

## THE THEORY OF FUNCTIONS.

*Theory of Functions of a Complex Variable.* By A. R. FORSTH, Sc.D., F.R.S. Cambridge, University Press, 1893. 8vo, xxii + 682 pp.

The year 1893 was marked by the appearance of four important treatises on the theory of functions. The second volume of Picard's *Traité d'Analyse*\* presents, as no other one book has ever yet done, the ideas that originated with Riemann and have been developed by him and his followers. The first volume of the new edition of Jordan's *Cours d'Analyse*† begins, to be sure, with the elements of the infinitesimal calculus, but it is only after such a treatment of the foundation on which analysis rests, enriched by the methods and dominated by the spirit of what is commonly known as the modern theory of functions of a real variable, that Cauchy's theory of functions can be developed in a manner that will be adjudged rigorous by the standards of this age.

On the other hand, Harkness and Morley's treatise,‡ like the work before us, is not confined to any one of the three theories due respectively to Cauchy, to Weierstrass, and to Riemann; and these are the first works to appear on the theory of functions in which all three theories are treated. While they have a common object, namely, to introduce the student to the whole field of the theory of functions, the manner in which this plan is carried out is quite different. The former writers feel keenly the advances that have been made in recent times in accuracy and rigor in analysis. They know that this work has as yet found scarcely any place in the text-books, and that a knowledge of it cannot be assumed on the part of the student who has just finished his differential and integral calculus. They, therefore, devote some introductory chapters to it and emphasize it throughout the subsequent developments of their subject. Our author, on the other hand, gives little heed to such matters. He takes the ground that the student who is interested in these questions can find them treated well enough elsewhere; and he does not regard it as part of his task to point out to the student such difficulties and thus to foster in him a critical spirit, nor does he shape his proofs, as Picard has done so successfully, so as to avoid these difficulties, or, if that is not possible, to meet them squarely. This, from the author's point of view.

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\* Reviewed in the BULLETIN, vol. 3, p. 39.

† Reviewed in the BULLETIN, vol. 3, p. 135.

‡ Reviewed in the BULLETIN, vol. 3, p. 155.