prior to publication, the references generally stop at 1968. This means that topics such as Weare's treatment of the energy gap in amorphous materials, Levine's bond-charge theory of non-linearities, the transient analysis of parametric amplification and short pulses, and the present experimental situation in the investigation of parametric processes are at best treated sketchily, if at all. However, the book is already 1026 pages long, and, as is hoped by the author, its qualities outweigh its defects and it is to be recommended.

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Infrared and Raman spectra of crystals. By G. TURRELL. Pp.xii + 384, 101 Figs., 73 Tables. London: Academic Press, 1972. Price £8.50, $26.50.

The study of infrared and Raman spectra of crystals has rightly attracted considerable attention in recent years from both chemists and physicists. Professor Turrell's book is an admirable account of the theory behind these spectra and their detailed interpretation for a variety of systems. In the first five chapters he gives a very clear and intelligible account of the normal modes of vibration of both molecules and crystals, and of their interaction with light. The description of the relevant group theory is particularly well presented. In the final three chapters he applies the formalism to the determination of interatomic forces in pure crystals, polymers and crystals containing defects.

The book should be particularly useful to students commencing optical work on normal modes of vibration, because the text is unusually clear and gives adequate detail for the student to follow.

Unfortunately the book cannot be recommended as providing a broadly based survey of the infrared and Raman spectra of crystals. There are many topics for which infrared and Raman spectra have and do provide vital results but which are not included. Polaritons are mentioned without any comment that they may be observed with Raman scattering techniques; interatomic forces in the perovskite lattice are discussed in detail without any reference to temperature dependent normal modes and phase transitions; no reference is made to work on electronic or magnetic excitations in crystals. The student's insight into Raman and infrared techniques would also have been greatly improved if the book had included a chapter on experimental techniques. In short the book would have been more appropriately titled, 'The theory of the infrared and Raman spectra of molecular crystals'.

The book, which will be of great use to many students, left this reviewer pondering how foolish we are to separate physicists and chemists from one another when we both have need of each other's insights. It is well produced, with clear diagrams and a good index.

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Chemical bonds in solids. Vol. 1. General problems and electron structure of crystals. Chemical bonds in solids. Vol. 2. Crystal structure, lattice properties and chemical bonds. Edited by N. N. SIROTA, Pp.xii +163 (Vol. 1), xii+133 (Vol. 2). New York: Consultants Bureau 1972. Price $43.00 each.

These two volumes are the first of four volumes under the collective title *Chemical Bonds in Solids*, which are revised and reorganized translations of the two Russian books *Chemical Bonds in Crystals* and *Chemical Bonds in Semiconductors*. The original books were the published proceedings of a conference on 'Chemical Bonds' held in Minsk between 28th May and 3rd June 1967, plus a few specially incorporated extra papers. The English versions are direct translations from the Russian, except in the case of non-Russian authors where the original manuscripts were consulted.

Vol. 1 is divided into two parts, the first of which contains 16 papers mainly on semiconductors, including three on gallium arsenide, and transition-metal compounds. Most are concerned with the physical consequences of the type of chemical bonding between atoms. The second part contains 11 papers dealing with electron distributions in crystals, involving resonance spectra, reflexion spectra, some theoretical calculations and a neutron diffraction study of magnetic structures.

Similarly Vol. 2 is divided into three parts, the 12 papers of the first part being of most interest to crystallographers, containing papers on inorganic crystal structures together with papers on magnetic susceptibility, carrier mobility, band structure and radiation damage in various solid systems. The 10 papers of the second part are concerned with the lattice dynamics of crystals, involving neutron and X-ray diffraction techniques with theoretical calculations. Finally there are three papers on defects, elastic and thermal properties of crystals.

Since all the papers date from 1967 it is inevitable that they are at least five years out of date and no longer in the mainstream of research. The interest to crystallographers is very limited, the majority of the papers being of interest to solid state physicists and inorganic chemists working on solids. In view of this it can be concluded that both volumes will find a place in the reference libraries of research institutions working on these specialist research topics.

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Technik-Wörterbuch. Kristallografie. Englisch-Deutsch-Französisch-Russisch. 1. Auflage 1972. By K.-O. BACKHAUS, Pp. 132. Berlin: VEB Verlag, 1972. Price 20 DM.

This work is a technical dictionary covering 2042 words and phrases in the field of crystallography in the languages English, German, French and Russian.

The first section gives translations from English to the other three languages and to each English word or phrase