

BOOK REVIEWS

DNAG celebrates Arctic geology

Grantz, A., Johnson, L. and Sweeney, J. F. (editors) 1990. *The Arctic Ocean Region*. Geological Society of America, Boulder, Colorado, U.S.A. 644 pp., 11 plates + 3 microfiche cards. ISBN 0 8137 5211 6. Price \$85.00.

In comparison with most other areas of the world, geological knowledge of the Arctic region is in its infancy. The principal reason for this, of course, is the practical difficulty of working in an inhospitable environment, but politics have played their part, not least because the Arctic Ocean has been for many years a no-man's land between the superpowers. With changing attitudes in the Soviet Union, however, the opportunities continue to grow for collaborative Arctic research. In fact, many of the fundamental problems still to be resolved require international co-operation. Aside from purely academic research, joint commercial ventures are also being explored. For example, half the Arctic Ocean is bounded by the extensive and poorly known shelf seas of the Soviet Arctic. Major gas discoveries in the Barents Sea and Kara Sea have already been reported by the Soviet authorities, but further exploration and exploitation would clearly benefit from collaboration with western oil companies.

Against this background, *The Arctic Ocean Region, Volume L*, of the *Decade of North American Geology* series is a welcome addition to the bookshelf. The aim of the book, as stated in the foreword, is to be a "comprehensive summary of the geology and solid earth geophysics of the Arctic region". With a few caveats, this aim is achieved successfully.

The book contains 32 chapters arranged into 10 subject areas. Chapters 1 and 2 provide an introduction, and a history of research and exploration. The remainder of the book is divided into sections as follows: *ice cover* (two chapters); *bathymetry and physiography* (one chapter); *geophysical data* (five chapters including seismicity, gravity, magnetic anomalies, geothermal observations and seismics); *the North American plate boundary* (one chapter); *continental margins* (six chapters beginning with East Greenland and working across Arctic Canada and Alaska to eastern Siberia); *ridges, borderlands and basins* (five chapters); *Arctic Basin sediments, fossils, paleoclimate and history* (two chapters); *Late Neogene and Quaternary geology* (two chapters); *mineral resources* (three chapters); and *the origin of the Arctic Basin* (two chapters). A summary and comprehensive index finish the book. Three microfiche cards contain an extremely useful bibliography, particularly the Soviet references.

A separate slipcase contains 11 high-quality plates (mainly maps) covering: bathymetry; seismicity and heat flow; gravity; magnetic anomalies; sedimentary thickness; seismic reflection profiles (the East Greenland shelf, Arctic Basin, and the Canadian and Alaskan margins of the Canada Basin); the East Greenland continental margin; and Phanerozoic tectonic features of the Arctic Ocean region.

The book has been edited to a high standard and typographical errors are few and far between. I was greatly amused by the unfortunate (intentional?) juxtaposition of the running head and illustration on p. 4. The text is well illustrated, and the use of red to enhance some of the black and white line diagrams both improves the clarity and increases the quantity of data that can be presented. The plates are a great bonus to purchasers of this book—they contain a multitude of data and have obviously been compiled with great care. If there was enough wall space available in my office, these plates would certainly be occupying it.

All geologists working in Arctic regions will want to own a copy of this book; however, they should be aware of the following points before buying it.

(1) As part of the *Decade of North American Geology* series, there is inevitable bias towards the North American part of the Arctic. The Barents Shelf and the western part of the Soviet Arctic are therefore only mentioned in passing, which seems a shame as their incorporation would have made the volume a complete reference work for Arctic regions.

(2) The book was compiled before recent Soviet collaboration with

the west, so that this is a predominantly western view of Arctic geology. However, despite the western bias of the authorship, a clear effort has been made to incorporate Soviet literature.

(3) The volume has taken some time to prepare (a perpetual frustration for editors of large, multi-author compilation volumes) and most of the contributions date from the mid-1980s. On the negative side this means that more recent data are already available for some topics (nearly one-third of the contributions have notes added in proof); on the positive side it means that more time has been available to produce a book of high quality and rigorous editorial standard. Overall, the delayed publication does not matter too much for a review volume of this type, as long as the delay is recognized.

Despite these caveats, *The Arctic Ocean Region* is an impressive volume and is worthy of its place in a series celebrating the centenary of the Geological Society of America. Not only does this book elegantly summarize what is known about the Arctic region, it also looks forward to the challenges that lie ahead; it will provide a benchmark against which progress in the coming years can be measured. At \$85.00 the book represents excellent value, especially considering the high-quality plates and the microfiche bibliography. As Arctic research gathers momentum, I am sure we will not have to wait for the bicentenary of the GSA before a second edition is required.

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The Cadomian encompasses Armorican, Monian and Avalonian

D'Lemos, R. S., Strachan, R. A. and Topley, C. G. (editors) 1990. *The Cadomian Orogeny*. Geological Society of London Special Publication No. 51. Geological Society of London, Bath, U.K. 433 pp. Price £58.

Special publications of the Geological Society of London appear to be designed to associate advances in fieldwork with geochemical and geophysical investigations. The volume under review is concerned with late Proterozoic tectonics of the Armorican massif of France (18 papers) and related areas (eight papers) in England, southeastern Ireland, parts of Wales, southwestern Iberia and especially Canada. Contributors to the Armorican massif include both British and French authors, although this fact introduces an editorial inconsistency in so far as the French authors where needed usually use accents whereas the British are not too mindful of this feature of French orthography. In places this inconsistency occurs in single lists of references, as for example Balé on p. 179 is accented in one reference but not in another. Otherwise the volume is well-edited and contains few typographic or grammatical errors.

In the discussion of their findings most authors employ stratigraphic, structural, geochronometric and geochemical data. Geophysical data with the exception of a single article on palaeomagnetism are conspicuous by their absence. As a whole this compendium has an aspect of a program report. Thus, for instance current controversies about stratigraphic units, such as the Brioverian, are reflected in papers that leave this unit undivided or elect to recognize its separation into lower and upper sub-units. In this and other respects the introductory statement by the editors and the article by Jean Cogné are especially useful and should be read prior to delving into the rest of the book.

The advances in investigations of late Precambrian geology are underscored by frequent, although not always entirely discriminate, use of isotopic age dates. For instance the paper by C. Guerrot and J. J. Peucat dealing with U-Pb geochronology of the Cadomian orogeny is the only paper that has a systematic evaluation of analytical procedures. One of the by-products of extensive isotopic dating has been