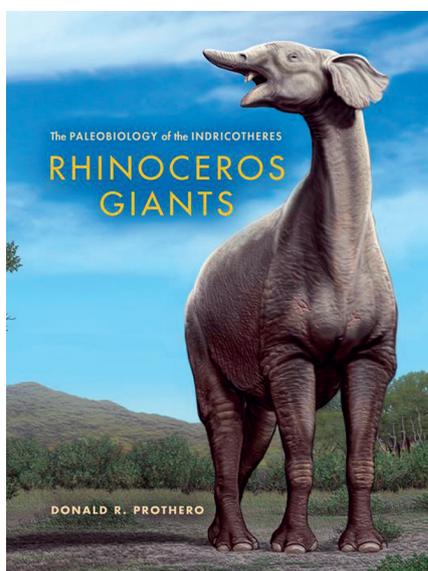




BOOK REVIEWS

Prothero, D. 2013. *Rhinoceros Giants: The Paleobiology of Indricotheres*. – Bloomington, Indiana University Press

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I have one vivid memory from my summer vacation between the 2nd and 3rd grade – discovering a ragged and faded copy of ‘All About Strange Beasts of the Past’ by Roy Chapman Andrews at a neighbor’s garage sale. To me, the most exciting chapter of this elementary-level book was Andrew’s obviously embellished recollection of the discovery of the mired ‘Beast of Baluchistan’ during the famous Central Asiatic Expeditions in the 1920s. The Beast is vividly described as longer than a school bus, nine feet taller than a giraffe, and as heavy as “the great dinosaur *Brontosaurus*”.

The size of the hornless Oligocene rhinocerotoid *Paraceratherium* (it has gone by many names) is main reason for its fame and it is not surprising that, along with mega-sharks,

mega-dinosaurs, and mega-crocs, there would be a book about mega-rhinos. The back cover of ‘Rhinoceros Giants’ boasts, “The life and times of the largest land animal that ever lived”. Nonetheless, Prothero acknowledges within the book’s pages that the size of *Paraceratherium* has long been greatly exaggerated. Andrew’s vivid description was derived from even earlier extrapolations made by American Museum of Natural History scientists (Granger & Gregory, 1935; 1936) who were likely biased by a desire to publicize their museum’s collections and exhibits. Using more rigorous statistical methods, Fortelius & Kappelman (1993) concluded indricotheres were about the same size as the largest of proboscideans.

Even if *Paraceratherium* is not a size record holder, it is the earliest terrestrial animal to have evolved a body size that approaches the upper physiological barrier for body size (for mammals) since the extinction of the dinosaurs. *Paraceratherium* is therefore a noteworthy paleobiological curiosity, yet surprisingly, the existing literature about it consists mostly of basic descriptive and taxonomic works. For this reason, 'Rhinoceros Giants' is understandably a short book. Prothero uses his exceptionally broad knowledge of mammal paleontology, geology, and paleoclimatology to fill out the book with ease, which, really, is an assemblage of chapters connected by the common theme of *Paraceratherium* though few of these chapters are directly about the giant rhino itself.

The first chapter is a biographical account of Andrew's discoveries of *Paraceratherium* in the Gobi Desert. Chapter 2 includes short biographies of other paleontologists whose research careers crossed paths with *Paraceratherium* fossils, including Henry Guy Ellcock Pilgrim, Sir Clive Forster-Cooper, Aleksei Alekseevich Borissiak, and Zhou Ming-Zhen (known in English as Minchen Chow). Chapter three reviews the Paleogene stratigraphy of Asia, emphasizing stratigraphic sections within which *Paraceratherium* fossils occur, including the Dera Bugti region of Southern Pakistan and other areas in Outer Mongolia, Kazakhstan, and Turkey. Chapter four walks the reader through the basic anatomy and evolutionary history of the Hyracodontidae, the extinct rhinocerotoid family of slender legged 'running rhinos' to which *Paraceratherium* belongs. Chapter five summarizes the complex and convoluted taxonomic history of *Paraceratherium*. Chapter six discusses body size, functional morphology, and biological constraints associated with giant size. Chapter seven reviews climate and faunal evolution of Asia and possible causes of *Paraceratherium* extinction. The final chapter suggests *Paraceratherium* extinction may have been exacerbated by the ecological impact of newly arriving proboscideans.

The book's greatest disappointment is its treatment of indricothere taxonomy. Having been discovered and named by a disparate assemblage of American, Western European, Russian, and Chinese paleontologists throughout the twentieth century, a menagerie of names have been applied to indricotheres. Prothero de-

fers to the taxonomic revision of Lucas & Sobus (1989) and disregards older and more recent works by Soviet and Chinese paleontologists, whom Prothero suggests do not view species as biological entities. In practice, Lucas & Sobus (1989) (and Prothero) are taxonomic lumpers in comparison to Chinese and Russian workers who would split *Paraceratherium* into many more taxa.

Chapter five argues that indricotheres belong to one genus, *Paraceratherium*. Despite the book's emphasis on the importance of the Biological Species Concept, the discussion of indricothere diversity focuses more on higher taxa (the genus) with little consideration given to indricothere species or phylogeny. If indricotheres are a monophyletic assemblage of multiple species (as all workers seem to agree), the number of genera to which indricothere species are assigned is not really a meaningful debate. The questions of indricothere diversity and the degree to which species overlapped in space and time are not satisfactorily resolved here. The rarity of good indricothere fossils prohibits adequate statistical analyses of population variation, making it difficult to understand indricothere diversity in terms of the Biological Species Concept.

Despite some shortcomings, 'Rhinoceros Giants' is a worthwhile volume to anyone interested in paleontological biographies, mammal paleontology, and the geological history of Asia. The short biographies of important Russian and Chinese paleontologists, which Prothero has drawn from other very brief publications about them, demonstrate gaps in the existing biographical literature concerning the history of paleontology. The geological and paleontological parts of the book, in particular, serve as a helpful introduction to the Paleogene of Central Asia and make use of a thorough and up-to-date bibliography. The degree of technical expertise required of the reader varies radically from chapter to chapter, but the volume brings together information that will be useful to some students and professionals and, to a lesser extent, popular readers with reading proficiencies in geology and paleontology.

Prothero, D. 2013. *Rhinoceros Giants: The Paleobiology of Indricotheres*. – Bloomington, Indiana University Press. 160 pp. ISBN 978-0-253-00819-0. Price \$42.00 (cloth). http://www.iu.press.indiana.edu/product_info.php?products_id=806719.

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