

an analytical framework for the strength and stability of thawing soils, and is critical to an understanding of cryogenic slope instability.

Explanations and descriptions of landforms and processes are generally clear and extremely well illustrated with photographs. However, the literature on which this account is based generally dates to the 1960s, 1970s, and early 1980s. The lack of up-to-date material may not detract seriously from the book as far as the layman is concerned, although valuable insights are, in consequence, omitted. However, for specialists and for students, this reduces the value of this book. As an example, take the work of Professor J.R. Mackay, surely the leading permafrost scientist of the later twentieth century. The most recent reference to his work in the book is from 1981. Thus, the fascinating and informative observations by Mackay on such topics as pingo formation, thermal contraction cracking, and mass-movement processes are, sadly, not included.

The third section of the book deals with the special problems associated with construction, mineral extraction, and the provision of transport and services in permafrost terrain, and the likely impacts of climate change in the permafrost zone. Again the focus is on the North American continent in general and Alaska in particular, but many excellent photographs, including 24 colour plates, provide superb illustrations of the more dramatic consequences of human activities. Chapter 5 begins with a description of techniques used in gold extraction in Alaska and northern Canada, then describes the engineering solutions adopted to avoid thaw subsidence of buildings and transport links, and finally briefly describes pipeline construction methods. Chapter 6, entitled 'Permafrost in transition,' commences with a useful summary of the geological history of climate change, and this palaeoclimate record is used to place trends in the late twentieth century into perspective. The author then provides a brief explanation of the greenhouse effect, before assessing potential changes in permafrost distribution in Alaska and northwestern Canada. Impacts discussed include increased slope instability, increased methanogenesis in thawed wetlands, and geochemical changes resulting from permafrost degradation. Anecdotal accounts of the effects of permafrost degradation in the Fairbanks area are scattered through this chapter.

Finally, three appendices are provided. Appendix A gives further background on the physics of ground freezing, essentially a more in-depth treatment of selected items from chapters 2 and 3. Appendix B presents soil classification schemes for describing cryogenic soils, and Appendix C lists 'accessible places where permafrost and active-layer features can be seen.' These locations are inevitably all in Alaska or northwestern Canada.

This book is clearly written, with a journalistic style that makes for easy reading. It should prove a fascinating and instructive resource for those who wish to understand the geocryological processes operating in permafrost environments, and the landforms that they generate. The

earlier chapters will prove valuable to many earth scientists working on cryogenic phenomena. The strong North American (Alaskan) bias clearly reflects the experience of the author, and does not necessarily detract from the book for the interested layman. The specialist, however, is likely to be more aware of its limitations in terms of the permafrost environments and the geographical location of the examples given. Notwithstanding this, Neil Davis' book could form the basis for an excellent introductory course in geocryology, although the scientific literature on permafrost landforms would need updating. (Charles Harris, Department of Earth Sciences, Cardiff University, PO Box 914, Cardiff CF10 3YE.)

**ENCYCLOPEDIA OF PREHISTORY. VOLUME 2: ARCTIC AND SUBARCTIC.** Peter N. Peregrine and Melvin Ember (Editors). 2001. Dordrecht: Kluwer Academic Publishers. Illustrated, hard cover. ISBN 0-306-46256-7. £138.00; US\$200.00; Eur210.5.

I love encyclopedias. Between two covers is an up-to-date, accurate, and comprehensive survey of information on whatever the encyclopedia is about: English literature, women in aviation and space, British sport, aging, and Heaven, to name but a few. When I hold an encyclopedia in my hands, I feel the weight of the summarized, alphabetized, and synthesized compendium of knowledge about a given topic. It gives me a feeling of well-being to know that I can peruse the encyclopedia generally over a sandwich at my desk, or delve into it deeply and with intent, the initial step in the serious pursuit of an unfamiliar topic.

Therefore it was with some disappointment that I read the *Encyclopedia of prehistory, volume 2: Arctic and subarctic*, edited by P.N. Peregrine and M. Ember.

My dissatisfaction does not lie with any of the essays written by the 14 non-editorial contributors, each of whom tackled the formidable task of presenting a reasonably detailed overview of an archaeological tradition. These essays are well written and informative, providing a synthesis and a starting point for the non-specialist. Particularly valuable is the detailed bibliographic information. The most informative essays are those in which authors break down the archaeological tradition into sub-traditions and important sites, providing extremely detailed and rigorously referenced information. Many of these contributions will be very useful for teaching university-level prehistory courses.

Rather, my disappointment lies with areas under editorial control: geographical and cultural coverage, quality of maps, organization of the volume, and copy-editing.

To deal with each in turn, I was surprised that an encyclopedic coverage of Arctic and sub-Arctic prehistory does not include those areas of Norway, Sweden, Finland, and northwest Russia that lie north of the Arctic Circle. The prehistoric peoples who inhabited these regions have much in common with those who lived in northernmost North America and north Asia. Because prehistoric

circumpolar peoples lived in similar seasonally regulated and periodically rich environments, there are many similarities of subsistence, settlement patterns, technology, social organization, and developmental trajectories. In this context, differences are highly significant. The encyclopedia is published in conjunction with the well-respected Human Relations Area Files (HRAF). One of the purposes of the HRAF is to facilitate cross-cultural comparisons. By excluding a significant portion of the Arctic and sub-Arctic prehistoric world, this volume loses an opportunity to provide a basis for broader and more interesting comparison.

Within Arctic and sub-Arctic North America, coverage is incomplete. Notably absent are the Maritime Archaic Indians of Labrador and Newfoundland. Maritime Archaic Indians were the first inhabitants of Labrador, arriving at least as early as 8000 years ago. Five hundred years later they built the oldest burial mound in North America, and three and a half thousand years later, in Newfoundland, they created the largest Archaic cemetery in the far northeast. Yet the only mention of Maritime Archaic Indians is by way of passing in Robert Park's coverage of pre-Dorset, where he brings up the important issue of cultural interactions on the Labrador coast. As for the Labrador coast, despite its rich and well-published prehistory, it is not even in the index. The impression given is that the North American Arctic and sub-Arctic have only one coast.

Other uneven coverage is due to the senior editor pinch-hitting for authors who were unable to write their pieces on time or at all, as acknowledged in the editor's preface. Consequently, for eight topics (Dorset, Amur Palaeolithic, Amur Neolithic and Bronze Age, Early Northwest Coast Pebble Tool Tradition, Northern Archaic, Palaeo-Arctic, Shield Archaic, and Siberian Protohistoric) a very short summary stands in for a more comprehensive piece, unintentionally de-emphasizing certain cultures. I am most familiar with Dorset Palaeoeskimo prehistory, and frankly I cannot imagine publishing such a volume without including comprehensive treatment of this core culture. I cannot comment on the other seven areas.

A regional survey of prehistory must be visual and spatial as much as textual. It is essential that every site mentioned in the text be located on an accurate and readable map. It would also be very useful to have line drawings or black-and-white photographs of diagnostic tools and features. Unfortunately, this volume has no illustrations and does not provide a detailed map for each cultural tradition.

Instead, it has a section of 15 maps, which are meant to portray large cultural areas through slices of time. These maps leave a great deal to be desired. They are visually unpleasant with jagged lines and heavy straight-line labelling, they are so generalized that they portray almost no information, and there are some errors. For example, two of the maps (#2 and #4) meant to show the distribution of Arctic North American cultural traditions in fact show

north Asia. One of the north Asian maps meant to show the major cultural traditions at 2000 BP (map #9) includes the significantly earlier Mesolithic and Neolithic. Maps #5 and #6 erroneously show the Shield Archaic extending eastward to include the coast of Labrador. The coast of southern Labrador and the island of Newfoundland, both with a rich sub-Arctic prehistory, are not included in any of the time slices.

I could not work out how the contributions in the volume are organized, since they are not presented chronologically or geographically. For instance, of the 31 contributions, early northwest coast is #6, late northwest coast is #12, and middle northwest coast is #14. Dorset Palaeoeskimo (2800–700 BP) is sandwiched between Cis-Baikal Neolithic and Bronze Age (8000–3000 BP) and early northwest coast (9500–5500 BP).

Finally, the copy-editing is not as good as it could be. There are spelling errors (page 23: 'mossess'), inconsistent use of style (page 28: '1 or 2 structures', but page 29: 'three to five families') and some words that don't look quite right (page 29: 'kayaklike boats'). There is at least one example of an acronym used without first explaining what it stands for, and without using it again (EAST for eastern Arctic Small Tool Tradition, page 28).

If an encyclopedia is an accurate and complete compendium of all available information on a certain topic, then this volume cannot lay claim to being an encyclopedia of Arctic and sub-Arctic prehistory. Too much is missing and there are too many errors. Sadly, given the high quality of many of the individual contributions, this volume does not weigh as heavily in the hands as it might. (M.A.P. Renouf, Archaeology Unit, Department of Anthropology, Memorial University of Newfoundland, St John's, Newfoundland A1C 5S7, Canada.)

**ICE DRIFT, OCEAN CIRCULATION AND CLIMATE CHANGE.** Jens Bischof. 2000. Berlin, Heidelberg, New York: Springer-Praxis. xvi + 215 p, illustrated, hard cover. ISBN 1-85233-648-X. £70.00; \$US105.00; DM210.

The first problem with this book is that the title is misleading. The aspiring reader quite reasonably expects to encounter a book that informs him about the relationship of sea ice and icebergs with ocean circulation and with climate change. Instead, it deals with none of these things, or at least deals with them as viewed through only a single narrow window, that of the record of ice-rafted debris (IRD) left on the seabed. Therefore we are dealing with a highly specialised book, which gives a detailed and rather contentious view of historical changes in high-latitude ocean circulation based on a single source of data. These results are often unsupported by other evidence, and the interpretations are flagrantly in opposition to what is suggested by other sources of data, such as ice cores, tree-ring data, etc.

A typical set of such assertions concerns reversals in the current systems in the Norwegian Sea during the Holocene. The distribution of coal fragments (fig 5.10) in