present article he points out, among other things, the connection between this matrix and the linear substitutions by means of which H and its isomorphic groups may be represented.

In a recent number of *Liouville* Laurent published an " Exposé d' une théorie nouvelle des substitutions,"[*] in which he proposes to create an algorithm by means of which the general theory of substitutions may be presented. He employs not only the product and powers of substitutions but also their sums and differences. The term *new theory* should perhaps be understood to mean that the author is dealing mostly with facts that have not appeared in treatises. References would seem to have made the article more useful. The author adds : " Ceux qui voudront bien lire les pages qui suivent se convaincront que je n' ai fait qu' effleurer un sujet très vaste."

In closing we would repeat what was stated at the beginning of this report that we have aimed to call attention to only a few of the important recent advances in the theory of groups. In almost all parts of higher mathematics the group theory is continually taking a more prominent position[†] and it would require a man of riper years and much wider attainments than those possessed by the writer to give a harmonious and extensive account of the marvelous recent progress in this field. If our humble efforts shall be of service to some beginner in leading him to problems whose solution will assist him to penetrate the rich fields of this theory they will be amply rewarded.

CORNELL UNIVERSITY,
        August, 1898.

NOTE ON BURNSIDE'S THEORY OF GROUPS.

BY DR. G. A. MILLER.

IT is well known that Professor Cayley published an enumeration of the possible substitution groups whose degree does not exceed eight[‡] and that Professor Cole pub-

* Laurent, *Liouville's Journal*, vol. 4 (1898), pp. 75–119 ; cf. recent articles by the same author in *Nouvelles Annales*.

† Klein-Fricke, Vorlesungen über die Theorie der automorphen Functionen, 1897, p. 1.

‡ Cayley, *Quar. Jour. of Math.*, vol. 25 (1891), pp. 71 and 137.