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0521619688 - Evolution of Tertiary Mammals of North America, Volume 1: Terrestrial Carnivores, Ungulates, and Ungulatelike Mammals

Edited by Christine M. Janis, Kathleen M. Scott and Louis L. Jacobs

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This book is a unique compendium and synthesis of the cumulative knowledge of more than 100 years of discovery and study of North American Tertiary mammals. A valuable contribution of this book is the detailed information of the distribution in time and space of each species at fossil localities, recorded in a uniform scheme, so that each chapter provides the same level of information.

Thirty-seven chapters are devoted to each particular family or order, written by a leading North American authority, including discussion of anatomical features, systematics, and paleobiology. Four introductory chapters summarize information on the geological time scale, Tertiary vegetation, and Pleistocene events, and four final chapters integrate systematic and biogeographic information for higher taxa.

This book will serve as a unique database for continuing studies in faunal diversification and change, and will answer questions such as how changing biogeography and climates influenced the evolution of mammalian communities. It will be an invaluable addition to the libraries of paleontologists and zoologists.

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Volume 1: Terrestrial Carnivores, Ungulates,
and Ungulatelike Mammals

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*To the memory Bryan Patterson,
his contributions to the study of fossil mammals, and
his dedicated mentoring of students (especially me).*

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Preface

CHRISTINE M. JANIS

This volume was originally conceived as a companion volume to the book by Maglio and Cooke (1978) on the evolution of African mammals. North America has a much richer fossil record than Africa, but, at least in the early 1980s when the idea for this book was first conceived, it had received much less attention, at least in terms of syntheses of Cenozoic patterns of faunal evolution. Perhaps this is because we are preoccupied with Africa, rather than North America, as the center stage for human evolution. A problem with the Maglio and Cooke volume is that there is no standardized layout for the chapters: Information is presented at different taxonomic levels in different chapters, and the method of presentation of faunal information is also idiosyncratic to each author (or locality information is absent entirely). Despite the large amount of useful information in the volume, it is very difficult to use it to reconstruct consistent faunal information of “what was where when.”

The initial aim in designing this volume was to have each chapter in a standardized format so every chapter would contain the same level of information, and faunal and biogeographical information could be readily extracted. Another prime motive was to present North American Tertiary mammals in a paleobiological context (hence the section entitled “Biology and Evolutionary Patterns” in each chapter), and to provide locality information on their distribution in space and time. This is in contrast to the volume edited by Woodburne (1987), which highlights the importance of mammals in biostratigraphy but does not emphasize systematics or paleobiology. The rich mammalian fossil record of North America should prove an excellent database for testing evolutionary hypotheses. Indeed, portions of the locality data gathered for the purposes of this volume (Van Valkenburgh & Janis, 1993), or similar databases of North American localities (Alroy, 1992), have already been used for this purpose. A recently-published compilation (Prothero and Emry, 1996) also provides information on taxonomy and stratigraphic occurrence for a number of North American mammal taxa, but from a limited portion of the Tertiary record: unfortunately, this book was published too late for most of its material to be incorporated into this volume.

A final, more personal, desire was to provide good restorations of extinct taxa for each chapter, and to this end I am exceedingly grateful to Brian Regal for the drawings that grace many of the chapters. The past couple of decades have seen a revolution in the restoration of dinosaurs as living animals, but extinct mammals have largely tended to be portrayed as if they were already stuffed and behind museum glass; virtually the only activity seen would be that of a sabertooth killing something! However, Brian has restored many extinct mammals in a variety of typically mammalian activities, including scratching and grooming. Note, also that many restorations for many of the chapters are of taxa that are not normally illustrated: For example, *Menoceras* (rather than *Teleoceras*) is illustrated for the Rhinocerotidae, and *Leptauchenia* (rather than *Merycoidodon*) provides an example of an oreodont.

This volume still represents only a portion of the fauna of North America: the paraphyletic groupings of the larger mammals, terrestrial carnivores and ungulates. However, in terms of the utility of mammal taxa in studies of evolutionary patterns, and so on, it is generally agreed that “macromammals” (i.e., those of greater mass than around a kilogram) provide a more reliable data source than smaller mammals (in part because of taphonomic problems of preservation; see, e.g., Behrensmeyer, Western, and Dechant Boaz, 1979). Certainly, macromammals can provide information on their own, and it has been suggested that macromammals and micromammals should be examined separately in faunal studies (Fortelius et al., 1996). The only macromammals missing from this volume are the edentates. North American Tertiary edentates are known only from the latest Miocene and Pliocene, and their faunal occurrences could easily be determined from the information provided in appendices I and II. The learning experience that we have obtained from editing this volume will make the task of producing Volume II much easier.

Thanks are due to numerous people. First, I must thank Kathy Scott and Lou Jacobs for the editorial work they put in at the inception of this volume, and Brown University and the University of Chicago for providing me with the facilities to edit this volume,

and for assisting with photocopying and postage. Many thanks also to Brian Regal, not only for the restorations of fossil mammals, but for the many instances when he “picked up the slack” in terms of other illustrations for contributors.

Unpublished (or at least, unpublished at that time) faunal information was kindly provided by Dan Bryant, Robert Emry, Ralph Eshelman, Dan Garcia, James Morgan, Alan Tabrum, and Mike Voorhies, and John Alroy was extremely generous in providing access to literature listings that he had gathered himself. Help with the faunal localities and their correlations was provided by Dave Archibald, Larry Barnes, Jon Baskin, Margery Coombs, Daryl Domning, John Flynn, Gregg Gunnell, Brook Ellen Hall, Jim Honey, Donald Kron, Dave Lambert, Don Prothero, Bill Simpson, John Storer, Alan Tabrum, and Richard Tedford.

Students who helped collate faunal lists, or with editing work, include Wendy Derman, John Hunter, Tricia Brady Wilhelm, Jeremy Kahn (Brown University), and Dennis Su (University of Chicago). Secretarial assistance was provided by Jean Padeloup (University of Chicago), Helen Shuman, and Carol Stewart (Brown University). Of the many contributors to this volume, some special thanks are due to certain people: Don Prothero, Gregg Gunnell, and Dave Archibald all provided extensive advice on the faunal listings; Earl Manning valiantly came to my aid with a couple of chapters at a relatively late date, and improved their content immensely; and the volume would probably not have been completed without continual infusions of encouragement from Jon Baskin.

Finally, I would like to thank my husband, Jack Sepkoski, for his continual encouragement and support through this editing process.

Jack and I were not yet together when I embarked on the production of this volume: I can only credit his patience and devotion to the fact that we are still together at its completion.

CHRISTINE M. JANIS

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