

Short Notices

Introduction to Engineering Materials

V. B. John

Macmillan, London, (1972). 276 pp. £2.95

With the numerous textbooks now available on the subject of Engineering Materials, the reader is tempted to ask the question, what justification is there for another one? V. B. John's book follows the well worn track in this subject, but it is distinguished from many of the others by its attempt to provide a good basis in Materials Science on which the rest of the text dealing with real materials and their properties is built.

The author's approach in the first third of the book is to consider the structure, constitution, mechanical and electrical properties of materials, in general and then to devote the rest of the text to a consideration of materials technology, (i.e. the production and properties of real materials). This latter section deals with shaping of materials non ferrous and ferrous materials, thermoplastic and thermosetting resins, ceramics and composite materials. The final chapters are devoted to a consideration of materials in service and materials testing.

Although the book is primarily written for students taking the H.N.D., H.N.C. courses there is much useful information that will appeal to university students taking introductory courses in Materials Science.

Two small features that appealed to the reviewer were (i) the appendix dealing with the relative costs of materials and (ii) the introduction in one or two places of short worked examples. It is a pity that there were not more of these throughout the text.

The price of the book is not too high by today's standards and the text should find a useful place on the bookshelves of students.

R. A. F.

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Eds.:

*Bruce Chalmers, J. W. Christian and
T. B. Massalski*

Pergamon Press, Oxford (1972). £1.75 (Paperback)

This separately-published part of volume 15 is devoted to a review entitled "Solidification of

Portland Cement", by R. B. Williamson of the Dept. of Civil Engineering of the University of California at Berkeley.

It is for two reasons an important and fascinating article. Firstly because it concerns a topic of immense technological importance. Secondly, because it concerns an area where the scope for scientific investigation using the newer tools of the materials scientist appears to be enormous.

Williamson sets himself the clear objectives of reviewing the state of knowledge on the processes of hardening of portland cement viewed as a "solidification" phenomenon, and of relating the resulting structure to the observed mechanical properties. Since this material or rather this range of materials has an extremely complex multiphase structure and since suitable techniques for investigating its fine detail have only recently become available the early work which gave rise to various structural models is very difficult to summarize in any simple way. The author presents but a brief historical survey going back to the 19th-century work of Henry Le Chatelier, and then treats in some detail the recent evidence obtained by scanning electron microscopy. The only mechanical property discussed is the fracture strength and here the origin of fracture from Griffith flaws is discussed in terms of the various possible stress concentrators observed in the microstructure.

This is an interesting contribution to a subject that is catching on with the materials science fraternity.

R.L.B.

An Introduction to The Properties of Engineering Materials (2nd edition)

K. J. Pascoe

Van Nostrand Reinhold Co, London (1972). 394 pp. £3.75 (Paperback)

Since the appearance of the first edition of this book in 1961 the subject of Engineering Materials has changed considerably. Whereas Pascoe's first book represented a great advance in the teaching of the subject, this second edition remains safely within the previous boundaries and does not attempt to break much fresh ground.

In the initial chapters, there is a study of the atomic structure which leads on to the concepts

of crystal and molecular bonding. There is also a brief treatment of the topic of crystallography which has been extended, compared to the first edition.

The second section of the book uses this fundamental basis to deal with the topics of phase equilibria, especially the iron-carbon system; and the mechanical properties of single crystal and polycrystalline metals.

Subsequent chapters then consider the methods which can be employed to test engineering materials and this edition now includes a short treatment of the important topic of fracture and fracture toughness. Other failure mechanisms such as creep, fatigue and corrosion are also included in this section.

The final chapters of the book then deal with specific metals and alloys in particular plain carbon and alloy steels. Two new chapters are added to this edition covering ceramic and organic (polymeric) materials.

The overall impression gained by the reader is that this is still essentially a book dealing with metals and metallic systems with a couple of chapters on non-metallic systems added. It is a pity that the opportunity afforded by the publication of this second edition was not used to produce a more unified approach to the subject.

However, it is still a good book and will appeal to those who are taking metallurgical courses in universities and colleges. R. A. F.