



EDITED BY REBECCA L. HOLBERTON

*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.*

*The Auk* 117(4):1084–1085, 2000

**The Origin and Evolution of Birds, 2nd Edition.**—Alan Feduccia. 1999. Yale University Press, New Haven, Connecticut. x + 466 pp., numerous text figures. ISBN 0-300-07861-1. Paper, \$29.95—This is the second and paperback edition of Alan Feduccia's outstanding coverage of the origin and evolution of birds (see *Auk* 114:531–534 for my review of the original 1997 edition). This edition contains some definite improvements, including being printed on better paper with a substantial increase in the quality of the illustrations and a lower cost that places this volume within reach of most ornithologists. Aside from a new final chapter entitled "*T. rex* was no Four-Ton Roadrunner and Other Revelations," and the additional citations that are integrated in the references, the material in this edition is the same as the first edition.

*The Origin and Evolution of Birds* is still by far the best treatment of the subject that is currently available. In the new final chapter, Feduccia discusses clearly and comprehensively the ongoing controversy surrounding avian and some dinosaur Mesozoic fossils, the occurrence of feathers in nonavian groups, and the origin of birds either from dinosaurs or from some other group within the archosaurian reptiles. Again, his treatment of this controversy is reasonable, especially within the constraints of the currently available information about these fossils. The problems in dealing with this material are enormous, and I have great admiration for Feduccia's ability and patience to delve through the burgeoning literature on these subjects, and especially for his skill in separating fact from fiction.

An example of the problems in this latter area is the recent article by C. P. Sloan, "Feathers for *T. rex*," that appeared in the November 1999 issue of *National Geographic*. The article featured a new fossil discovery from the Cretaceous of China named *Archaeoraptor*. This fossil was hailed as a feathered dinosaur and as further proof that many dinosaurs possessed feathers and that birds evolved from dinosaurs. Unfortunately, however, when this specimen was ex-

amined more closely by Chinese paleontologists, it was found to be a composite fossil consisting of the body of a bird and the tail of a dromaeosaurid dinosaur; it was put together by a clever Chinese farmer on whose land the fossils were found and who realized that a complete fossil was more valuable than its parts. The farmer had completely fooled those scientists who saw just what they wanted to see: a feathered dinosaur. This case is rather typical of the confusion being generated in both the scientific and lay journals to publish in haste on newly discovered fossils.

Equally important to consider is that most of the avian and other Mesozoic fossils pertinent to understanding the origin and early evolution of birds have not been sufficiently prepared, described, and analyzed. We have been most fortunate in the large number of spectacular new avian fossils discovered over the past two decades, but most of these specimens are known only by their names and the barest of descriptions. The best-known early avian fossil is still *Archaeopteryx*, which many avian paleontologists now believe to be a member of the Sauriurae and closely related to the Enantiornithes—the opposite birds—and not part of the other large group of birds—the Ornithurae—which gave rise to modern birds. Thus, *Archaeopteryx*, even though it is the best-known early avian taxon, appears to be off the main lineage leading to the large surviving radiation of birds and thus would be of less importance to our understanding of the evolution of birds. What is now needed is much preparatory work and careful description of the available fossil specimens, and then analysis and comparison of the characteristics of these taxa.

*The Origin and Evolution of Birds* is the outstanding treatment of what is now known about this subject, but much more remains to be learned. Hopefully, the necessary preparation and description of these Mesozoic fossils will be done without further delay so that we can look forward, perhaps in a decade, to a new edition of this book that will provide a much

better account of avian evolutionary history. Until then, I can recommend the current edition of Feduccia's book without hesitation to all ornithologists and others interested in the origin and evolutionary history of birds.—WALTER J. BOCK, *Department of Biological Sciences, Columbia University, 1200 Amsterdam Avenue, Mail Box 5521, New York, New York 10027, USA.*

---

*The Auk* 117(4):1085–1087, 2000

**The Giant Canada Goose, Revised Edition.**—Harold C. Hanson. 1997. Southern Illinois University Press, Carbondale. xxvi + 252 pp., 78 black-and-white plates, 31 tables, 21 figures. ISBN 0-521-63326-5. Cloth, \$29.95.—The first edition of *The Giant Canada Goose*, published in 1965, was a classic monograph spanning topics such as the rediscovery of this subspecies (once thought extinct) to its current annual changes in body composition and its nutrition. As acknowledged in the preface, the revised edition reproduces the first edition in its entirety and adds three appendices, the only new material in the book. However, the world has changed considerably in the last 35 years, and readers of the revised edition who might be expecting current material will find this text to be out-of-date. Nevertheless, for readers that have not read the original edition, the revised edition provides an interesting view into the world of zoology in the mid-1960s. Because the original edition makes up more than 90% of the revised edition, in this review I describe the original edition plus the new material.

The revised *Giant Canada Goose* consists of 15 chapters and three appendices. Chapter 1 is a delightful history of the rediscovery of the Giant Canada Goose, *Branta canadensis maxima*, which was thought to be extinct in the first half of the 20th century. Hanson includes excerpts from numerous letters between scientists (including Grinnell), amateur goose enthusiasts, and federal and state biologists from 1922 to 1940. Correspondence from Alexander Wetmore and Ira Gabrielson is also reproduced in this chapter. The letters provide an engaging view of a time when the most prominent ornithologists were also involved in applied questions of interest to the general public. Of course, except for museums, ornithological research was supported only if it had a directly applied nature. Today's scientists could, nevertheless, learn from the interactions among these different groups who had an interest in Canada Geese.

In Chapter 2, the author analyzes physical characteristics of *B. c. maxima* and related subspecies, including *B. c. canadensis*, *B. c. interior*, and *B. c. hoffitti*.

This chapter contains data available in 1965 on morphological measurements of geese shot by hunters or collected for scientific purposes. Several extensive tables include these data which, in some cases, have been analyzed little beyond the raw state. For those interested in reanalyzing data for comparative purposes, however, this and other chapters provide a rich source of data. This chapter also contains comparisons of plumage characteristics for the large subspecies of Canada Geese. Hanson describes several features of Giant Canada Goose plumage, including the high incidence of white neck rings and white forehead patches. In this chapter, however, Hanson reveals the circular reasoning that has plagued his hypotheses for the past two decades: despite pointing out in the next chapter that the range of *B. c. maxima* is defined primarily by the prairie biome, he indicates that a population of Canada Geese nesting in western Idaho may be *maxima* based on their size. Although it is easy to criticize a text written in the early 1960s, Hanson has not modified his view that variation in size and plumage is primarily genetically determined despite much evidence to the contrary (Van Wagner and Baker 1990).

In Chapter 3, which describes the historic breeding range of *maxima*, Hanson argues that *maxima* was primarily a bird of the midcontinental prairies whose range extended into deciduous forest east of the prairies and the areas surrounding the Great Lakes. Generally, Hanson's account is an interesting compilation of historical records except for the odd hypothesis that the large Canada Geese in western Idaho were *maxima*. The suggestion that the geese in western Idaho, far removed from other purported Giant Canada Geese, were *maxima* is based on morphology. Hanson's reasoning here is circular and ignores much more recent work demonstrating (1) substantial genetic differences among Canada Goose subspecies (Shields and Wilson 1987, Van Wagner and Baker 1990), and (2) the significant role that environmental factors play in determining morphology (Aubin et al. 1993, Leafloor et al. 1998, Sedinger et al. 1998). A lot of wonderful historical information occurs in this chapter, but Hanson's failure to come to terms with much research over the past two decades diminishes the value of some of his conclusions in this chapter.

Chapters 4 and 5 cover the periods of migration and the wintering grounds, respectively. Hanson uses captures and recoveries of banded geese to establish relationships between breeding and molting areas or wintering areas. In Chapters 6 and 7, Hanson describes goose nesting, growth, and development, and in Chapter 8, he describes plumage and morphological characteristics of the sex and age classes.

In Chapter 9, Hanson describes the foods and feeding habits of geese. Limited data existed at the time Hanson originally wrote this chapter in which