

in a sense the Liard is one of the book's main characters. Some of the adventures have been told before by R. M. Patterson, C. Wilson and A. A. Wright, but Professor Karamanski makes more systematic use of the Hudson's Bay Company archives. He also explains and integrates, over a wide area, explorations which have usually been treated cursorily in studies of the fur trade, clarifying for example such matters as the maritime and interior approaches to exploration of the Stikine River, the twin probes to the upper and middle Yukon, and the distracting effect of searches for the Franklin expedition to the northeast. One emerges from the book with a clear overview of northwest exploration and geography.

A distinct merit of this book is that the author, a canoeist, is familiar with several of the rivers he writes about. He does not intrude personal experiences, but his knowledge of the mechanics of whitewater, poling, tracking and portaging is very evident. He could perhaps have said more about James Green Stewart and James Anderson; however, he introduces many Hudson's Bay Company officers fully, adding to human interest. The sketch maps are an essential feature. One minor omission is Lake Simpson, which marked McLeod's turning point along the Frances River. There are 24-black-and-white illustrations from the late 19th century, and Karamanski further illustrates his book with vivid quotations both from original expedition accounts and from later geological survey reports. A strong advocate of the hardworking explorer, he decries the penny-pinching restraints of Governor Simpson and Chief Factor McPherson. He takes Robert Campbell very much at his own evaluation, a view which may have to be modified shortly in the light of new research and economic analysis by K. Coates, a young Yukoner. In conclusion, this book is a reasonable blend of scholarship and popularization, something rarer in North America than in Britain.

C. Stuart Mackinnon

Department of History, University of Alberta
Edmonton, Alberta, T6G 2H4, Canada.

ENVIRONMENTAL ATLAS FOR LANCASTER SOUND

THE LANCASTER SOUND REGION; DATA ATLAS. Dirschl, H. J. (project manager). 1982. Ottawa, Department of Indian Affairs and Northern Development. Pages various, semi-hard cover. QS-8297-030-HB-A1. Can\$100.

In 1979 a proposal to drill for hydrocarbons in Lancaster Sound was put before an Environmental Assessment and Review Process panel in Ottawa. The proposal led the Minister of Indian Affairs and Northern Development to set up the Lancaster Sound Regional Study, with the objective of reviewing the issues widely. This fine atlas arises out of the Study's work. It sets a new standard of presenting base-line information about a part of the world that is likely to be the site of development. The area covered embraces Lancaster Sound and adjoining land masses and marine channels, a total of 260 000 km². The information is presented as a series of distribution maps at a scale of 1:2 million, with brief explanatory text giving such essential information as the sources and reliability of the data presented. The maps are mostly in two colours, with distributions shown by hatching of various kinds. The only exception is a vegetation map, which uses at least a dozen colours. In fact hatching, though sometimes harder to interpret, is the best solution for overlapping distributions. All the text is given in three languages – English, French, and Inuktitut (syllabics).

There are 84 distribution maps, divided into four sections: physical and environmental characteristics, including geology, climate and floating ice; biological characteristics, including plankton, fish, birds, and mammals; existing human activities, such as settlement, tourism, transport, hunting, fishing, trapping, and mineral extraction; and potential human activities, which are projections into the future of the previous section. Compilation of the material was undertaken by a team of specialists from federal government departments, and the cartography by a team from James Dobbin Associates.

Terence Armstrong
Scott Polar Research Institute
Lensfield Road, Cambridge CB2 1ER

GLACIOLOGY AND CLIMATE; THE RECORD OF THE ICE SHEETS

THE CLIMATIC RECORD IN POLAR ICE SHEETS. Robin, Gordon de Q. (editor). 1983. Cambridge, Cambridge University Press. 212 p, illustrated, hard cover. ISBN 0 521 25087 0. £32.50

This volume represents results evolving from a workshop held in Cambridge, England in 1973, dealing with one of the most fascinating aspects of modern glaciological research. Ten years have passed since the workshop, but the book incorporates or gives reference to all important scientific results obtained during the interim period, and is thus thoroughly up to date.

The volume deals mainly with reconstruction of palaeoclimatic records, based on measurements of temperatures and isotopic ratios of glacier ice samples. Today it is well recognized that the two large polar ice sheets of Greenland and Antarctica contain, well preserved in layered stratigraphic sequence, the precipitation of the last one thousand centuries. The isotopic composition of hydrogen and oxygen in the water molecules of a given snow-fall depends on the condensation temperature at the time of precipitation. Firn temperature measured 10 m below the snow surface reflects the local mean annual surface temperature. Changes of temperature with depth are due to such influences as geothermal heat and deformation pressures of overlying strata, which can be calculated. In principle it is therefore possible to reconstruct, from boreholes augered in glaciers, the surface air temperatures of past epochs, based on analyses of isotopic ratios and measurements of temperature at depth. The principle is simple but the accurate reconstruction process is complicated and full of pitfalls. In this volume, the analytical methods employed and the model calculations used for interpretation are very carefully discussed.

Of the volume's six chapters, the first is an excellent introduction which explains the main concepts and familiarizes the reader with some of the problems and open questions involved. The second describes variations in size and behaviour of ice sheets in the past. The third chapter deals with techniques for measuring such single parameters as ice temperature, depth and movement, accumulation rates and total gas content, and with the significance of these parameters in the behaviour of ice sheets. Chapter four presents observations on the principal isotopic and temperature profiles that are currently available, and chapter five discusses and interprets these results, comparing them with calculated profiles. In the final chapter, the correlations of present day temperature records are compared with isotopic records of ice cores. Most of the chapters are written by several authors, all of whom are well-known in their fields.