

newly created Chair of Cloud Physics in the University of London. His larger text (*The physics of clouds*, Oxford, Clarendon Press, 1957) epitomizes the results of the decade of active research to which his elegant experimental techniques have contributed so much, as those who know his papers will acknowledge.

In this concise introduction to the subject we begin with a summary of cloud forms and features. Nuclei of cloud condensation and growth of cloud droplets will attract many who want a summary of progress in recent years. Glaciologists will find the two chapters on the germination and growth of snow crystals, and on snow, rain and hail as precipitation especially interesting, although the emphasis is on events in the atmosphere. Nakaya's work on crystal growth in this field has been extended by Mason and Hallett. Chapters follow on rainmaking experiments and on the electrification of thunderclouds.

Glaciologists who want a compact, up-to-date and readable account can be strongly recommended to this book. Physicists will welcome the descriptions of experimental techniques. The only criticism the reviewer would make is that readers will find it difficult to pick up many of the references, e.g. to Bowen's work in Australia or "the work of the Cambridge school" (p. 118) as there is no full bibliography or list of papers, although a few sources are named in footnotes and captions. Otherwise, an excellent and delightfully compact account.

GORDON MANLEY

ADRIAN E. SCHEIDEGGER. *Principles of geodynamics. Second edition.* Berlin, etc., Springer-Verlag, 1963. xii, 362 p., illus. DM. 49.60. (Distributed in U.S.A. and Canada by Academic Press, Inc., New York.)

THE five years that have passed since the appearance of the first edition of this book (reviewed in the *Journal of Glaciology*, Vol. 3, No. 25, 1959, p. 432-34) have seen a considerable increase in the effort devoted to geophysical research, and this is reflected in an increase in its size from 280 to 362 pages, with a more than proportionate increase in the number of diagrams. The new material, as might be expected, comes mainly from the rapidly expanding field of marine geophysics, although references to all parts of the literature have been brought up to date. As with the first edition, the bibliography includes many papers by Russian and German authors which may be unfamiliar to English-speaking readers, and a book of this kind is all the more valuable for drawing attention to them. This exoticism, however, sometimes leads to the more standard work being given barely adequate treatment (the reviewer finds this true of the section on palaeomagnetism, and specialists in other fields might well make similar complaints) or even to the inclusion (for example, on p. 268) of hypotheses of marginal importance apparently for no other reason than to give the author the pleasure of demolishing them. He would presumably argue that ideas which offend physical laws must be publicly demolished if they are not to be perpetuated, and that those which offend only existing geophysical data should at least be noted in a book of this kind so that they may be reconsidered if the balance of the evidence is changed as further research is carried out.

The new edition has enhanced the value of the book as a review of the subject and as a source of further information. It is to be hoped that Dr. Scheidegger is already collecting material for the third edition that will surely be necessary within the next few years.

R. F. KING

*Brekart over Sør-Norge, utarbeidet på grunnlag av flyfotografier (vesentlig fra 1955). Glacier map of southern Norway, compiled from air photographs (mainly from 1955).* 1 : 500,000. [Oslo], Norges Vassdrags- og Elektrisitetsvesen, 1963.

*Oversikt over breer i Skandinavia. Glaciers in Scandinavia.* 1 : 1,600,000. [Oslo], Norges Vassdrags- og Elektrisitetsvesen, Den Hydrologiske Avdeling, 1963.

THESE two maps have recently been compiled under the auspices of the Hydrologiske Afdeling of Norges Vassdrags- og Elektrisitetsvesen and of Norsk Polarinstitut.

On the first map, constructed by Dr. O. Liestøl and Dr. G. Østrem, nearly all the glaciers in southern Norway are plotted; many details, however, are omitted for practical and technical reasons. The map gives the general pattern of the glaciers as they appear on air photographs dating mainly from 1955.

On the second map, made by Dr. G. Østrem, the glacier outlines are plotted from different sources: old and new maps, sketches, and air photographs made in different years, including a Swedish glacier map made in 1960 by Dr. V. Schytt. In 1962 Dr. L. Vilborg revised Dr. Schytt's map, adding some fifty glaciers, and this revised map was used by Dr. Østrem. Owing to the fact that the information was obtained from so many different sources, varying accuracy in the map may have resulted. The most accurate parts, compiled from recent air photographs, have been marked with a green screen. Outside these areas the map gives only a very approximate outline of glaciers or glaciated areas.

More detailed maps of the glaciers in northern Norway will be made as soon as a better air photograph coverage is available in that part of the country.

The above notes have been amplified from material supplied by Dr. Gunnar Østrem, who has presented the maps to the Society's library.

G. SELIGMAN

JEAN TRICART. *Géomorphologie des régions froides*. Paris, Presses Universitaires de France, 1963. [iv], 289 p. ("Orbis", Introduction aux Études de Géographie.) Fr. 24.

THIS is a complete work on the effects of cold upon the Earth's surface. It is divided into three sections; the first deals with the areas of glaciation (former glaciers), glacierization (existing glaciers) and permanent snow cover throughout the world. It touches on the cold periods in geological history, although concentrating more upon those prevailing in the Quaternary.

The second section describes the effects of frost action, periglacial features, and erosion by air and by water. The term "permafrost" is not used, although the conditions are described in other language.

The third section is the longest. It is devoted to snow, ice and glaciers, beginning with snow and its transformation into ice. The author proceeds with consequences of snow and ice action, plain erosion and avalanche action. Cirque formation and classification are dealt with in a very interesting way. As one would expect from their importance, much space is devoted to the effects of erosion by glaciers and ice caps, to the morphology of the glacier margin, and of the land over which the glacial waters flow.

As the author points out, the importance of an account of the conditions in the cold regions of the Earth in comparatively recent times, naturally explains much of its present geomorphology, not only for scientific reasons but also for its economic applications.

There is a minor criticism which must be made—the lack of an index—but this is to some extent compensated for by a more than usually detailed list of contents.

G. SELIGMAN