application of these techniques for the determination of geometric and electronic factors and effects of the 'active site'. This section is particularly instructive in giving a complete survey of the variety of surface topography characterization.

The fourth part, *Imaging and microanalysis in STEM* by P. M. Williams, is a well illustrated review of scanning transmission electron microscopy for catalytic studies. The information on the instrumental aspects is followed by the description of STEM as an imaging and structural tool. The chapter ends with the microanalysis capabilities using energy-dispersive X-ray analysis and energy-loss spectroscopy.

In the article entitled *The formation and ordering of shear planes in non-stoichiometric oxides*, by C. R. A. Catlow & R. James, techniques for atomistic calculations are summarized which may contribute to the fundamental understanding of complex problems in inorganic shear plane structures. Thermodynamic and kinetic problems such as shear plane and point defect energetics, the ordering of extended defects, and the nucleation of shear planes are considered.

Non-stoichiometric crystals containing planar defects by R. J. D. Tilley gives a description of planar faults in inorganic compounds from the structural point of view. The crystal chemistry of various crystallographic phases containing planar faults is reported, tabulated and illustrated by structure models and high-resolution electron microscopic photographs. The author particularly emphasizes theoretical aspects in dealing with the questions 'why do planar faults form rather than point defects, what are the indices of the planar faults formed, and how do the faults interact and order?'

The final comprehensive report, *New trends and strategies in organic solid-state chemistry* by L. Addali *et al.*, outlines some of the authors' personal views on the subject of solid-state chemistry. The understanding of interaction modes of functional groups in defining molecular arrangements is applied in planning and execution of chiral polymer synthesis and purification of enantiomers. Further outlines are conformational isomorphism, host–guest and gas–solid reactions.

The contributions of the book are clearly written and are well illustrated. There are more than 800 references.

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Electrical transport in solids, with particular reference to organic semiconductors. By K. C. KAO and W. HWANG. Pp. xx + 663. Oxford: Pergamon Press, 1981. Price £50·00, US $120.00.

This volume is no. 14 in the *International Series on the Science of the Solid State*. It deals extensively with work on semiconduction, photoconduction, and luminescence. Of its seven chapters, one deals with charge-carrier injection from contacts, and three with space-charge currents and related effects. There is a subject index, and a bibliography, both valuable, but the lack of an author index is frustrating. When I wished to read the authors' treatment of Schmidlin–Roberts theory of localized levels, referred to in the bibliography, I had no alternative but to wade through the book from beginning to end. This is my only real criticism. The book is clearly written and well referenced, to 1977 inclusive. The last chapter deals with luminescence and includes a careful account of the neglected area of electroluminescence, where the authors have themselves researched.

The main area of experimental activity in organics is presently concerned with organic metals. This is probably only temporary, a balance of activity will be restored. It would be a mistake to imagine that the organic semiconductor and photoconductor field is worked out. In thirty years it has so far yielded only one really important industrial development, polyvinyl carbazole–trinitrofluorenone for photocopying. The reviewer believes that increased understanding will bring increased applications as in the classical areas of inorganic solid-state physics. This book forms an excellent textbook for postgraduates entering the research field to help in this endeavour.

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Topics in current physics. Vol. 25. Mössbauer spectroscopy. II. The exotic side of the method. Edited by U. GONSER. Pp. xii + 196, Figs. 67. Berlin: Springer-Verlag, 1981. Price DM 62.00, US $29.80.

There are many books available which describe the more conventional aspects of Mössbauer spectroscopy, but this volume is unique in that it concentrates on some of the more unconventional (or 'exotic') developments which are either taking place or are hoped for in the future.

Following a brief introduction by Professor Gonser, the first major chapter by Mössbauer, Parak & Hoppe gives an admirable description of an attempt to solve the long-standing phase problem in the structural analysis of biological macromolecules. It has been shown that measurements of the interference between gamma radiation scattered by Rayleigh (from electrons of all the atoms) and Mössbauer (from ^{57}Fe nuclei) mechanisms can, in principle, be combined with conventional X-ray diffraction data to solve structures with molecular weights of the order of 240 000 Daltons. The recent development of a two-dimensional position-sensitive proportional counter should overcome the inherent problem of a low radiation flux from the Mössbauer source by allowing the simultaneous observation of many reflections, and it seems likely that a practical demonstration of structure analysis could be achieved within the next decade.

The chapter by Pound is largely historical in that it gives a detailed description of the classic measurements at Harvard of the gravitational red-shift. However, the summary of possibilities for the future suggests that the technical difficulties associated with the ^{181}Ta and ^{67}Zn resonances