230.—K. Hayashi, *Tafeln der Besselshen, Theta-, Kugel- und anderer Funktionen*, Berlin, 1930.

Table X of 12D values of square roots contains the following errata. The starred entries have been noted by Fukuoka. There are 27 other errors in the 11th and 12th places.

k^2	*For*	*Read*
0,217	0,46583 15146 06	0,46583 25879 54
0,289	0,53758 72032 29	0,53758 72022 29*
0.498	0,70554 94312 95	0,70569 11505 75*
0,543	0,73688 53302 92	0,73688 53370 78*
0.699	0,83606 21926 13	0,83606 21986 43
0,787	0,88713 02040 49	0,88713 02046 49
0,800	0,89442 70910 00	0,89442 71910 00
0,845	0,91923 88101 03	0,91923 88155 43
0,917	0,95760 11173 76	0,95760 11695 90
2,53	1,59057 73720 59	1,59059 73720 59
2,90	1,70293 86395 93	1,70293 86365 93
3,17	1,78044 93812 80	1,78044 93814 76
6,40	2,52982 20281 35	2,52982 21281 35
7,36	2,71293 18932 50	2,71293 19932 50
8,55	2,92403 83031 93	2,92403 83034 43
8,71	2,94127 09126 75	2,95127 09126 75
8,72	2,94296 46120 47	2,95296 46120 47
8.73	2,94465 73405 39	2,95465 73405 39
8.74	2,94634 90998 19	2,95634 90998 19
8,75	2,94803 98915 50	2,95803 98915 50
8.80	2,96647 93848 38	2,96647 93948 38*
8.98	2,99666 28127 54	2,99666 48127 54*
9,31	3,05122 92504 78	3,05122 92604 87
9,51	3,08382 87889 22	3,08382 87890 22
14,1	3,75499 66666 56	3,75499 66711 04
14,3	3,78153 40798 26	3,78153 40802 38

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UNPUBLISHED MATHEMATICAL TABLES

159[A].—National Physical Laboratory (Great Britain), *Tables of Binomial Coefficients*. 20 quarto pages. Deposited with the Royal Society (no. 15).

The Binomial coefficients $C_n = \binom{x}{n}$ are given to six decimal places for $x = 0(.001)1$; $n = 2(1)8$. These are coefficients in the Newton-Gregory formula for interpolation with forward differences.

160[D,L].—INSTITUT DE MATHÉMATIQUES APPLIQUÉES, École Polytechnique de l'Université de Lausanne (Switzerland). Manuscript in possession of the author.

Table of the function $F(x) = \sin x/x$ and of its derivatives $d^nF(x)/dx^n$ for $x = 0(.01)4$, $n = 0(2)16$, 10D.

This table has been obtained by subtabulation from another table calculated on the base of series for $x = 0(.1)4.3$. A National accounting machine (class 3000) was used for the subtabulation. The error in the original tables does not exceed .55 units of the last order.

CH. BLANC

161[D].—SUBMARINE SIGNAL DIVISION OF THE RAYTHEON MANUFACTURING COMPANY, Transducer Department, Boston, *Sines and Cosines of the Decimal Circle.* 10 lithographed octavo pages of tables. Deposited with the ROYAL SOCIETY (no. 2).

This table gives $\sin \alpha$ and $\cos \alpha$ for $\alpha/2\pi = 0(.001)1$ to 5D when the entry is less than 1/6 and to 4D otherwise.

162[E].—A. YOUNG & T. MURPHY, "Tables of the Langevin Function and its inverse," 6 leaves. Deposited in UMT File, also in the depository of the ROYAL SOCIETY (no. 21).

The function $L(x) = \coth x - x^{-1}$ is tabulated for $x = 0(.01)7.50$ to 6D.

A comparison of this table with previously existing tables reveals errata in the previous tables which will be found in MTE **228**.

163[G].—E. M. IBRAHIM, *Tables for the plethysm of S-functions.* Deposited with the ROYAL SOCIETY (no. 1).

This comprises about two dozen large sheets of manuscript. The purpose of these specialized algebraic tables is described by the author in *Quar. Jn. Math.* (Oxford Series), Ser. 2, v. 3, 1952, p. 50–55. They relate to a special type of multiplication connected with symmetric functions and extend to partitions of a total degree of 18.

164[I,L].—C. W. JONES, J. C. P. MILLER, J. F. C. CONN, & R. C. PANKHURST, *Tables of Chebyshev Polynomials.* 2 typed double-foolscap sheets. Deposited with the ROYAL SOCIETY (no. 7).

These tables give exact values of $C_n(x) = 2\cos(n \cos^{-1} \frac{1}{2}x)$ for $x = 0(.02)2$ and $n = 1(1)10$. For $n = 8, 9, 10$ they extend and complete the curtailed values given in the table described in RMT **381**, *MTAC*, v. 2, p. 262. [See also RMT **1103**.]

165[L].—ADMIRALTY RESEARCH LABORATORY, *Solution of the Equation $(y'')^2 = yy'$ and two other Equations.* 3 foolscap manuscript pages of tables and 4 pages of description. Deposited with the ROYAL SOCIETY (no. 9).

The solution of the equation $(y'')^2 = yy'$ for which $y = 0$, $y' = 1$ when $x = 0$, is tabulated to 6 decimals for $x = 0(.05).5(.1)6$ and facilities are provided for interpolation.

The integral

$$2\pi^{-\frac{1}{2}}\beta^{-2}\exp(-\rho^2)\int_0^\beta \epsilon I_0(2\rho\epsilon)\exp(-\epsilon^2)d\epsilon$$

is tabulated to 4 decimals for the range $\beta = 0(.25)4$, $\rho = 0(.25)5$. Interpolation is possible in this table, but no differences are provided.

The root x of the equation $u \sin x - \cos x + e^{-ux} = 0$ that lies between π and 2π is tabulated to 4 figures for $u = .1(.01).3(.02)2$ and $u^{\frac{1}{2}} = 0(.02).5$. Interpolation is linear.

166[L].—M. S. CORRINGTON, *Tables of Fresnel integrals, modified Fresnel integrals, the probability integral, and Dawson's integral.* Radio Corporation of America, R.C.A. Victor Division. 25 quarto pages. Deposited with the ROYAL SOCIETY (no. 4).

These tables give values for $x = \frac{1}{2}\pi u^2 = 0(.001).02(.01)2$ of the functions

$$C(u) = \tfrac{1}{2}\int_0^x J_{-\frac{1}{2}}(t)dt = \int_0^u \cos(\tfrac{1}{2}\pi t^2)dt$$

$$S(u) = \tfrac{1}{2}\int_0^x J_{\frac{1}{2}}(t)dt = \int_0^u \sin(\tfrac{1}{2}\pi t^2)dt$$

$$Ch(u) = \tfrac{1}{2}\int_0^x I_{-\frac{1}{2}}(t)dt = \int_0^u \cosh(\tfrac{1}{2}\pi t^2)dt$$

$$Sh(u) = \tfrac{1}{2}\int_0^x I_{\frac{1}{2}}(t)dt = \int_0^u \sinh(\tfrac{1}{2}\pi t^2)dt$$

$$H(x^{\frac{1}{2}}) = \frac{\sqrt{2}}{\pi}\int_0^x K_{\pm\frac{1}{2}}(t)dt = \int_0^x \frac{e^{-t}}{\sqrt{\pi t}}dt = \frac{2}{\sqrt{\pi}}\int_0^{x^{\frac{1}{2}}} e^{-t^2}\,dt$$

and

$$D(x^{\frac{1}{2}}) = \frac{\sqrt{2}}{i\pi}\int_0^{-x} K_{\pm\frac{1}{2}}(t)dt = \int_0^x \frac{e^{t}}{\sqrt{\pi t}}dt = \frac{2}{\sqrt{\pi}}\int_0^{x^{\frac{1}{2}}} e^{t^2}\,dt$$

Two versions of the tables are given, one to 5D and another to 8D, with an error up to 2 final units.

167[L].—C. MACK & M. CASTLE, *Tables of*

$$\int_0^a I_0(x)dx \text{ and } \int_a^\infty K_0(x)dx.$$

Deposited with the ROYAL SOCIETY (no. 6).

The integrals have been tabulated to 9D for the range of argument $a = 0(.02)2(.1)4$. A brief description of the method of computation is given and also of the extent to which the tables are interpolable.

168[L].—NATIONAL PHYSICAL LABORATORY, *Tables of the complex Jacobian zeta function.* 9 foolscap pages. Deposited with the ROYAL SOCIETY (no. 14).

The Jacobian Zeta function Z_n of modulus $k = \sin\alpha$ can be found from the tabulated function f_1 by the relation

$$Z_n(K\psi_1 + iK'\phi,k) = f_1(\psi_1,\phi,\alpha) + if_2(\psi_1,\phi,\alpha) - \tfrac{1}{2}i\pi\phi/K$$
$$f_2(\psi_1,\phi,\alpha) = f_1(1 - \psi_1, 1 - \phi, \tfrac{1}{2}\pi - \alpha)$$

where K, K' are the complete elliptic integrals of modulus k. f_1 to 3 significant figures is given for $\psi_1 = 0(.1)1$; $\phi = 0(.1)1$; $\alpha = 5°(5°)85°$. No provision is made for interpolation.

169[L].—NATIONAL PHYSICAL LABORATORY, *Integrals of Bessel Functions.* 2 quarto pages. Deposited with the ROYAL SOCIETY (no. 17).

10D values of $\int_0^x J_0(t)dt$ and $\int_0^x Y_0(t)dt$ for $x = 0(.5)50$. No provision is made for interpolation.

170[L].—NATIONAL PHYSICAL LABORATORY, *Table of*

$$\int_0^{2\pi} J_1^2\ (2k \sin \tfrac{1}{2}\theta) \cos^2 \tfrac{1}{2}\theta\, d\theta.$$

1 quarto page. Deposited with the ROYAL SOCIETY (no. 18).

4D values are given for $k = 0(.1)10$. The table is interpolable using second differences, but no differences are given.

AUTOMATIC COMPUTING MACHINERY

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TECHNICAL DEVELOPMENTS

A SPECIAL PURPOSE DIGITAL COMPUTER

1. **Design considerations.** The design considerations of a special purpose computer for the solution of a large number of simultaneous linear, algebraic equations depend not only on the number of equations with which the computer must deal but also upon the properties of the matrix of the equations, the time to be allowed for computation and the required accuracy of the solution. In this particular case, it was estimated that up to 1200 equations might be expected and the arbitrary time of one day was allowed for computation, after the problem had been set up on the computer. An accuracy of one part in 100 was demanded in the solutions.

A set of simultaneous equations can be represented in the matrix notation as

$$AX = C \tag{1}$$