SHORTER NOTICES

Modern Researches on the Singularities of Functions Defined by Taylor's Series. By S. Mandelbrojt. Edited by E. R. C. Miles. The Rice Institute Pamphlet, Volume XIV, No. 4, pp. 225–352.

The material collected in this pamphlet is a result of a series of lectures delivered by the author at the Rice Institute during the academic year 1926–27. The purpose and scope are best described by a short paragraph taken from a foot-note on the first page of the book:

"The present type of research, which began with the famous thesis of Hadamard, has broadened considerably during the past few years. Complete proofs of all the theorems cannot be compressed in the space available in a short treatise, so the author treats only of such theorems as seem to give unity to the theory, and of the latter theorems proofs are given, for the greater part, in detail. The reader will find a large bibliography, as well as an enumeration of nearly all the results on the singularities of Taylor's series in Hadamard and Mandelbrojt: *La Série de Taylor et son Prolongement Analytique*, Scientia, No. 41, also in the author's volume of the Mémorial des Sciences Mathématiques. The present treatise may be regarded as complementary to, as well as an elaboration of, some parts of the works just mentioned."

The first four chapters deal with that part of the theory which has now become classical, treating such material as the theorems of Hadamard and Hurwitz on the composition of singularities and a necessary and sufficient condition that a function should be meromorphic on its circle of convergence. In Chapters V and VI the author launches into the more recent developments of the theory, proving first an interesting theorem of his own regarding power series which have on their circle of convergence at least one singularity not a pole, and then giving various generalizations and applications. Chapter VI again returns to classical theory, presenting the theory of order of singularities. In criticism of this chapter we call attention to the fact that although the first section defines and discusses fractional differentiation and integration, no mention is made of its connection with the Hadamard operator defined in the second section. A reader meeting the subject for the first time (and it is believed that the book will in general be valuable for such readers) may naturally inquire why fractional differentiation is introduced at all. It is not until the close of the chapter, twenty pages farther along that one reads the statement, without proof, that if one of these operators yields a continuous function of finite deviation so too does the other. Chapters VIII and IX deal with the fundamental theorems of Faber and Fatou and with the author's generalizations of the latter. Chapters X and XI center around Dr. Mandelbrojt's contributions to the theory and related theorems. The final chapter deals with series having the circle of convergence as a cut, following the method introduced by Hadamard and amplified by Fabry, Leau and others.