Crystal Growth, USSR, 1959, contains 79 papers, deals very comprehensively with theoretical and experimental studies of crystal growth and properties, but still finds space to report work on foil preparation for electron microscopy and grain growth in tin. Volume 4 contains work originally published in Moscow in 1964 but since 'expanded and updated by the editors'. The Foreword states that the volume 'contains 42 papers, of which ten deal with experimental studies on growth (in part, nucleation) of crystals and monocrystalline films, three with liquid crystals, twelve with the production of monocrystals of various materials, five with the search for ways of growing new crystals and four with reviews of some important aspects of crystal growth, crystal growing and methodical surveys for ferroelectric crystals. In addition there are two papers on crystal symmetry'.

Many of the papers might best be described as technical notes, briefly (often too briefly) reporting apparatus or experimental observations. Others stretch to ten or more pages, inviting drastic pruning before publication in a Western journal. With this imbalance, it is difficult to assess the rôle of the Editors of the series. Also, when reading through these papers, it is interesting to compare the content and treatment with the range of references cited. Some attention is given to vapour deposition, flux growth, propagation of defects from seed crystals, and growth by sublimation at very high temperatures. A most comprehensive paper on *Production of Monocrystals of Gallium Arsenide* is included, together with a similarly good dissertation on *Oriented Overgrowth of Crystalline Materials*. The paper on *The Definition of Symmetry* and the one on *The Physical Meaning of Symmetry* should be of particular interest to crystallographers. The whole is leavened by an article on *Frost Patterns on Windows* in which attention is drawn to the wealth of information that can be gained from simple direct observation of the world around.

In conclusion, this series forms a useful and interesting addition to the collection of English language texts on crystal growth and allied phenomena.

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**Crystal symmetry and physical properties.** By S. BHAGAVANTAM. Pp. x+230 with 14 figs. London and New York: Academic Press 1966. Price 57*s.* 6*d.*

This book of eighteen chapters gives the essential analysis in concise, but clear, form of the physical properties of single crystals in so far as these are related to crystal symmetry. In this book as well as the earlier work *Theory of Groups and its Application to Physical Problems* written with T. Venkatarayudu (1948), the author explains the use of group theory in determining the number of possible physical constants which can be associated with any physical property in a crystal of any symmetry. The new developments associated with magnetic space groups are considered in detail.

The first half of the book is taken up with concise statements on linear transformations, tensors, matrices, groups and crystallographic groups. One of the difficulties which the reader may experience in reading this part is the inadequacy of the index. Some references to books and publications are given in footnotes but there is neither an index of authors nor a bibliography.

The principles expounded in the early chapters are later applied to all the physical properties of crystals including even the most unusual ones. The tables of physical constants associated with particular symmetries, including the magnetic symmetries, are most valuable. The section on the higher order galvanomagnetic and thermomagnetic effects in single crystals is likely to prove especially valuable to all who study these properties in semiconductors.

The book is a little too condensed for student use because it assumes a considerable knowledge of crystallographic theory and does not indicate where more information on this may be found. For the research worker the book is a demonstration of the power of group theory and a justification of the use of this method. The tabular matter, relating various physical properties to crystal symmetries, is by itself a reason why all those concerned with the physical properties of crystals should have access to this work.

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