wxu and *yzu* then the joining line of the two remaining points of intersection of the sextics so determined will meet F elsewhere in the two lines *wx* and *yz*.

CORNELL UNIVERSITY,
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NOTE ON THE GROUP OF ISOMORPHISMS.

BY DR. G. A. MILLER.

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LET $s_1, s_2, \cdots, s_g$ represent all the operators of a group G and let $t_\alpha s_\alpha$ correspond to s_α $(\alpha = 1, 2, \cdots, g)$ in any given simple isomorphism of G with itself. It is evident that t_α is some operator of G. When G is abelian these t_α's must constitute a group T which is isomorphic with G.* In this isomorphism, t_α evidently can not be the inverse of s_α unless $s_\alpha = 1$. As this condition is sufficient as well as necessary, we have

THEOREM I.—*Every simple isomorphism of an abelian group A with itself may be obtained by 1° making A isomorphic with one of its subgroups or with itself in such a manner that no operator corresponds to its inverse, and 2° making each operator of A correspond to itself multiplied by the operator which corresponds to it in the given isomorphism.*

The simplest case that can present itself is the one in which the subgroup of G, which corresponds to identity of T in the given isomorphism between G and T, includes T. The resulting simple isomorphism of G with itself must correspond to an operator in the group of isomorphisms of G, whose order is equal to the operator of highest order in T. When the order of T is an odd prime number p, or the double of an odd prime, only one other case can present itself; viz, the case in which T corresponds to itself, or to its subgroup of an odd prime order, in the given isomorphism between G and T. The resulting simple isomorphism of G with itself may clearly correspond to a cyclical group of order $p - 1$, or to any one of its subgroups in the group of isomorphisms of G. These results lead to the following

* When G is non-abelian, these t_α's need not constitute a group, as can be seen from the simple isomorphisms of the symmetric group of order 6 with itself.