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INTEGRALS OF LEBESGUE.

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THE purpose of this paper is to present in detail the contents of an introductory lecture given by the writer at the symposium of the American Mathematical Society held in Chicago in April of this year on the subject of Lebesgue integrals. It would be impossible to have selected a subject for that occasion more characteristic of present mathematical tendencies. Volterra has pointed out, in the introductory chapter of his *Leçons sur les Fonctions des Lignes*, the rapid development which is taking place in our notions of infinite processes, examples of which are the definite integral limit, the solution of integral equations, and the transition from functions of a finite number of variables to functions of lines. In the field of integration the classical integral of Riemann, perfected by Darboux, was such a convenient and perfect instrument that it impressed itself for a long time upon the mathematical public as being something unique and final. The advent of the integrals of Stieltjes and Lebesgue has shaken the complacency of mathematicians in this respect, and, with the theory of linear integral equations, has given the signal for a reexamination and extension of many of the types of processes which Volterra calls passing from the finite to the infinite.

It should be noted that the Lebesgue integral is only one of the evidences of this restlessness in the particular domain of the integration theory. Other new definitions of an integral