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The book overall is elegantly produced and published, and remarkably free of errors (very few gaffs snuck through, such as linking the common name, Great Crested Flycatcher, with the scientific name, *Chondestes grammacus*, on page 9). This volume represents an important contribution to the history of American ornithology, and is recommended to any student (or professional) in the field.

A. TOWNSEND PETERSON, *Biodiversity Institute, University of Kansas, Lawrence, Kansas*

WHALES AND NATIONS: ENVIRONMENTAL DIPLOMACY ON THE HIGH SEAS.

By *Kirkpatrick Dorsey*; Foreword by *William Cronon*. Seattle (Washington): University of Washington Press. \$34.95. xxii + 365 p.; ill.; index. ISBN: 978-0-295-99311-9. 2013.

For anyone still interested in the ever-divisive subject of whaling politics and conservation, here is yet another installment. As would be expected of an academic historian, Dorsey hews to an essentially chronological and impartial approach in his effort to interpret, reconstruct, and synthesize a mass of archival information, mainly spanning the period from the rise of modern factory ship whaling in the early 20th century to the early 1980s when a global “moratorium” on commercial whaling came into effect. In doing so, he acknowledges and benefits from previous forays by other authors and to much of the same fraught terrain.

Dorsey makes no pretense of writing with authority when it comes to whale biology or population dynamics (in fact I would caution readers to take what he offers on those subjects with a large grain of salt). Instead, his focus is, as the title and subtitle indicate, squarely on international politics and diplomacy. Within those realms, this book makes a number of contributions. One is to remind readers that many, perhaps most, of what we assume are new or recently discovered concepts like sustainability and precaution have roots far in the past. For example, Dorsey points out that as long ago as 1938, a Norwegian whaling diplomat told a gathering in Oslo: “The question is not purely an economical one, it is first and foremost . . . a biological question. You see, we have to think about the next generation. What will they think if we take the last whale?” (p. 73). And that diplomat’s voice was far from the only one pushing hard in prewar negotiations for an international convention underpinned by thoroughly modern conservation principles, resistant to the self-aggrandizing claims of industry lobbyists.

As always, however, countervailing forces were also in play. The high-seas (“pelagic”) whaling nations, notably Norway and Great Britain, saw the

Antarctic whaling grounds as their own private oil patch, whereas upstarts like Germany and Japan regarded those same productive waters as a vital potential source of food and oil (for margarine and military glycerin). Indeed, the seeds of present-day conflicts over Japan’s determination to continue whaling were sewn in the 1930s when Japanese reluctance to sign on to the first international whaling agreements aroused suspicion and mistrust. Things only got worse after the war when General MacArthur’s Supreme Command for the Allied Powers, which served as the occupation government of Japan through 1951, sought to ensure that that country’s whaling fleet was capable of delivering desperately needed food to a starving populace. The sea was, as Dorsey puts it, “an obvious place to acquire tons of protein and fat quickly” (p. 134).

The author’s accounts of the jostling among nations for supremacy in Antarctic whaling, of the near-impossibility of managing an enterprise as lucrative and geographically dispersed as high-seas whaling, and of the deep (and abiding) divisions between protectionists and sustainable users are engaging and, for the most part, convincing. His treatment of events in more recent decades (since 1971), much of it based on popular media, newspaper clippings, and file correspondence, is at times cliché-ridden, superficial, even gossipy—I found myself wincing occasionally at statements from letter exchanges or newspaper stories that were probably never meant to be quoted out of context. Dorsey has nevertheless produced a serious, readable, and well-informed treatise on a fascinating topic that continues to inspire passion and controversy.

RANDALL R. REEVES, *Okapi Wildlife Associates, Hudson, Quebec, Canada*



PALEONTOLOGY

EMBRYOS IN DEEP TIME: THE ROCK RECORD OF BIOLOGICAL DEVELOPMENT.

By *Marcelo R. Sánchez*. Berkeley (California): University of California Press. \$39.95. xiv + 256 p.; ill.; index. ISBN: 978-0-520-27193-7. 2012.

The author gives a concise and accessible account of the information that fossils provide on development from embryo to adult in different groups of extinct animals. Sánchez takes a very broad view of development: his treatment goes far beyond the “embryos in deep time” of the title. Genes do not

fossilize, and sequence data from ancient DNA and proteins do not survive for millions of years. But fossil evidence of ontogenies and growth, even if rarely preserved and sometimes only revealed by special preparation techniques, provide clues to evolutionary processes. Evolution acts on all stages of development, not just the adult, and juvenile characters can be useful in determining relationships. The emphasis of the book is on vertebrates, reflecting Sánchez's research interest in mammals, but invertebrate examples are also mentioned. Studies of variation in segment number in trilobites, for example, suggest greater developmental flexibility during the Cambrian explosion than later in the history of life.

Sánchez writes for a general scientific audience, but the book provides an excellent introduction for biologists who might labor under the misapprehension that fossils have nothing to say about developmental evolution and genetics. The study of evolutionary development, or *Evo-Devo*, aims to identify the genetic controls on morphology, particularly on those large changes that can be effected by switching on or off developmental genes. Such mechanisms offer an explanation for the profound and rapid shifts in morphology that occur, for example, during evolutionary radiations. The fossil record reveals the time scale and the order in which features appeared—a fossil from the Triassic of China, for example, shows that the ventral shell of turtles evolved before the dorsal.

The author reviews many examples of development in fossil vertebrates. Ichthyosaurs and mosasaurs are known preserving fetuses, providing direct evidence of viviparity. Dinosaur eggs may preserve embryos, and there is evidence that certain dinosaurs brooded their eggs like birds today. Bone histology may reveal growth rates in dinosaurs, showing how they reached enormous sizes relatively quickly. Recognizing change in form during maturation (allometry) is important in taxonomy—to avoid assigning juvenile and adult to different species as has happened in the case of ground sloths, for example. The impact of evolution on growth patterns is dramatically illustrated by the appearance of dwarf forms, such as elephants and mammoths, on islands.

Some of the most exciting interactions of evolutionary development and paleontology involve identifying genetic mechanisms to explain major evolutionary changes revealed by fossils. Sánchez explains how the wings of bats, for example, may have evolved rapidly under the control of genes that promote the growth of skin between digits, and the reduction of the hind limb in dolphins and whales may reflect nonexpression or loss of particular genes. As highlighted in Sánchez's indi-

vidual synthesis, fossils provide the only record of changes that took place in the past, while developmental genetics may provide a mechanism for fundamental evolutionary transformations.

DEREK E. G. BRIGGS, *Geology & Geophysics and Peabody Museum of Natural History, Yale University, New Haven, Connecticut*

THE LOST WORLD OF FOSSIL LAKE: SNAPSHOTS FROM DEEP TIME.

By Lance Grande; with photography by Lance Grande and John Weinstein. Chicago (Illinois): Chicago University Press. \$45.00. xii + 425 p.; ill.; taxonomic and subject indexes. ISBN: 978-0-226-92296-6 (hc); 978-0-226-92298-0 (eb). 2013.

This volume surveys the remarkable fossils of the 52-million-year-old Fossil Butte Member (FBM), which offers the most comprehensive paleoecological portrait of a postdinosaur community known. Author Grande and photographer Weinstein describe a dynamic lake community that persisted for over a million years and whose fossils are remarkable both for their abundance and quality (many are both complete and finely detailed). This well-written, beautifully illustrated volume provides an excellent overview of the specimens contained in the formation and highlights its importance both as a site worthy of study in and of itself and as a useful reference for addressing a host of biological, geological, and paleontological subjects.

The preface, 26 chapters, six appendixes, glossary, and references cover the FBM with impressive thoroughness. The first one-quarter of the book provides a history of the formation, an overview of paleontological work done there, and an introduction to fossil preparation. The remainder of the volume focuses on the FBM's remarkable specimens. These chapters vary considerably in length due to the vagaries of preservation (some organisms simply preserve less often than others) and/or the varying degree of interest fossil collectors and paleontologists have in different taxa. Thus, the bacteria, green algae, and conifer chapters are only a few pages long, while those on ray-finned fishes and birds are more extensive (68 and 44 pages, respectively). All of the chapters provide spectacular photographs of remarkably preserved and prepared fossils. The FBM's most abundant vertebrate fossils are of fish, and Grande's ichthyological training coupled with his long-term experience with the site makes him especially well qualified to cover them. But the author's solid coverage extends to plants, tetrapods, trace fossils and, where the fossil record provides enough information (which is more often than many might realize), general paleoecology.