MULLER (O.) and ROY (R.). *The major ternary structural families.* Berlin, Heidelberg, and New York (Springer Verlag), 1974. ix+487 pp., 46 figs. Price DM 76, US $29.30.

This book, originally announced as Vol. 10 in the series *Minerals, rocks, and inorganic materials*, has now been rescheduled as one of four volumes comprising a new series entitled *Crystal chemistry of non-metallic materials*; the others are: Vol. 1, *Principles of crystal chemistry*; Vol. 2, *Properties of solids in relation to structure*; Vol. 3, *The major binary structural families.* It is the aim of the series to provide a comprehensive review of the important structure families of non-metallic inorganic substances, of the compositions found in each particular structure, of the influence of pressure and temperature on the structure and phase transitions involved, and of the relationship between important or useful physical properties and the structure/composition character.

It is unfortunate that the present volume, although the last in the series, is the first to be published: it is difficult to assess its value in isolation without a knowledge of the contents of the three preceding volumes, to which occasional allusions are made. It is basically a work of reference and consists essentially of three substantial chapters devoted respectively to compounds of the types A_2BX_4, ABX_4, and ABX_3. Each of these chapters is itself divided into three parts. The first part briefly surveys the most important structures found in, say, the A_2BX_4 compounds and emphasizes their significance in industry, technology, and the earth sciences. The second part (by far the longest) reviews each structure separately, discusses the compositional range within which it is found, and considers such factors as distortions, order–disorder, and superstructures. (The reader is, however, expected to have a knowledge of the detailed features of the individual structures, presumably by reading Vol. 1, for they are described only in very general terms and are rarely illustrated.) The data presented are amplified by a very large number of tables giving cell dimensions of virtually all the relevant compounds that have been studied by X-ray methods and references to original investigations. The references (over 1500) are admirable as a ready means of tracing original sources but the wisdom of including some 150 pages of tables containing nothing more illuminating than cell dimensions is more doubtful.

The third part of each chapter is the most valuable. It discusses the interrelationships between the structures adopted by compounds of a given type composition in terms of 'structure field maps', which show very clearly on a plot of r_A against r_B the 'fields' in which each structure is stable: thus on the map for $A^{2+}B^{4+}O_3$ the calcite field appears as a band centred on $r_B = 0{\cdot}06$ Å and extending from $r_A = 0{\cdot}8$ to $r_A = 1{\cdot}2$ Å while the aragonite field is a band centred on the same value of r_B but extending from $r_A = 1{\cdot}3$ to $r_A = 1{\cdot}7$ Å. Other fields on the same map show the stability ranges for the pyroxene, perovskite, and ilmenite structures. These maps are supplemented by further charts showing the influence of pressure and temperature on solid-state transitions between structures. The maps and charts considered together present a clear picture of, for example, the interrelationships between the ideal and many distorted forms of the perovskite structure and of the factors determining the occurrence of one or other of these structures in a given compound.

The authors have clearly gone to a great deal of trouble to present their material in a systematic way, as befits a work of reference. Unfortunately, however, this has involved the adoption of conventions the full understanding of which demands the mastery of many pages of 'small print'. The regular user will understand and remember these conventions but the occasional reader will be perplexed (and even irritated) by, for example, the liberal use of square brackets the significance of which will escape him unless his eye happens to fall on p. 8. In a work so systematically planned the reader would have been helped if every opening displayed not only the chapter number but also the symbol for the part, section, and subsection of the chapter, e.g. on p. 185 (IV.B.2c) instead of just (c), which appears in four different places in the same chapter. It would also help if all the pages carried a folio; as it is, many can be identified only by counting from the nearest numbered page. The formula index is admirable but the subject index meagre: the mineralogist who has momentarily forgotten the composition of rooseveltite will quest in vain but a search under $BiAsO_4$ will be immediately rewarded. R. C. EVANS

McKIE (D.) and McKIE (C.). *Crystalline Solids.* London (Nelson), 1974. x+628 pp., 382 figs. Price £6·50.

The authors of this new work are Lecturers in the Department of Mineralogy and Petrology at Cambridge University and are therefore in a rather special teaching situation. The Department has a long tradition of teaching 'Crystallography' (now termed 'Crystalline State') to large classes of students with strong backgrounds in and leanings towards physics, chemistry, and mathematics. It is no accident that well-established texts on crystallography, crystal chemistry, crystal optics, crystal physics, and X-ray diffraction have emanated from this source, and I am sure that the present publication deserves similar success. It is very different in that it encompasses all of the above together with some other subjects under one cover.

The Cambridge undergraduates, for whom the book is primarily intended, will no doubt find it extremely useful to have this single basic text, and, moreover, considering its size and coverage, and present-day costs, they should also welcome the very reasonable price. Students elsewhere, who more usually are designated from the start as chemists, physicists, metallurgists, or geologists, will also find the book useful, although it contains more than many of them will really need (not a bad feature for a good student!). One reason for the authors achieving surprisingly complete coverage in limited space lies in their frequent use of mathematical treatments, which, though not very complex, may not suit some students. This by no means implies that physical descriptions and explanations are lacking.

The first five chapters (150 pages) deal with basic crystallographic concepts, treating morphological and lattice geometry more or less in parallel. The next four chapters (130 pages) are on the principles and uses of diffraction methods, and these are followed by chapters on crystal chemistry (87 pages), crystal physics (28 pages), and crystal optics (75 pages). The former chapters constitute Part I of the book, and are