special functions which gives the location of their definition in the text.

Since the first two authors were part of the team of A. Erdélyi, W. Magnus, F. Oberhettinger and F. G. Tricomi which produced *Higher Transcendental Functions*, Vols. 1, 2, 3, 1953–1955, see *MTAC*, v. 10, 1956, pp. 252–254, and *Tables of Integral Transforms*, Vols. 1, 2, 1954, see *MTAC*, v. 11, 1957, pp. 114–116, it is natural to make some comparisons with the volume under review (call it MOS for short) and the five volumes noted above (call it EMOT for short). Virtually all of the material in MOS will be found in EMOT. The amount of material in MOS which is not in EMOT arises from results which appeared in the literature after 1953. This is a very small portion of the total work. EMOT in addition to being a compendium, sketches proofs of many important results. It also gives a more detailed set of references. This is important to locate related material and to check results for typographical errors and the like. EMOT includes a number of topics relating to the special functions of mathematical physics not found in MOS; for instance, detailed treatment of Lamé functions, Mathieu functions, spheroidal wave functions, and tables of integral transforms. As noted, MOS essentially does not give results on generalizations of the hypergeometric functions, while EMOT does. In the latter, the confluent hypergeometric function is presented in a single chapter. In MOS, two chapters are devoted to the topic. Of course, given results for the Whittaker functions and the formulae which connect them to the ${}_1F_1$, results for the latter are easily obtained and vice-versa. As both notations appear rather widely, the reader will appreciate the dual presentation. Each key equation in EMOT is given a number. This practice is not followed in MOS and consequently reference to specific equations is awkward.

Past experience indicates that in spite of numerous precautions to avoid errors in mathematical text, the avoidance of all is virtually impossible. It seems one can never proofread enough, and the reader should always impose some check on a formula before using it. We have examined a rather sizeable portion of MOS and in view of the vast amount of material covered, the number of essential errata seems rather small.*

Applied workers will find this volume very useful, but I would advise using it as a compendium about the kind of results which are available rather than as a collection of guaranteed data.

Y. L. L.

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* In particular, on pp. 1–3, 13–16, 25–28, 283–286 we found 2, 0, 1, 8 errors out of 32, 19, 28 and 41 entries respectively.

16 [7, 8].—S. H. Khamis, *Tables of the Incomplete Gamma Function Ratio*, Justus von Liebig Verlag, Darmstadt, Germany, 1965, il + 412 pp., 20 cm. Price DM 42.00.

These fundamental tables consist of 10D values (without differences) of the incomplete gamma function ratio or the gamma cumulative distribution function, represented by the integral

$$P(n, x) = \frac{1}{2^n\Gamma(n)} \int_0^x t^{n-1}e^{-t/2}dt\,, \qquad n > 0\,, \qquad x \geqq 0\,.$$

The range covered is $n = 0.05(0.05)10(0.1)20(0.25)70$, $x = 0.0001(0.0001)$ $0.001(0.001)0.01(0.01)1(0.05)6(0.1)16(0.5)66(1)166(2)250$. Occasionally, tabular values are listed for a few additional values of x. On the other hand, tabular values that round to 0 or 1 to 10D have been omitted. The underlying calculations were performed on an IBM 7090 system under the direction of Wilhelm Rudert at the Technische Hochschule Institut für Praktische Mathematik, at Darmstadt.

As the author points out in the introduction to these tables, the tabulated function $P(n, x)$ coincides with the well-known χ^2 cumulative distribution function for $2n$ degrees of freedom whenever $2n$ is a positive integer, and it is related to the Poisson cumulative distribution when n is a positive integer.

Indeed, the calculation of these impressive tables was motivated by a desire to provide more adequate tables for these two statistical distributions. Thus, earlier tables such as those of K. Pearson [1], Hartley & E. S. Pearson [2], Molina [3], and Kitigawa [4] are now superseded by this more extensive tabulation.

The author includes all these tables in his list of 13 references.

The introduction is written in English as well as in German. This section of the book includes a description of the tables; a brief description of the procedure followed in their calculation; a discussion of some of their general uses; a discussion, with illustrative examples, of interpolation (direct and inverse) and extrapolation; and an auxiliary 10D table of $\Gamma(n)$ for $n = 1(0.025)2$.

Attractively bound and printed, these tables constitute a significant contribution to the mathematical and statistical tabular literature.

J. W. W.

1. K. Pearson, *Tables of the Incomplete Γ-Function*, H. M. Stationery Office, London, 1922; reissued by *Biometrika* Office, University College, London, 1934.
2. H. O. Hartley & E. S. Pearson, "Tables of the χ^2-integral and of the cumulative Poisson distribution," *Biometrika*, v. 37, 1950, pp. 313–325.
3. E. C. Molina, *Tables of Poisson's Exponential Limit*, Van Nostrand, New York, 1942.
4. T. Kitigawa, *Tables of Poisson Distributions*, Baifukan, Tokyo, 1951.

17 [7].—Joyce Weil, Tadepalli S. Murty & Desiraju B. Rao, *Zeros of* $J_n(\lambda)Y_n(\eta\lambda) - J_n(\eta\lambda)Y_n(\lambda)$ *and* $J_n'(\lambda)Y_n'(\eta\lambda) - J_n'(\eta\lambda)Y_n'(\lambda)$, ms. of 20 computer sheets deposited in UMT file, also in microfiche section of this issue.

The first ten positive zeros of the two functions specified in the title are tabulated to 5D for $n = 0(1)10$ and $\eta = 0(0.05)0.95$. Details of the underlying computational procedure have been published [1] by the authors. The zeros of the second function were found in the same manner as those of the first, after use was made of the relation $Z_n'(x) = nZ_n(x)/x - Z_{n+1}(x)$, where Z_n represents either J_n or Y_n.

J. W. W.

1. Joyce Weil, Tadepalli S. Murty & Desiraju B. Rao, "Zeros of $J_n(\lambda)Y_n(\eta\lambda) - J_n(\eta\lambda)Y_n(\lambda)$," *Math. Comp.*, v. 21, 1967, pp. 722–727.

18 [7].—Henry E. Fettis & James C. Caslin, *Elliptic Functions for Complex Arguments*, Report ARL 67-0001, Aerospace Research Laboratories, Office of Aerospace Research, United States Air Force, Wright-Patterson Air Force Base, Ohio, January 1967, iv + 404 pp., 28 cm. Copies obtainable from the Defense Documentation Center, Cameron Station, Alexandria, Va. 22314.