here, the manuscript copy compiled with so much labor and care, by Mr. Lenhart, includes a Table,

'Containing a variety of Numbers between 1 and 100,000, and the roots, not exceeding two places of figures, of two cubes, to whose difference the numbers are respectively equal'; together with a Table,

'Exhibiting the roots of three cubes to satisfy the indeterminate equation

$$x^3 + y^3 + z^3 = A,$$

for all values of $A$, from 1 to 50 inclusive.'

"Both these tables are extremely curious, and are open to inspection of all who may wish to consult them. They are lodged in the library of St. Paul's College."

This was probably written by Gill.

Numbers I–IV of the *Mathematical Miscellany* were published at the Flushing Institute, which had become St. Paul's College when numbers V–VIII (1838–1839) were published. But by 1844 this College had ceased to function, and hence also its Library, no doubt.

Can any one tell us if the above mentioned ms. tables of Lenhart[1] (1787–1840) have been preserved in any library or have ever been published?

R. C. A.

[1] Lenhart made a number of excellent contributions to the *Mathematical Miscellany* and his name is mentioned several times in L. E. DICKSON, *History of the Theory of Numbers*, v. II; *Diophantine Analysis*, Washington, 1920. Many personal details are given in [S. TYLER], "The life of Lenhart the mathematician," *The Biblical Repertory and Princeton Review*, v. 13, 1841, p. 394–416. The name of the author of this anonymous article was taken from the *Index Volume*, 1871, of the *Repertory*. See also W. S. NICHOLS, "William Lenhart, the American Diophantist, potential actuary and mathematical testator of Professor Charles Gill," Actuarial Soc. Amer., *Trans.*, v. 21, 1920, p. 118-122, 124; note by W. A. HUTCHESON, p. 122–124. Also CALVIN MASON, York [Pa.] *Gazette*, 14 Sept. 1841.

That the Yorkshireman Gill, mathematician, and the first actuary in America (he prepared an Actuary's Report on the experience of The Mutual Life Insurance Co. of New York), does not appear in the *Dictionary of American Biography* is surely an oversight. See E. MCCLINTOCK, Actuarial Soc. Amer., *Trans.*, v. 14, 1913, p. 9-16, 212–237; v. 15, 1914, p. 11–39 + portrait, 228–270. "Historical sketch of the life of CHARLES GILL, Esq., late actuary of the Mutual Life Insurance Company of New York," Institute of Actuaries, *Assurance Mag.*, v. 6, 1857, p. 216–227. C. WALFORD, *The Insurance Cyclopaedia*, v. 5, London, 1878, p. 394. *The International Insurance Encyclopedia*, New York, v. 1, 1910, p. 313. D. E. SMITH & J. GINSBURG, *A History of Mathematics in America before 1900*, Chicago, 1934, p. 89, 98–99. S. NEUMARK, "Note on the life of Charles Gill," *Scripta Mathematica*, v. 2, 1934, p. 139–142.

## QUERIES—REPLIES

**43.** INTEGRAL EVALUATIONS (Q **22**, v. 2, p. 320).—In partial reply we may note that the integral

$$I(t) = \int_0^t \cos (a_0 + a_1x + a_2x^2)dx,$$

where the $a$'s are real, may be evaluated in terms of the so-called FRESNEL integrals

$$C(u) = \int_0^u \cos (\tfrac{1}{2}\pi\theta^2)d\theta, \qquad S(u) = \int_0^u \sin (\tfrac{1}{2}\pi\theta^2)d\theta,$$

tables of which are listed in *MTAC*, v. 1, p. 250, v. 2, p. 336, v. 3, p. 417, 467, 479, v. 4, p. 24, 30.

We may suppose that $a_2$ is positive so that $a_2 = a^2$. Completing the square and using the cosine addition theorem gives

$$\begin{aligned} a(2/\pi)^{1/2} I(t) &= [C(bt + c) - C(c)] \cos \delta \\ &\quad - [S(bt + c) - S(c)] \sin \delta, \end{aligned}$$

where

$$\delta = a_0 - a_1^2/(4a^2), \qquad b = a(2/\pi)^{1/2}, \qquad c = (2\pi)^{-1/2} a_1/a.$$

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## CORRIGENDA

V. 1, p. 184, l. 20 *for* 9D *read* exact.
V. 1, p. 336, 468 *for* Eschbach *read* Eshbach.
V. 3, p. 457, l. 19 *for* $a_{1i}$ *read* $a_{1j}$.
V. 3, p. 458, l. 2, *for* $a_{ij} - a_{i1}a_{1i}/a_{ii}$ *read* $a_{i1}a_{1j}/a_{11}$.