

from the beginning and intelligible even to those who are previously completely ignorant of the subject. This sketch occupies 39 pages, and includes definitions, the periods and poles, numerical examples using interpolation formulæ, complete elliptic integrals, change of argument and parameter, addition theorems, Jacobi's imaginary transformation, derivatives and integrals, Weierstrass's function, elliptic integrals of the first, second and third kind, Zeta functions, conformal mapping, factorization of cubic and quartic polynomials, and applications to the pendulum and to Euler's equations of motion of a rigid body. Then follow 83 pages of graphs and tables of the elliptic functions sn , cn , dn (to five figures), the complete elliptic integrals K , K' , E , E' and the nome q (to eight figures), and the zeta function (to seven figures). Should an isolated value of sn , cn or dn be required to more than five figures, it can be found from the series given on p. 13.

H. T. H. PIAGGIO

Theory of Groups and its Application to Physical Problems

By S. Bhagavantam and T. Venkatarayudu. Second edition. Pp. xiii+277. (Waltair: Andhra University, 1951.) 20 rupees.

THE first edition of this book has already been reviewed in *Nature* (163, 620; 1949), and the second edition differs from it in the following points. The account of one- and two-dimensional lattices is now expanded into two chapters; this was previously contained in one chapter. In the chapter on matrix groups, a section on Kronecker square and symmetrized Kronecker square representation, and Kronecker direct product of two representations, is added. A chapter on molecular structure and normal modes is inserted, and some slight additions are made in the chapters on vibrations of a dynamical system, on molecular structure and normal frequencies, on vibrations in a crystal lattice, and on the application to problems of atomic spectra. Finally, a new chapter is inserted on crystal symmetry and physical properties, and some alterations are made in "other applications".

The effect of these additions and alterations is certainly to improve this useful book.

R. G. COOKE

Advances in Radiochemistry

And in the Methods of Producing Radioelements by Neutron Irradiation. By Dr. Engelbert Broda. (Cambridge Monographs on Physics.) Pp. xi+152. (Cambridge: At the University Press, 1950.) 15s. net.

THIS excellent little volume by Dr. E. Broda is a recent addition to the "Cambridge Monographs on Physics" series. It is appropriate that this book should be found among physics texts, for the close connexion between radiochemistry and nuclear physics has never been so evident as to-day. Indeed, Dr. Broda's monograph will probably find its maximum value among nuclear physicists, who may through reading it be inspired to attempt for themselves some of the more elegant radiochemical techniques for the production of pure sources of radioelements at high specific activities (for example, by the Szilard-Chalmers reaction).

For other natural and applied scientists who would gain a speaking acquaintance with the relatively new radiochemical methods, the book provides a good introduction. The author has included chapters which review the fundamental procedures of nuclear

chemistry (carrier precipitation, distribution between solvents, volatilization and active deposits, electrochemistry, the production of nuclides by nuclear bombardment, and recoil effects) as well as chapters of general interest (fission, new radioelements, new measurement techniques). Much historical material is summarized, and the book is well laced with references.

The typography is of the high standard which we have come to expect of the Cambridge University Press, and errors are few. However, credit for the naming of element 61, promethium (p. 96), should have been given to Mrs. Charles Coryell, wife of one of the co-discoverers.

GARMAN HARBOTTLE

The Bird

Its Life and Structure. By Gertrud Hess. Translated from the German by Phyllis Barclay-Smith. Pp. 244. (London: Herbert Jenkins, Ltd., 1951.) 18s. net.

THE widespread interest in birds is reflected in the ever-increasing number of books about them. We here have one by Gertrud Hess, translated from the German by Phyllis Barclay-Smith. It deals with many aspects of bird-life from structure to behaviour, including migration, reproduction, nest-building and so on. The illustrations consist of a profusion of pen-and-ink sketches by the author which are very helpful to the text: for example, Fig. 114 of a common heron striding through the grass, and the line drawings on the next page; Fig. 115, of water birds, showing how gulls, being lighter, float higher in the water than ducks. There is an interesting chapter on the ancestry of birds, and at the end of the book some useful tables giving comparative figures for body-weight, heart-weight, temperature, etc. These remind us how hot-blooded a creature is the bird, temperatures of 109° F. or more being common. The "Length of Life" table could do with revision. Forty to fifty years is given for the parrot under the heading of greatest age in captivity, but there are well-authenticated cases of parrots living much longer. But such are minor points in a book which will provide the budding ornithologist with a great deal of useful information.

FRANCES PITT

Traveling Waves on Transmission Systems

By Prof. L. V. Bewley. (General Electric Series.) Second edition. Pp. ix+543. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1951.) 96s. net.

EIGHTEEN years have elapsed since the publication of the first edition of this mathematical treatment of the effects of lightning surges on electrical power transmission lines. It is natural, therefore, that in the second edition of the book there should be some increase in scope and more complete solutions to many problems.

Much of the additional material, in particular the provision of exercises for the reader, has been included to satisfy the needs of the student. In the text the derivations of solutions to differential equations and other mathematical processes are presented in detail, no doubt with the same object; but the detail tends at times to disturb the continuity of the exposition and to obscure the physical arguments. However, the techniques for the solution of practical problems are clearly defined and the book is one of the most comprehensive treatments of the subject and valuable to both the student and the engineer.