Table II (pp. 106–269) lists 8S values of the same four functions, again with second differences in both arguments, for $\beta = 3(0.02)4$, $x = 2.5(0.1)10$.

Table III (pp. 272–313) lists 8S values of the products of the same four functions by $A(\beta, x) = (2x)^{3/2-\beta}\,\Gamma(\beta)$, with second differences in both arguments, for $\beta = 3(0.05)4$, $x = 10(0.1)15$. In the sub-title on p. 271, for ρ read β.

Table IV (pp. 316–318) lists 9S values of $A(\beta, x)$, without differences, for $\beta = 3(0.05)4$, $x = 10(0.1)15$.

There is also (pp. 320–321) an 8D table of Everett interpolation coefficients, without differences, at interval 0.001.

ALAN FLETCHER

1. J. C. P. MILLER, "Note on the general solution of the confluent hypergeometric equation," *MTAC.*, v. 11, 1957, pp. 97–99.
2. A. ERDÉLYI, W. MAGNUS, F. OBERHETTINGER & F. G. TRICOMI, *Higher Transcendental Functions*, Vol. 1, McGraw-Hill, New York, 1953.
3. LUCY J. SLATER, *Confluent Hypergeometric Functions*, Cambridge University Press, Cambridge, 1960.

27[I, M].—J. E. KILPATRICK, SHIGETOSHI KATSURA & YUJI INOUE, *Tables of Integrals of Products of Bessel Functions*, Rice University, Houston, Texas and Tôhoku University, Sendai, Japan, 1966, ms. of 55 typewritten sheets deposited in the UMT file.

This unpublished report tabulates the integral

$$A \int_0^\infty t^\alpha J_{3/2+n_1}(at) J_{3/2+n_2}(bt) J_{3/2+n_3}(ct) f(t)\, dt$$

for the following cases: (1) $A = 4(2\pi)^{1/2}$, $\alpha = -5/2$, $f(t) = 1$, $a = b = c = 1$' and n_i are nonnegative integers $\leqq 20$ such that $n_1 + n_2 + n_3$ is even; (2) $A = 2\pi$, $\alpha = -4$, $f(t) = J_{3/2+n_4}(t)$, $a = b = c = 1$, and n_i are nonnegative integers $\leqq 10$ such that $n_1 + n_2 + n_3 + n_4$ is even; (3) same as the case (1) except that a, b, and c equal 1 or 2, and $n_i \leqq 16$.

Although the tabulated data are given to 16S (in floating-point form), they are generally not that accurate. A short table of the estimated accuracy (6 to 14S), which depends on the maximum value of the integers n_i, is given on p. 3. For some entries the exact value of the integral, as a rational number or as a rational multiple of $\sqrt{2}$, is also given (pp. 10, 27, and 55).

The integrals were evaluated by transforming them into Mellin-Barnes integrals and then applying the calculus of residues. As a by-product of these calculations the authors include a 16S table of ln $[(-1)^s/(-s)!]$ for $s = -25(1)0$ and of ln $\Gamma(s)$ for $s = -24.5(1)0.5(0.5)45$. A spot check revealed that several entries are accurate to only 14S.

Integrals of the type evaluated in this report have also been considered by this reviewer [1].

Y. L. L.

1. Y. L. LUKE, *Integrals of Bessel Functions*, McGraw-Hill, New York, 1962, pp. 331–332.

28[K, L].—L. S. BARK, L. N. BOL'SHEV, P. I. KUZNETSOV & A. P. CHERENKOV, *Tablitsy raspredeleniia Releia-Raisa* (*Tables of the Rayleigh-Rice Distribution*), Computation Center of the Academy of Sciences of the USSR, Moscow, 1964, xxviii + 246 pp., 27 cm. Price 2.80 rubles.

This volume consists of seven tables. The first five are devoted to data permitting the determination of the function

$$Q(u, v) = \int_u^\infty \rho \exp[-(v^2 + \rho^2)/2] I_0(v\rho)\, d\rho$$

to 6D, by interpolation, for all nonnegative real values of u and v. The remaining two tables represent condensed versions of available tables [1], [2], respectively, of the inverse function $u = u(Q, v)$ and of the function

$$V(K, c) = \frac{1}{c} \int_0^K e^{-B\rho^2/2} I_0(A\rho^2/2)\rho\, d\rho = Q(u, v) - Q(v, u),$$

where $A = (c^{-2} - 1)/2$, $B = (c^{-2} + 1)/2$, $u = K(c^{-1} - 1)/2$, $v = K(c^{-1} + 1)/2$. The authors include them for the sake of completeness.

A 28-page introduction contains comments on the various areas in which $Q(u, v)$ occurs, such as statistics, probability, heat conduction, fluid dynamics, chemical and phase decomposition, and information theory. The contents of the tables and the methods used in their computation are described, followed by a discussion of interpolation procedures, accompanied by illustrative examples. Further details are given in another review of these tables (*Math Reviews*, v. 31, 1966, pp. 750–751, #4142).

Table I consists of 6D values of $Q(u, v)$ and its second central difference for $u = 0(0.02)$ max 7.84, $v = 0(0.02)3$. About 80 per cent of the entire volume is taken up by this table.

Table II contains up to 4D values of an auxiliary function $R(q, \epsilon)$ used to evaluate $Q(u, v)$ for $u \geqq v > 3$. It is tabulated for $q = 0(0.0001)0.001(0.001)$-$0.1(0.01)0.57$, $\epsilon = 0(0.005)0.1$, and is defined by the relations $Q(u, v) = q - R(q, \epsilon)$, $q = 1 - \Phi(w)$, $w = u - v - (2v)^{-1}$, $\epsilon = (1 + v^2)^{-1}$. Here $\Phi(w)$ represents the normal distribution function, which is given to 7D in Table IV for argument y over the range $y = 0(0.001)3(0.005)4(0.01)5$.

Table III gives 7D values of $e^{-x} I_0(x)$ for $x = 0(0.001)3(0.01)15(0.1)24.9$; for $x \geqq 25$ the function $L(y) = \exp(-y^2) I_0(y^{-2})$ is tabulated to 7D for $y = 0(0.001)0.2$, where $L(x^{-1/2}) = e^{-x} I_0(x)$. The authors advocate use of the relation $Q(u, v) = 1 - Q(v, u) + Q(v - u, 0) e^{-uv} I_0(u, v)$, where $Q(v, u)$ is found from Table II if $v > u > 3$ or from Table I if $0 \leqq u \leqq 3$ and $v > 3$.

Table V contains 5D values of $\frac{1}{2}\theta(1 - \theta)$ for $\theta = 0(0.001)1$, which facilitates the application of Newton's quadratic interpolation formula to Tables I and II.

This reviewer has checked numerous values selected at random in Table I. No significant errors were found, although many of the values examined erred by about a unit in the final decimal place. The authors' claim that their Table I is the first of its kind is not correct. They are apparently unaware of other tables of $Q(u, v)$, which are not easily accessible. Prior to 1950 the Rand Corporation and the National Bureau of Standards Institute for Numerical Analysis in Los Angeles jointly prepared such a table. It gives 6D values of $Q(u, v)$ for v extending to 24.9; however, the intervals in the arguments are 0.1 and 0.05, as compared to 0.02 in the present table.

All the values in Tables III, VI, and VII were checked by the reviewer. Table III contains two entries that are in error by a unit in the last place: at $x = 0.039$ *read* 0.9621164, and at $x = 9.69$ *read* 0.1299204. Table VII, which is taken directly from [2] (cited as reference (30) in the introduction) contains a single error: at $k = 1.2, c = 0.4$ *read* 0.7358558. Table VI is free from error. The remaining tables were not checked.

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1. A. R. Di Donato & M. P. Jarnagin, "A method for computing the circular coverage function," *Math. Comp.*, v. 16, 1963, pp. 347–355.
2. H. L. Harter, "Circular error probabilities," *J. Amer. Statist. Assoc.*, v. 55, 1960, pp. 723–731.

29[K, X].—F. N. David, M. G. Kendall & D. E. Barton, *Symmetric Function and Allied Tables*, Cambridge University Press, Cambridge, England, 1966, x + 278 pp., 29 cm. Price $13.50.

This elaborate, attractively printed set of tables is accompanied by a detailed introduction of 63 pages, which constitutes a self-contained treatment of symmetric functions and their applications in statistics.

The senior author has written a preface giving some of the historical developments in combinatorial algebra and outlining the statistical uses of the tables. He also states there that all the tables were calculated anew and were checked against such similar tables as then existed.

The introduction is divided into nine parts, with the respective headings: Symmetric Functions; Moments, Cumulants and k-Functions; Sampling Cumulants of k-Statistics and Moments of Moments; Partitions; Quantities Based on the First n Natural Numbers; "Runs" Distributions; Randomization Distributions; Tables for the Solution of the Exponential Equations $\exp(-a) + ka = 1$, $\exp a - a/(1 - p) = 1$; and Partition Coefficients for the Inversion of Functions.

The 49 major tables in this collection are arranged according to the relevant parts of the introduction, and cross references thereto are given in the table of contents. At the end of the introduction there appears a list of 48 references; this is augmented at the end of the tables by a supplementary bibliography of 59 publications intended for those table-users who might desire to read more deeply in one or more of the areas covered by these tables.

The entries in most of the tables appear exactly as integers; however, Table 5.4.2, Difference of reciprocals of unity (decimals), gives 10D values of $\Delta^n(1/1^r)$ for $r = 1(1)20$, $n = 1(1)20$, while Tables 8.1 and 8.2 give 7D approximations to the roots of the equations $\exp(-a) + ka = 1$ $(0 < k < 1)$ and $\exp(b) - b/(1 - p) = 1$ $(0 < p < 1)$, respectively, for $k = 0.050\,(0.001)1$ and $p = 0(0.001)\text{-}0.999$. The authors illustrate the use of these roots in obtaining approximations to distributions outside the scope and range of the tables associated with the distribution of runs and the randomization distributions.

The multiplicity of tables represented in this book generally precludes their detailed description here or even their enumeration. It must suffice to state this