**14 [L].**—F. M. Arscott & I. M. Khabaza, *Tables of Lamé Polynomials*, The Macmillan Company, New York, 1962, xxviii + 526 p., 27 cm. Price $20.00.

Consider the Lamé equation

$$\frac{d^2w}{dz^2} + \{h - n(n+1)k^2sn^2z\}w = 0 \tag{1}$$

where $sn\ z = sn(z, k)$ is the Jacobian sine-amplitude (elliptic) function. If $sn\ z = t$, we get

$$(1 - t^2)(1 - k^2t^2)\frac{d^2w}{dt^2} - t(1 + k^2 - 2k^2t^2)\frac{dw}{dt} + \{h - n(n+1)k^2t^2\}w = 0 \tag{2}$$

Equation (1) may be transformed into four other forms like (2) by use of the substitutions $sn^2\ z = \zeta$, $k\ sn\ z = u$, $cn\ z = x$, and $dn\ z = y$. A trigonometric form results from putting $am\ z = v$ in (1). If in (1) we put $sn^2\ z = \zeta$ and then $\zeta = P(\xi)$, where $P(\xi)$ is the Weierstrass elliptic function, we then get the "Weierstrassian" form. Each form possesses finite solutions only when $n$ is a positive integer and $h$ is one of $(2n + 1)$ eigenvalues. For each form, these solutions fall into eight types. For example, for (1), they are of the form

$$w = sn^\rho\ z\ cn^\sigma\ z\ dn^\tau\ z\ F(sn^2\ z) \tag{3}$$

where $\rho, \sigma, \tau = 0$ or 1 and $F(sn^2\ z)$ is a polynomial in $sn^2\ z$ of degree $\frac{1}{2}(n - \rho - \sigma - \tau)$.

Let $N = n/2$ or $(n - 1)/2$, according as $n$ is even or odd. For $N = 1(1)15$ and $C = k^2 = 0.1(0.1)0.9$, this volume gives to 6S the $(2n + 1)$ values of $h$ and the corresponding coefficients of the polynomial $F$ for each type. Similar tables for $N = 16(1)30$ are deposited with the Royal Society, in the Depository of Unpublished Mathematical Tables, as Reference 78. There are a few other scattered tables in the literature, but this appears to be the first systematic tabulation attempted.

An introduction clearly presents the basic properties of the functions, correspondence with other notations, and the method of computation. The computations were done on the Ferranti MERCURY computer, and the computer program is given. The tables were printed by photo offset from the computer output. The entries are legible, but the type is not pleasing to the eye.

Y. L. L.

**15 [L].**—G. Blanch & Donald S. Clemm, *Tables Relating to the Radial Mathieu Functions, Vol. 1: Functions of the First Kind*, U.S. Government Printing Office, Washington 25, D.C., 1962, xxiv + 383 p., 27 cm. Price $3.50.

This table provides numerical solutions of the differential equation

$$\frac{d^2f}{dz^2} - (a(q) - 2q\cosh 2z)f = 0 \tag{1}$$

where the $a(q)$ are the eigenvalues corresponding to which

$$\frac{d^2f}{dz^2} + (a(q) - 2q\cos 2z)f = 0 \tag{2}$$