

maps showing the distribution of sand, gravel, clay, peat and glacial till. It documents permafrost — its age, distribution, effect on building construction and associated engineering problems.

The book ends with five papers that focus on the economic geology of the area. The first, which synthesizes geochemical data related to gold deposits in Archean Rocks (R. Kerrich and W.S. Fyfe), is followed by four papers that outline geology of the Con (H.R. Bullis, V.V. Pratico and D.R. Webb), Giant Yellowknife (D.W.T. Lewis), Tom and Ptarmigan mines (J.A. Brophy).

Kerrich and Fyfe's paper is the most theoretically oriented paper in the book. It gives the conditions requisite for the origin, extraction and deposition of gold, then summarizes the geochemical characteristics of Archean gold deposits in Canada with special reference to the Slave and Superior provinces. Following a superb summary of geochemical data, interpretations and theories for observed element distributions, and models for origin of load gold deposits, the authors state preference for a model whereby the greenstone-belt gold deposits formed during discharge of metamorphic and possibly magmatic hydrothermal fluids along shear zones at depth in a compressive, crustal regime. Major crustal structures act to focus hydrothermal discharge, generating the gold deposits.

Geology of the Con Mine is described in two papers that summarize the stratigraphy, complex structural deformation of ore bodies and localization of gold in quartz veins in three major shear zones. The one-page overview of the Giant Yellowknife Mine is disappointingly brief and not very informative. The paper on the Tom and Ptarmigan mines (examples of the occurrence of gold in quartz veins within highly deformed sediments of the Burwash Formation) presents little more than a road guide to the mine sites and brief descriptions of local stratigraphy and structural features.

Weaknesses of the book are mainly of an editorial nature. The title on the front cover is different from that on the inside title page. The format of the table of contents does not clearly reflect the essentially threefold divisions of the book: geological setting, field guides, and economic geology and mine descriptions. Figures are drafted in variable styles, quality and degree of reduction. Many figures show excellent balance, but some are reduced too small to be legible and others have been enlarged so that lines are unduly wide. Green is used on most line drawings. Although some diagrams make very effective use of colour, generally it does not enhance, clarify or provide focus for the diagrams. Commonly registration is inaccurate, resulting in double lines (green and black).

The book uses a novel numbering scheme for figures. Figures are numbered sequentially in the first two papers but, starting at the third paper, they seem to be numbered according to papers, yet the papers themselves are not numbered (e.g., the first figure in the third paper is Fig. 1-1). Furthermore the instances where figure numbers referred to in the text do not correspond to numbers on the figures are many. In one paper more than half of the references to figures are incorrect, in another all the figure numbers are different in the text from those on figures, and "stops" in the text are labelled differently from those on the guide map. One figure is erroneously reproduced twice in the book and has no number at all! Geologists familiar with the Yellowknife area can sort out these errors, but for the uninitiated, this confusing numbering scheme and the numerous errors are a frustrating annoyance. Numerous flaws occur in legends of maps. Some of these are listed on the extensive full page of errata, but many more are not reported. The book obviously has not undergone rigorous editing or even proofreading.

This well-documented and well-referenced book successfully fulfills its stated objective of providing a field guide to geology of the Yellowknife volcanic belt and its bordering rocks. Quality of reproduction is good: pleasing print and good photographs. The attractive covers in full colour show an aerial photo composite of the Giant Mine site and the West Bay fault on the front and a series of eight photos of structures and textures of volcanic and sedimentary rocks on the back.

This book is recommended to student and professional geologists, prospectors, geotechnical engineers and historians of the development of mining and exploration in the Yellowknife area. Since there is no attempt to simplify technical terms, the book is not aimed at the layperson with no previous background in geology. A future edition with the numerous minor flaws corrected would be a valuable, long-lasting guide and probably a best seller among Canadian geological books.

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#### ARCTIC IMPERATIVE: IS CANADA LOSING THE NORTH?

By JOHN HONDERICH. Toronto: University of Toronto Press, 1987.  
258 p. Hardbound. Cdn\$24.95.

Most Canadians assume their country's military posture to be somehow connected to the North. The DEW Line, that string of radar stations that is supposed to tell us when Russian bears take flight over the polar ice pack and head south, is for most Canadians as central to their image of the North as are snowshoes — and most will live out their lives very well thank you without much direct reference to either.

All that might now be changing — but not because snowshoes are likely to make new gains in footwear fashion. With the DEW Line becoming the North Warning System, with plans to establish a permanent military training base in the North, and with nuclear-powered submarines being sold to taxpayers on the basis of their under-ice capabilities, the military implications of the North are going to weigh more heavily on the minds of Canadians — or, at the very least, on their wallets. And it is this that makes John Honderich's *Arctic Imperative* so welcome.

Honderich writes out of an obvious respect for the North and its peoples, and out of an enthusiastic Canadian nationalism. He is most effective in describing current political and sovereignty disputes over the Northwest Passage. The book ranges rather widely from the Arctic to discuss a broad range of Canadian security concerns, including Canada's military presence in Europe and the role of NATO. It is divided into five sections, one each for sovereignty, security, NATO, arms control, and foreign policy. The five sections are prefaced by a general discussion of the growing strategic importance of the Arctic and the failure of Canadians to recognize this.

The latter he attributes to our "Mercator mindset." Traditional Mercator maps, says Honderich, depict the North as remote and imprecise, often blurring distinctions between water, ice, and land, and trailing off into obscurity with part of the arctic archipelago, particularly Ellesmere Island, often cut off entirely at the top of the page (p. 9). He charges that "the Arctic traditionally gets the short end of the stick" (p. 11) and urges Canadians to correct this historic indifference by coming "to grips with our true geography and our true place in the world. The challenges in the Arctic are real, as is the need to deal with them urgently. All that is needed now is the resolve" (p. 21).

The book is distinguished by a set of thoughtful and persuasive policy recommendations that should themselves contribute to the urgently needed national debate on the North. To assert Canadian sovereignty in the Arctic, particularly over the Northwest Passage, he recommends additional sovereignty air patrols by the Canadian armed forces, increased use and recognition of Inuit arctic rangers, Inuit land claim settlements that recognize long-standing Inuit use of the waters of the passage, and an up-graded navigation service to control all commercial traffic in the passage, among other

measures. The security recommendations include a "keep out" zone in the arctic archipelago that would prohibit submarines of either superpower from entering the zone. Here he notes that such a policy could not be advanced until Canada had installed an adequate surveillance system and the capacity to verify the zone as being observed. This in turn would require a combination of passive sonar surveillance systems and submarines with under-ice capacity (from which he does not conclude that nuclear-power submarines are essential).

He calls for independent Canadian policies that would include more Canadian interceptor aircraft in the North and an independent satellite system designed for peace-time surveillance of the region. Honderich is unequivocal in rejecting Canadian participation in the U.S. star wars system, elements of which imply deployment in the Canadian North, and he would make continued Canadian participation in NORAD conditional on it being separated from any strategic defence operations. He suggests closing down Canadian bases in Germany as a cost-cutting measure (to permit greater attention to the North) and calls on military security measures to be supplemented by arms control measures (the first of which should be the development of a Canadian expertise and a series of arms control proposals related to submarines and cruise missiles in particular). Lastly, he proposes measures to make the Arctic an integral part of Canadian foreign policy. To this end he counsels federal government support for Canadian Inuit in their membership in the Inuit Circumpolar Conference, calls for a separate division within External Affairs to deal with the circumpolar world, and looks for increased diplomatic and cultural links with other northern countries.

Unfortunately, there are also some flaws. Honderich was not well served by his editor. The book includes a surprising number of typographical and other errors that even minimal attention from an editor could have avoided. Canada's commitment to send troops to Norway in a crisis is described at one point as under review (p. 150) and at another as terminated (p. 159). There is a reference to "underwater radar" (p. 127) — a physical impossibility. CF-18 aircraft are at one point described as suitable for northern surveillance, owing in part to their "long range" (p. 73), and at another point the same aircraft is described as less than ideal for arctic operations, owing in part to its "relatively short range" (p. 129).

The discussions of strategic and arms control issues are sometimes weak. A description of the difference between first- and second-strike capabilities is reduced to the explanation that the former is derived from ballistic missiles and the latter from cruise missiles (p. 95). It is not always clear whether his references to "the Arctic" are to the Canadian Arctic or international territory, an ambiguity that becomes confusion in discussions about submarine traffic there. In an effort to portray the Canadian Arctic as central to U.S. military strategy, he says at least twice (p. 114 and 97) that Canadian waters provide one of the fastest and most direct routes for American attack submarines to reach Soviet missile-carrying submarines in the Arctic — an assertion not confirmed by a look at a globe or map. Access to the international Arctic could be gained from the Atlantic through Canadian waters, but it would be a slow and indirect route — which does not mean the Americans would never have an interest in using it, but it certainly would not be a preferred route.

Honderich assumes a close relationship between sovereignty and military capability — a relationship that even drives him to use the term "military sovereignty" (p. 110). Just what "military," as distinct from any other, sovereignty could mean is not clear and is not explained. It is certainly possible to enter into an agreement with a foreign power to have them undertake military patrols of parts of one's territory, without undermining sovereignty — indeed such an agreement would be an assertion of sovereignty. It may very well undermine national independence, but that's not the same thing as sovereignty.

His discussion of options is not helped by his assumption that for Canada to "pull out of NORAD" is the same thing as "going

neutralist" (p. 120). The termination of a particular military agreement is not an assertion of neutrality. Canada, in fact, has hundreds of military agreements with the U.S., of which NORAD is only one — albeit a major one. The critics of NORAD are not by definition advocates of neutrality — in most cases they are advocates of a more restricted alternative agreement with the U.S. — one that is focussed on early warning and excludes involvement in other nuclear and space military activity that is being drawn into NORAD.

From a false assumption that the termination of NORAD would be an assertion of neutrality, Honderich goes on to the now familiar claim that neutrality carries a hefty price tag, witness Sweden and Switzerland (p. 120). Even if the neutrality claim were credible, the comparison with two European countries in radically different security circumstances from Canada would not be valid.

*Arctic Imperative* is a somewhat flawed but nevertheless very welcome and useful book. Canadians will be hearing a great deal more about the Arctic and security in the coming years, and John Honderich's work is a worthwhile contribution to that discussion.

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OVERLAND TO STARVATION COVE: WITH THE INUIT IN SEARCH OF FRANKLIN 1878-1880. By HEINRICH KLUTSCHAK. Edited and translated by WILLIAM BARR. Toronto: University of Toronto Press, 1987. (Originally published in German as *Als Eskimo unter den Eskimos*. Vienna: A. Hartleben Verlag, 1881.) 261 p., maps, illus., index, bib. Hardbound. Cdn\$24.95.

When Sir John Franklin's 1845 expedition to the Arctic went missing, dozens of searches were undertaken, yet nine full years passed before any shred of information about Franklin's fate surfaced, and that was initially only an Inuit account of having seen forty white men travelling southward on the sea ice. Not until five years after that report did searchers locate the only written record to have survived the tragedy. Today, the enigma persists. We know little about what happened to the crews of the *Erebus* and *Terror* beyond the grim fact that every man perished. But while the many search expeditions answered few questions about Franklin, they produced a vastly improved map of the Canadian Arctic.

And something in the same way that those near-fruitless searches for the missing expedition led to an unanticipated wealth of geographical lore, recently revived interest in Franklin has enhanced our understanding of nineteenth-century attitudes toward the Arctic and its people. In the last twenty years, for example, the diary of Johann Miertsching, who accompanied Robert McClure on his expedition in aid of Franklin, has been published in English translation. The journals of John Richardson and Robert Hood, officers under Franklin on his 1819-22 land expedition, have similarly come into print. At the moment, George Back's journals from that same expedition are being edited for publication, as are Franklin's own field journals and correspondence from both the 1819-22 and 1825-27 expeditions. This activity suggests that the formal account carefully prepared and edited by the expedition leader does not satisfy the modern reader, who wants also to hear the more candid responses, both of the leader and of the other members of the party. In spite of our constant striving for objectivity in most of our daily affairs, we perhaps recognize that reality is essentially a subjective experience, and accordingly we desire a multiplicity of those subjective perspectives through which to view experience.