

### Numerical Tables for Nuclear Physics

By Charles Noël Martin. (French and English Texts.) Pp. viii+258. (Paris: Gauthier-Villars, 1954.) Paper 36s. 9d.; cloth 44s. 11d.

THIS book is devoted solely to tabulations from a number of semi-empirical formulae. The first half contains tables of nuclear masses, alpha and beta decay energies, etc., from von Weizsäcker's mass formula. All the computations were made by hand without benefit of a machine, and graphical checks were employed. I find it hard to believe that the computational effort put into this book by M. C. N. Martin is in any sense justified. The mass formula has already been extensively tabulated by Metropolis and Reitwiesner in America and merits nothing more than a thorough exposition of its many defects.

M. Martin would have done a better service if he had himself confronted the formula with experimental fact, and would have realized that for this purpose, and especially for comparisons with beta-decay data, it is more useful to have tabulations of the parameters usually connoted by  $M_A$ ,  $B_A$ ,  $Z_A$ ,  $\delta_A$ . It does not seem to be generally appreciated even now that the reliable experimental data are confined exclusively to the trough of the mass valley, so that the parameters  $B_A$  and  $Z_A$  are relatively ill-determined; on the other hand, nuclei further removed from beta stability (and for which no experimental data are available) are high up the parabolic walls, and their masses and decay energies are particularly sensitive to correct choice of the parameter  $Z_A$  of most stable charge.

Many of the tables in the second half of the book are rather trivial and suffer from too extensive tabulation: that makes the book more expensive and more complicated in use. For example, the recoil correction  $Em/M$  arising in nuclear bombardments and in alpha decay can be speedily and accurately assessed with a slide-rule. So far as nuclear radii and geometrical cross-sections are concerned, it would suffice to tabulate the cube roots of  $A$  and  $A^2$ . On the other hand, Coulomb barrier heights in MeV. and the barrier penetration factors involve several steps in computation and are more usefully tabulated. To be just it is necessary to add that, given the need for a table of semi-empirical masses, then M. Martin's production is well presented, well illustrated with examples, and convenient to handle. J. S. STORY

### Seismology

By Prof. K. E. Bullen. (Methuen's Monographs on Physical Subjects.) Pp. viii+132. (London: Methuen and Co., Ltd.; New York: John Wiley and Sons, Inc., 1954.) 8s. 6d. net.

THE small book under review is a worthy addition to the well-known series of "Methuen's Monographs on Physical Subjects". The chapter headings are as follows: the significance of seismology in physics; macroseismology; instrumental seismology;  $P$  and  $S$  waves; fitting elastic wave theory to the Earth; seismology and geology; seismic rays, phases and travel times; Earth models based on seismology; microseisms—seismology and meteorology; and some interesting earthquakes. The first three and last two chapters are shorter than the others. In addition, there are in the text eleven small line-diagrams, three large graphical diagrams, one map and an index.

Prof. K. E. Bullen, who is professor of applied mathematics in the University of Sydney and president of the Section of Seismology and Physics of the Interior of the Earth of the International

Union of Geodesy and Geophysics in the present triennium, is a very brave man to try to get the whole of seismology into some forty thousand words, even though he limits the meaning of the word seismology and also freely employs mathematical symbolism including differential equations and triple integrals. His own researches have been largely concerned with travel-time tables and the determination of the numerical values of the physical constants of materials likely to be found at various great depths in the Earth. In this book he states the parts of the scientific method which he has used in his researches, gives the theoretical basis for his calculations, and summarizes the results so far obtained.

In fact, Prof. Bullen has dipped his 'spoon' of mathematics into the 'basin' of seismology, and mathematical physicists will be grateful for the 'taste' he offers them. Should they desire to go further, I would recommend them to begin with "Lectures on Seismometry", by Prince B. Galitzin, in addition to Prof. Bullen's larger book, "An Introduction to the Theory of Seismology" (second edition, 1953).

ERNEST TILLOTSON

### Collected Papers on Aviation Medicine

Presented at Aeronautical Panel Meetings of the Advisory Group for Aeronautical Research and Development, Palais de Chaillot, Paris. (AGARD-ograph No. 6.) Pp. vi+209+38 plates. (London: Butterworths Scientific Publications, 1955; published for A.G.A.R.D.) 37s. 6d.; 5 dollars.

EIGHTEEN different papers presented at various meetings of the Aeronautical Panel of the Advisory Group for Aeronautical Research and Development, North Atlantic Treaty Organization, are published in this volume. The selection of the various papers in no way covers the field of aviation medicine in systematic form. Instead, the reader is confronted with an unusually random choice of topics, the standard of which varies from the informal and superficial to the advanced and original academic paper one might expect to find in a specialist technical journal. This is due to the different aims of the meetings and also the function of the various authors. In this type of publication, therefore, there is an inherent diversity of approach and level of treatment, all the more apparent owing to lack of editorial supervision. Such criticisms, however, have sometimes been regarded as offset by refreshing variations in style, and in addition the book is very well illustrated. One cannot help feeling, however, that a more limited choice of papers could, with advantage, have been supplemented by the inclusion of discussion abstracts on the more controversial subjects.

Much of the progress of aviation medicine is concerned primarily with research in basic physiological and psychological problems, so that this type of publication should have its appeal to the specialists in these sciences also. A detailed paper by John P. Stapp covers his more important and original work on body tolerances to crash decelerations, and other topics include such subjects as a theoretical approach to cockpit layout, arctic survival, high-intensity noise and visual problems. Of particular interest is a short critical survey of present concepts relating to explosive decompression. Throughout, the reader is left in no doubt that aviation medicine research depends on a detailed application of electrometrical recording techniques, which are also introduced by a composite paper describing recent advances in this field.

F. LATHAM