

## REVIEW

A. L. WASHBURN. *Periglacial processes and environments*. London, Edward Arnold, 1973. [viii], 320 p., illus. £8.50.

SINCE it appeared in 1973 this book has established itself as the standard text on periglacial geomorphology. Inevitably it will also find wide acceptance among research workers and students from related disciplines who are interested in the functioning of high-latitude and high-altitude environments.

As one of the patriarchs of periglacial geomorphology, Lincoln Washburn has written a wide-ranging text which draws widely upon his own field-work experience and also upon his vast knowledge of the periglacial literature. At the same time the publishers have designed a book of immediate appeal. Although the format is unusual and somewhat awkward (pages are only 180 mm high but 250 mm wide) the layout of text and figures is spacious and easy on the eye. There is a profusion of photographs, maps and diagrams, and mostly these appear in more or less the "right" places in the text. All of the photographs are printed in monochrome, but some of the more complicated maps are colour-tinted. At the head of each chapter there is a summary of chapter contents, and a liberal use of sub-headings makes the book straightforward to use as a reference work. There is a long consolidated bibliography at the end of the book, very clearly laid out and including many articles from the early 1970's. A particularly pleasing feature of the bibliography (and indeed of the whole book) is the attention paid to Russian and Eastern European work, which is all too often neglected in English-language texts.

The organization of the book is for the most part logical, although the author has clearly experienced difficulties over the placing of his discussions of certain landforms. There are twelve chapters in all. The first three are by way of an introduction to periglacial environments, dealing (rather cursorily) with climatic and other environmental factors before going on to a more detailed discussion of permafrost terminology and characteristics. By far the longest chapter in the book is ch. 4, on frost action. This covers 112 pages and includes a valuable survey of freezing and thawing processes, followed by sections on frost wedging, frost heaving and thrusting, frost cracking, and patterned ground. Much of the illustrative material comes from the author's best-known "field laboratory", the Mesters Vig area of north-east Greenland. Most of the content of this chapter is admirable, although it is a pity that features like string bogs, palsas and pingos had to be dealt with here. Ch. 5, on mass wasting, is an excellent summary of slope processes in areas subject to frost action, again including much original data from north-east Greenland. The remaining chapters are less detailed, dealing with topics such as nivation, fluvial action, lacustrine and marine action, wind action and thermokarst. The final two chapters present an "environmental overview" of the ranges of specific periglacial phenomena (ch. 11) and a number of interesting environmental reconstructions for Eurasia and North America, using the evidence of fossil features (ch. 12).

It may be apparent from this summary of the book's contents that the chapter-by-chapter treatment of major themes is very uneven. For instance, ch. 6-10, all dealing with highly significant components of the periglacial environment, cover only 35 pages, and many of these pages are given over entirely to illustrations. It is frustrating to find that high-latitude coastal processes are dealt with in only two pages of text, while talus slopes get only a brief mention. To a European inhabitant of the mid-latitude zone, where many Pleistocene environmental reconstructions have to be attempted from interpretations of thick pseudo-stratified periglacial slope deposits called "head" or "grèzes litées", it is again frustrating to find that the book has less than half a page of relevant text and next to no guidance on their formation. Perhaps the most severe criticism of the book is that there is no coherent treatment of segregated ice

masses, which are most important components of the periglacial environment in many continuous permafrost areas. True, ice-wedges and pingos *are* dealt with briefly, and there *is* a brief chapter on thermokarst; but a single chapter dealing with the differential expansion and differential collapse of bodies of ground ice would have been much more satisfying. Another minor criticism concerns many of the maps (especially those derived from Russian sources), which are far too complicated for the comfort or comprehension of the average reader. Finally the index, which is admirably detailed, is all too often inaccurate in its page references.

Some of the points made here are the result of personal taste, and they do not by any means reflect upon the quality of the meal. Clearly Professor Washburn has spent most time on preparing his favourite dishes, and who will blame him for that? It is just that, having enjoyed the tasty *hors-d'œuvre* and having feasted splendidly upon the main course of frost action and mass wasting, we are a little disappointed by the undercooked and hastily-served dessert. But an equal treatment of all topics would have turned this into a very big book with a very big price. We are thankful for what we have: an attractive and stimulating text which is very reasonably priced and which is at the same time the most authoritative and comprehensive review of the periglacial world yet published. Glaciologists will do well to read it, for the periglacial regions tend to be the places where glaciers are born. The book is certain of a place on the bookshelves of all who are interested in high-latitude geomorphology, ecology and environmental management.

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