

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

comprehensive than *Minerva* or *Who's Who in America*, as it includes a tolerably complete list of sketches of those living in North America who have published any research in the natural and exact sciences, and in addition some entries of those who are held to have advanced science by teaching, by administrative work, or by the publication of text-books.

In the case of about one thousand out of the four thousand biographical notes a star is placed before the field of research. This indicates that the subject of the sketch is to be regarded as one of the thousand leading American men of science. About 80 of the 360 entries of mathematicians are distinguished in this manner. Those who are inclined to estimate the scientific standing of a man by the post which he fills will be surprised at the large number of names of younger men whose work is starred, while many who hold prominent positions are not classed among the leading scientists.

In view of the great difficulties in forming a correct estimate of the merits of the work of our contemporaries, the present undertaking appears a bold one, but the importance of accurate knowledge on this point seems to justify such ventures. All men of science and especially those who require the services of such men must feel keenly the difficulties encountered in the effort of judging the relative merits of the work of those who may be under consideration; and as such judgments are sometimes imperatively necessary, any reliable aid is a great desideratum. Moreover, there are few other things which tend to contribute so much toward substantial progress as a general feeling that the opinion of experts in regard to individual achievements will speedily become common property. The present volume appears to be a decided step towards cultivating such a feeling.

As far as possible each entry contains information on the following ten points: Name and mail address, department of investigation, place and date of birth, education and degrees, positions with dates, temporary and minor positions, honorary degrees and other scientific honors, membership in learned societies, chief subjects of research, and whether the subject of the sketch is classed with "the thousand students of the natural and exact sciences in the United States whose work is supposed to be the most important."

G. A. MILLER.