Later he sledged in Svalbard, and later still worked with reindeer herders in Lapland. Croft writes lingeringly of these times: clearly he was laying down guidelines for later life. He never reached Antarctica, but unknown to him, his influence there was strong. A later generation of sledgers, myself included, learned much from his detailed, sensitive accounts of polar travel and camping.

The rest of the book is no less exciting. Before and between expeditions Croft had lived in Germany and France, acquiring languages and odd experiences. He met Nansen and many other key figures of the times, sat on platforms with Hitler, and may have been the only Englishman to see the Reichstag burning. He came to know Scandinavia well. World War II found him a ready leader. With the army he saw action in Finland and Scandinavia, later with resistance forces in Corsica and mainland France. The army and he seem to have used each other sensibly. Staying in after the war Croft saw service on the North-West Frontier, designed equipment for Korean and all-too-probable Arctic warfare, and took part in Canadian Operation Muskox. Involved in the education of boy-entrants and army apprentices, he brought in — what better? — adventure training to develop character and self-confidence. Betweenwhiles he raised a family of his own. On retirement in 1960 he served a further 11 years as commandant of the Metropolitan Police Cadet Corps, again using adventure training to stimulate initiative and leadership. This turned out to be his most exciting job of all: parachuting, he declares, had nothing on it.

Did adventure makeAndrew Croft the full man that he so clearly is? His book provides many clues. Polar and wartime experiences were clearly invaluable, but there were other less obvious influences: he learnt never again to fear any man, not in the heat of battle, but on the shop-floor of a Carlisle cotton factory. A country that values its Andrew Crofts had better ensure that it is still producing them. Does Britain still create young folk of his calibre, and are there adventures still for those who seek them? We shall be sadly impoverished if not. (Bernard Stonehouse, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

BRIEF REVIEWS

THE FROZEN EARTH: FUNDAMENTALS OF GEOCRYOLOGY. Williams, P. J. and Smith, M. W. 1991. Cambridge, Cambridge University Press. 306 p, illustrated, soft cover. ISBN 0 521 42423 4. £19.50, US$29.95.

Welcome re-issue in soft cover of a book originally published in 1989: see review by J. Dowdeswell in *Polar Record* 25 (156): 59-60, January 1990. Includes chapters on Periglacial conditions, Morphology of permafrost and seasonally frozen ground, Climate and frozen ground, The Ground thermal regime, The forms of the ground surface (1: slopes and subsidences), The forms of the ground surface (2: structures and microtopography of level ground), Thermodynamic behaviour of frozen soils, Hydrology of frozen ground, The mechanics of frozen ground, Geocryology past and future.

CANADA AS A BI-POLAR POWER: CANADA'S ANTARCTIC DIMENSION. Beck, P. J. 1991. Lakehead University Centre for Northern Studies: Occasional Paper 7. 50 p, illustrated, soft cover.

A review of the background to Canada's achievement in 1988 of observer status at Antarctic Treaty meetings, Canada's subsequent role in international debates on Antarctica, and the activities of Canadians in various aspects of Antarctic research and exploitation.

HARP SEALS: MAN AND ICE. Sergeant, D. E. 1991. Ottawa, Department of Fisheries and Oceans (Canadian Special Publication oFisheries and Aquatic Sciences 114). 153 p, illustrated, soft cover. ISBN 0 660 14052 7. Can $ 28.50: in other countries US$ 34.20.

A comprehensive account of the biology of harp seals *Phoca groenlandica* off eastern Canad and throughout their European and Greenlandic range. Probably the most numerous northern hair seal, controversial because of hunting and conservation issues, the species has long merited this very full treatment. A scientific study, based on many years' accumulation of evidence, but ending with traditional recipes for seal sausages, seal pudding and seal flipper pie.

THE SHAPING OF ENVIRONMENTALISM IN AMERICA. Scheffer, V. B. 1991. Seattle, University of Washington Press. 249 p, illustrated, hard cover. ISBN 0 295 97060 X. US$ 19.95.

A history of the environmental movement in USA, written for the up and coming generation by a dedicated conservationist with a long professional involvement in sea mammals. Contains illuminating comments on Alaska and the Arctic, and on Antarctic conservation, including US Capt Eddie Rickenbacker's interesting proposal to atom-bomb the south polar plateau, thereby unlocking 'the icy doors that withhold from human knowledge the potential riches of the Antarctic continent'.

THE YUKON CHRONOLOGY. Smyth, S. 1991. Whitehorse, Northern Directories. 263 p, soft cover.

A COMPENDIUM OF DOCUMENTS RELATING TO THE CONSTITUTIONAL DEVELOPMENT OF THE YUKON TERRITORY. Cameron, K. and Gomme, G. 1991. Whitehorse, Northern Directories. 332 p, soft cover.

These books form a two-volume set on 'The Yukon's constitutional foundations', written mainly for Yukoners who desired a general reference source describing, and providing the texts of, documents making up the constitutional framework of the Yukon. As their foreword asserts, this will stand as an essential reference source for anyone with an interest in the Yukon's constitutional past, present or future. No prices are given: refer to authors via Northern Directories Ltd. for details of availability.

THE ROYAL GEOGRAPHICAL SOCIETY HISTORY OF WORLD EXPLORATION. Keay, J. (general editor). 1991. London, Hamlyn. 320 p, illustrated, hard cover. ISBN 0 600 56819 9. £20.00.

A well-appointed book, lavishly illustrated in colour and black-and-white, covering exploration from the discovery of the Americas by Siberians 20,000 years ago. Arctic regions receive 20 pages by Anita McConnell, Antarctic regions 22 pages by Ann Savours: both brisk, introductory, highly compressed, but interesting enough to encourage further reading.

CHALLENGES OF A CHANGING WORLD. Fløistad, B. and Markussen, J. M. (editors). 1991. Lysaker, Fridtjof Nansen Institutt. 301 p, illustrated, soft cover. ISBN 82 7613 000 3.

A 50th birthday festschrift for Willy Østreng, this contains 20 papers by his colleagues and associates under headings [European Arctic] Security policy, The Arctic, Law of the Sea, New collective problems, Marine resources, Science and politics. There is also a selected bibliography of some 80 research papers of which he was single or joint author.

LIFE UNDER EXTREME CONDITIONS. di Prisco, G. (editor). 1991. Berlin, Springer Verlag. 144 p, illustrated, hard cover. ISBN 3 540 53108. DM 108.00.

Subtitled 'Biochemical adaptations', this is a slim but useful summary of recent research, based on papers given at the 19th meeting of the Federation of European Biochemical Societies in Rome, July 2–7 1989. Biochemically oriented rather than ecological, about half concern research in or relevant to polar regions. Cold-climate topics include antifreeze substances that keep the blood of Antarctic fishes circulating, cold-stable microtubules from Antarctic fishes, and molecular adaptation of oxygen-carrying proteins that operate at low temperatures. Non-polar topics include cell contents and structures relevant to to environmental stress in archaebacteria, protein thermostability, enzymes from thermophilic bacteria and proteins from halophiles.

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Lead poisoning and the Franklin expedition

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The In Brief section of *Polar Record* 162 gives further publicity to the unwarranted conclusion that lead poisoning was a significant cause of deaths during Sir John Franklin's Northwest Passage Expedition of 1845-48. The three expedition members who were buried on Beechey Island in winter 1845/46 and exhumed by a party from the University of Alberta in 1984 and 1986 (Beattie, O. 1987. *Frozen in time*. London, Bloomsbury) had been on a diet of tinned food for a maximum of six months prior to their deaths. If their deaths were due to accumulation of lead from their provisions, why are the levels measured in the bones of an expedition member found at Booth Point, King William Island, not proportionally greater, since he would have been living on such rations more than two years longer? Neither is there evidence that during those two years the remaining 126 men suffered from any of the 'physiological and neurological effects' referred to. The far-reaching hunting and scientific excursions undertaken suggest just the opposite.

The supplier of the tinned rations was under contract to the Royal Navy, and from the same contract he supplied a number of other major Arctic expeditions, including that of Sir James Clark Ross. No of these other expeditions experienced any undue deaths or problems with the rations.

Beattie's examination showed that all three of the Beechey Island bodies had suffered from serious chronic diseases and it is quite inconsistent with such evidence to claim lead poisoning played any signcant role in their deaths, let alone the outcome of the expedition. This work is a tribute to the application of advanced scientific techniques in a difficult environment, but it is also an example of how clues that such techniques provide can, if not kept in perspective, lead away from the reality of the enquiry. (See also Trafton S. J. 1989. Did lead poisoning contribute to deaths of Franklin expedition members? *Information North* 15(9)).

Standing, as I did a few years ago, by the hauntingly beautiful Beechey graves on a bleak spring evening after a long and difficult sledge journey, I needed no other evidence than the ferociously hostile land and climate to convince me of the ease with which life could have slipped away from any one of those unfortunate sailors who still lie there.

Vitamin C in Eskimo diet

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In the April 1991 issue of *Polar Record* J. S. Phillpotts relates an incident he heard about the way in which Vitamin C was preserved in Greenland, and wonders whether the most northern Indians and Siberians had a similar custom. Gremnia, the Alaskan Inuit wife of Klengenberg, a Dane who was the first to trade with the Copper Inuit, used a similar practice. As related in *Klengenberg of the Arctic*, (T. MacInnes, London, Jonathan