

## BOOK REVIEWS

**Seismosaurus: The Earth Shaker. David D. Gillette with illustrations by Mark Hallett. 1999. Columbia University Press, New York, NY. 205 p. \$17.95.**

There are many recent books about prehistoric animals, and many of them focus on dinosaurs. Do we really need another one, especially one that deals with a single skeleton? Yes! Dave Gillette has written a wonderful account of the discovery, excavation, reconstruction, and significance of a remarkable dinosaur.

Initially I was skeptical about the text because I have read some of Gillette's scientific articles and they are (as is appropriate) typical of dry, scientific writing. Such is not so with this book which is written in a style that is anything but dry. My fears were put to rest immediately, in the Preface:

"One hundred and fifty million years ago a dinosaur died in what is now central New Mexico. Attacked by scavengers and decomposers, the remains were finally buried beneath the sands of a capricious river. That particular dinosaur now lives again in a new way: it has a name, and it is the subject of an exciting episode in the realm of paleontology. . . . In the pages that follow, I hope to convey the rich story of how *Seismosaurus ballorum*—one of the biggest of all dinosaurs yet discovered—was reborn. . . . It is a story more of people than bones, more of ideas than facts."

Discovered by hikers in 1979, *Seismosaurus* wasn't seen by Gillette until 1985. From the small initial excavation that year, the book uses the discovery to show how dinosaurs are excavated, reconstructed, interpreted, and names.

Dinosaurs are being discovered at a rate of about eight new specimens per year. What many lay readers may not be aware of, and what this book so well describes, is the care that must be taken when a previously unknown organism is given a formal scientific name. Over 150 species of sauropods, the long-necked, long-tailed four-footed herbivores informally called brontosaurs, have been described. Gillette tells what distinguishes *Seismosaurus* from the rest, such as its closest relative, *Diplodocus*.

Before major excavation began, Gillette asked scientists and technicians at Los Alamos National Laboratory for help in locating more of the bones. They tried techniques ranging from the relatively low-tech procedure of searching at night with ultraviolet light (which proved useful) and dowsing (done as a lark) to high-tech methods including ground penetrating radar, proton free-precession magnetometry, scintillation counters (to measure radioactivity), and acoustic diffraction (sound waves). Although the latter shows promise for the future, it will be a long time before we have systems like the one portrayed in the movie *Jurassic Park*.

Chapter Five gives a great narrative of how the excavation was done. Readers of the journal are probably aware of the care needed to extract fossil vertebrate remains from the earth. Gillette gives a fascinating account of how that was done. He explains the challenges

involved in extracting individual vertebrae that were a meter long and more than a meter high from a sandstone as hard as concrete. Once excavated, the remains had to be transported to the lab, no mean feat as just the block containing the sacrum weighed 3,200 pounds.

Gillette explains that, as important as are the bones themselves, the entire context of the carcass—its surrounding sediment, its orientation, other fossils—are also very significant sources of information about the dinosaurs and their world. He discusses the importance of subtle clues in determining the sequence of events leading up to the death and burial of the skeleton, a subfield of paleontology called taphonomy. Once buried, the bones were not safe from destruction. They had to harden, fossilize. Gillette devotes an entire chapter to that process.

One section I found most fascinating was Chapter Six on gastroliths ("stomach stones"). Over 240 were found, ranging in size from an inch to four inches in diameter. Each was photographed, mapped, and labeled before removal. It appears that *Seismosaurus* had both a crop (towards the front end of its body, in front of the stomach) and a gizzard (between the stomach and small intestine).

To sum up, this is a beautiful book—the writing is good, the photos are sharp, the diagrams are clear, and Mark Hallett's paintings are spectacular. (Warning: the painting on page 131, showing a dinosaur carcass being ripped apart by scavengers, may give nightmares to young children). The index looks comprehensive (for example, there are 21 entries under "Caudal vertebrae"), and I found only a smattering of typographical errors. The book is well worth acquiring, not only by those with a passion for dinosaurs but by anyone interested in how modern paleontological research is done.

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**Edwin Lincoln Moseley (1865-1948): Naturalist, Scientist, Educator. Relda E. Niederhofer and Ronald L. Stuckey. 1998. RSL Creations, Columbus, OH. 292 p. \$34.50.**

In this age of specialization among scientists and educators, it is rare to find a true naturalist with the diverse talents of Edwin Lincoln Moseley. *Edwin Lincoln Moseley: Naturalist, Scientist, Educator* looks lifeless in the vine-covered border of its dust jacket. A more thorough examination of this recent publication reveals that nearly every fact available in print or by oral history about one of Ohio's most prolific scientists and beloved educators is contained in this volume.

The authors, Mrs. Relda Niederhofer and Dr. Ronald Stuckey, were each working on separate biographies of Edwin Lincoln Moseley when, by chance, they each interviewed the same former student of Mr. Moseley. Contact with each other was made, notes compared, and eventually this unusual biography, told in two voices, was created. Ronald L. Stuckey, Ph.D., professor

emeritus of Botany at The Ohio State University, first encountered E. L. Moseley's work while using species lists compiled by Moseley at the F. T. Stone Laboratory. Relda Niederhofer became interested in Moseley while she worked as a student curating Moseley's collection of biological specimens after his retirement from Bowling Green State University. She later discovered more of his work while teaching at Sandusky High School where Moseley had also taught. Niederhofer and Stuckey's collaborative project is unusual in that instead of combining the extensive data gathered from a meticulous literature review and personal interviews of many acquaintances and former students, the authors have presented their histories side by side. This format is a bit confusing and redundant to the reader at first, but one soon becomes accustomed to the style.

Readers will delight to find that this is not just a tale of an eccentric educator told from crib to coffin. Many side trips in the story, like Moseley's field trips with his students, are filled with surprises. One may begin reading about Moseley expecting the personality of the taciturn man with the shaded face as seen on the cover of the book, but soon will be chuckling aloud at Moseley's eccentric habits in the entertaining anecdotes in this book.

Moseley was a naturalist, in the classic sense of the word. He made extensive botanical collections in the Sandusky Bay area and later in Oak Openings after he relocated to Bowling Green. He made careful studies on the glaciation of Erie and Huron counties. As part of this work, he enlisted his Sandusky High School students to help him map pre-glacial stream beds in the bottom of Sandusky Bay. The information was used to widen the shipping channel in the Sandusky area of Lake Erie. His range of interests also included research on weather prediction and climatic patterns.

Mr. Moseley's style of teaching by luring his students into discoveries, while never losing his own youthful curiosity, has left generations behind who were inspired by his life's work. This intense curiosity led Moseley to serious scientific research in Ohio. Moseley was one of the youngest charter members of The Ohio Academy of Science which began at the end of 1891 in Columbus. He was also active with the American Associa-

tion for the Advancement of Science, the American Society of Mammalogists, and many other professional organizations.

Perhaps the most important scientific work of his middle years was Edwin Moseley's research into the cause of "milk sickness," which caused trembles in cattle and death in humans. Moseley was able to determine that the illness was caused by cattle ingesting White Snakeroot (*Eupatorium rugosum*). The toxin from this common pasture plant was lethal to humans who consumed the cows' milk. By finally settling the debate on the culprit for this disease, farmers were able to clear fields of this weed to ensure safe dairy products.

In addition to describing the life of Edwin Moseley as a teacher at Sandusky High School and professor at Bowling Green, the authors have included a detailed chronology of events in Moseley's life, his genealogy, and his scientific contributions and writings. The book is divided into several sections, including extensive introductions in the beginning. It is recommended that the reader study the layout of the book before beginning to read in order to understand the dual biography plan of the authors. Preface and introductions are followed by Section I: Personality & Career, Section II: Contributions and Achievements, Section III: Writing and Legacy. Of particular interest to scientists are descriptions of Moseley's research and reports by Stuckey in Chapters 9 and 10, and Moseley's essays and letters in Chapters 13 and 14. The book ends with extensive references, notes, and an index.

*Edwin Lincoln Moseley: Naturalist, Scientist, Educator* is recommended reading for students of Ohio natural history, particularly of the northwest and north central areas of the state. Historians of Ohio history and education will also find the book of interest. Although the authors were able to glean little on the enigmatic man's personal life, educators and interpreters can absorb techniques by taking a mental excursion with Moseley's pupils of the past. The book will satisfy anyone wanting the story of an Ohio original.

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