

Book Review

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Morphology and Evolution of Turtles: Proceedings of the Gaffney Turtle Symposium 2009.— Edited by Donald B. Brinkman, Patricia A. Holroyd, and James D. Gardner. 2012. Springer, Dordrecht. xix+577 pp. ISBN 978-94-007-4308-3, \$139 €107 (hardback); ISBN 978-94-007-4309-0, \$111 €100 (eBook).

This important compilation of articles (nearly 600 pages) follows from the Gaffney Turtle Symposium held in October 2009 at the Royal Tyrrell Museum of Paleontology, Drumheller, Alberta, Canada. The scientific meeting honored the work of Eugene S. Gaffney, paleontologist and pioneer in the application of cladistics to the study of turtle evolution. *Morphology and Evolution of Turtles* was conceived as a festschrift volume to the congress. As stated in the preface, such a volume “would ideally contain a mix of focused papers that would appeal to specialists, along with papers having a broader scope that would appeal to a more general audience.” The editors have certainly tried to achieve this.

Morphology and Evolution of Turtles is organized into six sections. The first section is a brief tribute to Eugene Gaffney (Perspectives on the Life and Accomplishments of Eugene S. Gaffney), including an autobiography by the celebrated scientist. The second section is centered on the hotly debated issue of “The Origin of Turtles,” the third section concerns “The Early Diversification of Turtles,” the fourth section focuses on the “Diversity and Biogeography of Pleurodira,” and the fifth section presents “Diversity, Biogeography, and Paleobiology of Late Cretaceous and Tertiary Turtles.” The final section deals with “Pathologies, Anomalies, and Variation in Turtle Skeletons.”

The second section starts (Chapter 3) with an interesting review on the ancestry of Chelonia. Chapter 4 discusses hypotheses concerning the ontogenetic origin of the turtle body plan, whereas Chapter 6 presents the case for a multidisciplinary approach to the study of turtle morphological evolution. The chapter on “The Evolution of the Turtle Shell” might seem a little redundant, but it actually has a special focus on the history of science. The last chapter in this section provides a morphometric analysis of internal carotid circulation in turtles.

Most of the papers from the following three sections are devoted to the description and discussion of new fossil types, ranging from the Jurassic to the Miocene

(Chapters 8–10, 12–18, 21, 25, and 26), often including a phylogenetic analysis (Chapters 8, 9, 13–15, 20, and 21). Chapters 14 and 18 also deal with biogeography or ecology. Chapter 11 describes the rediscovery of a lost holotype, whereas Chapter 22 is a re-examination of two holotypes. Chapters 19, 20, and 23 review Cretaceous turtle diversity in Eastern Central Europe, New Mexico, and Asia, respectively (although in the latter case, the review is restricted to Trionychidae). Chapter 24 relates the story of sea turtle fossil discovery in Europe.

Except for the introductory one, the final section is the shortest of the volume (only two chapters). It begins with an extensive review of abnormalities in turtle skeletons and ends with a description of the morphological variation found in *Terrapene coahuila*.

The book is superbly edited and lavishly illustrated. Contributors come from the most reputed institutions in the world, covering North and South America, Asia, Australia, and Europe. However, as is often the case in this kind of exercise, the result is a bit of a patchwork, with few links among the different papers. Indeed, many of the sections and chapters would have benefited from a broader introduction, to help place them in context. The balance between review papers and tightly focused papers favors the latter (238 vs. 300 pages, respectively), and even the reviews are sometimes very focused. Reviews such as Chapter 24 (Fossil European Sea Turtles: A Historical Perspective) and Chapter 27 (Osseous and Other Hard Tissue Pathologies in Turtles and Abnormalities of Mineral Deposition), although very well documented, may also seem a little out of place.

Finally, morphology and evolution are addressed only from the viewpoint of paleontology, and there is virtually nothing about extant species (the final section is an exception). Hopefully, noting that the book is part of Springer’s *Vertebrate Paleobiology and Paleoanthropology Series* should limit the risk of confusion about its scope. Overall, *Morphology and Evolution of Turtles* should appeal to a paleontologist more than to a researcher in any other field, let alone a more general audience. Despite its shortcomings, the book succeeds in showing the vitality of a field nourished by the seminal work of Eugene S. Gaffney.

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