

POLICIES FOR ARCTIC TECHNOLOGY

ARCTIC TECHNOLOGY AND POLICY: AN ASSESSMENT AND REVIEW FOR THE NEXT DECADE. Proceedings of the Second Annual MIT Sea Grant College Program Lecture and Seminars, and the Third Annual Robert Bruce Wallace Lecture, Cambridge, Massachusetts, 1–4 March 1983. Dyes, I and Chrissyostomids, C. (editors). 1983. Washington, Hemisphere Publishing Corporation. 281 p, illustrated, hard cover. ISBN 0 89116 361 1. US \$60.00.

This volume represents the proceedings of a conference, organized by the Department of Ocean Engineering and the Sea Grant College Program at MIT, and co-sponsored by Det Norske Veritas and the National Science Foundation. The conference discussed political, scientific and technological aspects of Arctic development, guided by two basic questions: what knowledge do we have today for working in the Arctic, and what are the challenges in science, engineering and policy-making in the decade ahead?

The MIT Sea Grant College Program Lecture was by Tucker Scully on 'Arctic Policy: opportunities and perspectives'. His paper raises the question of whether the US should have an overall Arctic policy, outlining US strategic and environmental concerns in the region, and making comparison with the Antarctic Treaty, within which member states may formulate and implement Antarctic policies. Scully concludes that further Arctic policy development requires a better definition of US regional interests in the area. Ira Dyer gave the Robert Bruce Wallace Lecture on 'The song of Sea Ice and other Arctic Islands Melodies'; his paper deals with sea ice under stress, ice strength and roughness, and the effect of these parameters on the transmission of sound in the Arctic Ocean.

The remainder of the conference papers cover three main subject areas. The first, Arctic Policy, looks at issues of international law, strategic concerns, state versus federal jurisdiction, native rights, and regulatory processes. This approach is particularly welcome; without a well-defined government policy framework, arctic science and technology supporting resource development operate in a vacuum. The first part of the section includes a paper by Hargrove and Kellnes on the 'International Legal Regime of the Arctic' outlining the need for a regional treaty similar to those covering the Antarctic, Baltic and Mediterranean, and one by Gissberg on 'Alaska's Role in Arctic Development', calling for an increased role by both the state and local communities in developing Arctic policy. The second part of the policy section deals with Arctic resource development. Bruchet and Robertson discuss regulatory and environmental issues associated with Arctic marine transportation, outlining the complex Canadian regulatory process which involves several federal and territorial government departments and leads to duplicative and lengthy public hearings. Gordan deals with the methodology of risk and safety assessments for Arctic offshore projects.

The second subject area is Arctic Technology, covering advances in design and construction techniques, and materials for offshore platforms and ice transiting ships. The first section deals with steel structures in ice-covered Arctic waters (Robert Smith) and artificial islands and steel structures in the Beaufort Sea (Maxwell and others). The second section includes papers on concrete structures by Gerwick, and a brief review of icebreaking technology history by Vance.

The third and final subject area, Arctic Science and Engineering, aims to understand the geology, geophysics and oceanography of the Arctic, and the characteristics and properties of the surface ice which dominates the region. This topic, arranged in three sections, lays heavy emphasis on Arctic sea ice studies with contributions from many

leading researchers in the field, though it provides less comprehensive coverage of other related earth sciences. Contributions to the first section include papers by Johannessen and others reviewing physical processes occurring in the marginal ice zones, by Lawver and others on the tectonics of the Arctic ocean basin, and by Baggeroer and Duckworth outlining improvement in seismic exploration technology and activities in the Arctic ocean since the 1950s. The second section covers sea ice distribution, morphology and thickness. Wadhams provides a valuable summary of the results of 28 000 kms of under-ice profiles by upward-looking sonar mounted in US and British nuclear submarines, and Campbell and others deal with four years of sea ice observations from the Nimbus-5 satellite, providing sequential synoptic information on Arctic sea ice coverage. The third section consists of two studies on ice characteristics and ice deformation properties. Pritchard takes a macroscopic view of sea ice, modelling its behaviour in terms of imposed forces and characteristic ice properties. Weeks and Mellor deal with the material properties of icebergs, shelf ice and sea ice related to their crystalline structure, composition, microstructure, and the influence of impurities.

In his closing remarks, Ned Ostenso notes that the common thread prevailing in all the papers was of the pioneering nature of all the fields of endeavour covered. Introductions by sectional chairpersons, including Judith Kildow, Don Haglund, Leonard Johnson and Norbert Untersteiner, provide the overviews necessary to knit the divers subjects systematically. Many of the papers are illustrated, though some of the black and white illustrations have lost definition and clarity in reproduction. All told this volume is a welcome addition to a limited but growing list of references on Arctic technology, policy and resource development (see also *Arctic Energy Resource*, ed. L. Rey, reviewed in *Polar Record* 22(137): 198–99, 1984). (Howard Hume, Petro-Canada Resources, PO Box 2844, Calgary, Alberta, Canada T2P 3E3.)

SOUTH GEORGIA OBSERVED

THE ISLAND OF SOUTH GEORGIA. Headland, R. K. 1984. Cambridge, Cambridge University Press. 293p, illustrated, hard cover. ISBN 0 521 252741. £14.95.

As Sir Rex Hunt reminds the reader in his foreword to this admirable book, South Georgia is, thanks to President Galtieri's folly, now firmly on the map and in the public eye. Information about the island, however, has tended to be scattered and hard to come by. L. Harrison Matthew's classic account, published in 1931, has long been out of print. Mr Headland's topical and timely review of the island seems likely to remain definitive for many years to come.

Of the book's nine chapters, the first is devoted to a general overview of the island's topography and government, sources of revenue, population and settlement. South Georgia's first township, Grytviken, dates from 1904. By 1913, when the first birth was registered, it had taken on all the characteristics of a Yukon mining community with desperados and a town goal. The discovery of South Georgia, as we learn from Chapter 2 which deals with the early history, dates from Antoine de la Roche's sighting in 1675. He was an Englishman, despite the name. Another Englishman, Captain James Cook, charted a part of the coastline in January 1775 and claimed the island as Britain's first Antarctic territory. Rather than repeat oft-told history Mr Headland is content to let the explorers speak for themselves through selected extracts from their narratives. Thus the naturalist George Forster reminds us that it was his father, Johann Reinhold, who suggested to Cook that it would be proper to name the island 'after the monarch who had set on foot our expedition solely for the improvement of science...'