeding Pied Flycatchers differed greatly in the various areas studied, being highest . . . in the garden and park near Dresden, but both these areas were small, so the birds perhaps depended for food partly on surrounding land" (p. 99). And, "though hundreds of shearwater corpses destroyed by gulls are found each season on Skokholm, the proportion killed is probably negligible" (p. 264). Re-laying of eggs is rare in Procellariiformes, "presumably because the females have difficulty in obtaining enough food to form their large eggs quickly enough" (p. 254). There are many more.

I recommend that this book be read as an introduction to avian population biology, as a guide to designing long-term population studies (don't forget Chitty's review), or for the interested layman as a summary of some interesting ornithological research.—BERTRAM G. MURRAY, JR.

The nesting habits of Finnish birds. I. Passeriformes.—Lars von Haartman. 1969. Commentationes Biol., 32: 1–187.—The author is working up a huge amount of material that Finnish observers have collected through the years. This material includes over 24,000 nest record cards, about 20,000 cards containing information from publications and ornithological archives, over 33,000 data cards from banders, the author's own nest records consisting of not less than 1,220 items about *Ficedula hypoleuca*, and, finally, two sizeable egg collections totaling around 80,000 items of information. The data cards are first critically scrutinized and the erroneous ones or suspects are not used. The nesting habitat of each species is given together with a tabulation of nest sites and nest heights where the material allows it, contrasting different parts of Finland. Nature and material of the nest, laying date, laying pattern, clutch size, incubation period, and nestling time are the main items tabulated for each species. Many other details (such

as whether the male feeds the incubating female or not, asynchronous hatching, and the like) can be learned from the descriptive text. Considering the large amount of data von Haartman had to ply through, the useful material is surprisingly small. Taking the commonest birds of Finland, I made a few spot checks. *Phylloscopus trochilus*, the ground nesting Willow Warbler, leads in numerical abundance (E. Merikallio, Acta Zool. Fennica, No. 65, 1950), but only 196 cards qualified for clutch size, 16 cards for incubation period, and 14 for nestling period. Another very common bird is the Chaffinch (*Fringilla coelebs*), a tree nester whose nest, in my own experience, is easy to find. Over 1,000 cards were used for nesting tree and nesting height, but only 318 for clutch size, 214 for starting date of laying, 24 for incubation period, and 10 for fledging period. The hole-nesting *Parus major* is the commonest nest-box breeder and of more than 2,000 data items for this species, only 11 cards provided exact data on nestling period.

I am reporting these details not in criticism of the screening procedure von Haartman used, but to demonstrate that even a well-organized nest record scheme such as this one nevertheless results in relatively little useful information in a country only slightly smaller than California, but with a population of less than 5 million people. Once all the data are processed, one realizes how unreliable is the information in the various handbooks that are based on single and scattered observations, on loaned information from older and often unreliable monographs, or on studies done in other geographic areas. The summarized data on Finnish passerines show how great indeed is the need to collect this sort of information, and how much more could be done in this field on other nesting avifaunas, for instance the North American!

This first volume is only a storehouse of information, presented in an orderly, organized way. Its author promises in the preface that a concluding volume is now in preparation. We are looking forward to see this real fruit of the laborious months spent assembling the presently reviewed publication.—MIKLOS D. F. UDVARDY.

An analysis of nesting mortality in birds.—Robert E. Ricklefs. 1969. Washington, D. C., Smithsonian Contr. to Zool., 9. Pp. iv + 48, 11 line drawings, 20 × 26 cm. Paper $0.55.—Reviews of the scattered information on nesting and other activities of birds are always welcome and often show patterns that workers on the birds had not suspected. Ricklefs here attempts to find patterns among data on losses of eggs and young. He restricts himself mainly to New World birds, and "in general" (p. 2) to studies with 50 or more nests, but 8 of 12 studies from the humid tropics include only 20 to 44 nests each. He has not attempted a complete review of the literature; for instance he does not include my data on two species of tropical tanagers (Willis, Condor, 63: 479–503, 1961), but he has gathered a fairly large selection of the available samples of nesting mortality.

He proposes that one can guess causes of nesting mortality by calculating two data: whether eggs or young are lost more often; and whether individual eggs or young are lost from nests. He suggests that there are characteristic combinations of these data for primary causes of nesting mortality: nest-site competition and desertion cause high losses of full clutches of eggs but seldom cause losses of parts of clutches or broods; hatching failure and brood parasitism cause high losses of eggs and especially parts of clutches; adult death and predation and weather cause equal losses of eggs and young but little loss of individual young within nests; and infestation by arthropod parasites and starvation cause high losses of full broods of young and high additional losses of individual young within nests.

He is aware that predation may at times be higher in the egg stage (see Willis, *op. cit.*) and thus mimic nest-site competition and desertion, or predation may be lower when nestlings are large in such cases as young raptorial birds. He is also aware that desertion is an adaptation that may have various causes, such as possible starvation or the repeated presence of humans or predators, and is not really a "cause." I think that he is aware that weather can affect small young more than eggs or older nestlings. He seems unaware that loss of individual young in nests, just like hatching failures, may be due to genetic failures, that adult death can lead to loss of individual young within nests if only one parent dies, that weather can lead to within-nest loss of a few susceptible eggs and young, that adult death may be greatest during the period when young are being fed most rapidly, and that disease is more likely to affect young rather than eggs. He does not list genetic failure or disease as possible causes of death, and seems to include such factors under "starvation." For instance, he attributes deaths of young Redwinged Blackbirds to starvation (p. 6), when many things can cause higher loss of young than of eggs in nests: weather, predators causing desertion of a nest for one night, as well as other factors already mentioned. Perhaps starvation is often the cause, but one must be cautious.

If one considers the above reservations minor, and accepts that they are only crude measures and that interacting factors will lead to additive or subtractive blurring of causality, one can hope that some generalizations are safe.

For temperate-zone passerines, mortality rates are high in marsh-nesting and field-nesting species and in one ground-nesting forest bird (the Ovenbird); other ground-nesting forest birds need study. Rates are lower in tree-nesting passerines, especially in cavity-nesters. He suggests that the simple structures of ground or marsh and field areas may make it easier for predators to locate nests; also predators are more plentiful on or near the ground than in trees. Nesting at the tips of limbs, for instance, almost eliminates predation by heavy carnivores. He suggests that the marsh and field nests often show "starvation" (i.e., factors leading to higher loss of young than of eggs and to high additional losses of young from within nests), and suggests that the variable rainfalls and climates that characterize such areas (and arid tropical ones with similar patterns of mortality) lead to patchy or unpredictable food supplies, hence to a tendency to start raising many young but to let them starve if food disappears. "Desertion" of nests (caused by factors other than nest-site competition leading to great losses of clutches but not of other individual eggs) is said to be more frequent in forests, but this assertion depends on proving that predators do not take more eggs than young in such habitats. Moreover, massive desertions of eggs or young occurs in marsh-nesting Tricolored Blackbirds (Orians, Ecol. Monogr., 31: 285–312, 1961), perhaps as a response to disappearing food supplies.

The author also reports that arctic passerines generally have low mortality rates and that tropical species have high rates, but that within the tropics similar gradients occur from arid to humid areas and from clearings or second growth to forested habitats. The observation that in the Arctic an abundant species (Common Redpoll) has higher losses than less common species, but that this is rarely true (Field Sparrow) in temperate or tropical habitats, suggests that in simple communities predators may specialize on common species but do not do so in more diverse communities. However the bush-nesting redpoll may be like marsh-nesting passerines (p. 34) in having a more conspicuous and easily-found nest than ground-nesting passerines in the same habitat.

In the humid tropics "predation" and other factors leading to equal mortality of eggs and young and to loss of whole nests are more important and "starvation" is

rare. Species of second growth perhaps have less predation because predators have not evolved for such sites. The very high diversity of predators in tropical lowlands is probably more important than slightly high numbers of predators; the greater successes of shorebirds and marsh birds and island-nesting seabirds are probably due to low numbers of predators as well as low diversity in isolated habitats. High predation seems to go with high species diversity in all areas.

A less complete review of nonpasserines adds a little: birds of prey lose few nests but often let a few young starve; seabirds lose eggs and young because of crowding and weather and poor nest construction; gulls and terns also lose chicks to attacks from neighbors; shorebirds, ducks, and marsh birds have higher success than ground-nesting passerines and game birds. Too little is known of chick survival, except that mortality rates are often higher just after young leave the nest.

Minor problems are that Ricklef's prose seems unnecessarily difficult (his graphological "negative vertical component" is too easily equated with "starvation," when it means simply "higher loss of young than of eggs"), and that errors are as frequent as tropical nesting losses. Three typographical errors in half a page (p. 24), six or seven on page 29, a figure "48" that has to be out of place vertically on one or both graphs on page 15, and "0.83" mutating to "0.93" on page 27 leave one wondering whether to trust figures and calculations for tables and illustrations or go to the original literature.

I look forward to eventual revision of this excellent paper, with a better abstract and style and proofreading, and hope it will have more data from old studies and from many new studies stimulated by Ricklef's exciting analyses and theories. At the price, it is certainly worth adding to one's library alongside Lack's "Ecological Adaptations for Breeding in Birds" (London, Methuen, 1968), which it supplements very well.—EDWIN O. WILLIS.

Ptitsy Pamiro-Alaya [Birds of the Pamir-Alai].—A. I. Ivanov. 1969. Leningrad, Izdatel'stvo "Nauka." 488 pp., 83 figs., 2 tables. 4 rubles 20 kopecks.—The term Pamir-Alai is probably unknown to most American ornithologists but designates one of the most interesting regions of the Soviet Union which extends from the Pamirs, and the Transalai and Alai ranges of the southwestern Tian Shan, westward to the last spurs of the latter beyond Samarkand. The region is extremely mountainous, rising from the desert to over 23,000 feet and is very complex with a wide range of habitats. Its avifauna is the most distinctive in the Soviet Union, as well as one of the richest with 370 species.

Professor Ivanov of Leningrad, one of the leaders of Russian ornithology, has specialized in the study of the Pamir-Alai for about 40 years. His first study of the region "Ptitsy Tadzhikistana" was published in 1940 and soon became a great rarity. The present book reflects nearly 30 years of additional experience in the field and study. It is an excellent example of a Russian faunistic work in the best tradition but is, nevertheless, thoroughly modern in its concept. The list of species is arranged in the general sequence of Wetmore, and the species are not divided into subspecies as they had been in the first book published in 1940—a new treatment in accord with the modern trend. Other sections are concerned with the ornithological history of the region, its geography, physiography, climate, vegetation, analysis of the avifauna, migration, and breeding seasons. The book is well-printed and illustrated and the only regret that I can express is that it is in Russian—a barrier which, hopefully, can be eliminated by the United States Government Program for Scientific Translation. I recommend it to this

program, since such a highly competent and fundamental work never becomes really obsolete, though subject to small modifications and additions from time to time.—CHARLES VAURIE.

Birds of the Bozeman latilong.—Palmer David Skaar. 1969. 501 S. Third, Bozeman, Montana, published by the author. 131 pp. plus addenda page. Offset, paper cover, plastic ring binding. $2.75.—This careful and detailed checklist has elements of novelty. The region of primary coverage is one "latilong" (an invented word for the area enclosed within the lines formed by one degree of latitude and one of longitude), here the area between 45° and 46° N and 111° and 112° W, which includes Bozeman, Montana. The latilong is designed to give a more uniform unit for zoogeographic comparisons. However, the convergence at the poles of the meridians of longitude causes the area of latilongs to vary with latitude. An attempt is made to estimate numerical abundance in a more sophisticated manner, although the author frankly points out the high degree of subjectivity involved. Details of status are provided for the birds seen or collected in the Bozeman latilong (3,320 square miles); these are numbered. Among the somewhat unusual data are frequency of observation and largest count. The free use of letter symbols facilitates compressing much information in a small compass. While these abbreviations are explained in the introduction, the memory of the reader may be somewhat taxed. The list also includes (unnumbered) any species otherwise recorded from Montana, and expressly indicates all those known from Idaho, Wyoming, and Yellowstone National Park and the counties impinging on the latilong. Some species are added to recent state lists and others are rejected, with reasons indicated. Thus the booklet serves as an up-to-date checklist for three states and the popular national park.—E. EISENMANN.

Lost heritage.—Henry Savage, Jr. 1970. New York, William Morrow and Co., Inc. 329 pp., 23 black and white reproductions of familiar 18th century natural history illustrations and portraits of their authors. $10.00.—Mr. Savage's laudable objective in this work is to awaken the reader to the ecological destruction wrought in eastern North America in the past 300 years. To describe 18th century plenty he gives brief biographies of seven men he calls "pre-Audubon naturalists." Six of them—Mark Catesby, John and William Bartram, Alexander Wilson, and André and François André Micheaux—were indeed naturalists, even when self-educated, but the seventh—John Lawson—was not. He was a traveler and land promotor for the Lord Proprietors of their grants called Carolina. If Mr. Savage wanted to add a less well-known figure to his galaxy of pre-Audubon naturalists, why didn't he pick someone like Peter Kalm, that student of Linneaus whose comments on conservation in eastern North America are still significant today?

In his last chapter Mr. Savage sums up the devastation modern technology is accomplishing on our planet with the aid of overpopulation. As the father of seven children I am sure he must know what he is speaking of when he says, "That his days may be long in the lands of his fathers (assuming that he has accomplished the obvious prerequisities of reducing his fecundity and confining beyond all chance of escape his atomic genii) man will have to succeed in rejoining nature's ecological symphony."

The professional ornithologist will find nothing new in this book. Even amateurs are apt to be distracted and annoyed by petty errors such as the statement that places jaguars in the eastern United States recently. Jaguars have not been found in the Carolina Piedmont for thousands of years, not since the Pleistocene.

Henry Savage, Jr.'s book is just one of a rash of popular polygraphy on population, pollution, and probable planetary pandemonium. Like other books of its kind, those who need it will never read it.—ELIZABETH S. AUSTIN.

ALSO RECEIVED

The birds of the Department of Lima, Peru.—Maria Koepcke. 1970. Wynnewood, Pennsylvania, Livingston Publishing Co. 144 pp., illus. $4.95.—This American edition of the author's "Las aves del Departamento de Lima" (1964) was translated by Mrs. Bradley Fisk, who was also largely responsible for its publication here. I can heartily echo Eisenmann's praise of the original (Auk, 82: 296, 1965) as a "remarkably fine guide," which is now available in clear, simple English, and which the author has brought up to date to include a number of new records since the original was published.—O.L.A., JR.

Audubon: a vision.—Robert Penn Warren. 1969. New York, Random House. 33 pp. + 13 unnumbered. $4.00.—Although Auk, we flatter ourselves, is the most literate scientific periodical in America, to review literature as such is not one of its functions. Nevertheless I feel that when a Pulitzer Prize-winning novelist and poet writes a series of poems that becomes one poem with a title such as this, it must be noticed. The many ornithologists who are voiceless poets and those who express themselves in poesy will enjoy this slim, strong work. The book is a very beautiful picture of the naturalist–artist and, in its way, quite accurate.—E. S. A.

Annotated index to some early New Zealand bird literature.—H. C. Oliver (compiler). 1968. Wellington, New Zealand, Dept. Internal Affairs, Wildl. Publ. No. 106. Pp. x + 222, 8 × 10 in. Cloth. No price given.—Designed to fill the need for an index to some early publications that are difficult to find in most libraries and containing reference to works in which information on localities and range are given. Works indexed are those of Gray, 1843, 1844; Sharpe, 1875; Buller, 1865, 1873, 1882; Hutton, 1871; Potts, 1882; Carrick, 1892; and Trans. and Proc. New Zealand Inst., 1868–1900. The annotated entries are divided into systematic, distribution, subject and author sections. There is a glossary of meanings of scientific names of birds in the 1953 "Checklist of New Zealand birds," and an index.—J. W. H.

The Scarlet Tanager.—Kenneth W. Prescott. 1965. New Jersey State Museum, Investigations No. 2. Pp. x + 62, 9 illus., incl. 2 col. pls., 9 figs., 12 tables, 6 × 9 in. Paper. $2.50.—Although published almost 5 years ago, this volume was received by the review editor in late 1969. It is a detailed life history study of *Piranga olivacea*, the research for which was conducted mainly at the Edwin S. George Reserve, University of Michigan in the late 1940s and was the author's Ph.D. dissertation at that institution. The original dissertation, available on microfilm since 1950 from the university, has been rewritten and updated where appropriate by the author. The work is of a straightforward, descriptive nature. The many tables give data on nests, clutches, young hatched and fledged, incubation rhythms, feeding of the nestlings and so forth. This is a valuable source that should be better known.—J. W. H.