

article on indium antimonide, omits chemical and structural work in his haste to reach the optical properties where, of course, his interests lie. The sixty-nine references might well have been considerably increased. His final section on applications is of special interest.

The electrical properties of semiconductor surfaces, a very difficult subject, is ably reviewed by T. B. Watkins, with 26 figures in the text and 99 references. He concludes with some pertinent comments on the effects of surface conditions in semiconductor devices.

J. Appel's article on thermal conductivity of semiconductors is concerned almost exclusively with the theoretical aspects of the subject, which are developed from two angles: first, phenomenological, and secondly, quantum mechanical. The conclusion touches very briefly on the practical problem of thermoelectric cooling. The author is to be congratulated on the clarity of his exposition since English is not his native tongue.

R. R. Haering and S. Mrozowski give a masterly survey of the band structure and electronic properties of graphite crystals. The authors divide the properties they discuss into two groups: those which can be explained on a band model and those which cannot as yet. This article should inspire further work as it stresses unsolved problems.

A welcome addition at the end of the book is a table of contents of past and future volumes. Many interesting articles on the properties of semiconductors in general and the elements germanium, silicon, carbon, tellurium and bismuth in particular are in preparation. There are, however, several bad gaps in the programme. Compound semiconductors and their alloys seem ignored entirely. Interest in these stems especially from thermoelectric cooling and thermoelectric energy conversion, and so it is not surprising to find these topics absent too. No proposed article deals specifically with any topic in semiconductor chemistry or crystallography. This may be deliberate policy, but, if so, perhaps the editors should change the title of the series to *Progress in Semiconductor Physics*.

B. R. PAMPLIN

MICROSCOPIC STUDIES OF REFLECTING SURFACES

Surface Microtopography

By Prof. S. Tolansky. Pp. viii+296. (London: Longmans, Green and Co., Ltd., 1960.) 55s. net.

PROF. TOLANSKY describes here a series of investigations made with the collaboration of his research students over the past fifteen years or so. Most of the work has involved the use of a microscope, in some cases with phase-contrast techniques, but more often with the multiple-beam interference methods for which Prof. Tolansky is famous. The space devoted to each topic is necessarily short, but each is illustrated by many beautiful photographs printed on the glossy paper used throughout the book.

As the author remarks in the preface, the book is a kind of atlas, in which the 359 excellent pictures show 'maps' of various physical features of the structure of solid surfaces and their behaviour under the action of physical agencies. It is remarkable how wide a field of study is open to the applica-

tion of multiple-beam interferometry in spite of the rather stringent limitations set by the need for the specimen to be able to withstand the cleaning and vacuum evaporation of silver without change. A large part of the book is concerned with crystals, particularly diamond, and the investigations cover aspects of their growth, cleavage, and etching, as well as studies of hardness and wear in relation to the crystalline structure. Other sections of the book include selected features of work on thin films, metal crystals and hardness testing, quartz crystals, silicon carbide, mica, and piezoelectric oscillators. The methods used are capable of extremely high sensitivity, and it is claimed that, in favourable cases, height differences of only a few angstroms can be estimated.

Something of value can be found here by those engaged in any of the branches of study included in the book, but in addition the book as a whole is valuable to students of optical techniques and to anyone who is likely to be inspired and stimulated by a fascinating account of highly informative experimental work carried out with very simple means. The text conveys the enthusiasm Prof. Tolansky so obviously has for this subject, and the way in which the story of each investigation is related holds the imagination and carries the reader along from the unravelling of one knot in the mystery to the next.

The first five chapters are concerned with the basic techniques of multiple-beam interferometry, and include better illustrations and diagrams of the equipment than have been published before. The diagrams, however, are still barely adequate to give more than just an idea of the arrangement of the apparatus required, and in some respects are actually misleading. One or two near-scale drawings of the apparatus would have been much more helpful to anyone wishing to try the technique, although this book is obviously not intended to be an instruction manual.

The remaining eighteen chapters are arranged in six groups, covering the topics already mentioned, and accompanied, where necessary, by further description of special techniques. The volume is concluded by two addenda introducing two more special interference systems, and two bibliographies confined to the publications of Prof. Tolansky and his students, and to the theses of his students. Other references are given in the text of the book as they occur. Some misprints and distortions of language seem to have escaped the proof-reading and editing, and this is annoying in a book of this price and quality; in a few cases the account of an experiment seems to have been shortened to an extent which makes the argument difficult to follow. A possible case of this occurs on p. 194, concerning the electro-deposition of layers, where the explanation seems to show an inconsistency with the illustrations. The point at issue here would best be resolved by line diagrams of the profiles of the edges of the layers, as in Plate 242. More profile diagrams of this kind would be helpful at other places too.

These minor defects do not detract much from the value of the book, if at all, as its chief function would seem to be as an introduction to the unique studies described more fully in the papers and theses on which it is based, and as a fascinating and stimulating account of a great deal of masterly experimental work.

J. W. GATES