

classification which is the basis of the climatic map. The whole of the information can be found elsewhere without too much difficulty; the book is a well-made luxury.

G. D. ROBINSON

Plasticization and Plasticizer Processes

A Symposium sponsored by the Division of Industrial and Engineering Chemistry at the 147th Meeting of the American Chemical Society, Philadelphia, Pa., April 6-7, 1965.) (Advances in Chemistry Series, No. 48.) Pp. ix+200. (Washington, D.C.: American Chemical Society, 1965.) 7 dollars.

PLANS for considerable increases in production capacity for polyvinyl chloride announced by manufacturers in Britain will be accompanied by similar increases in plasticizer output and interest in both plasticization and the production of plasticizers, and makes the publication of this book timely. It includes specialist papers of both a review and an experimental nature on a number of different aspects of the subject, which were presented at a symposium in the United States in 1964. Its title is, therefore, perhaps misleading since it is not a reference book. Unlike a number of other books published in recent years it is international in character, papers being presented from five different countries. These cover the theory of action of plasticizers; although it is clear that the user will still have to make his choice of plasticizer largely by means of empirical tests. Esters still predominate as plasticizers, and there are some interesting papers discussing recent developments of interest to the manufacturer of plasticizers, in particular further work on the production of ester plasticizers directly from olefins, and also the use of amphoteric type catalysts in esterification. Other papers include a review of polymeric plasticizers, analytical aspects and some highly specialized papers of rather limited interest. This book is probably the most authoritative to appear since the publication of Doolittle's book in 1954 and will be of considerable value to research workers who are interested in either the production of plasticizers or in obtaining a greater understanding of the action of plasticizers. It is reasonably priced.

R. J. WICKER

Heat Transfer in Structures

By H. Schuh. (International Series of Monographs in Aeronautics and Astronautics, Vol. 7.) Pp. xviii+338. (Oxford, London and New York: Pergamon Press, Ltd., 1965.) 70s.

THE author has set out to strike a balance between the interests of all workers in the heat-transfer field and the special interests of those in the field of aeronautics. Although his examples are taken wholly from aeronautics, *Heat Transfer in Structures* is certainly of considerable interest to a wider public.

After dealing with external heat-transfer to structures in high-speed flight, and the fundamental laws for heat-transfer within structures, the author deals separately with (a) analytical, and (b) numerical methods of calculation for (1) steady, and (2) transient heat flow. He finishes the work with a discussion of heat flow in particular structural elements, the use of analogues, the similarity laws and model testing for heat flow in structures.

Complex shapes, found in other fields such as turbine rotors and casings, and steam header pipes, are not mentioned. It is as well to remember while reading the book that the applications discussed are, on the whole, applications to simple shapes. This must be particularly borne in mind when assessing the justification for the author's happy conclusions regarding the small errors in his calculations.

Nevertheless, the author's approach is a fundamental one and everyone has much to learn. Many problems

common to aeronautical and other fields are discussed, and particularly interesting are the effects of the flight plan on heat-transfer and his comparison of the effects of the modes of heat-transfer.

RUSSELL HOYLE

Impeller Pumps

By Stephen Lazarkiewicz and Prof. Adam T. Troskoleński. Pp. xiv+648. (London and New York: Pergamon Press, Ltd.; Warsaw: Wydawnictwa Naukowo-Techniczne, 1965.) 120s. net.

IMPELLER Pumps is a good book, well written and well translated. The authors, one an eminent consulting engineer, the other a distinguished teacher, have revised and enlarged their first book, which was in Polish. Prof. S. P. Hutton has written the preface. The volume is an excellent treatise and book of reference for student, designer, draughtsman, consultant and contractor. Comprised of twenty-three chapters with 506 figures, the book deals with theory and design practice, installation and maintenance. Worked examples demonstrate methods where necessary and each chapter has a list of references which show that the authors have used books from ten different countries.

Diagrams, figures and printing are excellent. Proof reading has been good—there are few printers' errors—and a useful list of symbols is provided. Acknowledgment is made to thirty-nine pump-makers who have contributed to the book in some fashion; nineteen of these are British. Name index and subject index are adequate, although I feel that the latter might have had broader coverage. Centrifugal, mixed-flow, diagonal and propeller pumps are discussed in detail. Attention is given to hydraulic side-thrusts, volutes, recuperators and diffusers of all types, and reference is made to peripheral and water-ring pumps.

Quite properly, the authors have a large chapter on fundamental theory of impeller flow. The longest chapter of all is that dealing with pumps for special duties, such as pumped storage, boiler-feed, corrosive liquids, solids in suspension, etc. Constructional and design details are given for castings, balancing, sealing-rings, stuffing-boxes, shaft sizes, bearings, sudden temperature changes, etc. Much space is allotted to discussing impeller flow, number of blades and choice of blade angles. Dynamical similarity and scale-model tests are fully discussed, as well as full-scale and air testing. The sections on self-priming, pump driving, pump-pipeline systems and discharge regulation are useful, but little or no space is given to water-hammer or surge problems in connexion with complete impeller head-discharge characteristics.

Modern theories of cavitation phenomena are clearly expounded and in a long chapter on cavitation the authors give a full and lucid explanation of net positive suction head or, as they prefer to call it, anti-cavitation pressure margin. The book ends with a short section listing common faults in pump operation and how to correct them.

Undoubtedly, coming as it does from the authors' own experience, this volume is a welcome addition to the literature on the growing science of pump design.

A. S. THOM

Science of Ceramics

Proceedings of the 2nd Conference held under the auspices of the British Ceramic Society and the Nederlands Keramische Vereniging, at Noordwijk aan Zee, May 1963. Edited by G. H. Stewart. Vol. 2. Pp. 431. (London and New York: Academic Press, Inc., 1965.) 84s.

SCIENCE of Ceramics records the papers presented at a joint meeting of the British and Dutch Ceramic Societies held in Holland in 1963, which was the second of a series planned by the two societies to provide opportunities for the exchange of views and information in the rapidly growing and peculiarly challenging field of ceramics. The