

the 'modern' history of science. While referring to other treatments by historians of science, Bowler's subject is the science itself — specifically, the ideas and disciplines seen against the shifting landscape of explanatory power. But this vantage point can be precarious. History of science has achieved two great advances in recent decades: to abandon the Whiggish view of judging history with the hindsight of present views (no white hats versus black hats), and to approach scientific efforts in the cultural, philosophical and political contexts of their times. Although Bowler almost playfully flirts with some current scientific insight into these questions, for the most part he is thoroughly engaged with the first advance. By contrast, except for a few digressions (such as a tantalizingly elegant analysis of the cultural context of W. D. Matthew's evolving views on biogeography), he avoids the second. To have included it would have made a far different (and far longer) book.

On the other hand, if the cultural context of historically important scientific issues is not explored, and if current views of these issues are not relevant (and Bowler shows effectively that the terms of these questions were entirely different in the past century), what is the contemporary reader to take away? Here history is not so much an object lesson as a snapshot of a parallel world. The failure of scientists to reach consensus on the monophyly of the arthropods, for example, was rooted partly in the patterns of embryological differentiation. The assumption prevailed that embryology was not subject to selection and thus to morphogenetic change. Therefore, because different 'arthropod' groups did not pass through all the same ontogenetic stages, they

could not have come from common origins, and so their adult forms must be convergent. The same kinds of fallacious arguments are raised today, whether the taxon is arthropods or birds, but the fields in conflict are as likely to be systematics and molecular genetics.

For Bowler, as an historian, the patterns are primarily historical, not scientific. The problem is that these questions usually do not attain historiographic resolutions but empirical ones, situated in their contemporary contexts of explanation. Bowler's time frame ends around the 1930s, but not all the questions he explores enjoyed a successful integration of anatomical, embryological and palaeontological traditions by then.

The chapter on arthropods succeeds wonderfully, but those on the origin of vertebrates and the emergence of tetrapods are less successful, and the narratives on bird and mammal beginnings end inconclusively. This is not the fault of Bowler's approach; it is just how history works.

Reading this book, one feels in the hands of a real master of the craft, buoyed by its supple and muscular prose, always confident of the vast expertise behind it. Cavils are minor: some episodes explored here have been studied historiographically not only by historians of science but also by palaeontologists, although the works of the latter are often overlooked. The few typographical errors tend to be concentrated among scientific names that could confuse nonspecialists. On balance, however, this book is one of Bowler's best. □

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Bridge to the past

Paul G. Bahn

American Beginnings: The Prehistory and Palaeoecology of Beringia. Edited by Frederick Hadleigh West. *University of Chicago Press: 1996. Pp. 576. \$75, £59.95.*

THE Bering Strait between Siberia and Alaska was named after the Russian explorer Vitus Bering whose expeditions took him there in the mid-eighteenth century. The term Beringia was coined by the botanist Erik Hultén in 1937 to describe only the land bridge that linked the two continents until it was inundated at the end of the Ice Age. But in the 1960s the term was expanded to include north-east Siberia and western Alaska.

This weighty tome certainly lives up to its subtitle, but not necessarily to its title. It comprises an almost encyclopaedic survey, by US and Russian specialists, of the prehistory of Beringia. The editor and the organizers of the different sections must be congratulated for ensuring that the 56 authors produced a series of admirably short articles packed with information. As Yuri Mochanov and Svetlana Fedoseeva put it, "the limited number of pages has forced us to provide descriptions for only the most important and representative relics of the late Palaeolithic".

Roughly a quarter of the book is devoted to palaeoenvironmental studies. It used to be thought that the land bridge was flooded by 14,500 years ago. Newer work has begun to suggest a more recent date of up to 11,000 years ago, although data based on insect remains indicate that a climatic amelioration was already under way by 12,500 years ago. Everybody agrees that the land bridge was a treeless plain. But there is a vigorous and polarized debate between those who, relying on faunal remains, see its landscape as a rich mammoth steppe, and those who, relying on localized pollen samples, believe it was much less productive tundra.

The palaeoenvironmental section is thorough and balanced but it seems bizarre that Dale Guthrie, the leading specialist on Alaska's ancient fauna, is represented only by an abridged article almost 30 years old. And the Russian palynologist Boris Yurtsev, a champion of the steppe tundra concept, is absent, as is Andrei Sher, one of the foremost palaeoecologists of Beringia.

Turning to the far longer archaeological section, it is certainly useful to have short summaries of all the main Alaskan sites gathered in one place, but infinitely more welcome to have similar summaries of the Russian sites available, together and in English. The sites are primarily open-air settlements, with a few caves on either



NATIVE Americans relied on the buffalo as a source of food and spiritual power. But the animal was nearly exterminated in the nineteenth century. In *Buffalo Nation: History and Legend of the North American Bison*, Valerius Geist describes the war waged against the animal by the US army, and its rescue from the brink of extinction in one of the earliest conservation success stories. *Voyageur*, \$35.