ELLIOTT (R. J.) and GIBSON (A. F.). *An Introduction to Solid State Physics and its Applications.* London (Macmillan), 1974. xxi+490 pp., 297 figs. Price £5·95.

It is not many years since the mineralogist could, with considerable justice, have characterized the solid-state physicist as a peculiar fellow who devoted infinite time to the study of simple binary cubic crystals containing infinitesimal amounts of impurity, while ignoring the rest of the crystalline creation, and foregoing the delights of 'dirty' crystals (i.e. solid solutions), and other highly 'imperfect' crystals. The solid-state physicist might in turn have regarded those studying triclinic multicomponent solid solutions as unbalanced, or at least as engaged in an unrewarding enterprise capable of yielding only superficial results. This gap in attitude and interests is now narrowing rapidly, raising the problem of finding textbooks of solid-state physics suited to use by undergraduate and postgraduate mineralogists.

Elliott and Gibson begin with a brief (27 pp.) discussion of crystal structures, including sections on bonding and on diffraction by crystals. This is not sufficiently detailed to replace the texts in current use. The chapters on excitations, lattice vibrations, and electrons in bands are useful, and offer insights into these subjects which are not easily obtained from other books. Chapter 5 deals with imperfections, but pays little attention to the mineralogically important cases of crystals with high dislocation densities, or high impurity contents, and like Chapter 6 (optical properties of solids) concentrates attention on semiconductors rather than ionic solids. Chapter 7 deals with the properties of free carriers, and has relevance to the deep mantle and core. Chapter 8 (Transport) covers electrical and thermal conduction and related properties, and sections 8.1 to 8.8 should be of considerable interest to mineralogists. Devices are covered in Chapter 9, and magnetic properties in Chapter 10, which contains much interesting material.

From the mineralogist's viewpoint, the book suffers from an emphasis on semiconductor properties and perfect crystals, and the relative neglect of imperfect ionic crystals, which makes it difficult to recommend as a teaching text. Despite this, there is much to be gained by browsing through Chapters 2 to 8, and Chapter 10, which give readers a view of the subject usefully different from those in Kittel and Dekker. The book is well produced, with abundant illustrations of excellent quality, and is very reasonably priced by current standards. R. G. J. STRENS

ADAMS (D. M.). *Inorganic Solids: an introduction to concepts in solid-state structural chemistry.* London, New York, Sydney, and Toronto (John Wiley & Sons), 1974. xvi+336 pp., 220 figs. Price £3·50 paper; £7·50 cloth.

The best features of this book are that (although necessarily drawing heavily on earlier works like Wells's *Structural Inorganic Chemistry*) it is remarkably up to date, and the author's enthusiasm for the subject shows through, in a style that is at times almost racy. But its defects are many. It claims on the dust cover to deal with the subject 'in a rigorous yet informal and non-mathematical way for undergraduate students . . .', but it soon illustrates the incompatibility of the aims of rigour and

informality. Rigour is conspicuous by its absence, both in the use of mathematical notation and in imprecise usage of words. Very many of the diagrams are reproduced from elsewhere, and they are not always quite apposite to the points in the text that they are intended to illustrate. There is perhaps an unrepresentatively high density of errors on the 14 pages devoted to the silicates, of which 2 are taken up with a diagram of the various pyroxenoid chains and another with incorrect diagrams of talc and muscovite structures. The description of the composition of 'a sample of the mineral hornblende' is quite literally incredible.

A lecturer in the process of revising his lectures could well profit from a critical reading of the book, but in the hands of a student it could encourage woolly thinking and sloppy writing.

E. J. W. WHITTAKER

WOOSTER (W. A.). *Tensors and group theory for the physical properties of crystals.* Oxford (Clarendon Press), 1973. 344 pp., 141 figs. Price £7·00.

This book introduces the use of tensors and group theory in the interpretation of the macroscopic properties of single crystals. It does not deal with the applications of tensor notation to crystal chemistry, or to the properties of mineral aggregates, or the uses of group theory in such areas as the interpretation of crystal field spectra, in which the concern is with local (site) symmetry rather than macroscopic (crystal) symmetry. Within these limitations it is a very readable introduction to these mathematical techniques, which might usefully be employed in teaching crystal physics. A student of average ability, educated to University entrance level in mathematics, and prepared to read the text carefully and try the examples given, should have little difficulty in understanding and applying the contents.

Part 1 of the book is concerned with the application of tensors to the 'static' properties of crystals, and includes discussions of thermal expansion and glide twinning, stress and strain tensors, piezoelectricity, elastic properties, transmission of elastic waves, and photoelasticity. The coverage necessarily overlaps that in Nye's work (*The Physical Properties of Crystals*, Oxford, 1957) but is less comprehensive, Wooster taking 8 pages to cover stress and strain tensors where Nye takes 25.

Part 2 deals with the applications of group theory to the 'dynamic' properties of crystals, including wave vectors, Brillouin zones, molecular vibrations, and associated infrared and Raman spectra.

There are useful appendices including character tables and stereograms for the 32 point groups, and an adequate index. The book is well printed, and reasonably priced. It can be recommended as an essential purchase for libraries serving mineralogists, as a useful addition to the personal libraries of mineralogists concerned with crystal physics, and as a textbook for introductory courses in crystal physics.

R. G. J. STRENS