**65.** NYMTP, *Tables of Lagrangian Interpolation Coefficients*, New York, 1944. See *MTAC*, p. 314f.

P. 391, the entry corresponding to $n = 8$, $m = 1$, and $k = -2$, should be negative.

A. N. Lowan

**66.** R. M. Page, 14000 *Gear Ratios . . .* , New York, The Industrial Press, 1942. See RMT **87**, p. 21f.

In MTE **53**, p. 326f, I gave a long list of the errors in this table found by Mr. S. Johnston. We had hoped that the list would prove to be complete, but now Mr. F. Lancaster, of Huddersfield, writes that he has checked Table 4, and found the following additional errors:

| Page | N | *For* | *Read* |
|---|---|---|---|
| 371 | 621 | 23 × 37 | 23 × 27 |
| 388 | 3904 | 59 × 66 | Delete |
| 391 | 4901 | 67 × 73 | Delete |
| 393 | 5432 | 46 × 118 | Delete |
| 400 | 9682 | 94 × 113 | 94 × 103 |

There are also three errors of position—less serious because they are unlikely to be misleading.

| Page | N | |
|---|---|---|
| 384 | 2860 | 52 × 55 should follow 44 × 65 |
| 398 | 8100 | Transpose 81 × 100 and 75 × 108 |
| 401 | 10192 | Transpose 98 × 104 and 91 × 112 |

L. J. C.

## UNPUBLISHED MATHEMATICAL TABLES

Reference has been made to an unpublished table in RMT **202** (Bisshopp); also to results by Ince and Bickley, *MTAC*, p. 412, 417.

**34[A, B].**—*Table of* $x^n/n!$, Manuscript prepared by, and in possession of, the NYMTP.

This table is for $x = 0(.05)5$, $n = 1(1)20$, to 10S.

A. N. Lowan

## MECHANICAL AIDS TO COMPUTATION

**15[Z].**—H. P. Kuehni and H. A. Peterson, "A new differential analyzer," *Electrical Engineering*, v. 63, May, 1944, p. 221–227. (Also in A.I.E.E., *Trans.*, v. 63, 1945, and discussion p. 429–431) 20.5 × 28.6 cm.

The article describes a differential analyzer of the Kelvin wheel-and-disc type which was built by the General Electric Company and put into service in Schenectady in 1943. The design follows closely that of the machine started in 1926 at Massachusetts Institute of Technology by Vannevar Bush, but incorporates a number of improvements which have been suggested by experience with later models, especially the one at the University of Pennsylvania. It has fourteen integrators, four manual input tables, and two double output tables; it can therefore be used for problems of considerable complexity. It is also arranged for operation as two independent units on simpler problems when not all of the elements are required.

The most important of the design innovations is the electronic arrangement used to relieve the integrator disc of mechanical load, and thus to minimize slipping of the integrator disc with respect to the wheel upon which it rolls. The arrangement uses two beams of light which pass through a polaroid disc mounted upon the integrator disc and through crossed polaroid discs upon the output shaft which follows the integrator. Any angular difference in the positions of the integrator disc and output shaft causes one of the light beams to be attenuated more than the other. The difference is detected by balanced phototubes and used to control the speed of the motor which drives the output shaft. The entire torque of the motor is available at the output shaft, but the torque required from the rolling disc is only that necessary to overcome the friction of its jewelled bearings.

The electronic follower-system and other refinements have made it possible to operate the analyzer at higher speeds, thus cutting the time required for obtaining its graphical solutions.

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## NOTES

**37.** NOTATION $\mathrm{yer}_n x$, $\mathrm{yei}_n x$.—We have been informed by J. C. P. MILLER that ALAN FLETCHER, of the University of Liverpool, was the inventor of the notation

$$Y_n(xi^{3/2}) = \mathrm{yer}_n x + i\,\mathrm{yei}_n x,$$

which is used in the Liverpool *Index*. This note is in correction of the statements, *MTAC* p. 252, l. 23–24, and Corrigenda et Addenda p. 375.

**38.** A ROOT OF $y = e^y$.—In N **20**, p. 202f. (see also N **25**, p. 334f.) the solution was given of the transcendental equation $10 \log x = x$ or $x = 10^{x/10}$. In *Assurance Mag. and J.*, of the Institute of Actuaries, v. 3, 1853, p. 323, E. J. FARREN contributes an article "On the form of the number whose logarithm is equal to itself." The equation $y = e^y$ is considered, and it is found that

$$y = 1 + \frac{2}{2} + \frac{3\cdot 3}{2\cdot 3} + \frac{4\cdot 4\cdot 4}{2\cdot 3\cdot 4} + \frac{5\cdot 5\cdot 5\cdot 5}{2\cdot 3\cdot 4\cdot 5} + \cdots.$$

The derivation of this solution seems to have been due to ROBERT MURPHY.

R. C. A.

**39.** ROOTS OF $\tan x = xf(x)$.—Compare N **18**, p. 201f. In L. COHEN, "Alternating current cable telegraphy," Franklin Institue, *J.*, v. 195, 1923, p. 165f., there is a table, with 4–5S, of the first 8 roots of the equation

$$\tan x = 20x/(x^2 - 100).$$

H. B.

## QUERIES

**14.** TABLES OF $\mathrm{TAN}^{-1}$ $(m/n)$.—In some work I am now carrying on it is necessary to evaluate expressions of the form $\tan^{-1}(m/n)$, to 10D, where $m$ and $n$ are integers, ranging from 1 to 25 inclusive. For values of $n = 1, 2, 4, 5\ldots$, the values of the argument, and therefore the function may be found directly in NYMTP, *Tables of Arc Tan x*, Washington, D. C., 1942. Is there a table to cover the cases $n = 3, 7, 11\ldots$?

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