

**Semiconductors.** Report of a meeting held by the Physical Society. Pp. 153 with many figs. London: Physical Society. No date [1957]. Price 20s.

This report reflects the rapid growth of the semiconductor field in physics, chemistry and electrotechnics in the last ten years, as shown by the great diversity of subjects treated in the papers, ranging from fundamental theoretical considerations about semiconductors as such to special technological problems in making certain devices.

Common to practically all these diverse contributions (of which only three are non-British) is their remarkably high standard, which makes reading even nowadays very much worth while for a specialist, notwithstanding the rapid change in the field.

The papers may be tentatively classified into the following groups: fundamental theoretical considerations; preparation and physico-chemical properties of specified semiconductors or classes of semiconductors, as well as specific properties of semiconductors in general; transistor theory and experimental work related to transistor physics; technological problems in making semiconductor devices, and their performance.

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**Rheology: Theory and Application.** Volume II.

Edited by F. R. EIRICH. Pp. xiii + 591 with many figs. New York: Academic Press; London: Academic Books Ltd., 1958. Price \$18.00.

From the Greek *ῥέω*, flow, the word 'rheology' was derived to describe the science concerned with the variation of stress and strain with time. Volume I of the present series dealt with the fundamental theories relating plastic deformations and viscous flow to the molecular structure of materials ranging from solids to liquids. It also treated the effect of dislocations and other imperfections of crystal lattices on their mechanical properties.

This second volume similarly consists of separate contributions by 17 acknowledged experts and extends the application of the theory to specific high polymeric materials—organic glasses, raw elastomers or vulcanised rubber, cellulose plastics, textile fibres, gelatin, asphalts and even the interior material of the Earth. No attempt has been made to unify the separate parts, the basic theory necessary to the topics being expounded so that each section can be read independently.

Nevertheless, Ree and Eyring have contributed a section which consists of a valuable exposition and general application of Eyring's activation theory of viscosity and diffusion. This might seem more appropriate for Vol. I but instead it now graces Vol. II. Defying narrow logic, the editor rightly included it here because it provides a ready reference to the molecular theories by which the rheological behaviour of the above materials can be explained in physico-chemical and thermodynamic terms. Together with Leaderman's ad-

mirable introduction to the general visco-elasticity of high polymers, and Tobolsky's lucid account of their stress-relaxation properties, it makes this volume independent of the first.

Three final sections specially describe experimental techniques available for measuring rheological properties, although other sections also give detailed diagrams of the apparatus used to obtain some of the data given.

All the sections seem to give complete summaries of the essential phenomena as well as interpretation and, with the copious references to the literature, they make the whole book invaluable as a standard text.

It is impossible to review this volume adequately because it is not a single book in the usual sense. The list of contributors, however, contains names eminent enough to be a sufficient recommendation.

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**La Structure Atomique et la Résistance des Metaux.** Par N. F. MOTT. (Traduit par Geneviève Gueron). Pp. 102 with 26 figs. Paris: Dunod. 1958. Price 750 f.

The art of producing metals and alloys has been known for some thousands of years, but it is only in the last quarter of a century that a scientific explanation of their strength, ductility and work hardening properties has been put forward.

Prof. Mott now gives us a little book which explains these theories in simple language. The book contains the French translation of the Page-Babour lectures for 1956 given at the University of Virginia. The lectures were given to a non-specialist audience and dealt with the form of edge and screw dislocations and the role they play in metallic structures, with particular reference to the strength of metals and the growth of crystals.

Beginning with the picture of the Bragg bubble raft, the two-dimensional forms of the edge dislocation is described. Plastic deformation by movement of dislocations is discussed, together with Cottrell's explanation of the yield point. The second lecture ends with an interesting note on bells. The third lecture extends the discussion to the three-dimensional pictures of edge and screw dislocations, and describes the step method of crystal growth.

The book is well illustrated and gives a list of the essential references for those who wish to study the subject further. It should find many readers amongst those interested in science. It will also be valuable to those in the last year of school who intend to specialise in science.

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