degree, succeeded. Most of the sulphide structures are interpreted in terms of a blend of molecular-orbital and band theories of chemical bonding.

A chapter on sulphide thermochemistry begins with a basic introduction to thermodynamics, and then moves on to discuss the measurement of sulphur activity and the construction of phase diagrams. Techniques of sulphide synthesis are briefly summarized, and numerous examples of phase equilibria given. A separate chapter is devoted to sulphide equilibria in aqueous systems.

A number of minor topics relevant to sulphide mineralogy are covered, including reflectivity and hardness measurements, electrical and magnetic properties, sulphur isotope fractionation, and various kinds of spectroscopy, including X-ray emission, X-ray photoelectron, and Mössbauer. Wherever possible the results are interpreted within a theoretical framework which again leans heavily on molecular-orbital and band theories, although consideration is also given to valence-bond, crystal-field, ligand-field, and Brillouin zone theories.

In general the book is a happy blend of fact and theory. If the book has a drawback, it is that the important category of sulphosalt minerals has not been included; however, there are practical limits to the size of a volume, and it is difficult to suggest topics that should have been eliminated or curtailed in favour of sulphosalt coverage.

The book is copiously illustrated with line drawings, which, for the most part, are clear and legible, the text is well referenced, the quality of the paper is good, and the type comfortably legible. The book deserves a prominent place on the reference shelves of mineralogists and other technologists whose interests include sulphides, and it is easy to see it as a textbook for courses in sulphide mineralogy. For specialists in sulphide research, the book provides a very useful and up-to-date review of sulphide properties, and the principles and techniques involved in their study.

E. H. NICKEL

Pies (W.) and Weiss (A.). *Crystal Structure Data of Inorganic Compounds. Part f. Key Elements: d^4... d^8 Elements.* (Landolt-Börnstein: Numerical Data and Functional Relationships in Science and Technology, New Series. *Group III. Crystal and Solid State Physics. Vol. 7*). Berlin, Heidelberg, and New York (Springer-Verlag), 1977. xxvi+778 pp., 14 figs. Price DM 780 ($343.20).

This large and very expensive volume is one of a series of eight (six of tabulation plus reference and index volumes) in the Volume III/7 series, of which III/7a and III/7e have already been published. The key elements referred to in the title are Cr, Mo, W, Mn, Tc, Re, Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, and Pt, crystal structure data being tabulated for those multiple oxides which contain these elements in an anionic (or 'pseudo-anionic') grouping (e.g. chromates, molybdates, tungstates, etc.). Within these key element groups the compounds are arranged in order of increasing atomic number of the associated elements.

The information compiled includes the chemical formula and mineral name (where appropriate), space group, lattice constants, number of formula units in the unit cell, density, structure type, scope of the structure determination, and method used. Finally, where available, additional data, such as optical properties, morphology, phase relations, and magnetic properties, are listed. References are given by referring to the relevant volume of Structure Reports.

Despite the lack of an index with this volume, the tables are fairly easy to use, once the chemical classification scheme is understood, but the lack of direct reference to the source material could prove a disadvantage. Obviously the vast majority of the inorganic compounds listed have no naturally occurring counterparts, but the series should provide a compact source of structural data in the wider field of inorganic crystal-structure studies.

A. M. CLARK

Klemm (D. D.) and Schneider (H. J.), editors. *Time- and Strata-bound Ore Deposits.* Berlin, Heidelberg, and New York (Springer-Verlag), 1977. xviii+444 pp., 160 figs. Price DM 86.00.

This *Festschrift* in honour of Professor Albert Maucher's seventieth birthday, organized in 1975–6 has been produced in good time, and forms a fitting tribute to 'that unflagging advocate of the idea of time- and strata-bound ores' (I quote the dedication). Maucher has indeed been in the van of synsedimentary interpretation and is to be regarded as one of the architects of contemporary notions on layered or layer-controlled ore deposits. The articles nevertheless range widely both in geography and philosophy.

General topics include a contemplative discussion of time in ore genesis by V. I. Smirnov, who is prepared to accept sedimentary origin of the Pb/Zn ores of Karatau (Kazakhstan) in the Devonian followed by activity of migrant solutions in the Carboniferous. His comments on the general absence of clasts of ore from the roof-rocks of supposedly sedimentary ores are interesting. L. J. Lawrence also sees the possibility of a transition from syngenesis to epigenesis at Mount Morgan (Australia). E. T. Degens and P. Stoffers contribute