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Book Reviews

THE DISTANT AND UNSURVEYED COUNTRY: A WOMAN'S WINTER AT BAFFIN ISLAND, 1857–58. Edited by W. G. Ross. Montreal and Kingston: McGill-Queen's University Press, 1997. xli + 258 pp. + 4 maps. \$34.95. ISBN 0-7735-1674-3.

This is a fascinating book. It chronicles the activities of the wife of a Scottish whaling captain during a voyage on the "Lady Franklin" to Cumberland Sound, Baffin Island, Canada. Margaret Penny was the wife of Captain William Penny (for whom the Penny Ice Cap on Cumberland Peninsula is named). In 1857 she embarked on a whaling voyage with her husband and kept a detailed diary of events. The diary has been prepared for publication by Gillies Ross, an Emeritus Professor of Geography at Bishop's University, Montreal, and an expert on the whaling activities in the Eastern Canadian Arctic. He combines the simple transcription of the diary in terms of day-to-day activities with a discussion and explanation of events. This greatly adds to the enjoyment of the book because it puts specific issues and events in their appropriate historical context.

I had my own reasons for wishing to read this book, and which to a degree rendered it "special." This was because in the summer of 1973 Paul Carrara and I had worked along the north shore of Kingnait Fiord, and had camped for several days in what Ross believes was the harbor called "Sophie Harbour" in the diary (this name is no longer applied on topographic maps and its location is based on Ross's judgement of descriptions of the harbor in the diary).

The book starts with an Introduction which gives an informative overview and background to the whaling industry at this particular time. It also includes biographical sketches of the two main figures in this book, Margaret Penny and her husband, William. The diary starts on July 5th, 1857 with the ship en route to Baffin Island. Initially the diary is kept by Captain Penny, but from July 30th on Margaret Penny became the diarist, and is from this unique woman's perspective of native peoples, and life on-board a whaling ship in the mid-19th century which renders this book so absorbing. The editor has broken the diary and associated comments down into a series of chapters which simply march through the year. Each chapter is given an appropriate heading associated with the main events of that particular period of time. Thus for the period November 26th to December 31st the title is "Ill Supplied with Food," whereas the period May 13th to June 30th, 1858 is called "Fish in Every Direction." The book is illustrated in a number of different ways. Four maps are included and these are extremely useful in tracing some of the activities mentioned in the diaries. In addition, recent photographs of the area, older photographs of whaling activities, and lithographs are all used to place the contents of the diary into a better visual perspective. Ross himself visited several of the major sites noted in the diary, such as the old whaling station on Kererten, and has illustrated their setting with black and white photographs.

The book ends with an "Epilogue" by Ross who reviews some of the aspects covered in the diaries within their historical perspective. Thus there is an interesting discussion on whaling and a piece on missionary Mattheus Warmow and the role of the Moravian Church in the Arctic.

I heartily recommend this book to all interested in the de-

velopment and history of the Canadian Arctic, and in the role of whaling in these waters. It is a scholarly work but one that I read with great enjoyment and fascination.

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POLAR AND ALPINE TUNDRA. Edited by F. E. Wielgolaski. Amsterdam: Elsevier Science. 1997. 930 pp. Hardback, \$497. ISBN 0-444-88265-0.

Polar and Alpine Tundra is Volume 3 of David W. Goodall's 30-volume *Ecosystems of the World*. It is principally a compendium of ecosystem descriptions from diverse tundra regions around the globe, including Fennoscandia (authored by F. E. Wielgolaski), Iceland (T. E. Þórhallsdóttir), the European Alps (G. Grabherr), high mountains in the former USSR (R. I. Zlotin), the central Himalaya (G. Miehe), tropical African alpine (O. Hedberg), southern African alpine (D. J. B. Killik), North American alpine (J. S. Campbell), New Zealand alpine (A. F. Mark and K. J. M. Dickinson), South American páramos (A. Diaz. J. E. Pefaur, and P. Durant), Svalbard (A. Elvebakk), arctic Russia (Yu. I. Chernov and N. V. Matveyeva), arctic North American (L. C. Bliss), Greenland (J. Böcher and P. M. Peterson), and Antarctica (H. Kanda and V. Komárková). Four chapters from the former Soviet Union are particularly welcome additions with information that was previously not available in the West. Some chapters are on more focused topics, such as adaptations of alpine plants (Wielgolaski), alpine insects (L. Sømme), primary production and biomass in Russian tundra (N. I. Bazilevich, A. A. Tishkov, and G. E. Vilchek), chemical elements in tundra plants (Bazilevich), and subalpine ecosystems of the Carpathian Mountains (K. A. Malinovsky). The emphasis is on plant communities and ecosystem function. Most chapters provide excellent overviews of the climate, geology, soils, and biota. The book is about equally weighted between alpine and polar environments. For tundra aficionados, it is a fine adventure reading this book from cover to cover. As in any work of this nature, there is variability in the style and content of the various chapters. There is no way to adequately review all the chapters, but I have selected three to provide some idea of the type of information in the book.

My favorite chapter is Chernov and Matveyeva's from the Russian Arctic. It is the longest chapter in the book (146 pages), and it is a rich source of information regarding the ecology of the Taimyr Peninsula, a huge piece of the Arctic that is little known to western scientists. The chapter begins with a history of geobotanical and ecological research in northern Russia. The authors then examine biotic changes across the 10°C mean July temperature gradient of the Taimyr Peninsula. Chernov, a zoologist, and Matveyeva, a botanist, discuss the major changes in a wide variety of biotic parameters (productivity, structure, diversity, phenology, and abundance) for a broad group of organisms (vascular plants, insects, birds, and mammals). Their examination of the consequences of climate change to all trophic

levels is a great strength of this chapter. The chapter concludes with an insightful discussion of the ecological implications of reduced warmth to populations, communities, and trophic interactions. Their main message is that arctic tundra ecosystems are at the margin of global climatic conditions and are uniquely dependent on a single factor, temperature. This is reflected in the strong correlation of many biotic parameters with summer temperature. The micro-, meso-, and macrostructure of the living plant cover is dependent on the availability of summer warmth and its consequences (shortness of the growing season, lack of nitrogen, etc.). However, numerous mechanisms are operating to partly compensate for the negative effects of temperature and contribute to the preservation of complex community organization. Even though Taimyr community structure is relatively simple compared to other biomes, the consequences of changing the temperature regime, as will likely happen with climate changes, are extraordinarily complex, particularly when interactions between the various trophic levels and permafrost are considered. The influences of the lower plants, particularly mosses, are especially important. The changes across the tundra zone are so great, and the interactions so poorly understood at present, that averaged values for the communities and ecosystems over the whole tundra zone are of little value. Nevertheless, this kind of averaging is done on many global maps and in global-change modeling exercises. They also stress that the low resistance to disturbance and poor potential of these systems for full recovery following disturbance make these systems particularly vulnerable to anthropogenic impacts. The authors do not examine the ecosystems of the entire Russian Arctic as the title suggests. Actually, this is good because such a broad treatment would overly dilute this work. This chapter is a gem and a wonderful addition to the arctic ecological literature.

Bliss's chapter on the North American Arctic is a huge synthesis mainly from International Biological Programme (IBP) Tundra Biome research in the 1970s and 1980s. It contains good descriptions and excellent photographs of landscapes from several sites in Canada and Alaska. Bliss summarizes most what is known regarding tundra ecosystems in North America, including permafrost, patterned ground, soils, climatology, plant communities, floristics, plant adaptations, succession, physiological processes, ecosystem origins and evolution, history of Beringia, modern terrestrial ecosystem processes (production, nutrient budgets, energy flow, assimilation efficiency), and aquatic ecosystems. Bliss focuses on the physiological processes, energy flow, and system relationships. This is quite different from the focus of the Russian work, which is more descriptive, with a strong focus on geobotany and natural history. Bliss's chapter will likely be the standard reference for overviews of the North American arctic ecosystems. For an introductory student to the Arctic, this would be a good point to enter the North American arctic-ecology literature. I think, however, the chapter ultimately suffers from trying to do too much. Much of this information has been better summarized elsewhere, and in some cases is dated. Several key references from Alaska are missing. For example, there is little mention of the recent Long-Term Ecological Research (LTER) research at Toolik Lake, nor the extensive studies at Imnavait Creek and Prudhoe Bay.

The chapter by Campbell provides an overview of North American alpine areas. The scope of discussion extends from the Brooks Range, Alaska, in the north to the San Francisco Mountains, Arizona, in the south, and from the Sierra Nevada Mountains, California, in the west to the Presidential Range, New Hampshire, in the east. The chapter contains discussions of climate, soils, plant communities, microflora, and fauna. These dis-

cussions are quite general because of the huge variability and lack of similar data sets from such a wide variety of regions. The chapter hops across 23 mountain ranges with short discussions, which are helpful for finding key regional references, but lack much depth. The territory is too large for a single chapter. A synthesis of information in relation to obvious geographical gradients such as latitude, altitude, or regional climate would have been extremely useful. The bibliography shows few references more recent than the mid-1980s, and numerous key alpine references are not included, such as those of the 16-year history of intensive ecosystem research LTER program on Niwot Ridge, Colorado.

The book brings to light some current problems with geographic discussions of tundra regions. As Chernov and Matveyeva note from the Arctic, biotic response to temperature is the key factor controlling diversity, spatial patterns, and functioning of tundra ecosystems. It is interesting that although all the arctic chapters discuss bioclimatic zonation, they all use different terminology to describe these zones. The various authors also have strikingly different definitions for basic words, such as "tundra" and "polar desert." For example, Bliss uses "tundra" to describe more or less continuously vegetated portions of the Arctic, whereas Chernov and Matveyeva and Elvebakk apply the term more broadly to the zone between the treeline and polar deserts. Wielgolaski uses the word "tundra" most broadly to include all the treeless arctic and alpine landscapes in cold-dominated ecosystems. Similar differences occur with the various altitudinal zonation schemes. These terminology problems are understandable because of the different traditions, language barriers, and the Cold War, which long separated scientists working in different parts of the Arctic. However, it makes comparative studies for global syntheses much more difficult. This points to the need for a common circumpolar tundra vocabulary before we can place the tundra regions within a global framework.

Wielgolaski's book comes at a particularly good time as we move from regional to circumpolar and global perspectives of tundra environments. The wide geographic scope, the generally excellent chapters, extensive bibliographies, and superb indices (taxonomic, author, and general subject indices) make this the closest thing to a tundra encyclopedia that we have.

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EVA INTERGLACIATION FOREST BED, UNGLACIATED EAST-CENTRAL ALASKA: GLOBAL WARMING 125,000 YEARS AGO. By Troy L. Péwé, Glenn W. Berger, John A. Westgate, Peter M. Brown, and Steven W. Leavitt. Boulder, Colorado: Geological Society of America, Special Paper 319, 1997. 54 pp. \$36.00 (\$28.80 for Geological Society of America members). ISBN 0-8137-2319-1.

The Eva Forest Bed, a late Pleistocene organic deposit from the Fairbanks region, has been the object of Péwé's study for the past 50 yr. Because of its well-preserved spruce and paper birch macrofossils, the bed clearly indicates that boreal forest grew in interior Alaska during the late Pleistocene. In many ways, this fascinating deposit typifies the joys and frustrations of paleoenvironmental studies in Beringia, those regions of the Yukon Territory, Alaska, and northeastern Siberia that remained relatively ice-free during much of the Late Pleistocene. Because permafrost underlies so much of this huge region, fossil pres-