times in p.s.i. and sometimes in $kg.mm^{-2}$. The author is rightly at pains to emphasize the enormous amount of experimental data which has been analysed in demonstrating the generalization, but this, at times, gives the impression of reading a catalogue. Original experiment numbers have been retained in labelling curves, which makes it difficult to find on a diagram the particular curve, or group of curves, discussed in the text. Uniformity of units, greater selectivity in presenting data for discussion, and easier reference between text and Figures would improve the readability of the book.

On the second criterion the book nearly succeeds: one is almost convinced that there is more to the generalization than curve fitting. The scope of the experiments is enormous, and the degree of agreement between the data and the generalization is very impressive. The industry and tenacity of the author are admirable and his experimentation brilliant. However, I have one nagging doubt. Curves of σ^2 against ε are frequently considered, and the generalization can then be demonstrated by showing that straight lines having a discrete sequence of slopes, but an adjustable intercept, can be fitted to the data. Because of the proximity of the transition strains, the number of points to be fitted to any one straight line can be very few. Is the method, then, very critical? Can any smooth, shallow curve be broken down to a series of short, straight lines of given slope? Discussion of these questions might have convinced me completely.

Despite these criticisms I found the book intriguing, asking questions as well as answering them, and making me want to get involved in the subject. This, surely, is the measure of a good research monograph.

I. H. HALL

Physics Department
University of Manchester
Institute of Science and Technology
Manchester 1
England

Theory of elastic waves in crystals. By FEDOR I. FEDOROV, translated from the Russian by J. E. S. BRADLEY. Pp. 375 + 19 Figs. New York: Plenum Press, 1968. Price $ 25.

The modern developments involving ultrasonic generators and detectors, piezoelectric resonators and phonon interaction with X-rays and other types of radiation all require an understanding of the transmission of elastic waves through solid bodies and especially through crystals. Many standard works on the physical properties of crystals have one or more chapters devoted to the study of the propagation of plane elastic waves through crystals of various symmetries. However, the book under review is remarkable in that it is entirely devoted to this subject. It is based on a series of lectures given to graduate students in Moscow University but it would be misleading to imply that it is a book which students will find easy to read. It has the character of a monograph rather than that of a student text. In a foreword, H. B. Huntington says 'the author has gone to considerable pains to develop in his mathematical background a consistent tensor framework which acts as a unifying motif throughout the various aspects of the subject'. The author also explains in the Preface to the Russian edition that his method is based on general methods of vector and tensor calculus which do not necessitate explicit statement of the tensor components. This generalized tensor analysis makes the reading unfamiliar and, until the language is learned, rather difficult, but it gives a unity to the whole presentation.

There are nine chapters, the first three of which cover the relatively familiar ground leading to Christoffel's equation and its applications. Chapter 4 gives an account of the flow of energy and the form of wave surfaces. In the next three chapters the theory is applied, first to an isotropic medium, and then to hexagonal, cubic, tetragonal and trigonal crystals. Chapter 8 is concerned with the reflexion and refraction of elastic waves from plane boundaries and covers ground not usually to be found in the standard works. The last chapter deals with the calculation of Debye temperatures taking into account the elastic properties of cubic and hexagonal crystals.

The translation appears to be excellent and the production is good except that the suffixes are often rather too small to be seen easily.

W. A. WOOSTER

339 *Cherry Hinton Road*
Cambridge
England

Anisotropy in single-crystal refractory compounds, Volumes 1 and 2. Edited by FRED W. VAHLDIEK and STANLEY A. MERSOL. Pp. xix + 405 Vol. 1, xi + 493 Vol. 2. New York: Plenum Press, 1968. Price $ 45 set.

These volumes contain the papers presented at an international symposium sponsored by the Ceramics and Graphite branch of the Materials Laboratory of the United States Air Force, and held at Dayton, Ohio in June 1967. The range of the topics which are covered is far wider than the title of the volumes suggests. All the papers deal with some aspect of the behaviour of refractory compounds, with the exception of one excellent paper on the mechanical properties of beryllium. Subjects which are discussed include the electronic structure of transition metal carbides, the defect structure of non-stoichiometric compounds and problems in the chemical analysis of materials. Mechanical properties are prominent in Volume 2. The papers are in general more expansive and detailed than journal publications and in some cases review results accumulated over a considerable period of time. These points may go some way towards justifying these expensive books.

G. W. GROVES

Department of Metallurgy
University of Oxford
Parks Road
Oxford
England

Proceedings of the Symposium on Low Energy Electron Diffraction, Ramada Inn, Tucson, Arizona, February 1968. *Transactions of the American Crystallographic Association,* Vol. 4. 1968. Pp. v + 114. Price $ 5.00 post paid from Polycrystal Book Service, P.O. Box 11567, Pittsburgh, Penn. 15238, U.S.A.

Low energy electron diffraction (LEED) has been the subject of a rapid growth of interest over the last three