

SHORTER NOTICES.

Plane and Solid Analytic Geometry. By FREDERICK H. BAILEY and FREDERICK S. WOODS, Assistant Professors of Mathematics in the Massachusetts Institute of Technology. Boston and London. Ginn & Co. 1897. 8vo, xii + 371 pp.

ANALYTIC Geometry forms the basis of all higher work in mathematics and requires as preparation, beyond the algebra and geometry required for admission to most colleges and technical schools, nothing except such a knowledge of plane trigonometry as may easily be gained in the course of two or three months. It should therefore in the opinion of the reviewer, form the substantial portion of the mathematical course of the first year of colleges and technical schools. But even if postponed to a slightly later period the subject should, we believe, be treated in a thoroughly elementary manner, *i. e.*, without the use of determinants, abridged notation, cross ratio, the line at infinity, etc. The methods of elementary analytic geometry are not elegant and they are sometimes long, so that it is easy to understand how a teacher of this, as of other elementary subjects, listening perhaps to the advice of some misguided enthusiast may desire to "modernize" the teaching of the subject by discarding the old, cumbrous, but direct for the new, elegant and refined methods. He forgets, however, in doing this that his first duty to the student is to use not the methods which in themselves are the best, but those from which the student will gain most; and in a subject as novel to the beginner as is analytic geometry we are confident that these methods are the ones which will least withdraw the student's attention from the fundamental ideas. Messrs. Bailey and Woods have produced a text-book which is in the main in harmony with the ideas just stated, and which is calculated to give to the student such a grasp of analytic geometry as will enable him to deal with elementary problems with ease and accuracy.

Although, as has been indicated, the authors are on the whole conservative, their book presents several new features. The most striking of these consists in the introduction, as soon as the conic sections have been defined by the method of Boscovich and their shapes discussed, of a treatment of the general equation of the second degree in which the xy term is wanting. We do not think that this treatment will be found difficult even by the dull student and its introduction at this point has the advantage of making

it possible to dispose of the question of tangents, normals and polars for the ellipse, hyperbola and parabola at one stroke.

The small number of formulæ given and of theorems proven is an excellent feature of the book, for the student should be made to look upon analytic geometry not as a mass of formulæ and theorems, but as a method by which he can deduce formulæ and theorems when he wants them. Exercises occupy, as they should, a prominent place, though we regret that such a large proportion of them are of the trivial numerical sort.

Perhaps the most important class of exercises for developing the thinking power of the student are locus problems. Exercises of this sort are not wanting; but little attention is given in the text to the methods of solving them, even the introduction of auxiliary variables and their subsequent elimination not being explicitly mentioned. This is a serious omission, which, however, can be supplied by the teacher.

The portion of the book devoted to plane analytic geometry includes a discussion of some of the more elementary properties of the ellipse, hyperbola and parabola and closes with a chapter on the general equation of the second degree.

Nearly one quarter of the book is devoted to solid analytic geometry and in this space it has been possible to give an introduction to the subject amply sufficient as a preparation for higher mathematical work. At the close the questions of the rectilinear generators and circular sections of quadric surfaces are touched upon.

In conclusion the book deserves praise not only for clearness of statement but in the main for rigor of treatment.

MAXIME BÔCHER.

NOTES.

A REGULAR meeting of the AMERICAN MATHEMATICAL SOCIETY was held in New York, on Saturday afternoon, May 29, at three o'clock. Professor F. MORLEY and later the Vice-President, Professor R. S. WOODWARD, occupied the chair. There were eight members present. The Council announced the election of the following persons to membership in the Society: Mr. WILLIAM ANTHONY GRANVILLE, Yale University, New Haven, Conn.; Dr. KURT LAVES, University of Chicago, Chicago, Ill.; Professor ANNA HEL-