BOTANICAL STUDIES IN THE LAKE HAZEN REGION, NORTHERN ELLESMERE ISLAND, NORTHWEST TERRITORIES, CANADA. By JAMES H. SOPER and JOHN M. POWELL. Publications in Natural Sciences, No. 5. Ottawa: National Museums of Canada, National Museum of Natural Sciences, 1985. 67 p. No price indicated.

In organising the Canadian IGY Expedition to Lake Hazen, 1957–58 ("Operation Hazen"), the Defence Research Board believed that full advantage should be taken of the logistic effort by promoting field work in other disciplines besides geophysics, which was the main purpose of the expedition; the extra cost would be minimal. Accordingly, invitations were issued to other government organizations (including the national museums) to participate by sending field scientists. The present publication is one of the welcome results of this participation.

The authors give a comprehensive account of the vascular plants, which were their main concern during their collaborative work in the 1958 summer and during the junior author's further work in the 1959 summer. Following a general description of the natural features and climate of the area and a history of its botanical exploration, brought up to date with a note on post-IGY collections, the authors provide an annotated list of the 125 species of vascular plants they collected — 32 species more than had previously been recorded from northern Ellesmere Island.

Of the species on their list they estimate that perhaps one-third accounts for over 80% of the vegetation, the other species being restricted to certain habitats, such as solifluction lobes, marshes, consolidated scree slopes or bird perches. A description of these and the other more widespread habitats, such as turf hummocks and sandy areas, occupies a good part of the publication, and this is perhaps the most interesting part for the general reader. The authors show that in all habitats plant growth — or, indeed, the presence or absence of plants — is strongly influenced by aspect to the sun, exposure to the wind and, above all, the availability of moisture from melting snow and glaciers. By a fortunate dispensation of nature the permafrost ensures a high table for such water as there is in the soil. Some plants, e.g., *Salix arctica* and *Saxifraga oppositifolia*, are tolerant of most habitats, but others, e.g., the attractive *Arnica alpina*, are of occasional and local occurrence on rocky clay banks and around animal dens. For some plants altitude in itself, at least up to quite high levels, is not a barrier to growth, provided that moisture is available from melting snow patches; thus, *Papaver cornwallisensis* was found in flower at an altitude of nearly 1400 m on a nunatak. (In this connection it is worth recording that in 1967 the reviewer collected a moss *Grimmia* sp. at an altitude of c. 2500 m on Barbeau Peak to the northwest of Lake Hazen.) As might be expected, there is considerable variation between the flowering periods of the plants, which are dependent on the time of disappearance of the snow from particular sites. Some species flourish in both early exposed and late exposed sites, while others are restricted in their flowering periods. The vascular plants as a whole fall mainly into four phytogeographical groups: Circumpolar (73 species), amphi-Atlantic (24 species), wide-ranging North American (14 species) and endemic North American (10 species).

In spite of the delay of about a generation since the field work, this publication was well worth waiting for, and it will prove an indispensable guide to all summer visitors — not only botanists — to one of the most beautiful areas in the Canadian Arctic. Twenty well-chosen photographs give an excellent idea of most of the habitats and types of vegetation.

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THE EXPEDITIONS OF THE FIRST INTERNATIONAL POLAR YEAR, 1882–83. By WILLIAM BARR. Calgary: The Arctic Institute of North America, 1985. Technical Paper No. 29. 222 p., 50 illus. Softbound. Cdn.$21.00.

The First International Polar Year (IPY), 1882–83, was the forerunner of the Second IPY, 1932–33, and the Third IPY, also known as the International Geophysical Year (IGY), 1957–58. The First IPY involved 14 major expeditions and several auxiliary projects in the Arctic and Antarctic, organized by eleven nations. The idea was to establish a network of stations in the polar regions to make simultaneous observations for a year of meteorological phenomena, aurora and geomagnetism. In the event, all but two of the main expeditions were in the north polar regions. Each group had to maintain series of synchronous, standardized observations, some of which involved very rigorous, time-consuming schedules. However, most expeditions had sufficient time and personnel to undertake various local scientific and exploratory work so that the results of the year also include such things as topographic and geologic maps, anthropological observations, and reports of horticultural experiments.

The expeditions were remarkably conscientious and thorough in terms of their scientific and other records. Almost all submitted comprehensive reports, but these were written in a variety of languages. As a result they have not received due attention in the literature. William Barr, in his latest book, performs a great service in bringing together for the first time information on these expeditions, for it is as an interconnected group that they are most important.

The book includes a relatively short overview and appreciation of the IPY and its scientific programs, but the bulk of it is a blow-by-blow account of the expeditions themselves. In each case, the reader is given a careful description of the organization and personnel of the expedition, an account of preparations for the trip and travel to the selected base, and a description of the region and of the daily life, work, trials, etc., of the party. The cumulative impact of this for all 14 expeditions and 3 of the auxiliary projects can be appreciated only by a careful reading of the whole work.

Although most will enjoy dipping into the book, especially those who have a current interest in the regions concerned, I would urge all who are addicted to polar literature to clear the decks so that they have several hours to read this volume from cover to cover. Any other reading strategy will result in a considerable loss of the detail and linkages, which are the strengths of the book.

Here are some glimpses of the volume's contents.

The Germans organized two major expeditions, one to Baffin Island and one to South Georgia, and two auxiliary projects, one to Labrador and one to the Falkland Islands. Barr treats them all but the last. The expeditions, at near opposite ends of the earth, not only maintained synchronous scientific observations, but they also had more or less duplicate equipment, including identical build-by-numbers houses. Both expedition reports contain information on the whaling industry of the time, observations from two hemispheres. The Baffin group, for example, had a visit from a whaler's longboat manned by an American, a German, a Spaniard, a Polynesian and an Australian. The Baffin group's report was also notable for its detailed observations of Inuit life, as their base at Clearwater (Kingua) Fjord was a heavily populated area. The South Georgia Expedition was one of several that took along domestic animals, including dogs, geese, cattle, sheep and goats. (Other expeditions had pigs, pigeons, reindeer, and hens.) Not content with these, they kept King Penguins in leather corsets for scientific purposes. They were in the field at the time of the Krakatoa eruption and so were able to record some of its effects on the southern hemisphere atmosphere and oceans.

The German "extra" project in the northern hemisphere consisted of sending a physicist, Dr. K.R. Koch, to maintain six stations for observing weather and other phenomena at the Moravian missions along the Labrador coast. He ran the Nain station himself, training missionaries to run the others, but he did travel up and down the coast a good deal checking up on things. The idea was that the line of stations pro-

vided an efficient means of observing weather systems as they left continental North America. Barr cites Koch's excellent description of a winter depression as an example of the effectiveness of the strategy. In addition to experimenting with such things as the elasticity and plasticity of sea ice and observing the impact of German culture, transmitted through the Moravians, on the residents of the Labrador, Koch also hypothesized that the higher parts of the northern mountains of the coast had not been glaciated — anticipating graduate theses and scientific papers on this topic by a half a century.

I mention these particular, very selective, examples of one nation's contribution to the IPY in an effort to convey the value of all the expedition records over and above their meticulous and unique geophysical work, which was their primary purpose. Each expedition went to enormous lengths to set up its instruments and maintain them and keep to the pre-set schedule of observations. "Term days," on which all IPY expeditions were required to do intensive measurements of magnetism, etc., were days of frantic, often arduous activity throughout the year at all bases around the world. Yet today, the greatest value of their work may well lie in their accounts of how and how not to run polar expeditions or in their non-geophysical observations of their regions!

A good example of this is the snapshot in time they provide of the culture and conditions of high latitude native peoples. The Inuit, of both Greenland and Baffin, the Yakuts and Evenki of the Lena delta, the Nentsy of Novaya Zemlya, and the Yahgan of Tierra del Fuego all appear in expedition accounts. There are, from various corners of the earth, reports of measles, alcoholism, smallpox, relocation of native groups, etc. Native peoples from both hemispheres had been taken to the capitals of Europe and returned home with considerable loss of life. The adaptations of these diverse peoples to their inhospitable homelands varied greatly. Using means of travel as an example of this, kayaks, *kayuki*, *umiaks*, *vetki* (all boats) are mentioned, as are dogs (pack and sled), reindeer (for riding, packing, and drawing sleds), skis, and snowshoes. On one of the Russian expeditions, a man was observed riding one of three reindeer pulling his sled, to which two dogs were also hitched. On the sled was his *vetka* for water crossings. He was the Lena's equivalent of the modern-day person with a mobile home, towing a small car with a motorcycle and boat on the top.

Like the native peoples, the various nations involved in the IPY also adapted to polar life in different ways. Several used saunas as a matter of course, with reportedly beneficial results. Some used Russian-type brick stoves, some used skis routinely, one group used skates for travelling. As has been mentioned, several groups took livestock, with varying degrees of success. The clothing used varied, as did the houses and diets. Even the ships used varied, with different combinations of steam and sail and varying degrees of ice strengthening. What a remarkable wealth of information on polar technology based on trial and error by so many groups in such varied polar situations! A few decades later, it was Amundsen rather than Scott who was tuned in to this experience, which did not flow into the mainstream of the English language literature (see, for example, R. Huntford, 1983, *Scott and Amundsen, the race to the South Pole*, Pan Books, 565 p.).

The scope for meaningful comparisons among IPY groups and among their regions extends well beyond the "scientific" framework within which they worked. Barr's presentation allows the reader to pick up his own threads of interest and follow them around the globe.

Although the book is focused on a *polar* year, it provides a very interesting window onto late nineteenth-century society in general, especially in Europe. This was a time when Austro-Hungary was a major power and when Finland was a Russian Duchy (and when Finnish scientists had Swedish names and wrote their reports in French). It was a time when "German" science was booming. There is an interesting vignette of the leader of the Austro-Hungarian Expedition to Jan Mayen travelling by land from the Adriatic port, whence his expedition ship sailed, to Bergen, where it picked him up for the voyage to Jan Mayen. En route he was able to consult with German, British, Dutch, and Norwegian scientists and polar experts. He was able to meet first-hand several of those involved in other IPY expeditions. This sort of contact must have enormously strengthened the scientific programs of the IPY *and* produced a very healthy exchange of experience among polar workers.

This was also, of course, a time when what is now the northern coast of the USSR was open to all comers. Like the Canadian Arctic today, it was a magnet for "explorers" of various stripes. Indeed, Russian interest in the IPY was in part due to their desire to reinforce sovereignty over their northern region. For a while, it looked as though the expedition to Novaya Zemlya was going to be organized by Austrians rather than Russians.

The Russian expedition to the Lena delta makes particularly interesting reading for this and other reasons. The group took more than eight months to travel to the delta by land. In doing this they travelled by train, by post sled, on horseback, by stage coach, by barge, by steamer and by other vessels. On arriving in their expedition area, they were met by two U.S. naval officers searching for further evidence of the crew of the *Jeanette*, which had been lost a year or so earlier! They also met a group of Cossacks chasing escaped political prisoners who were hoping to make contact with U.S. whalers in the delta. In addition to the usual IPY geophysical program (for which they had to haul stone bases into the delta for instrument pillars), this expedition's reports are notable for their observations of life in this huge delta, of the delta itself (notes on pingos and other ground ice, etc.) and on mammoths. While trade in mammoth ivory was apparently brisk and skeletal remains quite common, hide and flesh of mammoths were rare. Barr includes an extensive description of a mammoth dig.

Although there have been great advances in the synchronous collection of global knowledge, although the idea of scientific "years" has been reasonably well exploited since the First IPY, and although the Antarctic Treaty has stimulated a remarkable amount of polar research activity, it is a sad reflection on polar politics and polar science that the First IPY is still, more than a century later, something of a model for us all. The circumpolar approach to polar problems is still an ideal toward which we strive. At the moment some of the greatest efforts to move toward this approach are being made by the circumpolar native peoples themselves. Even within Canada, northern work is plagued by compartmentalization among disciplines and among groups, which has resulted in a social and physical science landscape cluttered with reinvented wheels and oft-visited dead ends. There is little sense of a long-term polar focus within disciplines, let alone among them. Lt. Weyprecht, of the Austro-Hungarian Navy, who conceived of the IPY but who died of tuberculosis contracted on a previous expedition before participating in it, would weep if he were alive today.

William Barr, a physical geographer with a great facility for language, an intimate knowledge of the polar exploration literature, and an international network of friends and acquaintances with complementary interests, has performed a great service by bringing this overview of the First IPY to our attention.

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ARCTIC ORDEAL: THE JOURNAL OF JOHN RICHARDSON, SURGEON-NATURALIST WITH FRANKLIN, 1820–1822. Edited by C. STUART HOUSTON. Kingston and Montreal: McGill-Queen's University Press, 1984. xxxiii + 349 p., illus., maps. Hardbound. Cdn$29.95.

In 1974, C. Stuart Houston published *To the Arctic by Canoe 1819–*