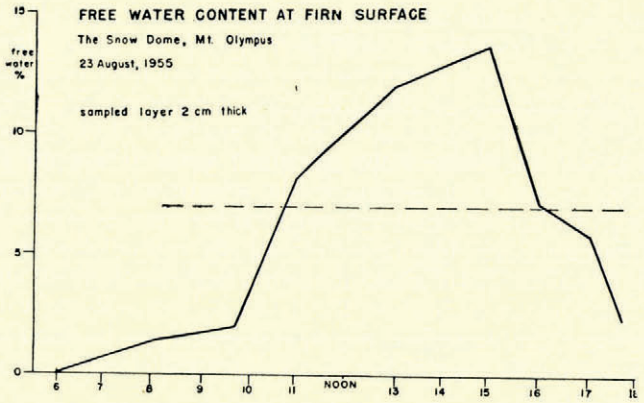

Fig. 2

The curve shown in Fig. 2 is not the one which would be expected if any large quantity of water were retained in the snow by surface tension. In the early morning and late afternoon, when the quantity of free water present in the snow fell below the critical amount retained, no water would be extracted by centrifuging, and the gradual rise in free water content from the zero value of the frozen crust would not be noted. If, for instance, the amount of water retained were equal to that found for sand and gravel, approximately the part of the curve in Fig. 2 shown above the dashed line would be obtained. As this was not the case, the error due to water retained after centrifuging apparently is lower with snow than with sand or gravel, though the evidence is not conclusive.

It is possible that in actual field operation the two principal sources of error, being of opposite sign, may tend to cancel.

Though sufficient data have not been obtained with this test instrument to warrant additional conclusions at this time, the centrifugal method of measuring free water in melting snow does merit further attention. Simplicity of the equipment and rapidity of operation commend the method to the field worker. More tests are planned, but this preliminary discussion is presented here in the hope of stimulating wider interest in the method.

These tests were performed as part of a project in glaciology supported by the Agnes Anderson Research Fund, University of Washington, and the Arctic Institute of North America under contract with the Office of Naval Research. The support of these agencies is gratefully acknowledged.

MS. received 11 *October* 1955

REFERENCES

1. Halliday, I. G. The liquid water content of snow measurement in the field. *Journal of Glaciology*, Vol. 1, No. 7, 1950, p. 357–61.
2. Oura, H., *and* Kinosita, S. Measurement of free water content in snow by centrifugal separator. *Teion-Kagaku* Ser. A, Vol 12, 1954, p. 61–72.

REVIEWS

REALMS OF WATER. P. H. KUENEN. London, Cleaver-Hume Press Ltd.; New York, John Wiley and Sons, Inc. 1955. 327 pages, 16 plates, 190 text-figures. Price 35 shillings.

THE plan of this book is lucid. It follows the movements of water in inanimate Nature which begin with the evaporation of water from the seas and end with its return thereto by river discharge—the hydrological cycle. The scheme is worked out in five long chapters, the first two treating water in the oceans and in the atmosphere and the remaining three dealing with land waters in the solid state, in the ground and flowing over the land surface. A short introductory chapter on the circulation of water in all its forms about the Earth and on the properties of water is brilliantly written.

The book is avowedly written for the non-expert. It would make an ideal present for the science sixth-former. At ease in an armchair the intelligent layman, the public administrator, and the geographical student will find much to interest him. Even the expert will profit by observing the efficacy of homely similitudes and the telling diagrams in popular form. The diagrams are well conceived and excellently drawn and the ration of both these and of the photographs is generous. The book is quite unlike the shorter more specialized accounts that the Pelican books have accustomed us to ; it has much more in common with the popular scientific writings of the nineteenth century. On every page the author evokes our wonder at the marvels of inanimate Nature.

Inevitably the treatment is somewhat uneven though the author turns the edge of criticism by claiming the right to select material of most interest to a beginner or a keen amateur. The quality and presentation of the chapter on water in the oceans is clear evidence of the author's special study of marine geology. The material in the other chapters can be found in a few text books coming from Europe and North America, but the treatment and selection is always interesting and bears the author's own stamp.

The glaciologist will find that the treatment of snow and glaciers in the chapter on water in the solid state is interesting for the beginner, but the specialist will recognize that the author has taken little or no account of recent work, and that some of the references are so old as to be unsuitable for "the further reading" recommended. The opening and closing of crevasses (annoyingly translated as "crevices" in one place) is forcibly brought home to the reader by the description of people whose fallen bodies have been recovered in a flattened state, but the presentation of the mechanics of opening and closing of the crevasses is scarcely realistic.

The author keeps his promise to observe the utmost economy in the use of technical terms. Unfortunately the translation of some of these terms is badly at fault or non-existent. The translator (May Hollander) would have benefited from the advice of English technical experts. German words are often used in the terminology of snow avalanches, *e.g.* "*Wächte*" instead of "cornice" (Fig. 6). "Snowslips" (p. 132) and "gelated" (p. 137) are not English, and "impenetrable" is not descriptive of the permeability of clay to water (p. 191). "*Schneebrett*" which is translated as "floe avalanche" (Fig. 6 and p. 134) is the well-known "wind slab avalanche". There are some misspellings, "steared" (of a ship, p. 30, Fig. 7), "laminary" (p. 260) and the usual translator's pitfall "tensions" instead of stresses or forces (p. 145).

W. H. WARD

SCHNEE UND LAWINEN IN DEN SCHWEIZERALPEN, WINTER 1952/53, No. 17 (1954), Davos-Platz. Buchdruckerei Davos AG, 120 p., illus.

THIS annual report of the operations of the Federal Snow and Avalanche Research Station at the Weissfluhjoch deals with:—Weather conditions, snow, avalanches and the damage caused by them throughout the Swiss Alps. There are notes on the sliding of snow, on the problem of snow pressure, and on sundry other scientific and practical work done by the Station. The value of the many tasks completed there under the competent leadership of its Director, Dr. M. de Quervain, is very great.

CORRESPONDENCE

The Editor,
The Journal of Glaciology

SIR, *Ice movement and temperature distribution in glaciers and ice sheets*

G. de Q. Robin's article in the *Journal of Glaciology*, Vol. 2, No. 18, 1955, p. 523, represents an important advance in the understanding of the temperature distribution and energy balance of extended ice formations on a level base. Sorge's observations of the firn temperature at Eismitte to