

considerable detail. Only the chapter on the Nagssugtoqidian of east Greenland is a short one, reflecting the relative paucity of data from that area.

The chapter on the Caledonian fold belt of east Greenland is interesting in that this is the only topic to have had major recent coverage in another textbook—J. Haller's *Geology of the east Greenland Caledonides* (London, John Wiley, 1971)—which was based largely on Lauge Koch's famous series of expeditions from 1926 to 1958. More recent work by GGU in the southern part of this Caledonian belt is presented in *Geology of Greenland* not only as a much more detailed structural analysis of the Scoresby Sund area, but also as a basis for revising the whole of Haller's interpretation of the Caledonian orogeny in east Greenland. It is a controversial re-interpretation based largely on new geochronological evidence, attributing much of what was previously held to be metamorphism and deformation of Caledonian age back to the Precambrian. Such an extrapolation of the limited recent work to the whole Caledonian belt is a highly speculative and individual contribution. In 61 pages, it cannot hope to rival the wealth of descriptive detail to be found in Haller's 320 pages.

A chapter on north Greenland is an excellent summary and synthesis of the rather scattered information from various exploratory expeditions. Much old material has lately been re-examined preparatory to a recently initiated GGU project, which should add greatly to our knowledge of this vast and remote region.

Apart from the last 150 pages of the volume, which are devoted to contributions on a series of special topics such as economic geology (including separate sections on coal, mineral, and petroleum geology), palaeontology (flora and vertebrate), kimberlites, and Quaternary geology, this work is completed by sections on the sedimentary basins and the Tertiary volcanic provinces of east and west Greenland respectively. The chapter on the Tertiary of east Greenland is unfortunately lacking several very recent developments which challenge, for instance, the long-held concepts on the Skaergaard intrusion and on the coastal flexure and dyke swarm. As far as the major plutons are concerned, a little is added to the summaries of these presented in L. R. Wager and G. M. Brown, *Layered igneous rocks* (Edinburgh, Oliver and Boyd, 1968).

The sedimentary basins of east and west Greenland are well described, and the complex faunal and stratigraphical problems of west Greenland discussed in some detail. Much of the more recent thinking on continental rifting is incorporated in the accompanying syntheses. In the case of west Greenland, particularly, oil exploration is likely to play an increasingly important role in providing new geological data and understanding.

This is then, an excellent volume for accurate and up to date coverage of its subject, although a few sections are already a little out of date due to material appearing during the period of compilation. Three areas of the work are likely to date more rapidly than the rest: the Precambrian, particularly geochemical and geochronological aspects where experimental work is advancing fast; north Greenland, where GGU exploration is currently gathering momentum; and west Greenland, where oil exploration is likely to lead to rapid accumulation of new data, particularly offshore. Nevertheless, the volume will provide an invaluable foundation for the building of future results. The editors are to be congratulated on their painstaking work, and not least for keeping the price of such a handsomely produced book down to 195 DKr, a most reasonable figure for these days.

A TRUE TALE

[Review by Roland Huntford* of William McKinlay's *Karluk*. London, Weidenfeld and Nicolson, 1976, 170 pp, illus. £4.95.]

Vilhjalmur Stefansson was a splendidly controversial figure. A luminary of the barnstorming days of exploration in the American Arctic, he could hardly be anything else. He had a flair for publicity. He could make enemies—sometimes on the expeditions that he led. But whatever his failings, he was a man of first-class intellect, rarely short of ideas. His books are eminently readable, and he could compose a dictum: the most often quoted and, it may be, the most penetrating is

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'Adventure is the sign of incompetence'. By that criterion, his great expedition of 1913–18 was not wholly unblemished. During those years Stefansson made the last major discoveries in the Canadian Arctic. He added three islands and 250 000 km² of hitherto unknown territory to the maps. He also proved—at least to his own satisfaction—that the northern lands, and the ice of the polar sea, were not the wildernesses of popular imagination, but places where it was possible to live off the wild life using Eskimo methods. It is all recounted in *The friendly Arctic*. However, one of the incidents not recorded with absolute candour in that otherwise persuasive work is the loss of the *Karluk*.

Karluk was the flagship of the tattered little squadron that was to carry Stefansson's expedition to the Canadian Arctic. The other ships were the *Alaska* and *Mary Sachs*; only they arrived safely. *Karluk* was caught in the pack ice near Flaxsman Island off the north coast of Alaska in the middle of August 1913, and swept westwards to the graveyard of many a whaler in the region of Siberia. She never got out. On 10 January 1914 she was crushed in the ice and sank. Her company made their way to Ostrov Vrangel'ya. Her captain, Bob Bartlett, managed to fetch help after a tremendous journey of 1 200 km across north-eastern Siberia to Alaska, and in September his men were rescued—what was left of them. 11 out of 18 had perished. Some drowned. Some died of an unidentified disease. One man shot himself. *Karluk* is the story of this nightmare.

The author is William Laird McKinlay, a Glasgow schoolmaster who was in *Karluk* as meteorologist and magnetician. He is the last known survivor of Stefansson's expeditions. For 60 years he has kept quiet about what happened, and only now has been persuaded to tell the story. 'I do not wish to detract in any way from the achievements of Vilhjalmur Stefansson', he says, 'but the record must be put straight. I owe that to the memory of my dead comrades, and to Captain Robert Bartlett, who saved my life.'

The tale that McKinlay has to tell is, not to mince words, one of bungling, bad leadership, amateurishness and desertion. That Stefansson was guilty of the last in particular emerges with very little doubt. When he saw that the ship was unlikely to get to her destination he went ashore in Alaska with a few chosen companions, and left the others to their fate. They never saw him again. *Karluk* ('fish' in Aleutian) was badly chosen and far too weak for the pack. With some notable exceptions her crew was a collection of misfits and failures. The cook was a drug addict. One man was picked up off a beach on his beam ends. Few were suited to the strains of polar life. Bartlett, a good captain and a splendid ice pilot, did not quite possess the stature to impose his will on this motley collection. He had been engaged at the last moment, and was presented with a ship and crew, neither of which, given the choice, he would willingly have taken. McKinlay himself had never seen the Arctic before. He was a complete tiro, one of the victims of the amateur ideal.

This book is the work of someone transparently honest, burning with a sense of justice, but in whom no grudges rankle. It is a moving human document; and a well written one. It tells a story and it has a message. It is one of the few books of exploration which one puts down without a nagging doubt whether the truth has been told. The only pity is that it was not published long ago. Historic truth should be no respecter of persons. If in the course of the story a hero or two is found to be tarnished, so be it. To that category McKinlay does not belong. He secures for himself a place in the quiet company of brave survivors.

TWO FOR THE COFFEE TABLE

[Reviews by Nigel Bonner* of *Frontiers of life: animals of mountains and poles*, by Joseph Lucas, Susan Hayes and Bernard Stonehouse (London, Aldus Books Ltd, 1976, 144 p, illus, £3.95) and John Croxall* of *Winter birds* by M. A. Ogilvie (London, Michael Joseph, 1976, 224 p, illus, £5.75).]

Frontiers of life is a rather surprising book in that it consists of two quite separate works, the first on polar life, by Joseph Lucas and Susan Hayes, the second on mountain life, by Bernard

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