

In conclusion he lists eight points learned from Arctic experience, that emphasize the close ties between technologies and political decisions relating to their application.

The final paper considers jurisdictional problems as they relate to Antarctic mineral resources. Sollie contrasts the Svalbard Treaty of 1920 with the Antarctic Treaty as a means of identifying some potential jurisdictional issues. A number of interesting points are raised and questions asked about how problems have been and will be dealt with under the Antarctic Treaty System. Sollie continues to be somewhat cautious in his response to the possible development of a minerals regime in Antarctica.

The importance and the timing of this volume cannot be overemphasized. It appears on the market at a time when external interest in the Antarctic is increasing. The most common criticism of the Antarctic Treaty consultative process is that it is closed. This book is the first easily accessible collection of papers that opens to public view the thoughts and opinions of those who have been helped to shape the Antarctic Treaty System. The book is expensive, but for any who want to learn about the development of the Treaty, it is well worth the investment. This volume should be on the bookshelf of all participants in treaty meetings, and required reading for those who would enter that arena. Had the editor chosen to present the papers in a somewhat more logical order the usefulness of the volume would have been greater. Nevertheless, I recommend it to all, and for those who wish to maximise their return on investment, I heartily encourage them to read it several times.

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ANTARCTIC GLACIOLOGY AND GEOPHYSICS

ANTARCTICA: GLACIOLOGICAL AND GEOPHYSICAL FOLIO. Drewry, David J. (editor). 1983. Cambridge, Scott Polar Research Institute. iv + 9 folios (5 to be added), maps, hard cover. ISBN 0.901021.04.0. £59.00.

The publication of this work appears very timely, as it compiles most of the measured and derived physical data currently available on Antarctica, comprehensively updating previous compilations of about 20 years ago. The progress this folio reports is mainly due to results obtained by a decade of research involving the recently-developed glaciological technique of airborne radio echo sounding. This has so far allowed the study of about half of Antarctica. Thus a considerable body of new data complements information obtained both by classical techniques, for example seismic studies, and such other recent developments as balloon altimetry and Landsat satellite imagery.

The basic data are summarized in a series of maps featuring surface and bedrock topography, ice sheet thickness, residual magnetic field and internal layering of the ice sheet. A further section deals with derived physical information, for example ice sheet driving stresses, isostatically adjusted bedrock, and depth to magnetic basement. All the maps are well printed in attractive colours, representing clearly the main features with illustrative inserts and diagrams. The scale of the maps (1:10 000 000 and 1:6 000 000) is adequate for both general and local reading of the data. It must be pointed out, however, that the density of information is not homogeneous for all Antarctica; as a consequence some of the maps do not cover the whole continent. Explanatory texts are generally very

good, describing in particular methods of calculation and giving an idea of the reliability of the displayed information.

Some minor criticisms may be made. Are large format maps really needed for some of the data, for example the one showing the isostatically adjusted bedrock? Folio presentation is luxurious and therefore expensive. I would have welcomed some additional data (for example *in situ* temperatures) to obtain a complete coverage of physical parameters. To balance these points the work includes very useful and new information, for example the coastline compilation, calculated area of Antarctica, integrated subglacial and surface features, ice sheet volume and internal structure, making it a very significant and original contribution. There are still a few more sheets to be published in the coming months; data on surface temperature and accumulation, ice sheet dynamics and geological units will doubtless add considerable value to the folio. We must therefore congratulate the Scott Polar Research Institute and the editor for presenting this up-to-date compilation of physical information about Antarctica in an integrated and attractive form. This folio will certainly be useful for many research topics concerning the still poorly-known ice-sheet and continent, and will stand as a major contribution in the field for many years.

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ECOLOGY OF THE TREE-LINE

TREE-LINE ECOLOGY: PROCEEDINGS OF THE NORTHERN QUEBEC TREE-LINE CONFERENCE. Morisset, P. and Payette, S. (editors). 1983. Québec, Centre d'études nordiques, Université Laval (Collection Nordicana, 47). 188 p, soft cover. ISBN 2.920197.47.9. Can\$15.00.

This publication presents eighteen papers by contributors from Canada, Finland, Norway, Sweden, United Kingdom and United States, given at the Second International Tree-Line Conference, held near Ungava Bay, northern Québec in mid 1981. The first conference was in Kevo, Finland, in 1977. The volume is dedicated to the memory of Professor Ilmari Hustich (1911–82) who was guest of honour of the conference and whose pioneer polar forest-line research is described by one of his colleagues in the opening paper. Following papers concern tree-line ecology particularly in Québec, Northwest Territories of Canada and northern Scandinavia, with some reference to other locations. Effects of climatic fluctuations, notably comparatively rapid colonization of alpine areas by certain tree species following warm periods of several years, are discussed with examples drawn from several regions. Holocene and recent shifts of the tree-line, and role of history in determining vegetation composition are also discussed. The final paper, by Professor Ilmari Hustich, gives most interesting subjective observations from fifty years of tree-line studies and provides a clear concept of time factors involved in substantial changes.

The papers embrace a wide range of related subjects including seed endurance, effects of fires, entomology of the tree-line area, dendrochronology and palaeoecology, geomorphological relationships and other topics. Respiration (carbon dioxide flux) and energetics of a community of Mountain Birch in northern Sweden are described, with