79. TABLES OF 2^n.—A table for $n = 1(1)120$ is given by PETERS & STEIN, *Zehnstellige Logarithmentafel*, v. 1, *Anhang*, Berlin, 1922, p. 13–32; for $n = 1(1)140$ by H. W. WEIGEL, *$x^n + y^n = z^n$? Die elementare Lösung des Fermat-Problems*. Leipzig, 1933; for $n = 1(1)50$, $52(4)100(5)150(6)180$ by BAASMTC, *Table of Powers*. Cambridge, 1940; for $n = 1(1)256$ by ALEKSANDER KATZ, *Riveon Lematematika*, v. 1, April, 1947, p. 83–85; for $n = 1(12)721$ by WILLIAM SHANKS, *Contributions to Mathematics Comprising chiefly the Rectification of the Circle*. London, 1853, p. 90–95. In *MTAC*, v. 2, p. 246, references were made to manuscript tables, for $n = 1(2)1207$ by Dr. J. W. WRENCH, JR., and for non-consecutive values of n up to 671 by Professor H. S. UHLER. In *Intermédiaire des Recherches Mathématiques*, v. 2, July 1946, p. 73, no. 0550, what purports to be the value of 2^{600} is given by D. FAU who asks if higher powers of 2 have been calculated. The seventy-sixth digit in the 181-digit value given should be 2, not 8, and the hundred and fifty-fifth and fifty-sixth digits 86, should be 68. Professor Uhler's later calculation has been to $n = 1000$, and checked as agreeing with the value obtained by Dr. Wrench in each of its 302 digits.

R. C. A.

QUERIES

23. HENDRIK ANJEMA.—What is known besides facts indicated below concerning this author of *Table of Divisors of all the Natural Numbers from 1 to 10000*, Leyden, 1767 (of which there were also Dutch, French, German and Latin editions of the same date)? In this volume's "Avertisement of the Booksellors" are the following notes regarding Anjema, "After having taught with success & applause, for several years, the Mathematicks in the University of Franequer, he resolved to devote the leisure hours, which an Employment given by the states of Friesland had left him, to the advantage of his old Disciples. He formed the design, of giving a Table of Divisors of all the natural numbers to the amount of 100 000, & he had already brought it so far as 10000, when unhappily he died." What was the year of death of the author of this posthumously published work? A. v. BRAUNMÜHL, in M. CANTOR, *Vorlesungen über Geschichte der Mathematik*, v. 4, 1908, misspells the name as "Ajema" (p. 434, 1099).

R. C. A.

QUERIES—REPLIES

30. LOG LOG TABLES (Q4, v. 1, p. 131; QR9, p. 336, 12, p. 373).—In MARCEL BOLL, *Tables Numériques Universelles*, Paris, 1947, p. 446–449, there is a 5D table of log log x, for $x = 1.001(.001)1.18(.002)1.3(.005)1.5(.01)$ $2(.02)3(.05)5(.1)10(.5)20(1)50(2)100(5)200(10)300(20)500(50)1000(100)2000$ $(200)5000(500)10000(1000)20000(5000)50000(10000)100000$.

In *Electrical World*, v. 122, Oct. 14, 1944, p. 118–119, is an article by JERRY AILINGER, "24-scale slide rule solves vector problems." This "Rota-Vec-Trig" rotating slide rule invented and designed by the author is designated as a log log vector and trigonometric slide rule. For greater flexibility there are log log scales in the hexagonal sliding section. There are also new log log scales of decimal quantities of full unit length for greater accuracy, referred to the D scale, which give the values of e^{-x} with a single setting." See also *Electronics*, v. 17, Sept. 1944, p. 252.

D. S. DAVIS, "Reading friction factors from a log-log slide rule," *Chem. and Metallurgical Engineering*, v. 51, July, 1944, p. 115. A table shows the very close correlation of results obtained both graphically and by this slide rule.

R. C. A.

31. SANG TABLES (**Q20**, v. 2, p. 225).—There is a copy of *Sang's New Table of Seven-Place Logarithms*, 1915, in the Princeton University Library.

M. C. SHIELDS

Fine Hall Library,
Princeton University

32. SYSTEM OF LINEAR EQUATIONS (**Q9**, v. 1, p. 203).—In this query it is noted that the method of GAUSS and SEIDEL for solving a system of linear equations is not satisfactorily described in WHITTAKER & ROBINSON, *The Calculus of Observations* (London, 1924, and third ed., 1940, p. 255–256).

The difficulty arises from two errors by Whittaker & Robinson, (1) a failure to note that $m = n$ when giving the normal equations (we retain n below), and (2) an error in the definition of Q; this is stated (wrongly) to be the "sum of the squares of the residuals," while, in fact, the equations

$$a_{r1}x + a_{r2}y + \cdots + a_{rn}t - c_r = 0 \qquad r = 1 \text{ to } n$$

arise as conditions for minimizing the quantity

$$Q \equiv a_{11}x^2 + a_{22}y^2 + \cdots + a_{nn}t^2 + 2a_{12}xy + 2a_{13}xz + \cdots - 2c_1x - 2c_2y - \cdots - 2c_nz + p.$$

The method outlined by W. & R. is correctly based on the latter definition of Q.

The example given in **Q9** yields to the treatment outlined quite satisfactorily. It is

$$N_1 \equiv 2x + y - 1 = 0$$
$$N_2 \equiv x + 3y + 1 = 0,$$

with true solution $x = +4/5$, $y = -3/5$. Starting with values $x = \frac{1}{2}$, $y = -\frac{1}{3}$, as in **Q9**, we first evaluate N_1 and N_2, and then apply $\Delta x = -N_1/a_{11} = -\frac{1}{2}N_1$; re-evaluate N_2 (we shall have $N_1 = 0$) and apply $\Delta y = -N_2/a_{22} = -\frac{1}{3}N_2$; re-evaluate N_1, and put $x = -\frac{1}{2}N_1$ again, and so on. The values x, y, N_1, N_2, Q are given below:

Approx.	1st	Δx	2nd	Δy	3rd	Δx	4th	Δy	5th	Soln.
x	+1/2	+1/6	+2/3		+2/3	+1/9	+7/9		+7/9	+4/5
y	−1/3		−1/3	−2/9	−5/9		−5/9	−1/27	−16/27	−3/5
N_1	−1/3		0		−2/9		0		−1/27	0
N_2	+1/2		+2/3		0		+1/9		0	0
$Q-p$	−7/6		−11/9		−37/27		−113/81		−340/243	−7/5
	−1.17		−1.22		−1.37		−1.395		−1.3992	−1.40

As implied in **Q9**, the sum $N_1^2 + N_2^2$ shows an initial increase from $\frac{1}{9} + \frac{1}{4} = 13/36$ to $4/9 = 16/36$, but this is not relevant to the process.

J. C. P. MILLER

CORRIGENDA

V. 2, p. 77, l. 32, *for* Steinmetz, *read* Steinitz; p. 342, l. 5, *for* 1856, *read* 1857.