

Siberian economy today, and R. North tackles the problems facing the development of a comprehensive transport-communications network over the vast, sparsely-populated distances. Special attention is devoted by V. Conolly to the newly-constructed Baykal–Amur railway. J. Erickson's chapter on military and strategic factors I found weaker than its counterpart in Swearingen's book—a Who's Who of the Eastern Theatre rather than a synthesis of the historical geography of conflict along disputed borders with China and Japan. However, Wood's collection ends strongly with a summary by S. Kirby of Siberia's relations with its Asian neighbours, and a look by J. Stephens at past and potential involvement of Siberia in the world economy. This excellent survey of Siberia is enriched by maps and good bibliographies at the end of each chapter. Chapters contain frequent cross-references to each other, enhancing the book's integrity.

Swearingen aims at more specific themes—the 'guns over growth' trend of Siberian development and its implications for regional security and potential trade relationships. Some of the essays address this theme directly; others, while providing solid scholarship, touch on it more tangentially. Stricter editing could have enhanced the continuity and thematic cohesiveness of this work. V. Conolly (the only contributor to both volumes) provides a lively introduction to the environment and resources, including population, of Siberia. V. Mote contributes an informative and highly readable chapter on transport and communications. Energy industries are covered by T. Gustafson; M. Bradshaw analyzes the regional impact of trade and technology transfer in the Soviet economy, with special emphasis on Siberia. W. Czerniejewicz's treatment of economic linkages with Europe takes a while to home-in on Siberian trade, and would have benefitted from editorial contraction, but provides a useful analysis of the Siberian-Western European Gas Project. K. Ogawa discusses Siberian-Japanese trade, painting a darker picture of prospects for the future than does Kirby in Wood's volume, who refers to relationships between these two partners as 'extremely portentous'. H. Gelman gives a good overview of the military build-up in Siberia—the 'Pacific Shift' in Soviet troops and ordnance, rich in historic detail. In his chapter on strategic dimensions in the Pacific area, Swearingen elaborates on the significance of this build-up.

Especially commendable in Swearingen's book is the final chapter by P. Polansky on resources for research on Siberia, a terse yet invaluable guide providing a refreshing variation to the more-often proffered 'Further Reading' appendix. Listing bibliographies, journals, newspapers, institutes, libraries and publishing houses of vital interest to the student of Siberia, it is an example that more editors might follow. One grins at the minor editorial slip—Conolly's too-literal translations of Russian buzzwords, Mote's amusing entry of 'Not available' for data on passenger transport by pipeline in Table 2.2. One grimaces at Swearingen's summary dichotomy of 'peace-

loving nations' versus the Soviet Union (p 257), though by this juncture one has already caught on to the biases behind the book.

Wood's volume is the more useful and more readable for a general audience, and a valuable basic text for students of Soviet and northern geography and history. Swearingen's book, narrower in intent, caters to specialized interests, but also provides embellishing material and analysis complementary to Wood's offerings. Both should be read by those interested in Siberia. (Gail Fondahl, Department of Geography, University of California, Berkeley, California, USA.)

SCENIC ANTARCTICA

SHIP IN THE WILDERNESS. Snyder, J. and Shackleton, K. 1986. London, Dent. 208 p, illustrated, hard cover. ISBN 0-460-04719-1. £14.95.

WILDLIFE AND WILDERNESS: AN ARTIST'S WORLD. Shackleton, K. 1986. London, Clive Hollo-way Books. 120 p, illustrated, hard cover. ISBN 0-907745-06-7. £15.00

The first of these two outstanding books, subtitled 'Voyages of the MS Lindblad Explorer through the last wild places on Earth', covers the travels of a famous cruise ship to out-of-the-way places including the Aleutian Islands, Bering Strait, the Northwest Passage, Iceland, Greenland and Svalbard, several islands of the Southern Ocean fringe, and both East and West Antarctica. Jim Snyder's photography is superb, Keith Shackleton's illustrations and warm commentary are a blessing, the production is faultless and the price unbelievable. For those who prefer their Shackleton undiluted I no less strongly recommend the second. This too is the result of the artist's travels for 15 years as naturalist aboard *Lindblad Explorer*. Whoever thought up that job for him did the world a service. Keith Shackleton's enthusiasm and love for polar animals and scenes is patent in both the text and the marvellous pictures; I know no other writer or painter who catches the polar world so neatly. The last few years have brought many books covering the polar regions in black, white and colour. These are among the best—good value for the armchair traveller, and powerfully evocative for those who have been there. If you cannot manage a polar cruise, they may serve as the next best thing. (Bernard Stonehouse, Scott Polar Research Institute, Lensfield Road, Cambridge CB2 1ER.)

ENGINEERING FOR PERMAFROST

PIPELINES AND PERMAFROST: SCIENCE IN A COLD CLIMATE. Williams, P. J. 1987. Ottawa, Carleton University Press. 129 p, illustrated, soft cover. ISBN 0-88629-056-2. Can \$9.95.

This is a study of northern pipelines in Canada and Alaska. It concentrates on the geotechnical aspects of the projects,

but sets them in a wide economic and political context. The book starts by examining the rich and complex subject of permafrost, and goes on to consider the Alaskan oil pipeline, completed ten years ago, and two Canadian gas pipeline projects, now indefinitely delayed. (Ironically, the companies that dreamed of \$10 per thousand cubic feet of gas, and rushed to invest at a time of high interest rates and enormous construction costs, may now count themselves lucky that the projects were stopped.) It also describes the recently-completed oil pipeline from Norman Wells, a low-profile project which will be watched with great interest.

Peter Williams argues that each project must be seen as part of a whole system, and that engineering questions cannot be disentangled from economic and social factors. His book is a bold and honourable effort to demystify its subject, and to create a wider informed discussion. It would have been far easier to write for a narrow group of specialists, and far less worthwhile.

There are clear and interesting accounts of experiments designed to throw light on basic questions, such as the ability of water to move through frozen soil. Occasionally the book falls short of the highest level of scientific writing for the non-scientist. A reader who has not previously thought about the mechanics of frost heave will find Williams' exposition difficult. In my own view, he could have gone further, and might have argued that frost heave and permafrost engineering in fact depend on rather straightforward phenomena, which are broadly understood.

The author gives an interesting account of the controversy at the Canadian Arctic Gas hearings about the extent to which frost heave movements could be suppressed by a small berm over the pipeline. It seems rather a simple question, which could have been resolved by a modest experiment. He is understandably indignant about short-sighted policies on full-scale trials. The need for trials was apparent in the early seventies: if they had been set up then, with long term funding and continued high-quality scientific support, there would now be accurate data of heave and thaw over 15 years' operation, and the outstanding problems would be resolved. To an outsider, it seems unfortunate that the controversy was conducted in a public enquiry, where the context forces the players into adversarial positions and the search for scientific truth becomes obscured. It was right that it was in public, but wrong that it became a legal game.

The future must depend on the development of the price of gas. Present economics do not begin to justify the grandiose projects that were lightly talked of ten years ago, when a senior oil executive said to this reviewer '... when we're talking about an [Arctic] project like this one, a billion dollars don't amount to a hill of beans'. Gas is such a good fuel, and people use it up so enthusiastically once they are given a chance to do so, that demands for Arctic gas pipelines will resurface soon. When they do, Peter Williams' book will have been a worthy contribution to

informed debate. (A. Palmer, Andrew Palmer and Associates Ltd., 49 Ashley Gardens, Ambrosden Ave., London SW1P 1QF.)

MACQUARIE ISLAND SEaweEDS

TAXONOMY AND BIOGEOGRAPHY OF MACQUARIE ISLAND SEaweEDS. Ricker, Robert Wallace 1987. London, British Museum (Natural History). 344 p, illustrated, hard cover. ISBN 0-565-00998-2. £40.00.

This work presents a detailed and comprehensive account of the marine algae of one of the peri-Antarctic islands; it is the only recent work available on the subject for the region. There are 103 species described, forming 81 genera in 43 families. Seventy species are reported from Macquarie Island for the first time and 11 are new. The systematic accounts are well presented and supplemented with a good selection of photographs and drawings. The book includes a history of collections from the island and a concise biogeographical account of the marine algae of other islands in the Southern Ocean. Details of distribution indicate that 41% of Macquarie Island seaweed species are restricted to far southern regions, 17% are bipolar, and 11% are endemic. Approximately 660 bibliographical references, an appendix of collection data, and a key to the species complete this essential contribution to Antarctic phycology. (R. K. Headland, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

SCIENCE IN ANTARCTICA

ANTARCTIC SCIENCE. Walton, D. W. H. (editor). 1987. Cambridge, Cambridge University Press. 280 p, illustrated, hard cover. ISBN 0-521-26233-X. £25.00.

Every so often Antarctic scientists take stock of themselves, summarizing work in their various fields for the interest of the world in general. The tradition began 60 years ago with J. Gordon Hayes's one-man survey *Antarctica, a treatise on the southern continent* (1928). Pioneers now in retirement will cherish well-thumbed copies of Frank Simpson's compilation *The Antarctic today* (1952), Priestley, Adie and Robin's *Antarctic research* (1964), Trevor Hatherton's *Antarctica* (1965), and Louis Quam's *Research in the Antarctic* (1971). Each of these books gave a good picture of the state of the sciences when it was compiled. Editors and contributors alike took pains to be understood by colleagues in other disciplines, and by the tax-payers who stayed home and footed the bills. It is high time for a new survey; David Walton's *Antarctic science* proves a worthy successor.

His contributors are all British and, though far from parochial, tend to concentrate on the British sector they know best. The 18 chapters are grouped under five headings; there are four on the geographical, political and