

SEA ICE IN THE SOVIET ARCTIC

DYNAMICS OF ICE COVER. Timokhov, L. A. (editor). 1984. Rotterdam, Balkema. (Russian translations series 25.) 219 p, illustrated, hard cover. ISBN 90 6191 441 8. £17.65, US\$26.00

I am always rather saddened when I read a translation of Russian scientific research for the first time. Primarily this is due to its inevitable late arrival in the West, but also to the apparent lack of dialogue between Soviet scientists and their counterparts in the United States, Canada and Europe. 'Dynamics of Ice Cover', edited by L A Timokhov, is no exception and reports work first published in 1974 just before the main AIDJEX (Arctic Ice Dynamics Joint Experiment) began in the Arctic Basin. There is no doubt that AIDJEX would have profited immensely from the theoretical and experimental studies reported in this book; there is no doubt that many of the contributors in 'Dynamics of Ice Cover' would have found data collected during AIDJEX pilot studies in 1970, 1971 and 1972 of great value. Without scientific discourse West and East appear to have gone their separate ways, and in many cases have re-invented the wheel.

'Dynamics of Ice Cover' is a translation of a series of scientific papers on the morphology and dynamics of sea ice in the Russian Arctic. Papers dealing with oceanographic and meteorological factors which influence or control sea ice behaviour and distribution are also included. The translation is excellent, and the General Editor Dr Kothekar and two translators, Drs Guha and Kathavate, are to be congratulated on producing such a readable text. All the accepted sea ice terminology and jargon are there (and correctly applied in all but a few cases) yet the papers retain the clarity that one supposes was present in their original language. Furthermore the book is not turgid. One criticism, which presumably faults the original authors rather than the translators, is that in many papers undefined symbols often occur leaving the reader to interpret complex equations with little or no help from the text.

The text offers a fine, though dated, introduction to Arctic geophysics for a graduate level student in one of the physical sciences. The standard of published material is good throughout, but certain authors deserve special mention; papers by Bogorodskii, Borodachev, Doronin, Gavrilo, Gorbunov and Savchenko are of the highest standard. Very few authors cite similar work done outside the Soviet Union, yet the material draws many parallels with issues studied by US scientists of that decade. It is fascinating to see the development of ideas converging to like conclusions despite lack of interaction.

I thoroughly recommend 'Dynamics of Ice Cover' to all scientists studying sea ice, especially in view of its relatively low price. (Vernon A. Squire, Scott Polar Research Institute, Lensfield Road, Cambridge CB2 1ER.)

CONFERENCE ON PERMAFROST

PERMAFROST: FOURTH INTERNATIONAL CONFERENCE PROCEEDINGS. University of Alaska and National Academy of Sciences (chairman of organising committee T. L. Péwé). 1983. Washington, DC, National Academy Press. 1524 p, illustrated, hard cover. ISBN 0-309-03435-3. US\$65 in US, \$78.25 export.

Permafrost, or perennially frozen ground, underlies 20% of the land surface of the earth. It affects many human activities, especially in the field of engineering, and thus an understanding of its distribution, characteristics and behaviour is important. To judge from the wealth of information contained in this 1524 page volume, permafrost research is alive and kicking. The book brings together 276 of the papers presented at the fourth

international conference held in Fairbanks, Alaska in 1983, a conference attended by 900 people from 25 countries. The papers have abstracts, and are concise, usually full of diagrams, and well referenced. The overall quality of the papers is impressive; several are landmarks in that they open up new fields of research (for example Hallet on frost wedging, Brigham and Miller on the use of amino acid ratios to reconstruct past permafrost temperatures, and Chatwin on the use of isotope analysis of plant cellulose in sphagnum peat to reconstruct Holocene palaeotemperatures). The fact that these, and indeed all 276 papers, are readily available so soon after the conference brings great credit to the organizers. The volume is splendid and will remain a mine of information for years to come.

The papers cover an enormous breadth of subject matter. They are arranged alphabetically under the name of the senior author and there is a subject index. Some notable papers deal with the fundamental processes of frost heaving, wedging and soil-water migration. Others focus on landforms such as rock glaciers (10000 of which are in Soviet Central Asia alone and a unique type of which is described in China), sorted patterned ground (including polygons in limestone caves in Czechoslovakia and beneath lakes), cryopediplains, ventifacts, tundra polygons, pingos, thaw lakes and shorelines. There are papers on remote sensing techniques used for surveying permafrost, often sub-sea, and on approaches to mapping permafrost. And then there are numerous papers on the engineering aspects of permafrost, involving railways, roads, airstrips, cable cars, power lines, building foundations, utilidors, canals, artificial gravel islands, storage tanks and waste water. A group of papers deals with the vegetation associated with permafrost, including its germination characteristics, its response to fire and oil spillage and its general ecology. Still others concern the hydrology of permafrost.

One of the impressive achievements of the volume is the way it brings together Western, Soviet and Chinese permafrost research. Whereas the Soviets can draw on a long experience of permafrost research, the start of Chinese interest dates only to 1949. Since then, and reflecting the fact that over 2 million km² of China is underlain by permafrost, there has been an explosion of activity and this is mirrored in the symposium volume.

The areal coverage of permafrost research as represented in the proceedings volume is interesting. As one might expect, the northern high latitude areas of Alaska, Canada, the Soviet Union, Svalbard and China are well represented. There are additional papers on relict permafrost features, for example in Western Europe. Permafrost specialists have not been slow to realise the importance of Mars as a planet whose surface is dominated by their field of interest. Permafrost underlies the Martian poles of a depth of 4–5 km and is present at the equator to a depth of one km. There are several papers discussing the ice types, landforms and possible permafrost processes on Mars. Two areas of our planet which unexpectedly do not seem to have attracted much permafrost research, at least as represented by the proceedings, are Greenland and Antarctica. This is surprising since it is likely that the climatic environments of the ice free parts of Antarctica provide the best analogies for the unglaciated permafrost areas of the Arctic during the Ice Ages. Bearing in mind that Ice Age conditions have predominated for most of the last few million years, then the sparsity of Antarctic information may represent a major loss in understanding. (David Sugden, Department of Geography, University of Aberdeen, Old Aberdeen, AB9 2UF.)