

In view of the reproducible nature of this packing, the description "random" seems hardly appropriate, and it is suggested that "irregular close-packing" would be a better name.

References

1. G. D. SCOTT, *Nature* **188** (1960) 908.
2. M. M. LEVINE and J. CHERNICK, *Nature* **208** (1965) 68.
3. C. A. ROGERS, *Proc. London Math. Soc.* **8** (1958) 609.
4. H. S. M. COXETER, *Illinois J. Math.* **2** (1958) 746.
5. C. S. SMITH, *Met. Rev.* **9** (1964) 1.
6. D. W. BUDWORTH, submitted for publication. *Trans. Brit. Ceram. Soc.*

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Book Reviews

Diffusion Data, Vol. 1 No 3 (December 1967)

Edited by R. H. Wohlbiel

Pp viii + 146 (Diffusion Information Center, Cleveland, Ohio, USA) \$38 per annum

All active research workers are conscious of the difficulty of maintaining familiarity with the recent literature of their subject. Flourishing abstract journals testify to this difficulty but even skimming through the index of such journals has become a formidable task. Critical reviews also have their place but in general these are not useful for recent work. Clearly there is a place for an intermediate type of journal neither as comprehensive as the abstracting journals nor as carefully digested as review articles.

The periodical under review is a good example of such a journal. It claims to include "all data on mass transport in and through inorganic solids and their melts . . . within a few weeks after their publication". This is an ambitious claim but spot checks substantiate it. For this reason the journal is clearly one to which anyone interested in the properties of materials must have access. Because of the wide range of materials covered, the journal will certainly provide opportunities for cross fertilisation between disciplines. From this point of view it is disappointing that solid inert gases and organic solids have been excluded. Diffusion in these substances is of considerable interest. In particular the study of mass transport in organic solids promises to become one of the more important branches of diffusion in the near future.

There are other minor criticisms which must be made. In a journal of this kind, success depends on the ease with which information can be located. With the present arrangement five separate steps are necessary to obtain full information about a paper. These are (i) looking up the system of interest in the table of contents; (ii) finding the page where the first author's name and the abstract can be found; (iii) looking up the journal reference supplied in the abstract; (iv) looking up the author's name in the index to obtain an address reference; (v) looking up the address reference. This number of steps is excessive. Putting the authors' names, the journal reference and the address with the abstract would seem preferable.

It must be admitted, however, that the index of laboratories studying diffusion, classified by country, is very useful, particularly in planning visits. This usefulness is much reduced as there is no simple way of locating an author from the laboratory address list. It is pleasing to me personally to find the journal sufficiently up to date to list Scotland and England separately.

Another error is that the equation defining the isotope effect in the introduction (repeated in each issue which seems unnecessary) is incorrect. The square root should include only the isotopic masses. The form in which this equation is given is clumsy. The original form used by Schoen,

$$E = \left(\frac{D_\beta}{D_\alpha} - 1 \right) / \left[\left(\frac{m_\alpha}{m_\beta} \right)^{\frac{1}{2}} - 1 \right], m_\alpha > m_\beta$$

is much more convenient and preferable on the grounds of priority.

F. J. P. CLARKE

Scanning Electron Microscopy*P. R. Thornton*Pp xv + 368 (Chapman & Hall, London, 1968)
80s

Thornton's book is assured of wide use as it is the only one available in this rapidly developing field. It is therefore pleasant to be able to report that it is a very good book. A thorough review of the fundamental principles underlying the techniques involved constitutes the bulk of the book (chapters 4 and 5 on electron beam energy losses in solids, chapter 6 on Interactions between electron beams and specimen surfaces, and chapters 8 to 10 on the emissive, conductive and luminescent modes of operation). This material is of permanent value as is much of the content of the first three chapters on the development and electron optical design of scanning electron microscopes. The present applications of the

instrument will be rapidly superseded, as Thornton emphasises, and have therefore been only briefly treated in the final three chapters with much of the emphasis on fundamentals and on possible future developments. The treatment is clear and critical and the author's style conversational and, on the whole, readable in consequence. A feature that will be found useful on first reading is that each chapter begins with an introductory outline and concludes with a critical summary. As experienced lecturers will know, this practice greatly decreases the chances that students will be unable to see the wood for the trees.

This book can therefore be highly recommended both for its content and for its reasonable price. Indeed the only real ground for complaint is that typographical errors are rather too frequent.

D. B. HOLT

**High Temperature Materials:
The Controlling Physical Processes***Edited by A. J. Kennedy*Pp vii + 102 (Oliver & Boyd, Edinburgh and
London, 1968) 47s 6d

This book reproduces five lectures presented at a one-day discussion meeting which was intended to clarify the factors which limit the engineering utilisation of refractory materials. After the editor's historical introduction, McLean surveys some aspects of creep mechanisms, Reid discusses microstructural stability, Argent and Birks deal with dry oxidation, Miles and Clarke with brittleness in monocrystalline and polycrystalline magnesia and Beevers with high-temperature failure mechanisms, especially intercrystalline ones.

The level of treatment is elementary but quantitative in spurts, particularly in the oxida-

tion chapter which is much concerned with the role of defects in controlling diffusion in semi-conducting oxides, and in the creep chapter which is rather abstract. Reid's and Beevers' essays are particularly variegated and at the same time give plenty of concrete examples. Miles and Clarke lean heavily on their own excellent work.

At a time when we are apt to expect a prohibitive combination of depth and breadth of our overworked undergraduates, this book establishes a helpful level for a first introduction to its topics, without being unduly descriptive or skipping over all uncertainties; moreover, the density of quoted references is just about right. It can be recommended to teachers who like to preserve their students' sanity.

Needless to say, the price is too high for the number of pages provided. This refrain can be taken as read nowadays.

R. W. CAHN