gneisses) and treating in considerable detail its chronological evolution. In the four chapters which follow, outlines are given of the structural provinces which were affected by events during the early Proterozoic, viz. the Nagssugtoqidian, Rinkian and Ketilidian Mobile Belts.

The next chapter by Emeleus and Upton presents an account of Gardar age (1330-1150 m.y.) activity in South Greenland, a period of ensialic sedimentation, volcanism and alkaline plutonism which was responsible for the production of some of the worlds most spectacular and yet enigmatic igneous rocks, i.e., the Ilimaussaq intrusion.

Credible structural models for the formation of orogenic belts, and in the last few years, plate tectonic explanations, have been severely hampered by the lack of stratigraphic, bio-stratigraphic and structural detail on a local scale. In the three chapters which follow, Precambrian to Tertiary relationships in the East Greenland Caledonian and North Greenland fold belts are presented with abundant regional and more specialised local stratigraphic detail. As a result these chapters document not only the Precambrian history of the region but also its tectonic and lithological evolution during the formation of the Palaeozoic Proto-Atlantic Ocean (Iapetus), its subsequent closure to form the Caledonides and eventual fragmentation in the Mesozoic to generate the present Atlantic Ocean. Pertinent to this latter event are discussions of the East and West Greenland Tertiary igneous provinces

The remaining chapters in the book which are by no means less important, include a discussion of the Quaternary geology of Greenland, a review of the metallogenic potential and organic fossil energy resources of Greenland, and an outline of fossil flora and palaeovertebrates. It concludes with an account of recently discovered kimberlites in Western Greenland.

The book is a scholarly and well edited work. It will certainly become one of the classics of regional geology and is a real bargain at approximately $35.00.

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Volcanism in Australia

Edited by R. W. Johnson
Elsevier Scientific Publishing Company, 405 p. 1976.
Price $23.25

Reviewed by P. M. Clifford
Department of Geology
McMaster University
Hamilton, Ontario L8S 4M1

This volume is an interesting assemblage of papers about volcanoes in Australasia. Most of us have scant idea about the range and continuity of activity there, and few of us have actually watched a volcano at work. This book enlightens us on both matters

The 28 constituent papers are arranged as a "tour" clockwise from Australia via Papua-New Guinea to New Zealand. Six papers have a geochemical bias. Three of these deal with island arc situations, one with activity on a continental plate. All areas show a wide compositional range for their volcanic rocks and none lead to a satisfying petrogenetic model. Four papers cover odds and ends - an early Cambrian flood basalt province in northern Australia, long flows in Queensland, a model for ore deposits associated with andesitic strato-volcanoes, and a discussion of volcanic emanations in the Solomon Islands which supports the idea of exhalative ore deposition.

The bulk of the book, however, is concerned with physical studies. Eight deal with observed eruption patterns, four more discuss activity of volcanoes recently deceased, and four have to do with geophysical means of keeping a wary eye on potentially dangerous volcanoes.

Given the many active volcanoes in Australasia, and their tendency to violence, this emphasis is not surprising. Precise levelling, infra-red scanning, magnetic and thermal surveys and seismic monitoring are all yielding interesting and eventually useful results. But assessment of hazard based upon eruptive history and style is still the most common approach, and it is this that may be served by the volcanic histories, with their descriptions of repose patterns, and the style and products of individual eruptions. These histories, too, are a valuable antidote to the disease of layer-cake thinking which can often afflict interpretations of ancient volcanic assemblages. These island-arc volcanoes are erratic in output, rarely providing an identifiable unit which is distributed all about the vent. When they come close to doing this (a pyroclastic eruption perhaps) but are not badly damaged by tectonic activity, there is the chance, as at Witori volcano on New Britain, to examine unaltered tephra and to see just how good correlation of units may be based upon such things as textural variations. Such studies link the currently alive to the long-since dead.

G. A. M. Taylor, in whose memory these papers are published, would, I suspect, have been pleased to see these accounts of the growth of work he began at Rabaul in 1950. For readers far removed from the area, the papers have interesting points to make, and are worth reading. But there is not really enough of general application to make it worth buying, except by the most avid volcanologists.

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Applications of Thermodynamics in Metamorphic Petrology

By Edgar Froese
Geological Survey Paper 75-43
Printing and Publishing Supply and Services Canada
Ottawa, Canada, K1A 0S9
73 pages, 1976
Price $3.00 in Canada,
$3.60 in other countries

Reviewed by H. J. Greenwood
Department of Geological Sciences
The University of British Columbia
Vancouver, B.C. V6T 1W5

This small and compact book fills neatly a serious gap that has developed between theoretical-experimental petrologists and more field-oriented chemical petrologists. Thermodynamic theory and calculation has been assuming an ever-increasing role in the