put the work into a more permanent form than the present; then simple indexes can be included and the whole work made much more useful to the average man of science who has become used to the ordinary ways of extracting information from the literature. H. Lipson

LIFE AT A SUB-ANTARCTIC WEATHER STATION

Fourteen Men

The Story of the Australian Antarctic Expedition to Heard Island. By Arthur Scholes. Pp. xii+273+21 plates. (London: George Allen and Unwin, Ltd., 1951.) 15*s*. net.

NEARLY five years ago the Australian Government established scientific and meteorological stations on Heard and Macquarie Islands in the Southern Ocean, and these stations have been manned continuously since that time. Although Heard Island, which lies in lat. 53° 10′ S., long. 73° 35′ E., was first discovered by the British sealer Peter Kemp in 1833, and American sealers often wintered there in the third quarter of the nineteenth century, no scientific party had previously spent more than a few days on shore. Mr. Arthur Scholes was a member of the first party of fourteen Australian observers who landed in December 1947, and his book tells the story of their experiences on the Island until their relief by a second team in January 1949.

Mr. Scholes writes entirely as a journalist who has been taken at very short notice from his job in a newspaper office and transported some 2,500 miles through tempestuous seas to a practically unknown destination. Everything is strange to him, and he describes his adventures with a lively enthusiasm. Frankness is indeed the outstanding characteristic of his account, and the reader is made to feel that he is the writer's confidant throughout. Although the difficulties of setting a party and its stores ashore on a sub-antarctic island must not be under-rated, the description of the landing on Heard Island leaves the reader with the impression that the expedition was fortunate in accomplishing this part of the operation without mishap. There are few who will not agree with the exclamation of a member of the party that there must have been "Someone upstairs" looking after them at that time.

Of the fourteen men, three were meteorologists, two physicists, two surveyors, three radio operators; a medical officer, a geologist, an engineer and a cook made up the party. Life at the base, in which we are told that the cookhouse was the focus of all interests and a barometer of the party's morale, is well portrayed. Mr. Scholes was one of the radio operators and did not have the opportunity of accompanying the field parties which had the task of making a detailed survey of the Island. He does, however, succeed in giving the reader a good idea of the difficulties with which the surveyors were confronted. Faulty or inadequate equipment, inclement weather, with on an average one hurricane a week throughout the year, when the wind would often reach a recorded speed of 100 m.p.h., severely hampered field-work. Temperatures were never severe, even in mid-winter; but conditions of wet cold, with alternate periods of freeze and thaw, made all field-work unpleasant and even hazardous. For example, it was found that in a period of five days, a sleeping bag might increase as much as 8 lb. in weight by saturation, so that individual loads tended to become heavier rather than lighter with time spent in the field. Such conditions call for special equipment which is only now being developed. It is a credit to the spirit of the surveyors that a detailed map of Heard Island was completed.

Although the last chapter is entitled "The ship! The ship!" and ends with the departure of the fourteen men, it should not be forgotten that their successors on Heard Island are still carrying on the work. J. D. M. Blyth

MEASUREMENTS OF MICROWAVE RADIATION

Micro-Wave Measurements

By Prof. H. M. Barlow and A. L. Cullen. Pp. xvi+400. (London: Constable and Co., Ltd., 1950.) 30*s*. net.

THE years 1940–50 saw a great development and expansion of the application of very short radio waves: new techniques were evolved which necessitated the investigation of new methods of measurement to establish the characteristics and performance of novel equipment. As is stated by the authors in the preface to this book: "Progress in the application of microwaves inevitably goes hand in hand with the development of the technique of measurement at the frequencies concerned. Improvements in efficiency and design of equipment demand more precise information about the conditions of its operation and the part played by its various components. Big strides forward have recently been made to meet this need, and although much remains to be done, a stage has now been reached at which a wide variety of measurements can be undertaken with reasonable accuracy".

The material presented in the book is primarily concerned with techniques of wide application, and particular attention has been given to principles of operation rather than to details of the apparatus itself.

After introductory chapters on the fundamentals of transmission and wave-guides, and the properties of cavity resonators, the authors proceed in Chapter 4 to a description of the measurement of wave-length and frequency. There then follows in the remaining eight chapters a discussion of the methods used in the measurement of voltage standing-wave ratio, power, attenuation, Q-factor, dielectric properties of materials, receiver and transmitter characteristics, and finally of several factors relating to the performance of microwave aerials. There are, in addition, five appendixes which extend the general theoretical treatment in the book to certain cases of specific interest, and which touch on such matters as the theory of wave-impedance transformation and Fourier analysis as applied to spectra.

This work is written in a clear style, is very well produced, and is liberally illustrated with clear line-diagrams. At the end of each chapter there is a useful list of references to original publications. The book should prove a useful guide to engineers concerned with the application of microwave techniques, and also to those using such techniques for research. J. A. Saxton