



Ice Age Mammals of North America: A Guide to the Big, the Hairy, and the Bizarre, by Ian M. Lange, 2002. Mountain Press Publishing Company, Missoula, Montana, 225 p., USD 20.00, ISBN 0-87842-403-2.

Ice Age Mammals of North America: A Guide to the Big, the Hairy, and the Bizarre goes beyond what the title suggests. Its longest chapter provides an overview of selected Pleistocene animals, highlighting their enormous size, unusual features, and hairiness—or lack thereof. This section is preceded by a synopsis of the geological and ecological context of this epoch and the science behind why there are ice ages and is followed by a summary of the Pleistocene megafaunal extinction and theories about their demise.

Chapter One gives an overview of what life would have been like during the Pleistocene. Chapter Two chronicles the shifting continents from the supercontinent Pangea, around 250 myr, to the modern continental configuration, emphasizing the role of paleogeography in allowing the movement of animals between North America, South America, and Eurasia over land bridges. Chapter Three summarizes glaciation events throughout Earth's history and highlights some of the current scientific research on ice ages, such as oxygen isotopes and pollen. Chapter Four delves into the different factors that may contribute to ice ages and their potential interactions, including Milankovitch cycles, volcanism, and more. Chapter Five highlights many of the large and unusual animals of the Pleistocene, including xenarthrans, carnivores, and proboscideans. Chapter Six gives an overview and brief discussion of the main theories about what caused the extinction of ice age mammals.

This book is content-rich across a spectrum of sciences and is filled with colorful illustrations, maps, graphics, and interesting sidebars. As an educator in a science museum, I was pleased to see the inclusion of metric measurements throughout the book—it is the international science standard, after all—and found it useful to have key references at the end of each chapter. The list of museums and fossil sites to visit in the USA and Canada is a great resource for readers, though incomplete—my own museum was not among those listed.

The vast amount of information contained in this book is one of its strengths, as is the historical context for the distribution and evolution of plants and animals during the Pleistocene and today. Most sections are written in a clear, concise manner with terms and concepts clearly explained, using a casual writing style and

humor. At other points, however, there is limited explanation of terms, particularly in some discussions in Chapter Five. A more extensive glossary would be useful, including geological and anatomical terms, such as moraines, strandlines, homogenized, concurrent species, and carnassials.

There are a few inconsistencies and some misinformation, such as the reference to amber as fossilized sap (it is actually resin), two slightly different translations of Pangea, and reference to tribe designation when it was not introduced in the sidebar on classification. At times the language about evolution is somewhat imprecise, with phrases like “begun evolving” and “changing to help meet the challenges,” and the horse evolution section does not make clear that *Eohippus* is a synonym for *Hyracotherium*.

There are a few things that would have enhanced the usability of this text, including: (1) basic skeletal and, in particular, dental anatomy, given the importance of teeth to studying fossil mammals; (2) a table or diagram summarizing glacial features and their interpretation (e.g., strandlines, polishing or mirroring, direction lines); (3) a table or map showing the movement of animals between the Old and New Worlds; and (4) a reminder of land mammal ages and overall classification of all the animals covered in Chapter Five.

It is obvious the author is enthusiastic about the topic and spent a great deal of time researching this book. The book paints a picture of what the Pleistocene would have been like, with an overview of ice age mammals and the physical and ecological impacts still visible today due to geological forces and intercontinental animal exchange. It is an ambitious undertaking and cannot possibly cover all the interesting life around during this time; rather it highlights the enormous, exotic, and unusual, such as flightless carnivorous birds. How can you not like a bird that can eat a horse (albeit not a modern horse)?

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