Book Reviews

EDITED BY R. TODD ENGSTROM

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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The Flexible Phenotype: A Body-Centred Integration of Ecology, Physiology and Behaviour.—Theunis Piersma and Jan A. van Gils. 2011. Oxford University Press, New York. 238 pp. ISBN 9780199597246. Paper, $52.95.—A bit of a revolution in our understanding of the relationship between genotypes and phenotypes has been taking place in recent years. The age of the genome, though still with us and providing more and more depth to our understanding of molecular processes in biology, is entering a new phase. The recognition that gene sequences do not translate directly into phenotypes, and that environmentally generated changes can be transmitted across the generations, is changing our view of evolution. The environment is being reinstated as the key component that determines what phenotype a particular genotype gives rise to. This phenotypic plasticity is the essence of this book. Piersma and van Gils want to "encourage further integration of ecology, physiology and behaviour." They set about this with great gusto, and their enthusiasm is contagious. Their chatty and intimate style both engages and challenges the reader throughout. They write in the first-person plural—"We grew up in the Dutch countryside and…," "We think that…"—and occasionally directly address the reader—"Do you still remember that…." This makes us feel that we are all embarking on a journey of discovery together.

The Flexible Phenotype begins with an introductory chapter that sets out the focus of the book and the attitude and aims of the authors. The authors tell us that they are putting evolution in "the back seat," but this isn't really the case, because evolutionary thinking still pervades the whole book. However, the environment does take center stage. Piersma and van Gils are concerned with two kinds of phenotypic plasticity: that induced by the developmental environment, which is generally not reversible, and the reversible, often cyclic changes that occur in the phenotypes of animals living in seasonal environments. They focus more on the latter, and their main example is the Red Knot (*Calidris canutus*), the small shorebird species that they know best. The cyclic phenotypic changes in this small bird as it prepares for its long migration, or to breed, are remarkable. However, although the general approach is pretty bird-centered, nonetheless they do their best to encompass examples from other taxa, and the book is packed full of interesting comparative information. Clear, and sometimes comic, diagrams, very much in the Dutch style set by Rudi Drent (to whom the book is dedicated), are used to good effect throughout. There are also a few boxes in which particular issues or concepts, such as allometry and Basal Metabolic Rate, are explored in a bit more depth. The authors further capture the reader's attention with intriguing subheadings such as "Dutch dream cows do not exist," "Dying strategically," and "It takes guts to eat shellfish." This will make the book particularly attractive to undergraduates and reduce the risk of lapses in concentration.

The book is divided into four parts. The chapters within each part are linked, and each ends with a short synopsis that recapitulates the main points. Part I comprises two chapters dealing with aspects of organism design. These deal with various challenges that organisms face, such as thermoregulation, energy and water balance, flight, and the need to maintain homeostasis. This is a quick romp through basic physiology. Part II deals with physiological constraints such as maximum sustainable work level, heat dissipation, and excretory capabilities. It then explores the effect of the environment and examines developmental and cyclic phenotypic changes, and their costs and benefits. I found the introduction of atrophy, such as muscle wastage, somewhat confusing here, because this is a very different phenomenon. I was a little surprised that the section on phenotypic plasticity in birds did not deal with molt, for the dramatic changes in plumage that some birds undergo is one of the most marked changes in phenotype that we see. The study of molt, its costs and benefits, is not yet well integrated into a life-history framework, and this would have been a nice context in which to further emphasize the need to look at the tradeoffs involved here. Molt is not totally ignored, however, and gets a mention elsewhere in the book in relation to color change in ptarmigan. Part III then brings in behavioral flexibility, particularly focusing on foraging. This section could cover many things, of course, but the authors maintain their body-centered approach; the link between foraging and gut morphology is given particular attention, with lots of information from the knot studies.

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The final section, Part IV, tries to bring things together into an integrated framework. The important selection pressures of disease and predation are examined. The need for rapid responses in both these contexts is discussed, the immune system of course being particularly flexible. The implications for conservation are also explored. In the final chapter, we come back to evolution. I felt that a bit more consideration could have been given here to epigenetic effects. The recent realization that inheritance of gene expression patterns, not just of different alleles, is important in driving phenotypic change, and that this is where environmental factors, particularly in early life, play a key role, is causing us to recast the evolutionary paradigm. However, there is a nice diagram illustrating epigenetic inheritance pathways, though the suggestion that so-called "symbolic" or cultural inheritance is confined to humans is certainly debatable.

Overall, I liked this book very much. It is full of interesting information, presented in an accessible form, and there are 33 pages of references for further detail. It will be very useful for undergraduates, but also thought-provoking for researchers. And even if you do not agree with everything the authors say, you will certainly enjoy reading and thinking about it.—Pat Monaghan, *Institute of Biodiversity and Animal Health, Graham Kerr Building, University of Glasgow G12 8QQ, United Kingdom. E-mail: pat.monaghan@glasgow.ac.uk.*

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Atlas of the Breeding Birds of Arabia.—Michael C. Jennings, Ed. 2010. Fauna of Arabia, vol. 25. King Abdulaziz City for Science and Technology, Riyadh, Kingdom of Saudi Arabia; Saudi Wildlife Commission, Riyadh; and Senckenburg Forschungsinstitut und Naturmuseum, Frankfurt a.M., Germany. 751 pp. ISBN 9783929907834. Hardcover, ~$301.00.—This attractive and well-produced volume covers all the states of the Arabian Peninsula: Saudi Arabia, Yemen (including the Socotra Archipelago), Oman, United Arab Emirates, Qatar, Bahrain, and Kuwait. The Arabian Peninsula lies on the southern edge of the Palearctic Realm, and its breeding birds are mostly Palearctic, with a strong Afrotropical element in the southwest. About half of its Palearctic species are confined to the Saharo-Sindian Zone, which is a subset of the arid Eremian Zone extending from North Africa, across the Middle East, through Central Asia to Tibet and Mongolia (Kachkarov and Korovine 1942). A small portion of the breeding avifauna originates in the Indo-Malayan Realm. A majority of the endemic species are Afrotropical in origin.

The previous standard work on Arabian birds, Meinertzhagen's (1954) *Birds of Arabia*, was based largely on a nearly complete manuscript by G. L. Bates, who died before he could publish it. Meinertzhagen embellished it a great deal and published it as his own, giving little credit to Bates. These embellishments are being called into question because of Meinertzhagen's prolific propensity for prevarication, as detailed in Garfield (2007). Indeed, Jennings felt it preferable to ignore Meinertzhagen's additions as well as later works that depended on them because there was no way to verify whether his observations were actually made in Arabia or simply made up. The late Charles Vaurie (pers. comm.), in a continuation of his interest in the birds of the Eremian Zone, began work on Arabian birds in the mode of his Tibet studies (Vaurie 1972), but unfortunately his papers related to this work cannot be found and it is not known how far he progressed.

The atlas maps are divided into 1,142 half-degree (30 × 30 minutes) squares. When Jennings began his surveying in 1984, many had no breeding bird records. Over the ensuing 25 years, he made 40 trips to various parts of Arabia to fill in the blanks. Still, there remain 106 squares for which there are no breeding records, mainly in the Empty Quarter (Rub al-Khali). Regular updates were posted on the Internet and in a newsletter, and nearly 500 collaborators provided unpublished records. Some 48 of the species accounts were contributed by 18 authors with expertise on the species covered. An extensive literature search covered nearly all the written record of Arabian birds, and several collections of Arabian birds were studied for distribution. Logistical and financial support was provided by the Saudi Wildlife Commission, Riyadh. After publication, the atlas project continues (www.qc16.dial.pipex.com).

The bulk of the atlas is devoted to the accounts of the 273 species proven to breed in the Arabian Peninsula and an additional 24 species that have probably bred or are likely to breed there. The 2- to 6-page accounts of each known breeding species consist of (1) a pen-and-ink drawing of the species; (2) a brief discussion of the species' world range and Arabian taxonomy; (3) its status in Arabia, including occurrence in each state, movements, seasonality, and an estimate of population numbers, as well as changes in numbers or distribution over time if known; (4) habitat; (5) breeding biology and timing; and (6) a map. The maps are slightly larger than half-page size at 16.5 × 13.2 cm, usually one map per species (although there are 4 for *Streptopelia decaocto* to show its radical change in distribution and abundance in the past 50 years). The distribution and breeding records before and after 1984 are shown. Of the 273 breeding species, 20 are established exotics, mostly in the Arabian (Persian) Gulf states. The 24 species that are considered likely to breed are given brief accounts of 15–75% of a page. One breeding species, the Ostrich (*Struthio camelus*), was extirpated in the Arabian Peninsula in the 20th century.

The 127 pages of introductory material give a comprehensive picture of the Arabian Peninsula, its birds, and the atlas project. Topics covered include record collection, data sources, acknowledgments, endemism, nomadism, exotic species, climate and altitude, geology and topography, vegetation, habitats and habitat change, zoogeography, regional bird communities and habitats, conservation, and the breeding birds. Recent anthropogenic changes are discussed, such as manmade wetlands and extensive agricultural areas (often well irrigated) that provide new types of habitat for breeding birds. Appendix 1 is a useful table listing each of the 297 species covered by English and scientific name, zoogeographic assignment, estimated population size (pairs), notes on population, and size of the record base. Appendix 2 is a 10-page gazetteer for the 497 localities mentioned in the atlas by country, feature type, geographic coordinates, and atlas square. The bibliography lists 588 references.

The line drawings of the 273 breeding species drawn by 13 artists are mostly accurate and pleasing to the eye and often include vegetation or habitat to add context and flavor. Hanne and

Jens Eriksen provided the 70 excellent quarter-page color bird photos that grace the introduction, covering a broad selection of Arabian birds, including all the 11 Arabian Peninsula endemics and 8 of the 9 Socotra Archipelago endemics. The 34 color habitat photos, mostly by the author, give a good idea of the environment available to wildlife. The volume's illustrations, maps, and format on glossy paper add up to an attractive book. The page size (28.5 × 21.8 cm) makes for a weighty tome (2.8 kg).

While it is true that Arabia is mainly desert, it has a wider variety of terrain than is generally realized. The Southwest Monsoon brings summer rains to the Mahra region of southwest Oman and southeast Yemen, and average annual rainfall in the highlands of Yemen is 1.5 m. The highest point in Arabia is 3,700 m, in Yemen, whereas Saudi Arabia attains an altitude of 3,000 m in the southwest and 2,580 m in the northwest, and Oman tops out at 3,000 m in the north. There are still forests in some of those mountains. Mangroves, albeit threatened, are present in coastal areas. I was privileged to visit Saudi Arabia three times in 1976–1977 for two months of field work, mostly in the mountains of the escarpment that runs the length of western Arabia, rising up from the Red Sea littoral. During one of those visits, I was told that Saudi Arabia's third largest export at that time was charcoal—who knew? I also had a couple of days in Bahrain in 1977 and two weeks in Oman in 1982. Watching tropicbirds fly by from a high cliff in Dhofar in southern Oman while Sperm Whales swam by below was thrilling, as was observing nesting Sooty Falcons on an islet off Muscat, Oman, as large rays and sea turtles swam in the sea below.

This thorough and impressive atlas, although expensive, is destined to be the standard work for many years to come and will be necessary for all those with an interest in Arabian birds.—Ben King, *Ornithology Department, American Museum of Natural History, Central Park West at 79th Street, New York, New York 10024, USA. E-mail: kingbirdtours@earthlink.net.*

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Conservation of Tropical Birds.—Navjot S. Sodhi, Çağan H. Şekercioğlu, Jos Barlow, and Scott K. Robinson. 2011. Wiley-Blackwell, Chichester, United Kingdom. 312 pp. ISBN 9781444334821. Hardcover, $129.95.—In the past three decades, the study of ecology and conservation of tropical birds has increased exponentially. With more and more researchers dedicating their lives to understanding the evolutionary and ecological dynamics of tropical avifauna, a completely new body of knowledge has been generated. As a consequence, a synthesis was urgently needed. Fortunately, four authors with field experience in different portions of the tropical world combined their efforts to produce this book, the first of its kind covering all major issues on conservation of tropical birds.

The book is organized in 10 chapters, with 12 color plates with figures and pictures. The book begins with a synthesis of the state of tropical avian biodiversity. Of the 1,227 bird species threatened worldwide, 79% occur in lowland and montane tropical forests. Habitat loss and degradation are the major causes of bird extinction, but hunting, pollution, invasive species, and disease play a role as well. The second chapter presents theoretical background and empirical data from studies that analyzed the effects of habitat fragmentation on tropical birds. The third chapter presents a good summary on tropical bird extinctions. The current bird extinction rate may be at least 30× more than expected, but conservation initiatives may have slowed the bird extinction rate in the past century. There is some empirical evidence that certain forest bird species may be able to use disturbed landscapes, but it is not clear whether they are able to sustain their populations in those areas.

The fourth chapter is on ecological functions of tropical birds. From an ecosystem perspective, birds are mobile links that are crucial for ecosystem function, memory, and resilience. The roles of birds in seed dispersal, pollination, predation and pest control, scavenging, nutrient deposition, and as ecosystem engineers are presented in some detail. Rapid loss of tropical birds may cause substantial reductions in certain ecosystem processes and services before we have a clear understanding of them. In this chapter, I think that the discussion on the role of birds in the process of restoration of tropical ecosystems could be improved significantly; the subject is very important in conservation biology, and a vast literature on the theme has been produced in the past two decades. The next chapter covers the effects of fire on the conservation of tropical birds. Fire regimes are natural, but humans have altered them in 70% of landscapes. Consequences of fire for bird conservation are highly context specific, depending on a multitude of complex factors, including variability in life-history strategies, the history of fire in each ecosystem, and the spatial and temporal scale of the burn events. The sixth chapter is on biotic invasions and tropical birds. It is estimated that 597 bird species are threatened or have gone extinct owing to the negative effects of invasive species. Cats and rodents are the main culprits in these losses. Several species are deliberately released in regions outside their ranges and successfully establish invasive populations. However, we know very little of how to develop successful management of invasive bird species. In this chapter, I think that a list of birds that become invaders with the relevant sources would help students and researchers to define research priorities on this topic.

The seventh chapter is an interesting synthesis on harvesting of tropical birds. Around 42% of the extant bird species are utilized as pets or hunted for food by humans. A large number of wild birds, 5–10 million, are caught annually in developing countries and exported to developed countries. Although birds may not form a major component of the bush meat trade, large frugivore birds may have populations affected by hunting and their decline may, as a consequence, severely affect forest dynamics. The next chapter covers the effects of climate change on tropical

birds. It is expected that 2,500 land bird species will go extinct by the year 2100, and most of these are expected to be tropical birds. Tropical mountain birds, species restricted to flat lowland areas, coastal forest birds, and restricted-range species are especially vulnerable to climate change. Climate-change effects will be especially exacerbated by ongoing habitat loss in the tropics. Networks of protected areas need to be designed with climate change in mind, given that 92% of the current protected areas are likely to become unsustainable in a century. Recommendations on how to design protected areas to face climate change are provided. The ninth chapter covers the conservation of migratory birds. There are more than 500 species of birds, numbering in the billions of individuals, that spend the non-breeding season in the tropics. These birds occur in virtually all habitats and play crucial roles in tropical ecosystems. Conservation recommendations for these species are outlined. My major criticism of this chapter is that it is biased toward the north temperate–south tropical migratory system and fails to explore the conservation implications of all other migratory avian systems that encompass tropical regions. The last chapter explores the conservation prospects for tropical birds. The authors suggest that Endemic Bird Areas can be a good way to define conservation priorities. I agree, but I think that they could provide a more substantial review on the major lessons learned from the use of birds in systematic conservation planning in tropical countries. Protected areas are considered the most effective way to protect vulnerable tropical birds, but governments and conservation organizations should integrate human livelihoods in conservation programs. The cost of managing all protected areas around the world is $13 billion per year, but only $1 billion of this is invested annually. Lack of funds for protected areas is hard to understand because the world spends around $2 trillion annually to subsidize environmentally destructive policies. Creating economic opportunities associated with bird watching and payment for ecosystem services may be useful at the local scale but difficult to scale up. Improving knowledge on ecology of tropical birds is essential for designing innovative and meaningful conservation strategies.

In general, the book is a remarkable achievement, with all chapters providing a succinct, factual, well-referenced, and state-of-the-art review of all relevant topics. Because the book is multi-authored, some differences in style as well as content redundancy occur among chapters. My major general criticism is that the book lacks two important chapters: one on composition and evolution of tropical birds and another synthesizing the major patterns and processes of tropical avian assemblages. These two chapters plus the chapter on ecological functions will set the stage so that the reader can better understand tropical avifaunas, how they differ from those of the other regions, and how they have been assembled over time. Then, chapters 1, 3, 5, 6, 7, and 8 could compose a second section to present the state of tropical birds and the major factors that affect them. Finally, chapters 9 and 10 could compose a third section that outlines the major conservation strategies for migratory and resident species. I enjoyed reading this book, and I strongly recommend it for all students and researchers interested in the fate of tropical birds. Unfortunately, the price is too high for most of the young tropical ornithologists who could benefit most from the information so well organized by the authors. I urge the publisher to offer a lower price for the ebook format to tropical ornithologists, to make this important book accessible to a broader audience.—José Maria Cardoso da Silva, *Conservation International, 2011 Crystal Drive, Suite 500, Arlington, Virginia 22202, USA. E-mail: jsilva@conservation.org.*

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The Golden Eagle, 2nd ed.—Jeff Watson. 2011. Yale University Press, New Haven, Connecticut. 448 pp., color plates, 72 tables, 82 figures. ISBN 9780300170191. Hardcover, $65.00.—The second edition of *The Golden Eagle* is an update of Jeff Watson's first book of the same name that was published in 1997. The second edition was released 3 years after Watson's untimely death in 2007. A team of Watson's friends and relatives took on the task of completing the edition that Watson was working on until his death.

Watson's first edition of *The Golden Eagle* brought together diverse sources of data to produce a comprehensive treatise on the Golden Eagle (*Aquila chrysaetos*). It was the first attempt to assemble existing scientific information on the widely distributed species in a single volume (see review of the first edition; Steenhof 1998).

The new edition, published by Yale University in the United States and T. & A.D. Poyser in the United Kingdom, has a different cover illustration and is in a smaller format (24 × 16 cm instead of 26 × 20 cm). As in the earlier edition, illustrations are by Keith Brockie and the author's father Donald Watson. Brockie's illustrations appear a bit crisper in the smaller format than in the first edition. The second edition has more color plates than the earlier edition and includes photographs that were not in the earlier edition. Tables are interspersed with the text instead of at the end of the text as in the previous edition.

The new edition has 30 pages of introductory material, including a preface, an introduction, acknowledgments, reflections by the author's surviving wife and son, and a foreword by Ian Newton. These pages document the process of creating the second edition and constitute a virtual "who's who" in eagle biology throughout the world. The book has the same 22 chapters with the same titles and in the same order as the first edition. Each chapter now begins with a quotation from an eagle researcher or a literary reference. The running head of the right-hand page now shows the chapter title, whereas the first edition showed the chapter subsection title. Each chapter has a section on other species of *Aquila*. As in the first edition, Watson emphasizes the Scottish population that he knows best.

In the preface written only 3 weeks before his death, Watson stated that much new research had been done since 1997, and questions that he posed in the first edition have been addressed in the second. Indeed, 240 of the references in Watson's 35-page bibliography are dated 1997 or later. Some of the additional information throughout the new edition is based on unpublished data from Todd Katzner and Mike McGrady, two of Watson's colleagues who helped complete the volume. The chapter on "Ranging Behaviour"

has considerable new material, reflecting recent research in Scotland. There is also some new information on postfledging dispersal patterns from recent telemetry studies. The section on taxonomy has been expanded to include recent genetic analyses, and the chapter on "Population Estimates and Trends" has been updated. There is an expanded section on electrocution and collisions with wires and wind turbines in the chapter on "Mortality." The chapter on "Threats" also includes new information on electrocutions and wind farms. New information on lead poisoning appears in both the "Mortality" and "Threats" chapters, reflecting recent concerns and evidence that has accumulated since 1997. The "Threats" chapter also has a new, albeit short, section on climate change. Watson expanded the chapter on "Conservation" on the basis of his 10 years as Director of Operations for the Scottish National Heritage agency (SNH). The chapter now contains a relatively detailed overview of the Conservation Framework for Golden Eagles, commissioned by SNH.

Some chapters, however, have very few changes: sometimes merely a sentence added to the end of a paragraph. For example, the chapter on "Nest Spacing and Density" was virtually unchanged from the first edition. Most of the tables and figures are identical to those in the first edition. Only 8 of the 84 figures are new, and only 11 of the original 76 have updates, corrections, or modifications. Unfortunately, the shading modifications to Figure 7 make it more difficult to distinguish some categories than in the first edition. Three of the new figures have been redrawn from articles published in journals, and three display unpublished data from colleagues. Two others display the conservation status of Golden Eagles in Scotland. Similarly, only 4 of the 72 tables are new. One of the new tables is based on a recently published journal article, and two list the conservation status of eagles and protected areas in Scotland. The new table on dispersal dates of juvenile Scottish eagles (Table 17, page 134) would have been more useful if it also had reported dispersal ages. Thirteen tables have been updated or modified. Many of the changes are minor, addressing only taxonomic changes (e.g., splitting the Imperial Eagle [now *A. heliaca* and *A. adalberti*] and renaming the Black Eagle as Verreaux's Eagle [*A. verreauxii*]). Fortunately, the table on population status has extensive updates. Five tables from the first edition about diet are in the second edition as appendices and follow the same six appendices that were in the first edition.

In the 2002 *Birds of North America* account on Golden Eagles (Kochert et al. 2002), we reported that Watson (1997) had erred in his calculation of winter Golden Eagle densities in the western United States. Watson converted data reported by Boeker (1974) incorrectly and erroneously reported the data as being obtained by aerial rather than ground surveys. We corresponded with Watson about this. Unfortunately, the error was not corrected in the second edition, and the numbers reported on page 163 were exactly the same as those in the first edition. Most of the other errors that I found in the first edition were corrected in the second. However, I found several errors in the second edition, including misspelled names in the text and bibliography, incorrect headings, and inconsistent bibliographic format. The writing style could have been crisper and more streamlined. I assume that the apparently incomplete and uneven editing reflects Watson's untimely death and the involvement of multiple editors.

Watson does not hide his passion for eagles or his outrage at eagle persecution in this book. He was a sentimental and unapologetic advocate for eagle conservation. Nevertheless, this is a scholarly compendium of information. This new edition, like the first, will be an important reference for both serious students and naive readers.—Karen Steenhof, *Owyhee Desert Studies, 18109 Briar Creek Road, Murphy, Idaho 83650, USA. E-mail: steenhof@hughes.net.*

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