

## Soviet Research in Glass and Ceramics

Basic Science I. Pp. 1-259. Basic Science II. Pp. 260-497. 90 dollars. Glass, Glazes and Enamels. Pp. 197. 40 dollars. Cements, Limes and Plasters. Pp. 203. 35 dollars. Refractories. Pp. 70. 20 dollars. Miscellaneous. Pp. 31. 7.50 dollars. (New York: Consultants Bureau, Inc.)

THE Consultants Bureau, Inc., New York, have prepared translations of recent publications in Soviet research in glass and ceramics. These are available in five mimeograph collections. Full contents lists are available from Consultants Bureau, Inc., and individual reports can be purchased for 7.50 dollars each. It is useful to have in a form so easily available these translations of Russian publications. A very brief indication of the nature of the topics discussed may be given by referring to two major subjects on which several papers are included.

There are several papers on solid-state reactions by Ginstling and co-workers; these reactions are considered under the following headings: Chemical Reaction; Diffusion; Sublimation; Fusion; Crystallization.

Apen, in a lengthy series of papers, discusses the structure of silicate glasses in the light of the trend of behaviour of glasses as the composition is varied systematically. This information, together with the known co-ordination numbers of the various ions in crystals, is used to discuss the co-ordination of those ions in glasses.

There are many technological papers dealing with the reaction between sodium sulphate, carbon and silica, the thermal analysis of limestone, magnesite and dolomite in gas streams, the reaction of glasses with water and hydrofluoric acid, to mention only a few.

Of rather more general interest is a paper on X-ray transmitting glasses (Lindemann glass) with improved chemical durability.

R. W. DOUGLAS

## Linear Equations

By P. M. Cohn. (Library of Mathematics.) Pp. viii+74. (London: Routledge and Kegan Paul, Ltd., 1958.) 5s. net.

## Sequences and Series

By J. A. Green. (Library of Mathematics.) Pp. viii+56. (London: Routledge and Kegan Paul, Ltd., 1958.) 5s. net.

## Differential Calculus

By P. J. Hilton. (Library of Mathematics.) Pp. vii+56. (London: Routledge and Kegan Paul, Ltd., 1958.) 5s. net.

## Elementary Differential Equations and Operators

By G. E. H. Reuter. (Library of Mathematics.) Pp. viii+67. (London: Routledge and Kegan Paul, Ltd., 1958.) 5s. net.

THESE booklets, by members of the mathematics department of the University of Manchester, are intended for the student of science or engineering; they are in paper covers, but are well printed and reasonably cheap. The scope of Cohn's book is wider than the title, since linear equations are used to link together basic ideas about vectors, matrices and determinants. The discussion of  $m$  equations in  $n$  unknowns is carefully carried out, and a numerical method of solution is described.

Green's book treats sequences and their limits rather narrowly as a preliminary to the theory of

series. The frightening professional apparatus of modulus signs and epsilons is discarded, and formal proofs are replaced by careful descriptions and apt numerical examples. The main convergence tests for series are given, including the integral test, and the properties of power series are given in some detail.

Hilton aims at comprehension rather than facile manipulation. The student must understand the meaning of the derivative; if correct proofs are too difficult, he must not be deceived by bogus arguments or false statements. Applications are to maxima and minima, and Taylor's theorem; the proof of the latter is a little too sophisticated for the science student, usually too ready to believe that mathematics is largely trickery.

Reuter is concerned with linear differential equations with constant coefficients. He first gives the familiar  $D$  method, and then an operational method which takes care of initial conditions; this is essentially Heaviside, and Reuter's treatment is on the lines of that given in the Cambridge tract by Sir Harold Jeffreys.

These are all useful little books, and topics suitable for similar treatment are doubtless under consideration by the editor of the series, Dr. Ledermann.

T. A. A. BROADBENT

## Advances in Biological and Medical Physics

Vol. 5. Edited by John H. Lawrence and Cornelius A. Tobias. Pp. x+488. (New York: Academic Press, Inc.; London: Academic Books, Ltd., 1957.) 12 dollars.

THE latest volume of this series contains an excellent selection of review articles taken from various parts of the subjects of medical and biological physics, together with a few excursions into subjects which can scarcely be regarded as 'physics', although no doubt they are of interest both as tools and as subjects for future biophysical researches. T. T. Puck's article on the genetics of somatic mammalian cells comes mainly within this category, although it includes some account of the action of high-energy radiation cells when grown under tissue culture conditions. The remaining articles cover a wide range of physical approaches to biological phenomena, for example, paramagnetic resonance, action spectroscopy, dielectric properties and even television techniques in biology and medicine.

Other articles deal with methods of low-level counting of radioactive isotopes (Anderson and Libby), which have assumed world-wide importance in view of the increasing contamination of the atmosphere, and the radioactivity of the human body (Spiers and Burch), an equally important subject at the present time.

W. F. Bale and J. L. Spar discuss the use of antibodies as carriers of radioactivity for therapy. This is an interesting idea, but I do not think the authors have quite established their case that (with isolated exceptions) the therapy of specific organs is a practical proposition at present. Still, it is of much interest to have a review of the experiments made in this direction.

A. Rose gives a discussion of some rather special features of human vision and R. E. Zirkle, in an excellent article, discusses the methods developed in his laboratory for the irradiation of small parts of cells and the effects observed so far.

J. A. V. BUTLER