

The third part of the work covers 248 pages, and considers the integral calculus and its applications. The integral is defined as the limit of a sum, making the definite integral properly the foundation of the whole subject. The connection with the primitive of the simple differential equation $dy = f(x)dx$ is immediately brought out, and some of the formulas of differentiation, as $d \cdot uv = vdu + u dv$, are interpreted in integration, this one leading to integration by parts. The calculation of mean values is given as an example of the use of the definition. A chapter follows on general methods of finding indefinite integrals. Chapter three extends the notion in some directions, as that of improper integrals, line integrals, double and triple integrals, leading up to the formulas of Green and Ostrogradsky, although singularly the complete formula of Stokes is omitted at the point where it would have naturally come in. A chapter is given to elliptic functions, one to Fourier series, one to geometric applications, one to applications to mechanics. In the latter the notions of vector fields, curl, divergence, flux, vector lines and tubes, work, circulation, level surfaces, and potential are brought in. The approximate calculation of integrals has a chapter. The last two chapters consider differential equations, total and partial, and though quite elementary, the author has nevertheless given the student a good working basis. The accompanying problems of the manual of exercises reenforce the text materially.

The author states that he considers the needs of the student who has to study by himself, with little or no assistance. This no doubt accounts for the very plain treatment, and would suggest that in general a text written for students will be clearer than one written for the use of teachers. Of course a certain amount of rigor in books written for teachers is demanded, but rigor does not always lead to usable knowledge. Professor Zoretta is to be congratulated on his success.

JAMES BYRNIE SHAW.

College Algebra with Applications. By E. J. WILCZYNSKI.
Edited by H. E. SLAUGHT. Boston, Allyn and Bacon, 1916.
xx+507 pp.

THIS algebra, unlike the traditional college algebra, possesses unity, the centralizing theme being the function concept. The book opens with an excellent chapter on the number sys-