

others on earlier Antarctic expeditions — the clash between the resolute leader, ever wishing to push further, and the ship's master, concerned only with the safety of his ship. In the event, Law succeeded in making three landings by launch at different places in the Larsemann Hills for survey and geological work. He later wrote: 'We had "cracked" the Larsemann Hills, a feat in those days (without helicopters) of no little difficulty.' As the present author does not mention, Law was honoured when, early in 1987, the ANARE established the auxiliary Law Base in this area in about 76°E.

As a result of negotiations conducted by Law, the United States IGY Wilkes Station at 110°E in Wilkes Land was transferred to Australia; it was later named Casey Station after Lord Casey, Australian Minister for External Affairs. By 1961, with three permanent stations on the continent, Australia had become a leading country in Antarctic exploration and scientific research, and Law's efforts were rewarded when Australia became one of the 12 original parties to the Antarctic Treaty, ratified in that year as a direct result of the uniquely successful cooperation in the IGY. With better ships and modern technology, the ANARE had achieved in a short time results inconceivable to Law's distinguished Australian predecessors in Antarctica.

However, after 16 years as director of the Antarctic Division, Law felt that he had had enough. He was worn down not by the seasonal struggle with Antarctic ice and weather, which he enjoyed, but by his continual battles with government officials. Others in equivalent posts elsewhere have fought similar battles with scientifically ignorant and ineducable bureaucrats, but none more tenaciously than Phillip Law. Strong-willed by nature, Law resented the constant questioning in his department of his requirements for running the Antarctic Division. As the government's principal adviser on Antarctic affairs, he believed that his superiors should either accept his recommendations or sack him. He had wanted to see the ANARE with its own ship under the Australian flag, and with long-range aircraft available for landing on airstrips in the Antarctic, but many more years were to pass before his ideas bore fruit. In particular, he had struggled to gain sufficient established and properly salaried positions for his senior scientific and administrative staff. In this he was also unsuccessful, and this was the main reason for his resignation as director in 1966, to the great loss of the ANARE but to the great gain of the Victoria Institute of Colleges, of which he became vice-chancellor.

Of the very fine selection of black-and-white and colour photographs in this book, two especially stand out. One shows the expedition ship moored to the ice edge with Law's late wife Nell seated on a folding chair and sketching a scene of almost surreal serenity; as an accomplished artist and expedition member in her own right, Mrs Law was accompanying her husband on the southern relief voyage of 1960–61. The other is a group photograph showing Law with Mawson, Davis, and the Norwegian

polar explorer and airman General Hjalmar Riiser-Larsen — the four men pre-eminent in the exploration of the AAT.

The author is to be congratulated on producing a book that is hard to put down, for it gives the full flavour of Phillip Law's forceful personality and style of leadership. As one member of the ANARE wrote, 'never again would ANARE or Australia's Antarctic involvement be so influenced by one individual.'

In his retirement, many honours and awards have come to Phillip Law, including his country's highest honour, Companionship of the Order of Australia, in 1995. In his mid-eighties he leads a very active life that would tax a much younger man, and, mellowed perhaps with the passing years, he is able to look back with detachment and in tranquillity on 'battles long ago.' (Geoffrey Hattersley-Smith, *The Crossways*, Cranbrook, Kent TN17 2AG.)

CONTESTED ARCTIC: INDIGENOUS PEOPLES, INDUSTRIAL STATES, AND THE CIRCUMPOLAR ENVIRONMENT. Eric Alden Smith and Joan McCarter (Editors). 1997. Seattle: University of Washington Press. xx + 156 p, soft cover. ISBN 0-295-97655-1. \$US20.00.

Beginning with the premise that the Arctic is one of the last frontiers of colonialism, where industrial societies are ruthlessly exploiting resources and undermining indigenous cultures, the contributors to *Contested Arctic* consider some of the major threats posed to the Arctic environment and how the indigenous peoples of the region are responding to them. The volume as a whole underlines the argument that sociopolitical and socioeconomic problems faced by Arctic communities cannot be viewed in isolation from ecological problems, and emphasises contemporary perspectives in the social sciences that suggest that scientific understandings of the Arctic environment need to be broadened to include the human environment. As Eric Alden Smith argues in his 'Introduction' to the chapters that follow, the circumpolar north has not yet entered a post-colonial or even neo-colonial period, but is the frontier of contemporary colonialism. The contemporary colonial agents are not representatives of nation-states as such, but of government agencies and powerful transnational corporations. The Arctic today, says Smith, is a contested historical and contemporary space where cultural, political, and ecological forces interact and collide.

The six authors of the chapters that comprise the book all illustrate Smith's argument with extremely detailed accounts of how these cultural, political, and ecological interactions affect specific localities, peoples, and communities. Aileen Espiritu, Gail Fondahl, and Craig ZumBrunnen show the environmental and cultural consequences of industrial development, pointing out how indigenous land claims and the formation of aboriginal nations are linked, among other things, to pollution and environmental degradation. Espiritu's chapter in particular considers the politicisation of native culture within this context, and illustrates how indigenous peoples in north-

west Siberia and northern Alberta were forced to redefine and renegotiate their perceived identities, and indeed their relationships to the nation-state, as a result of large-scale industrial development and the accompanying environmental degradation of their homelands.

Charles Johnson shows the role indigenous peoples have played, and continue to play, in environmental policy-making in the Arctic. His emphasis is on the social and environmental impact of trans-boundary pollution. In the Arctic, persistent organic pollutants (POPs) enter the food chain at every level. Because they break down more slowly in the Arctic than in more temperate regions, POPs pose greater dangers to human and animal populations. Johnson demonstrates indigenous concerns over pollution and environmental degradation as a public health issue, but also as a cultural issue. His chapter is also representative of indigenous discourses that argue for a recognition of the unique relationship that indigenous peoples have to the Arctic environment, and argue for the inclusion of indigenous perspectives in procedures and processes of environmental policy decision-making.

Discussing the relationship between environmental problems and human rights, Beach and Collings examine, respectively, how Saami reindeer herding as a livelihood is threatened by both state rationalisation and environmentalists in Sweden, and the political and cultural contexts of wildlife management in Canada. In the Saami case, reindeer herding is under pressure from legislation to make it conform to the Swedish state's view of what constitutes profitable business, while environmentalists criticise Saami reindeer herders for abandoning what they see as a 'traditional' lifestyle. In Collings' chapter, the virtues and drawbacks of co-management of wildlife are examined: while the indigenous environmental knowledge of Inuit hunters is considered 'useful' by scientists, Collings argues that such knowledge is not always taken as valid in the same way as the scientific knowledge of biologists. Rather than knowledge being transferred and shared, it is more often controlled, leading to a situation of the passive involvement of local communities rather than active involvement. Thus full community participation is not necessarily achieved, calling into question the effectiveness of co-management as both process and policy.

This book is a valuable contribution to current debates about the impact of rapid social and cultural change and the causes and consequences of the environmental crisis affecting virtually every part of the circumpolar north. It shows how indigenous concerns and anxieties over industrial development, resource exploitation, and environmental degradation arise because of the close relationship between the cultural, economic, political, and ecological situations of native communities. Each chapter points to the importance of ethnography and local case studies in understanding the complexities of local and regional processes as interacting with, being influenced by, and impacted upon by global processes. (Mark Nuttall, Department of Sociology, University of Aberdeen, Aberdeen AB24 3QY.)

ANALYSIS OF SAR DATA OF THE POLAR OCEANS. Costas Tsatsoulis and Ronald Kwok (Editors). 1998. Heidelberg: Springer-Verlag. viii + 290p, illustrated, hard cover. ISBN 3-540-62802-9. 248 DM; £95.50; \$US159.00.

This is a readable and thorough technical volume on the analysis and application of satellite synthetic aperture radar (SAR) data. Since 1991 four key satellites have been flown using this advanced (active microwave) technology: ERS-1 (European Space Agency) in 1991; JERS-1 (National Space Development Agency of Japan) in 1992; ERS-2 in 1995; and, RADARSAT (Canadian Space Agency) in 1995. The ERS-1/2 satellites have routinely produced 100 km swath (width) Earth images with 25 m resolution. RADARSAT can produce 50 km swaths with 10 m resolution imagery; however, in a wide-scan mode of operation (called ScanSAR), 500 km width swaths of 100 m resolution are achieved. This unique data is key to RADARSAT's effective use in operational monitoring of large regions of sea ice. Such polar orbiting satellites have ushered in a new era of remote sensing of the polar regions. These high resolution images of the Arctic and Antarctic will become increasingly important to the study of global environmental change. Without question this timely book provides a comprehensive 'state of the art' of SAR and its many capabilities for monitoring the Arctic and Southern oceans.

Seven chapters are devoted to SAR data analysis, which has yielded a surprisingly wide range of applications. In Chapter 2, a new algorithm automatically classifies ice floes in SAR images; techniques are also presented for the computation of ice-floe size distribution. Useful colour-coded images illustrate the segmentation of a SAR image and the resulting floe-size distribution. In Chapter 3, SAR is used to estimate components of the surface energy balance within the ocean-sea-ice-atmosphere interface ('the marine cryosphere'). During 1990-1995, a pioneering research project in the Canadian Arctic — the Seasonal Ice Monitoring and Modelling Site (SIMMS) — focused on the interrelationships among the geophysical, electrical, and microwave scattering properties of snow-covered sea ice. The project's key findings are summarised, including the successful use of SAR to detect the onset of melt in the cryosphere.

Chapter 4 reports on the efforts to use SAR data better to understand sea-ice deformation on an intermediate regional scale of 10-50 km (between a climate scale at 100-300 km and a floe scale at 1 km or less). At this scale, leads (with resulting thin ice and open water) form from sea-ice divergence, and pressure ridges are created from sea-ice convergence. An automated computer program is described that analyses ice-motion products of the Alaska SAR Facility, selecting only those where there is substantial sea-ice deformation. Several examples illustrate the algorithm's ability to identify openings and changing leads in SAR images. One of the most important and challenging tasks is the possible fusion of data from