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Donation

On behalf of the International Union of Crystallography the Executive Committee wishes to record its gratitude to the Rigaku Corporation, Tokyo, Japan, for a generous donation to the General Fund of the Union.

Crystallographers

This section is intended to be a series of short paragraphs dealing with the activities of crystallographers, such as their changes of position, promotions, assumption of significant new duties, honours, etc. Items for inclusion, subject to the approval of the Editorial Board, should be sent to the Executive Secretary of the International Union of Crystallography (J. N. King, International Union of Crystallography, 5 Abbey Square, Chester CH1 2 HU, England).

Professor **Lawrence Olin Brockway** died on 17 November 1979 at the age of 72. As a graduate student, he and his thesis adviser, Linus Pauling, introduced gas electron diffraction in the 1930's into the United States. He performed a great number of fundamental structural investigations in the 1930's and for this work was honored as an early recipient of the American Chemical Society Award in Pure Chemistry. He was also research adviser to several individuals who went on to make distinguished contributions to the field of molecular structure research. Lawrence Brockway was former president of the American Crystallographic Association, chairman of the USA National Committee for Crystallography and member and chairman of the IUCr Commission on Electron Diffraction.

Dr **H. M. M. Shearer** died in August 1979 at the age of 56. After taking his PhD with J. M. Robertson at Glasgow and postdoctoral fellowships at Glasgow, and at the ETH, Zürich with J. D. Dunitz, he was appointed to a lectureship in chemistry at Durham University in 1959, and became senior lecturer in chemical crystallography in 1967. His research work at Glasgow and Zürich was concerned mainly with structural studies on organic compounds, but at Durham his attention turned to organometallic structures and he made important contributions to our understanding of the covalent chemistry of main group metals. He served on the first committee of the Chemical Society Chemical Crystallography Group from 1966 to 1968, and again from 1975 to 1977. By his death crystallographers have lost a valued colleague.

Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (J. H. Robertson, School of Chemistry, University of Leeds, Leeds LS2 9JT, England). As far as practicable books will be reviewed in a country different from that of publication.

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Crystal growth: theory and techniques. Vol. 2. Edited by *C. H. L. Goodman*. Pp. x+191. New York: Plenum Press, 1978. Price $ 29.40.

Crystal growth techniques play very important roles in modern technology and numerous papers on crystal growth are being published every year in the specialised literature. These papers are, however, often too condensed in volume to discuss matters in detail, so that subtle but vital information may easily be concealed or overlooked in the description. Such short-comings are overcome in this volume by allowing contributors to describe in sufficient detail the theory and techniques of crystal growing related to their special fields. This volume selects three main subjects which are of particular importance in semiconductor or laser device technology. All contributors are expert crystal growers in their respective areas and therefore descriptions are soundly based on their original work and experience. This feature makes the book quite useful and interesting not only to crystal growers in the same special fields but also to those who work in other fields of research.

In Chapter 1, growth effects in the heteroepitaxy of III–V compounds like $Al_xGa_{1-x}As/GaAs$ are reviewed by G. H. Olsen and M. Etternbers of RCA Laboratories, USA. The techniques for growing heteroepitaxial layers from the vapor or liquid phase as well as the microstructure and morphology of the resulting layers are thoroughly reviewed with many actual examples. Emphasis is put on theoretical and practical treatments of the elastic strain effects and the dislocation effects of epitaxial layers, the most important effects appearing in heterojunctions. The composition grading technique thus developed (in order to reduce the deleterious effects of lattice mismatch) is very interesting and may also have broad applicability to other fields.

Chapter 2 is concerned with the vapor-phase epitaxy of silicon. Since the process is of great technological importance, much research has been done on it, as was reviewed in the first volume of this series by D. W. Shaw of Texas Instruments. Several basic problems have still not been fully investigated. J. Nishizawa of Tohoku University, Japan, outlines the work of his group, particularly concerning the growth rate, crystal perfection and purity in the epitaxial growth process of silicon based on chlorosilanes. The mechanism and morphology of epitaxial growth, techniques of growing perfect crystals not containing defects other than point defects, and effects arising from impurity doping are described in detail with convincing evidence. The techniques of growing high-perfection silicon crystals have important implications for device technology, as the author exemplifies by their application to static induction transistors.

The Verneuil process is reviewed in Chapter 3 by R. Falchenberg of Siemens Research Laboratory, Germany. This process, though the oldest, has indispensable advantages over other methods for preparing single crystals of certain materials such as high melting oxides, and is still undergoing continuous improvement and progress. The author describes in detail the current state of techniques for the Verneuil process as well as the theory and associated problems such as flame compatibility and crystal perfection. It is now possible to grow large crystals with good mechanical stability by this process and crystal quality can also be greatly improved by controlling each of the steps comprising the process. The review, made from the standpoint of the crystal grower who is familiar with the process in practice, provides comprehensive information concerning the process and hence is very useful for both experts and beginners.

The last chapter presents a brief note by C. H. L. Goodman on the subsidiary electrical heating used for the massive Verneuil furnaces in the USSR; this is almost unknown outside the USSR but is highly successful for the growth of large crystals.

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