

give the general flavor, here is the treatment of botany, a subset of 'Life and environmental sciences,' which is broken down into a brief overview followed by botanical sources for polar and cold regions, the Antarctic, the Arctic, Alaska, Canada, Greenland/Iceland, the European Arctic, and Russia, for a total of some 40 references.

Most of the references are monographs, and most are in English. There is extensive cross-referencing to other parts of the book, and websites and e-mail addresses are given where known. The authors cite more than 1000 sources here, and appear to have covered the ground most thoroughly. Initially this seemed a bewildering array of information, but if one follows the table of contents, it becomes manageable. The field of information to be considered is a vast one, so its documentation is necessarily somewhat complex.

Part III is a 'Directory of selected organizations,' namely those organizations mentioned elsewhere in the book. It is ordered broadly under international and national organizations; libraries, archives, and museums; and publishers. URLs and postal and e-mail addresses are included. The book concludes with an index of proper names.

I searched for gaps in the *Keyguide*, but was hard put to find any. I think that the Russian *Referativnyy Zhurnal*, while mentioned, deserves a fuller treatment, since the series (which is published monthly, not irregularly as listed here) covers the world uniquely in science and technology. *Referativnyy Zhurnal-Geofizika*, for example, has much cold regions material, and I would cite *Referativnyy Zhurnal-Vodnyi Transport* for its excellent coverage of icebreakers. I note also the absence of patents, which I would have thought a source worthy of mention (the number of patents cited in the *Cold regions bibliography* is now approaching 2000). There are just a few other quibbles. *Bibliography on cold regions science and technology*, supported by CRREL, is listed as having citations without abstracts; this is correct except for entries by CRREL authors, which do include the author's abstract. There are the inevitable few typos; one is under zoology, where the subset numbers appear to have slipped a digit. But these are minor flaws in an otherwise very solid work.

This reviewer's only other correction is rather an addendum, referring to the *Antarctic bibliography*, published by the Cold Regions Project at the Library of Congress. Owing to a recent budget dispute between the Library of Congress and the National Science Foundation sponsor, NSF has withdrawn its support, so the *Antarctic bibliography* and *Current Antarctic literature* have ceased publication. They are therefore both dead files. As of this writing, the future of the Antarctic effort is uncertain, as are the prospects for the remaining Cold Regions Project at the Library of Congress. The effort may possibly be resumed at some future date by a private contractor.

In conclusion, the authors have done an impressive job when one considers that the universe of publications concerning cold regions is extremely diffuse; there are

now, for example, more than 2000 periodicals cited in the *Cold regions bibliography*, and that is just in science and technology. What Mills and Speak have done is to focus on only the most important of the available sources; thus the *Keyguide* provides a starting point without overwhelming the user. This is a skillfully organized and highly informative reference book that should prove useful to anyone seeking information on the cold regions, whatever the topic. (Stuart Hibben, 7719 Sebago Road, Bethesda, MD 20817.)

NORWEGIAN MARITIME EXPLORERS AND EXPEDITIONS. Kåre Berg, Thor N. Devig, Øystein Kock Johansen, and Henrik Ulven. 1999. Oslo: Index Publishing AS. 175 p, illustrated, hard cover. ISBN 82-7217-102-3. NOK 100.

This year is the one thousandth anniversary of Leif Eiriksson becoming the first European to reach North America. As part of the commemoration of that event, the Norwegian Trade Council sponsored this book, which is a tribute to the great maritime and polar explorers who made significant contributions both to Norwegian history and to the geographical knowledge of the Earth.

The book, which has contributions by four authors, is divided into 10 chapters, five of which, as well as the Introduction, are written by Øystein Kock Johansen, a well-known archaeologist who has specialised in Nordic and maritime archaeology. Johansen's first chapter is about the ninth-century voyages of Ottar the Viking, who is credited with sailing both to the White Sea and to the Wessex of King Alfred. The next chapter looks at the Norse discovery of the New World. Johansen indicates that, according to the *Greenlander saga*, Bjarni Herjólfsson was the first Norse mariner to sight the east coast of North America, some time around 986. However, both that and the other great Vinland saga, *Eirik's saga*, agree that around the year 1000 Leif Eiriksson was the first European to go ashore in the New World, landing most likely on Baffin Island (which he named Helluland), Labrador (which he called Markland), and, finally, Newfoundland (his famous Vinland).

In the next five chapters, the other three authors deal with polar exploration. Henrik Ulven writes about Jens Munk's Northwest Passage expedition of 1619–20, on which only three of the original 65 men survived the scurvy that appeared during their wintering at the estuary of Churchill River on Hudson Bay. Thor N. Devig makes the one Antarctic contribution to the volume with a chapter on Carl Larsen, who, after having served as a sealer and whaler in the Arctic, was captain of *Antarctic* on Otto Nordenskjöld's Swedish Antarctic expedition (1901–04) and then became a pioneer in the Antarctic whaling industry.

There are three chapters by Kåre Berg, one about Fridtjof Nansen's Arctic drift on *Fram* (1893–96), one on Otto Sverdrup's second *Fram* expedition (1898–1902), and one on Roald Amundsen's magnificent attainment of

the South Pole. Little need be said here about Nansen or Amundsen — the greatest mind and the greatest technician, respectively, in the history of polar exploration — but it is certainly satisfying to see Sverdrup receive his due. Not only was he a member of Nansen's first crossing of Greenland and the captain of *Fram* on its polar drift, but under his leadership the second *Fram* expedition discovered and charted some 200,000 km², more land than any other polar expedition before or after.

The book then finishes with three chapters by Johansen on expeditions led by Thor Heyerdahl: the *Kon-Tiki* expedition from Peru to Polynesia on a balsawood raft, the *Ra* expeditions crossing the Atlantic Ocean on a reed boat, and the *Tigris* expedition through the Persian Gulf, the Indian Ocean, and the Red Sea. These chapters, obviously, have nothing to do with the polar regions, but they are fascinating, and make entertaining reading.

Norwegian maritime explorers and expeditions charts some of the most innovative and exciting adventures in the history of exploration. Due to its brevity, it lacks the depth for which a historian in the field would look, but it serves as an excellent introduction to a wide range of expeditions covering a period of more than 1000 years. Indeed, the book has only one major flaw — by comparison to the three chapters dedicated to Thor Heyerdahl, the space allotted to Nansen and Amundsen is simply not adequate. There should be a chapter about Nansen's crossing of Greenland, one of the major events of late-nineteenth-century exploration. One could defend it not being included because it was not a maritime expedition, but then the same would be true of Amundsen's South Pole expedition, which is included. Similarly, Amundsen's successful navigation of the Northwest Passage, coming after three centuries of efforts to do just that, deserves its own story, rather than two paragraphs near the beginning of the South Pole chapter. Arguments could also be made for the inclusion of Amundsen's *Maud* expedition.

The overall presentation of the book is very pleasing. It has one or more maps for each chapter, and the reproduction of its many drawings and photographs — both black-and-white and colour — is outstanding. (T.R.D. Grade, History Department, Stanford University, Palo Alto, CA, USA.)

THE ANTARCTIC REGION: GEOLOGICAL EVOLUTION AND PROCESSES. C.A. Ricci (Editor). 1997. Siena: Terra Antarctica Publication. xii + 1206 p, illustrated, hard cover. ISBN 88-900221-0-8. 150,000 lire.

This book is the proceedings volume of the VIIth International Symposium on Antarctic Earth Sciences, held in Siena, Italy, 10–15 September 1995.

Professor Antonio C. Rocha-Campos (president of SCAR and a geologist) addressed the participants at the symposium and assured them that earth-science research in the Antarctic was alive and well, judging by the number of participants and the standard of the presentations. Indeed, the sheer size of the proceedings volume shows that the

subject is not just alive and well but positively flourishing, despite the funding difficulties faced by so many national programmes in the Antarctic.

More than 400 participants from 26 countries attended the symposium, providing more than 400 papers for oral and poster presentation. Of these, more than 200 were submitted for publication in the proceedings volume, which contains 162 papers accepted after peer review. The volume is divided into 11 chapters, reflecting the thematic sessions of the symposium, and each chapter has one or more associate editors, who have provided brief introductions.

Following the introduction by Carlo Alberto Ricci and an appreciation of Professor Felice Ippolito, the chapters are as follows:

1. Antarctica in the amalgamation of Gondwana (21 papers edited by S.L. Harley, B.J. Jensen, and J. Jacobs);
2. Tectonic evolution of the active margins of Gondwana and Antarctica (32 papers edited by T. Flötmann and R.A.J. Trouw);
3. Break-up processes—Jurassic to recent (28 papers edited by G. Leitchenkov and T.J. Wilson);
4. Southern Ocean evolution (14 papers edited by A. Giret and C.A. Raymond);
5. Climate change in Cenozoic records (five papers edited by G. Brancolini);
6. Onshore and offshore geological signatures of the last glacial cycle (13 papers edited by L.R. Bartek and Y. Yoshida);
7. Investigations in petrology, sedimentology, and glaciology (eight papers edited by C.H. Smith Siddoway);
8. Antarctic fossil biotas through time (nine papers edited by R.M. Feldmann and J.E. Francis);
9. Antarctic station geophysics (10 papers edited by K. Kaminuma and A. Meloni);
10. New directions in Antarctic earth sciences (nine papers edited by R.E. Bell and A. Morelli); and
11. Antarctic geoscientific maps (13 papers edited by J.W. Thomson).

Finally, there is an 'Author and keyword index' and a loose map inside the back cover.

The first three chapters constitute just over half of the volume and indicate the great interest in understanding the evolution of Antarctica from earliest times and not just the fragmentation of Gondwana. Much of chapter 1 focuses on East Antarctica, where highly sophisticated analytical techniques have been used to look beyond the pan-African metamorphism to shed light on the earlier history of continental development. The complex South America–southern Africa–West Antarctica and Dronning Maud Land region is not neglected and includes a serious challenge to the SWEAT hypothesis. The greatest obstacle to the progress of geological research in East Antarctica is still the blanket of the ice sheet, but great advances are being made despite this handicap. Chapter 2 has two principal foci, the Transantarctic Mountains, representing the palaeo-