

Book Review

The Mammalian Radiations: An Analysis of Trends in Evolution, Adaptation, and Behavior. By John F. Eisenberg. Chicago: University of Chicago Press, 610 pp. + xx, with 157 figures, 61 tables and 6 appendices, \$45.00.

A familiar bestiary eyes us from the cover: big cats stand above a herd of galumphing herbivores. But the scene changes with the first page, and we're reminded that most mammals are small, nondescript, and relatively unknown. Why are they interesting? Comparisons lead both to theories of social evolution and to ways of testing them. With this in mind John Eisenberg has collected data on every available species. In this massive, generous book he uses three perspectives to present his findings.

The first, a descriptive review, reflects the author's unique credentials. His twenty years of work with captive and wild mammals enables him to survey each Order with an astonishingly even hand. He covers the key features of their evolution, distribution, and natural history, all in about 10 pages per Order. The result accounts for half of the book. As a source of information and references it holds unprecedented value to anyone requiring an introduction to a particular group of mammals, or to the mammals as a whole.

A principal contribution of comparative analysis is to show how far some characteristics are constrained by others. This is the second perspective, an examination of relationships among life-history variables and body size. The volume

of facts is again remarkable, though as the author notes their validity is sometimes uncertain. The level of analysis is also somewhat crude: with so many relationships few can be treated in depth. Nevertheless a strong sense emerges of the way features such as home range size, metabolic rate, gestation length, longevity, and brain size are related in different Orders or trophic levels. At the same time we are implicitly reminded that the observed constraints are not fully understood. For example, there is a trend for bigger mammals to have small litters: so why do bigger tenrecs have bigger litters? Such exceptions stress that description should not substitute for explanation.

The third perspective is behavioral: patterns of behavior and social organization are compared across selected mammals. This is the least successful section, because it lacks a unifying theoretical framework. The choice of variables is therefore arbitrary. The author expresses the hope, devoutly to be wished for, that sufficient cases of convergence will be discovered to allow clear correlations of ecological pressures with behavior. But they have not been found yet, and seem more likely to be found when we know better what we're looking for.

So ambitious a book as *The Mammalian Radiations* could hardly expect to satisfy all its aims. It lacks confidence on theoretical issues

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and does little to evaluate the merits of reported studies. It is also somewhat out of date in the faster-moving areas, such as primatology. But such problems arise from the nature of the task, which is to broaden our sense of the diversity and relationships of the whole class of mammals,

from monotremes onward. In this remarkable endeavour it succeeds impressively.

Richard Wrangham
Department of Anthropology
University of Michigan, Ann Arbor