thought regarding electron microscopic instrumentation, preparation of specimens and techniques of image analysis by Fourier methods. The publication is divided into three sections corresponding to these headings. Theoretical concepts underlying the new developments – and serving, as well, as the basis for standard techniques – are well covered.

Papers on scanning electron microscopy, high voltage electron microscopy and phase contrast electron microscopy comprise the bulk of the instrumentation section. Preparative techniques discussed include freeze etching, and special procedures for electron microscopy of DNA and electron microscopic auto-radiography. In application, the emphasis rests heavily on structures of biological interest; several of these are discussed in detail in the section on Fourier methods.

Provision of an index would have been most welcome and would have increased the utility of this book as a work of reference. However, as a source of 'food for thought' for innovative electron microscopists seeking a better tomorrow, this publication deserves full marks.

J. E. BERGER

Center for Crystallographic Research
Roswell Park Memorial Institute
666 *Elm Street*
Buffalo
New York 14203
U.S.A.

Group theory in solid-state physics. By H.W. STREITWOLF. Edited by B. DONOVAN. Pp.248. London: Macdonalds, 1971. Price £5.

Several of the standard texts on group theory and its application to solid state physics devote a chapter to space groups and energy band structures in solids. This book gives a detailed treatment of this aspect of group theory intended for specialized post-graduate study.

Originally produced in 1967, it has been meticulously translated by J. B. Sykes and well presented by Macdonalds in their University Physics Series under the editorship of Professor B. Donovan. A reasonably formal treatment of the mathematical principles of group theory is followed by a detailed coverage of space groups, their irreducible representations and basis functions. This is followed by chapters on the application of group theory to quantum mechanics, dealing in particular with electrons in periodic potentials and the calculation of band structures. The final sections deal with the application of group theory to the prediction of selection rules for both lattice absorption and Raman effects in solids.

There are however several applications of group theory to solid state physics which are omitted and which, by their inclusion, the reviewer feels would have made this a much more valuable volume in the University Physics Series.

For instance there is no mention of the application of group theory to the localised ion or defect in a solid matrix, the importance of group theory in crystal field, e.s.r. and n.m.r. studies. This book deals with only two of the 'solid-state particles' *viz.* Bloch electrons and phonons. For completeness mention could have been made of colour centres, excitons and magnons. There is also no specific mention of the magnetic symmetry groups, a subject of increasing importance to the solid-state research worker.

For a graduate course in group theory this volume is probably too specialist in its content and assumes a background knowledge of vector spaces not normally acquired in an undergraduate course. A greater use of diagrams could have been made to illustrate the reciprocal lattice, Brillouin zones and wave functions.

For the solid-state research physicist this is a useful book in the treatment of space groups and band structure calculations but the omissions which have been mentioned do limit its usefulness.

D. W. GOODWIN

Department of Physics
University of York
Heslington
York YO1 5DD
England