book was limited to biochemical studies, with few excursions into either pharmacology or biophysics. Nevertheless, the contributions of researchers in these disciplines are frequently cited and their influence on the direction of biochemical experimentation is made clear.

In summary, Sato and Omura have produced a volume that will be a superb introduction to newcomers and a valuable overview to researchers in the field.

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Igneous Systems

Trondhjemites, Dacites, and Related Rocks. F. BARKER, Ed. Elsevier, New York, 1979. xvi, 660 pp., illus. $65.75. Developments in Petrology, 6.

Trondhjemites are a ubiquitous, but minor, component of igneous terranes all over the world. To devote a 660-page volume to these K_2O-poor, SiO_2-rich rocks requires assurance that they occupy a significant role in petrogenesis. Barker makes a sound case for this premise, both as editor and as co-author of five of the 22 papers in this zesty potpourri of the earth's crustal history.

After a series of papers that define petrographic, chemical, and tectonic ingredients, 17 papers describe the geologic settings, petrography, and chemistry of trondhjemite-bearing complexes from the Archean of North America to the Recent of the South Pacific. The latter are mostly volcanic occurrences of dacite.

The organization of the book would have been stronger if the papers by Bryan, Tomblin, and Gill and Stork on Tonga, the Lesser Antilles, and Fiji had directly followed the superb reference paper by Ewart on the tectonic setting of Cenozoic volcanism. Ewart's paper contrasts the petrographic and chemical characteristics of volcanic rocks with particular tectonic settings. It is a readable summary, containing enough illustrations and detailed tables to be a ready guide for the comparison of one's favorite igneous complex with 19 Cenozoic examples. A pleasure of reading the book is to use this paper as a base of comparison for the others.

The authors generally agree that the two basic ways in which trondhjemite is formed are the fractional crystallization of K_2O-poor mafic magmas and the partial melting of metamorphosed basalts. Combinations of these two processes are shown in a paper by Phelps to explain the Sparta Complex in Oregon. Phelps also demonstrates that the more chemistry one has available, the more complex the model of origin will be. Trondhjemites by themselves do not define a tectonic setting, but, as is shown by Malpas in a paper on rocks of Newfoundland, their study can place constraints on tectonic models.

The papers on Precambrian complexes provide enough geologic detail and associated chemistry to show how future work will require close collaboration of those in geological and chemical disciplines—all the better if the two orientations are combined in the same individual. McGregor clearly points this out in the acknowledgements for his paper on the ancient rocks of Greenland.

Most papers fall short in petrography, mainly with regard to the sequence of crystallization and the relative oxidation and hydration states of trondhjemitic and dacitic magmas. Osborn demonstrated that the peppering of calc-alkaline rocks with magnetite indicates that they are more oxidized than those derived by fractional crystallization of a mantle-derived basaltic parent. This relationship, probably due to the oxidation of most crustal igneous rocks during or after emplacement, serves to separate rocks generated by partial melting of igneous crust or sedimentary crust and those derived directly from the mantle. The relationship, exploited by White and Chappell in Eastern Australia and by Ishihara in Japan, is now being applied in the study of granitic terranes. After Ewart's introduction, it is a shame that most of the authors did not exploit the relationship.

The complete handbook on trondhjemites should have had a paper on pertinent phase equilibria. The papers by Arth, Longstaffe, and Peterman serve trace elements, oxygen isotopes, and strontium isotopes well in this regard. In addition to melting relations, a paper on phase equilibria could have discussed the difficulties of a metasomatic origin for trondhjemites, a process rejected by most authors on the basis of geologic and chemical data.

The text was prepared by a word processor. There are relatively few typographical errors, but the type, a sans-serif, is difficult to read. I plead with future authors and publishers to use more readable types.

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