° W. Patz, *Tafel der regelmässig Kettenbrüche für Quadratwurzeln aus den natürlichen Zahlen* 1–10000. Leipzig, 1941. Errata were found in these tables as follows:

Seeling: *Insert* 3802; *delete* 4717.

Patz: The diamond sign is printed one line too low at 6938, 6949, 6953, 9698.

N. G. W. H. Beeger

Nicolaas Wirsenkade 10,
Amsterdam

UNPUBLISHED MATHEMATICAL TABLES

References have been made to unpublished tables in RMT **279** (Beeger); MTE **81** (Goodwyn); N **52** (NYMTP); QR **23** (Hillman & Salzer).

42[F].—N. G. W. H. Beeger, *Second List of Additions* to *Binomial Factorisations*, Manuscript table of 5 p. in possession of D. H. L.

The title refers to A. J. C. Cunningham's extensive *Binomial Factorisations* in 9 v., London, 1923–1929. The first list of additions was prepared by Beeger in 1933 and published under the title *Supplement to Binomial Factorisations by the late Lt.-Col. Allan J. C. Cunningham, R.E. vol. I to IX*, by the London Mathematical Society, London, 1933. The present second list gives the factorizations of 81 numbers left unfactored in v. 1 and v. 2 and the 1933 Supplement.

D. H. L.

43[F].—Hansraj Gupta, Three ms. tables in possession of the author at Government College, Hoshiarpur, India.

(a) Tables of partitions giving the values of $p(n, m)$, the number of partitions of n into exactly m non-zero summands for values of $n \leqslant 200$. This table gives also the number of partitions of n in which the largest part is exactly m. [Compare *MTAC*, v. 1, p. 313–314.—Ed.]

(b) Tables of distributions giving the values of $u(m, a)$, the number of ways in which m different particles can be accommodated in exactly a similar cells. $m \leqslant 50$.

(c) The number of lattice points on the sphere $x^2 + y^2 + z^2 = n$, for values of $n \leqslant 10000$.

H. Gupta

44[F].—H. K. Hammer, *Tables of Periods of Reciprocals of Primes in Various Number Systems*. Typed mss. prepared by, and in possession of the author at 21 West Street, New York City 6. There are copies of these mss. in the Library of Brown University. 11 leaves + 35 leaves. 21 × 29.5 cm.

Each of the first 11 leaves is devoted to the periods of $1/p$, $p < 100$, in each one of the number systems with base 2(1)12. The number of integers in each period, t, varies from 1 to 96. The next 35 leaves contain the periods $1/p$, $p < 1000$ in the decimal notation; t varies from 1 to 982.

H. K. Hammer

Editorial Note: All of the periods listed on the last 35 leaves were included in those published by Henry Goodwyn in his *A Table of the Circles arising from the Division of a Unit or any other whole number, by all the integers from* 1 *to* 1024, *being all the Pure Decimal Quotients that can arise from this source*. London, 1823. Tables of the period of $1/p$, for $p < 1000$, were given by K. F. Gauss, in his *Werke*, v. 2, 1863, second ed., 1876, p. 412–434. A table of periods of $1/p$ to the base 2, for $p \leqslant 383$, has been given by G. Bellavitis, in R. Accad. Naz. d. Lincei, *Cl. d. Sci. fis., mat., e nat., Memorie*, s. 3, v. 1, 1877, p. 790–794.

A. J. C. CUNNINGHAM, "On binal fractions," *Math. Gazette*, v. 4, 1908, p. 266–267, gives the complete period of $1/n$ to base 2, for $n < 100$; and tables to the same extent for the bases 3 and 5, in "On tertial, quintal, etc. fractions," *Math. Gazette*, v. 6, 1911, p. 111–116. The first 16 digits in the period of $1/n$, for $n = 1(1)1728$, to base 12, may be obtained from G. S. TERRY, *Duodecimal Arithmetic*, London, New York, Toronto, Longmans, 1938, p. 59–70.

45[G, I].—H. E. SALZER, *Coefficients in Polynomials*. Two mss. in the possession of the author at NYMTP.

The first ms. gives the coefficients of the various powers of p in the polynomials $q(q^2 - 1^2)(q^2 - 2^2) \cdots (q^2 - n^2)$ where $q = 1 - p$, and $n = 1(1)10$.

The second ms. gives the exact values of the coefficients of the eleventh to the twentieth Laguerre polynomials.

H. E. SALZER

EDITORIAL NOTE: For Laguerre polynomials compare *MTAC*, v. 2, p. 31.

MECHANICAL AIDS TO COMPUTATION

18[Z].—MAX BORN, R. FÜRTH & R. W. PRINGLE, "A photoelectric transformer," *Nature*, v. 156, 22 Dec. 1945, p. 756–757.

The following is the first paragraph of this preliminary account of the transformer, from the department of mathematical physics, University of Edinburgh: "The 'Fourier transform' $g(y)$ of a function $f(x)$, usually defined by the integral

$$g(y) = \frac{1}{\sqrt{2\pi}} \int_a^b f(x) e^{-iyx} dx,$$

plays an important part in many problems of pure and applied physics. It represents, for example, the connexion between the intensity distribution of a wave scattered by matter of a certain density distribution, which has to be calculated in a number of acoustical and optical problems and, above all, in X-ray crystal analysis work. It further allows the resolution of a complicated oscillation into a continuous frequency spectrum of harmonic oscillations, which is required in many problems of mechanical and electrical engineering. It therefore seems of some importance to have an instrument by which the Fourier transform of a given function can be automatically and quickly produced. We have now succeeded in building up an instrument which produced the graph of the function

$$g'(y) = \int_a^b f(x) \cos (yx + \delta) dx$$

on the screen of a cathode ray oscillograph, from a mask cut out of black paper in the shape of the graph of the function $f(x)$, or from a record of this function on a plate or film in density variation. Obviously two of the functions $g'(y)$ for two values of δ, say, $\delta = 0$ and $\delta = \frac{1}{2}\pi$, are equivalent to the complex function $g(y)$ when $f(x) = 0$ for $x < a$, $x > b$."

19[Z].—V. BUSH & S. H. CALDWELL, "A new type of differential analyzer," Franklin Institute, *J.*, v. 240, Oct. 1945, p. 255–326; 51 figures and illustrations.

The first proposal for a machine to solve differential equations appears to be due to Lord Kelvin, in 1876, but the present activity in the construction of such devices was initiated by the independent work of V. Bush, and others at the Massachusetts Institute of Technology, starting in 1925. The first machine capable of handling a fairly wide class of differential equations was described by Bush in 1931, and named the "Differential Analyzer." Since that time many similar machines have been built in this country, in England, Norway and Germany.