It is perhaps in the last two chapters, dealing with the fractionation of both stable and radioactive isotopes, that this book differs from many other texts. In the lighter isotopes, particular attention is paid to their natural fractionation and to the $^{18}O/^{16}O$ and $^{32}S/^{34}S$ ratios and their use in geothermometry and in the study of the genesis of hydrothermal deposits. In the description of radioactive isotopes, attention is given to the general equation for the evolution of a radioactive system, and details of the U/Pb, K/Ar, and Rb/Sr systems are discussed, with consideration of isochrons, Concordia diagrams, and variations in $^{87}Sr/^{86}$ Sr ratios.

Throughout the book a basic knowledge of both chemistry and geology is assumed. References cited in the text giving credit for the original work are not necessarily listed in the bibliography, where the authors have chosen sometimes to refer to more readable reviews. This will be a useful text for courses in geochemistry, a topic for which there is in general a lack of suitable course books, but although the approach is good the attack is rather superficial. Time and time again one wishes the authors could have gone much further into various problems, at best no doubt giving a much larger text but at least giving a fuller and more comprehensive bibliography.

R. A. HOWIE

[GRIGORIEV (D. P.) and ZHABIN (A. G.)] Григориев (Д. П) и Жабин (А. Г.), Онтогения Минералов (*Ontogeny of Minerals*), in Russian. Moscow (Publishing House 'Nauka'), 1975, 339 pp., 236 figs., 39 tables. Price 2.23 roubles.

Although there are fine, detailed descriptions of minerals, common practice in the mineralogical and petrological literature is to dwell but in a cursory manner upon the peculiarities of individual minerals making up an aggregate or rock. This book by an eminent Russian mineralogist and his pupil is meant to stress the necessity of careful studies of the individual crystals or aggregates of a mineral in order to gain better information about its genesis. The biological term 'ontogeny', becomingly picked up in 1955 by Professor Grigoriev and since then widely used in and outside the Soviet Union, conveys a broader sense to the genesis of mineral individuals and aggregates, non-crystalline and metamict products included. 'Each mineral (mineral individual, N.B.) recites its own history' is the leitmotiv of the book.

The book, very well printed and with a very pleasant outer appearance, comprises an introduction along historical lines and three main chapters: Nucleation of the Mineral Individuals; Growth of the Mineral Individuals; and Alteration and Destruction of the Individuals. Homogeneous and heterogeneous nucleation, growth mechanisms and modification of crystal forms, mechanical and chemical alterations, and recrystallization phenomena are all amply illustrated by examples of minerals occurring under varying geological settings; cosmic environments are hinted as well. Attention is also paid to pseudomorphs and radiogenic alterations of minerals. Many of the examples are original, others taken from richly quoted literature. From 728 entries, 496 are in Russian, thoughtfully selected in order to display a cross-section of the present-day 'ontogenetic' trend in the studies of Soviet mineralogists.

The scope of the book is wide but genetic indeed. Both field and laboratory data are involved in the interpretation of the problems raised, the original ideas of the authors being laid down side by side with ideas put forward by other scientists. The result is twofold: first, one gets a clear picture about the wealth of data behind the 'ontogeny' of minerals, and next, one is stirred towards fruitful thinking. Not less important for mineralogists and petrologists is the driving rule that emerges after one closes the final pages of the book to be more precise about the whole description of minerals both before and after they have been picked up from their natural position. I. KOSTOV

ERNST (W.G.), Editor. *Metamorphism and Plate Tectonic Regimes* (Benchmark Papers in Geology). Stroudsburg, Pennsylvania (Dowden, Hutchinson, and Ross, Inc.; distributed by Halsted Press: John Wiley & Sons, Inc.), 1975. xiv + 440 pp., 148 figs., 1 pl. Price £13·90.

The collection of papers reprinted here attempts to place metamorphic belts and the process of recrystallization (caused by chiefly physiochemical changes) in a plate tectonic framework. Five main topics are covered, one subdivided into three sections, and the papers presented in each of these are introduced briefly by the Editor, supplying a commentary and emphasizing the particular role of each contribution in the growth of the field, and giving further references; a brief summary constitutes the last chapter.

The concept of metamorphic belts in time and space is first presented, with the classic paper by Miyashiro [M.A. **15**–483] on their evolution and that by Zwart (*Geol. en Mijnbouw*, **46**, 283–309, 1967) on the duality of orogenic belts. Thermal regimes computed for divergent and convergent plate margins are then examined with the aid of two papers by Oxburgh and Turcotte, and the relationship of metamorphism to such tectonic environments is considered with papers by Miyashiro on ocean-floor metamorphism and Coleman on blueschist metamorphism. Eclogites, the ophiolite suite, and blueschists all present petrological problems. The problems posed by eclogites are illustrated with papers by Coleman *et al.* [M.A. **19**–159] on their differences and similarities, Ringwood and Green [M.A. **18**–256] on the experimental study of the gabbro-eclogite transformation, Banno (*Phys. Earth Planet Interiors*, **3**, 405–21, 1970) on their classification in terms of physical conditions of their origin, and Fry and Fyfe [M.A. **72**–2412] on the occurrence of eclogites versus amphibolites.

One of the first clear suggestions that alpine-type peridotites represent mantle material was that by de Roever (*Geol. Rundschau*, **46**, 137–46, 1957). This paper is followed by two providing mineralogical, petrological, chemical, and tectonic data on the material interpreted as constituting the basal portions of the oceanic crust and the mantle material immediately beneath the Mohorovičić discontinuity, and by papers describing examples of ophiolite suites from California and Cyprus and a work dealing with the mode of emplacement of alpine-type peridotite complexes [Coleman, M.A. **71**–3129]. The question of whether blueschists result from overpressure of tectonic origin or deep metamorphism is posed by de Roever in a paper here usefully