

## REVIEW

CLIFFORD EMBLETON and CUCHLAINE A. M. KING. *Glacial geomorphology*. [*Glacial and periglacial geomorphology. Second edition. Vol. 1.*] London, Edward Arnold, 1975. x, 573 p. £17.90 (cloth), £8.95 (paper).

WHEN Embleton and King brought out their *Glacial and periglacial geomorphology* in 1968, they made an outstandingly useful and scholarly contribution to the literature. A synthesis of results of original research relating to the processes, both erosional and depositional, associated with the formation and characteristics of glacial landforms had not previously been available. Advances in glacial research during the last decade have been so substantial as not only to warrant a new edition but also to cause the authors to bring it out in two volumes, separating off the periglacial material.

*Glacial geomorphology* follows its predecessor very exactly in both outlook and structure. A great deal of the original material remains completely unchanged. The authors have kept abreast of the rapidly expanding literature and new sentences, paragraphs and sections have been inserted into the text, for the most part very successfully.

The authors occasionally show some reluctance to take up a definite standpoint on the validity or utility of a hypothesis or line of investigation, for example McCall's notion that the erosive effectiveness of boulders in ice cannot increase below depths of about 22 m (p. 252). The chapter on "Indirect effects of Pleistocene glaciation" is distinctly less authoritative than the rest, the section on "Pluvial periods in extra-glacial regions" being positively misleading. It is surprising to find glacial maxima still being correlated with pluvials in the lower latitudes. Even in the south-west of the U.S.A. it seems unproven that there was an increase in precipitation during the major glaciations (Galloway, 1970). Recent research has made it increasingly clear that the last major glaciation coincided with arid, not pluvial, conditions in Africa, Australia and probably South America (Williams, 1975).

For the rest, this text benefits greatly from the authors' wide personal experience of glacial research. It is attractive in format and very well illustrated. It is no longer quite alone in its field; other approaches are available elsewhere but they do not duplicate this work which deserves to keep a central place in the literature.

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## REFERENCES

- Galloway, R. W. 1970. The full glacial climate in the southwestern United States. *Annals of the Association of American Geographers*, Vol. 60, No. 2, p. 245-56.
- Williams, M. A. J. 1975. Late Pleistocene tropical aridity synchronous in both hemispheres? *Nature*, Vol. 253, No. 5493, p. 617-18.