

Zofia Kielan-Jaworowska, Richard L. Cifelli, and Zhe-Xi Luo, *Mammals from the Age of Dinosaurs Origins, Evolution, and Structure*

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Language, or actually differences in languages, can have a powerful influence upon the way we perceive a concept. Science is no exception. Take for example the phrase in English, “the first two-thirds.” For any native English speaker this makes perfect sense and needs no further explanation. Not so, if English is a “second” language. If there is a “first two-thirds,” what about the “second two-thirds?” Such was posited to me by one of the authors of “Mammals from the Age of Dinosaurs,” Zofia Kielan-Jaworowska. For those who may not know, “Mammals from the Age of Dinosaurs” is not Dr. Kielan-Jaworowska’s first foray into a book-length treatment of the, yes, dare I say, esoteric world of Mesozoic mammals. Given that her first effort was over 25 years ago (1979), for those of us who find these beasts irresistible, such a new treatment is long overdue.

The previous comprehensive treatment of Mesozoic mammals was two companion volumes by George Gaylord Simpson in 1928 and 1929. Going even further back, the very first such treatment was by Sir Richard Owen in 1871. One might ask, why such a new treatment after only 25 years when more than 50 years separated the first and second, and second and third attempts. The answer is obvious and forgone. There has been a renaissance of interest in earlier mammal evolution, especially within the context of great strides in technologies for molecularly based studies, and with the marked increase in new localities and specimens. To provide some perspective regarding this second point, in the introductory chapter to “Mammals from the Age of Dinosaurs,” the authors note that “the number of known Mesozoic genera increased to 283 by the year 2000. New Mesozoic mammals discovered in the past 20 years are one and one-half times more than the total of those known to science from the previous 200 years combined” (pp. 6–7).

The volume is long, 630 pages, and horribly expensive, almost \$200. As a worker on Mesozoic mammals, I find that it is a “must” for my library, but I fear the cost will scare away too many potential readers. We can only hope that a less expensive paperback version is in the offing. The book is large format, which is of great help in producing illustrations at an adequate size.

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This was not always the case with such books. Although illustrations in volumes such as Owen (1871) were exquisitely done, they showed tiny jaws often at natural size. Most of the figures in “Mammals from the Age of Dinosaurs” are adequately sized line drawings, a few shaded drawings, and fewer photographs. With very few exceptions, they are all of superb quality. While the paper stock is bright but still pleasing to read, it is thin enough that some text and figures bleed through from the other side. I do like the “brown wrapping paper” look and feel of the cover. This is set off nicely by simple, embossed, gold colored lettering and a blind stamped skeletal outline of the earliest known eutherian, *Eomaia* – nice touch. Fortunately, there is what appears to be a very good index, something that was missing in the 1979 Mesozoic mammal volume. This was remedied in 1981 by Chiment and Chiment.

The book is organized into 15 chapters. The first three are an introduction, a chapter on the paleobiogeography and biochronology of mammal localities, and a chapter on the origin of mammals. I note the authors chose to use “Mammalia” in the traditional sense to include Mesozoic and Cenozoic taxa that are outside the crown group, which includes monotremes, marsupials, and placentals. I happen to prefer the newer convention of calling this more inclusive taxon Mammaliaformes (Rowe, 1988) for several reasons, not least of which is that I find that my advanced mammalogy students grasp the subject matter better when this distinction is made. This is not a major issue, as the authors clearly delineate their usage.

The next 11 chapters compose the majority of the book, dealing with various non-monophyletic groupings, usually set off in quotation marks (e.g., “Symmetrodontans”), and clades (e.g., eutherians). That the authors have paid close attention to this issue is to be lauded as it helps the reader have a better feel for what we do and do not know about the evolutionary relationships of a particular group of taxa. These chapters include an historical background, a Linnean classification, descriptions of anatomy that vary depending upon how well a particular higher taxon is known, and some discussions of systematics and paleobiology where appropriate. It is always difficult to choose what to illustrate in such a volume that must rely heavily on line drawings. For the most part their choices work very well to compliment the text. I think that cladograms within chapters, where such information is known, would have been especially helpful for students who might otherwise be overwhelmed by the sheer number of new taxonomic names. We must remember that relatively few of our therophilic colleagues are as versed in Mesozoic mammals as some of us true believers.

The final chapter provides a very good analysis of the various issues pertaining to the interrelationships of Mesozoic mammals, and to a lesser extent their relationships to extant clades. They naturally push their own views on higher relationships, which they have presented in various earlier journal articles. In particular are the clades Australosphenida and Boreosphenida, the former including a suite of taxa coming from Gondwana (Australia, South America, and Madagascar) and the latter mostly including living marsupials, placentals, and some Mesozoic forms of Laurasian origin (hence “boreo”). The “sphenid” part of these names alludes to the triangular upper molars that interlock with the lowers forming a “slicing and dicing” form of tooth that has been extremely successful and heavily modified during the evolution of marsupials and placentals. The Boreosphenida are essentially equivalent to what many of us still prefer to call by its earlier name, Tribosphenida. While many now agree with the authors that most of the Gondwana taxa do form a clade within the authors’ Australosphenida, which may have evolved a tribosphenic molar convergently with boreosphenids (or simply tribosphenids), fewer believe that the authors have correctly placed monotremes within this clade.

One seldom agrees with all that is found even in the very best volumes such as this one; such disagreements are the grist of the scientific mill. While the authors are to be congratulated on producing a truly synthetic volume that will provide valuable information for a number of years,

they have also produced a synergistic work that will help show where we must go if we wish to more fully comprehend the “first two-thirds” of mammal evolution.

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