



## BOOK REVIEWS

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**Molt in North American Birds.**—Steve N. G. Howell. 2010. Houghton Mifflin Harcourt, Boston. 267 pp. ISBN 978-0-547-15235-6. \$35.00 (cloth).

The study of molt has remained important in ornithology for many decades, yet it has never been truly in vogue nor has it assumed a central place in the ornithological literature. Recently, research output in this specialty has been on the rise, and the birdwatching public has become more interested in this field as well. The study of molt, however, is ruled by complicated terms and patterns that must be understood if one is to make sense of what is being seen on a given bird; what has been needed is an introduction to molt that is accessible to the field ornithologist and the birding public alike, and Howell's volume accomplishes this feat. The author is perhaps uniquely suited to this task, with a strong background in field birding as well as a strong record of publication of original research in the ornithological literature.

*Molt in North American Birds* can be divided into two parts: a lengthy introduction and overviews of molt biology for every family of North American birds, presented in the familiar phylogenetic order. Each family account begins with a brief description of the natural history of that family, and follows with a description of the molt strategies of the species in that family. Accounts may also include brief to extensive essays on various topics related to molt. The length of these accounts ranges from a single paragraph for families with a single species to a multi-page treatise summarizing variations among and within species. The text is footnoted with references to the primary literature and ends with a list of authors and years of publication of works cited; full citations are in a comprehensive bibliography at the end of the book.

The book begins with a detailed introduction of 67 pages devoted to familiarizing the reader with molt and molt terminology. After a brief section on how to use the text, the reader is introduced to the basic questions of molt (how long it takes for a bird to complete a molt, energy expended during molt, etc.). These sections are clearly written and use minimal technical jargon. Once the introduction comes to the explanation of various molt patterns in a section titled "Underlying Patterns," the text enters murkier waters. The entire book depends on the reader's being familiar with the author's revision of the Humphrey–Parkes system (Howell et al. 2003), and it devotes much space to explaining the four strategies (simple basic, complex basic, simple alternate, and complex alternate). For the newcomer to molt biology, this is tough sloggng. The fault lies not with the writing but in how difficult these strategies truly are for the nonspecialist to understand. This section may require several passes by the reader, as the remainder of the book is impenetrable without an understanding of these four patterns. Explanations are accompanied by illustrative figures to which most readers will refer; figures 35 and 36 communicate the details of the four main strategies clearly

and compare the terminology to the life-year terms with which many readers will already be familiar. Figure 36 is dense but well done, and the book would be easier to use if the figure had been duplicated on the inside cover. The introduction then moves into its final section, "Birds in the Real World." Thanks to varying life histories, there are myriad variations on these four strategies. Some examples are handled here, but the detail is deferred to the family accounts. The modified Humphrey–Parkes system of Howell et al. (2003) is not without controversy, and many pages of the *Condor* have been devoted to hashing out details of this system's philosophical approach. Very little of this controversy makes its way into the book, but when Howell covers the genus *Spizella* in some detail, using work by Ernest Willoughby, he concludes that discussion with a quite conciliatory statement (p. 230): "The H-P system is informative in terms of evolution but often impractical to use in the field, whereas the life-year system is relevant to what we actually see, as birders and field ornithologists." The modified Humphrey–Parkes system was used throughout Pyle (2008), which has become the standard for bird banders operating in North America, and with Howell popularizing this approach in the present book, this system will continue to gain acceptance among field ornithologists regardless of the continuing debates in the primary literature.

The remainder of the book, pages 70 through 243, is devoted to the family accounts. Each family receives from one to eleven pages of attention, and the structure of each account varies greatly with the state of knowledge of molt strategies, the amount of variation within the family, and whether essays summarizing the state of knowledge of selected topics are included. For example, within the woodpecker account the author tackles patterns of molt of primary coverts within the woodpeckers and across class Aves, summarizing what is understood about this subject (in this case, essentially nothing). An essay within the account for the blackbirds highlights the recent literature on the evolution of cryptic versus bright plumage in dichromatic species. Topics of other focal essays include the evolution of stepwise molts, redundant molt in the terns, and the conflict between molt and migration, all of which are well written and cite appropriate literature.

Many family accounts and focal essays end with the author considering unanswered questions in molt biology and suggesting possible answers. For example, in his treatment of the wrens, Howell concludes the section with a discussion of the existence of a prealternate molt in the Marsh (*Cistothorus palustris*) and Sedge (*C. platensis*) Wrens, indicating areas of contradiction in the primary literature and proposing potential areas of study (e.g., the relationship between habitat type and the extent of a prealternate molt; the possibility of a facultative prealternate molt on the head and neck of inquisitive wrens). One third of the account of the wood warblers is devoted to a discussion of the delayed plumage maturation of a single species, the American Redstart

(*Setophaga ruticilla*). The account includes some discussion of the theoretical explanations for this phenomenon, evidence for its benefits, studied only in the Mute Swan (*Cygnus olor*), and a concluding paragraph that suggests a possible scenario for the evolution of delayed plumage maturation that is both conjectural and largely untestable. In a only few places are Howell's conjectures overextended; most of the thought-provoking questions are well-grounded in the primary literature and his own field observations. It may be jarring to some to see so much of the book's text focused on what is not known, but Howell ably captures why so many of us are interested in molt—even for common, familiar species there is still much to be learned (see “The Red-eyed Vireo Problem,” pages 190–191).

It is worth considering who is likely to read this book and feel compelled to pursue these unanswered questions. Many passages read as though Howell is speaking to a gathering of birders at an American Birding Association conference, encouraging them to study Rock Pigeons (*Columba livia*) more carefully in order to train themselves to identify molt limits (p. 165) or providing an interesting trivia question for long car rides (p. 15, presumably during a chase of a rare bird or a pilgrimage to Cape May, New Jersey). The tone of this book will appeal to the active field ornithologist, whether professional academic or amateur birder, and many of the questions Howell poses could be answered by careful field observation and/or study of museum specimens. The majority of readers may ponder these questions and simply move on, but Howell may capture the interest of the more motivated field ornithologists. Dittmann and Cardiff (2009) documented the existence of an additional molt in the Ruby-throated Hummingbird (*Archilochus colubris*) with digital photography at their hummingbird feeders, demonstrating the potential for discoveries in one's own backyard. I hope readers will follow up on these questions and generate their own additional research questions as a result of this book.

Teaching the science of molt, especially the identification of individual feathers or recognition of subtle molt limits, cannot be accomplished solely with text, and this book uses a large selection of superb photos to accomplish this feat. Most photos were taken by the author himself; Howell has clearly spent a great deal of time finding individual birds to illustrate important points. For example, a series of photos of Brown Boobies (*Sula leucogaster*) in flight (Figure 45) aptly illustrates both molt patterns and fading of feathers. The pairing the author's clear writing with well-chosen photography makes this book the best introduction available for anyone with a basic interest in molt in birds.

*Molt in North American Birds*, by its very existence, demonstrates the sophistication that field study in ornithology has reached. The level of detail in a book devoted to molt could be onerous and therefore inaccessible, or the author could focus on less detail while spending more time explaining patterns and teaching the reader to recognize them. Howell has opted for the latter approach, resulting a book that will be of great interest to field ornithologists at all levels, I hope inspiring careful field observers to make their own discoveries.—ANDREW W. JONES, Department of Ornithology, Cleveland Museum of Natural History, 1 Wade Oval Drive—University Circle, Cleveland, OH 44106. E-mail: ajones@cmnh.org.

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