can obscure the importance of the volume, which cannot fail to be found very useful. Only in the case of Part IV has the reviewer heard of any similar or related table of comparable scope, namely the table of the Jacobian zeta function by Fox and McNamee [2].

A. F.

1. G. W. Spenceley & R. M. Spenceley, *Smithsonian Elliptic Functions Tables*, Washington, 1947. See *MTAC*, v. 3, 1948, p. 89–92.

2. E. N. Fox & J. McNamee, "The two-dimensional problem of seepage into a cofferdam," *Phil. Mag.*, s. 7, v. 39, 1948, p. 165–203. See *MTAC*, v. 3, 1948, p. 246, 252, also v. 7, 1953, p. 190.

19[L].—L. Lewin, *Dilogarithms and Associated Functions*, MacDonald & Co. Ltd., London, 1958, xvi + 353 p., 21 cm. Price 65 Shillings.

The functions treated here are for the most part special cases of the Lerch zeta function, which can be defined by the series $\sum_{n=0}^{\infty} z^n/(n+b)^s$, $|z| < 1$, b not a negative integer or zero. To describe the text and tables, it is convenient to give some notation. Let $z = x + iy$, where x and y are real and $i = \sqrt{-1}$. Then

$$(1)\qquad Li_2(z) = -\int_0^z t^{-1}\ln(1-t)\,dt, \qquad Li_n(z) = \int_0^z t^{-1}Li_{n-1}(t)\,dt;$$

$$(2)\qquad Ti_2(x,a) = \int_0^x (t+a)^{-1}\arctan t\,dt, \qquad Ti_2(x) \equiv Ti_2(x,0), \qquad Li_n(iy) = 2^{-n}Li_n(-y^2) + iTi_n(y);$$

$$(3)\qquad Cl_2(\theta) = -\int_0^\theta \ln\left(2\sin\frac{1}{2}t\right)dt, \qquad Cl_{2n}(\theta) = \int_0^\theta Cl_{2n-1}(t)\,dt, \qquad Cl_{2n+1}(\theta) = Li_{2n+1}(1) - \int_0^\theta Cl_{2n}(z)\,dt;$$

$$(4)\qquad Gl_{2n}(\theta) + iCl_{2n}(\theta) = \sum_{k=1}^{\infty}\frac{e^{ik\theta}}{k^{2n}}, \qquad Cl_{2n+1}(\theta) + iGl_{2n+1}(\theta) = \sum_{k=1}^{\infty}\frac{e^{ik\theta}}{k^{2n+1}}.$$

The function $Gl_n(\theta)$ is a polynomial in θ of degree n.

Chapter I deals with the dilogarithm function $Li_2(x)$. The function $Ti_2(x)$ is considered in Chapter II; $Ti_2(x, a)$ in Chapter III. $Cl_2(\theta)$, θ real and positive, is Clausen's integral, and is studied in Chapter IV. Chapters V and VI take up $Li_n(z)$ for $n = 2$ and 3, respectively, and the analysis of this function for general values of n is the subject of Chapter VII. The general relations in (3) and (4) are also studied in this chapter. Chapter VIII deals with series expansions and integrals which can be expressed in terms of the basic functions in (1)–(4). Chapter IX is very useful. It is a compendium of results derived in the previous chapters. It also contains a survey of mathematical tables.

A description of the tabular material in this volume follows.

Table I.	$Li_n(x)$,	$n = 2(1)5$	
		$x = 0(.01)1.0$,	5D
Table II.	$Ti_n(y)$,	$n = 2(1)5$	
		$y = 0(.01)1.0$,	5D

Table III. $Cl_n(\frac{1}{2}\pi\alpha)$, $n = 2(1)5$
$\alpha = 0(.01)2.0$, 5D

Table IV. $Gl_n(\frac{1}{2}\pi\alpha)$, $n = 2(1)5$
$\alpha = 0(.01)2.0$, 5D

Table V. $Li_2(r, \theta)$ = real part of $Li_2(z)$, $z = re^{i\theta}$.
$r = 0(.01)1.0$, $\theta = 0(5°)180°$, 6D.

Throughout Table V the symbol x should be replaced by r. No information is supplied for interpolating in the tables.

The volume is replete with striking and curious results, some of which have been rediscovered a number of times, and the book should prevent future duplication of effort. There is a well-detailed table of contents and index. An extensive bibliography is also given.

Y.L.L.

20[L].—Vera I. Pagurova, *Tablitsy integro-eksponentsial'noĭ funktsii*

$$E_\nu(x) = \int_1^\infty e^{-xu}u^{-\nu}du$$

$\left(\textit{Tables of the Exponential Integral Function } E_\nu(x) = \int_1^\infty e^{-xu}u^{-\nu}\,du\right)$, Akad. Nauk SSSR, Vychislitel'nyy Tsentr, Moscow, 1959, xii + 152 p., 27 cm. Price 9.60 rubles.

This volume from the Computational Center of the Academy of Sciences of the USSR deals with well-known integrals which depend on the exponential integral when ν is a positive integer n. There are three tables. Table I (pages 3–52) is reproduced, with acknowledgment, from the NBS table calculated for a report of 1946 by G. Placzek and Gertrude Blanch (see *MTAC*, v. 2, 1947, p. 272) and more widely disseminated in 1954 in [1]. The table gives $E_n(x)$ to 7 or more decimals for $n = 0(1)20$, $x = 0(.01)2(.1)10$, and also 7-decimal values of the auxiliary functions $E_2(x) - x \ln x$ and $E_3(x) + \frac{1}{2}x^2 \ln x$ for $x = 0(.01).5$ and $x = 0(.01).1$, respectively; these last two ranges need transposing in the sub-title on page 1.

The other two tables are original. It is not stated what machines were used in computing them. Table II (pages 54–62) gives $e^xE_n(x)$, $n = 2(1)10$ to 7 decimals (6 figures) and e^x to 7 figures, all for $x = 10(.1)20$. Table III (pages 64–151) gives $e^xE_\nu(x)$, $\nu = 0(.1)1$ to 6 or 7 figures and e^x to 7 figures, all for $x = .01(.01)7(.05)12(.1)20$. No table gives differences.

A short introduction contains mathematical formulas and recommendations about interpolation. For integral n, the formula $d^rE_n(x)/dx^r = (-1)^rE_{n-r}(x)$ enables the tabulated function values themselves to be used for interpolation by means of Taylor's series. A table is given showing the accuracy attainable in interpolating various functions linearly or with 3 or 4 Taylor terms or with 3, 4, or 5 Lagrange terms.

A. F.

1. Nat. Bur. Standards, Appl. Math. Ser. No. 37, *Tables of Functions and of Zeroes of Functions*, U. S. Government Printing Office, Washington, D. C., 1954, p. 57-111. See RMT 104, *MTAC*, v. 10, 1956, p. 249.