

ROALD AMUNDSEN'S *BELGICA* DIARY. Hugo Declair (Editor). 1999. Norwich: Bluntisham Books and Erskine Press. v + 208 p, illustrated, hard cover. ISBN 1-85297-058-8. £24.95.

Polar scholars usually split into two groups over Roald Amundsen's contribution to polar history: either they consider him a hero, the first to navigate the Northwest Passage, first to reach the South Pole, and first to fly across the North Pole in an airship, or they regard him as a villain, the explorer who embraced deception to challenge Robert Falcon Scott in Antarctica, and the man who befriended the notorious Frederick Cook. Fortunately his service on *Belgica* (1896–99) came early in his career and well before his better known polar exploits.

Amundsen, anxious to extend his polar experiences after two successful seasons in the Arctic, volunteered for the Antarctic aboard *Belgica* in 1896 and was appointed second officer by the Belgian commander, Adrien de Gerlache de Gomery. The expedition sailed for the Antarctic Peninsula, explored the South Shetland Islands, and was obliged to overwinter in pack ice just south of the seventieth parallel of latitude, becoming the first known ship to spend a winter so far south. This book is Amundsen's personal diary of that voyage. It has been edited by the Belgian glaciologist Hugo Declair, and is published here for the first time in English translation.

The diary has been divided into chapters charting the chronology of the voyage from the Atlantic crossing to Tierra del Fuego, thence to the Peninsula, and eventually to the escape from the imprisonment of ice and the return home. Each chapter is prefaced with a short editorial commentary and modern charts of relevant areas accompany the text.

The personal nature of the diary leads inevitably to a repetitive style with banal comments on daily weather and sea-ice changes (or the lack of them), rather than the excitement of new discoveries or the hardships of survival. The most absorbing chapters describe the period when *Belgica* was beset in the ice, the hunting of seals and penguins for meat, the routine in and about the ship, and its eventual release.

In the light of Amundsen's later life, his comments for Monday, 20 June 1898, are apposite: 'This is the life I have always wished for. It was not a childish whim which made me do it. It was a mature decision. I have no regrets and I hope to be able to retain my strength and health in order to complete the work I have started.'

Unfortunately for a book subtitled *The first scientific expedition to the Antarctic*, there is little detail on the practice of science by the expedition members. Interpersonal relationships between officers, crew, and scientists are touched on without analysing them in any depth, and the deaths of Wienke and Danco are only briefly recorded. It appears clear that Amundsen had the highest regard for the doctor, Frederick Cook, who did so much for the health and morale of the entire expedition, and that they formed a friendship due to survive the many vicissitudes ahead.

Amundsen remained in good health and apparently equable in temperament throughout the entire voyage, but he was roused to anger over the contract signed between de Gerlache and the main sponsor, the Belgian Geographical Society. This document was unknown only to Cook and Amundsen, amongst the officers, until it was discovered in November 1898, although it was signed in August 1897. It gave precedence of command in the case of the death of de Gerlache to the Belgian officers and ignored 'the foreigners.' Although de Gerlache disclaimed any responsibility for the failure to make the contract known earlier, Amundsen declared, 'I consider my position on this ship as no longer existing. For me this is no longer a Belgian Antarctic expedition. It is my duty to help the handful of people here on board. I will continue my work as if nothing has happened. I will do my duty as a human being.' None the less when the ship arrived back in Punta Arenas, Amundsen left the ship and returned to Norway on a passenger boat.

The diary is a valuable adjunct to the narrative accounts reprinted for the centenary of the *Belgica* expedition, such as *Fifteen months in the Antarctic* (Gerlache 1998) and *Through the first Antarctic night* (Cook 1998). It is accompanied by portrait photographs of the scientists, several original crude drawings by Amundsen, and a book jacket photograph of Amundsen himself, gloomy and careworn. (Peter Speak, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

References

- Cook, F.A. 1998. *Through the first Antarctic night*. Pittsburgh: Polar Publishing Company.
Gerlache, A. de. 1998. *Fifteen months in the Antarctic*. Norwich: Erskine Press.

THE GEOLOGY OF SVALBARD. W. Brian Harland. 1998. London: The Geological Society (Memoir 17). xviii + 521 p, illustrated, hard cover. ISBN 1-897799-93-4. £99.00; US\$165.00.

For those concerned with the geology of the high Arctic and the evolution of the Eurasian and Amerasian basins, Svalbard plays a key role. Located in the northwestern corner of the Barents Shelf, Svalbard's long record of geological history provides essential evidence for all theories of Arctic evolution. The rock successions span the Phanerozoic and extend well back into the Mesoproterozoic; fragments of Palaeoproterozoic and even Archaean 'basement' provide glimpses of an even older history.

For more than 50 years, the author of this outstanding book has been studying Svalbard's geology. No one has a more wide-ranging knowledge of the European high Arctic than Brian Harland. His book is a most welcome culmination of a lifetime's research.

The flavour of the book is, of course, dictated by the discipline of the pen. The author is essentially a stratigrapher with a consuming interest in the wider regional context,

which is essential for an understanding of global tectonics. Harland has been a long-standing 'drifter,' never satisfied with the concept of stationary continents. His early papers on transpression/transension and tectonic regimes profoundly influenced structural geology in the 1970s. His evidence for tectostratigraphic provinces, displaced great distances by transcurrent movements, was well anchored in the high Arctic in the 1960s, long before the concept of terranes was recognised and became popular along the west coast of North America and elsewhere. As a stratigrapher, he has been concerned with principles and terminology and has contributed much to these fields, including the geological time scale. The chronometric time scale has been particularly important in the context of Svalbard's pre-Carboniferous history, where isotope data are essential. One of the author's finest achievements has been the establishment of the Cambridge Arctic Shelf Programme (CASP), which now runs strongly and independently of its founder, to his lasting credit. The influence of all these achievements shines through the book, leaving an unmistakable trademark.

The geology of Svalbard is comprehensive. To ensure full coverage, Harland has obtained the help of 10 Cambridge colleagues (present and past) who have made important contributions to several of the 22 chapters; only one of the latter is entirely the work of co-authors. The book is divided into four parts, providing a wide-ranging introduction (part I), followed by regional descriptions (part II), historical syntheses (part III), and, in part IV, a summary of economic geology, together with various indexes and references. The organisation is logical and convenient for readers with interests ranging from local geology to regional synthesis. However, it has also its disadvantages, by involving substantial repetition, especially between parts II and III. This problem is compounded by the fact that the book was put together during the last decade; revision and updating is no easy task, especially when it involves independent, but related, sections. The book is richly illustrated (all black and white) with about 250 diagrams and some well-chosen photographs that catch the flavour of expedition life in the high Arctic.

The first chapters provide a concise general introduction to the Svalbard archipelago, ranging from some political background and the decisive Svalbard Treaty of 1920, to geomorphology, biota, populations, places, and climate. This is followed by an account of the history of geological exploration, from the early expeditions after the Napoleonic wars to the Swedish dominance in the mid to late nineteenth and early twentieth centuries, and the subsequent increase in British, Norwegian, Polish, and, eventually, Russian activity. The focus then was on bedrock. In today's highly internationalised Svalbard geoscience community, coordinated by a strong Norsk Polarinstitut presence and with a university in Longyearbyen, bedrock research continues. However, work on the present environment now dominates, with studies of the impact of ongoing climate change in the context of wide-ranging research

into the long glacial history of the Barents Shelf. Nevertheless, the need for mineral resources, the driving force behind so much geological exploration in the past, has not diminished. The Arctic basin remains one of the least known regions on Earth and has a vast economic potential that can hardly be neglected during the coming decades. This book provides a timely synthesis of an important segment of the Arctic margin.

Part II describes Svalbard's geology, dividing the archipelago into eight regions. The first two chapters provide accounts of the areas dominated by Carboniferous and younger strata — the Central Basin on Svalbard and the platform to the east, extending out to the islands of Barentsøya, Edgeøya, Hopen, and Kong Karls Land. Some previously unpublished CASP data on deep drill holes on Edgeøya provide welcome insight into the deeper parts of the platform successions. The other six chapters treat the areas dominated by basement metamorphic complexes and Old Red Sandstones. Along the west coast, these are much influenced by Tertiary folding and thrusting.

Descriptions of the least accessible parts of the Svalbard archipelago, Nordaustlandet and Kvitøya, are dependent on meagre published sources and are less well understood. There is no evidence of a Palaeoproterozoic Barents craton in eastern areas, but only that the Laurentia-related Neoproterozoic and Cambro-Ordovician successions were deposited on a Grenvillian-age basement. In these areas of easternmost Svalbard, the grade of Caledonian metamorphism increases eastwards towards a suture to continent Baltica, probably located somewhere between Zemlya Frantsa-Iosifa and Kvitøya. Harland's treatment of Ny Friesland's Caledonian complex is overwhelmed by a recent flood of isotope age and provenance data; it is much to his credit that he presents these data (up to 1997!) and argues for alternative interpretations. Farther west, the isotope age record is less comprehensive, but again there is a Grenvillian-age component of intrusions penetrating Mesoproterozoic supracrustal successions. Farther south, near Spitsbergen's west coast, is located the only unambiguous Caledonian (Ordovician) suture zone, with blue schists, eclogites and mafic rocks of probable ophiolitic affinities — evidence of an important plate boundary. Harland presents a strong case for correlating the westerly parts of the Spitsbergen basement with the North Greenland–Ellesmere Island fold belt (fig. 14:10); regions farther east were derived from the East Greenland margin.

Part III uses the platform of the regional descriptions to analyse Svalbard's evolution through time. Eleven chapters, nearly half the book, are dedicated to historical syntheses, taking the reader, step by step, from the Proterozoic to the Quaternary, and on to modern glaciation and climate change. Palinspastic reconstructions provide useful syntheses of the detailed database. Many of the interpretations are controversial; most can readily be tested and will stimulate new work. Thus, the evidence for a close affinity between western Svalbard's pre-Devonian rocks and the Pearya terrane of Ellesmere Island leads Harland to exclude western Spitsbergen from the Caledonides; these regions

are thought to have escaped the main Caledonian (Silurian) orogeny (page 270). The next generation of bedrock specialists are here presented with fundamental problems to tackle!

A 500-page book with so many illustrations and much overlap between the sections inevitably contains a wide range of small errors. They seldom lead to misunderstanding and are sometimes entertaining (even welcome, if one disagrees with the interpretations)! I read most of the text during the 1999 Arctic field season, having previously briefly browsed, examining closely only those chapters directly concerned with my own research. As we waited on Severnaya Zemlya for long-delayed helicopter transport, a colleague from Novosibirsk, glancing over my shoulder at figure 3:1, commented 'Good heavens! Maybe the choppers are using Harland's map. Look, we are on the (New) Siberian Islands!' Other mistakes are more geological and provide insight. Thus, on page 135, Harland's controversial interpretation of the basal beds of the Old Red Sandstones (Siktefjellet Group) refers to the Rabotpasset unit as both a member and a formation; at best, the former, some would say. It is convenient that the author shows he was in two minds. Errors in the illustrations are only occasionally misleading. It is unfortunate that figure 3:2 shows a complete lack of Mesoproterozoic rocks on Svalbard. Indeed, much of the Precambrian representation on this figure is mistaken — only part of western Ny Friesland is Palaeoproterozoic, none of Nordaustlandet is of this age, and certainly there is scant support for the high grade metasediments and migmatite terranes of northwestern Spitsbergen being late Neoproterozoic. Large areas of Vendian in southwestern Svalbard are also a controversial interpretation. Interestingly, figure 12:1 presents a quite different picture.

The language is not always easy, especially for the non-English speaking public. And this is compounded by a (publisher's?) decision to reduce punctuation to a minimum. Those writing geoscience for a wide international audience need to strive for simple language; commas and other punctuation marks certainly help.

An important part of this book is the last, with an index of place names, a glossary of stratigraphic names, a general index, and a comprehensive reference list. The last of these is particularly welcome. As the next generation of geologists takes over and reinterprets the old data, they will need to weigh the evidence and understand the previous, often obscure, arguments that provide the foundation for today's interpretations. The book is inevitably a very Cambridge-centric view of Svalbard. Nevertheless, Harland goes to some pains to present alternative hypotheses and cite the sources. Those working on Svalbard need to go deeper than the citations. One does not have to agree with the interpretations to appreciate the importance of all these references. This book leads the reader back into the heart of the controversies and that is what is important. The 37 pages of small-type references are a gold mine for future work.

Books as comprehensive as this one take a long time to

write. One has to have the tenacity of a marathon runner to take them on. Most of us follow an easier path, gather a flock of 'experts,' and obtain an acceptable product in about twice the time we had originally estimated would be necessary. Harland chose the way less travelled by, much the longer and harder, but it made all the difference. Of course, this book should have been published a decade ago; it would have avoided much of the tortuous updating of the mid-1990s. So much has happened since the 1980s, not least the flood of isotope age and provenance data that has added a new dimension to many of the old controversies. But ambitions seldom come to fruition on time; they are still worth celebrating!

At the end of the book there are some nice pictures catching the spirit of Svalbard; these are nostalgic for some of us. The caption on a picture to the north of Liefdefjorden comments that 'the dots in the sky are geese training their young to fly in formation for the migration back to the UK at the end of the summer.' This flight of fantasy is perhaps related to Harland's own geese, who did not always fly in formation or return to the UK, but nevertheless salute him for a masterly book; it will remain the Svalbard bible for many years to come. One should remember to read it in the spirit of the author: with an inquiring mind, never satisfied with conventional wisdom and present-day interpretations. The Geological Society is to be congratulated for another fine memoir. (David Gee, Department of Earth Sciences, Uppsala University, Villavägen 16, 752 36 Uppsala, Sweden.)

ABORIGINAL PEOPLE AND THE COLONIZERS OF WESTERN CANADA TO 1900. Sarah Carter. 1999. Toronto: University of Toronto Press. xi + 195 p, soft cover. ISBN 0-8020-7995-4. £9.75; \$Can12.95.

This the latest instalment in the University of Toronto Press' 'Themes in Canadian Social History Series,' edited by Craig Heron and Franca Iacovetta. Geared towards the non-specialist reader and with the paperback edition very inexpensively priced, this slender volume offers much to the generalist reader and undergraduates alike. Throughout the book, Carter engages a sweeping literature, exploring historiography as much as historical content. Indeed, one of its chief strengths lies in Carter's ability to introduce the uninitiated to a veritable tangle of the scholarly interpretations surrounding the nature of post-contact relations in the Canadian west (excluding British Columbia). She outlines the basic challenges faced by those attempting to write Aboriginal history, ranging from the nature of sources to the very question whether an Aboriginal understanding of the past is even possible for non-Aboriginals. Yet the struggle to produce solid history in this field is well worth the effort: 'it is necessary to have knowledge of the past and to appreciate that there are often conflicting interpretations of the past, sometimes clearly as a result of present-day concerns. Lively and intense debates about the past are very often linked to the issues that are before the courts and Indian claims commissions