variably called 'Alpine-type peridotites', 'orogenic peridotites', 'diamondiferous ophiolites', etc. UHPM conditions have been deduced with P as high as 40, 50 or even 60 kbar. In this book, unfortunately, only Morocco and Spain (Chap. 13 by D.G. Pearson, G.R. Davies and P.H. Nixon) and Norway (Chap. 8 by E.J. Krogh and D.A. Carswell) receive detailed treatment. The latter chapter is, however, predominated by a review of non-UHPM eclogites in the Scandinavian Caledonides; although undoubtedly an interesting half-chapter, one can honestly ask why it figures in this book.

The above-mentioned chapters, principally devoted to specific regions, are accompanied by some useful thematic chapters dealing with subjects of general interest. Thus, in addition to an overview (Chap. 1 by R.G. Coleman and X. Wang), experimental/thermodynamical/paragenetical aspects are dealt with by H.-J. Massonne (Chap. 2). C. Chopin and N.V. Sobolev (Chap. 3) summarize a series of mineralogical indicators of UHPM. A. Michard, C. Henry and C. Chopin (Chap. 4) review structures in UHPM rocks.

Of course the logical objective of any petrographical/petrogenetical study is to try to fit the origin of the rocks concerned into an appropriate geodynamical context. Not surprisingly, the Plate Tectonic Theory was seized by most eclogitologists as an ideal way for creating first eclogite and then UHPM parageneses by subduction to ever-increasing depths of crustal material from one plate under another plate, in particular by continental collision. However, the subsequent exhumation and preservation of thoroughly metastable relict UHPM mineral assemblages creates problems which are difficult, if not impossible, to solve in the context of presently-accepted geodynamical models. Three chapters discuss these aspects: B.R. Hacker and S.M. Peacock in general (Chap. 5); M.C. Blake, D.E. Moore and A.S. Sayko with special reference to the Western Alps (Chap. 6) and E.A. Eide with special emphasis on Eastern China (Chap. 11).

One of the greatest challenges to today's scientific research in the Earth Sciences as a whole, and not just concerning metamorphic rocks, is to satisfactorily solve the overall geodynamical problem of the creation, exhumation and preservation of UHPM terranes; the solution will undoubtedly have significant repercussions for the geodynamics of igneous and sedimentary rocks. It is often stated, including in this book, that no single model can be applied to all UHPM terranes. This is certainly the case, but the present writer has often declared his opinion (1985, 1993) that no single model yet applies satisfactorily to any terrane and that the solution to this intriguing problem may not come from adjusting existing inadequate models but from a future revolutionary approach which, by definition, is quite unknown and unpredictable, and hence towards which future research cannot be aimed. It is thus important that researchers learn to think in other directions, in particular sideways into other disciplines where new clues might be found, whilst maintaining a forward effort in the ever-deepening description and analysis of old and new localities of UHPM, especially of their micro-minerals and micro- to mega-structures.

This book provides a solid base for anyone pursuing these courses, in particular new students and young researchers; established UHPM researchers will no doubt have already acquired this well-written book which will, no doubt, soon become a standard text. As for libraries, this is the third book devoted to eclogites (following *Eclogites and Eclogite-Facies Rocks* [ed. D.C. Smith, Elsevier, 1988], and *Eclogite Facies Rocks* [ed. D.A. Carswell, Blackie, 1990] and it should rapidly join its two elder brothers on the bookshelves. D.C. SMITH

Bender, F. K. and Raza, H. A., eds. *Geology of Pakistan*. Stuttgart (E. Schweizerbart'sche Verlagsbuchhandlung: Nagele u. Obermiller), 1995. x + 414 pp, 3 coloured maps (1:500 000). Price DM 248.00 (US$ 178.00). ISBN 3 443 11025 8.

The *Geology of Pakistan* is a monograph covering the overall geology (chapters on sedimentary sequences, igneous and metamorphic rocks, tectonics and structure, palaeogeographic and dynamic evolution) and energy resources and raw materials of the country. The latter section includes chapters on hydrocarbons, coal, nuclear fuels and geothermal energy, metallic and non-metallic raw materials, water and soils. The approach is a basic descriptive one, with little discussion of geological processes, kinematics or dynamics. Pakistan contains some of the most spectacular geology in the world with the unique and beautiful mountains of the Karakoram and Hindu Kush. It contains probably the world's best exposed section through a deeply eroded arc complex (Kohistan), the world's fastest and youngest exhuming partially melted crust (Nanga Parbat), and the deep erosion and high uplift of the Karakoram range has unlocked many of the secrets of processes of crustal thickening, melting and exhumation. However, none of these processes are discussed and the text often reads like a bland shopping list. Although it is undoubtedly a source of much information on Pakistan, there is none of the excitement of new tectonics, dynamics and kinematics of the Himalaya–Karakoram mountain ranges. References seem to be largely pre-1990, which is a pity because so much excellent new work has come

out of Pakistan since then. The authors, both German and Pakistani, are more familiar with the geology of the foreland and the western ranges than the geology of the Himalaya and Karakoram. Indeed the classic Kohistan terrain is given only a few pages and the Karakoram geology even less, with almost all the key references missing. By far the most useful part of the book is the three large fold-out maps, at a scale of 1:500 000, of the Western Fold Belt compiled from Landsat MSS Satellite Imagery by D. Bannert, A. Cheema, A. Ahmed and U. Schäffer. These colour maps interpret the stratigraphy and structure of this remote and somewhat inaccessible area along the western borderlands of Pakistan with Iran and Afghanistan, which form the western transpressional margin of the Indian plate. The book and the maps are well produced, and, although expensive, priced at DM 248 (US$ 178) will form a useful library reference volume for some of the basic data on Pakistan.

MIKE SEARLE

Ehlers, J. *Quaternary and Glacial Geology* Chichester and New York (John Wiley and Sons), 1996, xii + 578 pp. Price £75.00. Hbk. ISBN 0 471 95576 0

This book is a translation of the author's original *Allgemeine und historische Quärtargeologie* with editing by P.L. Gibbard. In many ways it is an update of R.F. Flint's 1971 classic *Glacial and Quaternary Geology*, also published by Wiley. Alas, modern printing quality does not equal that of 25 years ago. Ehler's book is effectively two separate ones of similar length within the same cover — an overview of glacial and periglacial geology (Sections 1 and 2) and an outline of Quaternary Geology with reviews of selected areas of the northern hemisphere (Section 3). There is a huge reference list which, with the index, occupies over 1/5th of the pages.

P. WORSLEY

Craig, J. R. and Vaughan, D. J. *Ore Microscopy and Ore Petrography*, 2nd Edition, Chichester and New York (John Wiley and Sons, Ltd). 1995 xiv + 434 pp. Price £18.95. ISBN 0471115991.

Some geology textbooks prove to be invaluable as sources of information or handy reference books whereas others, for no apparent reason, lie in nearly mint condition on the bookshelf, read through once then consulted very occasionally for a very limited range of points. It is often not obvious why books fall into the former category; ease of use, logical layout of topics and information so that data may be found without recourse to the index may all contribute, or it may just be a personal response conditioned in the formative stages of one's training. Craig and Vaughan's *Ore Microscopy and Ore Petrography* has been in constant use, readily accessible for reference, lying beside my reflected light microscope. For a paperback book it has lasted very well considering the amount of use it has had. However, age and hard use have taken their toll and the cover has become raggy and, despite several running repairs with parcel tape, blocks of pages threaten to escape unless carefully looked after. The publishing of a 2nd Edition has come just in time and allows comparison to be made with the edition it supersedes.

The first impressions are not particularly encouraging. It is smaller and thicker and the cover illustration in evolving shades of brown of concentric growth banding, showing sequential development of hematite and goethite in pisolitic iron ore, has given way to white lettering on plain black. Clear? Yes, but perhaps a trifle funereal. Opening the book the overall darker impression persists; narrower margins and more lines to the page make the print seem bigger and the layout more cramped. While some of the photomicrographs have been replaced with better examples others are less clearly illustrated in the 2nd Edition, leading to the impression that less care has been taken in the quality of the printing.

In content the book is reassuringly familiar, with the rewriting restricted largely to adding additional sentences and paragraphs to explain points more clearly and incorporating descriptions of newer techniques such as a semi-automated reflectance measurement or newer examples, including the paragenesis of the Mashan gold-base metal deposit, in new sub-sections. On the principle of "if it ain't broke, don't fix it" the authors have maintained the best of the 1st Edition but, even so, reflected light optics seem just as difficult!

Perhaps the most obviously altered chapter covers ore mineral textures. The changes bring in numbering of the sub-sections in conformity with the rest of the book as well as modification of the layout of the sections on replacement textures and cooling textures. A new section covers the textures of placer grains which was a significant omission in the 1st Edition. Throughout this chapter are minor amendations, rewritten and enlarged introductions, additional explanatory sentences and some new diagrams.

Chapters 9 and 10 on ore mineral assemblages retain the same layout but have been generally updated bringing in newer examples and references. The reference lists are considerably more extensive and up to date but, in a less welcome change, are now lumped together at the end of each chapter rather than being given specifically at the end of each section. Though the occurrence of opaque minerals in