through near-shore to off-shore shales. Arsenic, chromium, vanadium, and zinc increase seawards whereas organic carbon, gallium, aluminium, and titanium decrease.

The use of coals to define biofacies is suggested but the trace element evidence is inconclusive. Non-chemical methods of defining facies, for example authigenic minerals and electrolytic properties of pore-waters, are briefly mentioned.

The future of geochemistry in this field seems to lie in the analysis of the clay or organic fractions of the rocks. Its main use is in sub-dividing thick, uniform rock sequences that lack other facies indicators.

The German ancestry of the book is clear. Literal translation of some German sentences combined with very patchy punctuation often obscures the sense. The number of mis-spellings and use of the wrong word is considerable and sometimes humorous. More serious is the lack of clarity of many of the diagrams especially where element variations in a stratigraphic sequence are being illustrated. Some tables have ill-chosen 'examples', which fail to illustrate, or contradict, points made in the text.

The main value of this book lies in the critical reviews of the various geochemical factors thought to indicate depositional environments. In addition, the 15-page bibliography, including many references to continental authors, makes this an invaluable source book. R. J. L. C.

BOLLMANN (W.). *Crystal defects and crystalline interfaces.* Berlin, Heidelberg, and New York (Springer-Verlag), 1970. xi+254 pp., 158 figs. together with a set of moiré models. Price DM98 ($27).

The title of this book suggests that it is a text on crystal imperfections, in particular the solid–solid boundaries, which are all too often neglected by many authors in this field. The attractive illustration on the dust cover reinforces this impression. However, after a cursory glance through its pages many mineralogists might conclude that this is a text of linear algebra, which somehow has found its way into the wrong dust cover. In fact, the author is presenting his geometrical concept of crystalline interfaces and in this is contained a new and potentially significant technique for the structural analysis of these defects. These analyses are being applied by metallurgists to grain boundary studies. It is too early to assess the real value of the author's concept to this field and therefore draw any definite conclusions as to its mineralogical potential. There are no apparent reasons why it should not be applied by mineralogists to interfaces in mineral systems.

The book can be subdivided into two sections. The first, which occupies chapters 1–10 (approximately half the book), is an elementary and condensed introduction to crystalline lattices and defects. Unfortunately this section has little value as a basic text because of the selective treatment of the subject-matter. The author concentrates upon dislocations and the metallurgically important lattices. Point defects are scarcely mentioned and twinning is entirely neglected. Little emphasis has been placed on derivations in these introductory chapters; however, an appendix is included to assist

those readers who may not be familiar with matrix calculations. The apparent purpose of this section is to acquaint the reader with the geometrical representation of lattices and dislocation properties, and in this sense it forms the foundation for what is to follow.

The second section (chapters 11–14) is the book's 'raison d'être'—the development of the coincident lattice (O-lattice) concept of crystalline interfaces. The section commences with a general discussion of sub-grain boundaries (chap. 11), followed by the mathematical development of the O-lattice concept (chapter 12), which involves the extensive use of linear algebra. Applications of the concept to actual crystalline interfaces are demonstrated in chapter 13. It is shown to predict the observed dislocation structure of grain boundaries in metals and the stability of exsolution lamella boundaries in moonstone. In the final chapter (chapter 14) the theory is further extended to more complex, non-linear boundaries. The many derivations in these chapters are dealt with in depth. Sets of transparent 2-d grids, with which moiré patterns can be constructed, are included at the back of the book. These help the reader to appreciate the mathematical development of the O-lattice concept, as the theory of coincident lattices is based upon these patterns. Although the O-lattice representation of crystalline interfaces is attractive, it is by no means the only possibility; however, the alternative models are not discussed, let alone compared with the author's theory.

The book is well written, well illustrated, and contains few errors, misprints, etc. The reproduction of the included photomicrographs is excellent. The overall understanding of the text is aided by the regular inclusion of summaries and discussions.

The book is not suitable as an introductory or general text on defects and interfaces for undergraduate or graduate mineralogists and geologists. Its appeal is, at present, limited to researchers studying the structure and properties of solid–solid boundaries. However, as the study of solid state reactions by electron miscroscopy becomes more universal in mineralogy, the need for a specialized book such as this will increase amongst mineralogists. S. WHITE

CHIZHIKOV (D. M.) and SHCHASTLIVYI (V. P.). *Tellurium and the tellurides.* Transl. from the Russian by E. M. Elkin. London and Wellingborough (Collet's), 1970. xii+296 pp., 102 figs. Price £8·50.

Interest in chalcogen chemistry has always been considerable in Russia, so it is not surprising that this comprehensive monograph on tellurium and its compounds is by Russian authors. It is an English translation of the original Russian version, which appeared in 1966.

The book is divided into two parts. Part I (Chapters 1–6) deals with elemental tellurium; Part II (Chapters 7–18) deals with inorganic tellurides.

In Part I, the first chapter describes in detail the physical and chemical properties of elemental tellurium; Chapters 2 and 3 deal respectively with geochemical aspects and the distribution of tellurium in various ores. Chapters 4 and 5 describe in detail