polycrystals. Chapter 15 by A. Hever *et al.* describes the slip systems in uranium dioxide and Chapter 16 (C. Hennig-Michaeli and J.-J. Couderc) describes dislocation rections in experimentally deformed chalcopyrite singel crystals.

In summary this book is a mixture of reviews of the state of knowledge on micro-deformation processes in non-metallic materials together with new data. It is well presented, well edited and indexed. The volume contains a wealth of information and up-to-date references that will be invaluable to the reader. To those unfamiliar with the fields of brittle micro-mechanics this volume will be a useful high-level introduction. The chapters on plastic deformation processes also provide a valuable review of the current theories and level of knowledge. At £65 it is perhaps a little expensive for individual libraries but is a must for all departmental and University/College libraries. It is highly recommended for any Earth scientist who needs to understand deformation processes in the lithosphere.

K. R. McClay

Mason, R. *Petrology of the Metamorphic Rocks* (2nd edn.). London (Unwin Hyman), 1990. x + 230 pp. Price £35.00 hardback; £14.95 paperback.

The First Edition (1978) of Roger Mason's textbook on metamorphic petrology was presented as the third volume in the series published by Allen & Unwin covering the main classes of rocks—igneous, sedimentary and metamorphic. This pretence was never convincing and has been dropped in the present edition. Mason's approach is entirely different from those adopted in earlier texts. Instead of a systematic classificatory framework, metamorphism and metamorphic rocks are presented through a series of case histories drawn from the author's own research experience in Britain, Ireland, other parts of Europe, Turkey, the United States and China.

This original approach has been retained in the Second Edition, although the subject matter has been updated and rearranged so that it is now more overtly related to the plate tectonic environments in which the different types of metamorphic rocks have been formed.

After introductory chapters dealing with the definition of terms, schemes of classification, methods of study and the chemical and thermodynamic aspects of metamorphism, the main body of the text covers the einvironments of contact metamorphism related to intrusion, dynamic metamorphism in thrusts and shear zones, metamorphism on the ocean floor and in zones of subduction and collision of tectonic plates. An account is given of high-grade granulite facies terrains, found in the stable continental cratons, and of metamorphisms of mantle materials seen in ophiolite complexes and mantle xenoliths, brought up in kimberlite pipes and basaltic lava flows. The final chapter introduces 'extra-terrestrial metamorphism', as seen in meteorite impact craters on earth, represented by the Nordlinger Ries crater in Southern Germany, and the Moon rocks brought back from the Apollo missions. The text is well illustrated by clear line drawings of maps, graphs and thin sections of metamorphic rocks.

The book originated as a Second Year University course in metamorphic petrology and it certainly provides a valuable and stimulating introduction to metamorphism for students at this level. It will also provide a readable and useful update in current methods and concepts in metamorphic petrology for teachers and professional geologists. The personal and anecdotal approach in spite of a Glossary of terms and an Index, will limit its value as a standard course textbook, as the author has not attempted to provide a comprehensive coverage of the whole range of metamorphism and metamorphic rocks.

A. J. Barber

Poirier, J.-P. *Introduction to the Physics of the Earth's Interior*. Cambridge (Cambridge University Press), 1991. Price: hardback £40.00, paperback £17.50.

This is an excellent soft-bound book, packed with essential mathematical models and physical explanations for current research through mineral physics and geophysics, to determine the structure, composition and temperature of the deep Earth. In the first two chapters, the book presents a succinct review of the fundamentals of thermodynamics of solids, and elastic moduli. The next chapter provides a fairly rigorous review of the fundamentals of lattice vibrations, including, for example, recent observations on Gruneisen parameters. The next two chapter explain the origins and applications of the equations of state for solids at high temperatures and pressures, and examine the thermodynamics and theoretical models of melting with, for example, specific application to our current understanding of the Earth's core. Dynamic processes in the Earth, including mechanisms of diffusion and viscosities of solids and liquids are linked with the principles of electrical and thermal conduction in a longer chapter 6, under the title of transport properties. Finally in Chapter 7, the three major types of