

of the Russian literature combined with the very adequate summaries of the more familiar Western accounts render this a unique and unrivalled reference work. The first two chapters are concerned with the Bipyroxene-gneiss facies (granulite facies) and the accounts, with maps, of the Ukrainian and Siberian shields are particularly valuable. However, the Western reader, weaned on Turner's translation of Eskola and all that has followed, must steel himself to some surprises. 'The facies of regional metamorphism at low pressures' are taken to comprise all rocks regionally metamorphosed at pressures less than those of the andalusite-kyanite and the sillimanite-kyanite univariant curves. We thus find the bipyroxene facies (= Eskola's granulite facies) slashed in two with virtually no mention of the Central European granulites and in particular the work of Smulikowski and his colleagues on the Silesian granulites. No doubt these will find a place in the fourth volume on high-pressure metamorphism; but the division adopted here, cutting across naturally related associations, is to me irritating and artificial.

The third to sixth chapters concern the amphibolite facies; the epidote-amphibolite facies; andalusite-sillimanite sequences (seven regions discussed); and the greenschist facies. Here too the rejection of kyanite has some curious consequences. In the Scottish Caledonian, for example, the 'Buchan' sequence falls within the scope of the book, and is described in Chapter V, on metamorphic assemblages of the andalusite-sillimanite type. The low-grade assemblages of the 'Barrovian' zones fall within the scope of Chapter VI, on the greenschist facies, but the higher, kyanite grade associations of this sequence must perforce be omitted. It is perhaps this artificial separation that has encouraged the authors to resurrect the hoary chestnut that 'Buchan' metamorphism is a subsequent, post-tectonic superimposition on an earlier, syntectonic pattern of 'Barrovian' zones.

In general, however, the authors eschew such judgements and confine their accounts to factual summaries of the mineral associations developed, illustrated by maps of the metamorphic zonations observed in various regions, with little petrogenetic analysis. An interesting exception, Chapter VII on 'Low-Temperature metasomatic processes and regional epigenesis', treats the zeolite facies from a strongly metasomatic viewpoint, including a brief account of sea-floor metamorphism and spilite formation with a curious emphasis on the occurrence of rhodusite (*not* crocidolite) in low-grade metamorphism.

As in the previous volumes the translation appears to be excellent and the printing, by photo-offset, is clear.

G. A. CHINNER

MILLIMAN (J. D.). *Recent sedimentary carbonates. Part I. Marine carbonates*. Berlin, Heidelberg, and New York (Springer-Verlag), 1974. xvi+336 pp., 94 figs., 39 pls. Price DM 66.00 (\$27.10).

This first part of a two-volume treatise on carbonate sediments is an attempt to synthesize man's knowledge of calcium carbonate in the marine environment in terms of composition, sedimentation, and diagenesis. Discussion is restricted to marine

Holocene materials, and thus ancient limestones, freshwater carbonates, and subaerial diagenesis are not considered. The text, based upon the author's considerable experience and an impressive number (about 1300) of cited references, is arranged into four parts: I, carbonate mineralogy; carbonate equilibria in seawater; and a brief discussion of the various analytical methods used to investigate modern carbonate sediments. II, a comprehensive description of the different types of skeletal and non-skeletal components found in present-day marine sediments. III, carbonate sedimentation (*a*) in shallow water environments such as coral and other organic reefs, (*b*) on the continental shelves, and (*c*) in the deep-sea. IV, diagenesis, including carbonate degradation processes, cementation, and dolomitization. Two appendices provide a guide to the identification of carbonate components in both thin-section and under reflected light.

Treatment of the subject-matter is reasonably well balanced, up to date, and generally well illustrated, although information in many of the photographs is obscured by their unusually small size. It is unfortunate that greater care was not exercised in the spelling of generic and specific names, and that deep-water coral deposits are considered reefs when even the cited authors refer to them as banks rather than reefs, preferring to reserve the latter term for wave-resistant structures. As a work of reference, the volume suffers from an inadequate subject index. A reader searching for 'continental shelf' and 'coral', for example, will find these entries between the words '*Coccolithus*' and '*Coccospheres*'. Much more annoying, however, is the failure to subdivide index entries; under 'calcite' one is referred to 97 different pages without any further indication of what aspect of the mineral is under consideration. Despite these minor reservations, however, there is little doubt that this book represents a major, important contribution to the literature on carbonates, and it is likely to remain so for some time to come.

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HUTCHISON (C. S.). *Laboratory handbook of petrographic techniques*. London and New York (Wiley-Interscience), 1974. xxx+527 pp., 148 figs. Price £10.60.

Descriptions of many of the petrographic techniques in everyday use are often only to be found scattered in the literature or passed on from laboratory to laboratory. It has been the author's intention to remedy this situation by bringing together many of the commonly used techniques generally applicable to igneous and metamorphic rocks. This book includes methods for staining techniques, modal analysis, photomicrography, conoscopic methods for the polarizing microscope, the spindle stage, mineral separation, X-ray powder diffraction, determination of specific gravity and refractive index, individual chemical determinations (e.g. ferrous iron, water, fluorine, CO₂), XRF, AAS, and DTA techniques, and the recalculation and plotting of results.

The emphasis here is on keeping theoretical discussion to a bare minimum so that the techniques will be available not only to the experienced research worker but also to students and laboratory technicians who normally would not consult original