

REVIEWS

S. K. RUNCORN, *ed.* *Continental drift*. New York and London, Academic Press, 1962. xii, 338 p. (International Geophysics Series, Vol. 3.) £4 6s.

CONTINENTAL drift is of great importance to glaciologists as it affords the only credible explanation of the Permo-Carboniferous glaciation of the now widely separated Southern Hemisphere continents. Wegener's theory was shelved on geophysical grounds and the appearance of this stimulating book is ample proof that the geophysicists have repented. It consists of easily readable contributions by a dozen experts from quite widely different geophysical fields. In all of them, however, movements in the crust and mantle, only slightly less spectacular than those involved in continental drift, are somewhere postulated.

Recent interest in continental drift has been revived by palaeomagnetic studies which are reviewed in the first chapter by the editor who is himself a vigorous worker in this field. The palaeomagnetic data are reconciled with the palaeoclimatic data in the second chapter. The next three chapters discuss large horizontal movements in the Earth's crust as revealed by earthquake and magnetic studies. That the search for a mechanism usually involves a consideration of thermal convection in the Earth's mantle is largely due to the work of Vening Meinesz who has contributed a most illuminating chapter, which is followed by one in which the theory of convection in spherical shells is developed and applied to the Earth's mantle. Convection is also involved in some of the mountain-building hypotheses which are fully discussed (and all found wanting) by Chadwick. The two-thirds of the Earth under water are not ignored. The longest chapter deals with the deep sea-floor in which Heezen discusses the drift hypotheses. Dietz is given the succeeding chapter to present his "sea-floor spreading" mechanism. Gaskell, in the final chapter, concludes that the differences between the Pacific and Atlantic Ocean floors may well be due to drift. The book concludes with a chapter devoted to Wegener.

No specific pronouncements about continental drift are made in this book, the aim of which the editor says has been to stimulate. By taking us to the frontier in so many fields, one feels it will be stimulating for some years to come.

M. AFTAB KHAN

J. TRICART and A. CAILLEUX. *Traité de géomorphologie. Tom. 3. Le modèle glaciaire et nival*. Paris, Société d'Édition d'Enseignement Supérieur, 1962. 508 p., illus.

THIS book is one of a series devoted to various aspects of geomorphology, written by two of the leading French workers in this field. Snow and ice produce very distinctive modifications of the landscape, which are discussed in detail in the book. The first section deals with glaciological data, beginning with the nature of snow and its distribution, and going on to discuss different types of glaciers. Throughout the book the emphasis is on the geomorphological significance of ice and snow. The study of present-day ice cover is followed by a discussion of past ice ages and a short section on Pleistocene chronology and stratigraphy. The second part deals with the dynamics of ice movement and stresses the paucity of data concerning the flow of ice at depth. Most of the recent views on glacier flow are mentioned, and a fair assessment of the present state of knowledge in this field is given, although it is not always related to the morphological forms that glacier flow produces and which are described in the rest of the work. The discussion of glacier flow is followed by an account of the theories of glacial erosion. In the third section the processes operating to erode typical glacial landforms, such as cirques and glacial troughs, are considered in detail, following a valuable section on the geomorphological significance of avalanches. The section ends with a discussion of the processes operating on the margin of the ice, in which deposition plays a significant part and melt water becomes one of the dominant forces in operation. The morphological effect of a sequence of glacial stages is discussed in the last section; the features