

## 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.*

**Crystal growth in gels.** By HEINZ K. HENISCH. Pp. 111. Pennsylvania State University Press, 1970. Price \$6.95.

Die Züchtung von Kristallen zählt seit jeher zu den ästhetisch reizvollen Beschäftigungen vieler Kristallographen, Chemiker und Physiker und ist darüber hinaus in Verbindung mit der Entwicklung einer Reihe von Industriezweigen wie z.B. der optischen oder der Halbleiterindustrie auch zu einem wichtigen Anliegen der Technik geworden. Das von H. K. Henisch vorgelegte Büchlein liefert den an dieser Materie interessierten Fachleuten sowie jenen, die sich mehr aus Liebhaberei mit Kristallzüchtung befassen, auf knappem Raum eine umfassende Darstellung eines sehr leistungsfähigen und ausserdem in vieler Hinsicht noch weiter ausbaufähigen Gewinnungsverfahrens, dessen Anwendung heute noch keineswegs allgemein bekannt ist, nämlich das Kristallwachstum in Gelen. Die Darlegungen sind klar, übersichtlich und auch für den Laien auf diesem Gebiete recht gut verständlich. Ein wohlausgesuchtes Bildmaterial unterstreicht die Ausführungen.

Der Inhalt des Buchs ist in fünf jeweils in mehrere Abschnitte unterteilte Kapitel aufgliedert, von denen jedes am Schluss eine für den an speziellen Fragen interessierten Leser ausführliche Literaturübersicht enthält. Der Autor gibt zunächst einen Überblick über die geschichtliche Entwicklung sowie die physikalisch-chemischen Grundlagen der Gelmethode. Unter den zahlreich angeführten Beispielen wird hier, wie auch in den späteren Abschnitten dem Calciumtartrat wegen seiner bequemen Handhabbarkeit als Modellsubstanz besonderes Augenmerk geschenkt. Die folgenden Kapitel sind der Beschreibung von Struktur und Eigenschaften der Gele, den Kristallwachstumsmechanismen und deren Charakteristika und schliesslich der Schilderung einiger Untersuchungsergebnisse an aus Gelen gezüchteten Kristallen sowie einer Reihe noch offener Probleme dieses Verfahrens gewidmet.

Mit seinen interessanten Ausführungen versteht es der Autor nicht nur, über ein entwicklungsfähiges Kristallzüchtungsverfahren zu informieren, son-

dern beim Leser auch Neugier auf dessen praktische Nutzenanwendung zu wecken. Deshalb wird das inhaltlich wie sprachlich niveauvoll abgefasste Buch vielen, denen Kristallzüchtung Beruf oder auch nur erfreuliche Beschäftigung ist, eine anregende Lektüre sein.

F. GÜNTHER

92 Freiberg (Sachs.)  
Anton Günther Str. 42  
Deutschland

**Diffusion processes in iron alloys.** By M. A. KRISHTAL. Pp. vi + 232. Israel Program Scientific Translations, 1970. Obtainable from U. S. Dept. of Commerce, Springfield, Va. 22151. Price not known.

By taking iron as his theme and then covering the whole field of diffusion by reference uniquely to iron and its alloys, M. A. Krishtal has produced a most unusual and interesting book. Topics covered include diffusion mechanisms and techniques of measurement, the Kirkendall effect and pore formation, together with very extensive consideration of the efforts of alloying elements on diffusion and self-diffusion in iron alloys. The emphasis in the treatment is on the need to describe the complex, so binary, ternary and quaternary alloys are considered, as are the dynamic processes of heat and chemical treatment of alloys. As a compendium of data on diffusion processes in iron, the book can hardly be surpassed but it is poorly systematized and there is no real synthesis – perhaps the whole subject has not yet reached the point where this is possible.

The stated aim of the work is the development of a treatment suited both to those interested in theoretical aspects of diffusion and to heat treatment engineers. Curiously, this aim has been achieved with only a modest bridge between the two outlooks. There are, as it were, two interpenetrating but separate presentations. One is theoretical and one applied, but relatively little attention is given to the validity with

which the one presentation may be applied to the other.

I found this book an interesting attempt to use theoretical methods on very complex problems. It should be of interest both to diffusion specialists and to anyone with the ambition to relate theory to difficult industrial processes.

D. A. BLACKBURN

The Open University  
Walton Hall  
Walton  
Bletchley  
Buckinghamshire  
England

**Diffusion processes in metals.** Edited by V. N. SVECHNIKOV. Pp. v + 151. Israel Program Scientific Translations, 1970. Obtainable from U. S. Department of Commerce, Springfield, Va. 22151. Price not known.

A collection of papers from the All-Union Scientific Conference on Diffusion in Metals and Alloys held in Kiev in October 1964, this book deals with a wide range of subjects in the general field of diffusion. While no theme appears to have been declared for the conference, many of the papers deal with the more complex problems of diffusion, including the effects on diffusion of strain, phase change, radiation, and reaction with a surrounding atmosphere.

The single topic which has received most attention in the book is that of diffusion and thermodynamic activity in alloys, with a number of papers on both binary and multicomponent systems. The discussions here are among the most stimulating of the book and they are accompanied by an impressive volume of experimental data.

Since this translation has taken some five years to come to press, most of the speculative work of the conference is already outdated. Interest in the book must, therefore, be centred on the alloy diffusion data which it contains. It is unfortunate that no attempt has been made to systematize this information,

since it tends to be poorly presented in the individual papers and much of it, in any case, is already accessible in translated periodicals.

D. A. BLACKBURN

*The Open University*  
Walton Hall  
Walton  
Bletchley  
Buckinghamshire  
England

**Micron – The International Journal of Electron Microscopy, Electron Probe Micro-analysis and Associated Techniques.** Vol. 1 No. 1. Pp. xiii + 83; 1969. U.K. Structural Publications, Price. £2.10 each number.

The development of the transmission electron microscope alone is one of the triumphs of post war applied science. Later developments in electron optics such as the scanning electron microscope and the microprobe analyser confirm that the story is one of remarkable success. The appearance of the new quarterly journal *Micron* devoted entirely to the application of these instruments is evidence enough that they are now in widespread use in a number of different disciplines.

Judging any journal by reference to any one edition is always hazardous and the first edition of *Micron* is no exception. The editors have managed to include papers mentioning the use of all the instruments. Nevertheless, there is clearly a biological flavour in the choice of discipline; of the eight papers presented, five deal with problems in biological science, two with materials science, and one with the instruments themselves. Most of the papers are qualitative rather than quantitative, being written in the manner of an observer peering down a microscope reporting to someone who isn't. Certainly the journal is not intended for the theoretically inclined unless the search is for raw material.

One of the striking features is the large number of plates. In this first edition there are 83 pages of script and no less than 48 plates. Every laboratory using electron optical equipment will certainly have its favourite collection of micrographs and *Micron* seems destined to become their resting place. It is to

be hoped that the journal will not develop into a sort of scientific *Picture Post*. A series of plates giving progressively more detail of a leaf, without any depth of focus problem, is not without interest; the worry concerns the number of available leaves.

The production of the journal is good, being printed on fine quality gloss paper which gives a feeling that no expense has been spared. Anyone wishing to purchase a single personal copy will no doubt confirm this feeling on receipt of the bill for two guineas – sorry £ 2.10. Every plate is printed on just one side of a page, the reverse side being used to give brief details. Because of the large number of plates this does mean a lot of vacant space. An irritating point, particularly when reference is made to them in the text, is the gathering together of the plates at the end of each paper. The contents include the usual diet of a diary, book reviews, conference reports and a sprinkling of advertisements. The publishers are also offering a reader inquiry service for the latter. Justification for the international title is provided by an abstract of each paper in French and German.

If there is a demand for a non-mathematical journal capable of reproducing to high standards the sort of visual information that electron optical devices yield, then *Micron* should survive to become a permanent feature of the library shelf.

J. A. BICKNELL

*Physics Department*  
*University of Manchester*  
*Institute of Science & Technology*  
*Sackville Street*  
*Manchester M60 1QD*  
*England*

**Principles of structural metallurgy.** By B. HARCOPOS. Pp. 146. London: Iliffe, 1963. Price £0.50.

This is a cheap student's edition of a book that was first published in 1963. The advantage of the book is that it contains forty-eight photomicrographs of the most common alloy structures with discussions on them. The rest of the book (the first half) contains standard material on phase diagrams, solidification, defects and mechanical properties etc. It is a good little book that could be used in introductory

courses that aim at a practical knowledge rather than a deeper understanding of the mechanisms that determine the mechanical properties of alloys.

G. GRIMVALL

*Materials Research Center*  
*Chalmers University of Technology*  
*Fack*  
*S-402 20 Göteborg 5*  
*Sweden*

**An outline of crystal morphology.** By A. C. BISHOP. Pp. 314. London: Hutchinson, 1967. Price £1.50.

This modest work whose objective, according to the author, is 'to give an outline of the principles of crystal structure and then, on this foundation, to acquaint the reader with the more practical aspects of crystal morphology that he is likely to meet in an elementary university course,' consists of two parts: 1, *The Principles of Crystallography* (80 pages), and 2, *Systematic Crystallography* (207 pages). This book is essentially one on morphological crystallography, as the title indicates, but part 1 cannot be regarded as giving an adequate 'outline of the principles of crystal structure'. In chapter 1, *General Introduction to Crystallography*, the principal weakness is the inadequate discussion of the 14 Bravais lattices, symmetry, and the crystal systems. The symmetries of the space lattices are not dealt with, and so the restrictions upon the (non-translation) symmetry elements observed in crystals are not explained. Similarly, the fact that the 14 space lattices fall into seven symmetry groups cannot be correlated with the existence of the seven crystal systems. Initially (p. 22) the systems are defined only in terms of the shape of the 'lattice' (the term 'unit cell' is not used), although later in chapter 4 of part 2 (p. 100) the systems are defined in terms of characteristic symmetry.

In the rest of part 1, chapter 2 entitled *A Chemical View of Crystals*, gives a very elementary introduction to crystal chemistry including simple descriptions of some classical structures, but no real attempt is made by the author to relate the chemical characteristics of a crystal structure to the morphology of the crystal. In chapter 3, *Methods of Study*, the author discusses X-ray diffraction by crystals in six pages and then gives reasonably satisfactory descrip-