Reviews

EDITED BY ROBERT M. ZINK

The following critiques express the opinions of the individual evaluators regarding the strengths, weaknesses, and value of the books they review. As such, the appraisals are subjective assessments and do not necessarily reflect the opinions of the editors or any official policy of the American Ornithologists' Union.

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Biotic Interactions and Global Change.—Peter M. Kareiva, Joel G. Kingsolver, and Raymond B. Huey, Editors. 1993. Sinauer Associates, Sunderland, Massachusetts. xii + 559 pp. ISBN 0-87893-429-4. $65.00 (cloth). ISBN 0-87893-430-8. $32.95 (paper).—This book consists of a series of 29 papers prepared in conjunction with a workshop on the impact of global environmental change on ecological and evolutionary dynamics. The workshop was held at Friday Harbor, Washington, in September 1991. The theme of the workshop, as well as of the contributed manuscripts, concerned incorporating the roles of evolutionary, population, and community processes into predictions about global change (especially climatic changes and habitat fragmentation). The participants were challenged to show how ecology matters in developing models of environmental change; that is, to demonstrate that the preparation of more complex models is necessary to avoid overly simplistic predictions. For example, biotic interactions might exacerbate or, in other cases, mitigate the environmental consequences of global warming and massive deforestation. The papers are predominantly focused on Temperate Zone systems.

The book is organized into six major sections; these concern: current patterns and forecasts for global changes, physiological and population responses to environmental change, evolutionary responses to environmental change, community responses to such change, landscape change and habitat fragmentation, and agendas for policy responses and research directions associated with global change. The individual papers in these sections are a mixed bag, typical of such broadly defined symposium volumes.

The first section of the book consists of three review papers on scenarios of global warming, worldwide patterns of deforestation, and processes of biotic responses to climatic change. These are useful overviews written for a general audience. The next four sections consist of a series of uneven papers detailing generalities, models, and experimental and other empirical studies relevant to the overall theme of the volume. Two of these contributions are of interest to avian biologists.

Terry Root briefly considers the effects of global climate change on North American birds. In earlier work, she had found correspondence between avian geographic distributions and environmental factors such as temperature and precipitation. In this chapter she points out that some species will rapidly change their ranges with climatic warming; other species—such as Kirtland's Warbler—may be doomed to extinction because their requisite soil/vegetational associations will cease to exist. Root's short chapter illustrates a major problem of the volume: she presents a paragraph or so synopsis of an entire research program with which many readers will already be familiar. Those who are not will need to consult extensive literature to catch up.

In the other chapter of particular interest to ornithologists, McKelvey, Noon, and Lamberson present a useful report on the history of research and planning for maintaining viable populations of Spotted Owls in a fragmented old-growth landscape. The authors describe how life-history data were gathered and analyzed, models of population demographics were developed, and their sensitivity to estimates and other parameters assessed. These results subsequently were integrated into computer simulations used to predict the effects of alternate spatial patterns of habitat patches on long-term viability. Assumptions about juvenile dispersal and simulations of habitat-patch arrangements indicated that long-term persistence is quite sensitive to the spatial geometry of reserves; these simulations are now being used to devise management strategies. This is a good case history for discussion in a course on conservation biology.

The last section of the volume includes a chapter by Gordon Orians on how policy can respond to the problems detailed in this volume, as well as a chapter by the three editors on useful research directions indicated by environmental threats. Ecological researchers may find it useful to review these suggestions. NSF sponsored the symposium.

Overall, this is not a unified, coherent, or easily read work. With the exception of a few chapters, ornithologists may only want to quickly peruse it. University libraries will certainly have copies, and graduate courses in ecology may find some chapters worth examination. Ecological workers interested in global change and habitat fragmentation will find the volume useful for remaining current.—GEORGE F. BARROWCLOUGH, *Department of Ornithology, American Museum of Natural History, New York, New York 10024, USA.*

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The Downy Waterfowl of North America.—Colleen Helgeson Nelson. 1993. Delta Station Press, Deerfield, Illinois. xx + 302 pp., 9 color plates, numerous pen and ink drawings and charcoal sketches, 3 appendices. ISBN 1-55056-219-3. $39.95 in USA; $49.95 in Canada.—This long awaited monograph had its inception in 1962 as an artistic project. Colleen Nelson was encouraged by H. Albert Hochbaum to compile a set of paintings of day-old waterfowl using live birds from the hatchery at the Delta Waterfowl Research Station as models. The resulting watercolor paintings were widely acclaimed for their accuracy and charm, and Colleen was encouraged to publish them. Originally, she planned an elegant folio with a color plate for each species, but this proved to be impractical. A compromise in the form of a monograph began to take shape as she painted additional species, added text, and reviewed the literature on downy waterfowl. After 30 years the project has been completed, and we have the first book ever devoted solely to downy waterfowl.

The book has several objectives. First and foremost, it presents paintings of day-old birds made from live models, with special attention to accuracy in color, downy plumage pattern, body proportions, and postures. This objective is met in nine superb color plates, surely unmatched for quality in any previous publication. Samples of Colleen Nelson's downy waterfowl paintings have already appeared in Volume 2 of *The Handbook of North American Birds* (1976), but the new plates are more finely crafted and more delicately reproduced. They are especially interesting for the varied postures represented, all of which reflect the artist's acute observations of her models as they stand, sit, walk, preen, sleep, and threaten one another. The same keen sensitivity to characteristic postures adopted by downies is reflected in the many charcoal sketches sprinkled through the text.

The first half of the book consists of a systematic description, by tribe and species, of the morphology of downy waterfowl of North America, Central America, and the West Indies. The main focus is on the colors and patterns of downy plumages. Munsell color charts and notations are used to describe colors of down and unfeathered parts. Direct observation of live birds was supplemented by color transparencies of wild birds and extensive use of museum collections in North America and abroad to describe color variations. Notes on vocalizations and other behavior of downy young are based on the author's observations on hatchery birds. The sections introducing each tribe give summaries of distribution, taxonomy, appearance, and behavior based largely on review of the literature on Anatidae worldwide. Under each species, appearance and color variation are described and discussed, and the source of specimens examined is listed, with references.

This half of the book is packed with descriptive detail meticulously presented and carefully discussed. Taxonomic disputes are reviewed and sources of variation are evaluated based on the author's extensive experience and wide circle of consultants. The result is a handbook that summarizes much of what is currently known about the external morphology of downy waterfowl and draws attention to noteworthy aspects of behavior. The importance of downy plumages in anatid systematics is reaffirmed, although only a few taxonomic suggestions are made (e.g. retention of genera *Philacte* and *Mareca* based on distinctive color patterns).

The second half of the book consists of three appendices giving weights and measurements, color descriptions, and identification keys for downy waterfowl. Morphometric data, derived from live birds, are presented in four age categories of birds between 8 and 96 h of age. Color descriptions for each species are based mainly on the author's Munsell notations taken from live, newly-hatched birds. An identification key to genera is followed by keys to species in each polytypic genus. Characteristics of plumage pattern and bill structure, rather than color differences, are emphasized in the keys, and diagnostic features are illustrated in excellent line drawings from museum specimens. For most species, age changes in bill shape and head patterns are illustrated for day-old and several-week-old ducklings.

This book is a gold mine of detailed information about the comparative morphology of downy waterfowl. It will certainly be the major reference on this topic for many years to come. The keys will be invaluable for identification of specimens by systematists, aviculturists, and field workers. The mass of detailed descriptive material and precise documentation of specimen sources make the first half of the book heavy going for the general reader, but the illustrations (color plates, sketches, key drawings) are superb. For the price, this is a very good buy for waterfowl enthusiasts of every kind, and many ornithologists will want to own a copy just for the plates alone. The book is handsomely produced with few typos and effective layout, as is appropriate for the magnum opus of the leading expert on downy waterfowl.—FRANK MCKINNEY, *Bell Museum of Natural History, University of Minnesota, 1987 Upper Buford Circle, St. Paul, Minnesota 55108, USA.*

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Essentials of Conservation Biology.—Richard B. Primack. 1993. Sinauer Associates, Inc., Sunderland, Massachusetts. 564 pp., 207 black-and-white figures and photographs. ISBN 0-87893-722-6. $28.95.—Conservation biology has emerged during the last decade as a new multidisciplinary field focusing on global

biodiversity protection and management. University students are attracted to this discipline in increasing numbers because it incorporates a much broader perspective than that typically presented in traditional natural resource undergraduate and graduate programs. As the discipline of conservation biology has evolved, many books have been produced on the topic, but until publication of Richard Primack's *Essentials of Conservation Biology*, none has been suitable as an introductory textbook. Primack's purpose in writing this book was to provide a current textbook on the basics of conservation biology for undergraduates and beginning graduate students.

The book will be of interest to anyone teaching an introductory course on conservation biology, and has particular value to the ornithological community as a resource for teaching avian conservation or introductory ornithology. At present, none of the major ornithology texts has satisfactory coverage of avian biodiversity conservation and management. Out of approximately 1,200 references in the Bibliography, 8% are examples of avian conservation and even the cover depicts a well known bird conservation effort: a cross-fostered Whooping Crane (*Grus americana*) standing in the midst of a flock of Sandhill Cranes (*G. canadensis*). The topics necessary for an introductory text on conservation biology are very broad; Primack uses the biological sciences as the book's core and integrates appropriate social sciences (e.g. economics, public policy, anthropology, philosophy) into the 22 chapters. Although the author's intended audience is undergraduate and beginning graduate students, I believe the content and writing style is most appropriate for intermediate to advanced undergraduates. The book is divided into six parts: (1) what is conservation biology?; (2) threats to biological diversity; (3) the value of biological diversity; (4) conservation at the population level; (5) practical applications; and (6) conservation and human societies. Of these, sections 2, 5 and 6 include information probably of greatest interest to ornithologists. For example, in the section on threats to biological diversity, significant coverage is given to the decline of songbirds in North America and changes in raptor populations due to pesticide pollution and the subsequent ban of organochlorine pesticides. Additionally, Hawaiian bird extinctions are used to show how introductions of exotic species can affect biological diversity, particularly on islands. The section on practical applications also offers major coverage of avian examples, including a discussion of the diverse conservation efforts to protect Whooping and Sandhill cranes, particularly the importance of establishing protected areas that meet the needs of species throughout the year. In a section on conservation problems outside protected areas, the author uses the Snail Kite (*Rostrhamus sociabilis*) as an example of a species that cannot meet its needs within traditional protected area systems because, during dry years, individuals are forced to forage in habitat outside refuges that is rapidly disappearing to development. The California Condor (*Gymnogyps californianus*) is used as an example of *ex situ* conservation and a two-page account provides a succinct summary of this major conservation effort. Finally, the section on conservation and human societies focuses on the Northern Spotted Owl (*Strix occidentalis caurina*) to discuss how volatile conservation issues can become when the species in question resides in habitat with high economic potential.

In addition to specific ornithological references, this book provides carefully written discussions of many topics relevant to avian conservation, but not covered in more traditional sources. These include: how species and habitats are legally protected, international agreements, international funding, and an appendix listing selected environmental organizations and sources of information. I highly recommend *Essentials of Conservation Biology* as a textbook for undergraduates and an important general reference for personal and institutional libraries.—FRANCESCA J. CUTHBERT, *Department of Fisheries and Wildlife, 200 Hodson Hall, University of Minnesota, St. Paul, Minnesota 55108, USA.*

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Current Ornithology, Vol. 10.—D. M. Power (Ed.). 1993. Plenum Press, New York. 383 pp. ISBN 0742-390X. $85.00—Many look forward to each new volume of *Current Ornithology* because the series has earned a reputation for presenting timely and original review papers. Volume 10, divided into six chapters, is no exception.

In Chapter 1, "The Role of Phylogenetic History in the Evolution of Contemporary Avian Mating and Parental Care Systems," J. David Ligon discusses the phylogenetic approach and the interaction between adaptation and constraint. As one of several examples, clutch sizes and mating systems of shorebirds are examined. Phylogenetic inertia is presented as being perhaps the best explanation for the apparent limit of four eggs in these taxa; the danger of possible circularity in such arguments is mentioned. The implications of the apparent constraint of four eggs per clutch is viewed as being important in the evolution of the diversity of mating systems manifest in shorebirds. This paper will be widely discussed, both in the classroom and in the literature.

"Trophic Structure of Raptor Communities: A Three-Continent Comparison and Synthesis," by C. D. Marti, K. Korpimäki, and F. M. Jaksić, is a comprehensive summary of information on the finding, capturing and consumption of prey by raptors (Falconiformes and Strigiformes) from Europe and North and South

America. Results are presented in a series of clearly prepared tables, and the lists of species examined and sources cited are long. Ecologists as well as students of raptor behavior will find this contribution valuable.

"Matrix Methods for Avian Demography," by D. B. McDonald and H. Caswell, represents the first major review of such methods in 20 years. It requires careful study, but will almost certainly prove to be a benchmark paper.

"Nocturnality in Colonial Waterbirds: Occurrence, Special Adaptations, and Suspected Benefits," by R. McNeil, P. Drapeau, and R. Pierotti, presents information on nocturnality in the 27 families of waterbirds that are partly or principally active at night—their nocturnal habits, adaptations, and the benefits of nocturnality.

"Latitudinal Gradients in Avian Species Diversity and the Role of Long-distance Migration," by K. N. Rabenold, discusses trends in species diversity in eastern North America. Surprisingly, diversity and richness increase at higher latitudes in both coniferous and deciduous forests. Most of the birds that breed in northern forests are insect-eating long-distance migrants, taking advantage of the summer bloom of arthropods. Nonetheless, even rather simple tropical American habitats have higher bird diversity than North Temperate ones.

In the last of the chapters, "Evolution of Avian Ontogenies," J. M. Starck presents a system of eight different avian hatchling forms, ranging from superprecocial, in which there is no parental care (e.g. megapodes), to altricial (divided into two groups), in which young display no motor activity, are blind at birth, and generally grow rapidly. Evolutionarily, precociality appears to be primitive in birds, whereas altriciality occurs several times in independent clades in derived groups. Superprecociality represents an independent evolutionary offshoot of precociality. Ecological constraints on developmental mode, egg composition, and the development of different organ systems are discussed.

D. M. Power and his editorial board are once again to be commended on assembling a series of papers covering a wide range of topics, each representing a rigorous and contemporary discussion and summary of a topic.—J. D. RISING *Department of Zoology, University of Toronto, Toronto, Ontario M5S 1A1, Canada.*

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The Birds of CITES and How to Identify Them.—Johannes Erritzoe. 1993. Lutterworth Press, Cambridge, United Kingdom. xxii + 198 pp., 75 color plates, 10 black-and-white plates, color guide, color world map, 158 line drawings illustrating bird families. ISBN 0-7188-2895-X (leatherbound), $161.00 or £95.00; ISBN 0-7188-2894-1 (hardback), $51.00 or £30.00; ISBN 0-7188-2892-5 (ringbound), $44.00 or £26.00.—The Convention on International Trade in Endangered Species (CITES) was founded in 1972, and now has more than 120 signatory nations. According to the foreword of this book by H.R.H. Prince Philip, President of the Worldwide Fund for Nature, "CITES lists all threatened and endangered species and regulates the conditions under which they can be exported and imported . . . 1,400 bird species that are at varying degrees of risk of global extinction . . . appear in the CITES lists." According to TRAFFIC, USA, "In the United States alone 800,000 live birds are imported annually, representing a value of $15 million, and this is based on lawful trade alone."

One of the major problems involved with the importation of birds lies in identification of the species and of the correct country of origin. Especially with Neotropical psittacines, many species are exported from countries to which they are not native, because they are protected in their true country of origin; in other instances, examples of endangered and protected species are exported under the names of legal species, and the local customs officers are not trained in identification (see Pasquier [Ed.]. 1980, Conservation of New World parrots, I.C.B.P. Tech. Publ. 1).

Johannes Erritzoe, a Danish ornithologist, aware of these problems, has put together the book under review as a "reference for all controlling authorities: bird conservationists, customs officers, taxidermists, aviculturalists and scientific advisers." The CITES species lists are divided into three catagories. List I includes all species threatened with extinction that are, or may be, affected by trade. Erritzoe has illustrated all of these. List II includes species that may become threatened with extinction unless trade in those species is strictly regulated, and also species that must be subject to regulation because of their similarity of appearance to, and possible confusion with, threatened species. For List II species, Erritzoe has provided a black-and-white drawing of a representative member of a group, usually of a genus, and lists of other species in the group. This is true of the List II diurnal birds of prey, cranes, parrots, owls, hummingbirds, and birds of paradise. CITES List III consists of species for which export is forbidden or restricted in a particular signatory country. Erritzoe pictures these, and mentions in the text the country in which the species is protected.

The book opens with a useful introduction explaining its contents. This is followed by a "Quick Guide to All Bird Families," with the English and scientific names of each family, an abbreviated range, number of species, plate reference (if appropriate), and a line drawing of a representative species. Erritzoe lists Sibley and Monroe, Morony, Bock and Farrand, and Howard and Moore as his sources for this "Quick

Guide," and the multiplicity of sources is evident in the figures given for numbers of species, which are given as a range. Differences in taxonomic approach of his sources leads to species counts as varied as 53 to 75 for Procellariidae and 315 to 338 for Trochilidae.

Next comes an alphabetical "Glossary to the Topography of a Bird and Some Important Ornithological Terms," illustrated with numbered diagrams. Some of the omissions from this list seem odd; "streak" is defined properly as "pattern of colour oriented longitudinally on the feather," but there is no entry for "bar." One would not think that a definition would be necessary for "young bird" and, in fact, the reader is instructed to "See: Juvenile." However, the definition for "Juvenile" is of the plumage, not of the age class.

The first color page is a color guide, with 54 small numbered patches, in many of which the colors are quite uneven; this may be a fault of the reproduction. If one is matching a bird to a color sample, the alphabetical listing of color names is an inconvenience; if the bird matches color 30, then one must search up and down the list for number 30. On the other hand, if one reads a color name in the text description of a bird and then looks for it in the list, it may not be there. Spot-checking color names in the text, I find no color sample for raw umber, chestnut-red, grass-green, grey-brown, and many other hyphenated colors (although the list does include such hyphenated colors as ashy-grey, bronze-green, mahogany-red, and sooty-brown). Some of the colors do not match my concept of that color—persons putting this book to practical use should have copies of the Smithe color guides, which are now in wide use.

The main body of the book follows. The text for the birds on the color plates is on the facing page, and seems quite thorough for the small space occupied per species. Alternate English names are given when appropriate, as well as names at a minimum in German, usually in French, often in Italian, and sometimes in appropriate exotic languages such as Nepalese and Indonesian. The range is usually given just as names of countries or islands, but in some instances, notably in Australia, more precise ranges are specified. The paragraph headed "identification" is a color description, with the sexes, age classes, and geographical variants described as appropriate. The status of the species or subspecies as to CITES list (I, II, or III) is given, and a list of numbers referring to entries in a 432-title bibliography in the back of the book.

Plates 79 to 85 and their texts cover species added to the CITES lists at the conferences of October 1989 and March 1992. The bibliography is followed by the full text of CITES and a five-page dictionary giving French, German, and Spanish equivalents for English words used in the book's main text. The index is confined to scientific names, which may make things difficult for the customs agent dealing with birds identified only by an English (or other nonscientific) name. A double-page color map of the world ends the book. Countries or other geographic entities on the map are numbered approximately west to east, from Alaska (1) to Campbell Island (168). The index to the map is alphabetical; if you want to know where Zaire (76) is, you can find it fairly quickly by noting the cluster of numbers in the 70s in Africa. But if you are wondering what the name is of the islands south of New Guinea (155), then you have to search halfway through the list to locate 155 and learn that these are the Moluccas.

Finally, we come to the plates themselves. These were done by the author and his wife Helga, with initials identifying the artist for a given plate. The plates vary in quality, and neither artist is consistently superior to the other. The Erritzoes will not be numbered among the great ornithological illustrators of our time, but the point to be considered is whether the figures, if a bit stiff and distorted, are sufficiently accurate to permit their use for identification by their intended audience. I believe they probably are.

The idea of publishing a comprehensive guide to the birds covered by the CITES lists was an excellent one, and the Erritzoes have obviously worked very hard on this one. Whether they have succeeded in their goal will only be determined when the book is in actual use by customs inspectors and other officials. The publication of the work in ringbound format is intended to help these officials keep current through the publication of supplements every two years.—KENNETH C. PARKES, *Carnegie Museum of Natural History, 4400 Forbes Ave., Pittsburgh, Pennsylvania 15213, USA.*

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Waterfowl Ecology and Management.—Guy A. Baldassarre and Eric G. Bolen; illustrated by D. Andrew Saunders. 1994. John Wiley & Sons, Inc., New York, New York. xvii + 609 pp., numerous black-and-white figures and tables. ISBN 0-471-59770-8. $69.95.—Because of their diversity, conspicuous behavior, and importance for food and recreation, few groups of birds have been more thoroughly studied than waterfowl (order Anseriformes). This has resulted in an extensive and dispersed literature that is ever more difficult to locate, much less digest. There are numerous university-level courses that focus on the group, and there are many professionals around the world employed in understanding, monitoring, and managing waterfowl and their habitat. It is therefore surprising that there has never been a comprehensive

textbook treating the group and their conservation. The taxonomy and natural history of waterfowl have been the subjects of numerous major works, and various aspects of their biology have resulted in special treatises. Now-outdated summaries of ecology and conservation issues were included in Delacour's four-volume treatise (*Country Life*, 1959–1964) and in a compilation of published papers (Ratti et al. 1982, The Wildlife Society), while Owen and Black's 1990 book on *Waterfowl Ecology* (Chapman and Hall) was effective but of limited scope. This new work will fill a long-standing void.

This book is a joint effort of two well-published and respected authors who independently and jointly have worked with many different species of waterfowl in various geographic areas on diverse aspects of their ecology and management. They know the literature thoroughly, and have utilized much of it; thus, the citations by chapters form an important contribution of the book. The scope of the book challenges its title, but it would be difficult to find a brief one that covers diverse topics such as waterfowl taxonomy, physiology, wetland habitat, and administrative and policy issues in addition to "ecology and management." Some readers will question the detail favored by the authors for some topics, and others will find favored papers missing. However, the coverage is broad and thorough, and provides either a well-balanced discussion of most topics, or sufficient literature to start the reader on the logical path. North American literature is emphasized by necessity, but relevant foreign works are utilized. Classical and historical, as well as current literature is cited, but recent reviews are emphasized. Commonly, the literature forming the factual basis of a section or chapter is indicated and justified. References are up-to-date, including some from 1993 and data through 1992.

Many will question the order of presentation of topics, but the options are limited in a linear presentation of material of a multivariate subject, and the choice has to rest with the authors when background information is needed that may otherwise seem like a diversion. In general, the basis of the order is the annual cycle followed by management and administrative issues. Its origin probably stems from an amalgamation of approaches used in teaching such courses. For example, information on nutritional and reproductive physiology are presented where the topic is judged most relevant rather than in a separate chapter on physiology; artificial nesting stuctures are covered in the chapter on nesting rather than in habitat management; and management of agricultural foods is addressed with feeding ecology rather than habitat.

After an Introduction outlining the scope of the field, the chapter on Waterfowl Classification is quite comprehensive and well-illustrated, following Livezey (Auk 108:471–507, 1991). In addition to a sampling of the descriptive aspects of behavior, the chapter on courtship includes good coverage on mating systems and pair-bond formation. The chapter that follows on reproductive ecology includes some anatomy and physiology, as well as chronology and other aspects of the annual cycle. Here as elsewhere, management implications are identified. Feeding ecology includes some details of nutritional physiology and examples of food habits of various taxa. "Nesting, brood rearing, and molting" also includes some aspects of management of nest predators and nest cover. Discussion of plumage and molting follows Humprey and Parkes (Auk 76:1–31, 1959). "Winter" considers body mass and carcass composition as tied to energy demands of climatic influences and food resources, as opposed to descriptive aspects of where and when. Time budgets and habitat selection are well integrated here. Chapter subjects then shift from the annual cycle to mortality factors, including hunting and population management. Annual population surveys, diseases, lead poisoning, use of steel shotgun pellets, and the influence of hunting on populations all are treated with up-to-date information. Issues of concern related to the release of hand-reared and exotic waterfowl are considered here. Major waterfowl habitats are treated in a separate chapter that includes breeding, migration, and wintering areas. This descriptive chapter includes some aspects of plant succession and water dynamics expanded in the following chapter on wetlands and wetland management. The wetland chapter details plant sucession based mainly on the Gleasonian approach of van der Valk (Ecology 62:638–696, 1981). Both habitat chapters are quite current in references and issues presented. The need for management to preserve and maintain habitat is emphasized, and examples of major management approaches are presented. The penultimate chapter on policy and administration provides a thorough summary of historic and current bird protection legislation that forms the basis for waterfowl conservation strategies, harvest, and management. In the conclusion, global warming and human population growth are stressed as potential major impacts on habitats for waterfowl, and issues of maintaining biodiversity and recreational use of waterfowl are considered.

This book will be the book of choice for all classes focussing on waterfowl and their habitats, and should be on the desks of all waterfowl biologists and managers. It will be a valuable reference for ornithologists and conservation biologists in search of up-to-date information on the group and, therefore, should be available at all major educational and agency libraries. Although not its intent, this summary will help identify future research needs and opportunities for synthetic analyses of the mass of data now available on the group. Ironically, it comes at a time when governmental agencies are reducing their efforts on waterfowl—in part because of this extensive knowledge base.—MILTON W. WELLER, *4302 Ocean Drive, Corpus Christi, Texas 78412, USA.*

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The Marin County Breeding Bird Atlas. A Distributional and Natural History of Coastal California Birds.—W. David Shuford. 1993. California Avifauna Series 1. Bushtit Books, P.O. Box 233, Bolinas, California 94924. xv + 479 pp., 15 text figures + 157 maps, 16 black-and-white photographs, 30 drawings, 19 tables, 3 appendices. ISBN 0-9633050-0-X. $24.95 + 3.50 S/H; California residents add $1.81 tax. **Atlas of the Breeding Birds of Monterey County, California.**—Don Roberson and Chris Tenney, Editors. 1993. Monterey Peninsula Audubon Society, P.O. Box 5656, Carmel, California 93953. viii + 438 pp., 54 text figures + 33 additional figures and 255 maps, 1 black-and-white photograph, 184 drawings, 13 tables (+ 5 additional tables), 7 appendices. $24.00 (paper), $51.00 (cloth; prices include tax + S/H).—Breeding-bird atlases have revolutionized the study of avian distribution. Traditionally, scattered specimen and/or sight records formed the basis for general distributional summaries that were useful only on a broad level. Thus, biologists interested in the occurrence of a species or group of species within a particular geographic region often had to conduct their own field investigations in order to fill in the gaps in distributional knowledge. Although atlases should not replace independent fieldwork, the geographic concentration of records provided by such efforts is indispensible. In contrast to previous work, atlases provide more refined methods for compiling detailed maps on the occurrence of all breeding species within a well-defined geographic area. Because individual records are mapped according to rigorously defined criteria that denote different levels of breeding certainty, interpretation of records is not relegated to the user. The fact that fieldwork for atlases typically spans several breeding seasons attests to their completeness as a baseline against which future distributional work can be compared.

Atlases are distinguished from most other mapping efforts by the use of a grid-based system. Although other projects have used grids to map avian distributions (e.g. latilong analyses), the size of individual units or blocks is smaller in breeding-bird atlases. Methods of dividing geographic regions into blocks varies among atlas projects. The Marin County atlas, for example, followed standard methodology when the project began in 1976 (the first in California). A grid system was overlain on 7.5-minute USGS topographic maps to identify blocks of approximately 2.5 km square; these were then combined into larger units to "facilitate direct comparisons" with other atlas projects. A more commonly used method now is the Universal Transverse Mercator (UTM) grid system, which uses blocks of 5 km square. This system was employed for the Monterey County atlas and has been widely adopted for other atlasing projects in California and elsewhere.

Although the geographic size of grid units ideally should be comparable among atlas projects, a more serious issue concerns differences in the quality and completeness of block coverage, both within and between atlases. Because breeding-bird atlases rely entirely on volunteers, which inevitably vary in their level of birding expertise, the potential for erroneous records is tremendous. To counter this problem, atlasers have developed strict criteria for evaluating data on species' distributions. For example, numerous lines of evidence are used to distinguish between records that indicate confirmed, probable, or possible breeding status. Participants are given clear instruction on methods of data collection, close contact is maintained between observers and project organizers or coordinators, and questionable records are scrutinized. Determining adequacy of block coverage is also of high concern for atlas leaders, although methodologies vary among projects. This emphasis on obtaining quality data, both in terms of species identification and accuracy of breeding status, adds enormously to the hands-on value of breeding bird atlases such as those produced for Marin and Monterey counties.

In addition to the introductory comments and detailed methods contained in each of these atlases, extensive information is given on abiotic, biotic, and cultural factors that influence avian distributions. The Marin County atlas has three chapters devoted to such topics: "Understanding Bird Distribution," which covers topographic, geomorphic, and climatic characteristics; "Marin County Breeding Bird Habitats," which discusses native plant communities as well as exotic plants and additional habitats such as cliffs, offshore islands, ponds, and human structures; and "History of Land Use in Marin County," which reviews environmental changes that have occurred during the last 400 years of European influence. A fourth chapter, "Timing of Breeding," summarizes factors that influence the breeding biology of species in Marin County and provides extremely useful comparative data on arrival dates of summer resident landbirds.

Similar information is provided in four chapters in the Monterey County atlas: "Topography and Biogeography of Monterey County," which focuses on drainage patterns and their relation to topographic and vegetational characteristics of the county; "The Physical Environment," with valuable graphs showing temporal variation in precipitation since 1600 and during this century; "Habitats," which illustrates the percent coverage of 18 major habitat types (natural and nonnatural) by atlas blocks; and "A Brief History of Monterey County," which emphasizes human-induced changes in habitat. A minor criticism for both atlases concerns the title of chapters dealing with topographic features. "Biogeography" (presumably avian biogeography?) is only a small component of the Monterey County atlas discussion on topography, and subsequent topics also include information on

bird distributions. Likewise, all three chapters in the Marin County atlas, and especially that on habitat, contribute to our understanding of current bird distribution. Nonetheless, the substantive coverage of these topics provides useful background information when reading the individual species accounts which comprise the heart of each atlas.

Species accounts take up 80.2% (356 pp.) and 85.8% (368 pp.) of the main text in the Marin and Monterey County atlases, respectively. Possible, probable, or confirmed breeding species are separated from those for which current breeding status is unclear. Although most of the data on avian distribution and abundance were gathered by atlas observers during four to five breeding seasons, other sources also contributed important information. These included: spring bird counts or breeding bird censuses (published in *American Birds*), U.S. Fish and Wildlife Service breeding seabird censuses, environmental consultant reports, other special government surveys (e.g. for Peregrine Falcons [*Falco peregrinus*], Burrowing Owls [*Athene cunicularia*], and Spotted Owls [*Strix occidentalis*] in Monterey County), and/or casual observations. A comprehensive survey of available literature (Marin atlas has 1,228 references; Monterey atlas has 521 references) further supplemented the data by providing information on historical and current distributions, as well as various aspects of natural history.

The main species accounts in both atlases are divided into three sections that cover (1) current breeding status and distribution, (2) historical records and population trends, and (3) information on ecological requirements and natural history (the title and order of these sections varies between atlases). Conservation is discussed in a fourth section in the species accounts for Monterey County, whereas the Marin County atlas briefly comments on population threats in its accounts, but has a separate chapter devoted to "Conservation Applications." I found these accounts easy to read and very informative. More important than the text, however, are the distribution maps which comprise the core of each account and which distinguish breeding bird atlases from other studies of distribution and natural history. These maps illustrate the occurrence of records on a block-by-block basis according to different lines of breeding evidence (i.e. possible, probable, or confirmed status). Distribution maps for breeding birds in Marin County also include a "Confirmation Index" indicating the relative difficulty of determining breeding status for individual species (method described on p. 75). Although a useful idea, I found these indices difficult to interpret because no scale or range of values was given against which each index could be judged. Limitations of the maps for species that are difficult to census (e.g. nocturnal birds), occur in low density, occur in at least partially inaccessible terrain, or have unusual breeding biologies (e.g. Red Crossbills [*Loxia curvirostra*]), are noted in the accounts. Although the Marin County distributional maps could have been improved graphically by increasing the size of symbols relative to grid lines and other background detail, both atlases provide a clear and detailed picture of the occurrence of each breeding bird species in those counties.

The major difference between the two atlases concerns their treatment and presentation of abundance data, which are of greater value than simple presence/absence data. In contrast to the Monterey County project, Marin County atlasers did not make any systematic effort to estimate species' abundance per block. Rather, two qualitative abundance ratings are given for each breeding bird species observed there: a "Fine Scale Abundance Rating" (scale = 1–7), which scores a species' relative abundance according to the number of pairs one would expect to encounter in an "average" atlas block during 4 h of fieldwork ("based on notes and impressions gathered by the [Marin County atlas] author over a number of years"); and an "Overall Population Index" (scale = 1–1010, divided into seven verbal categories), which was derived by multiplying the abundance rating times the number of blocks in which a species was recorded during the atlas census periods. Additional, more quantitative data on local abundance are provided in tabular form for certain species or groups of species (e.g. seabirds, Ospreys [*Pandion haliaetus*], and herons and egrets); such data were obtained from non-atlas censuses of colonies, nests, and rookeries, respectively. Abundance data from spring bird counts and breeding-bird surveys are summarized in two appendices.

Although the aforementioned indices provide some indication of abundance patterns, they are useful only in a general sense to potential gleaners of the data. Furthermore, one must refer constantly back to the categorical descriptions of each score, a minor inconvenience. Block-by-block estimates of abundance, such as those overlain on county maps for selected species in Monterey County, are of much greater practical value (however, as noted on p. 14, these population estimates are "rough, general, and subject to error," and thus readers should recognize their limitations). Abundance maps are provided for 75 (43.9%) of the 171 native and nonnative breeding-bird species in Monterey County, excluding those in Appendices A–C. Although most of these maps occur within the account for that species, the layout of others are unnecessarily far removed; for example, although the text and distribution map for Great Horned Owl (*Bubo virginianus*) occur on pp. 160–161, the abundance map is combined with that for the Acorn Woodpecker (*Melanerpes formicivorus*; account pp. 194–195) on p. 222 (60 pages apart!). Although I would have liked maps for all species (space limitations precluded publishing maps for the remaining species), the population estimates provided for certain breeding birds are truly

enlightening. A list of the 15 most widespread species in Monterey County is given in Table 7. These estimates are especially astonishing in view of the fact that they were obtained during a period of prolonged and severe drought. Thus, for example, the 20,000 pairs of Plain Titmice (*Parus inornatus*) and 30,000–40,000 pairs of Rufous-sided Towhees (*Pipilo erythrophthalmus*) likely represent minimum estimates of abundance. Although such numbers reveal healthy populations for certain species, the 40,000–50,000 pairs of European Starlings (*Sturnus vulgaris*) estimated for Monterey County alone should raise serious concern about their potential impact on cavity-nesting native birds!

In addition to data on distribution and abundance, species accounts in the Monterey County atlas also contain histograms that illustrate breeding phenology for 33 species. Interpretation and limitations of these graphs are discussed briefly and incompletely. Although sample sizes are given for each graph, it is not clear what they represent (number of individual observations, number of birds, or number of pairs?). Similarly, no explanation is given for the *y*-axis. Despite these problems, the graphical presentation of such data nicely supplements information described in the section on "Breeding and Natural History" for that account. Unfortunately, no reasons were given for restriction of breeding histograms to those relatively few species. Given that comparable data were collected for all birds censused during the atlas project, I would like to have seen similar graphs for other species (at least the common ones with, presumably, the most complete data).

Both the Marin and Monterey county atlases contain a brief section that highlights and discusses major findings of the project. This review is more extensive in the Marin County atlas, which presents useful tabular summaries of relative distribution, abundance, seasonal status, and habitat association of the breeding birds there. Furthermore, species also are classified according to biogeographic zones and faunal affinities (following A. H. Miller, 1951, An analysis of the distribution of the birds of California, Univ. Calif. Publ. Zool. 50:531–644). Compared to this summary, the one-page "Highlight of Results" in the Monterey County Atlas seems inadequate. Nonetheless, both atlases reveal important findings and numerous surprises. In Marin County, for example, Cooper's Hawks (*Accipiter cooperi*) were observed to be a "secretive but regular breeder" in broadleaf mixed evergreen forests, and Grasshopper Sparrows (*Ammodrammus savannarum*) were found to occur fairly commonly in grasslands throughout the county. New and localized breeding records were obtained for a number of species, including, American Bitterns (*Botaurus lentiginosus*), Sharp-shinned Hawks (*A. striatus*), Short-eared Owls (*Asio flammeus*), Red-breasted Sapsuckers (*Sphyrapicus ruber*), Say's Phoebes (*Sayornis saya*), Blue-gray Gnatcatchers (*Polioptila caerulea*), and Northern Parulas (*Parula americana*). Several species (e.g. Northern Mockingbird [*Mimus polyglottos*], European Starling, Brown-headed Cowbird [*Molothrus ater*], and Hooded Oriole [*Icterus cucullatus*]) that have expanded their ranges in California during this century also were documented to be well-established in Marin County as a result of the atlas work.

The Monterey County atlas likewise provided evidence of range expansion for many of these same species, as well as for additional ones such as the American Robin (*Turdus migratorius*). While Dark-eyed Juncos (*Junco hyemalis*) seem to have spread eastward in Monterey County in response to horticultural plantings in towns and around ranches, their populations have become reduced and fragmented in Salinas Valley as a result of loss of oak and riparian forests. The first records of confirmed breeding in Monterey County were obtained for several species (e.g. Great Egret [*Casmerodius albus*], Green Heron [*Butorides virescens*], Virginia Rail [*Rallus limicola*], Greater Roadrunner [*Geococcyx californianus*], Dusky Flycatcher [*Empidonax oberholseri*], Red-breasted Nuthatch [*Sitta canadensis*], Red Crossbill), and two species (Mountain Chickadee [*Parus gambeli*], Blue Grosbeak [*Guiraca caerulea*]) were rediscovered as nesting there after apparent 30- to 40-year absences. Unfortunately, viable populations of certain ducks, shorebirds, and Forster's Terns (*Sterna forsteri*) have been lost in Monterey County as a result of predation by nonnative red foxes (*Vulpes vulpes*).

Species-specific data on distribution and abundance, such as those provided by breeding-bird atlases, have enormous value for wildlife conservation and management. In particular, the detailed baseline data provided by these atlases are indispensible for tracking temporal patterns of change. Whereas accurate documentation of declining populations (at least locally) is an essential prerequisite for conservation planning, evidence of expanding populations for certain "problem" species (e.g. European Starling, Brown-headed Cowbird) also should alert conservationists to the potential need for active intervention. Although individual atlases are most useful at the local or regional planning level, the compilation of such atlases for entire states will provide the broader-scale perspective on population trends that is critical for conservation purposes.

A related application concerns the potential use of breeding bird atlas data by state law-enforcement agencies that issue scientific collecting permits. Despite a growing and unfortunate anticollecting sentiment, it is clear from at least the Marin and Monterey county atlases that many bird species have large population sizes which will not suffer at the hands of scientific collectors. Although exemptions should be made in certain counties for rare or local breeders, it is important to keep in mind that species local in one region may be common in another. A good example is the coastal form of Sage Sparrow (*Amphispiza*

belli belli), which was recently added to California's list of standard exceptions for scientific collecting. Although a rare resident in Marin County, coastal Sage Sparrows were found to be fairly common in Monterey County, and personal experience suggests that they are also common elsewhere in suitable chamise-dominated chaparral. Thus, regulations on collecting should take into account overall population sizes in addition to population trends (positive and negative) as revealed by atlases or other sources.

Both the Marin and Monterey county atlases reflect years of planning and hard work that have paid off in the form of two comprehensive, extremely useful publications. I must note, however, the relatively slow publication time of the Marin County atlas compared to that for Monterey County (fieldwork in those two counties ended in 1982 and 1992, respectively); hopefully, the quick turnaround of the Monterey County atlas will serve as an example for other current and future atlas projects. Atlases such as these two would be impossible to produce without geographic concentrations of birders willing to volunteer hundreds of hours of personal time in the field, and their dedication is commendable. Such efforts yield reams of original census data that, in conjuction with information from other sources, were carefully compiled and summarized in these atlases into detailed maps and easily readible text that can be used by amateur and professional ornithologists alike. Black-and-white sketches of birds and/or habitats, as well as photographs of selected species that breed in Marin County, enhance the appearance of both books (although the quality of bird sketches varies between the two atlases and especially within the Monterey County atlas). Not only are the Marin and Monterey county atlases essential for anyone interested in the distribution of California birds, but they also serve a broader audience because of the well-referenced reviews of natural history for individual species.—CARLA CICERO, *Museum of Vertebrate Zoology, 3101 Valley Life Sciences Building, University of California, Berkeley, California 94720, USA.*

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A Field Guide to the Birds of Borneo, Sumatra, Java, and Bali: The Greater Sunda Islands.—John MacKinnon and Karen Phillipps in collaboration with Paul Andrew and Frank Rozendaal. 1993. Oxford University Press, Oxford. xvi + 491 pp., 88 color plates by Phillipps. ISBN 0-19-854035-5 (paperback; also available in hard cover). $39.95.—One of the anomalies of international birding has been the general lack of modern field guides to the Indo-Malayan islands, which comprise some of the world's most densely populated areas as well as several important centers of avian endemism. This gap in the literature is all the more surprising in light of the long colonial rule of the Dutch and British, two nations very active in both birding and ornithology. That situation has changed rapidly with the publication over the last decade of several bird guides of varying quality to one or more of these large islands. This volume is the first to cover all of the Greater Sundas (the islands between Wallace's Line and the Asian mainland) and is a significant advance over previous field guides. During my visit to Borneo and Bali in 1990, I relied on a hodge-podge of sources, including *Pocket Guide to the Birds of Borneo* (1984. The Sabah Society, Kota Kinabalu, Malaysia), an extract of the color plates by A. M. Hughes with brief notes from B. E. Smythies' classic *Birds of Borneo*, and MacKinnon's earlier work *Field Guide to the Birds of Java and Bali* (1988. Gadjah Mada University Press, Yogyakarta, Indonesia), supplemented by J. Delacour's (1947. The Macmillan Co., New York) out-of-print and very dated *Birds of Malaysia*. With the new guide I was able to identify retrospectively many of the "mystery" birds in my 1990 field notes.

The book begins with a section entitled "Background," which includes the usual field guide discussions of the book's organization and the region covered, plus sections dealing with biogeography, conservation, birdwatching techniques, and birding localities. The discussions of geography and ecology are brief but well done, including useful information about birds in the local culture. The biogeography section details the recent geological history of the Greater Sundas and the Malay Peninsula and shows, with a sophisticated diagram, how it relates to endemism within and among the islands. My only complaint about this presentation is that it underestimates endemism by using counts made at the species level in a region that has many distinctive forms that were badly over-lumped in the past (see below). The conservation section, with a diagrammatic presentation of recent primary forest loss on Sumatra, is depressing but important because it will help to counteract some recent Indonesian propaganda spots on American television that claim that 79% of the country's forests are preserved. (Perhaps they mean 79% of the tiny remaining remnant!) The section about birding techniques, which includes such elementary items as how to "pish," will undoubtedly be glossed over by sophisticated birders, but I am glad the authors included it if only to reach local beginners (English being widely spoken at least in Malaysian Borneo). Even if the book is available to them only in libraries, the discussions, written in the context of their own birds, on keeping field notes, looking for distinctive marks, making lists, reporting records, and transcribing bird calls are sure to contribute to a better appreciation of

the birds of their rapidly disappearing forests. The section on where to see birds is rather superficial and overlooks some often-visited sites such as Niah Caves National Park in Sarawak.

The species accounts follow the traditional "finches last" sequence of higher categories, with the new Sibley/Monroe order discussed in general descriptions of families. However, the authors follow Sibley and Monroe's (1990. *Distribution and Taxonomy of Birds of the World.* Yale University Press, New Haven) English names "as closely as possible," a commendable decision that contributes to international standardization. MacKinnon and Phillipps also follow Sibley and Monroe's efficient system for listing alternative names.

Species accounts occupy the largest section of the book and are, for the most part, easy to use, informative, and accurate. Those of resident land birds clearly demonstrate the authors' extensive first-hand knowledge of these birds. Although the book is intended as a field guide and appropriately avoids taxonomic innovation, the authors provide insightful observations about and revealing illustrations of many polytypic species that will probably be split when they are studied more thoroughly. The most striking example I found is the so-called Black Laughingthrush (*Garrulax lugubris*), which is black, with a yellow bill and bare blue eye-patch, only on Sumatra. The Borneo "subspecies" is gray with a differently shaped red bill and a completely bald crown with yellow skin! Other species whose accounts and illustrations will pique the interest of systematists include Chestnut-breasted Malkoha, Coppersmith Barbet, Brown Barbet, Garnet Pitta, Blue-winged Leafbird, Black-crested Bulbul, Cream-vented Bulbul, Ashy Bulbul, Black Magpie, White-browed Shortwing, Magpie Robin, Sunda Whistling-Thrush, and Oriental White-eye. One would have to spend many days in a major museum to discover the possibilities for future taxonomic research that this book reveals at almost every turn of the page.

In contrast to these important contributions, the seabird and shorebird accounts add nothing new to the literature and often are inadequate or inaccurate. For example, most shorebird accounts overlook distinctive fall juveniles and breeding plumages, even though resident observers would see them, and those for the smaller sandpipers are inadequate even for identification in winter plumage. The accounts of the two dark noddies are misleading and imply differences that do not exist in the eye-ring and extent of the pale cap. No mention is made of the best field mark of adults (i.e. the pale tail of the Black Noddy compared to the dark tail of the Brown). The juvenile Black Noddy, which breeds in the area, is incorrectly said to have "less white on the crown." The white crown of the juvenile is sharply demarcated from the black nape, but is just as extensive as the adult's crown, which fades gradually into the black. In the field, the juvenile may actually appear to have more white because of the stronger contrast.

The book could have been shortened by: (1) elimination of the unusually large spaces between the accounts; (2) shortening the descriptive sections; and (3) eliminating full accounts for vagrants and pelagic birds. If the color plates are accurate, detailed head-to-tail descriptions are unnecessary; the authors can shorten accounts by concentrating on "field marks." In this book, such distinctive features sometimes are buried in unnecessarily long descriptions. Full accounts for vagrants and hypothetical species, most of which are seabirds or shorebirds with poor accounts anyway, only confuse beginners and are superfluous for more advanced users. Anyone skilled enough to look for vagrants is sure to have one of the recent world guides to seabirds, shorebirds, waterfowl, etc. Thus, shortening the book would have improved it.

The success of any field guide ultimately rests on its illustrations, and evaluation of them is naturally subjective. Those in the present guide reflect the choice of several unfortunate design and style options. Like many other recent field guides, this one numbers the species accounts, and then uses those numbers on the plates to key the illustrations to their names on the facing page. I consider this style an abomination introduced by publishers who fail to appreciate how field guides are used. It frees editors and typesetters from the necessity of providing actual page numbers on the plate facing pages, but causes nothing but problems for the user. I should point out here that all popular field guides to North American or European birds have the names on the plates. This greatly increases a book's heuristic value and makes it much easier to use in the field. The constant back-and-forth reference from numbers to names is particularly annoying when the figures on the plate are not in numerical order, as on Plate 56 of minivets. The argument is often made that putting names on the plate creates crowding, but Phillipps' plates are awash in unused space (the aforementioned minivets have nearly an inch of margin all around). The individual figures could be enlarged relative to the size of the page and still leave ample room for names.

Phillipps' illustrations show a general improvement over her earlier published works, and are vastly better than the primitive ones by local artists in MacKinnon's Java/Bali book, but lack the sophistication of Hughes' Borneo plates. Her style is of the school of field-guide art that attempts to show accurate "local color" (i.e. the exact plumage color without highlights or shadows, rather than depicting birds in natural light). Of course, this is a matter of taste, but to me, lack of shading not only makes the birds look flat, but is misleading because birds are rarely seen in the field belly-up and, thus, almost always have shadows underneath. No one viewing a properly painted portrait of a Sanderling would misinterpret the shadow as a gray line down the center of the

underparts! Because so much of a bird's character depends on shape, leaving out the shadows actually gives less information and reinforces the mistaken notion, common among beginning birders, that color is always a bird's most important field mark. The lack of shadowing is particularly noticeable on brightly colored birds such as fruit pigeons, trogons, minivets, and leafbirds, which look very flat indeed. But Phillipps is inconsistent in applying the "no shadows" principle; some glossy dark birds (e.g. drongos, crows, and starlings) are shown with appropriate highlights and shadows; on some plates, one species may be shaded (e.g. Magpie Robin on Plate 70), whereas the rest are not; or as in the case of the Nicobar Pigeon (Plate 34), which always looks black at a distance, the highlighting is overdone with no compensating shadows. A frequent affectation of Phillipps' work is egg-shaped eyes, especially noticeable on her cuckoos and barbets. Birds' eyes are not perfectly round, but the pupils always are! Also, she has an occasional tendency to make heads disproportionately large, as on the *Tringa* sandpipers, rails, pigeons and doves, and munias. Nevertheless, the plates as a group are aesthetically pleasing, and some (e.g. hornbills, owls) are particularly good. She has successfully met the challenge of giving each owl species its own "personality." Supplementing the plates are a few text figures, the most important of which is a well done diagrammatic presentation of flying hornbills. I only wish something similar had been done for nightjars. The plate shows perched birds, but most field marks are visible only in flight.

Subjective matters aside, the plates include a number of outright errors, mostly among seabirds and shorebirds. The remiges of the Red-footed Booby are too black (they have a silvery "bloom"). The Masked Booby's wing should show more black near the body. The frigatebirds' tails are too straight, and the gray throat of the female Great Frigatebird should be darker (it often looks almost black in the field). The White-shouldered Ibis does not have a red nape (it differs from the mainland Black Ibis in this respect). Most Common Terns in the Greater Sundas are of the race *longipennis*, which has a black bill year-round. The Brown Noddy is shaped like a Black Noddy, with the tail proportionately too short, and both noddies show too much tail notch. The immature Black Noddy should have twice as much white on the crown, and the adult's tail should be paler than the back. The characteristic overall shape difference between Pacific Golden-Plover and Gray Plover is not shown. Obviously, no one should buy this book for its coverage of seabirds, and most users would have been better served by a smaller (and cheaper) book that included only those typically seen from land.

Appendices 1 and 2 deal with distributions of "endangered species," a category that is not defined and does not correspond to any list published by governments or major conservation organizations. The lists are difficult to evaluate because they idiosyncratically include such things as an introduced population of *Padda oryzivora* that is listed as endangered on Borneo! Appendices 3 and 4 are tabular presentations of distributions of small island and Bornean mountain birds, and Appendix 5 is a list of birds of the Malay Peninsula not covered by the book. The "sonosketches" in Appendix 6 are quasi-sonagrams that revive a diagrammatic technique, pioneered decades ago by Aretas A. Saunders, for describing bird sounds. They would have been more useful if distributed among the species accounts rather than buried in an appendix, but are a good idea nevertheless. Appendix 7 lists regional clubs, journals, and museums.

This landmark book deserves a place in the libraries of both birders and ornithologists. Despite its relatively minor shortcomings, it adequately fills a previously unoccupied niche in avian literature. Even those who have no plans to visit the Greater Sundas will profit from perusing its pages for what they reveal about avian biogeography and the often uncritical acceptance by ornithologists of dated, overlumped taxonomies of island birds. We can also hope that it will contribute to the preservation of bird habitats in this remarkable avian crossroads.—H. DOUGLAS PRATT, *Museum of Natural Science, Louisiana State University, Baton Rouge, Louisiana* 70803, USA.

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Ornitologia no Brasil [Ornithology in Brazil].—David C. Oren, José Maria Cardoso da Silva, and William Leslie Overal, Eds. 1992. Boletim do Museu Paraense Emílio Goeldi, Série Zoologia, volume 8, number 1. Museu Paraense Emílio Goeldi, Cx. P. 399, Belém, Pará 66017-970, Brazil. 268 pp. ISSN 0077-2232. $15.00—This book-length special issue of the Goeldi Museum's zoological journal is dedicated to Fernando da Costa Novaes, Curator of Birds at the Goeldi, in honor of his long and distinguished career in ornithology. The issue contains nine technical papers, a biographical sketch of Novaes (Silva and Oren), and a complete bibliography of Novaes' ornithological publications. Novaes' bibliography is reason enough for students of Brazilian birds to consult this publication. Among the 55 papers listed (spanning the years 1947–1992), I was embarrassed (but delighted) to "discover" several directly relevant to projects I am currently involved in. Most of Novaes' titles deal with distribution, taxonomy, and geographic variation, primarily in the Brazilian Amazon, but his bibliography also includes some of the first papers on avian community ecology in Amazonia. North American readers will be interested to note in the biography

that the celebrated influence of Alden Miller (Pitelka 1993, Condor 95:1065–1067) extended directly to South America as early as the mid-1950s in the person of Novaes, who spent nearly a year at Berkeley on a Guggenheim Fellowship under Miller's tutelage.

Some of the best-known authors in their fields contributed technical papers to this volume. These papers—all but one written in Portuguese and all containing both English and Portuguese abstracts and key words—offer a sampling of ongoing avian research in Brazil. Several are review papers that cover such varied topics as the avian pineal gland (Redins), cytogenetics (Lucca and Rocha), and Amazonian birds as hosts to arboviruses (Dégallier et al.). Willis and Oniki review army-ant-following in birds, expanding on their prior work with an African-Neotropical comparison. In the only English-language paper, Haffer critiques the "river-barrier" hypothesis of Amazonian biogeography. A monograph-length paper (Willis) details the behavior and ecology of a single species (Barred Woodcreeper, *Dendrocolaptes certhia*). A fascinating example of "ethno-ornithology" is Teixeira's discussion of the indigenous practice of artificially inducing abnormal plumage coloration in captive parrots. Conservation priorities for Amazonian birds (Oren) and the importance of skeleton collections of Brazilian birds (Alvarenga) also are presented.

This volume is not a rehashing of primarily English-language literature for the consumption of Brazilian audiences. On the contrary, the works included should serve to expose Temperate Zone ornithologists to the vast body of under-cited literature in Brazilian peer-reviewed journals. Even for researchers unwilling to confront texts in Portuguese (with very little help, anyone who can read Spanish can read Portuguese), the extensive lists of literature cited in each paper should be helpful. This volume will contain something of value for anyone interested in Brazilian birds and for conscientious scholars from other regions interested in the considerable Brazilian contribution to diverse areas of ornithology.—MARIO COHN-HAFT, *Museum of Natural Science and Department of Zoology and Physiology, 119 Foster Hall, Louisiana State University, Baton Rouge, Louisiana 70803, USA.*

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Handbook of Australian, New Zealand and Antarctic Birds. Volume 2, Raptors to Lapwings.—Stephen Marchant and Peter J. Higgins, Editors. Illustrated by Jeff N. Davies with Peter Marsack, Frank Knight and Brett Jarrett, 1993. Oxford University Press, New York. 984 pp., 68 color plates of birds, numerous text illustrations and range maps. ISBN 0-19-553069-1. $295.00 (cloth).—This, the second volume in a series covering the birds of Australia, New Zealand (and their external territories) and Antarctica, the Antarctic and subantarctic islands, continues the high standards set by its predecessor. The number of species is reduced from the 196 covered in the first Volume to 118, and the average length of text per species has increased from seven to nine pages. Both have led to marked improvements. Volume 2 covers the Falconiformes, Galliformes, Gruiformes, Turniciformes (recognized as an order here following Sibley et al. [Auk 105:409–423]), and part of the Charadriiformes. The Scolopacidae, Laridae, and Glareolidae will be covered in Volume 3. Having orders split between volumes can be inconvenient, but this is just a matter of personal taste.

The format for this and the previous volume is based on the successful *Handbook of the Birds of Europe, the Middle East and North Africa: The Birds of the Western Palearctic* (BWP). Each order and family has a introductory section detailing taxonomy and general biology. These are succinct, well researched, and particularly useful to the general reader. However, the taxonomic affinities of the Falconidae (p. 235) are poorly covered, with Sibley et al. (Auk 105:409–423) being incorrectly cited as supporting an association between the Falconidae and Strigiformes. Nevertheless, this was the only major lapse in the general taxonomic sections. It is a welcome improvement on the previous volume, where the taxonomic sections were poorly handled, with such flaws as woefully misrepresenting the DNA-DNA hybridization data of Madsen et al. (Auk 105:452–459) regarding the position of the Musk Duck (*Biziura lobata*), and the omission of a major study on relationships within the herons by Sheldon (Auk 104:97–108). Handbooks are, rightly or wrongly, often sourced as taxonomic references, so it is critical that discussion of taxonomy be well researched.

The species accounts cover a range of topics including breeding, social organization, diet, voice, distribution and plumage variation. The amount of information and detail is overwhelming and the editorial team has done an excellent job of maintaining high quality and consistency throughout. Unlike the BWP, there is a uniform setting in print size in all sections of the species accounts. This has its good and bad points. Thus, while it can be argued that large print throughout is easier to read, it also would have been useful if some of the less essential parts were in smaller type, allowing one to skip over them. The food sections are a case in point and, in particular, the entry for the Brown Falcon (*Falco berigora*), which includes a long list of prey items. The problem of course is that what one reader considers essential others may not. The BWP has the section on food in large print and sections on social behavior and plumages in small print. Perhaps a useful compromise exists somewhere between the two formats.

Despite the large amount of information in each species account, the reading is easy. The sections on social organization and behavior are particularly interesting and will provide valuable source material for students of comparative biology for years to come.

One potentialy misleading aspect in the format concerns the maps. Both Volumes 1 and 2 attempt to detail known breeding sites on the maps by using two color tones. These, however, are not equivalent to the breeding and nonbreeding ranges of migratory birds. Most of the resident species covered breed throughout their range in suitable breeding habitat, whereas the highlighted areas in the maps only represent confirmed breeding records obtained during surveys undertaken for the *Atlas of Australian Birds* (1976–1981) and subsequently, as well as the published literature. Given that the *Atlas* was not directed towards establishing breeding ranges, and that our general knowledge of breeding sites for many species is scant, it is premature to attempt to distinguish breeding from nonbreeding ranges. Although it is briefly mentioned in the General Introduction (p. 11) that the maps only depict documented breeding records, readers could be misled into believing that these correspond to breeding ranges. This discrepancy in the actual meaning of the maps is highlighted when one considers, in the same volume, the distribution maps for the migratory waders. Here the distinction between the breeding and nonbreeding ranges is a biological reality and not a sampling artifact. A breeding record of the Osprey (*Pandion haliaetus*) from the Antarctic continent (page 220) is a printing error.

The reduced number of species accounts in Volume 2 has meant that sections on plumage and geographical variation are covered in more detail. Each of the contributors has done a highly commendable job in combining their own comparisons with those in the literature. The main strength here is that age and wear on plumage of the specimens examined have been carefully considered when assessing geographical variation. In several instances, the brief treatments in this volume far surpass more wordy taxonomic papers. I found the treatment and reassessment of subspecies in the *Gallirallus phillipensis* complex and in *Faco berigora* particularly thorough. I strongly recommend that anyone contemplating a taxonomic study on geographical variation in Australasian raptors and rails first consult the relevant sections in this volume.

The New Zealand Quail (*Coturnix novaezelandiae*) is treated as a species separate from the Stubble Quail (*C. pectoralis*) on the basis of differences in plumage pattern and size. This appears to be a well justified conclusion. It is unfortunate, then, that none of the plates depict the New Zealand Quail. The editors' chosen policy of not illustrating extinct species and subspecies is glaringly inadequate in this instance. A comparison of the plumage differences between *C. pectoralis* and *C. novaezelandiae* would have been very useful. A similar case occurred in Volume 1, where the extinct New Zealand Bittern, (*Ixobrychus novaezelandiae*) was treated as a species separate from the Little Bittern (*I. sinensis*) on plumage and size characters, but was not illustrated. Color plates in handbooks are more than just aids for field identification; they should complement the text in presenting what is known about the birds of the region. If an extinct species qualifies for a separate species account (two pages in the case of *C. novaezelandiae*), then please provide some illustrative material too. This omission is particularly galling when the Purple Gallinule (*Porphyrio martinica*) is illustrated three times. This species is only known in the region from a single specimen found dead in South Georgia in 1943. The supportive illustrative material is here out of proportion with the quarter page of text accorded for the species account.

There are several other questionable choices in illustrations. Instead of dedicating an entire plate to the introduced Common Pheasant (*Phasianus colchicus*), the subspecies of the Orange-footed Scrubfowl (*Megapodius reinwardt*) perhaps could have been illustrated. Similarly, the inclusion of illustrations depicting relevant plumages of the Eurasian Golden-Plover (*Pluvialis apricaria*) and the American Golden-Plover (*P. dominica*) would have been useful in assessing possible sightings of the two. The former is apparently accepted as a vagrant to New Zealand, so in that regard (at least) should have been illustrated. Hopefully, in future volumes a more enlightened approach will be taken when choosing what is to be illustrated.

Having had the pleasure of seeing many of the original paintings, I looked forward to the published plates. The originals were first rate. It is a real pity then that the publishers, Oxford University Press, failed to reproduce the quality of many of the original paintings. The washed-out reproductions depicting the quails and button-quails (Plates 32–36) are a poor representation of the originals. The reproductions in Volume 1 were better, though still not excellent, so hopefully this lapse in quality production will not be repeated in subsequent volumes. Given the high purchase price, buyers should expect better quality from the publishers. Despite the production flaws, the colored plates are a highlight. They not only depict accurate and detailed features, but are aesthetically pleasing as well. Those on birds of prey are among the best illustrations of raptors I have seen.

The poor production efforts of Oxford University Press also are evident in the typeface. The print appears very faint making reading difficult. Similarly, the sonagrams are printed so faintly that it is not possible to see the range and frequency of the sounds. Several maps also suffer from the same problem; for example, the distribution points for the Ringed Plover (*Charadrius hiaticula*) in Australia (p. 830) are hard to see. It is annoying that the professionalism and

dedication of the editorial team and artists appears to have been let down by the sloppy production efforts of the publishers.

Two production features are, however, worth commending. First, the inclusion of references after each order, family and species account is an infinitely more user friendly approach than having all the references listed at the end of the volume as is done in BWP. Secondly, in such an encyclopedic work, the layout of figures and maps often can make or break a book—here the layout is first rate and invites reading.

The previously mentioned production problems detract little from the overall scholarship and usefulness of the volume. To anyone interested in Australian, New Zealand and Antarctic birds, access to the *Handbook of Australian, New Zealand and Antarctic Birds* series is a must. It should be part of each university and museum library, as the completed series will be the definitive work on the region. Even those without a specific interest in the region will probably find parts of the biology sections informative and the color plates a pleasure to view.—LES CHRISTIDIS, *Department of Ornithology, Museum of Victoria, 71 Victoria Crescent Abbotsford, Victoria 3067, Australia.*

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Arena Birds: Sexual Selection and Behavior.—Paul J. Johnsgard. 1994. Smithsonian Institution Press, Washington, D.C. viii + 330 pp., 38 color plates, 70 sets of multiple line drawings. ISBN 1-56098-315-9 $39.95 (cloth).—This book is an extensive, interesting, and lavishly illustrated collection of accounts of the social behavior of birds that exhibit lek, promiscuous, or highly polygynous mating systems—arena birds as Johnsgard call them. It is not a general review of the behavior of such birds, but is focussed on those aspects of behavior that relate to the action of sexual selection in the evolution of morphology, display behavior, and mating systems. This focus contributes to the strength and interest of this book: it is an excellent reference for comparative aspects of social behavior in this diverse assemblage of bird species.

There are two introductory chapters, on the theory of sexual selection and on a description and definition of avian arena behavior. Two important tables in Chapter 2 list all species of birds for which promiscuous and lek behavior have been described. The other 10 chapters are each devoted to the major groups of lek and promiscuous species. All the typically recognized lekking groups—the grouse, bustards, sandpipers, hummingbirds, manakins, cotingas, birds of paradise, and wydahs—are covered. Johnsgard also includes accounts of ducks, lyrebirds, bowerbirds, and widowbirds because of the functional similarities that sexual selection in these groups shows to that in true lekking species. Taken together, the accounts demonstrate a very important point that the author implicitly puts forth. That is, that species in which males are emancipated from the duties of parental care show many similarities in their behavior and in the dynamics of their mating systems. These similarities transcend the different phylogenetic histories and differences in ecology exhibited by the species.

The species and genera accounts summarize data on display behavior and dispersion of males, interactions between the sexes, patterns of female choice of mates, and specific ideas concerning evolution in each group. The accounts are consistent in their focus across each group discussed, which makes it easy to compare particular aspects of behavior in different species. The text is vividly illustrated by many excellent drawings by the author. These drawings and the color plates demonstrate, in a way not possible in writing, how elaborate, bizarre, and truly amazing the displays of promiscuous species of birds really are.

Unfortunately, there are several problems with this book that temper my excitement about it. First, the book is, in my opinion, poorly written. The author repeatedly uses extended compound forms as adjectives in his writing and, while this style is becoming more commonplace, it remains clumsy and difficult to read. The most extreme example of this is the heading for Table 7, which reads "Examples of male age-related dominance/fitness ratios and/or age-dependent sexual success rates in lekking birds." There are countless other examples. In some cases, the author ends up contradicting himself because of his poor selection of words. In writing about the Buff-breasted Sandpiper, Johnsgard states "Unfortunately, there is still no information of possible individual variations in male mating success," even though he presents those exact data in his Table 6. I assume that Johnsgard meant to write that there are currently no published data on how variation in male mating success relates to phenotypic traits in male Buff-breasted Sandpipers. That statement is true. What the author wrote is not. Lastly, in some cases, the author's writing simply does not make sense. In discussing interspecific variation in displays in tragopans (Phasianidae), he suggests that "It seems probable that the frontal displays of male tragopans have evolved in close conjunction within the normal environmental range of tragopan habitats, which are typically rich in logs, rocks, and boulders." What this sentence is supposed to say, even imagining that "within" should be "with" is beyond me. It may seem nit-picky of me to select for criticism three examples of text from a book 330 pages long, but I could, if pressed, find such examples in every chapter if not on every page.

These stylistic problems are important to mention because they are indicative of sloppy editing and a

lack of careful attention to detail. This same lack of attention appears in the context of Johnsgard's writing. As an example, for the accounts of species that I have the most personal experience with—shorebirds, birds of paradise, and bowerbirds—Johnsgard cites every relevant publication, but in at least 10 instances he cited papers inappropriately or in a misleading manner. It was my impression that he knew the literature in terms of what was published, but not in terms of the details of each paper. From both a stylistic and scholarly standpoint, this book reads like a first draft that is badly in need of careful editing and checking.

A second problem with this book is that the author does not consistently write to just one audience. The intended audience would, I believe, be graduate students and professionals in animal behavior and ornithology. Nevertheless, Johnsgard suggests in the preface that if readers find the discussion of theory difficult that they should consult the glossary at the end of the book. In my opinion, anyone who needs a glossary to read this book will not understand the text. It is not user-friendly in the sense of clearly explaining difficult concepts. On the other hand, Johnsgard's description of behavior is sometimes so elementary that several times during my reading I was convinced that the author's intended audience must be laypersons. I have concluded that I do not know what audience Johnsgard wrote this book for. The book would be difficult for a layperson or amateur ornithologist to understand, but neither is it sufficiently rigorous or scholarly for a strictly academic audience.

The author's presentation of the theory of sexual selection is simplistic at best. He tries to present a balanced view of the conflicting theories in this introductory chapter, but then ignores his own efforts in the rest of the book. Johnsgard has adopted the adaptationist paradigm hook, line, and sinker. Everything that arena birds are and everything that they do, from their morphology to their behavior and the design of their display sites, is interpreted *a priori* as adaptive. Males are portrayed as always trying to display their dominance, and females are portrayed as always choosing the most fit males. It is as if the actual data no longer matter. The interpretations and conclusions are known from the start. When behaviors are difficult to interpret easily as adaptations (e.g. the elaborate displays of the Kakapo, the lekking parrot), they are suggested to have been "accidentally" carried over through evolution. I tire rapidly of this approach because it becomes difficult to maintain trust in an author's objectivity. It would, in my opinion, be a mistake for anyone to cite this book for its evolutionary interpretations of social and sexual behavior in birds.

Having said all of that, it may be a surprise to a reader of this review that I actually like the book. Also, I think everyone interested in the social behavior of birds or in lek systems generally, will want to see this book. Personally, I would buy this book for three reasons. First, it is an excellent reference for the social behavior of all birds exhibiting promiscuous mating systems, if not for the theory or dynamics of sexual selection. Second, the photographs and illustrations are fantastic, and they make the topic of arena birds and behavior instantly exciting. Each time I opened the book, I flipped through the pages specifically to look at drawings and was always reminded of the fascination I have with animal behavior. On a more sobering final note, however, I would also buy this book as an example to my graduate students of the type of prose and general style to avoid if they want to become effective writers. If the illustrations in this book remind me of so many positive aspects of biology, the text reminds me that in this career you do not necessarily have to write well to get your work published.—STEPHEN PRUETT-JONES, *Department of Ecology and Evolution, University of Chicago, 1101 East 57th Street, Chicago, Illinois 60637, USA.*

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History and Nomenclature of Avian Family-Group Names.—Bulletin of the American Museum of Natural History, volume 222. W. J. Bock. 1994. 281 pages. $22.00.—Linnaeus devised his binomial system of nomenclature with no provision for categories between those of order (Ordo) and genus. Linnaean genera were very inclusive, being much more nearly equivalent to the modern concept of the family, a category whose use evolved gradually, subsequent to Linnaeus. When rules of nomenclature began to be formalized, the taxa above the level of genus received varying consideration. The rules now embraced by the *International Code of Zoological Nomenclature* still do not apply to taxa above the level of family-groups, so that the nomenclature of orders, for example, is determined by consensus or individual preference. Eventually, however, it proved necessary to promulgate some rules to apply to family-group names (i.e. taxa between superfamily and genus). As an example, family-group names must be based upon a validly proposed generic name. It was not until 1961 that the International Commission on Zoological Nomenclature (ICZN) decided to extend the law of priority to family-group names in zoology. But the problem with applying priority to family-group names, at least of birds, is that there are no reasonably comprehensive lists or indices of synonyms from which one may determine the earliest available name for a given family. Pierce Brodkorb, of whom Bock is usually scornful, was a pioneer in providing familial synonymies

in his *Catalogue of Fossil Birds*. Although these are demonstrably incomplete, they generally are accurate as far as they go and continue to be useful. In the course of compiling these synonymies, Brodkorb replaced a few avian family-group names then in use with others that had been proposed earlier. These actions were unacceptable to those, such as Bock and his mentor Ernst Mayr, who prefer to depart from the unambiguous principle of priority in favor of a more or less undefinable doctrine of "established usage."

Bock (p. 86) relates that an attempt was made to submit an application to the ICZN to forestall the extension of priority to family names of birds, but this was rejected by the secretariat on "the thin excuse that a full analysis of the history of avian family-group names is required before such an application can be considered." Although Bock grumbles that the *Code of Zoological Nomenclature* should be rewritten so as not to mandate such laborious research, his work is ostensibly an attempt to satisfy this requirement by discovering the earliest use of each family-group name of birds, the goal being to suppress all senior synonyms that might threaten any family name deemed to be currently in use. Thus, unlike the charitable Mormon who conducts his genealogical investigations with the promise of offering posthumous salvation, Bock's historical research has as its objective the exhumation of entities that can then be condemned to perdition.

Another motivation for Bock's work is contained in a draft version of a 4th edition of the *Code of Zoological Nomenclature*, which is now circulating for comments. This includes a provision for abrogating the law of priority and substituting official lists of accepted taxa, which would then become sanctified as essentially new starting points for nomenclature (see also *Systematic Zoology* 39:424–425, 1990). This is an abhorrent idea to a large body of working taxonomists, but one that Bock eagerly espouses. Thus, his list of family-group names has been advanced with the proposal that it "be accepted as the base line for avian family-group names. Only the names included in this list with the authors and dates of publication as given will be available for zoological nomenclature. Names published prior to its publication but overlooked will be treated as unavailable for zoological nomenclature" (Bock 1991:84).

By his own reckoning, Bock (p. 122) has devoted "six to eight solid years of effort" to the publication under review here. His credentials as a Member of the ICZN and as Chairperson (apparently for life) of the Standing Committee on Ornithological Nomenclature (SCON) of the International Ornithological Committee, as well as his status as a scion of the Hartert-Stresemann-Mayr dynasty, ought to qualify him to undertake a work of this nature. Unfortunately, in this instance the Teutonic fountain of omniscience has spewed forth a *sphagnum opus* that is a bog of fatuous and sometimes inexplicable errors that can only be regarded as mire. Because this work is one of the most meretricious and fallacious documents ever produced in the history of zoological nomenclature, a frank *caveat lector* must be issued lest it be accepted and its myriad errors perpetuated.

Bock's opus begins with a long, pedantic introductory section mostly devoted to the history of the ICZN. Past and present members of that body inform me that Bock did considerable research on this section, and they tend to regard it favorably. Much of it is not particularly germane to the subject of avian family-group names, however, and might better have been presented as a separate publication. Included in this section is a brief review (p. 60) of differing philosophies of nomenclature, in which Bock equates his viewpoint with what he terms "continuity" of nomenclature, which is somehow opposite to the philosophy of prioritists, who are regarded as having a destabilizing influence. However, as I have shown previously (Olson 1987; literature is cited in the manner in which it appears in Bock's publication, so that his bibliography can be consulted for the references), nomenclature, even in such a well-known fauna as North American birds, is inherently unstable as a result of changing systematic evaluations, not because of nomenclatural rules. But Bock (p. 60), in a petulant fume of mixed metaphors, simply dismisses these data as "a red herring (a smoke screen) used to conceal real considerations about continuity of nomenclature," and refuses to consider this issue.

Following the protracted introductory material is a section containing Bock's proposal to the ICZN to change the *Code of Zoological Nomenclature* where it concerns family-group names, including a long list of names to be conserved or suppressed. Bock's formal petition to the ICZN on avian family-group names is among four titles that Bock cites as "In press" in the *Bulletin of Zoological Nomenclature*. According to P. K. Tubbs, Executive Secretary and Editor of the ICZN (in litt. 8 March and 29 March 1995), the proposal in question was "provisionally submitted" but Bock "decided not to proceed until after the appearance of the Discussion Draft of a 4th edition of the Code." Another title (Bock "In press b") was never received by Tubbs, and the other two have been held in abeyance, so that none of these four titles can really be said to be "in press."

The heart of Bock's opus is the list (pp. 129–158) of supposed first citations of family-group names of birds, arranged in the modified Gadow/Wetmore sequence of Peters' *Check-list*. For each entry, Bock gives the family-group name, author, date, and the name of the type-genus, with its author's name and date. A glaring deficiency in this list is the complete omission of page numbers. As a consequence, in researching this review I often was constrained to plough through the entirety of multipaged and multivolumed works in search of names that all too frequently did not appear in the work cited, or that apparently were taken from

some Latin construction that Bock had mistakenly construed as a family-group name. If I have erred in any of my attempts to interpret the probable point of origin of Bock's various mistakes, the blame is his for not providing page references.

Another deficiency of this list is that Bock does not give the spelling of supposed family-group names in their original form nor give the rank that the original author gave to the group. Instead, he converts the supposed names automatically, and often arbitrarily, to families or subfamilies by adding "-idae" or "-inae" endings, in the process frequently creating new family-group names himself where none had existed before. Had Bock attempted to provide original spellings and ranks, as Brodkorb always did, he might have had to evaluate his supposed names more carefully. At the least, the bogus names that he introduced would have been much easier for others to spot. His list of family-group names is followed by an extensive section on "problem family-group names," much of which is irrelevant simply because so many of the problems are solely of Bock's creation.

The work concludes with an annotated bibliography incorporating numerous interesting historical notes. Under each reference that contains supposed original family-group names is an alphabetical list of those names, which I must at once acknowledge as having greatly facilitated my ability to ascertain that so many of them are erroneous.

The least criticism of Bock's opus is that it is a forest of typographical errors. The incredible level of sloppiness evident throughout the preparation of this document is inexcusable in a work devoted to bibliographical and nomenclatural details. Errors can be minor and unimportant, such as the failure to italicize generic names (e.g. pp. 110, 183, 191, 200, 207 [twice], 220), or careless typos such as "Federan Republic of Germany" (p. 13), "variuos" (p. 43), "ommunicate" (p. 83), and "sane" for "same" (p. 209). Then they become a little more serious, as when authors' names are misspelled: Brdaley (p. 75), Möhrng (p. 165), R. J. (= J. R.) Forster (p. 181), Grebe for Gerbe (p. 204), Deigan for Deignan (p. 252), and Daubin for Daudin (p. 220, but perhaps not a typo because it is also spelled Daubin in the bibliography). Scientific names are often misspelled, such as Lariinae (p. 9), Caracariinae (p. 11), Scyalopodidae (p. 11), Culicivinae (p. 95), Thremmophilinae and *Thremmophilus* (for Thremmaphilinae and *Thremmaphilus*, p. 157), Parvonidae (p. 175), *Chais* (for *Clais*, p. 188), *Tryannula* (p. 197), Hyrdobatidae (p. 204), and *Creation* [!] (for *Creadion*, p. 220). Of a more serious nature, Reichenbach is twice cited for a work actually written by Reichenow (p. 185) and Gray, 1885, is cited four times when the correct date is 1855 (p. 198). This by no means exhausts the supply of typos.

Bad grammar, syntax, and word usage are distracting throughout, the following being but one example: "Recall that in the summer of 1948, most European countries had not yet recovered from the ravishes of World War II" (p. 49—presumably "ravages" is intended). Small grammatical errors such as "there are no reason why" (p. 8), are ubiquitous, as are run-on sentences that would leave even Faulkner breathless.

Bock's Latin is likewise deficient. The singular of *nomina nuda* is *nomen nudum*, but Bock never gets this right and keeps referring to "a nomina nudum" (pp. 201, 202), or worse still, "a nomena nudum" (p. 188). Even genus/genera, taxon/taxa are at times misused, viz.: "a type genera" (p. 170); "two categorical levels between the class and the genera" (p. 235); "were placed in a taxa" (p. 186). Other much more serious mistakes due to faulty comprehension of Latin will be evident below.

The bibliography, which I liked better than any of the rest of the work, is similarly flawed. Although I did not check all of the references, I happened upon misspelled or misrepresented words in the titles of at least seven, as well as several errors in the citation of page numbers.

The starting point for family-group names of birds is debatable. Some authors have accepted names based on Illiger (1811), an important and scholarly publication that Bock categorically rejects, not without some justification. On the other hand, Bock takes many family-group names as dating from the excessively recondite and eccentric work of Rafinesque (1815). There is no rational basis for accepting any of Rafinesque's names while rejecting all of Illiger's, however, as the nomenclatural problems attendant on both works are virtually identical.

Bock repeatedly concedes that the validity of Rafinesque's names is doubtful, but proceeds to use many of them anyway. This was a most unfortunate decision because these include several very familiar groups and Bock does not provide the next available authority for each of these names should Rafinesque's publication be rejected. Rafinesque's family names are clearly only latinized versions of his French vernacular names, such as Cultrirostria for "Les Cultrirostres," Clunipedia for "Les Clunipèdes," Petrelia for "Les Pétreliens," etc. A few of these names appear to be based on generic names, but are not and, hence, are unavailable. For example, Buceronia is based on "Les Bucériens" not *Buceros*, Pavosia on "Les Pavosiens" not *Pavo*, etc., yet Bock takes these and numerous others as valid family-group names.

If we reject the works of both Rafinesque and Illiger for the nomenclature of avian families, as I would prefer, then the real "father of avian family-group nomenclature" (p. 18) becomes William Elford Leach of the British Museum. Bock deserves much credit for bringing this significant fact to light. Leach's family-group names, which were based on generic names and had "-idae" or "-adae" endings, appeared in what is now a very obscure guidebook titled *Synopsis of the Contents of the British Museum* that went through many editions, of which Leach contributed to only a few.

Although Bock dates Leach's names to the 17th edition of 1820, Leach actually first used family-group names in the 15th edition of the *Synopsis*, so that eight of the names that Bock credits to Leach 1820 were instead first published in 1819. (I thank Michael Walters, Tring, for supplying much valuable information on this subject).

Although recognition of Leach's contribution to family-group nomenclature by modern ornithologists is overdue, his names were well known to his contemporaries such as Horsfield, Vigors, and Swainson, who credit Leach with many of the family names that they used. These authors also happen to be the source of a great many errors made by Bock that have arisen mainly from his mistaking generic plurals and other Latin constructions for family-group names. A generic name is a Latin noun, or is supposed to be treated as a Latin noun, so that when used in a Latin sentence its ending will vary according to whether it is singular or plural, a subject or an object, etc. All educated naturalists in the 18th and 19th centuries were well-versed in Latin, so that instead of writing "the various species of *Corvus*," for example, they might simply have said "the various *Corvi*," using the Latin nominative plural ending. This is what is meant by a generic plural and the *Code of Zoological Nomenclature* specifically states that such names are not available for family-group names. Bock (pp. 97–98) is well aware of this rule and discusses it at length. Although he claims that it is often difficult to determine an author's intention in this regard, this definitely is not true for Horsfield, Vigors, or Swainson, from whom Bock has lifted numerous generic plurals and erroneously converted them to family-group names. He claims that later authors have accepted some of these as family-group names, but I did not detect any documentation of this. In cases where it may be true, the citation of the name should date from the publication in which it is first clearly used as a family-group, not from where it is clearly a generic plural. In cases that may truly be ambiguous, why assume that a name is intended as a family-group when this is not certainly demonstrable? Why not assume the opposite?

Errors in interpretation of names in publications by Vigors and Swainson are particularly indefensible because of the context in which these authors worked and because they were very clear about what they intended to be suprageneric categories, in most cases designating them with "-idae," "-inae," or "-ina" endings. Both Vigors and Swainson were dedicated quinarians who believed that taxa were disposed in circular configurations of groups of five. For example, Vigors (1825a:468) recognized five tribes of Insessores, each of which contained five families. Neither he nor Swainson would have created more families than would fit five to a circle. It is especially easy to know exactly what Vigors (1825a) intended as family-group names because all are laid out in the quinarian diagrams that appear on pages 468 and 509. Thus, any name that does not appear in these figures is immediately suspect as not being a family-group name. The only exception to this is the provisionally proposed name "Gypogeranidae?" (p. 425), which is represented by one of the two blank spaces with queries that appear in the figure on page 509. Gypogeranidae takes its first appearance from Vigors 1825a and not from Vigors 1825b, as Bock (p. 113) has it, but where *Gypogeranus* appears only under "Fam. ____?" (p. 392).

Bock (pp. 135, 146, 241) attributes the names Phasianidae and Bucconidae to Horsfield (1821a), but in that publication Horsfield credits both names to Leach, so if they were not published previously by Leach, which bears investigation, they should at least be cited as "Leach in Horsfield." The name Bucconidae as used by Horsfield (1821a) included only species now placed in the Capitonidae. Regardless of how one chooses to resolve the complicated issue of preserving the modern usage of the family name Bucconidae for puffbirds, it is simply nonsensical to give as the original citation of the family a publication in which the name is used exclusively for barbets, as Bock has done. The same kind of problem exists with the Nectariniidae. Also, note that in his discussion of the complicated history of the Nectariniidae (p. 211), Bock refers to actions by authors who he thought might be considered "first revisers," despite that fact that the first-reviser principle (Article 24) applies only in situations where two or more names were proposed simultaneously, which is not an issue in this case. Thus, Bock seems not to have a clear idea as to what the first-reviser principle pertains.

Bock (p. 241) gives Horsfield (1821–1824) as the author of four other supposed family-group names (Centropodinae, Motacillidae, Phaenicophaeinae, and Platyrinchinae), not one of which was actually used in that manner. The first three of these are generic plurals and, therefore, are invalid. The only *Motacilla* that Horsfield (1821–1824) discussed is *M. speciosa*, which is a synonym of *Enicurus leschenaulti*, a thrush. Horsfield put this in the Sylviidae, saying that "the remiges of our species have an arrangement different from those of the European Motacillae," which Bock has taken as a family-group name, but which is patently intended to mean only "the European species of *Motacilla*." Elsewhere the statements "the general physiognomy of our bird is that of the Phoenicophai," and "a peculiar property of the plumes covering the head and neck, which belongs to all *Centropi*," are mistakenly conceived by Bock to contain family-group names.

The attribution of Platyrinchinae to Horsfield seemed most peculiar considering that Horsfield's work concerns Java, whereas *Platyrinchus* is a Neotropical genus. I found no such familial name in the general catalogue that prefaces this work. In the text, Horsfield (1822, unpaginated) was concerned with justifying his new genus *Eurylaimus*, for which he made comparisons with "*Platyrhynchus* [sic], as estab-

lished by Mr. Desmarest." But he referred *Eurylaimus* to the Meropidae and at no time mentions *Platyrinchus* as other than a generic name. The only possible source for Bock's error that I could detect was in the following sentence in Latin. "Genus hocce pedibus familia Syndactylarum quadrat, rostro generi Platyrhyncho, familiae Dentirostrum affine; difficilis tamen dispositio naturalis." This is simply the genus *Platyrhynchus* in the ablative case, so the pertinent passage would translate roughly "with the bill of the kind in *Platyrhynchus*."

The following names given by Bock as originating in Vigors (1825a) are *not* used as family-group names in that publication: Anserinae (p. 133), Aquilinae (p. 132), Artamidae (p. 158), Dicruridae (p. 157), Galbulidae (p. 146), Icteridae (p. 156), Oriolidae (p. 157), Paridae (p. 153), Paradisaeidae (p. 158), Regulinae (p. 152), Saxicolinae (p. 151), Sternini (p. 138), Tanagrinae (p. 155), Tyrannidae (p. 148). Most of these errors have arisen through mistaking generic plurals for family-group names. The following are clearly in this category and are unavailable (Vigors' page numbers in parentheses): Anseres (p. 499), Dicruri (p. 472), Galbulae (p. 433), Pari (p. 440), Paradiseae (p. 449), Reguli (p. 440), Sternae (p. 507), Tanagrae (p. 446), Tyranni (p. 472).

Bock's attribution (p. 204) of the Saxicolinae to Vigors (1825a) is definitely derived from entries on page 441 of Vigors, as this is one of the few times when Bock deigns to cite a page number. Here, however, the "section *Saxicoles*" mentioned on line 4 is obviously only a French vernacular, as shown by mention of "the section of *Merles Saxicoles*" in line 8. At one point (p. 95), Bock says that "it is not completely clear whether Vigors (1825a) based his Saxicolinae on the present-day genus *Saxicola* Bechstein, 1803, although it appears likely that he did." But later (p. 204) he states that Vigors "definitely used *Saxicola* Bechstein, 1803 as the type of his Saxicolinae, and it appeared that he included the currently recognized members of this genus within *Saxicola* when he proposed the subfamily." This is pure fabrication, as there is absolutely no indication of what Vigors included among the "*Merles Saxicoles*," much less mention of a specific type. It is an irrelevant mendacity here, because no subfamily Saxicolinae was actually proposed by Vigors, but one wonders how many others like it occur throughout Bock's work, in which numerous statements regarding the type genera of various families are made.

Although the genera *Artamus*, *Oriolus*, and *Icterus* are at least mentioned by Vigors (1825a:436, 438, 446), he considered these genera to belong to the Laniidae, Merulidae, and Sturnidae, respectively, and I found nothing that could be interpreted as family-group names based on these genera. Thus, Bock's citation of the names Artamidae, Oriolidae, and Icteridae as dating from Vigors (1825a) is erroneous.

The case of the subfamily Aquilinae, which Bock dates from Vigors (1825a), affords us more than the usual diversion. The only place I found in the whole work that contains the Latin word *aquila* is in a footnote on page 419 that consists of a quote from John Ray (presumably from Willughby's *Ornithologiae* of 1676): "*Fregata* avis—Oculi nigri, acie acutissima et *Aquilinâ*," which is to say that the frigatebird has black eyes and a very sharp and eaglelike beak. Thus, Bock has evidently taken a family-group name for eagles from a purely descriptive term used to characterize frigatebirds that appeared in a direct quote from a pre-Linnaean author! The name Aquilinae actually dates from Vigors (1824), where it is the largest and most prominent of Vigors's five "stirps" of his Falconidae (Aquilina, Falconina, Accipitrina, Buteonina, and Milvina). Bock correctly attributes the last three to the 1824 publication, so his spurious attribution of Aquilinae to a later publication is difficult to understand.

Bock (p. 154) dates the family Emberizidae from Vigors (1825b), but here *Emberiza* is listed as a genus of the "Subfam. Alaudina" (p. 393), with absolutely no indication of any higher category based upon it.

Bock's citation of Noctuinae as dating from Vigors (1825b) is correct in that such a group is actually used there, but Bock consistently misspells it as "Nocturinae" (pp. 142, 187 [thrice, with "*Noctura*" thrice as well], 264). Of course, misspelling the name avoids the problem of homonymy of Noctuidae Vigors with the lepidopteran family of the same name. Why Bock (pp. 142, 225) should single out Syrniinae as dating from Baker (1835:18) is a mystery, as Baker's work is based upon the works of Vigors, as stated in its title, and the subfamily Syrniana actually first appeared a decade earlier in Vigors (1825b:393).

Bock's (pp. 151, 264) citation of the much-used family name Timaliidae as dating from Vigors and Horsfield (1827) seemed redolent of spuriousness from the outset. Why would anyone name a family based on the rather unprepossessing genus *Timalia* at such an early date, when family limits were very broad? The Vigors and Horsfield paper is an extensive one (162 pages) and Bock's consistent failure to cite page numbers makes checking for a single name such as this exceedingly time-consuming. After several attempts, I finally located the probable source of Bock's error on page 231, where the genus *Dasyornis*, which was listed in the "Sylviadae," is said to bear "a very close resemblance to the group of *Timalia* of the Javanese ornithology." This is certainly not a family-group name, the "group" being only the genus *Timalia* as used by Horsfield (1821–1824), which included *T. pileata* and *T.* (=*Macronous*) *gularis*.

Bock (pp. 150, 261) dates Malaconotidae from Swainson (1824), but this is in error, as the only entry that could be interpreted in this way is a passage that "acquaints us with the true economy of the *Malaconoti*," which is a generic plural and is not available. Swainson clearly identified his subfamilies of Lani-

idae as Lanianae, Thamnophilinae (to which he referred *Malaconotus*, both here and in his 1827 publication), and Edoliinae. It is certain that he never introduced a family-group name based on *Malaconotus*. Bock's Drymophilidae (p. 148), supposedly proposed in Swainson (1826), also has as its basis a generic plural, Drymophilae, which appeared in a work in which family-group names consistently end in "-inae" and "-idae."

An extraordinary number of blunders came to light in analyzing just the family-group names that Bock attributes to Swainson in the *Fauna Boreali-Americana* (cited as 1831, with the actual date of publication 1832). At least 12 of the supposed family-group names that Bock derives from Swainson (1831) are not family-group names either in formation or intent, the following being clearly based on generic plurals that have no validity whatever as family-group names (Swainson's spelling and page number are in parentheses): Dasycephalinae (Dasycephalae, p. 171), Maluridae ("part of the Maluri of M. Temminck," p. 157), Ocypteridae (Ocypteri, p. 130), Oidemiinae (Oidemiae, pp. 438, 449), Pittidae (Pittae, p. 172), Setophagidae (Setophagae, pp. *li*, 218, 225), Sylvicolidae (Sylvicolae, pp. *li*, 204, etc.), Totanini (Totani, p. 391), Trichophoridae (Trichophori, p. 159), Tyrannulinae (Tyrannulae, p. 131—Bock's extended discussion [pp. 197–198] of the problems associated with the supposed name Tyrannulinae thus are completely superfluous), Vangidae (Vangae, p. 171), Vermivoridae (Vermivorae, pp. 204, 205, 222). Despite its appearance, Glaucopinae probably belongs in this category as well, as Swainson (1831:289) wrote that "the genus *Crypsirina* and the Short-legged *Glaucopinae* of M. Temminck form part of a group typifying the Drongo Shrikes." Some of the above names such as Maluridae, Pittidae, and Vangidae, are very well known and in current use, but their authorship will have to be sought elsewhere. Others have possibly never been used as family-group names until inadvertently created by Bock.

Bock (pp. 135, 262) attributes the name Lagopodinae to Swainson (1831), but I can find nothing in that work that could be construed in any way as a suprageneric category involving *Lagopus*. Swainson consistently treated *Lagopus* as a subgenus of *Tetrao*, so that it would have been completely illogical for him to base a higher category on it. Brodkorb (1964: 320) does not list any family-group name based on *Lagopus*, so the name Lagopodinae may not have existed prior to Bock's invention of it.

That Bock (pp. 134, 262) attributes a family-group name Oxyurinae to Swainson (1831) is nothing short of incredible because Swainson (1831:455 footnote) roundly rejected Bonaparte's genus *Oxyura* as being preoccupied, listed the Ruddy Duck in the genus *Fuligula*, and referred it to his own subfamily Fuligulini. He voiced a suspicion that the Ruddy Duck and similar Neotropical species might at most "constitute a subgenus," so there is no possibility of a subfamily Oxyurinae dating from Swainson (1831).

Bock repeatedly (pp. 95, 148, 197, 207, 262) attributes a family-group name Culicivorinae to Swainson (1831) and attaches great importance to the fact that Swainson supposedly was the first to recognize the gnatcatchers (later *Polioptila*) as a family-group, despite the fact that his generic name *Culicivora* (Swainson, 1827:359) was later transferred to the Tyrannidae. Bock (p. 95) singles out the name Culicivorinae Swainson (1831) versus Polioptilinae Baird (1858) as a particular example of how a family-group name may change according to the disposition of its type genus. This entire story appears to be a fantasy. I could find no evidence that anyone prior to Bock ever based a family-group name on the genus *Culicivora*—certainly Swainson never did.

Swainson (1827) first coined the generic name *Culicivora* for the species *Muscicapa stenura* Temminck (=*M. caudacuta* Vieillot), which is the type by original designation (and by monotypy). He placed this species in the Muscicapidae, whence it was later transferred by other authors to the Tyrannidae. Swainson next used *Culicivora* in a binomial for his new species *C. atricapilla* (Swainson, 1832), which is a gnatcatcher. Here he clearly refers to his 1827 publication as the source of the generic name, so he was not forgetfully reinventing it for a different group of birds. He considered *C. atricapilla* to belong to the subfamily Sylvianae (sic passim) of the Sylviidae.

In the publication that Bock gives as the source of the name Culicivorinae, the genus *Culicivora* is mentioned thrice (Swainson, 1831:201, 207, 208) but never in a manner that its identity can be determined, and always clearly as a member of the subfamily Sylvianae. There is nothing here that could possibly be taken for a family-group name based on *Culicivora*. Furthermore, nothing identifiable as a gnatcatcher appears anywhere in the entire volume. Five years later, when Swainson (1837a:61, 243) had occasion to mention "gnat-snappers" under the genus *Culicivora*, he still regarded them as belonging among the "true warblers (*Sylvianae*)." Thus, Swainson never regarded the gnatcatchers as forming a distinct family-group taxon, and the name Culicivorinae does not seem to exist outside of Bock's imagination.

Bock (p. 201) states that the type species of Swainson's *Brachypus* of 1831 is "unclear." In Appendix 1 of Swainson (1831:485), under the family Merulidae, subfamily Brachypodinae, is a synopsis of the subgenera of *Brachypus* and distinctly set off under the subgenus *Brachypus* is the statement "Type.—*Brachypus dispar*, Sw. (*Turdus dispar*, Horsf.)." What could be clearer than this?

Bock (p. 156) attributes Quiscalinae to Swainson (1837a), but in this work *Quiscalus* is listed under the Scaphidurinae (p. 272) and Quiscalinae appears neither here nor in the index, so how did this error arise?

Despite his adherence to the discredited Quinarian

system, William Swainson undeniably ranks among the great ornithologists of all time. Bock's statement (p. 20) that "Swainson's sloppiness in nomenclature was doubtless the consequence of extensive writing, but insufficient time devoted to proofreading" is gratuitous in the extreme, for Swainson was a paragon of rectitude compared with Bock, who has badly misinterpreted Swainson's nomenclature. Furthermore, Bock is the last person with grounds for casting aspersions on other people's proofreading—note, for example, the word "certqainly" in the line preceding the above quotation.

Bock (p. 142) attributes a subfamily Flammeinae to Anonymous (1915) with the statement that "*Flammea* = *Tyto*," although he does not give the author of *Flammea* (there actually is such a generic name, however). The reference was difficult to locate in Bock's bibliography because there are several categories of "Anonymous" and in none of these is there a title dated 1915. Further search in the bibliography (p. 224) revealed that "Flammeinae" is credited to Anonymous 1883 (= B.O.U). But in this publication the Barn Owl is listed as *Strix flammea* under the family name Strigidae in both the table of contents (p. xviii) and the text (p. 85). There is no hint of anything here that could possibly be taken as a reference to a family-group name based on *Flammea*. Out of curiosity, I checked Bock's entire 43-page bibliography for publications dated 1915, which seems to have been a rather dry year for nomenclature, as there were only two titles (Lowe, Miller), neither of which contains a name Flammeinae.

French trochilidomania of the 19th century produced a plethora of superfluous names for hummingbirds. Bock (pp. 144–145) has added to the mess by misrepresenting no fewer than 60 names by French authors that probably or certainly have no standing as family-group names. All of the supposed 39 names cited by Bock from Mulsant et al. (1866), Mulsant (1875), and Eudes-Deslongchamps (1881) first appear as French vernaculars (e.g. "Les Calliphloxaires," "Les Dorichaires," etc.) and are not available unless "latinized by later authors" and "generally accepted as valid by authors interested in the group concerned and as dating from that first publication as a vernacular name" (Article 11,f,iii), which may not apply to any of these names.

Bock has mistakenly credited Simon (1921) with 21 additional family-group names of hummingbirds. Simon lists 46 different "groups," presenting them in the text in the following format: "1er Groupe.—*Hemistephania*." These are simply generic names with no family-group endings. The synopsis at the front of Simon's work clearly identifies these as the type genera of his groups, not as group names. The first requirement of a family-group name is that it "be a noun in the nominative plural" (Article 11,f,i,1), which is definitely not the case here. By attaching "-inae" endings to Simon's type genera, Bock, at one stroke, has cluttered up the literature with 21 family-group names now of his own authorship. Several of these have been incorrectly rendered: Klaiinae should be Klaidinae, Loddigornithinae should be Loddigiornithinae, etc., but since these are not really family-group names anyway, I suppose it does not matter how one spells them.

Only a masochist would willingly undertake to check the accuracy of all of the names Bock credits to the bibliographically complicated and diffuse writings of Reichenbach, or the multifarious outpourings of Bonaparte. Nevertheless, I could not resist checking on two of these that struck me as suspicious.

Among the synonyms of Alcidae, Bock (p. 138) lists "Triolidae Reichenbach, 1849," with the type "*Triole* auct." In the text (p. 181) he explains that "no indications exist in any of the standard reference works that a genus *Triole* has been proposed formally; hence Triolidae Reichenbach, 1849 (*Triole*) lacks a type genus and is unavailable." It struck me that if there were a name similar to this in the work cited, it would surely be based not on *Triole* but on *troile*, as in *Colymbus troile* Linnaeus, 1766 (=*Alca lomvia* Linnaeus, 1758). Sure enough, after the usual protracted perusal, I found that plate 2 of Reichenbach (1849) is captioned "Pygopodes Troilinae Colymbinae," though Troilinae does not appear in the text, nor is a genus *Troile* used in either the plate or the text. Further consultation of sources showed that "*Troile*" has apparently never been used as a generic name, so Troilinae would indeed be an invalid family-group name—not that Bock proved it by looking under "*Triole*".

As an aside, throughout his work Bock uses "auct." (see example above) in a most misleading manner. The Latin *auctorum*, meaning "of authors," is customarily applied to a name known to have been used by various authors who are unspecified. Bock, however, uses it to mean that he does not know who the author may be, which often translates into no author at all.

My sole venture into the Napoleonic literature was to investigate Pipromorphinae Bonaparte (1853a), which perplexed Bock (p. 198) because it was published prior to the generic name *Pipromorpha* Gray (1855). This caused Bock to engage in vacuous speculation as to whether Pipromorphinae "should perhaps be based on *Pipromorpha* auct. or ?*Pipromorpha* Bonaparte, 1853 rather than on *Pipromorpha* G. R. Gray, 1885 [sic]. Or perhaps Bonaparte had access to the manuscript of Gray's 1855 paper. However, no way exists to solve this nomenclatural conundrum . . . ." He continues on to retain Pipromorphinae Bonaparte, 1853, with *Pipromorpha* Gray, 1855, as its type, which he considered as having priority over Mionectinae Sibley and Ahlquist (1985c). At the end of the discussion he winds up attributing the name Pipromorphinae to G. R. Gray (1885 [sic = 1855]), who certainly did not use any such term.

The least checking of standard ornithological sources would have clarified this situation. In Gray's (1855:

146) original publication the name *Pipromorpha* is attributed to Schiff 1854. Sclater (1888:111) and Ridgway (1907:452) showed that the name *Pipromorpha* ex Schiff MS dates from Bonaparte (1854:134), and Hellmayr (1927:497, footnote b, Field Mus. Nat. Hist. Zool. Ser. 13, 5) showed that at this point it was a *nomen nudum*, so that the name *Pipromorpha* then had to take its origin in Gray (1855). Bonaparte had simply gotten ahead of himself and published the subfamily name (a *nomen nudum*) before that of the genus (also a *nomen nudum*). Because Pipromorphinae Bonaparte 1853 was not based on any then-existing generic name, it is simply invalid as of that date, and would have to take the author and date of the next publication after Gray (1855) in which it was used, if there were one, which we cannot find out from Bock.

The preceding are among the more serious nomenclatural errors that I found. There are many others that I have not detailed and numberless others doubtless await detection. How are we to account for a work that is so unremittingly erroneous? It hardly seems possible that the mere concatenation of carelessness and ignorance, each of which is manifest, could produce such a treasury of blunders. The fact that this was not a labor of love, but was evidently undertaken grudgingly, to satisfy a requirement that Bock believed to be unnecessary in the first place, may explain the want of care that a different motivation might have mitigated. But this cannot explain the names that do not exist at all in the references cited.

Regardless, the result is that Bock's entire list must be condemned as worthless and unusable for any purposes of nomenclature. Although Bock may have assembled the greater part of the literature that pertains to family-group names of birds, to generate an accurate list of these names would require going back through this literature and starting over from scratch. In the meantime, Bock's list should *never* be used by itself as a reference for family-group names of birds. Serious consideration should be given to formal suppression of this work for purposes of nomenclature, so that the many spurious names that have been inadvertently created here by Bock will be invalidated.

It would be difficult to imagine a greater folly than adopting Bock's publication as the basis for an official list—a new starting point—for avian family-group names. On the face of it, his effort ought to provide abundant ammunition for those who regard such official lists as anathema. The realization that the of job of producing "official lists" will most likely fall to those who are incompetent to the task, ought to provide a sobering thought for the members of the ICZN, who are now contemplating a drastic and unnecessary overhaul of the rules of nomenclature. On the other hand, those in favor of official lists may well argue that Bock's astonishing performance underscores the view that the level of scholarship necessary to comply with the present code is too difficult to attain. They might then even hold up the Bock debacle as a prime example of the need for change! *Mit der Dummheit kämpfen Götter selbst vergebens* (Schiller).—STORRS L. OLSON, *Department of Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560, USA.*

Announcement

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New Editor Selected.—Thomas E. Martin has been selected as the new Editor of the *Auk*. All new manuscripts should be sent to: Editorial Office, *The Auk*, Montana Cooperative Wildlife Research Unit, NS 205, University of Montana, Missoula, Montana 59812, USA. Submit five hard copies of the manuscript and include an ASCII version and a wordprocessor version (preferably Word or WordPerfect; identify the software and the type of computer used) on floppy disk (3.5-inch disk preferable).