

Tables of Light-Scattering Functions

Relative Indices of Less than Unity, and Infinity. By R. H. Boll, J. A. Leacock, G. C. Clark and S. W. Churchill. Pp. viii+360. (Ann Arbor, Michigan: University of Michigan Press, 1958. Published for the Engineering Research Institute.) 9.50 dollars; 71s. 6d.

Tables of Angular Distribution Coefficients for Light-Scattering by Spheres

By Chiao-Min Chu, George C. Clark, and Stuart W. Churchill. Pp. xv+58. (Ann Arbor, Michigan: University of Michigan Press, 1957.) 3 dollars.

THE scattering of light by small particles is of interest in several fields, for example, aerosol physics, atmospheric physics, astronomy, and colloidal chemistry. The fundamental theory rests on Mie's solution of the Maxwell equations for the interaction of a linearly polarized wave and a single spherical particle of diameter D comparable with or larger than the wave-length λ . The solutions are in the form of infinite series of complex mathematical functions, tabulated values of which are still not available for many important conditions.

In the first of these two volumes, values of the scattering coefficient K and the amplitude functions are tabulated for values of the particle refractive index in the range 0.6-0.93, and also infinity, and for 39 values of $\alpha = \pi D/\lambda$ in the range 1-200. These functions are particularly applicable to bubbles of a gas in a liquid or a solid and to the dispersion of a liquid in another of higher refractive index.

In the second publication are tabulated the scattering coefficients and the coefficients of angular distribution of randomly polarized radiation scattered by a sphere for 9 values of refractive index m ranging from 0.9 to 2.0, and also for $m = \infty$, and for values of $\alpha = \pi D/\lambda$ ranging from 1 to 30.

These sets of tables, which are surprisingly expensive, are to be borrowed rather than bought.

B. J. MASON

Vector Spaces and Matrices

By Prof. Robert M. Thrall and Leonard Tornheim. Pp. xii+318. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1957.) 54s. net.

WITH the exception of the final chapter, the book covers well-worn ground, but does so in an interesting and instructive manner, valuable from the teaching aspect. It builds up the instruction through levels of abstraction, from the concrete to the highly abstract. The reviewer has always held the view that an 'abstract' work on mathematics is unsuitable for the elementary student, especially if, as is so often the case, the work is totally, or almost, lacking in examples. Such students often imagine they understand such a work, but later find out that they did not understand in the least. They should be started on a concrete level, with plenty of examples, but not for too long, and then work up gradually to the heights of abstraction. This procedure the book under review carries out, and it is ably written; most of it is suitable for an honours degree course on the subject-matter.

The chapters, in order, are on: vector spaces, linear transformations and matrices, systems of linear equations, determinants, equivalence relations and canonical forms, functions of vectors, orthogonal and unitary equivalence, structure of polynomial

rings, equivalence of matrices over a ring, similarity of matrices, linear inequalities.

The final chapter, containing sections on linear programming, the minimax theorem, and matrix games, is interesting in itself.

R. G. COOKE

An Atlas of Airborne Pollen Grains

By H. A. Hyde and K. F. Adams. Pp. xvi+112. (London: Macmillan and Co., Ltd.; New York: St. Martin's Press, Inc., 1958.) 36s. net.

THIS book is the result of collaboration between a botanist and a medical man engaged in the study of pollen allergy. Its most striking feature is an excellent series of photomicrographs of pollen grains in their natural condition. These have been carefully selected to show the critical features of the grains in both optical section and surface view on a scale of about a thousand diameters. Although many technical terms are necessarily introduced, they are fully explained in the glossary. A well-arranged dichotomous key should make the book a valuable introduction to the study of palynology. Most of the grains illustrated and described are from wind-pollinated flowers, but a number of entomophilous forms are also included.

The book should be a valuable work of reference for the medical palynologist, who will find examples in it representative of all the indigenous pollen types of importance as well as a few exotics, such as *Ambrosia artemisiifolia*, the noxious American ragweed, occasionally found as an adventive in Britain. Apiculturists will also find the book interesting, as many of the anemophilous pollens are utilized by bees as well as the entomophilous forms. The book is admirably produced on glazed paper.

J. HUTCHINSON

Classics of Librarianship

Further Selected Readings in the History of Librarianship. By John L. Thornton. Pp. x+203+8 plates. (London: Library Association 1957.) 24s.

THESE further selected readings in the history of librarianship include little of specific interest to the scientist or even to the technical librarian, save that each selection is accompanied by a biographical note on the author. Among the selections of general interest may be mentioned Sir Edward Bond's remarks on public libraries (from his address to the Library Association), H. Bradshaw's presidential address to the Library Association (1882); W. E. A. Axon's "Professorships of Bibliography"; H. R. Tedder on "Librarianship as a Profession"; T. Greenwood on "The Place of Public Libraries in our National Life"; J. C. Dana's presidential address to the American Library Association (1896); T. Mason's paper on Robert Watt, the author of the "Bibliotheca Britannica"; F. Pacy's retrospect of the Library Association at its fiftieth anniversary conference, 1927; W. W. Bishop on the "Backs of Books"; A. Esdaile's "Confessions of a Victorian"; and W. Blade's "The Enemies of Books". As Mr. Thornton admits, the selections are not all major contributions to major literature and are sometimes presented as typical of an author introduced for his contribution to librarianship in ideas or ideals or work. The biographical notes accordingly give the volume an interest and an appeal which may run outside the purely professional field represented by membership of the Library Association.

R. BRIGHTMAN