

HERPETOLOGY. *Fourth Edition.*

By F. Harvey Pough, Robin M. Andrews, Martha L. Crump, Alan H. Savitzky, Kentwood D. Wells, and Matthew C. Brandley. Sunderland (Massachusetts): Sinauer Associates. \$99.95. xvi + 591 p.; ill. + G-1 - G-8; LC-1 - LC-92; TI-1 - TI-12; SI-1 - SI-16. ISBN: 978-1-60535-233-6. [A companion website is available.] 2016.

When I took a course in herpetology as an undergraduate in 1989, we did not use a textbook. My professor indicated that he was not satisfied with available volumes because none had accomplished the daunting task of effectively capturing in depth a sufficient diversity of topics relevant to amphibians and reptiles. Thus, the first edition of *Herpetology*, which appeared in 1998, was, in my view, a revelation. The team of authors, which included six herpetologists with expertise in a broad diversity of fields had produced a reference that not only covered the systematics of amphibians and reptiles (subjects extensively covered in the books available at the time), but also provided intensive coverage of topics such as physiology, reproduction, feeding, mating systems, conservation, and others. *Herpetology* became my “go-to” reference manual for amphibian and reptile biology. In addition, the volume was twice revised in rapid succession, first in 2001 and then again in 2004, with each revision resulting in the inclusion of necessary updates and refinements reflecting new research findings. Given the long gap between the third and fourth editions, much has changed in our knowledge of amphibians and reptiles, and I was keen to see how extensively the new version was revised.

The new edition still emphasizes the same general set of topics as did the previous edition, and remains broadly organized into four parts. Part I—What Are Amphibians and Reptiles?—includes five chapters that begin with a general overview of the book, before jumping into more comprehensive treatments of amphibian and reptile phylogenetic origins, relationships, systematics, and biogeography. Part II—How Do They Work?—includes six chapters on water and temperature relations, energetics and performance, reproduction, locomotion, and feeding. The next part—What Do They Do?—includes five chapters on spatial ecology, communication, mating systems and sexual selection, dietary relations, predators and parasites, populations, and species assemblages. Part IV—What Are Their Prospects For Survival?—is the sobering final chapter on amphibian and reptile conservation.

The most prominent improvement in the new edition is the inclusion of extensive and often spectacular color imagery throughout. Virtually every page now has high-quality color photographs and/or graphics that enhance both the aesthetics and the information conveyed in the figures. This ver-

sion of the book saw a change in the authorship line, with Matthew C. Brandley replacing John E. Cadle. Brandley’s imprint on the volume is evident in the substantially expanded treatment of phylogenetic principles and methods, species descriptions, and taxonomy, as well as in the discussion of the application of molecular data to species identification (cursorily as it may be). I see this book as an invaluable reference and perhaps the most important feature of this revision is the authors’ commitment to keeping the book fresh and up to date. The literature cited spans 92 pages and a significant fraction (perhaps most) of the citations postdate the last edition of *Herpetology*. A glowing review of the third edition (D. Seburn. 2004. *Canadian Field-Naturalist* 118:140–141) concluded that the one conspicuous missing element from the volume was a glossary, which has now been added to the new edition. Finally, the preface includes a link to a website listing links to other online resources useful to the study of herpetology, including relevant news reports, stories, and videos showcasing amphibians and reptiles. This website is frequently updated even though more than a year has passed since the book was released. All three prior editions of *Herpetology* have been outstanding contributions to the field. The authors made us wait a bit too long for the newest edition, but the improvements to an already outstanding reference were clearly worth the wait. Every herpetologist should own a well-worn copy of this volume.

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TURTLES AS HOPEFUL MONSTERS: ORIGINS AND EVOLUTION. *Life of the Past.*

By Olivier Rieppel. Bloomington (Indiana): Indiana University Press. \$45.00. vii + 206 p.; ill.; index. ISBN: 9780253024756 (hc); 9780253025074 (eb). 2017.

Turtles represent one of the most distinct animal groups with their characteristic shell. Their shell, made up of a carapace (dorsal portion) and plastron (ventral portion), is one of the most recognizable features of animals today. However, their origins, evolution, and shell development are not as well understood. Olivier Rieppel uses his knowledge and expertise in reptile anatomy and evolution to help shed light on these questions in *Turtles as Hopeful Monsters: Origins and Evolution*. Although the book’s title suggests a focus on turtles and turtle evolution, and they are a common thread throughout, much of the volume is about the scientists and history of evolutionary biology.

The book contains six relatively nonlinear chapters. Rieppel first discusses his history, scientific

background, and his interests in the origin of turtles. During the next few chapters, the author details the history and evolution of evolutionary biology. He does this by contrasting ideas between scientists, such as neo-Darwinism versus neo-Lamarckism and transformationist versus emergentist paradigms. It is not until Chapter 5 that the focus shifts more to turtle evolution directly, including their genetics, embryological development, and fossil record to help elucidate their origins. He concludes with a chapter discussing fossils from China, including some important recent fossil discoveries helping shed more light on turtle origins and their early evolution.

Prominent in the volume, and part of its namesake, is the idea of hopeful monsters first put forth by Richard Goldschmidt. Rieppel sees mutations as pathways that lead to "monsters" who survive or die off, depending on many factors, including the mutation, its benefits, or detriments. The hopeful portion is that some mutations are beneficial and lead to speciation and potentially macroevolutionary changes and new Bauplans. Specifically, the author discusses the idea that changes in early embryological development can lead to novel evolutionary pathways and significant changes in adults. These embryological changes leading to new mutants that hope to survive is then his focus for turtles developing their characteristic shells and accompanying morphology.

The author discusses numerous different scientific ideas and points of view, for the most part, perspicuously. He uses these as a foundation for discussing the origins of turtles and, often more importantly, the sister group to turtles. They also serve as a walk through the history of evolutionary biology. However, this leads to shifting forward and backward through time, with some things restated, making the book feel disjointed at times. Additionally, although Rieppel notes that some authors have used deft language and wording to promote particular ideas and disparage others, he subtly does something similar when talking about the idea of a "Polka Dot Turtle Ancestor" (p. 5), a term that can be taken as potentially satirical. Even so, the author gives multiple points of view, and allows readers to make up their own minds.

Although this volume felt like it was more about the evolution of evolutionary thought than directly about turtles, they still were used as a potential exemplar. Turtles, and their potential sister groups, are discussed throughout the book in relation to these scientific ideas. The vast amount of biographical information of various scientists also provides readers with a more thorough understanding of the players in these scientific games. We do not yet have a clear answer to exactly what turtles evolved from, and Rieppel shows there is still much to learn, including work by those looking at modern, genetic,

and paleontological data. In the end I found this to be an enjoyable read that helped broaden my background knowledge, particularly of evolutionary biology. *Turtles as Hopeful Monsters* can be read by scholars and amateurs and should be read by anyone interested in the history of evolutionary biology, paleoherpetology and herpetology, and turtles, particularly in their origins, among others.

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THE PYGMY HIPPO STORY: WEST AFRICA'S ENIGMA OF THE RAINFOREST.

By Phillip T. Robinson, Gabriella L. Flacke, and Knut M. Hentschel; with contributions by Waldemar Bülow, April L. Conway, Henk Dop, Alexander L. Peal, Klaus Scheurich, Annette Scheurich, Charles Steiner, and Frans G. Van den Brink. Oxford and New York: Oxford University Press. \$69.95. xx + 413 p. + 12 pl.; ill.; index. ISBN: 9780190611859. 2017.

I was enthusiastic about the promise of a book devoted to the pygmy hippopotamus (*Choeropsis liberiensis*), a timid mammal difficult to observe in the wild. Straightaway the authors clear up any potential confusion that the pygmy hippopotamus is merely a diminutive version of the common hippopotamus. Each of the main authors, Phillip Robinson, a veterinarian and former director of the Laboratory of Animal Resources at the University of Toledo in Ohio, Gabriella Flacke, veterinarian and researcher affiliated with well-known conservation organizations, and researcher Knut Hentschel contribute to the five parts, with one or two chapters featuring guest contributions by additional authors. Combined they are arguably the world experts on this elusive species and familiar with the challenges of in situ conservation efforts.

After introducing readers to the pygmy hippopotamus and exploring the physiological and morphological differences between it and the common hippopotamus, the first part of the book is largely dedicated to the history of the species, including the role folklore and culture has on how it is perceived. A number of chapters detail the various researchers, hunters, and explorers that encountered the pygmy hippopotamus in one way or another. Perhaps most disheartening for readers is the documentation of the inhumane and abusive treatment of this species in captivity.

The second part of the book is composed of chapters illustrating and chronicling the experiences, challenges, and adventures of conducting field research in a difficult environment. From the relationships with local people to navigating the dense forests and coping with voracious driver ants, this section