REVIEWS AND DESCRIPTIONS OF TABLES AND BOOKS

1[B, C, K, S].—A. H. WAPSTRA, G. J. NIJGH & R. VAN LIESHOUT, *Nuclear Spectroscopy Tables*, North Holland Publishing Company, Amsterdam, 1959, viii + 136 p., 27 cm. Price $8.90.

This book consists of a well-selected collection of tables and graphs of interest to nuclear physicists. A slightly condensed list of contents follows:

Chapter I. *Mathematical Data.*

Common logarithms. Powers of 10 and 2, for exponents 1.00(0.01)9.99, 4D. Cube roots of integers 1(1)999, 5D. Brief discussion of least-squares method, and a graph for checking the consistency of least-squares computations. Table of Gaussian distribution and its integral for arguments 0.00(0.02)3.48, 4D.

Chapter II. *Tables of Atomic Constants.*

Chapter III. *Elements and Isotopes.*

Names, atomic numbers, and symbols of elements. Atomic weights and abundances of isotopes.

Chapter IV. *Heavy Particles.*

Range energy curves for protons, deuterons, and alpha particles. Straggling of protons in air (graph). Magnetic rigidity of protons, deuterons, and alpha particles (table). Half-lives for alpha disintegration and spontaneous fission of heavy elements (graphs).

Chapter V. *Electrons.*

Range energy curves for beta-particles. Saturation backscattering coefficient (graph). Magnetic rigidity of electrons (table). Discussion of shapes of continuous beta-spectra. Reduced Fermi function $f(z, p)$ and beta-decay functions L and M for negatrons and positrons (tables). Screening correction for negatrons and positrons (graphs). Discussion of beta-decay transition probabilities and their values. Ratios of electron capture in different electron shells. Computation of log ft values (nomogram and graphs). K capture/positron emission ratios (table and graphs).

Chapter VI. *Gamma Rays.*

Half-thickness of some substances for absorption of gamma rays vs energy (graph). Photon absorption cross-sections vs energy (table). Energy of Compton scattered gamma rays (discussion and graph). Gamma-decay half-lives (discussion, nomogram, and graphs).

Chapter VII. *X-rays and Auger Electrons.*

Electron binding energies in different shells for all elements (table). Relative intensities of K X-ray components and of K-Auger electrons (table).

Chapter VIII. *Angular Distributions and Correlations.*

Brief discussion of angular distributions and correlations involving photons, alpha particles, beta rays and K conversion electrons. Tables of $F_\nu(L, L', j_i, j)$ coefficients.

Chapter IX. *Nuclear Models.*

Discussion of nuclear mass formula, nuclear shell model, collective model, magnetic moments, quadrupole moments, and gamma- and beta-decay

probabilities. Graphs of Nilsson level scheme of single particle orbits in spheroidal potential. Table of measured ground state spins of odd-A and odd-odd nuclei. Tables of Clebsch-Gordan coefficients.

Chapter X. *Calibration Standards.*

Tables of standard gamma and electron lines and of standard alpha rays. Gamma-ray absorption coefficient in NaI crystals. Table of standard nuclides for calibration of gamma-ray spectrometer.

The tables and graphs have been presented so as to be easily read, and the quality of the printing is good. Much of the material is used frequently by nuclear physicists but is widely scattered in the literature. Thus, this book should prove very helpful to people in the field of nuclear physics, and this reviewer recommends it highly.

MICHEL A. MELKANOFF

University of California
Los Angeles, California

2[D, L].—L. K. FREVEL, J. W. TURLEY & D. R. PETERSEN, *Seven-Place Table of Iterated Sine*, The Dow Chemical Company, Midland, Michigan, 1959. Deposited in UMT File.

Following a detailed description of the method of computation employed, the authors give a 7D table of the nth iterated sine function of x for $n = 0(.05)10$, and $x = k(\pi/20)$, where $k = 1(1)10$. It is stated that the computations were perperformed on a Datatron 204, and the results are considered correct to within $5 \cdot 10^{-7}$.

J. W. W.

3[G].—K. M. HOWELL, *Revised Tables of 6j-Symbols*, U. Southampton Math. Dept., Research Report 59-1, 1959, xvi + 181 p., 33 cm.

The Wigner $6j$-symbol has been defined by Wigner in general in connection with the reduction of the triple Kronecker product of any simply reducible group. In these tables this group is taken to be either the three-dimensional rotation group or the two-dimensional unitary group. The symbols are denoted by

$$\begin{Bmatrix} j_1 & j_2 & j_3 \\ k_1 & k_2 & k_3 \end{Bmatrix}$$

where the quantities $j_1, \cdots, k_3$ are integers or half-integers. If we let

$$J_0 = j_1 + j_2 + j_3, \qquad J_1 = j_1 + k_2 + k_3, \qquad J_2 = j_2 + k_1 + k_3$$

$$J_3 = j_3 + k_1 + k_2$$

$$K_1 = j_1 + j_2 + k_1 + k_2 \qquad K_2 = j_1 + j_3 + k_1 + k_3$$

$$K_3 = j_2 + j_3 + k_2 + k_3,$$

then the explicit expression for the $6j$-symbol is

$$\begin{Bmatrix} j_1 & j_2 & j_3 \\ k_1 & k_2 & k_3 \end{Bmatrix} = \{\prod_{r,s} (K_r - J_s)!/\prod_{s} (J_s + 1)!\}^{\frac{1}{2}} \cdot \sum_{t} (-1)^t (t+1)!/\{\prod_{r} (K_r - t)! \prod_{s} (t - J_s)!\}.$$