

other questions if he has once become interested in them, and a great merit of this book is that he will almost inevitably become interested in many of the subjects treated.

We have noticed the absence of only one important subject which would seem to belong in a treatment of this sort. We refer to the theory of the conformal transformation effected by the ratio of two solutions of a homogeneous linear differential equation of the second order (Schwarz's s -function). The volume before us does not, of course, touch those sides of the subject with which Lie's name is connected, nor is any special attention devoted to the theory of the real solutions of differential equations, but in those parts of the theory which he professes to treat the author has achieved more than ordinary success.

MAXIME BÔCHER.

Ιωάννου Ν. Χατζιδάκι — Εισαγωγή εἰς τὴν Ἀνωτέραν Ἀλγέβραν.
Second edition. Athens, 1898.

THE work of Professor Hatzidakis is a scientific development by Weierstrass's methods of the general principles of arithmetic which form the basis of algebra, of calculus, and of the theory of functions. The natural numbers are defined by the process of counting and in the first chapter is placed the *formal* reasoning by which the associative and commutative laws are deduced from the special cases

$$\beta + a = a + \beta, \quad (1)$$

$$a + (\beta + \gamma) = a + \beta + \gamma. \quad (2)$$

The second chapter deals with fractional numbers, which are regarded as collections of fractional units, and the fraction $\frac{a\beta}{\beta}$ is equal to the natural number a . Then any two numbers of the enlarged system are said to be equal if integral equimultiples of them are equal. Multiplication of fractional numbers is defined according to the distributive law, *i. e.*, 1.41×1.73 is the sum of the products obtained by multiplying every one of the units of the one factor by every unit of the other. The product of two units is defined in like manner so that equals multiplied by equals shall give equals. Thus, since we wish the two products $\frac{1}{10} \times \frac{1}{100}$ and 1×1 to be equal and since

$$\frac{1}{10} \times \frac{1}{100} = 1000 \left(\frac{1}{10} \times \frac{1}{1000} \right),$$

the product $\frac{1}{10} \times \frac{1}{100}$ is defined to be $\frac{1}{1000}$. From this