ORNITHOLOGICAL LITERATURE

PROCEEDINGS OF THE 16TH INTERNATIONAL ORNITHOLOGICAL CONGRESS. Edited by H. J. Frith and J. H. Calaby. Australian Academy of Science, Canberra, A.C.T., Australia, 1976: xvii + 765 pp., many black-and-white photographs, drawings, and charts. $50.00 Aust.—The 16th I.O.C. was held in Canberra, Australia, from 12–17 August 1974. The scientific program included 11 symposia with 61 papers, and an additional 131 papers in general sessions. Abstracts of the latter were published in *The Emu*, vol. 74, Supplement, 1975. The present volume contains only the papers from the symposia, and thus is a very incomplete representation of the meeting. In general it appears that the symposia papers are more reviews than research reports, while the general session papers are mainly of the latter type. There are some exceptions, however. Although the symposia cover a variety of topics, there is a strong emphasis on ecological and biogeographical subjects, especially in relation to the southern continents. Most of the papers present well prepared integrative summaries of the then current status of their subjects, but several differ little from other writings by their authors. A number of papers review the biology of Australasian birds, which must have been particularly interesting to non-Australians attending the congress.

The volume opens with several I.O.C. committee reports, and the presidential address by Jean Dorst on "Historical factors influencing the richness and diversity of the South American avifauna." Symposium No. 1 is titled *Origins of Australasian Avifauna*, and includes papers on paleogeography and paleoclimatology (J. Cracraft); the fossil record (P. V. Rich); protein evidence (C. G. Sibley); adaptive radiation in Meliphagidae (A. Keast); and the origins of Australian waterfowl as evidenced by their reproductive photoresponses (J. Kear & R. K. Murton). The symposium is unified by its consideration of the roles of immigration and isolation in the development of the Australasian avifauna.

Symposium No. 2, *Biology of Southern Hemisphere Species*, includes a general discussion by A. Keast; a study of the natural history of the emu (S.J.J.F. Davies); and a consideration of Australasia and the origin of the Phalacrocoracidae (G. F. van Tets). Papers on Australasian specialities include a comparative field study of Scrub-birds and Lyrebirds (G. T. Smith); evolution of the bowerbirds and birds of paradise (R. Schodde); osteology of Grallinidae, Cracticidae, and Artamidae (A. McEvey); and a review of the New Zealand Wattlebirds (G. R. Williams). A general conclusion from this symposium is that less is known about the biology and relationships of Australasian birds than about those of most other regions.

Symposium No. 3 concerns *The Value of Various Taxonomic Characters in Avian Classification*. W. J. Bock gives a general review of recent advances in avian systematics. Other papers include analyses of various kinds of taxonomic characters: external morphology (L. L. Short); fossil birds (P. Ballman); the digestive system (V. Ziswiler); behavior (K. Immelman—abstract only); oology (W. Meise); and bioacoustic characters (V. Ilyichev). I found this symposium disappointing. In his introduction E. Mayr identifies its main concerns as (1) the relationships of aberrent or isolated taxa, and (2) the mutual relationships of major avian groups. Few authors addressed these problems directly. It is remarkable that there is almost no discussion of the various systematic philosophies currently vying for predominance. Perhaps this is because the symposium was defined in terms of characters rather than the methods of their analysis.

Symposium No. 4, *Breeding Birds in Southern Continents*, includes studies on en-

dogenous controls of reproductive rhythms (E. Gwinner & V. Dorka); breeding seasons of Australian waterfowl (L. W. Braithwaite); onset of breeding in African hornbills (A. C. Kemp); breeding of African birds in non-arid habitats (G. L. MacLean), and environmental control of breeding and movements in Australian birds (H. A. Nix).

Symposium No. 5 concerns *Biology of Crowned Sparrows (Zonotrichia) in Two Hemispheres.* Papers by B. B. deWolfe, J. R. King, M. L. Morton, F. Nottebohm, A. H. Meier, and D. S. Farner discuss the various environmental and internal factors controlling reproductive and related behaviors in several species.

Symposium No. 6 is titled *Structure of Feathers.* It includes papers on gross feather structure (E. Rutschke); structural adaptations of feathers (P. Stettenheim); structural colors (J. Dyck); taxonomic and evolutionary aspects of feather proteins (A. H. Brush); keratin synthesis (D. J. Kemp et al.); and the molecular structure of feather keratins (R. B. D. Fraser and T. P. Macrae). The symposium demonstrates that feathers, the most distinctive characteristics of birds, are the subject of active research at levels ranging from gross anatomy to biochemistry, and leads to the expectation of important advances in the near future.

Symposium No. 7, *Physiological and Behavioural Adaptations to Arid Zones* includes a general review by W. R. Dawson, and papers on the birds of Africa and South America (G. L. MacLean); Australia (S. J. J. F. Davies); Australian ducks (L. W. Braithwaite); and Sandgrouse (G. L. MacLean).

Symposium No. 8 considers the *Systematics of Australian Passerine Birds.* It includes studies of Australian and Pacific Island warblers (A. Keast); some monotypic genera of Australian oscines (R. Schodde & J. L. McKean); the Quail-thrushes (J. Ford); and protein studies of various forms (C. G. Sibley). It is clear that new approaches to systematic analysis promise to clarify the relationships of many enigmatic Australian passerines.

Symposium No. 9 examines the *Evolution of Island Land Birds.* A. Keast discusses general principles in relation to the specific case of isolated forest outliers in southern Australia, and F. Salomonson gives a theoretical analysis of the main problems concerning avian evolution on islands. Other papers include studies of population variation on islands (P. R. Grant); land-bridge islands (J. M. Diamond); the species-area relation within archipeligos (T. W. Schoener); and plant succession and avifaunal structure (C. Ferry et al.).

Symposium No. 10 deals with *Co-operative Breeding in Birds.* I am told by one who was there that many considered this to be the most exciting topic at the meeting. This is not so apparent from the papers, which deal mainly with surveys of co-operative breeding in various regions, including Australia (I. Rowley); Africa (L. G. Grimes); America (G. E. Woolfenden); and Eurasia (A. Zahavi). The symposium is important in bringing together in one place an enormous amount of data on the occurrence of co-operative breeding, but now a general synthesis is needed.

Symposium No. 11 concerns *Seabirds: Distribution, Speciation and Ecological Diversification at Sea.* Papers cover birds of the tropical "middle seas" (K. H. Voous); the North Atlantic Ocean (W. R. P. Bourne); South America and the North West Atlantic (R. G. B. Brown); the Australian sector of the Southern Ocean (G. W. Johnstone and K. R. Terry); and a general review by M. D. F. Udvardy.

Altogether this is a valuable collection of papers on a diverse group of topics, although as noted above it is only part of the proceedings of the 16th I.O.C., rather than the complete collection of papers that the title suggests. It should be a useful addition to any ornithological library.—Robert J. Raikow.

BIRD LIFE. By Ian Rowley. The Australian Naturalist Library, Taplinger, New York, 1975. 284 pp., 28 plates of color and black and white photographs, 34 line drawings, maps and tables. $14.95.—This excellent book with a rather unfortunate title is part of a new series on Australian natural history, modeled after the Collins New Naturalist Library. If Rowley's contribution is typical of this new series, Australians and Australia buffs have a great deal to look forward to.

Most introductory ornithology books are written by Americans or Europeans for Northern Hemisphere readers. Rowley has now supplied Australians with an antipodean equivalent: an introduction to the ecology and behavior of birds, using examples from the Australasian fauna. It is also a highly interesting summary of recent field research on Australian birds, drawing from material that hitherto has been hidden in technical reports or journal articles not available to most readers—especially those in the Northern Hemisphere.

The first 5 chapters comprise a general introduction: how birds have evolved and adapted to Australia's unique environmental conditions. This is followed by 16 chapters of research-oriented accounts of single species or groups of related species that illustrate the introductory statements. Ten of these chapters deal with resident or sedentary birds such as the Superb Blue Wren (*Malurus cyaneus*), Australian Raven (*Corvus coronoides*), Australian Magpies (*Gymnorhina* spp.), Kookaburra (*Dacelo gigas*), Miners (*Manorina* spp.), and Mallee Fowl (*Leipoa ocellata*). The last six discuss migrant species (using an overly strict definition of the term) such as Tasmanian Mutton-birds (*Puffinus tenuirostris*) and nomadic species such as Brolgas (*Grus rubicundus*) and White-tailed Black Cockatoos (*Calyptorhynchus baudini*).

Rowley begins most accounts by stating who conducted the research, where and how it was done, and whether or not it is still in progress. He then summarizes the results in an interesting manner, successfully avoiding both the too technical and the too elementary. Much of the excitement of this book lies in reading about active research; one cannot help wondering whether some of the questions raised have been answered since the book was completed. For those who wish to read further about a given species, the accounts are well referenced.

The book ends with a chapter on economic ornithology and conservation problems, an appendix on methods of study (especially banding), another on books, journals, and societies, eight pages of references, and a good ten-page index.

As an American interested in Australian birds, but with only a few weeks of first-hand experience with the fauna, I found Rowley's book fascinating. He has done a particularly good job in describing the varied social systems—breeding regimens and movements—showing how they are adapted to the Australian climatic and ecological conditions that are so different from those in the Northern Hemisphere. Also of interest is the comparatively small number of migratory species in the Australian avifauna (approximately 8%) vs. residents (66%) and nomads (26%). The few trans-equatorial migrants are mostly waders and seabirds (no passerines). Other species migrate north-south within the Australo-Papuan region or between Tasmania and mainland Australia. A few may also be altitudinal migrants, but this is still poorly known. An American reader will be struck by the very different components of the Australian avifauna: the large number of nectivorous birds (lorikeets, sunbirds, silvereyes, and some 69 species of honeyeaters), and the many nomadic species. Most nomads breed seasonally, but may change the breeding locale from year to year. A few seem to be able to breed whenever conditions are favorable. Nomadic species are not just arid land birds affected by erratic rainfall in the interior of the continent. They are also forest

and farmland species that follow a changing food supply. These latter include flower feeders (such as lorikeets and honeyeaters), insectivores (currawongs), fruit eaters (dicaeids), seed eaters (some cockatoos and grass finches), and scavengers (some corvids).

It is unfortunate that most ornithological research in Australia has had to be concerned only with economically important species: game birds, agricultural pests, etc. The CSIRO-conducted research has been of generally high quality but its limited scope has left serious gaps in the general knowledge of the avifauna. Fortunately private individuals and groups, particularly banders, are becoming increasingly active, so the serious research effort is becoming better balanced.

In a few instances Rowley's discussions have been outdated in information, or he has limited himself too much on a topic. His treatment of navigational theories is slightly behind the times, and in the section on zoogeography he begins with the Pleistocene, omitting mention of the important recent studies of plate tectonics and their effect on the origins of the Australian fauna. The book also should have been edited more tightly for grammatical errors: on p. 163 the word "data" is used both as a singular and plural in the same paragraph; on p. 108 one finds "orientate"; farther and further apparently are considered interchangeable; and in places the usage of commas, colons, and semicolons is quixotic.

The only serious fault of the book lies in the poor placement of the plates in relation to the text. For example, the plate showing nestling growth rates of Australian Ravens and 2 photographs of White-winged Choughs is inserted in the middle of the Kookaburra chapter, 24 pages after the raven account and 6 pages after the end of the choughs. The raven text is "illustrated" instead by a wren plate that belongs in the previous chapter. As the plates are not evenly spaced through the book, they could easily have been better coordinated with the text. It is also annoying to have the plates referred to only by number rather than by page, especially when they are so badly scattered.

These minor objections aside, considering his stated aims, Rowley has done an excellent job. This book will be enjoyed by anyone even slightly interested in the Australian avifauna or in the intricate adaptations of birds to their environment. The title is sadly undescriptive of the contents, but perhaps through listings such as "Bird Life [Australian]" that I saw recently in a dealer's catalog, this book will find its intended, and deserving, readership outside Australia.—MARY H. CLENCH.

AVIAN PHYSIOLOGY, 3rd Edition. Edited by Paul B. Sturkie. Springer-Verlag, New York, Heidelberg, Berlin, 1976: xiii + 400 pp., 77 tables, 102 figures. $23.80.—The prospect of having a current treatment of avian physiology in one volume is an attractive one, for the primarily physiological chapters of "Avian Biology" (D. S. Farner and J. R. King, editors; Academic Press) are distributed over 4 volumes and a 3 year interval (1972–75). Sturkie's book is thus timely and worth considering as to its adequacy as a reference work for ornithologists requiring physiological information in their studies. Authoritativeness has been assured in this volume through assemblage of a group of authors who have contributed chapters on their respective fields of interest: Nervous System (T. B. Bolton); Sense Organs (M. R. Kare and J. G. Rogers, Jr.); Blood: Physical Characteristics, Formed Elements, Hemoglobin, and Coagulation (P. D. Sturkie with P. Griminger); Heart and Circulation: Anatomy, Hemodynamics, Blood Pressure, Blood Flow, and Body Fluids (P. D. Sturkie); Heart: Contraction, Conduction, Electrocardiography (P. D. Sturkie); Respiration (M. R. Fedde); Regula-

tion of Body Temperature (G. C. Whittow); Energy Metabolism (G. C. Whittow); Alimentary Canal: Anatomy, Prehension, Deglutition, Feeding, Drinking, Passage of Ingesta, and Motility (P. D. Sturkie); Secretion of Gastric and Pancreatic Juice, pH of Tract, Digestion in Alimentary Canal, Liver and Bile, and Absorption (P. D. Sturkie); Carbohydrate Metabolism (R. L. Hazelwood); Protein Metabolism (P. Griminger); Lipid Metabolism (P. Griminger); Kidneys, Extrarenal Salt Excretion, and Urine (P. D. Sturkie); Hypophysis (P. D. Sturkie); Reproduction in the Female and Egg Formation (P. D. Sturkie with W. J. Mueller); Reproduction in the Male, Fertilization, and early Embryonic Development (P. D. Sturkie with H. Opel); Thyroids (R. K. Ringer); Parathyroids, Ultimobranchial Bodies, and the Pineal (R. K. Ringer and D. C. Meyer); Adrenals (R. K. Ringer); Pancreas (R. L. Hazelwood). The chapters are well supplied with tables and figures that effectively supplement the text. Each of the chapters concludes with a list of the references cited in it, which should facilitate access to the original literature. The coverage of this literature extends mainly through 1974; only a handful of references later than this are included.

The various chapters are all quite informative. I found those on respiration; regulation of body temperature; carbohydrate, protein, and lipid metabolism; excretion; reproduction in the female; and various aspects of endocrinology of particular interest. The involvement of so many authors leads to only a few inconsistencies. For example, one derives quite different impressions of the state of knowledge concerning the avian pineal from the statements by P. D. Sturkie (p. 287) and by R. K. Ringer and D. C. Meyer (pp. 365–368).

My principal dissatisfaction with the third edition of "Avian Physiology" concerns the insufficient attention it devotes to the physiology of wild birds. The bulk of the available information on avian physiology does pertain to the domestic fowl, but a substantial body of literature exists on wild birds, which could permit broadly comparative treatments of a number of topics, something done very well in the volumes of "Avian Biology." Adequate use of this literature has been made in only a few of the chapters, notably those dealing with respiration, regulation of body temperature, energy metabolism, and excretion, which have a fairly strong comparative orientation. Further use of such an orientation would have led to improved coverage of a variety of processes important in the lives of birds, e.g., molt, migration (including its navigational aspects), winter fattening, reproductive timing, circadian periodicities, respiratory gas exchange and moisture loss in eggs. What comparative coverage does exist in many of the chapters is complicated by use of imprecise common species names (e.g., "sparrow") and/or omission of scientific names.

"Avian Physiology" will be a useful reference and text for individuals concerned with domesticated species. It also will be helpful to ornithologists seeking information on topics for which the domestic fowl is an adequate model species. However, the utility to this latter audience would have been increased by more extensive treatment of wild birds.—William R. Dawson.

The Birds of the Malay Peninsula, Vol. 5. By Lord Medway and David R. Wells, illus. by H. Grönvold. H. F. & G. Witherby Ltd., London, 1976: 448 pp., 25 color plates. £25.—Since the authors of this volume were my colleagues and since I had a deep personal interest from the inception of their work, I take pleasure in reviewing this important addition to the recorded knowledge of the birds of the Malay Peninsula. The careful understatements in the preface only hint at the struggle and pathos in-

volved in the development and completion of the 5 volume work first conceived by H. C. Robinson, and later continued by F. N. Chasen, and in an unpublished form, by E. Banks. All of the first 3 authors died before the set could be completed, and its publication extended over a period of 5 decades. The first 4 volumes were published in 1927, 1928, 1938, and 1939.

When, in 1964, the plates for the final volume were discovered in the British Museum, David Wells told me that he and Lord Medway were contemplating completing the series both with enthusiasm and trepidation. They wished to duplicate the format of the previous 4 volumes, but realized that the costs would be much above the original. I do not know what the original volumes sold for, but they had become collector's items by 1958 when I bought my copies. There was no handbook or field guide for Malayan birds at that time, but Smythies "Birds of Borneo" encompassed most of the species and was very useful. The recent "A field guide to the birds of S. E. Asia" by King and Dickinson helps to fill the field guide needs for that area.

It is necessary for the reader to have at hand the previous 4 volumes before approaching the 5th critically. The authors have done a commendable job of recreating the format. Any criticism leveled at type form, color plates, book size, etc. must be tempered by knowledge of the objectives involved.

Use of the volume and its many local names is made easier by having a gazatteer of localities in the introductory section. Following the introduction are 3 chapters by David Wells (Resident Birds), Lord Medway (Migratory Birds), and Ian C. Nisbit (The Eastern Palearctic Migration System in Operation) based upon their research and observations. In these they summarize much of what has been learned of Malayan birds since the 1938 volume was published.

These introductory chapters take up the first 77 pages of the book. The remainder, over 325 pages, is devoted to a discussion of the 576 species recorded from Malaya. In this the taxonomy is brought up to date, progression of molt is indicated where known, migration information such as arrival and departure dates are given, and information on such topics as nesting, number of eggs, and a description of the voice is provided. Detailed biological descriptions are not given except where such data were inadequately reported in previous volumes. By this method a great mass of information is added to that already provided in the first 4 volumes, and knowledge is brought up to 1973 when the manuscript was closed for editing and publication.

The authors are to be highly commended for this authoritative and carefully prepared volume of great historical interest as well as value to the ornithology of Southeast Asia. —H. Elliott McClure.

Falcons Return. By John Kaufmann and Heinz Meng. Wm. Morrow and Co., New York, 1975: 128 pp., 106 black and white photos. $5.95.—Subtitled "Restoring an endangered species," this book is an account of the Peregrine Falcon and details its life history, its widespread destruction due to DDT poisoning, and efforts to restore the species by introducing captive-bred Peregrines back into the wild.

The first section is a description of the birds' external anatomy, nest sites, courtship, flight, and other aspects of Peregrine biology. The text is illustrated with black and white photographs ranging in quality from fair to excellent. Those of the Holt's Ledge eyrie are particularly good and show all aspects of the breeding biology of Peregrines. This section records the demise of the birds and concludes with a nontechnical discussion of pesticide poisoning and food chains.

Falconry is the subject of the second section. The history of the sport is described, and many falconry terms are defined. Capture, training, and flying of eyasses (young Peregrines removed from the nest) are described, and lure flying and hunting are examined. Although some conservationists may cringe at the mention of falconry, the authors contend that the only chance of bringing the Peregrine back depends upon the skillful use of the techniques of falconry. They suggest that hacking, an old method of raising eyasses so that they remain basically wild, but learn to fly and hunt on their own, is a possible means of replenishing the natural population.

The third section is devoted to the efforts of Heinz Meng to breed and raise Peregrines in captivity. The account of Meng's devoted and skillful work as the chicks' father is unnecessarily detailed and frequently melodramatic. Efforts by workers at Cornell University's Laboratory of Ornithology are also mentioned. Their capability of raising more than 200 Peregrines a year and placement of captive-bred chicks in eyries where parent birds fail to breed due to eggshell thinning, offer some glimmer of hope. However, the continued use of DDT and other pesticides in poorer countries of Central and South America where many birds winter continues to threaten the existence of Peregrines and other raptors. The book concludes with a brief bibliography.

Although this book is for general readers, particularly those with an interest in wildlife, it will also interest some ornithologists. It is a simply, but well-written and informative account of the Peregrine Falcon.—DAVID R. MAURER.

GEOGRAPHIC AND CLIMATIC RELATIONSHIPS OF AVIFAUNAS WITH SPECIAL REFERENCE TO COMPARATIVE DISTRIBUTION IN THE NEOTROPICS. By Paul Slud. Smithsonian Contributions to Zoology, No. 122, 1976; iii + 149 pp.—This massive study presents an extremely detailed analysis of bird distribution patterns throughout the world, although emphasis is placed on birds of the Neotropics. In addition, the bulk of the world's islands for which species lists exist are also examined. Dr. Slud has divided his book (for it is sufficiently lengthy to be so labeled) into four major sections: the Passerine-Nonpasserine Relationship; the Suboscine-Oscine Relationship; the Passerine-Nonpasserine Suboscine-Oscine Relationship; and Requirements for Further Research.

A too-detailed discussion as to why water birds should not be included in the analyses which will follow, and further interesting discussion on the separation of migrants and native land birds, lead into the first major subdivision detailing various properties of the world's Passerine-Nonpasserine relationships. Regarding migrants, the author's belief that migrants "complement the residents" (p. 9) rather than "compete with them" (p. 9) is not really borne out by Fig. 4, p. 10. Instead, migrants seem to have a difficult time existing in the complex and apparently highly competitive tropical rainforest as if there were no empty niche space to go around, or as if the highly specialized and competitive residents keep temporary migrants from coexisting in the community. Slud himself notes (p. 9) that, "Both in Africa and South America it is the richest biotope, the equatorial rain belt, that acts as a barrier which many migrants do not cross, very few enter, and the remaining ones skirt or pass over in order to winter in the southern third of the continent." Admittedly there is much rain forest north of Colombia (where the migrant percentage diverges from the native fauna, see Fig. 4, p. 9), but the data can realistically be interpreted both ways, as arguing for and against competitive interactions. In fact, the inverse correlation of percent migrants with total avifauna ($r = 0.99$, p. 8) also supports a competition hypothesis.

The author points out the similarity of the Passerine-Nonpasserine ratio in habitats

throughout the world and notes that it is generally 2:1, with the ratio being higher in temperate areas and lower in tropical regions. The ratio then logically (and nicely) rises with altitude in the tropics. Figure 6 clearly illustrates the positive relationship of Passerine-Nonpasserine ratios with what is apparently overall physical environmental complexity, with the highest U.S. values being concentrated in the Southwest and adjoining Mexico. Slud discusses a "peninsular effect" of lowered ratios and specifically mentions Florida (0.89 P-N ratio) and the Yucatán Peninsula (1.03). He ignores Baja California (a physiographically complex peninsula) which has the highest ratio on the North American land mass!

Perhaps one of the most interesting sections is that dealing with birds on islands. "Insular avifaunas tend to correlate in size with the area of the island, but only in a general way" (p. 21). "Insular biotas, however, conform to no universal standard and their compositions are each the unique result of interplay among many factors that are differentially peculiar to islands: this makes islands synecologically nonintercomparable." (p. 21). With these statements a reader is led to think that perhaps the author has been isolated from the open literature for ten years and that the theories of island biogeography have slipped by him. But no, Slud has kept up with the literature. He is merely launching a low key attack on a number of studies that have dealt with avian insular biology, in particular, early work by Diamond, Terborgh and Faaberg, and MacArthur and Wilson. Slud is not speaking theoretically, but presents data on turnover rates, the effect of distance and colonization rates on islands. In particular, he reanalyzes earlier reported results with apparently more complete data and arrives at different conclusions. Slud notes, for example, that there is no evidence yet for believing that small far islands and large near islands have similar extinction rates of bird species. He also points out errors in previously published calculations of colonization rates and notes the difficulty of defining the species pool of potential colonizers in biogeographic studies. The author very likely places too much emphasis on anomalous little Cocos Island in the tropical eastern Pacific which has undergone no species turnover in about 70 years (no extinctions and no successful colonizations), and has an endemicity value of possibly 50%. One does not read this well-reasoned section and feel that the basic island biogeographic theory is shaken, for it is built on evidence from numerous and varied fields of study. One does, however, see a hard-working field biologist who gathers data carefully for years before publishing a monograph, challenging members of the "MacArthurian school" to bring a more solid data base into theoretical constructs. The "quick and dirty" techniques of idea biology have made large and exciting contributions to modern ecological theory, but such papers are open to attack by the very limited nature of their data. Perhaps fewer useless theories (which often tie up reasearchers who are committed to supporting or refuting such will-o-the-wisp hypotheses) would clutter the literature if more detailed empirical results were obtained before publishing. However, the spark of imagination is necessary if predictive syntheses are to be made and if one is going to be able to see the forest, rather than the individual trees, the rule, rather than the exception.

Trends in the Suboscine-Oscine ratio are discovered (it declines from about 60% in South America to about 20% in Mexico: it is lower in the dry tropics than in the humid tropics). The comparative Passerine-Nonpasserine:Suboscine-Oscine ratio is probably more useful. In particular, such a ratio can indicate whether or not a site is in the humid tropics (a low ratio), and allows comparisons of values obtained from highlands or higher latitudes (a higher ratio). As Slud notes, the ratio is most useful in site-oriented situations. The usefulness of ratios in surveys where time is limited (and

some useful results can still be obtained) is pointed out in Figs. 32 and 33. The overall tone of the "Further Research" section seems to be artificially tacked onto the bulk of the publication, although the section is in itself informative. The data base for this study is presented in detailed tables at the end of the publication.

Basically, this is an enjoyable, if ponderous, work. There is much food for thought. The style is possibly too reportorial and I wish that the author had gone on to pursue other ramifications of the data, particularly from the evolutionary standpoint. One recalls (again) the MacArthur technique. Here are the data, now we need more ideas. —MICHAEL A. MARES.

THE BIOGEOCHEMISTRY OF BLUE, SNOW, AND ROSS' GEESE. By Harold C. Hanson and Robert L. Jones. Southern Illinois University Press, 1976: xviii + 281 pp., 266 figures, 45 tables. $15.00.—The purpose of this study is to show how elemental analyses of goose feathers can be used to determine the local origin of the birds. The book is divided into 8 chapters which cover a discussion of geographical origins of wild geese, sampling, analytical procedures, data analyses, soil and plant relationships, geology, soils, and feather mineral patterns. Data are also presented on the differences in feather mineral patterns and the origins of migrant and wintering geese. An adequate review of the previous literature on the chemical composition of feathers is also presented. Finally, the authors are able to discuss the biogeochemistry of feathers and wild geese and their chemical and mineral environment.

Detailed data for 12 elements in feathers (calcium, magnesium, sodium, potassium, phosphorus, iron, zinc, manganese, copper, boron, silicon, aluminum) are presented and discussed, while a less detailed discourse on sulfur is presented in an appendix.

The data were obtained by analyzing the vane portions of the pimary feathers, since these are more highly mineralized than the shaft. Optical emission spectroscopy was employed on ashed and subsequently liquefied samples using reference plant samples as standards.

Although it is not possible in a short review to mention all the important observations and conclusions obtained from this vast and important study, a few comments might serve to provide some concept of the variety of information that has been gleaned from this project.

Sodium is the dominant ion affecting the levels of absorption and excretion of calcium, magnesium, and potassium. Canada Geese, for example, have enough calcium and magnesium in their environment to exceed the excretory losses stimulated by their high sodium intake. The calcium content of feathers was the most important aid in distinguishing geese from the various colonies of Blue and Lesser Snow Geese. Coastal geese can be distinguished from inland populations of western Canada Geese on the basis of the high concentration of phosphorus in their primary feathers. A favored food of Canada Geese is one species of *Equisetum*, a zinc accumulator, which may account for the high zinc content of Canada Geese from the Belcher Islands. There is at least one species of *Equisetum* which is reputed to be a gold accumulator which Hanson and Jones might consider employing as a tracer as they continue to expand their study further.

In such an extensive study interelemental relationships arise which are quite important. Aluminum and silicon are closely related as is potassium with both these elements, reflecting their involvement with micaceous clays. Iron and manganese coherence are reminiscent of their association in soils as well as ore bodies. In addition, close

significant relationships were observed between iron, silicon, and aluminum as well as between zinc and copper, reflecting the metalliferous areas over which birds have passed.

It is clear from this study that the chemical examination of feathers provides a sensitive record of environmental and metabolic relationships of elements. The concentration of these elements in feathers indicates the breeding grounds of geese of known and unknown origins.

This book is well worth reading, heavily illustrated, and nicely printed. It presents much valuable data of interest to avian biologists as well as general biogeochemists.—URSULA M. COWGILL.

BIRDS AND THEIR WAYS. By Alexander Dawes Du Bois with Charlotte A. Du Bois. T.S. Denison & Co., Minneapolis, Minnesota, 1976. 184 pp., 81 black and white photos. $8.95.—Intended as a companion to the author's earlier work, *Glimpses of Bird Life*, this book consists of two parts. Part I is an anecdotal and haphazard account of various species encountered during the author's lifelong pursuit of birds (one early account is on a horse drawn mail stage). Birds were observed in many parts of North America, although most observations are from around the author's Minnesota home or near Cornell University. Topics such as nesting, care of young, feeding, song, and sociality are discussed. Part II is a more detailed description of the lives of a dozen favorite species.

With the exception of a blurred kingfisher on p. 16, a spotted photo on p. 127, and a repetitive series of woodpecker holes, the photographs are of good quality and add to the text. These pictures, taken from a blind by the author, are illustrative of his devotion to birds and photography.

A major criticism is with the constant anthropomorphic interpretation of birds' actions: a bluebird "had sung to instill courage in his two fearful young, to give them promise of safety, and hope of food as a reward." A Red-headed Woodpecker showed so much grief at his wounded mate, "that I shot him also, out of compassion." Some of the wording is awkward: "All these hazards birds have no way of coping with," while other material is stilted: a bathing tanager is likened to "a flame trying to extinguish itself."

This book will have a limited appeal since it is neither visually impressive enough for the coffee table trade nor rigorously scientific.—DAVID R. MAURER.

THE BLUEBIRD: HOW YOU CAN HELP ITS FIGHT FOR SURVIVAL. By Lawrence Zeleny. An Audubon Naturalist Library Book, Indiana University Press, Bloomington, 1976: 170 pp., 7 color plates, 33 text figs., 3 tables. $7.95.—In this excellent book for conservationists and naturalists, Lawrence Zeleny gives a succinct and informative account of bluebird life history encompassing the breeding ranges of the three species, food habits, courtship behavior, nesting and care of the young, and migration. He makes the reader acutely aware of the problem of declining bluebird populations due to the effects of man's destruction of their natural habitat, and competition from Starlings and House Sparrows. Other contributing factors are a decline in bluebird winter food supplies, adverse weather conditions, and the indirect effects of insecticides. He also provides a listing of plants (by botanical and common name) that yield supplies of winter berries enjoyed by bluebirds.

After defining the scope of the problems, Zeleny presents solutions by which man can assist the bluebird in maintaining and increasing its present population size. He gives

detailed directions and illustrations for the construction and placement of suitable roosting and nesting boxes. Based on a typical bluebird nesting timetable, the author explains how to monitor the nesting sites, and how to protect the bluebirds from predatory mammals, snakes, birds, and other cavity-nesting competitors. He also discusses various insects that are troublesome for bluebirds during the nesting period, and offers a table of insecticides that can be employed in the destruction of these pests, but that are unlikely to be noxious to the birds. He also gives the history, objective, construction, and management of bluebird trails that have been successful in helping the bluebirds to survive.

Throughout the book Zeleny ascribes the human attributes of love, happiness, sorrow, and altruism to the bluebird. The dispassionate scientist may criticize this anthropomorphic connotation, but after reading the heartwarming and delightful accounts of the author's handraising a brood of orphaned bluebirds to adulthood and seeing them and their offspring return to nature, one can only admire and think of the true beauty of God's creatures. This is a truly enjoyable book that I recommend most enthusiastically. —EDWARD V. SWIERCZEWSKI.

ORNITHOLOGICAL NEWS

AARON M. BAGG STUDENT MEMBERSHIP AWARDS—1977

Student Membership Awards in the Wilson Ornithological Society have been made available through funds generously donated in the memory of the late Aaron M. Bagg, former president of the Society. The Student Membership Committee has designated the award recipients for 1977 as follows: Theresa M. Allen, University of Texas at Arlington; Jonathan L. Atwood, California State University at Long Beach; Albert Aulette, Michigan State University; Bruce M. Beehler, Princeton University; Keith L. Bildstein, Ohio State University; Erik J. Bitterbaum, University of Florida; Roderick N. Brown, McGill University; Kelly B. Bryon, Sam Houston State University, Texas; William D. Clark, University of Illinois; Leon J. Folse, Jr., Texas A&M University; Eric D. Forsman, Oregon State University; Kimball L. Garrett, University of California at Los Angeles; Ralph J. Gutierrez, University of California at Berkeley; Geoffrey G. Hogan, Brock University, Ontario; Ronald L. Kalinoski, Syracuse University; Walter D. Koenig, University of California at Berkeley; Scott M. Lanyon, State University of New York at Geneseo; Howard Levenson, Humbolt State University, California; Douglas W. McWhirter, Michigan State University; Michael C. Moore, Indiana University; Gerald R. Meyers, Kent State University; Barry R. Noon, State University of New York at Albany; Douglas O. Norman, State University of New York at Stony Brook; Gary L. Nuechterlein, University of Minnesota; Richard T. Reynolds, Oregon State University; Douglas G. Richards, University of North Carolina; Kim M. Riddell, University of Florida; Wanda K. Rola-Pleszcynska, University of Toronto; Mark R. Ryan, Iowa State University; Josef K. Schmutz, University of Alberta; Bonita M. Smith, Miami University, Ohio; Donald L. Sparling, University of North Dakota; Gail E. Spealer, University of Florida; Michael N. Weinstein, California Polytechnic State University—Douglas James, Chairman, Student Membership Committee.