

integrals, their definition as the limit of a sum, their general properties, and their evaluation in a few simple cases. The work thus far covers a little more than half the volume; the remaining portion is given to various applications.

The remarkable thing about all these applications is the complete omission of any ideas concerning limits of sums. The method is always to find a derivative, and then integrate. For example, the result for ds/dx has been found; hence s may be obtained. In like manner $dA/dx = y$ may be established, and hence A is the integral of y . And so on, to arcs and areas in polar coördinates, to surfaces and volumes of revolution, to centers of gravity, centers of pressure, moments of inertia, and attractions. All are treated by differentiation. Why not? Why not eliminate the troubles connected with limits of sums? The author has made the presentation clear and rigorous, and has shown conclusively that we do not need to bother with the integral as a limit of a sum in elementary calculus. His method is worthy of our most serious consideration—if we desire to be rigorous instead of suggestive, and we can hardly be both in a first course on calculus.

The remaining applications are to the dynamics of a particle, prefaced by a few sections on the integration of the simpler differential equations. There are notes on the integration of infinite series, on Riemann's discontinuous integrable function, and on Fourier's series.

These texts merit our special consideration because they are different from those we are used to. It would be interesting to see them tried on American classes both for the effect on the students and for the effect on the teachers.

EDWIN BIDWELL WILSON.

MASSACHUSETTS INSTITUTE
OF TECHNOLOGY.

SHORTER NOTICES.

Mémoires Scientifiques. By PAUL TANNERY. Publiés par J. L. HEIBERG and H. G. ZEUTHEN. I. *Sciences Exactes dans l'Antiquité*, 1876-1884. Toulouse, Edouard Privat; Paris, Gauthier-Villars, 1912. xix+465 pp. Price 15 francs.

IN our time there have been three men whose love for ancient science and whose perfect command of the Greek language