

sive and very useful presentation on cloud observations, distribution, types, and physical properties follows. The material on precipitation is similarly expansive, with formation mechanisms, synoptic origins, spatial distribution of annual mean values, and seasonal variations all being covered. The chapter concludes with an overview of the belt of sea ice surrounding Antarctica, as well as a discussion of the Southern Ocean itself.

The final chapter concerns climate variability and change. The trends in recorded surface air temperatures are examined primarily since the International Geophysical Year (1957–1958) with an emphasis on the Antarctic Peninsula and the East Antarctic plateau. This is followed by a section on the interactions between Antarctica and lower latitudes, in particular the teleconnections associated with the El Niño–Southern Oscillation (ENSO) phenomenon. Regrettably, the description of this important topic is not well organized and stops around 1993. Since that time, a number of important studies have been published (for example, White and Peterson 1996), and many more can be expected as a result of the very strong El Niño event during 1997–1998. The book finishes with a good summary of predictions of Antarctic climate in conjunction with a doubling of atmospheric carbon dioxide content ('global warming').

To summarize, King and Turner have done a good job in reviewing the developments in Antarctic weather and climate during the period 1985–1994, and are to be congratulated on their effort. It complements the earlier scholarly treatise by Schwerdtfeger (1984). Particularly strong aspects are the effort to place Antarctica in the context of the Southern Ocean, the attention paid to data aspects that are not readily obtained elsewhere, and the liberal use of satellite imagery from Rothera to illustrate key points. One drawback is the figures, especially in chapters 3 and 5. As Antarctic atmospheric investigations are progressing rapidly, it is inevitable that recent developments are not covered. Two areas that are not adequately treated by the text are atmospheric numerical modeling by regional and global models, and ENSO investigations; perhaps these topics will form the basis for the book's first revision. The book is well produced, of sturdy construction, and is reasonably priced in relation to similar offerings. This book is strongly recommended for the polar scientist who wants to gain an appreciation of modern Antarctic atmospheric investigations, as much of the material does not require an in-depth knowledge of meteorology to be understandable. All polar libraries should have a copy, and even more general science libraries could benefit from its acquisition. (David H. Bromwich, Polar Meteorology Group, Byrd Polar Research Center, The Ohio State University, 1090 Carmack Road, Columbus, OH 43210, USA.)

References

Schwerdtfeger, W. 1984. *Weather and climate of the Antarctic*. Amsterdam: Elsevier.

White, W.B., and R.G. Peterson. 1996. An Antarctic circumpolar wave in surface pressure, wind, temperature and sea-ice extent. *Nature* 380: 699–702.

GREENLANDERS, WHALES AND WHALING: SELF-DETERMINATION AND SUSTAINABILITY IN THE ARCTIC. Richard A. Caulfield. 1997. Hanover, NH, and London: University Press of New England. xiv + 203 p, illustrated, hard cover. ISBN 1-87451-810-5. £25.00.

Aboriginal subsistence whaling by Inuit in Greenland, Canada, Alaska, and the Russian far east remains under close scrutiny by the International Whaling Commission (IWC) and anti-whaling groups, even though no organisation concerned with whale management and conservation has yet come up with a satisfactory definition of 'aboriginal' or 'subsistence.' Too often the rhetoric of whale management bodies and environmentalists is couched in moral and ethical language, while advocates for the continuation of aboriginal whaling have criticised the concept for its imperialist associations. Indigenous peoples themselves are arguing for the right not only to continue whaling but to develop domestic and international markets for whale products. This in turn has brought more opposition from anti-whaling organisations that express concern at what they see to be an increasing commercialisation of what was once a 'traditional' activity.

In this book, Richard Caulfield looks at these conflicts and contested perspectives, and describes the economic, cultural, and symbolic importance of whaling for Greenlanders in general and the people of Qerqertarsuaq, in Disko Bay, in particular. Aboriginal subsistence whaling in Greenland provides a powerful example of how environmentalist action and globalist models of environmental management clash with indigenous or local modes of production, and Caulfield's book is effective in its treatment of the Greenlandic position that international opposition and management fails to understand the needs of local people. Caulfield shows how co-management of whaling is increasingly effective in the way it attempts to reconcile global concerns about the exploitation of whales with the needs of local Greenlandic communities caught up in what is a global environmental issue — the discourse is influenced and made more complicated by the interests and concerns of a number of players, such as the IWC, international NGOs, the Greenland Home Rule government, local municipal authorities, indigenous peoples' organisations, and the Danish government, each of which has its own particular agenda.

Although the IWC has allowed aboriginal subsistence hunting for fin and minke whales in Greenland to continue under a strict quota system, it nonetheless faces increased regulation. Caulfield explains how whaling in Greenland must be understood as something that is important to Inuit in both a cultural and economic sense, as well as a political and symbolic one. He argues that whaling's contemporary significance can only be appreciated by understanding the historical connections between Greenland and global political and economic systems. Thus, while subsistence

hunting is a way of life based on the harvesting of renewable resources (seals, whales, and other sea mammals), it is a way of life long made possible by the complex interplay between informal and formal economic activities. This is an important part of the book, because part of the strategy used by anti-whaling groups in their criticism of whaling communities in contemporary Greenland is to reify traditional hunting as something that is only permissible if hunters live within a 'non-commercial,' non-market-based economy and utilise simple technologies. Caulfield shows how this is a false premise.

It is Caulfield's view that Greenland's whale management policies, structured in terms of co-management, are effective, as far as they currently operate. However, he nonetheless points out that the present whaling regime is not without its problems and has resulted in political and cultural tensions within Greenland. Since 1979, Greenland has embarked on a process of nation-building, a process that has produced complex ideological oppositions evident between interest groups in a national context (such as political parties, hunters, fishermen, and producer organisations) rather than between local communities. In Greenland today, the whaling debate highlights some of these oppositions. In particular, conflicts arise over the use of science versus indigenous knowledge in whale management, the introduction of new technology for whale hunting, the ethics and morality of selling whale meat for cash rather than distributing it through traditional patterns of sharing and exchange, and the changing nature of power relations within and between communities as a result of participation in the international politics of whaling. There are also concerns expressed by hunters and local communities that the Greenland Home Rule Authorities do not give them a fair share of the IWC quota.

As the debate on aboriginal subsistence whaling enters a period when the concepts of 'aboriginality' and 'subsistence' will be redefined, and as questions are raised over whether co-management practices offer a compromise by merely regulating access to resources and do not allow the promise of greater self-regulation by Greenlanders, Caulfield has written a timely book that will appeal to Arctic specialists as well as those concerned with the politics of resource management elsewhere in the world. (Mark Nuttall, Department of Sociology, University of Aberdeen, Aberdeen AB24 3QY.)

ANTARCTIC ENVIRONMENTAL PROTECTION: A COLLECTION OF AUSTRALIAN AND INTERNATIONAL INSTRUMENTS. Donald R. Rothwell and Ruth Davis (Editors). 1997. Sydney: Federation Press. xii + 306 p, hard cover. ISBN 1-86287-271-6.

The Antarctic Treaty System (ATS) has long been the subject of academic scrutiny and analysis, and has generated a significant volume of literature. With the entry into force of the Madrid Protocol on Environmental Protection in January 1998, it is unlikely this situation will change in the immediate future. For those wishing to examine the

Treaty and the other constituent elements of the ATS, it has always been somewhat frustrating that the relevant documents are scattered through a variety of sources, not easily lending themselves to access. Until recently, only Bill Bush's *Antarctica and international law* sought to centralise the primary source material concerning the Antarctic. The only limitation to Bush's excellent work is its thoroughness, as the original edition covered four volumes, and it has subsequently expanded as much again in a looseleaf service. The size of the book, and therefore the attendant cost, meant that its possession was restricted to those with a strong research interest in the field, or to specialist libraries. Consequently, it might be argued that a place existed for a work providing a compilation of the more significant Antarctic materials, a work that could have a wider degree of availability. This appears to be the objective of *Antarctic environmental protection*, edited by Donald R. Rothwell and Ruth Davis.

The book itself is divided into two parts. The first half considers the international instruments that make up the ATS, namely the Antarctic Treaty itself, the Convention for the Protection of Antarctic Seals, the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), and the Madrid Protocol. In addition are certain key Recommendations and Measures adopted at Antarctic Treaty Consultative Party Meetings and CCAMLR meetings. These latter materials are particularly welcome, as they are seldom extracted in articles or monographs. The Measures selected were chosen with an eye to their relevance to the broader environmental issues that have faced the Antarctic in the last decade, notably tourism, mineral-resource activities, area management, and living-resource exploitation. With regard to this last category, it is particularly pleasing to see extracted the provisions dealing with exploratory fisheries under CCAMLR. These provisions are occasionally overlooked by authors considering CCAMLR, yet they are an important plank in implementation of a precautionary approach within the CCAMLR area.

The second part is directed towards the legislative implementation of the ATS within Australia. Each of the principal acts, stretching back to Australia's acceptance of the Australian Antarctic Territory in the 1930s, through to the scheme to implement the totality of the Madrid Protocol, is extracted. While this will be of principal benefit to Australian researchers, it may be of interest to researchers elsewhere, curious to see what form an overall legislative response to a state's Antarctic obligations has taken. Rarely has all of a state's Antarctic legislation been condensed together in so convenient a form. In addition, an Initial Environmental Evaluation, submitted under the Australian legislation, is extracted. This is particularly useful, as it provides an insight into the actual scope of the commitment each state party has made, which may be difficult to gauge when reading a commentary or legislation alone.

In addition to the primary source material, each of the