BOOK REVIEW


Teeth have long fascinated members of the general public and scientific communities alike. From the dagger-like canines of saber-tooth cats to the formidable tusks of mammoths to the ever-growing incisors of aye-ayes, mammals past and present exhibit considerable variation in the number, function, size and shape of their dentition. As the most highly mineralized, and thus well preserved, tissue in the body, dental remains have long been employed by paleontologists to offer a unique window into the behavior and evolutionary relationships of extinct species. Due to the greater diversification and central role of the mammalian dentition in food procurement and processing, analyses of tooth morphology have figured prominently in our understanding of the biomechanics and evolution of the feeding apparatus. Teeth likewise have been incorporated into the complex social fabric of mammalian communities, being involved in agonistic displays within and among taxa. Indeed, phenotypic variability in the mammalian dentition is anything but astounding. To the relatively uninitiated observer, however, this remarkable diversity can be daunting, if not simply overwhelming, especially given the breadth and increasingly disparate nature of the evidence regarding the function, development, genetics and phylogeny of mammalian teeth.

In part for these reasons, there have been several recent works directed at furthering our knowledge of mammalian teeth, most notably books by Lucas (Dental Functional Morphology: How Teeth Work, 2004, Cambridge University Press) as well as Teaford, Smith and Ferguson (Development, Function and Evolution of Teeth, 2000, Cambridge University Press). Such excellent tomes have differentially catered to scientific experts and/or professionals interested in specific aspects of the analysis of dental form and function. Into this fray, we find a new contribution from Peter S. Ungar, Mammal Teeth: Origin, Evolution, and Diversity (2010, Johns Hopkins University Press), devoted more to providing an entrée into the dentition of the myriad mammalian groups as well as overviews of the diverse approaches often employed to unravel the functional and evolutionary underpinnings of variation in dental morphology.

Mammal Teeth is divided into three sections. The first aims to provide a background into mammalian teeth, specifically what they are, how they grow, how they vary, why they vary, and a series of key terms and concepts. It also includes information on systematics and the classification of mammals. This organization facilitates a clear understanding of how one can examine dental form and evolution by providing a sensible analytical and theoretical context for interpreting evidence introduced in later sections. Subsequently, as a prelude to the discussion of recent mammals, the second section offers a review of the fossil record of early mammals and their precursors as well as an historical perspective on the origin of mammalian mastication. The book concludes by summarizing patterns of variation and covariation in dental anatomy for the recent major mammalian groups. While obviously not a goal of this final section, the presentation of information clearly delineated on a clade by clade basis allows one to skip to one’s group(s) of interest, if so desired. One particularly informative aspect of Mammal Teeth is the authors’ “Final Thoughts” often located at the conclusion of a subsection. These help to focus the reader’s attention on outstanding issues in the study of mammal teeth, thus introducing and reinforcing the notion that the means by which we analyze and investigate dental evolution itself is an evolving science.

In sum, Mammal Teeth is a very enjoyable and informative read. The author is quite knowledgeable and clearly excited about the subject of dental evolution. His considerable curiosity and broad-based interests in mammalian teeth are infectious, all of which keep the reader engaged throughout a book of 304 pages. Brief reviews of cutting-edge approaches to dental developmental genetics and biomechanics ensure that this volume is current vis-à-vis ongoing research in mammalian dental evolution. Although designed to impart a more general knowledge of the form and phylogeny of teeth that will allow undergraduates and graduate students to segue into more specific research topics on this subject, the depth of coverage and inclusion of detailed information (including many primary citations) on all mammalian groups also makes this an important resource for more seasoned experts in organismal biology, paleontology and biological anthropology. Given the inherently visual nature of the subject...