



**The New Encyclopedia of Snakes**, Chris Mattison, 2007, Princeton University Press, Princeton, New Jersey, 272 p., hardcover, USD 35.00, ISBN 0-691-13295-X

Snakes have historically received unfair treatment and prejudice by the popular press. While they are often portrayed as the embodiment of evil, they are a fascinating, attractive, and frequently helpful animal and an important component of ecosystems around the world. *The New Encyclopedia of Snakes* provides a general overview of snake diversity, ecology, behavior, and global distribution. Mattison states that his strategy in writing this book was to place snake morphology and behavior into an evolutionary context. As a paleontologist and specifically a continental ichnologist I am interested in the early evolutionary history of snakes and their behavioral responses (especially burrowing) to different environmental conditions. In light of these interests I found this to be a useful and entertaining book.

*The New Encyclopedia of Snakes* is a very attractive book filled with full-color photographs of a diverse assemblage of snakes in their natural environment engaged in a variety of behaviors. The writing style is entertaining and engaging without becoming overly simplistic. Mattison cites references only occasionally within the chapters, which he states in the introduction was to prevent the text from being disrupted. I would have preferred to see more citations, especially in the chapters covering snake evolution and snake classification. Mattison does provide information on 75 scientific papers at the end of the chapters for those wishing to pursue more details on the research presented. There is also a bibliography listing over 110 books and field guides. The book is organized into 10 chapters that take the reader through snake morphology, habitats, behavior, and classification. Each chapter also includes call-out boxes containing interesting asides to the subjects being discussed. Topics covered by these call-out boxes include a discussion of amphisbaenians (one of my favorite reptiles), techniques of measuring snakes using so-called squeeze boxes and photographs, convergent evolution in snakes, snake bite statistics, as well as descriptions of such important snake species as the northern viper (*Vipera berus*), the snake with the largest global distribution, and the brown tree snake (*Boiga irregularis*), the troublesome invader of Guam.

I was excited to see that the lead chapter in the book was entitled The Origin and Evolution of Snakes. Unfortunately,

Chapter 1 is very short, only eight pages long, and is composed mostly of large photographs. Mattison presents a good definition of a snake using a variety of morphological features and then contrasts these to other elongate limbless reptiles that are often mistaken for snakes, including some lizards and amphisbaenians. The discussion on the early evolution of snakes is extremely brief, however. Mattison mentions a few fossil genera but does not provide photographs or illustrations of these fossil snakes, nor does he provide any references to his sources. The chapter is also missing a geologic time scale for those unfamiliar with geology. The bulk of the chapter is dedicated to the family-level classification of modern snakes, a topic covered again in Chapters 9 and 10. Chapter 2: Morphology and Function covers various aspects of the morphology of snakes including size and shape, color, scales, and internal anatomy, including a detailed discussion of snake skulls and teeth. Since length is typically the measure of a snake most people are interested in, Mattison presents a series of reports and entertaining tall tales about what he calls the big six including anacondas, pythons, and boas. There are also sections on the functional morphology of snakes, including the different types of snake locomotion and the senses.

Chapters 3 and 4 examine the environments that snakes inhabit around the world as well as the morphological, physiological, and behavioral adaptations employed to deal with the unique environmental conditions of each habitat. Chapter 3: How Snakes Live, is divided into two sections. The first section covers the various physical aspects of the environments that snakes respond to including different means of thermoregulation, respiration, water balance, and salt balance. The second section, entitled The Biological Environment, primarily deals with controls on snake populations, including mortality, abundance, and sex ratios. Chapter 4: Where Snakes Live, includes a brief overview of the characteristics of the different types of snake habitats (e.g., tropical forests, deserts, grasslands), as well as the different types of snakes associated with each one. Following this is an excellent discussion of some of the adaptations of snakes to different environments including those of highly specialized arboreal, burrowing, and aquatic snakes. The chapter concludes

with a region-by-region summary of the global distribution of snakes and an excellent discussion of snakes on islands, both endemic and invasive.

Chapters 5, 6, and 7 cover important aspects of snake behavior including feeding, defense, and reproduction. Chapter 5: Feeding, includes several photographs one would expect in a book on snakes including snakes eating frogs, lizards, eggs, mice, birds, bats, and, of course, other snakes. In addition to reviewing the types of prey, Mattison discusses behavioral aspects of hunting and means of overpowering prey. The tables are turned in Chapter 6: Defense, which includes photographs of snakes being eaten by birds, monitors, and crocodiles. This chapter discusses the wide variety of defensive mechanisms utilized by snakes. These include such passive measures as coloration patterns that serve as camouflage, visual warning signals, and mimicry of more dangerous snakes. There are also several active means of defense including feigning death, spitting venom, and autohaemorrhagy—voluntary bleeding from the eyes and mouth. Chapter 7: Reproduction, covers every aspect of the topic including mating behavior, breeding seasons in different climate zones, birth and development, and parental care. There is even a section on snake nest construction and architecture.

Chapter 8 is an interesting examination of the interaction of snakes and humans through history including snake worship and snake myths, the exploitation of snakes as natural resources, and current conservation efforts. There is also a de-

tailed discussion of keeping snakes in captivity, with instructions for constructing enclosures, feeding, and breeding. Chapter 9 and 10 cover the detailed aspects of snake taxonomy, including a brief overview of how snakes are classified and named. Chapter 10 is dedicated to the current classification of snakes down to the genus level. The level of detail varies considerably, with the boas and pythons receiving the most exhaustive treatment.

*The New Encyclopedia of Snakes* is an excellent book for anyone with an interest in snakes. While it is not a professional reference by any means, it provides a good overview of snake behavior, habitats, and taxonomy. At USD35, the book is a bargain for the photographs alone. As a paleontologist, I would like to have seen a more detailed account of the fossil record of snakes in Chapter 1. This would have made it a more useful book to vertebrate paleontologists. For those interested in the fossil record of snakes, I would recommend J. Alan Homan's *Fossil Snakes of North America* (Indiana University Press, 2000). But if you are looking for a good general text covering all aspects of modern snake morphology and behavior, this is an excellent place to start.

Daniel I. Hembree  
Department of Geological Sciences  
316 Clippinger Laboratories  
Athens, Ohio 45701, USA  
hembree@ohio.edu