

SHORTER NOTICES

Lezioni di Analisi. By Francesco Severi. Volume I. Bologna, Zanichelli, 1933. viii+434 pp.

Just what one may expect to find in a volume which bears the title *Lezioni di Analisi*, seems to be in general an uncertain quantity. It depends upon the whims and interests of the individual writing the volume. About all that seems to be guaranteed is that at some point or other, one will be introduced to some of the fundamental facts concerning real function theory, that is, questions of limits and continuity, derivatives, and possibly integrals. The volume under review is no exception.

A casual glance through the headings of the chapters is perhaps illuminating. They read in succession: *Combinatory Analysis, Determinants and Linear Equations, Real Numbers, Complex Numbers, Functions and Limits, Derivatives and Differentials of Functions of one Variable, Numerical and Taylor's Series, Preliminary Notions on Integrals, Algebraic Functions*. Considering the fact that the last chapter covers over a hundred pages, we have here a volume in which more than a third of the space is devoted to matters of algebra, and the remaining two thirds to functional analysis.

The method of presentation adopted is to give the simple and pertinent facts concerning the topics under consideration in the main body of the chapter, and to relegate to the last paragraph, headed supplement and exercises, additional ideas which the author considers worthy of mention. The result is that frequently very elementary facts rub elbows with profound and abstract considerations. For instance, the chapter on functions and limits gives a thorough presentation of the fundamental facts of function theory and in its supplement takes up such things as the Bolzano-Weierstrass Theorem and the Borel Theorem in higher dimensions, discusses the Zermelo Axiom of Selection, and finishes up with allusions to notions of topology and analysis situs. On the other hand, the succeeding chapter on derivatives is of a most elementary nature, while the following chapter on integration is limited to the simpler methods of evaluating indefinite integrals. Apparently this brief chapter on integrals is intended to salve the author's conscience on having fulfilled some unwritten requirement of including integrals in this volume, and permit him to take up topics close to his heart at greater length, namely, the basic matters pertaining to algebraic functions as a foundation for algebraic geometry.

The last chapter, devoted to algebraic consideration of algebraic functions, is one of the distinguishing features of the volume. It takes up in detail matters of divisibility of polynomials in one and many variables, matters of elimination and resultants from different points of view, discusses the continuity of the roots of an algebraic equation as a function of the coefficients, gives a simple proof of the fundamental theorem of algebra and the general solution of equation of the third and fourth degree, and winds up with the approximation of roots of algebraic equations. The extensive supplement to this chapter includes geometric interpretations of some of the processes involved in the chapter itself. It is an excellent treatment of the subject under consideration.