the use of this theory to solve both the structures of the low-index faces of simple metals and the structures of ordered adsorbates upon these faces. This book describes these developments from the point of view of one of the major protagonists of LEED. It is quite clear that the community of scientists working on LEED have surmounted the first barriers towards using the technique to solve surface structures and Dr Pendry shows how the complicated theoretical treatment necessary is built up and then programmed for the computation of LEED intensities.

After a brief introduction dealing mostly with the elements of the experimental method the book contains descriptions of the theory of scattering processes for low energy electrons, diffraction from rigid lattices, schemes of calculation and perturbation schemes which can save computational time, diffraction modified by thermal vibrations and, finally, the solution of the structure of simple ordered adlayers on low-index metal faces. There are substantial appendices containing programs in Fortran IV for the calculation of LEED intensities, the phase shifts for spherically symmetric ion cores and their temperature dependence and of the structure of simple adlayer systems.

The book is offered as a stimulus to the further application of LEED theories to new problems in surface science and it is for this reason that the computer programs have been appended. Although this is extremely useful it might have been wiser to include a clear warning to the potential surface crystallographer pointing out that the theory is not at the point where it can be simply used. These are long, complicated and sophisticated calculations with many approximations 'built-in' and the potential investigator should be aware that he is about to commit himself to many hundreds of hours of effort assessing the validity of the theory/experiment comparisons. He should not be lulled into a false sense of security.

Nevertheless, this in important book which will be useful to anyone working with LEED or planning a start in the field because it makes clear many of the theoretical ideas in use now. It is marred by a moderately high incidence of typographical errors which means that the reader will need to check equations rather carefully.

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Dynamical properties of solids. Vol. 1. Crystalline solids, fundamentals. Edited by G. K. HORTON & A. A. MARADUDIN. Pp. ix + 662, Figs. 103, Tables 19. Amsterdam: North Holland, 1974. Price ƒ 225.00, U.S.$86.50.

There have recently been written a number of introductory books on the dynamical properties of solids, but the classic text by Born and Haung has remained the definitive work for all serious workers in the subject. The editors undoubtedly hope that the three books to be published in this series will replace Born and Huang as the standard reference. In this aim the editors are to be praised because there has been considerable progress in the subject during the last twenty years and a new definitive text on the subject would be welcome. Alas, I feel they fail in their aim by choosing the medium of a multiple authorship book. Many of the difficult and subtle aspects of the subject are omitted because none of the authors is prepared to dwell on too much detail, while conversely many of the connexions between different aspects of the subject are lost by having them described by different authors using different notations.

Many of the individual chapters are, however, excellent accounts of particular aspects of the subject. I found the three chapters on the microscopic theory of lattice dynamics of metals (Brovman and Kagan), semiconductors (Sham) and insulators (Bilz, Gliss and Hanke) particularly good. Even in these cases there is of necessity much overlap between the chapters and they would have been even more useful if they had been written in a common framework by a single author when the reader would have been more easily able to see the similarities and differences between the treatment of the different types of solids, and their relationship to the unfashionable phenomenological models described by Hardy.

The three chapters on anharmonic effects I found less appealing. The authors seem to have forgotten that anharmonic effects occur in real crystals on which experimental results can be obtained. There is more to anharmonicity than Green's functions: There is another account of the application of group theory to lattice dynamics, and, surprisingly in such a theoretical book, there is a good description of neutron scattering techniques, mostly as practised at Chalk River, by Dolling.

Unfortunately the price of this book is so high that one must be sure of obtaining value for money before ordering it for the library. Despite the undoubted quality of the individual chapters, I find it disappointing that the editors have not imposed greater discipline on their authors, so that the books could cover the whole of the subject in a more coherent and uniform presentation than is provided at present.

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Ondes élastiques dans les solides. By E. DIEULESAINT and D. ROYER. Pp.xvi+407, Figs.252. Paris: Masson, 1974. Price 196F.

This book is one of a series entitled Monographs d'Electronique under the general editorship of Professor Pierre Grivet. The intention of the authors is to cover the mathematical techniques which are necessary for an understanding of mechanical waves in crystals, and the associated phenomena of piezoelectric and electro-optic interactions. The book is clearly for engineers with rather more than average mathematical ability; it does not set out to explain the fundamental physics underlying the macroscopic behaviour of the materials which are involved.

Even with this restriction, a very wide range of subject matter has to be covered, and the authors have evidently tried to give the reader a sound grounding in fundamental theory and a list of references which will enable him to