

Boreal Birds of North America: A Hemispheric View of their Conservation Links and Significance

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For the avian traits, S. Walsh and A. Milner provide a detailed and engaging review of the evolution of the avian brain and senses. A discussion of the brain of *Archaeopteryx* illustrates how far Jurassic birds had advanced from their nonvolant archosaurian ancestors. On the basis of avian brain anatomy, the authors even pose the question, which is novel for this volume, of whether some so-called theropods were really flightless birds. An elementary review of flight in modern birds is presented by B. Tobalske et al., with an unfortunate nod to the strange hypothesis that chicks of highly derived neornithine birds are good models for the evolution of flapping flight. C. Organ and S. Edwards review what they consider to be major events in avian genome evolution, while stressing that too few avian genomes are known to draw any conclusions regarding genome evolution in birds. B. Lindow reviews earlier papers that discuss avian evolution across the Cretaceous–Paleogene boundary but offers no new information or insights into this critical period of explosive avian diversification. A chapter by G. Kaiser on diversity in marine and aquatic birds is best avoided. G. Dyke and E. Gardiner discuss what the fossil record might tell us about when the neornithine radiation began, remarkably proclaiming that little progress in understanding avian evolution has occurred in the past 50 years!

The third theme is split between two parts of the book. On the one hand, the late B. Livezey provides a thorough evaluation of the contrasts and commonalities between morphological and molecular methodologies for arriving at avian phylogenies. As a counterpoint, J. Brown and M. Van Tuinen provide an overview of molecular phylogenetic dating techniques and their application to studies of neornithine origins and evolution. Ironically, both contributions, and other chapters in the book, tout rigorous phylogenetic analyses as key to constructing avian phylogenies while failing to recognize that both morphological and molecular phylogenetic methodologies are rooted in subjective decisions as to what is or is not important as data and how to interpret “characters.” The rigor of subsequent analyses is in the eye of the beholder.

The book ends with a chapter on the state of the world’s birds and the future of avian diversity by G. Thomas. The picture presented is that of a double-edged sword of human habitat destruction and climate change wreaking havoc on avian species diversity. Certainly, avian diversity faces a bleak and uncertain future, which is perhaps the most important reason for documenting current diversity and distributions to the maximum extent possible. Soon, the only records of too many modern species and the evolutionary history recorded in their genes will be limited to specimens preserved in museum collections.

To return to the inexplicable title and first chapters, although the BAD (birds-are-dinosaurs) hypothesis is de rigueur in some circles, there remains no meaningful, much less substantive or definitive, evidence that birds are derived from dinosaurs. The statement presented on the book’s back cover that controversies over avian origins “have been swept away” is nonsense. Indeed, so many Mesozoic birds have been mistakenly characterized as theropod dinosaurs (e.g., *Caudipteryx*, *Microraptor*, and *Anchiornis*) that it will probably take decades to sort them out and arrive at an accurate picture of avian origins. This is not the place to enumerate the numerous faulty arguments upon which the BAD hypothesis is based, but because two are prominent in the first chapters, it might be informative to see just how obfuscatory characters purported to support the BAD hypothesis have become.

First, “dinofuzz” is a hair-like integumentary covering that is, as noted by P. Makovicky and L. Zanno, found in several dinosaur groups, and even pterosaurs. It is present on some theropods, so it is interpreted by BAD supporters as a precursor to avian feathers. Except in fertile imaginations, however, no transitional phases between dinofuzz and feathers exist, not even among the hundreds of splendid Mesozoic fossils from China. Integumentary coverings are not included in the “comprehensive” cladistic analysis of J. O’Conner et al.

Second, the homologies of the digits of the avian manus have been argued over seemingly forever. Recently, however, three different laboratories, working independently and with different techniques, demonstrated that avian digits are II-III-IV, not I-II-III as in theropods. Makovicky and Zanno perfunctorily dismiss these data, whereas O’Conner et al. acknowledge the possibility that II-III-IV is correct for birds, but strangely extend the II-III-IV enumeration to theropod dinosaurs. In their text and cladistic analysis, however, they treat the digits as I-II-III, which clearly corrupts their results. There are no functional similarities between the wrists of theropods and those of birds, so correctly identifying digit homologies is only one step toward a more accurate analysis.

Technically, the book is reasonably well produced. Nonetheless, there is an irritatingly large number of misspellings, missing words, and lapses in punctuation. Most of the illustrations of avian fossils are printed at such a small scale as to be of little value, which is unfortunate because they could have been very informative. Conversely, color figures are also presented in black-and-white in their respective chapters, and some figures appear three times. A glossary and index are included, although some of the glossary definitions are erroneous, which is bad for students.

All in all, the book might be useful for those who wish to keep abreast of various aspects of avian evolution, especially specialists in the field and those with specific interests in the topics covered. Given its relatively high cost and unbalanced presentation, I doubt that it will achieve the purpose for which it was intended. As J. Cracraft remarks in his foreword, the book might be a place for young investigators to get their feet wet, but I would caution them not to drink the water.—KENNETH E. CAMPBELL, JR., *Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, California 90007, USA. E-mail: kcampbell@nhm.org*

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Boreal Birds of North America: A Hemispheric View of Their Conservation Links and Significance.—Jeffrey V. Wells, Editor. 2011. Studies in Avian Biology No. 41. Cooper Ornithological Society, University of California Press. 136 pp. ISBN 9780520271005. Cloth, \$39.95.—The boreal forests of Canada and Alaska represent 25% of the earth’s remaining intact forests, over half of the North American bird species breed there, and

3 to 5 billion birds are estimated to migrate from the Canadian boreal region each fall. Unfamiliar to many, these hinterlands of the north are seriously threatened. Oil and gas extraction has a footprint of 46 million ha as of 2003, more than 31 million ha have been logged since 1975, and hydropower projects have flooded millions of hectares of terrestrial habitat in Quebec. These are examples of the stark facts presented in this book on the status of North America's boreal forests. Complacent or ignorant, most of us take these forests for granted.

The book emphasizes the linkages and importance of boreal birds to the avifauna of the United States, Mexico, Central America, the Caribbean, and South America. The book is not an attempt to dissuade concerns in other areas but simply emphasizes "us too" regarding the threats that so many birds and regions are experiencing from habitat and landscape changes due to human and industrial development.

The book is an eclectic mix of nine chapters with 38 contributors. Several chapters are broad in scope (chapters 1, 2, 3, and 7), whereas others are narrowly focused on specific species (chapters 4 and 9; see below). Chapter 5 on the Ontario breeding bird atlas and chapter 6 on passerine banding data from the eastern United States are brief reviews of available data. By contrast, chapters 7 and 8 provide a fascinating analysis and overview of wintering distributions of boreal migrants in North, South, and Central America and in the tropical Andes, respectively.

Wells (chapter 1) and Wells and Blancher (chapter 2) set an impressive stage on the threats to North American boreal forests and the important role that boreal birds have in the global conservation of birds. Wells emphasizes that this "volume highlights new research that is illuminating the importance of the region to North America's avifauna and the complexity of avian ecological connectivity between the boreal forest region and ecoregions throughout the Americas." This book is an excellent complement to his previous publications on boreal birds and his contributions to the boreal songbird initiative (see www.borealbirds.org). Despite all of the habitat changes in Canada's boreal forest, there are some positives, such as the 45 million ha of new protected areas since 2000 and improvements in forest stewardship.

The book contains many thought-provoking analyses on where the 1.65 to 3 billion birds that breed in North America's boreal forest overwinter. For instance, chapter 7 includes an

estimate that 66 species and more than a billion landbird individuals that breed in the Canadian boreal forest overwinter in the continental United States. In comparison, 115 species and 680 million individual landbirds overwinter in Mexico. Chapter 8 approximates that 123 species of boreal migrants overwinter in the Tropical Andes of Bolivia, Colombia, Ecuador, Peru, and Venezuela. These include 28 species with over half and 11 species with most of their winter distribution in that region.

Even though the chapters on the Surf Scoter (*Melanitta perspicillata*) and Rusty Blackbird (*Euphagus carolinus*) seem out of place in a book primarily focused on broad issues of boreal bird species, both are interesting. Chapter 4, on the Surf Scoter, exemplifies the difficulty in studying a species that nests in the remote landscapes of the far north. It also highlights how little we know about many of these species and how satellite transmitters or other technology will aid in improving this knowledge. Chapter 9, on the Rusty Blackbird, is justified because it may have experienced the greatest decline of any North American landbird. Breeding Bird Survey data suggest a decline of 12.5% year⁻¹ over the past 40 years, or a cumulative decline of 95%. The chapter is an excellent summary of the evidence for the decline, hypotheses on its causes, and recommendations for future research and management.

The book is not error free, but the errors are few. Numerous awkwardly written sentences could have been more tightly edited for better clarity. Additional illustrations and better illustrations would have improved the readability of the chapters.

In general, this volume is a substantial contribution to our understanding of North America's boreal birds and, especially, their importance in other parts of the Americas. The opening chapters will be an eye-opener to many ornithologists not familiar with boreal regions. The book will be essential to ornithologists with an interest in boreal bird species and especially appealing to those interested in the distribution of boreal species throughout the Americas. Editor Wells should be commended for his guidance and perseverance in the improvement of our knowledge and communication on boreal birds. With its reasonable price, the book belongs in university libraries.—GERALD J. NIEMI, *Department of Biology and the Natural Resources Research Institute, University of Minnesota, 5013 Miller Trunk Highway, Duluth, Minnesota 55811, USA. E-mail: gniemi@umn.edu*