47[A, S].—A. F. Nikiforov, V. B. Uvarov & Yu. L. Levitan, *Tables of Racah Coefficients*, translated by Prasenjit Basu, Pergamon Press, New York, 1965, xx + 319 pp., 26 cm. Price $15.00.

Racah coefficients occur in the quantum theory of angular momentum and may be briefly characterized as the matrix elements of invariant operators formed in the coupling of three tensor operators. These coefficients are of great importance in atomic and nuclear spectroscopy, in angular correlation theory, and in the quantum theory of angular momentum itself. The importance of the Racah coefficient may be judged from the fact that some 15 more or less extensive tabulations have appeared since 1952. The two most extensive recent tabulations (besides the compilation under review) are *The 3-j and 6-j Symbols*, by Rotenberg, et al., Technology Press, Cambridge, 1959, and *Tables of the Racah Coefficients*, Ishidzu, et al., Pan-Pacific Press, Tokyo, 1960 (English).

The present tabulation gives the Racah coefficient $W(abcd;\, ef)$ as 8-place decimal fractions, and has as its chief merit the extensive range of variables. The tables are divided into three sections:

1. a, b, c, d half-integral $(\frac{1}{2}(1)\ \frac{17}{2})$; $e, f = 0(1)17$, (153 tables),
2. a, b, c, d integral $1(1)9$; $e, f = 1(1)18$ (162 tables),
3. a, c, e half-integral: $a, c = \frac{1}{2}(1)\ \frac{17}{2}$; e half-integral $\frac{1}{2}(1)\ \frac{35}{2}$; b, d, f integral $1(1)9$, (153 tables).

The present volume is essentially the Russian original with a translation of the preface (9 pages). The translation is not very smooth, but is quite adequate for the use of the tables. This tabulation suffers in comparison to earlier work (in particular, those mentioned above) in that it lacks both a discussion of the properties of the Racah coefficients as well as algebraic tables of the Racah coefficients (these are often more useful than numerical values in theoretical applications). It should be mentioned, too, that the Racah coefficients are square roots of rational numbers; consequently, tabulation as decimal fractions involves some loss of information (only the Ishidzu, et al. tabulation—of the recent work—is expressed in exact (nondecimal) form).

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48[D].—D. G. Martin, *Tables of* $(\sin^2 x)/x^2$ *to Six Decimal Places*, Report 4935, Atomic Energy Research Establishment, Harwell, England, 69 pp., 29 cm. Available from H. M. Stationery Office. Price 10s.

These unique tables were computed on an IBM 7030 system to expedite the calculation of the attenuation of a beam of long-wavelength neutrons passing through a solid containing a number of randomly oriented defects.

The format resembles that of the companion tables of $(\sin x)/x$, described in the preceding review. Values of $(\sin^2 x)/x^2$ are presented to 6D for $x = 0(0.001)25(0.01)100$, together with rounded first differences.

The critical comments on the typography in the companion tables of $(\sin x)/x$ apply equally to these tables.

J. W. W.

49[D].—D. G. MARTIN, *Tables of* $(\sin x)/x$ *to Six Decimal Places*, Report 4934, Atomic Energy Research Establishment, Harwell, England, 115 pp., 29 cm. Available from H. M. Stationery Office. Price 16s.

In an introduction to these extensive tables the author states that they were prepared on an IBM 7030 system to facilitate computation of the scattering of long-wavelength neutrons by defects in irradiated solids. He cites, as a further application, calculations of the diffraction of electrons and X-rays by polyatomic molecules in liquids, gases, and amorphous solids. Pertinent references to such applications are included in a short bibliography, which follows a concluding introductory paragraph describing the use of the tables.

These double-entry tables consist of 6D approximations to $(\sin x)/x$ for $x = 0(0.001)50(0.01)100$, together with first differences. As the author notes, the only comparable table is that of Reynolds [1], which gives 8D values for $x = 0(0.001)$ 49.999, *without* differences.

Unfortunately, the photographic reproduction of the computer sheets here has left much to be desired with respect to legibility; indeed, many entries contain figures that are completely, or almost completely, undecipherable. Apparently little effort was expended in assuring that these useful tables were printed in an acceptable manner.

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1. G. E. REYNOLDS, *Table of* $(\sin x)/x$, Technical Report 57-103, Air Force Cambridge Research Center, Cambridge, Massachusetts, 1957.

50[D, E, H, L, P, X].—KEITH A. SWITZER, *Tables of Roots of Certain Transcendental Equations Arising in Eigenfunction Expansions*, Circular 23, College of Engineering, Washington State University, Pullman, Washington, 1965, 61 pp., 28 cm.

The numerical tables herein were motivated by a need for a more extensive compilation than those already available of eigenvalues associated with boundary-value problems arising in analyses of heat transfer and of mechanical vibrations.

The first table (Table A) consists of 5D values of the first eight roots S_n of the transcendental equation $C = S_n \tan S_n$, corresponding to $C = 0.001(0.001)0.1$ $(0.01)1(0.1)10(1)100(10)400$.

In Table B there appear, to the same precision, the first eight roots of the equation $C + S_n \cot S_n = 0$, for $C = -0.999(0.001)-0.1(0.01)1(0.1)10(1)100(10)400$.

Finally, Table C presents, again to 5D, the first eight roots of the equation $C = S_n J_1(S_n)/J_0(S_n)$, for the same range of the parameter C as in Table A.

The computational scheme followed in evaluating the tabular entries consisted of successive halving of the interval containing the desired root, starting with an increment of 0.1. This algorithm is written in ALGOL in this report, and the author states that the FORTRAN programs actually used to develop the tables may be obtained by communicating with him.