

in glacier ice formed by pressure during its motion is new to the reviewer. With the exception of the mistakes mentioned above, this book is a useful concise summary of the field, and also introduces most of the French equivalents for most of the more common glaciological terms. Its format is, of course, not lavish, but, for the price, quite adequate.

J. W. GLEN

THE ANTARCTIC TODAY. *Ed.* FRANK A. SIMPSON, A. H. and A. REED in conjunction with the New Zealand Antarctic Society. 1952. 389 pages, 46 plates, 50 text-figures, folding map. 47 shillings and 6 pence.

THE New Zealand Antarctic Society has recently produced an attractive volume in order to portray the Antarctic from the view-point of the South Pacific and South Indian Oceans. As a timely mid-century survey of the problems of Antarctic research a number of contributors provide useful accounts and critical summaries of different fields of work in that region.

The primary importance of glaciological studies to any general understanding of the Antarctic is well realized throughout the book, and emphasized by making glaciology the first subject for specialized discussion. The introductory chapter states the delightfully long-term view that "It may eventually be necessary to chart the ice movements much as the currents of the sea are charted." Practicable future developments are, however, indicated by the former leader of the Australian National Antarctic Research Expedition who states "The future development of the Antarctic would seem to be not in economic exploration, but in providing sites for bases where meteorological and other physical studies can be made in high southern latitudes." This appears to be the aim of the present leader, Mr. P. G. Law, and it is hoped that glaciology will benefit considerably from his long-term planning.

The chapter dealing specifically with glaciology has been written by Professor N. E. Odell, a glaciologist of wide experience in the northern hemisphere who is now Professor of Geology at Otago University. He has drawn carefully on a wide range of recognized authorities up to almost the middle of the century and expresses the general ideas of the late nineteen-forties. He has drawn attention to the importance and nature of the preliminary reports from the expedition to Dronning Maud Land, but their work, the French results from Greenland, and recent theoretical work on ice sheets have appeared too late to influence the author. Being in close touch with these changes I have an unfair advantage as a reviewer. The author's acceptance of 600 m. as the probable maximum thickness of the ice sheet is now too small by a factor of around five. In consequence I would like to modify his reference to the "now only historic calculations of James Croll." I feel Croll deserves more credit than this, as in 1879 he considered the surface inclination necessary to cause flow, and according to my reading he consequently calculated the ice thickness at the South Pole to be 7 miles, but gave 3 miles as a reasoned guess. Both this figure, and the factors he considers as necessary for ice flow roughly agree with some current views. Gould's concept of an Ice Divide parallel to the Victoria Land Horst is another well-recognized hypothesis which I feel should now be considerably modified in view of recent knowledge.

The connection between floating glacier tongues and depression glaciers is emphasized as providing the major outflows of ice from the continent. With regard to wastage of such tongues and of ice shelves, bottom-melting has been stressed more than the calving of icebergs.

A summary of different forms of sea ice is concise and clear, and the size and density of Antarctic bergs have been soundly discussed as distinct from bergs elsewhere. The passage here on relative movements of icebergs and pack ice in strong winds is at variance with the description given in each of two later chapters on ice navigation with which I agree.

The discussion of the erosive effects of Antarctic ice appears sound. Plastic flow has, however, not been stressed, while other ideas on flow appear to deal mainly with local features. The importance of Antarctic studies as a means of improving our knowledge of Pleistocene glaciation has been well emphasized.

The section on past variations in Antarctic glaciation brings in data from many fields such as the depth of the continental shelf and the nature of the bottom deposits. I found this section particularly useful as providing data in a field which I have not read widely, but which seemed to fit in with a physicist's picture. It is in such stimulation of thought by the summarizing of data from various allied fields that the book should fulfil a most valuable function for many specialists.

Other items of interest to glaciologists include discussions of the geological and oceanographical evidence for and against the existence of a *Senkungsfeld* between the Weddel and Ross Seas, the answer still being considered indefinite. Marine biology and bird life are dealt with at length in four chapters, but the relationship of plant life to glaciation has not been covered.

A map of Antarctica includes many place-names, but apart from an up-to-date coastal outline, in which some but not all known areas of the ice shelves are indicated, it is not of particular value.

The chapter on meteorology discusses the weather of the southern ocean thoroughly from the synoptic point of view, but scarcely touches the continent itself, or the question of the nourishment of the ice cap. Court's upper-air work at Little America in 1940 is not mentioned, and unfortunately Court's recent and very comprehensive paper on "Antarctic Atmospheric Circulation" was not apparently available to the author at the time of writing.

After mention of New Zealand's work at Campbell and Auckland islands, and an historical summary of Antarctic expeditions and their association with New Zealand, the book concludes with a plea that the time has come for "adventurous and qualified young New Zealanders to be given the opportunity to study their own portion of the Antarctic for themselves." We wish the New Zealand Antarctic Society every success in these efforts, and congratulate them on their enterprise in producing this useful book.

G. DE Q. ROBIN

**AVALANCHE HANDBOOK.** Published by the Forest Service, U.S. Department of Agriculture, 1952. 146 pages, tables, illustrations, diagrams. (Mimeographed.)

THE principal collaborators in this work are Mr. M. Atwater, snow ranger at Alta, Utah, and Mr. F. Koziol, of the Wasatch National Forest Service, both of whom, in 1948, produced *The Alta Avalanche Studies*; this was reviewed in this *Journal*, Vol. 1, No. 9, 1951. They have been helped in their studies by Mons. A. Roch, the mountaineer and a great authority on snow.

A notable advance in the subject has been made since the earlier work, which was "an attempt to gather all the relevant information." Since then the authors have culled experience and data from several other snowy and mountainous districts, which has considerably broadened their outlook.

It is claimed that the handbook serves a triple purpose—first as a textbook "which again summarizes our knowledge to date on avalanches"; secondly as a field handbook for the "guidance of administrators who have duties where avalanche hazard is a problem"; thirdly as a second "progress report." They go on to admit that the study of avalanches is far from being complete. With this the reviewer agrees. But he also believes that years of practical experience in the mountains is the best training for going safely on mountain expeditions. To those who have not had long experience a study such as this, carefully and scientifically compiled, is absolutely necessary in explaining basic causes. With this knowledge the inexperienced will know what dangers to look for. Thus can theory and practice help each other.

While the reviewer cannot find much, if any, new light on the avalanche problem, this book does, very admirably indeed, combine the most recent European research with American snow conditions, and its authors and publishers are to be congratulated on having produced something very worth while.

G. SELIGMAN

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#### W. R. B. BATTLE

It is with great regret that the Society has learned of the death of Mr. W. R. B. Battle in an accident in Baffin Island. An obituary notice will appear in the next issue of this *Journal*.