

interesting. If the ice pressure on a dam is calculated on the assumption that the ice surface remains plane, and that the pressure arises because thermal expansion is restrained, the pressures calculated are much too high. It seems that buckling of the ice sheet plays an essential part. The author proposes to use his expansion measurements in a theory, as yet undeveloped, which will include buckling. His figures agree, in general, with those of other workers; but in tests on artificial ice he finds a variation of 30 per cent in the coefficient, which he attributes to the presence of impurities and to the influence on them of the thermal history of the specimen.

J. F. NYE

CRARY, A. P., *and others, ed.* Antarctica in the International Geophysical Year, based on a symposium on the Antarctic. *Geophysical Monograph*, No. 1. Washington, American Geophysical Union, 1956. (National Research Council Publication No. 462.) vi, 133 pages, map in folder at back.

THIS geophysical memoir is based on a symposium on Antarctica held in April 1956. It consists of 16 papers by different authors, explaining first, the general International Geophysical Year programme of the United States, and secondly, the work to be done in the Antarctic during the International Geophysical Year. The papers fall broadly into five sections: general, geographical and meteorological, geological and structural, upper atmospheric physics and lastly flora and fauna. The collection has been well edited and despite the width of the field covered the memoir is very readable.

The papers are short, generally 5–10 pages, which means that no one topic can be carried very far. Most papers are, however, followed by good selective bibliographies. The general reader will find that this volume gives a survey of our knowledge of Antarctica at the beginning of the forthcoming Geophysical Year when a third of the continent “still remains to be seen or photographed for the first time”. The greater number of the contributions are related to suggestions of research topics connected with the I.G.Y. programme, but one or two, notably the paper by Duncan Stewart on “The petrology of Antarctica,” are up-to-date surveys of our present knowledge in certain branches of science.

Only one paper deals directly with Antarctic glaciological research, but since the Antarctic continent is 99 per cent ice-covered, many of the other problems discussed are clearly related to glaciology. The paper on “Objectives of Antarctic glaciological research,” by R. P. Sharp, gives a good summary of the main glaciological problems to be tackled by the I.G.Y. parties in the Antarctic and briefly considers such topics as the total volume of the ice, crystal fabrics, glacier movement, climatic fluctuations and the Ross Ice Shelf. There is also a short paper on “The Weddell Sea”.

The geological and structural section of the memoir contains a list of all the minerals ever reported from the continent, together with the detailed analyses of 234 rocks and minerals. There is also a stimulating discussion by M. Ewing and B. C. Heezen on “Some problems of Antarctic submarine geology”, which includes results of the latest work in this field.

A major section in the memoir is devoted to papers of a more strictly physical nature, and these deal with geomagnetic disturbances, ionospheric conditions, cosmic ray experiments and the aurora australis. This section contains a list of auroral stations with their particulars for the years 1841–1940.

The volume is accompanied by a two-colour map of the Antarctic on a stereographic projection and on a scale of 1 : 6,000,000. The greater part of the map, which is 3 ft. 6 in. (107 cm.) square, is blank and illustrates that our knowledge of the Antarctic is indeed still very rudimentary. The memoir is well-produced and is illustrated by clear line blocks; the most significant omission is an index.

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