

many valuable earlier publications, the author of the present work has won the confidence of the mathematical public, and the usefulness of the present volume will doubtless increase this confidence. It is hoped that it may also inspire others to render such scholarly services even if their accomplishment demands a vast amount of time, care, and patience. The more our science grows the more need there will be for such works, and conversely such works contribute materially towards stimulating real growth.

G. A. MILLER.

*Ueber das Wesen der Mathematik.* Rede gehalten am 11. März 1908 in der öffentlichen Sitzung der K. Bayerischen Akademie der Wissenschaften von DR. A. VOSS, O. Professor der Mathematik in München. Erweitert und mit Anmerkungen versehen. Leipzig und Berlin, B. G. Teubner, 1908. 98 pp.

ADDRESSING a mixed assembly of scientists, Voss endeavors to answer the questions: What is the nature (Wesen) of mathematics? How does it happen that mathematics is the only science which presents truth in apodictic form? What has the past century accomplished toward the elucidation of the inner structure of mathematics?

Though not answering these difficult questions with the precision some may desire, the address is extremely able and instructive. The annotations occupy about half the space of the book and contain numerous valuable references to the literature of the subject. The author passes in rapid historical review the fundamental concepts of variables, functional dependence, and limits. He points out the triumphs of mathematics during the eighteenth century, a period which culminated with Laplace. This great savant made the well-known utterance, now admitted to be a gross exaggeration: An intelligence to whom at a given moment were presented the conditions of the entire material world would be able by mathematical analysis to survey the entire past and future of the world. In considering the various attempts to define mathematics, Voss passes from the antiquated "science of quantity" definition to the more recent ones based on the consideration of the logical steps involved, namely the definitions of B. Peirce, E. Papperitz, G. Itelson, B. Kempe, M. Bôcher, H. B. Russell, and L. Couturat. Geometry and mechanics belong to applied mathematics. Pure