

experience.

This work has a number of distinctive features. It is meticulously researched with extensive references to relevant government documents and legal literature. Much effort was expended in providing a comprehensive review of relevant Soviet law of the sea commentaries — which is most useful for interpreting Soviet state practice. A number of relevant maps and figures are also included to guide the reader. The introductory chapter provides a helpful description of the physical characteristics of the area under consideration. The author also devotes some effort in justifying his choice of topic. However, given the emerging importance of the Arctic in international affairs and the increased interest shown in the region by social scientists the need to justify this study hardly seemed necessary.

The major aim of this book is to compare the Arctic maritime claims and policies of Canada and the USSR (page 3), and this is achieved without much difficulty. However, the legal review of the Canadian and Soviet legal positions is at times so dominated by the views of other commentators that it is difficult to determine what the author's own views are. A more balanced analysis may have been achieved if less weight had been given to the views of parochial Canadian and Soviet scholars. In concluding this comparative analysis, it is suggested that Canadian and Soviet policy-makers may have maintained contact during pivotal periods in their Arctic maritime policy development process (pages 236–237), although no evidence is presented that a joint approach was taken to these issues.

While the major purpose of this study is admirably achieved, much effort is also spent in discussing future prospects for Arctic cooperation. This represents a major extension of the work, which is unfortunate, because it is here that the author begins to encounter difficulties. While there can be no denying that international cooperation in the Arctic will very much revolve around the resolution of law of the sea issues, there are also a great many other issues that will be relevant, especially those dealing with environmental protection and national security. This topic is worthy of a separate study, and Franckx's review of these issues in chapter 4 is not as comprehensive as it could be. Initiatives such as the 1991 Arctic Environmental Protection Strategy are glossed over. Despite this criticism, some well-considered conclusions are made concerning the potential relationship between increased Arctic cooperation and the resolution of the Northwest and Northeast passage jurisdictional disputes.

This work represents an important study of the two major jurisdictional issues that have confronted the Arctic in recent times. It demonstrates how both Canada and the former USSR, and now potentially Russia, have a substantial Arctic outlook in their national policy. If there is the prospect of greater cooperation amongst Arctic states, similar to what has taken place in Antarctica, there shall need to be some resolution of long-standing jurisdictional disputes and potentially the loss of some sovereign rights.

Franckx provides important insights into how two of the major players in the Arctic have dealt with these problems in the past and how they may react in the future if jurisdiction over their maritime areas is questioned. In doing so he allows for a greater understanding of two of the issues that will need to be confronted if Arctic cooperation is to prosper. (Donald R. Rothwell, Faculty of Law, University of Sydney, 173–175 Phillip Street, Sydney, New South Wales 2000, Australia.)

CANADA'S COLD ENVIRONMENTS. Hugh M. French and Olav Slaymaker (Editors). 1993. Montreal, Kingston, and London: McGill–Queen's University Press. xxii + 346 p, illustrated, hard cover. ISBN 0-7735-0925-9. £42.75.

Students of Arctic and alpine environments will know that *Canada's cold environments* is a book they should read, and they will be rewarded when they do so. So will many others beyond the community of polar physical scientists, as this book is also intended for their use. It is a concise statement of the state of the art of current understanding about cold environments, emphasizing their physical characteristics, with illustrations from Canada. The editors assume that the user of the book has a modicum of background in physical geography. The editors did not intend it to be comprehensive; literature is selectively reviewed by citing only the best, most innovative, most surprising, and most forward-looking research. This approach brings life to its topics much more effectively than the encyclopedic approach. Many other books are available that provide comprehensive reviews of the various aspects of the cold environment.

Canada's cold environments is, in many ways, an update and regionalization of *Arctic and alpine environments* (1974), edited by J.D. Ives and R.G. Barry. The latter book, however, was not an update of something published earlier, and, therefore, it was a much bigger book with a global perspective and many more literature references. Most chapter topics — such as climate, vegetation, hydrology, and permafrost — are common to both books, but most chapter authors are different, reflecting the Canadian focus of the present book. An important addition is a chapter on high-latitude oceans, which are so important in shaping the cold Canadian environment and in global climatology. *Canada's cold environments* lacks a chapter on glaciers and glaciation of northern lands, but coverage of glacial hydrology and ice-core stratigraphy in other chapters partly fills this gap. Surprisingly, there is no map of surficial materials or soils, and the geologic history that produced the land of northern Canada is given little attention. The section on mountains is better in that it provides thorough historical treatment, especially in the very interesting chapter on karst.

The overall messages are that people are learning rapidly about cold environments, that the attendant explosion of information is overwhelming to specialists, much less non-specialists, and, finally, that specialists recognize the need to communicate the state and vitality of the art to

non-specialists; the need is more than purely academic, it is driven by concerns about the future of the environment. The final four chapters on hazards and climatic and global change make this clear.

The book is well-edited and well-written, comparatively free of drafting and typing errors, and enjoyable reading. It is certainly appropriate for upper-level undergraduates and should be read by a much wider audience. It handily accomplishes its task of expanding and enlivening the understanding of the cold north. (William N. Mode, Department of Geology, University of Wisconsin Oshkosh, Oshkosh, WI 54901, USA.)

THE GREAT RUSSIAN NAVIGATOR, A.I. CHIRIKOV. V.A. Divin. Translated and annotated by Raymond H. Fisher. 1993. Fairbanks: University of Alaska Press (Rasmuson Library Historical Translation Series VI). xiii + 319 p, maps, soft cover. ISBN 0-912006-63-3. US\$20.00.

Bering's expeditions, which lasted from 1725 to after his death in 1741, are still relatively unknown in the western world, although they permitted a great leap forward in the knowledge of the North Pacific coastline, including the discovery of Bering Strait and part of the Alaskan coast. Even less known is the man who served as Bering's deputy for 17 years and his successor after his death, Alexei I. Chirikov, a bright Russian naval officer who had specialized in navigation. Therefore one can only welcome Raymond Fisher's translation of a biography of Captain Chirikov, first published by V.A. Divin in Moscow in 1953. In 1925 an American, F.A. Golder, had already published two volumes on Bering's voyages in the American Geographical Society research series, giving some information about Chirikov's accomplishments; then, in 1951, a Russian author, D.M. Lebedev, published a full version of Chirikov's logbook for the voyage to Alaska on board *Sv Pavel*.

In reviewing Divin's book, one must first acknowledge Professor Fisher's tremendous work of notes and translation, although it is also necessary to concur with his introductory statement that 'Divin's monograph contains serious flaws.' Divin's book was published shortly before Stalin's death, and this may explain in some measure his attack against foreigners — including Bering, a Dane by birth who had been personally selected by Peter the Great — and his labelling of pre-revolutionary Russian historians as 'bourgeois' whenever he does not agree with them. An alternate explanation to these tendencies could be the practice during Stalin's era of having an editor introduce Marxist statements in a manuscript without the author's knowledge.

The book is actually an account of Bering's two expeditions more than it is a study of the life of Chirikov. There are in the naval archives in St Petersburg many materials about Chirikov, including his personal notebooks, which seem to have been ignored. This is also true of logbooks where astronomical observations could be found and that could be used to show the expertise of Chirikov as a

navigation officer, including during the crossing of Siberia on riverboats. A possible explanation for these omissions may be found in a statement by the great Arctic historian M.I. Belov, who commented that Divin's book was really 'a popular science book.' Professor Fisher is, of course, fully aware of all this and succeeds in making the book attractive with 65 pages of notes, supplementary biography, and exhaustive index. At this point one should also point to Professor Fisher's very interesting chapter 'To give Chirikov his due' in the book edited by O.W. Frost on the occasion of the 250th anniversary of Bering and Chirikov's American voyages (Frost 1992: *Bering and Chirikov*, Anchorage: Alaska Historical Society).

Chirikov was born in 1703 and enrolled in 1715 in the school of mathematics and navigation, a kind of secondary school for children of nobility, which had been created by Peter the Great. Four years later Chirikov was selected to join the new Naval Academy. In 1722, aged 19 and a sub-lieutenant, he was again assigned to the Naval Academy, but as an instructor of navigation. In 1725 he joined Bering's first expedition, which was to last three years, mostly because of the hardships of crossing Siberia with the equipment, craftsmen, and crew needed to build a ship in Kamchatka and to sail it in northern waters.

Wintering in Bolcheretsk in Kamchatka, Chirikov observed and accurately recorded an eclipse of the moon, and was therefore able to obtain the first astronomical longitude of Kamchatka with the help of J.N. Delisle (described as a spy by Divin). Delisle had come from Paris to St Petersburg at the request of Peter the Great to build an observatory and to improve the maps of the Russian Empire.

When sailing from Kamchatka to Bering Strait on Bering's ship *Sv Gavriil*, Chirikov made a survey of the coast; this was highly praised by Cook when he sailed in the same waters in 1778. In 1741 Chirikov discovered the North Pacific coast of America while with Bering's second expedition, but the two ships they commanded were soon separated and never met again. Chirikov approached the American coast south of Bering and three days ahead of him. Due to the loss of 15 men and his two boats Chirikov returned to Kamchatka, arriving in October 1741 with great difficulties, due to death or ill health of the crew from scurvy. Bering died in December 1741, his vessel wrecked on what is now Bering Island, although some survivors succeeded in sailing back to Kamchatka a year later, just after Chirikov had left for Okhotsk.

Chirikov was called back to St Petersburg, where he arrived in March 1746. He had but two years to live, but he still produced some very interesting documents that are well described in Divin's book: general charts of the discoveries, including the Arctic shores, and a number of proposals for the development and administration of the Siberian and American regions. The publication of this book marks the first time, thanks to Professor Fisher, that these proposals have been translated and annotated in a western language, giving us unique insights into Chirikov as an able strategist encompassing social, economic, and