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
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

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

arise as conditions for minimizing the quantity

\[
Q = a_{11}x^2 + a_{22}y^2 + \cdots + a_{nn}t^2
\]

\[+ 2a_{12}xy + 2a_{13}xz + \cdots - 2c_1x - 2c_2y - \cdots - 2c_nz + p.
\]
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 satis-
factorily. It is

\[
N_1 = 2x + y - 1 = 0
\]

\[
N_2 = x + 3y + 1 = 0
\]

with true solution \( x = +\frac{4}{5}, \quad y = -\frac{3}{5} \). 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:

<table>
<thead>
<tr>
<th>Approx.</th>
<th>1st ( \Delta x )</th>
<th>2nd ( \Delta x )</th>
<th>3rd ( \Delta x )</th>
<th>4th ( \Delta x )</th>
<th>5th ( \Delta x )</th>
<th>Soln.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( x )</td>
<td>+1/2</td>
<td>+1/6</td>
<td>+2/3</td>
<td>+2/3</td>
<td>+1/9</td>
<td>+7/9</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>-1/3</td>
<td>0</td>
<td>-2/9</td>
<td>0</td>
<td>-1/27</td>
<td>0</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>+1/2</td>
<td>+2/3</td>
<td>0</td>
<td>+1/9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>( Q - p )</td>
<td>-7/6</td>
<td>-11/9</td>
<td>-37/27</td>
<td>-113/81</td>
<td>-340/243</td>
<td>-7/5</td>
</tr>
<tr>
<td>( \Delta x )</td>
<td>-1.17</td>
<td>-1.22</td>
<td>-1.37</td>
<td>-1.395</td>
<td>-1.3992</td>
<td>-1.40</td>
</tr>
</tbody>
</table>

As implied in Q9, the sum \( N_1^2 + N_2^2 \) shows an initial increase from \( \frac{1}{2} + \frac{1}{3} = 13/36 \) 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.