

Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (M. M. Woolfson, Physics Department, University of York, Heslington, York YO1 5DD, England). As far as practicable books will be reviewed in a country different from that of publication.

Lasers. Vol 3. Edited by ALBERT K. LEVINE and ANTHONY J. DE MARIA. Pp. xi+367. New York: Marcel Dekker, Inc., 1971. Price \$22.50.

The enormous flood of papers on laser topics makes the 'critical review' type of publication especially valuable. This volume continues the excellent pattern of its predecessors and deals with three sections of the field for which the time is appropriate for stock-taking. Semiconductor lasers have not occupied the limelight in the laser field, in which gas and doped-crystal systems have dominated. Although in some ways the semiconductor laser is less impressive – in terms of power output and stability – than other types, it does have a wide range of possible applications. The present position on this type of laser is admirably summarized in Kressel's paper.

The carbon dioxide laser has for some time been recognized as one which might reasonably be expected to move into the area of 'heavy technology'. The CO₂ laser is now fairly well understood and Chec's review gives an excellent perspective of the extensive results which have led to this remarkable development.

In the five years since the dye laser first appeared, the tunable laser, which seemed so remote in earlier laser days, has become a reality. Pumped with either a flash-tube or a simple pulsed Nd:YAG laser, these devices at present cover the range 3400 to 11750 Å, giving peak powers in the megawatt range. Although we can expect significant developments in the future, the fact that well over a hundred different dye lasers have now been built makes a review of the subject a timely exercise.

These reviews are all clearly and authoritatively written, invaluable both for the specialist and as a means of keeping

abreast of the general developments in the laser field.

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The growth of single crystals.

By R. A. LAUDISE. Pp. xv+352. New York: Prentice Hall, 1970. Price not given.

Scientists and others have been growing single crystals for over half a century but until ten to fifteen years ago the main activities were concerned with either reproducing or improving natural minerals. Since that time, the field of crystal growth has expanded rapidly and advances made in the technology and science of single-crystal manufacture have provided the stock upon which a large number of important devices have been grafted and from which new industries have grown, particularly in the field of electronics. Hitherto, much of this information has been scattered widely in the literature, so this particular publication is welcome because it represents the first major attempt to coordinate the vast amount of information which has accumulated during the past decade whilst at the same time relating new knowledge to that derived in earlier years.

The aim of the first chapters is to provide background information upon the general nature and perfection of single crystals, crystal growth equilibria and the kinetics of crystal growth. The book seeks to fulfil this aim by providing the information in a condensed form which is a reasonable approach when applied to general defects such as dislocations, but is detrimental to the general standard of the book when applied to important crystal-growth phenomena such as constitutional supercooling and faceting.

The remaining four chapters are concerned with specific methods of growth which are classified initially in terms of monocomponent and polycomponent systems with further subdivision into the more usual categories of solid–solid, liquid–solid and gas–solid techniques. Most of the major techniques and materials are reviewed and a pleasing amount of detail is associated with a substantial number of the growth methods described. Descriptive references to the literature concentrate mainly upon work carried out in the U.S.A. with particular emphasis on work from the author's own laboratory. This preference is obviously quite natural but United Kingdom workers in this field will be disappointed to find little reference to some of the excellent work they have published during the past few years. In this context, some useful laboratory rather than commercial techniques are not mentioned, particularly in the sections devoted to melt growth.

A section describing crystal defects induced during growth, and their control, would have added merit, but the newcomer to the subject will still find the book a useful starting point, whilst the practising crystal-growth scientist is presented with a coordinated view of information he should already know.

In summary, the book is a useful first attempt to present a unified view of modern crystal growth but it is not, and does not aim to be, an encyclopedia of the subject and it still leaves room for a larger standard work of reference to be compiled.

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