

1898. "Beweis eines von Herrn Dedekind angegebenen Satzes." *Göttinger Nachrichten*, page 1.

TABER.

1892. "On a theorem of Sylvester's relating to non-degenerate matrices." *Proceedings of the American Academy*, page 46.
 "Note on the representation of orthogonal matrices." *Proceedings of the American Academy*, page 163.
1893. "On real orthogonal substitutions." *Proceedings of the American Academy*, page 212.
1894. "On the automorphic linear transformation of bilinear forms." *Proceedings of the American Academy*, page 178.
 "On orthogonal substitutions." *Bulletin of the New York Mathematical Society*, volume 3, page 251.
1897. "Notes on the theory of bilinear forms." *Bulletin of the American Mathematical Society*, volume 3, page 156.

WEIERSTRASS.

1884. "Zur Theorie der aus n Haupteinheiten gebildeten complexen Zahlen." *Göttinger Nachrichten*, page 395.

H. E. HAWKES.

An Elementary Text-book on the Differential and Integral Calculus. By WILLIAM H. ECHOLS. Professor of Mathematics in the University of Virginia. New York, Henry Holt and Company, 1902.

IN this book Professor Echols has made a commendable and, on the whole, a successful attempt to establish the principles of the differential and integral calculus with proper regard to modern ideas on the subject, pointing out carefully the limits under which the processes can be applied and giving examples of exceptional cases, such as Weierstrass's example of a continuous function which has no determinate derivative, and Pringsheim's example of a function for which Maclaurin's series is absolutely convergent and yet does not represent the function. One would like to see also, however, an example in which $\partial^2 z / \partial x \partial y$ and $\partial^2 z / \partial y \partial x$ are different — a case of peculiar interest in some of the applications.

The book is far more comprehensive than the usual text-books, and should therefore be useful for consultation by

students in the later years of their course. The author states that it is intended to cover about one year's work, but it seems doubtful if it could be completed in a much longer period in many colleges. However, there should be no trouble in making a judicious selection from the wealth of material and an ambitious student would be glad to possess a book which would give him so much opportunity for work outside of the classroom.

Special features of the book are the complete separation of functions of one variable from those of more than one, the liberal use of the theorems of mean value, the definition of an integral primarily as the limit of a sum, a definition to which it may be hoped all of our text-books will ultimately return, a careful introduction on variables and functions and a number of notes at the end including the examples referred to.

Where there is so much to commend it may seem invidious to criticize, but it seems to the reviewer that the definition of transfinite numbers and of infinitesimals is likely to be misunderstood by the beginner; that it would be well to print the definition of irrational numbers in larger type and let it precede the employment of such numbers; that something would be gained in the treatment of trigonometric integrals by the introduction into the text of more of the theory of the complex variable, including at least De Moivre's theorem. It is also somewhat surprising not to find a definition of curvature—the radius of curvature being defined merely as the radius of the osculating circle.

The reviewer is disposed to agree with the author in his relegation of the well-known and too much worshiped reduction formulas for the integral

$$\int x^a(a + bx^n)^r dx$$

to a note at the end of the book.

M. W. HASKELL.

American Men of Science. A Biographical Directory. Edited by J. MCKEEN CATTELL. New York, The Science Press, 1906. 4to. 7 + 364 pp.

THE chief object of this directory is to make American "men of science acquainted with one another and with one another's work." In the field which it aims to cover it is much more