A summary of the contents of the book would show that the author has selected his material from many distinct engineering fields and that every application of the principles of the calculus included would be considered fundamental and discussed thoroughly in some particular engineering course in any technical school of merit.

Since the flavor of actual engineering practice pervades every one of the 172 pages we naturally expect to find, as we do, much use made of figures and diagrams to illustrate the text, and great emphasis placed on the merit of the geometric intuition in developing the theory. The differential is used frequently and approximations are numerous, but the reader is nowhere worried by the presence of involved demonstrations employing epsilons and limits.

Instructors in the calculus, if interested, will find in the pamphlet under review some new material, several new viewpoints, and many applications of principles—all of which might aid them to add new life and vigor to their courses.

ERNEST W. PONZER.

The Dynamics of Particles and of Rigid, Elastic, and Fluid Bodies. By A. G. WEBSTER. Second edition. Leipzig, B. G. Teubner, 1912. xii + 588 pp.

THE second edition of Professor Webster's Dynamics has appeared in less than ten years after the first, and the fact that it is substantially identical with the first is evidence of the value of the work. The book grew out of the lectures delivered by the author to students of physics, and presents in compact form a treatment of so much of the science of dynamics as is considered an essential part of the equipment of an investigator in physics. The classical treatises in English as well as other languages are too bulky for a student to read completely, and they presuppose frequently a knowledge of mathematics which the student does not possess. "The attempt has been made to treat what is essential to the understanding of physical phenomena, leaving out what is chiefly of mathematical interest." The wisdom of the selection of material is attested by the success of the first edition. It is assumed that the student has a good knowledge of the calculus, but not of differential equations or higher analysis. This does not mean that subjects involving advanced mathe-

matics are avoided, but that the necessary mathematical theory is developed in the text; for example, the treatment of the brachistochrone is preceded by a sketch of the fundamental notions of the calculus of variations.

The book is divided into three parts. The first part treats the general principles and the motion of a material point; the second considers the dynamics of rigid bodies, and the third is devoted to the theory of the potential and the dynamics of deformable bodies. The brevity of the work is appreciated by a comparison with the standard treatise of Appell, where each of the three parts occupies a volume equal in size to the single volume under consideration. Professor Webster's success in presenting so much material in this compact form is due to the rapidity and directness with which results are obtained. There is no wasting of words and no unnecessary repetition, and, at the same time, no ambiguity. The statements of the fundamental principles are clear and concise and the discussions of their significance are particularly illuminating. It is to be regretted that there are no problems. Plenty of problems can be found in other treatises, but if a selection had been made for this book with the same good judgment displayed in the preparation of the text it would have been appreciated by the instructor using the book in the classroom.

While the selection of topics and method of exposition have been determined by the needs of the student of physics, the book is equally valuable to the student of pure mathematics. The constant reference to actual practical use of the principles and the reproduction in the text of drawings made by physical experiments (e. g., the spherical pendulum, page 50, and the dynamical top, pages 270, 293, 294, etc.) designed to realize the results of the theory have a peculiar interest to the student of mathematics who is less familiar with such matters than the worker in the laboratory. As a reference book for the more mature investigator this volume is quite as convenient as for the student approaching the subject for the first time.

The author asks pardon for errors of proofreading, which are numerous but, fortunately, obvious. Most of them are of the kind that should be eliminated by the professional proofreader in the printing office and probably would not have occurred if the book had been published in an English-speaking country.

Professor Webster is to be congratulated on the well-deserved success of his work and we may justly take pride in this product of American scholarship.

W. R. LONGLEY.

NOTES.

THE concluding (October) number of volume 14 of the *Transactions of the American Mathematical Society* contains the following papers: "Applications and generalizations of the conception of adjoint systems," by MAXIME BÔCHER; "On a certain class of self-projective surfaces," by E. J. WILCZYNSKI; "On the representation groups of given abstract groups," by G. A. MILLER; "On the accuracy of trigonometric interpolation," by DUNHAM JACKSON; "On a simple type of irregular singular point," by G. D. BIRKHOFF; "On quadratic residues," by J. MCDONNELL; "A set of five independent postulates for Boolean algebras, with application to logical constants," by H. M. SHEFFER; "Formal modular invariants with application to binary modular covariants," by MILDRED SANDERSON.

THE December number (volume 15, number 2) of the *Annals of Mathematics* contains: "On the numerical factors of the arithmetic forms $\alpha^n \pm \beta^n$" (continued), by R. D. CARMICHAEL; "Geometric characterization of isogonal trajectories on a surface," by J. LIPKA; "On the second variation, Jacobi's equation, and Jacobi's theorem for the integral $\int F(x, y, x', y')dt$," by ARNOLD DRESDEN; "Quartic surfaces invariant under periodic transformations," by F. R. SHARPE and F. M. MORGAN; "Postulate sets for abelian groups and fields," by W. A. HURWITZ.

UNDER the auspices of the International commission a congress on the teaching of mathematics will be held at Paris, April 1–5, 1914, in the halls of the Sorbonne. The chief subjects of discussion by the congress will be the introduction of the first notions of the calculus and of primitive functions in the secondary schools (lycées, Gymnasia), and the teaching of mathematics to engineering students.