GLACIERS. By MICHAEL HAMBREY and JÜRG ALEAN. Cambridge: Cambridge University Press, 1994. Reprint of 1988 edition. 208 p., 160 illus., glossary. Softbound. US$15.95.

Glaciers seem to hold a strange fascination for many people. In one summer's day alone, 4000 ticket-toting tourists may take the 2 km trip in mammoth rubber-tired vehicles out onto the icy expanse of the Athabasca Glacier, Alberta, Canada. Still hundreds of others in Bermuda shorts and sneakers swarm over the terminal ice and peer, undaunted, into crevasses, poke the ice and pose for photographs. In the last three years one boy and a German tourist have died of hypothermia after falling into crevasses. My current wristwatch (a Timex Ironman) was found, with a broken wristband, on a ledge on the wall of a crevasse in the Athabasca Glacier in 1993.

This glacier and all the activities associated with it can easily be seen from the comfort of a vehicle travelling the Banff-Jasper Highway. The glacier has also been the object of intense scientific research by government and university scientists over three decades. Meltwater from the glacier makes its way into one of the major waterways of the western provinces. Being in a federal park, it represents a national "resource"; it also represents, in this case, a commercial resource. In addition to the glacier trips at $26 each, one can stay at a luxury hotel in full view of the glacier and just enjoy the view. If you are interested in these and the many other aspects of glaciers, then this book certainly fits the bill.

In a little over 200 pages, the authors, who are well known in the international glaciological community, have created a highly readable and very comprehensive book about the world's glaciers. In many aspects, this book resembles an issue of the *Alaska Geographic* titled *Alaska's Glaciers* (Henning et al., 1982) but *Glaciers* gives us global coverage. Also the earlier book must be out of print and is not a competitor to *Glaciers*. The book reads like a greatly expanded entry on glaciers that one would expect to find in an encyclopedia. Most of the pictures were taken by the authors during their extensive travels around the world. Nothing seems to have been overlooked as Hambrey and Alean systematically work their way through 12 interesting and superbly illustrated chapters. The last two chapters relate glaciers to their environment, both atmospheric and terrestrial, including the biological realm. (There is even mention of ice worms, but, to actually see a picture of one, you will have to refer to *Alaska's Glaciers*).

Virtually every story that I have heard about glaciers is in the book, with the exception of the account of the finding of the 5300-year-old body of the *Iceman* in the Tyrolean Alps in 1991. (*Glaciers* is a reprint of the original 1988 edition). Mark Twain's amusing account of his "trip" down a Swiss Glacier is there, and also a well-informed answer to the most often asked question: "Are glaciers advancing or receding?"

Alternating nicely with the 85 colour pictures of National Geographic quality are about 75 black-and-white photographs and diagrams. Thus, it is a highly illustrated book. This fact and the well-written and not too technical text make this book suitable for a wide readership. The absence of equations and references is deliberate: these exist in other books, for example, Paterson (1981), which is nearing a third edition.

Typographical errors are rare. The diminutive "gletscherli" (small glacier) on Mount Titlis in Switzerland is only 80 m long (not 800 m as reported). The Krakatoa volcano erupted in 1883, not 1783, although there were two important volcanic eruptions in 1783 that may be identified in ice cores, which the authors describe. Two pictures of Mount Logan, Canada's highest glaciated mountain, are impressive; however, it is approximately 5959 m high, not 6050 m (an incorrect value commonly in use). On p. 188 Nevado Huandoy is misspelled, as is the name of the pro-glacial Lake Parón, a good map of which may be found in Ricker (1977). There is a generally well-prepared glossary of terms used in the text. The absence of equations has led to the (unavoidably) loose definition of the term *strain* as being "the amount by which an object—in this case glacial ice—becomes deformed under the influence of stress" (*stress* is not formally defined in the glossary, but may be deduced adequately from the text). This point is not raised in criticism but only because it defines the book's technical upper limit, to which the authors have paid very careful attention. Overall, this attractively priced book is both a very enjoyable read and a superbly illustrated glacier "travelogue." I highly recommend it to all those interested in glaciers, professional glaciologists included.

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ECOLOGY OF A POLAR OASIS, ALEXANDRA FIORD, ELLESMERE ISLAND, CANADA. Edited by J. SVOBODA and B. FREEDMAN. Toronto: Captus Press, 1994. 268 p., figs., tables, annex. Softbound. Cdn$38.50.

Few interdisciplinary ecological studies have been undertaken in the Canadian High Arctic. They are difficult to organize and expensive to conduct. Josef Svoboda and Bill Freedman organized and directed such a project for a seven-year period, with more than 20 students, field assistants and faculty, at Alexandra Fiord on the east coast of Ellesmere Island (78°53′N). The book is organized into 25 chapters, 6 appendices of species lists, and an annex of reflections, watercolors, and poems by participants.

The Alexandra Fiord lowland is bounded by steeply dipping walls of gneisses interlaid with granite and pegmatite and capped by Lower Cambrian quartz arenite, dolostone, and conglomerate

of Dallas Bugt and Cape Leiper Formations. The Lower Cambrian series may be an erosional remnant of the Arctic Platform.

The dark-colored walls on either side of the lowland provide a thermal oasis, which accounts for the vegetation and wildlife that are more lush than the latitude would suggest. The main climatic controls are the proximity to the Greenland high-pressure system and the arctic circumpolar vortex. This results in more heating and drying on the eastern coast of Ellesmere and a two- to three-month growing season at this lowland. A comparison of climatic data for Alexandra Fiord and Eureka indicates that mean annual temperatures are 5–6°C higher on this lowland. The growing season over a nine-year period averaged 376 degree-days at Alexandra Fiord and only 300 at Eureka. Two very important components of the climatology chapter are the year-round sets of data and the comparison of climate in the lowland oasis and the polar desert site at 500 m.

Here, as elsewhere, there is a close relationship between soils and plant communities. Regosolic static cryosol soils support plant communities of lichen–cushion plants–dwarf shrub (*Dryas*) along rock outcrops, outwash plains and beach slopes. Regosolic turbic cryosol soils also support a lichen–cushion plant–dwarf shrub community in sites with frost boils. The orthic static cryosols support dwarf shrub–cushion plant (*Cassiope*) communities at the base of beach ridges in snowbed sites. Gleysolic static cryosols with dwarf shrub–cushion plant communities occur at the southern part of the lowland on seepage and run-off slopes kept moist from meltwaters. Brunisolic static cryosols support deciduous dwarf shrub–graminoid communities along outwash plains near stream channels. Other gleysolic static cryosol soils supporting sedge–cushion plant–dwarf shrub communities occur on outwash plains kept wet from flowing surface water. All soil profiles exhibit weak horizon development due to the climate and frost action. These soils are all acidic because of the granitic parent material. This contrasts with many lands in the High Arctic, where soils are neutral to alkaline.

The vegetation of the lowland was ordered into six plant communities, with the coastal salt marsh the most distinct but of minor extent. Dominant species include *Stellaria humifusa* and *Puccinellia phryganodes*. The sedge–cushion plant–dwarf shrub community with *Eriophorum angustifolium*, *Carex stans*, *C. membranaceae* and the woody species *Dryas integrifolia*, *Salix arctica*, *Cassiope tetragona*, and *Vaccinium uliginosum* accounted for 28% of the vegetation. The lichen–cushion plant–dwarf shrub community (37%), and the dwarf shrub–cushion plant community (19%) were the other most important communities. The herb–dominated (*Epilobium latifolium*) community (5%) and the deciduous dwarf shrub–graminoid (4%) were minor components. These community types, in some modified form, have been reported from elsewhere in the High Arctic.

Additional sections cover standing crop and net production of these lowland communities, and there is a separate chapter on the communities of the upland polar desert (500–700+ m).

The section on autecology includes a chapter on resource allocation that shows the strategy of stress tolerator to be most important. The characteristics of this strategy are slow growth, small allocation below ground, a large allocation to attached litter, and internal cycling of nutrients. This strategy contrasts with *Carex stans* and *Oxyria digyna* that have a high allocation below ground. *Cochlearia officinalis* has the strategy of a ruderal species, with most allocation to reproduction. Another chapter deals with allocation patterns in 10 species of *Saxifraga*, and another one with *Cassiope tetragona*. The ubiquitous *Dryas integrifolia* was studied in 10 habitats that showed leaf size and mass changed from xeric to hydric sites.

Two short but interesting chapters deal with the patterning of species around a large rock and the recovery of well-preserved plants with glacial retreat averaging 4.1 $m \cdot y^{-1}$ over the last 22 years. *Dryas* and *Cassiope* plants appear as dormant individuals. This supports the theory that these glaciers are frozen to their base and that their forward movement results from internal deformation.

The final section covers the fauna of the area. The breeding bird density for a three-year period was similar to other high arctic oases (13.2 $pr \cdot km^{-2}$). Ten species commonly nest on the lowland, and an additional 17 species occupy the area. Snow Bunting is the most common species, as it is in other oases. Collembola species are the most abundant arthropods here, as elsewhere, and they reach their greatest species richness in wet habitats. A second major study was conducted on the moth *Gynaephora groenlandica*, because of its amazingly long life history (14 years). There are at least seven insect species that parasitize *Gynaephora* species.

Although quite a few of these articles have been previously published, it is very convenient to have all of the studies combined in one book. The articles are well illustrated and there are few typographical errors. Those who seek information from a multidisciplinary study on a high arctic polar oasis will find this book most valuable. With limited research funding and a seemingly reduced interest in the Canadian Far North, similar studies will be difficult to repeat in the future.

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ARCTIC ADAPTATIONS: NATIVE WHALERS AND REINDEER HERDERS OF NORTHERN EURASIA. By IGOR KRUPNIK. Hanover, New Hampshire: University Press of New England. Originally published in Russian. Expanded English edition, translated and edited by MARCIA LEVENSON. 355 p., 14 maps, illus., bib., index. Hardbound. US$54.00.

This book is an important work for those interested in indigenous arctic peoples. The recently released American edition is intended to provide Western researchers with "concrete information about Siberian subsistence systems and current patterns of transformation among them" (p. xvi). By combining Western theory about human ecology with the long tradition of Russian ethnography in Arctic Eurasia, Krupnik presents a stimulating and provocative hypothesis about the interconnectedness of successful human ecological adaptation in the North. Using case