for $m = 0(1)4$, n, $\nu = 0(1)5$, and $ka = 0(.25)5$, where $J_p(\xi)$ is the Bessel function of the first kind of order p. The function $X^m_{\nu s}$ is defined in terms of the equations

$$\sum_{\nu=0}^{\infty} G^m_{\nu n} X^m_{\nu s} = \delta_{sn}.$$

Tables for $X^m_{n\nu}$ for $n = 0(1)4$, $\nu = 0(1)2, 5$, $m = 0(1)4$, over the same range of ξ, are also included.

In addition, tables are given which are useful for the calculation of the field distribution at large distances, and tables are given which enable one to determine the current distribution on the plate and the electric field distribution on the whole.

All table entries are given to four decimal places. However, no indication is given as to the numerical method of evaluating the table entries nor as to their actual accuracy.

A. H. T.

16[P].—CHARLES J. THORNE, *Temperature Tables: Part 1. One-Layer Plate, One-Space Variable, Linear*, NAVORD Report 5562, U. S. Naval Ordnance Test Station, California, 1957, iv + 711 p., 28 cm.

This table is concerned with listing the solution of the heat conduction equation in a plate of finite thickness, with heat transfer at both faces. In mathematical form

$$\begin{aligned}
U_{XX} &= kU_t && 0 < X < L, \quad t > 0\\
KU_X &= -h_i(U_i - U) && X = 0, \quad t > 0\\
KU_X &= -h_0(U - U_0) && X = L, \quad t > 0\\
U &= U_0 && t = 0, \quad 0 < X < L
\end{aligned}$$

where the conductivity K, density ρ, specific heat c, diffusivity $h = c\rho/K$, heat transfer coefficients h_i and h_0, and stagnation temperatures U_i and U_0 are assumed to be constant. L is the plate thickness, x is the distance, and t is the time. For the tables a dimensionless system of variables is adopted, i.e., $x = X/L$, $kL^2\tau = t$, $u = (U - U_0)(U_i - U_0)$, $\alpha_0 = h_0L/K$, $\alpha_i = h_iL/K$. Then the above problem becomes

$$\begin{aligned}
u_{xx} &= u_\tau && 0 < x < 1, \quad \tau > 0\\
u_x &= -\alpha_i(1 - u) && x = 0, \quad \tau > 0\\
u_x &= -\alpha_0 u && x = 1, \quad \tau > 0\\
u &= 0 && \tau = 0, \quad 0 < x < 1
\end{aligned}$$

The analytical solution of this problem is

$$u(x, \tau) = 1 - \frac{\alpha_0(1 + \alpha_i x)}{\alpha_0 + \alpha_i + \alpha_0\alpha_i} + 2 \sum_{n=1}^{\infty} \frac{e^{-\beta_n^2\tau}}{\beta_n D'(\beta_n)}$$
$$\cdot \{\alpha_i[\beta_n \sin \beta_n - \alpha_0 \cos \beta_n] \sin \beta_n x + \alpha_i[\beta_n \cos \beta_n + \alpha_0 \sin \beta_n] \cos \beta_n x\},$$

where

$$D'(\beta) = -\beta(2 + \alpha_0 + \alpha_i) \sin \beta + (-\beta^2 + \alpha_0 + \alpha_i + \alpha_0\alpha_i) \cos \beta,$$

and the β_n's are the positive roots of

$$(\alpha_0\alpha_i - \beta^2) \sin \beta + \beta(\alpha_0 + \alpha_i) \cos \beta = 0.$$

The table gives the dimensionless temperature u, where $0 < u < 1$, for the following ranges of parameters

$x = 0(.01).02(.03).05(.05).3(.1).7(.05).95(.03).98(.01)1$

$\tau = .001(.0005).002(.001).008(.002).01(.01).08(.02).1(.1).8(.2)1(1)8(2)10(10)$
$80(20)100(100)800(200)1000$

$\alpha_i = .001, .002, .004, .006, .01, .02, .04, .06, .1, .2, .4, .6, 1, 2, 4, 6, 10, 20, 40, 60, 100, 200, 400, 600, 1000.$

$\alpha_0 = 0, .001, .004, .01, .04, .1, .4, 1, 4, 10, 40, 100, 400, 1000.$

The tabular entries are given to five figures, with better than three of the figures being accurate. For the most part, the error appears to be one or two units in the fifth figure.

The table should be very useful to those people who are engaged in design work involving heat transfer, as, for example, rocket nozzle design. The introduction also contains a generalization of the heat conduction problem defined above which can be solved by means of the tables.

The tabular entries are printed with reasonable clarity. There are, however, a few obvious misprints in the introduction.

R. C. ROBERTS

Naval Ordnance Laboratory
Silver Spring, Maryland

17[S].—G. A. BARTHOLOMEW & L. A. HIGGS, *Compilation of Thermal Neutron Capture Gamma Rays*, Report AECL No. 669, 1958, 146 p., 27 cm. Available from Scientific Document Distribution Office, Atomic Energy of Canada Limited, Chalk River, Ontario, Canada. Price $2.50.

This report presents a compilation of energy, absolute intensities, and spectral distribution of gamma rays produced by capture of thermal neutrons, together with a complete bibliography of information on this subject through June 1, 1958. The results obtained from measurements at the Chalk River Laboratories over several years using the pair spectrometer have been reviewed. These results have been modified where necessary such that all intensity determinations are presented on a uniform basis. The accuracy of pair spectrometer intensity measurements is discussed.

Included in the tables are the energies and intensities (photons per hundred captures) of resolved gamma rays obtained from experiments in which absolute intensities were determined. References to other data not tabulated is also given. Where an appreciable portion of the gamma ray spectrum is unresolved, a spectral distribution curve is given. Most of the curves plot the number of gamma rays per capture per Mev as a function of energy. Results published by the Moscow group are included. A rough measure of accuracy and completeness of the results is given with each tabulation and with most of the curves.

K. SHURE

Westinghouse Electric Corporation
Bettis Atomic Power Division
Pittsburgh, Pennsylvania