

tures take over from the text.

For polar specialists this book will revive happy memories: they will wish to give it to their friends. For those coming new to polar studies it is an excellent introduction. (Peter Speak, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

### ANTARCTIC MINERALS

**ANTARCTIC MINERAL EXPLOITATION.** Orrego Vicuña, F. 1988. Cambridge, Cambridge University Press. 615p, hard cover. ISBN 0-521-32383-5. £60.00, US\$89.50.

This is a very comprehensive examination of what probably is currently the most discussed Antarctic subject. The subtitle, 'The Emerging Legal Framework', indicates the evolutionary and developmental nature of the work which examines in detail the large number of aspects in this complicated problem. At present the exploitation of minerals in Antarctica is unlikely for many years but investigation and, in as far as practicable, clarification of the legal basis for such operations prior to their beginning is an essential preliminary. The work will be of interest to international lawyers and others involved in Antarctic affairs, and of importance to the legal advisers of mineral companies.

The work is in three main parts. It starts with an analysis of the beginnings of exploration of Antarctica and the origins of the several national claims which resulted. A note follows on claims of sovereignty, with the development of the Antarctic Treaty which places these in abeyance. The evolution and extension of the Treaty to adjust to many factors which have arisen in the years since it was written (1959) is described. Similarly a discussion of other aspects of International Law, especially the Law of the Sea, which provide examples and precedents is included.

The second part discusses alternative approaches to conservation and development of Antarctic minerals, with processes of internal accommodation. Conflicting interests and desires are examined with an analysis of the criteria for determining suitable regimes in a quest for an equilibrium between them. This section gives attention to the complexity of interests involved, with discussion of a wide range of subjects that will need analysis. It leads to the third section where the application of the Antarctic Treaty is specifically treated, in particular the present participation of states and relation with the international community. It concludes with a consideration of the future of the Treaty.

The work is characteristically provided with very comprehensive notes and details of sources which make it a useful reference for Antarctic legal studies in general. A series of appendices summarises legal and national situations, and an excellent 54 page bibliography follows. The index is efficiently arranged and a useful guide

through a complex subject. (R. K. Headland, Scott Polar Research Institute, Lensfield Road, Cambridge CB2 1ER).

### TO THE NORTH POLE

**NORTH TO THE POLE.** Steger, Will and Schurke, Paul. 1987. London, Macmillan. 339p, illustrated, hard cover. ISBN 0-333-47490-2. £14.95.

The official narrative, based on the leader's, co-leader's and other journals, of the Steiger International Polar Expedition 1986; this was a joint U.S.-Canadian-New Zealand enterprise, and one distinguished by its single woman member, Ann Bancroft, who can now claim to be the first woman to sledge to the North Pole. The object of the expedition — much in the spirit of R. E. Peary — was to achieve the Pole 'unsupported', ie aircraft would be used only to evacuate casualties and superfluous dogs and equipment. This policy was rigidly adhered to.

The expedition of eight members and 49 dogs left northern Ellesmere Island on 7 March. Going proved heavy in the early stages with heavy pressure and temperatures in the minus seventies Fahrenheit. Later conditions improved, and over 30 miles travel daily was not unusual. Light relief from frostbite and painful drudgery was provided by the occasional visit of a relief plane bearing a media circus of reporters and cameramen (the inevitable price of sponsorship) and a serendipitous meeting with the solo French explorer Jean-Louis Etienne. The pole was achieved on 1 May, the expedition having traversed nearly twice the actual distance of 488 miles due to ice drift relaying and navigational errors. This is a readable account, with much in the appendices and elsewhere of value to any potential assailant of the North Pole. The black and white photography is disappointing, though. (H. G. R. King, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

### ICE MECHANICS

**ICE MECHANICS: RISKS TO OFFSHORE STRUCTURES.** Sanderson, T. J. O. 1988. London, Graham and Trotman. 253 p, illustrated, hard cover. ISBN 0-86010-785-X. £75.00, US\$ 141.00.

This is a book for which Arctic ice engineers and scientists have been waiting for years. It is the first reference text to deal in a comprehensive way with ice loads on marine structures. It is also written in a clear and attractive style and is a pleasure to read.

Beginning with two chapters of the physical properties and distribution of sea ice and icebergs (which in themselves constitute an excellent text for students of oceanography), the author then deals with the mechanical properties of ice as measured on a laboratory scale and on the full scale. The description of full-scale measurements of ice forces on islands (natural and artificial) and drilling platforms is particularly useful and authoritative, since it