

BOOK REVIEW

## Chris Manias, *The Age of Mammals: Nature, Development, and Paleontology in the Long Nineteenth Century*

Pittsburgh: University of Pittsburgh Press, 2023. Pp. 488. ISBN 978-0-8229-4780-6. \$65.00 (hardcover).

Adrian Currie

University of Exeter

When reading the history of science, I am often expecting a specific theme or argument that provides a through-line for the rich historical detail: think of Martin Rudwick's focus on the discovery of deep time in *Bursting the Limits of Time* (2005), David Sepkoski's accounting of the palaeobiological revolution via revitalizing conceptions and analyses of the fossil record in *Rereading the Fossil Record* (2012), Lukas Rieppel's economic-ideological explanation of turn-of-the-century American palaeobiology in *Assembling the Dinosaur* (2019), or Elizabeth Jones's analysis of celebrity in driving molecular palaeontology in *Ancient DNA* (2022). Chris Manias's impressive new book, on the surface, eschews this approach by centring a particular group – mammals – and embarking on a global, intellectual, economic, social and institutional history of palaeontology across the nineteenth century.

By the nineteenth century's beginning, the protosciences that would become geology and palaeontology had established the existence of a history before humanity: deep time. But this past had hardly been populated. What were these pasts like, what creatures were found there and what might this tell us about the nature of life? Manias tracks how palaeontology became palaeontology over the nineteenth century via a global effort of fossil collection, interpretation and theorizing, an effort shaped and enabled by, and closely linked to, developments in European empire and colonialism and global responses to it.

Insofar as Manias's book has a central idea, it is that mammals were much more important and central to the development of palaeontology than is often realized, and that as such a mammal-centric history is needed. The case for the lacuna and its filling is achieved admirably: although I doubt anyone would deny Manias's central thesis, nonetheless a book of this nature fills a crucial gap in the history of the life sciences. A focus on mammals also highlights some of the driving theoretical issues underlying early palaeontology. As mammals were the presumed apex of life – us humans count as mammals, after all – they were at the centre of discussion of progressivist models of historical change, especially as Charles Darwin's ideas came online. Moreover, as mammal fossils are typically common, at least compared to those of other large vertebrates, they could be used to reconstruct evolutionary patterns and sequences. Further, analyses of mammals in a global context were closely linked to conceptions of the relationship between environment and biology more generally: 'The deep past was not just about monsters and strangeness (even if this could be part of its appeal), but the origin of the modern world' (p. 382).

The book is organized into three major parts, roughly tracking chronological periods, although the chapters themselves do not follow any kind of strict temporal narrative,

instead individually taking up particular themes or topics. Let us consider Part 3, for instance. Here, we have four chapters anchored to particular locations (South America, Australia, Africa and the United States). Meanwhile, Chapter 10 highlights the role of the horse, a lineage that formed the focus of reconstructions of particular sequences of evolutionary transformations, thus acting as an exemplar for evolutionary reconstruction. Chapter 9 focuses on the founding and flourishing of various institutions from museums to university departments. Each chapter's focus provides internal coherence, helped by Manias's admirably clear and enjoyable writing. The result is that chapters can be dipped into without too much attention required by the remainder of the book, while still together bringing out a rich picture of the development of palaeontology. A recurring theme through Part 3, for instance, is the ways in which researchers on the fringes of empire leveraged their access to fossils in order to maintain some power – as well as a kind of national identity – thus entering into intellectual debate with those from Europe and the eastern United States, while simultaneously impacting local, particularly indigenous, communities via extractive practices. (I found Chapter 11's discussions of South America particularly fascinating on this score.)

And so, although Manias's grand scope and expansive tether, mammals, undermines thematic or argumentative focus, this is a feature, not a bug. It is a wonderful demonstration of how good history can manage to be both global and local: different chapters highlight differing strands of the history of mammal palaeontology while, where possible, weaving various strands together. In Chapter 10's discussion of the horse, for instance, in a few pages we shift from scientific reconstruction of an evolutionary sequence, to the cultural reception of these ideas in light of views of horses as 'perfected' animals, to how this reception influenced models of evolutionary change and how horse-like reconstructions of *Eohippus* (an early ancestor) were.

A frequent refrain across the book's framing is that an over-focus on dinosaurs and reptile palaeontology has led to a skewed perception of the nature of nineteenth-century palaeontology, which a mammal-centric approach goes some way towards correcting. Manias pulls this off excellently, but it does leave me with a question concerning the split between mammal and reptile palaeontology. Manias has little to say about how sciences focused on these two groups interacted, and I wonder if this is an artefact of his historical focus or reflects a division in the development of palaeontology. That is, did palaeontologists in the nineteenth century themselves follow a split between the mammals and the reptiles, or is this impression the result of trends in how we have told that history? No doubt the development of the 'ages' (of fish, of reptiles, of mammals) that Manias's book's title references underwrites a kind of staged, progressive view of life's history. 'For mammals to truly reach their potential, the Earth itself had to move beyond the Age of Reptiles, into a new age of creation' (p. 208). But many of the major players of palaeontological history – Georges Cuvier, Richard Owen, Edward Drinker Cope, Othniel Marsh, and so on – contributed across palaeontology, from invertebrates to reptiles to mammals, and play (naturally) major roles in Manias's book as well. Indeed, as Manias frequently points out, palaeontology is closely tied to comparative approaches in biology; thus it would be odd to see reptile and mammal palaeontology as isolated. So I suspect a kind of artificiality is introduced in Manias's attempt to rebalance the scales.

In addition to filling a major lacuna in our history of nineteenth-century palaeontology, then, Manias also provides an argument that understanding science's history requires a complex weaving of themes across intellectual, economic, social and colonial perspectives. It is an impressive and often arresting achievement.