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SNAKES OF EASTERN NORTH AMERICA. By Carl H. Ernst and Roger W. Barbour. 1989. George Mason University Press, 4400 University Dr., Fairfax, Virginia 22030, vii + 282 p., $62.50 (hardcover).—This book is the first major compilation on the snakes of eastern North America since the now badly outdated Wright and Wright (1957). It contains a wealth of information on the 58 species of snakes found in North America east of the Mississippi River and the western border of Ontario. Ernst and Barbour purposed to write a book that would allow one to identify any snake species from this area (facilitated by a key to species) and which would summarize information on life history, a term they use in a broader sense than currently used by population and evolutionary biologists.

For the most part, I found that Ernst and Barbour achieved their goals. With few exceptions, they covered the primary literature well through 1986 (including some 1987 references). For each species, they provide a summary of its ecology and behavior from the literature, interspersed with occasional personal anecdotes. After reading the accounts, one is impressed with the extensive literature that exists on snakes, but the incomplete and anecdotal information available for most species leaves one less than satisfied that we know a lot about their ecology. This will not come as a revelation to anyone who has worked with snakes in the field. They know well that snakes are not the animal of choice for ecological studies, being secretive, periodically dormant, and generally intractable. Thus, studying snakes requires a commitment to the organism in addition to (or instead of) a commitment to a biological problem. Many books surveying the biology of a group of animals illuminate our ignorance and stimulate further study. Ernst and Barbour's book certainly does the former and I hope will also do the latter. To this end, the authors frequently point out species in need of additional work.

The book is organized into six sections. The first summarizes the general biology of snakes. Next is a guide to identification including an illustrated key to species. Species accounts follow and are arranged in this taxonomic order: Typhlopidae, Colubridae (Xenodontinae, Colubrinae, Lampropeltinae, Natricinae), Elapidae, and Viperidae. The accounts contain sections on recognition, karyotype, fossil record, distribution, geographic variation, confusing species, habitat, behavior, reproduction, growth and longevity, food and feeding, venom and bites (in venomous forms), predation and defense, populations, and remarks. The remarks section addresses miscellaneous topics such as taxonomic problems, biogeography, gaps in knowledge, mimicry, effects of environmental pollutants, conservation, genetics and hybridization, suitability for captivity, and folklore. Each species account contains a black and white photograph and a distribution map showing the

range within eastern North America as well as the entire range. Color photographs of each species are grouped in plates in the middle of the book. Common names conform to those in Collins et al. (1982). After the species accounts, there is a glossary of scientific names, a bibliography containing over 1500 citations primarily concerning ecology, behavior and systematics dating 1955–87 (the reader is referred to Wright and Wright, 1962, for older papers), and an index to scientific and common names.

The most disappointing feature of the book, especially to non-professionals, will be the uniformly poor quality of the black and white photographs. This appears to be more related to poor reproduction on low quality paper than to low quality of photographs. The maps also are poorly reproduced, the crosshatching is dark and distinct on some, while on others it is light and indistinct, fading completely in portions of the map leaving holes in the range. The color plates are excellent, but (at least in my copy) are arranged in an order opposite that in the text.

It is unfortunate that the glossary includes only scientific names. Ernst and Barbour apparently assume much technical backgrounds on behalf of their readers, an assumption unwarranted considering the broad audience that this book could attract. For example, many readers will be stimied when they encounter in the key the loreal, a scale undefined in text and unlabeled in the illustrations, but used as the basis for discrimination in several couplets of the key. Also unfortunate is that instead of adopting the most important and most frequently used measure of body size in snakes (snout–vent-length, SVL, Seigel and Ford, 1988), the authors use, again without defintion, "total length" and "total body length" apparently as synonyms. Enigmatic is the controversial use of the subfamily Lampropeltinae, made without comment.

The authors state, "When a topic is not mentioned in a species account, it is unknown." This bold statement challenges readers. Here I offer some more general concerns. One is the erroneous interpretation of literature, for example the statement, "When the tongue is retracted, its tips are inserted into the openings of Jacobson's organ, ..." Gillingham has shown that the tongue tips are not inserted into the openings, rather their ventral surfaces are drawn over the anterior processes in the floor of the mouth which, in turn, transfer chemicals to the openings. Another is dubious conclusions. For example, considering the extreme rarity of finding snake eggs in the field, I doubt that "gathering of eggs" by humans contributes significantly to the decline of snake populations. Another is using the most appropriate literature for a topic. For example, to summarize growth and age at maturity in *Opheodrys aestivus*, Ernst and Barbour use studies in which growth and age at maturity were inferred from museum specimens collected at various localities over extended periods of time rather than on a published study based on recaptures of living individuals in a natural population.

I agree with the authors that one of the factors in the terrestrial success of reptiles has been their reduced cutaneous water loss. However, the statement, "The scaly skin has few surface glands; that is, very little fluid is lost cutaneously," oversimplifies and misrepresents. This book is supposed to feature diversity, but oversimplification reduces diversity. Recent research by several investigators has revealed much interspecific variation in rates of cutaneous water loss in reptiles, related to the aridity of their habitat and to the lipids in their skin. Thus, semi-aquatic and fossorial snakes lose more water than terrestrial snakes which lose more water than arboreal snakes. Some species of reptiles lose as much water as do some amphibians. These differences are more than trivial. It is becoming clear that some behaviors we observe in snakes are dependent upon underlying physiological processes. Therefore, diversity in physiology may be expressed as diversity in behavior, an interesting relationship that warrants consideration in a book featuring diversity.

In any large compilation of material, there likely will be typographical errors, and this book has enough (misspellings, missidentifications, wrong and missing values, citations running together in the bibliography and misalignment of headings in the table of contents) to suggest a lack of proper proofreading and editing.

I enjoyed reading this book and learned many new "facts" while doing so. For example, I learned that *Farancia abacura* is found in Iowa, "mean clutch length" at ovulation in *Carphophis* is 23.9 mm, and 10 subspecies of *Micrurus fulvius* occur in eastern North America! But lest I be too critical, these and the above errors do not distract in a major way from the usefulness of this book as a source of information. Citations are used liberally in the species accounts so that questionable points may be readily investigated.

In short, Ernst and Barbour have produced a useful reference for anyone interested in snakes. I highly recommend Snakes of Eastern North America for public, school and university libraries, and also for interested laymen and amateur naturalists. For professionals the value of owning a copy of this book will primarily be in its bibliography and species accounts. For North American herpetologists beginning work in the growing field of snake biology, arming themselves with copies of Ernst and Barbour's Snakes of Eastern North America and Seigel et al.'s Snakes: Ecology and Evolutionary Biology (1987) would not be a bad way to start.

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DIGGING INTO THE PAST. By Edwin H. Colbert. 1989. Dembner Books, 80 Eighth Ave., New York, New York. 496 p., $25.00 (hardcover).—When I read Roy Chapman Andrews' description of collecting dinosaurs in the Gobi Desert, I knew (at age 11) that I wanted to hunt dinosaurs when I grew up. Over the years, I have met others who relate similar experiences. Although many did not become paleontologists, they can trace their decision to work in science to the influence of a dinosaur collector's autobiography. So in addition to providing interesting reading, such books are important because they seem to recruit young people into the sciences.

I do not know if Colbert's book would have the same influence on a child as the books of Roy Chapman Andrews. I doubt it. Andrews was an adventurer who had the knack of telling a good story. Colbert does not have these qualities, although his autobiography is much more honest to the profession. He paints his past almost as a series of coincidences. He happened to become interested in vertebrate palaeontology because of a visit to the museum at the University of Nebraska. On a whim he asked what kind of a future there might be in paleontology. As a student, he became the research assistant of Henry Fairfield Osborn, the most famous vertebrate paleontologist of that time, because he happened to be in the right place at the right time. He married the daughter of another eminent paleontologist, W. D. Matthew, although this had little to do with any association he had with that reknowned scientist. Although Colbert started off working on Cenozoic mammals, he became an authority on dinosaurs only because he was asked to fill a vacancy left by the retirement of Barnum Brown.

This autobiography is more personal than most, describing in detail the events that led to the development of the professional style and biases evident in many of Colbert's papers. There is some useful insight into the trials and tribulations of being a paleontologist with a wife and children, something that is usually ignored in works like this, and not thought of by those working towards careers in field oriented sciences. Social pressures and historical events obviously have a major impact on the growth and development of scientific ideas. Colbert has documented many of the changes that occurred throughout his career (such as the shift in transportation from horses to automobiles, and the advent of commercial air travel) in a picturesque manner that gives the reader a feel for how different the influences are today. He also discusses the advent and slow acceptance of new ideas in the Earth Sciences, such as plate tectonics, and their influence on paleontological research.

Colbert has had a long and distinguished career, during the course of which he met and associated with many famous vertebrate paleontologists. His comments and anecdotes about some of these people are of great interest, but