

Better seen than read

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Mammal Evolution: an Illustrated Guide, by R.J.G. Savage and M.R. Long. 1986. New York: Facts on File. 259 pp. \$35.00.

Fossil mammals have long played an important role in our understanding of mammalian evolution. This book intends to tell nonspecialists the story about the evolutionary history of mammals, based primarily upon the fossil record and often giving the kiss of life to the dead bones. The unique feature and, to me, the principal attraction of the book is the lavish use of fabulous illustrations, as the book's subtitle indicates. Those pictures alone would be worth the price. Yet, the general reader might find Bob Savage's text more or less equally appealing. However, contrary to the publisher's advertisement (on the front flap of the dust cover), I would be extremely reluctant to regard the text as either "highly authoritative" or "an indispensable source of reference" for students and professional researchers. In fact, it is not a book for specialists, nor to be fair, did the authors expect it to be.

The first three chapters provide the general reader with the necessary background information, both geological and biological, to understand the rest of the book. The author of the text generally succeeded in that aspect, and should be applauded for his lucid prose. However, I was disappointed about two minor matters. First, despite his highly readable introduction to cladistics (roughly a full page long), he did not include a single cladogram among the seventeen graphics that he used in the book to illustrate the phylogenetic relationships of various mammalian groups. I was disappointed not because I especially favor cladism, but because I do not understand why the author only introduced cladistics for cladistics' sake. Second, from my own bias, I was rather discontented with the author's formal classification of mammals into a dichotomous division of subclasses Prototheria versus Theria. In the past several years, new studies have shown that this tidy dichotomy of Mammalia, as once popularly thought, simply cannot reflect the much more complicated picture of mammalian evolution.

The following chapter deals with the origin of mammals from non-mammalian synapsids. This should be a very interesting subject. Unfortunately, it is neither well treated nor up to date. Contradictory statements are not difficult to find within the chapter. For example, the most recent common ancestry of a lizard and a cat is said to be back in the early Mesozoic in the opening paragraph of the chapter, but indicated as the end of the Carboniferous later on. Incidentally the latter is closer to the truth. A hard secondary palate is assumed to be "absent in reptiles" (p. 27); yet many non-mammalian synapsids that possess the hard secondary palate are allotted to the

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class Reptilia. It is stated that "In all mammals the skull and mandible articulate using the squamosal and dentary bones, and there are three middle ear bones -- the stapes, incus and malleus" (p. 27). Nevertheless, we are quite sure that, among "the first true mammals" discussed in the chapter, Megazostrodon still possessed a double jaw joint, and had not yet evolved a triossicular middle ear. In spite of my general criticism of the chapter, I did find my favorite line therein -- "The mammals had a long wait in the wings, but during that time they did one very important thing -- they survived" (p. 40).

The rest of the book consists of nine chapters, which introduce various mammalian groups from the points of view of their temporal and spatial distribution, their morphology and physiology, their locomotive and, occasionally, sensory adaptations, and their phylogenetic relationships. The author's grouping of those beasts is based variably upon what they eat, how they move, and where they live. The quality of each chapter ranges from excellent to marginal. The chapter on carnivores is the best, and the author's functional account of dentition and sense organs in those animals is especially good. Classification and phylogenetic relationships of "Insectivora" are now in a controversial but exciting flux, and the author's fear to burden the general readers with the issue is certainly understandable. Nonetheless, he has oversimplified the matter, and consequently has offered a classification even less acceptable than the existing ones. Additionally, while confronting the problem of "glires", the higher-level grouping of rodents and lagomorphs, the author stated that "they do not appear to be in any way related" (p. 128). This view seems both one-sided and outdated, and contradicts the current, though admittedly tentative, consensus. Among a number of osteological features that the author uses to characterize marsupials, many are just mammalian plesiomorphies, e.g., inflected angular process of the dentary bone and lack of bony auditory bulla. Characters like these cannot be used to diagnose a taxon.

There are other statements throughout the book that could be considered as either ambiguous or only partly true, or even incorrect. Some statements that sound so definitive are, in fact, beyond the limits of our confidence. A few examples of this sort include: "From the haramiyids evolved the multituberculates" (p. 42); "The passages of these (cranial arterial) vessels is [sic] standard for each family of mammals" (p. 21, words in the parentheses are mine); and the monotremes and multituberculates are closely related (p. 180).

Despite these negative comments about the text, I am indeed pleased to see this book standing, though outnumbered by dinosaur books, on the bookshelves of many bookstores and gift shops of zoos and natural history museums. I think that specialists might also be interested in having a copy, in particular as an invaluable source of terrific slides for lectures and talks.