

If $f(x)$ is integrable in Riemann's sense then this new definition of the integral coincides with the ordinary one. Perhaps the relation of these two ideas is most clearly shown by means of the geometric conception of the integral as the difference between the two-dimensional measure of the set of points in $[a, b]$ having positive ordinates for which $0 < y < f(x)$, and that of the set of points for which these signs of inequality must be reversed. If these measures exist according to Jordan's definition, their difference is the integral in Riemann's sense; the insertion of the words "or enumerably infinite" in the right place in the definition of measure gives us the Lebesgue integral.

In so brief a notice as this it is impossible even to indicate the many applications which the author makes of this new and powerful instrument of analysis. There still remain unsolved cases of the problem of the primitive function, *i. e.*, the problem of determining a function whose derivative is given, but the solution is found in many cases where the ordinary integral cannot be used. In particular the question is settled whenever the given function is limited, or when it is known that the primitive function must be of limited variation. And in the case of rectifiable curves the Lebesgue integral gives their length whenever the functions $x(t)$, $y(t)$, $z(t)$ which define the curve have limited derivative numbers.

The treatment of several topics connected with the main subject should be mentioned, especially the chapters and sections on functions of limited variation and on derivative numbers. The volume closes with an admirably clear and concise note on point sets and transfinite numbers. D. R. CURTISS.

NOTES.

AT the meeting of the London mathematical society held on May 14 the following papers were read: By P. A. МАС-МАНОН, "On the invariants of the general linear homogeneous transformation in two variables"; by H. HILTON, "On the order of the group of isomorphisms of an abelian group."

A NEW academy of sciences has been established in Finland, with seat at Helsingfors. Two sections have been organized, one consisting of mathematics and the physical sciences, the other consisting of philology and philosophy.