

restriction of the term spilite to volcanic rocks of basaltic composition with distinct types of primary fabric (here illustrated by photomicrographs). The preferred hypothesis for their origin considers them as resulting from the transfer and differentiation of constituents in a separate aqueous phase during primary crystallization, the hydrous nature of the melt being either a result of primary differentiation or due to contamination. In reviewing the eclogite problem and the many theories as to their origin, W. R. Church adheres to the original nomenclature of Haiüy, who defined them as metamorphic rocks composed essentially of omphacite (jadeite-bearing pyroxene) and garnet. The metamorphism, mainly regional, of mafic rocks is summarized succinctly by A. Miyashiro. Particular attention is given to the mineralogy of metabasites, especially the amphiboles. The concluding chapter, by D. H. Green, deals with the origin of basaltic magmas: they are considered to be derived by partial melting within a somewhat inhomogeneous mantle of peridotitic composition, but there is no clear attempt to relate the type of magma produced with the three parental magmas discussed in the chapter on the differentiation of basaltic magmas.

Some of the authors seem uncertain as to whether to deal with intrusive rock bodies that formed from basalt magma, in particular the large differentiated sills. The lack of any consideration of amygdaloidal minerals and of the evolution of basalt plateau areas and shield volcanoes would seem to be major omissions.

The production and printing is uniformly excellent and very few errors of typography were noticed. The line-drawings are clear but the presentation is less fortunate in the several 'plates', which are in fact printed as text-figures and which lack contrast. In the review copy, plate 8 (p. 13) of entrail pahoehoe appears to have been taken in a fog and in plate 4 (p. 73) the 'distant mountain capped by a thick curved dolerite sheet' is a uniform light grey.

The authority and general high quality of exposition of the contributions in this treatise will cause these two volumes to be an essential item in all geological libraries, but the price of £20. 11s. (almost 6d. per page) regrettably puts them beyond the reach of many individual petrologists.

R. A. HOWIE

SEDERHOLM (J. J.). *Selected Works: Granites and Migmatites*. Edinburgh (Oliver and Boyd), 1967, 608 pp., 207 text-figs., 17 pls., 8 coloured maps. Price £15. 15s.

This splendidly produced book contains seven of the most important publications of J. J. Sederholm. There is also an outline of Sederholm's life and work by Pentti Eskola (this in itself is a valuable appreciative document), together with a bibliography of Sederholm's works, a list of no less than 146 titles.

The selection is well made, for it is fully representative of Sederholm's achievements. His classic paper 'On granite and gneiss', which was published in 1907, appears as an English translation for the first time. In this he shows how the history of events in the immensely complicated terrains of schists, gneisses, and granites can be read by a reasoned appraisal of the detailed relations to be seen in the field and

studied under the microscope. His concept of cycles of sedimentation and orogeny has provided the key for unravelling the Pre-Cambrian throughout the world. The two contributions described as 'explanatory notes' for the geological map of Finland (1930) and for the geological map of Fennoscandia (1932) are superb essays presenting an exposition of principles and a synthesis of conclusions relating to these most complex chapters of earth history.

Sederholm's 'trilogy' 'On migmatites and associated Pre-Cambrian rocks of south-western Finland' appropriately occupies a large part of this volume, for it is in these works that are recorded his patient and devoted analyses of the most intractable of geological problems and with which his name will always be primarily associated, namely, the nature and origin of gneisses and granites. Their publication spans the last eleven years of his life, from 1923 to 1934, and indeed the last was published posthumously from an uncompleted manuscript. These are not merely pioneering works; on their subject they have yet to be equalled or surpassed.

The decision to re-publish Sederholm's major works was happily taken; the present volume says much for the devoted labours that have made it possible. Long after most contemporary publications have ceased to have more than historic value this will continue to be appreciated as a masterly exercise in geological observation, argument, and exposition.

B. C. KING

KIRSCH (H.). *Applied Mineralogy for Engineers, Technologists and Students*. Translated from the German by K. A. Jones. London (Chapman & Hall and Science Paperbacks), 1968, xi+233 pp., 103 figs. Price 35s. (paperback), 60s. (hardback).

The author attempts the difficult task of introducing the uninitiated reader to the field of applied mineralogy in general and industrial mineralogy in particular. His failure, if any, lies in the width of field that he has attempted to survey. Of the 214 pages of text, approximately half are devoted to introductory mineralogy, from basic definitions, and lead, through chapters on geochemistry, petrology, mineral deposits, and systematic mineralogy, to the second section, entitled 'Applied Mineralogy'. Industrial uses of minerals in ceramics, metallurgy, and manufacturing are covered. Engineering geology, rock and soil mechanics, and mining command a section of sixteen pages and others cover diverse subjects ranging from biomineralogy and silicosis to the applications of polarization microscopy and X-ray investigation of materials.

J. MCM. MOORE