groups would have been useful. Perhaps Dr Steadman would consider writing a sequel?

P. E. CHAMPNESS

Bollman, W. *Crystal Lattices, Interfaces, Matrices: An extension of Crystallography.* Geneva (Bollman), 1982. viii+360 pp., 109 figs. Price SFr. 70 (available from 22 Chemin Vert, CH-1234 Pinchat, Geneva, Switzerland).

Although this book was published privately by a distinguished scientist because a commercial publisher would not take the risk, a potential buyer should not worry about the quality of the book. This is essentially a tutorial work-book on the mathematical basis of O-lattice theory. Consider two perfect crystals, not necessarily of the same type, meeting at an interface. The geometrical misfit between the lattice nodes provides the simplest possible guide to the energy at the interface, and can be used in understanding the textures of polycrystalline metals and of mineral intergrowths.

This book develops the mathematical theory of the misfit geometry between two lattices, and provides questions and exercises to test a reader. The flavour can be obtained from three quotations: 'The primary O-lattice is the O-lattice due to the deviation from the primary PS (preferred state), the single crystal state. Secondary O-lattices, due to the deviation from secondary PSs will be discussed later.' 'The O-lattice models describe boundaries as dislocation networks with the complete Burgers vector balance within the boundary.' 'This town of crystallography has a twin town, a mirror town, namely that of the reciprocal lattices. On the P-level (possibility level) there are the interpenetrating reciprocal lattices of the bi-crystals and the reciprocal O-lattices, and on the R-level (real level) are the actual diffraction patterns, obtained by the intersection of the Ewald sphere with the reciprocal lattice configuration.' Fifteen chapters cover crystal lattices and geometrical aspects (point lattice, structure matrix, reciprocal lattice, rotation, shear, mirror imaging, inversion, translation, etc.) in 110 pages; nine chapters cover interfaces, and applications to interface structure (primary O-lattice, choice of unit cells, etc., secondary dislocation networks, etc.) in 139 pages; thirteen chapters cover matrices and algebraic methods, (vector algebra, matrix operations, eigen values, etc.) in 100 pages. The style is mathematical but easy to follow because of full explanations. Minor criticisms are: absence of Cottrell (1953) and Read (1953) in the bibliography; absence of $\bar{3}$, $\bar{4}$, and $\bar{6}$ in Fig. 14/1; presence of spelling and other minor errors. I did not detect mathematical errors in selective reading.

All scientists interested in interface theory will wish to consult this book for possible purchase. They will also wish to set the book in the context of other theories for coherent and partly coherent phase boundaries in which strain energies are calculated (e.g. references in R. A. Yund's articles in *Feldspar Mineralogy*, ed. P. H. Ribbe, 1983).

J. V. SMITH

Jawson, M. A., and Rose, M. A. *Crystal Symmetry: Theory of Colour Crystallography.* Chichester (Ellis Horwood/Wiley), 1983. 190 pp., 85 figs. Price £18.50 hardback; £8·50 paperback.

This book from the Ellis Horwood Series in Mathematics and its Applications is theoretical in tone, and lacks detailed discussion of applications to crystals and minerals—indeed the only reference to a mineral in the index (diamond crystal) is incorrect! Nevertheless it is a useful book for crystallographers and mineralogists who have proceeded past the elementary stage, and wish to follow a formal and rigorous development of colour crystallography.

The subject headings are: Part I: Crystallographic Point Groups. 1. Symmetry Patterns, 2. Mathematical Formulation, 3. Cubic Symmetries, 4. Colour Point Groups; Part II: Space Lattices. 5. Lattice Geometry, 6. The Seven Crystal Systems, 7. Non-primitive Unit Cells, 8. Translation Groups; Part III: Space Groups. 9. Symmorphic (Bravais) Space Groups, 10. Screw Axes, 11. Principal and Secondary Screw Axes, 12. Glide Planes, 13. Diamond Glide, 14. The Colour Space Groups; Appendices.

Jawson and Rose start with crystallographic point groups and assume that $n = 1, 2, 3, 4$, and 6 because of a later theorem involving lattices. They do not consider general point groups. After a logical treatment with group theory, they derive the thirty-two classical crystallographic point groups and the fifty-eight colour ones; an important feature is the stereographic representation in black and red of the equivalent positions. The key relation between a lattice and rotation symmetry is given on pp. 69–70. Fig. 6.12 lacks perspective. Chapter 7 considers the simple forms of sphere packing as part of the development of face-centred cells. Colour translation operators are introduced in Chapter 8, and the colour Bravais lattices are given in Fig. 8.3. The authors introduce the term 'groupoid' to denote the set of space-group operators which interrelate all the equivalent positions of a motif pattern; this is the basis of their abstract development of space groups. Two-dimensional classical and colour space groups are listed in appendices 7 and 8, rather than being presented in Chapter 6. A thorough review would take at least one week