culties in the demonstrations to which these quantities give rise are surmounted by a device which again is suggested by measurement and which exhibits all the rigor that the student is likely to be able to appreciate.

It will hardly be questioned that this text will appeal more strongly to the students' interest than Euclid, nor that the material is better selected with reference to the students' capacity to receive it, nor that the student can, by the expenditure of a given amount of energy, obtain a greater amount of mathematical information from this text than from Euclid's Elements. It still remains in doubt, however, whether the student will obtain the same thorough training in rigorous, careful reasoning in this course as under the present discipline.

C. H. SISAM.

The Foundations of Mathematics. A Contribution to the Philosophy of Geometry. By Dr. PAUL CARUS. Chicago, The Open Court Publishing Co., 1908. 141 pp.

THIS book is, mathematically speaking, a more or less popular treatise, which would appear to have for its primary object an effort to show that geometry can be obtained a priori, by abstraction, from the notion of motility, and can be constructed from this alone by making use of the principles of reasoning, *all axioms being unnecessary.*

The book opens with a historical sketch, which is fairly accurate, mentioning particularly the work of Euclid, Gauss, Riemann, Lobachevsky, Bolyai, Cayley, Klein, and Grassmann. The author then introduces chapters on "The philosophical basis of mathematics" and "mathematics and metageometry" in which his philosophical theories are presented. Briefly expressed, his doctrine seems to be about as follows: "Space is the possibility of motion, and by ideally moving about in all possible directions, the number of which is inexhaustible, we construct our notion of pure space. If we speak of space we mean this construction of our mobility. It is an a priori construction and is as unique as logic or arithmetic. There is but one space, and all spaces are but portions of this construction." Mathematical space is a priori, in the Kantian sense, not however ready made in the mind, but the product of much toil and careful thought. Mathematical space is an ideal construction, hence all mathematical problems must be settled by a priori operations of pure thought, and can not be decided by external