The format is identical with that used in other factor tables by the author (see the preceding review).

The explanatory text (in Italian) consists of four printed pages prepared by L. Poletti in 1921 to accompany the printed fascicles constituting his "Neocribrum."

Cumulative counts of the primes belonging to each member of the reduced residue class modulo 30 are shown on each page. The total number of primes in the table is given as 5005.

Dr. Beeger compiled the first fascicle between 1 January 1928 and 4 May 1929; the remainder of this unique table was completed on 1 January 1933.

Both this manuscript and the one described in the preceding review are listed in the *Guide* [1] of D. H. Lehmer.

J. W. W.

1. D. H. Lehmer, *Guide to Tables in the Theory of Numbers*, National Research Council Bulletin 105, National Academy of Sciences, Washington, D. C., 1941 (reprinted 1961), pp. 39 and 86.

70[L, M].—L. N. Osipova & S. A. Tumarkin, *Tables for the Computation of Toroidal Shells*, P. Noordhoff, Ltd., Groningen, The Netherlands, 1965, 126 pp., 27 cm. Price $7.00.

This is a translation by Morris D. Friedman of *Tablit͡sy dlya rasheta toroobraznykh obolochek*, which was published by Akad Nauk SSSR in 1963 and previously reviewed in this journal (*Math. Comp.*, v. 18, 1964, pp. 677–678, RMT **94**). The highly decorative dust jacket of this translation shows a sea shell, which the publisher presumably associates with the subject matter.

J. W. W.

71[L, M, K].—I: F. D. Murnaghan & J. W. Wrench, Jr., *The Converging Factor for the Exponential Integral*, DTMB Report 1535, David Taylor Model Basin, Washington, 1963, ii + 103 pp., 26 cm.

II: F. D. Murnaghan, *Evaluation of the Probability Integral to High Precision*, DTMB Report 1861, David Taylor Model Basin, Washington, 1965, ii + 128 pp., 26 cm.

These two reports, herein referred to as I and II, concern the calculation, to high precision, of converging factors (c.f.'s) for the following functions:

$$\text{(A) } Ei(x) = \int_{-\infty}^{x} (e^t/t)\, dt, \qquad \text{(B) } -Ei(-x) = \int_{x}^{\infty} (e^{-t}/t)\, dt,$$

$$\text{(C) } T(x^{1/2}) = \frac{1}{2}\int_{x}^{\infty} e^{-t} t^{-1/2}\, dt.$$

Functions (A) and (B), the exponential integrals of positive and negative arguments, are treated in I; function (C), which is related to the probability integral, in II.

For a function $f(x)$ with asymptotic expansion $\sum_{r=0}^{\infty} a_r x^{-r}$, the c.f., $C_n(x)$ is given by

$$f(x) = \sum_{r=0}^{n-1} a_r x^{-r} + a_n x^{-n} C_n(x).$$

The c.f.'s $C_n(n + 1)$ and $C_n(n + \frac{1}{2})$ are tabulated to 45D in Case (A) and to 48–50D in Case (B), for $n = 4$ or 5(1)20. In Case (C), $C_n(n + \frac{1}{2})$ and $C_n(n)$ are given to 63D for $n = 0(1)64$ and $n = 2(1)64$, respectively. In addition, auxiliary tables are presented which permit the evaluation to comparable accuracy of a c.f. when the argument is not an integer or half an integer. These take the form of tables of coefficients in the Taylor series for $C_n(n + 1 + h)$ (Cases (A) and (B)) or $C_n(n + \frac{1}{2} + h)$ (Case (C)). The same series, whose coefficients can be generated by recurrence, were in fact used to compute the key values $C_n(n + 1)$ (or $C_n(n + \frac{1}{2})$) for successively decreasing integer values of n. We note that when x is small a very large number of terms is needed; thus in Case (C), 326 terms in the expansion of $C_1(1.5 + h)$ are significant to 63D. A variant of the method, in which this difficulty is avoided by use of a variable interval in x, has been described by the reviewer [2] and applied to Case (B).

A starting value $C_n(n + 1)$ or $C_n(n + \frac{1}{2})$, for some large n, can be calculated from an expansion in inverse powers of n. The so-called Airey asymptotic series, applicable in Cases (B) and (C), is extended in II from the 23 terms listed by Airey [1] to as many as 67 terms. Various generalizations are also treated. In Case (A), 21 coefficients (of which only 4 were available previously) are derived by ingenious use of recurrence relations. As a by-product, 20 coefficients in Stirling's asymptotic series for the Gamma function are also obtained, 13 more than had previously been published. (The computational utility of the extended Stirling's series in the evaluation of factorials of integers has been noted in a recent review [3].) Furthermore, in I function (A) is tabulated to 44S for $x = 6(1)20$, and function (B) to 45D for $x = 6(1)21$.

These reports undoubtedly constitute an important contribution to the art of calculating special functions to high precision.

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1. J. R. Airey, "The 'converging factor' in asymptotic series and the calculation of Bessel, Laguerre and other functions," *Philos. Mag.*, (7), v. 24, 1937, pp. 521–552.
2. G. F. Miller, *Tables of Generalized Exponential Integrals*, Math. Tab. Nat. Phys. Lab., v. 3, 1960. (See *Math. Comp.*, v. 15, 1961, pp. 213–214, RMT **49.**)
3. See RMT **40,** *Math. Comp.*, v. 18, 1964, p. 326.

72[P].—James L. Marshall, *Introduction to Signal Theory*, International Textbook Co., Scranton, Pa., 1965, xv + 254 p., 24 cm. Price $9.00.

Professor Marshall's well-written monograph on the transformation of signals is intended to be an elementary textbook for advanced undergraduate students in the physical and engineering sciences or in applied mathematics. Following tradition, prime emphasis is given to electric systems rather than to nuclear, mechanical, chemical, or thermal processes. Graduated problems, together with some solutions, accompany each of the ten nonintroductory chapters of this handy book.

The author gives the rudiments of such standard topics as polynomial and trigonometric approximations to wave forms, use of Fourier and LaPlace transforms for the analysis of linear systems, complex Fourier series, reciprocal spreading relations, Parseval's theorem, and partial-fraction expansions of rational functions. A novel