order of C_xH_y (other elements, alphabetically); a cross reference of the 91 classes above is given with each formula; and (3) transition-metal index (95 pp.), in which the transition metals are listed in alphabetical order, with, for each metal, their compounds listed in order by class and then by formula. Each entry in all three sections is followed by the volume and page numbers to *Strukturbericht* or *Structure Reports*. The method used for producing this volume did not allow for subscripts in the formulas nor for bold face for volume numbers, but this should cause no difficulties.

The *Sixty-Year Index* of metals and inorganic compounds, with supplement, is also well organized, but in a somewhat different way. First comes a metals classified index (48 pp.), by formula, of elements, binary alloys, ternary alloys, hydrides, borides, carbides, ..., tellurides; (2) metals structure-type index (59 pp.), with the entries listed according to the structure-type code of Pearson (this is fully explained in the introduction); (3) inorganic index (103 pp.) in which the entries, by name, are listed under the classifications: elements, hydrides, carbides, nitrides, ..., silicate minerals. Within each classification the order is that of the groups of the Periodic Table; and (4) mineral index (28 pp.), in which minerals in the metals and inorganic sections are listed together in alphabetical order.

In both of the preceding volumes, if you know the name or formula of a compound in which you are interested it is easy to find out if that particular compound has been referenced in *Strukturbericht* or *Structure Reports* in 1913–1973.

The cumulative index for *Strukturbericht*, Vols 1–7, is based on English translation from the original German indexes. It consists of a subject index (24 pp.), a formula index (36 pp. of metals and inorganic compounds, 8 pp. of organic compounds), and an author index (27 pp.). This volume will be useful for locating references to the original early literature without having to leaf through the separate *Strukturbericht* indexes.

Although the combined cost of all of these volumes is a whopping Dfl 800 ($373 or £191 at today's exchange rates) librarians and crystallographers (who may purchase them at 50% of the list prices) will have to bite the bit and add them to their collections. They are essential, the few reservations expressed above notwithstanding.

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Dynamical scattering of X-rays in crystals. By Z. G. PINSKER. Pp. xii + 511. Berlin: Springer, 1978. Price DM 86.00, US $39.60.

The dynamical theory of X-ray diffraction was developed by Darwin and Ewald immediately after the famous discovery by Friedrich, Knipping and von Laue, and was extended sometime later by von Laue. Very few crystals, however, were at the time perfect enough for extensive verification of the dynamical theory. New interest arose in the 1940's when Borrmann discovered the anomalous transmission effect and von Laue interpreted it using dynamical theory. But it was only in the late 1950's and early 1960's that the interest become more widespread and this coincided with the development of X-ray topographic techniques on the one hand, and crystal-growth techniques for high-perfection crystals on the other. The dynamical theory was then extended to incident spherical waves and a large number of properties of wave-field propagation were verified experimentally. Simultaneously, extensions of the dynamical theory were developed for slightly or highly deformed crystals. Professor Pinsker's important book covers all these aspects extensively, keeping close to the original papers, and the reader will find in it all the necessary theoretical developments. The book also includes a description of all the multicrystal settings which have had many applications in recent years as well as a treatment of the three- and four-beam cases. It will be very useful to all those, and they are very numerous nowadays, who perform diffraction studies with perfect or nearly perfect crystals. Useful numerical tables are given in an appendix.

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Physics and chemistry of materials with layered structures. Vol. 4. Optical and electrical properties. Edited by P. A. LEE. Pp. viii + 464. Dordrecht, Holland: Reidel, 1976. Price Dfl 135.00, US $49.00.

Each chapter is reviewed separately below. Taken as a whole these chapters constitute a very well written book with a wealth of information and a pleasant mixture of experimental and theoretical sections. The latter require the reader to be familiar with quantum mechanics and solid-state theory on at least the level of introductory textbooks. Although the volume keeps to the subject of layered structures, much of the content is of a more general nature than the title suggests, and hence of value not only for the specialist. In particular, the book could probably inspire some research workers in the fields of energy-band calculations and structural analysis to turn their activity towards these interesting materials.

Common to all contributions is a clear and purposeful presentation which leaves little room for criticism. Perhaps the only justifiable critical remarks concern a few omissions of an editorial nature. Thus, for some chapters a list of explanations of the many abbreviations in the text could have been useful, as would some cross references between chapters. For instance, the reader not familiar with the notation used in the classification of polytype layer structures would be grateful for a reference to the explanation in Chapter 7. However, these omissions are only of slight inconvenience, and in general the comprehensive index (of both names and subjects) at the end of the book serves its purpose well.

The first chapter (B. L. Evans) outlines the theory of optical processes in solids and its comparison with experiment. Based on the quantum mechanics of interaction between light and matter, it is shown how the varied