$(\Delta - \sin \Delta)/2$. The main table is supplemented by an 8D conversion table of angles in minutes and seconds to degrees.

The same criticisms apply to this set of tables as apply to the other set by this author; namely, numerous rounding errors and partially indistinct figures, though still legible.

Despite these flaws, this compilation should prove especially useful to civil engineers (for whom it is mainly intended) because it is the most extensive of its kind.

J. W. W.

15 [7].—WILHELM MAGNUS, FRITZ OBERHETTINGER & RAJ PAL SONI, *Formulas and Theorems for the Special Functions of Mathematical Physics*, Springer-Verlag, New York, 1966, viii + 508 pp., 24 cm. Price $16.50.

This is a new and enlarged English edition of a previous work by the first two authors which appeared under the title *Formeln und Sätze für die Speziellen Funktionen der Mathematischen Physik*; see *MTAC*, v. 3, 1948, pp. 103–105, 368–369, 522–523. A great deal of the present edition did not appear in the earlier editions. As in the previous editions, there are no proofs. The style of references has been changed. These are restricted to books and monographs and are placed at the end of each pertinent chapter. On occasion, references to papers are given in the text following the associated results. The authors justify this change in that, 20 years ago, much of the material was scattered over numerous single contributions, while in recent times, much of the material has been included in books with quite extensive bibliographies.

The volume covers a vast amount of ground as evidenced by the description of its contents which follows. Chapter I is devoted to the gamma function and related functions. The hypergeometric function is the subject of Chapter II. Nearly all the results are for the ${}_2F_1$—the Gaussian hypergeometric function. Generalized hypergeometric series are touched upon in two pages. There are no results on Meijer's G-function and other generalizations of the ${}_2F_1$. Bessel functions and Legendre functions are detailed in Chapters III and IV respectively. Chapter V takes up orthogonal polynomials. Chapter VI presents the confluent hypergeometric function—the ${}_1F_1$, and Chapter VII deals with Whittaker functions which are also confluent hypergeometric functions. The next two chapters deal with special cases of confluent hypergeometric functions, namely, parabolic cylinder functions (Chapter VIII) and the incomplete gamma functions and related functions (Chapter IX). Chapter X presents elliptic integrals, theta functions and elliptic functions. Integral transforms is the subject of Chapter XI. Here examples are given for Fourier cosine, sine and exponential transforms, and the transforms associated with the names of Laplace, Mellin, Hankel, Lebedev, Mehler and Gauss. This chapter contains a section giving closed-form solutions for integral equations of the form $f(s) = \int_a^b K(s, t)y(t)dt$, where a and b are finite, and $K(s, t)$ has an integrable singularity in the range of integration. An appendix to the chapter gives representations of some elementary functions in the form of Fourier series, partial fractions and infinite products. Chapter XII deals with transformations of systems of coordinates and their application to numerous partial differential equations of mathematical physics. A list of special symbols is provided. There is also a list of 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

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