an up-to-date account of current research and interpretation of the role of high-grade metamorphism in migmatite formation and in the genesis of granitic magmas. The production and presentation are good and although there is no index, some 500 references are usefully collected together at the end. The price is such that this work should be on the shelves of all research workers in this area of the Earth Sciences.

R. A. HOWIE

Hutchison, R. *The Search for Our Beginning: an Enquiry Based on Meteorite Research, into the Origin of our Planet and of Life.* London (British Museum [Natural History]) and Oxford (Oxford University Press), 1983. 164 pp., 64 figs., 4 colour pls. Price £7·95.

This small book reviews the flood of recent research results in meteoritics, and emphasizes the contribution they have made to the understanding of the early stages of the evolution of the sun and planets. The frontispiece shows the discovery of a meteorite among Antarctic ice, and the large number of new meteorite finds from such sources, as well as some of the discoveries made from them, are well described in the text. Individual chapters summarize the history of meteorite studies, relevant information about the Earth, Moon, and the Solar System, the petrological variety of meteorites, their chemistry, the principal conclusions of research about the origin of the Earth, and in considerably less detail, the origin of life.

The book is written for non-specialists in Geology or Petrology, but specialists will find its reviews of such topics as the discovery of the daughters of short-lived isotopes (for example, aluminium 26) surprisingly comprehensive. There is a very short reading list at the end, which might have been extended to four or five references for each chapter. The text of the book is easy to read, but the author's wide knowledge of the subject and active involvement in research shows through and adds an air of authority. It is an excellent account of the subject for students who would like background reading to introductory lectures about meteorites, or for Earth and Planetary scientists who would like a brief survey of the recent advances in meteoritics.

ROGER MASON

Reeder, R. J., ed. *Carbonates: Mineralogy and Chemistry* (Reviews in Mineralogy, Volume 11). Washington, DC (Mineral Society of America), 1983. xii + 394 pp., 291 figs. Price $13.00.

This latest volume of 'Reviews in Mineralogy', a series begun as 'Short Course Notes' in 1974, attempts to synthesize present understanding of certain aspects of the mineralogy and chemistry of the rock-forming carbonates. Because of their importance in sedimentary rocks, low-temperature examples are given emphasis, but the broader consideration of all aspects of carbonates is a reflection of their widespread occurrence also in metamorphic and some igneous environments.

The nine chapters include descriptions of the crystal chemisty (R. J. Reeder) and phase relations (J. R. Goldsmith) of rhombohedral carbonates, solid solutions and thermobarometry of metamorphic carbonates (E. J. Essene), magnesian calcites (F. T. Mackenzie *et al.*), crystal chemistry and phase relations of orthorhombic carbonates (J. A. Speer), $CaCO_3$ polymorphs and the aragonite–calcite transformation (W. D. Carlson), the kinetics of dissolution and precipitation of $CaCO_3$ (J. W. Morse), trace elements and isotopes in sedimentary carbonates (J. Veizer), and microstructures in carbonates (H.-R. Wenk *et al.*). This last chapter introduces transmission electron microscopy, a relatively new tool that has great potential in carbonate research. The references for all chapters are sensibly placed together at the end of the book.

This review follows, by ten years, a major assessment of sedimentary carbonate minerals by F. Lippmann, and allows the reader to appreciate the tremendous if belated development of interest in this important group of minerals in the past decade. The applications of calcite–dolomite thermometry to metamorphic rocks are a case in point, and here, as for most topics, the discussion concludes with suggestions for future work. As with earlier volumes in this series, the work is clearly produced and well illustated; all mineralogists will continue to be grateful for these stimulating and up-to-date texts at a very reasonable price.

R. A. HOWIE

Ferry, J. M., ed. *Characterization of Metamorphism through Mineral Equilibria* (Reviews in Mineralogy, Volume 10). Washington, DC (Mineral Society of America), 1982. xiii + 397 pp., 124 figs. Price $13.00.

This is the second book in this series to be dedicated to a subject other than a distinct mineral group (the other being Volume 8: *Kinetics of Geochemical Processes*, 1980). In this new volume, the orientation is primarily directed to the application of methods of determining the history of metamorphism via chemical and mineralogical studies. There are nine chapters contributed by a galaxy of authors including J. B. Thompson on composition and reaction space—an algebraic and geometric approach, F. S. Spear *et al.* on the linear

algebraic manipulation of n-dimensional composition space and analytical formulation of phase equilibria, using the Gibbs method, E. J. Essene on geological thermometry and barometry, J. M. Ferry and D. M. Burt on the characterization of metamorphic fluid composition via mineral equilibria, J. M. Rice and J. M. Ferry on buffering, infiltration, and control of intensive variables during metamorphism, D. Rumble on stable isotope fractionation during devolatilization, and R. J. Tracy on zoning and inclusions in metamorphic minerals.

The volume attempts to answer the question 'what can we learn about metamorphism through the study of minerals in metamorphic rocks?' It concentrates on the chemical aspects of metamorphism and attempts to report basic research strategies and examples of their application. There is an emphasis on the quantitative characterization of metamorphism, together with analytical as opposed to graphical treatments of mineral equilibria. However, the increasing trend is for less of the snapshot estimations of P–T conditions at a particular stage but rather for the characterization of metamorphism as a dynamic process; the developments of such concepts are outlined.

R. A. Howie