ing from the multiplication of S_1^p by S_2^p. Special example: $T_1^3 \cdot T_2^3$ is absolutely convergent, but T_1^3 and T_2^3 are each divergent when $r < \frac{2}{3}$ and $s < \frac{2}{3}$.

In the divergent series S_1^p the terms increase without limit in numerical value, as v increases without limit. The same is true of S_2^p. Herein lies the difference between this pair of divergent series yielding an absolutely convergent product, and the pair given by Pringsheim.* In the latter the terms of the divergent series remain finite as v increases indefinitely.

From the relation $S_1S_2S_1S_2 \cdots = S_1^p \cdot S_2^p$ we see that there are cases in the multiplication of series in which divergent series may be used with safety—the sum of the final product series being convergent and equal to the product of the sums of the initially given convergent factor series, even when the product of *some* of the given factor series is divergent.

If two or more convergent series, when multiplied together, yield a convergent product series, then the sum of this product series is equal to the product of the sums of the factor series.

This theorem was proved by Abel for the case of two factor series,† and his method of proof is applicable to the general case. The extension is obvious.

COLORADO COLLEGE, COLORADO SPRINGS,
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CONCERNING THE CLASS OF A GROUP OF ORDER p^m THAT CONTAINS AN OPERATOR OF ORDER p^{m-2} OR p^{m-3}, p BEING A PRIME.

BY DR. W. B. FITE.

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IF a non-abelian group of order p^m contains an operator of order p^{m-1} it is of the second class.‡ It is the object of

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* *Loc. cit.*, p. 409.

† *Oeuvres complètes* de N. H. Abel, Tome Premier, 1839, "Recherche sur la série $1 + \frac{m}{1}x + \frac{m(m-1)}{1 \cdot 2}x^2 + \ldots$," Theorem VI.

‡ Burnside, Theory of Groups, p. 76. If we form the group of cogredient isomorphisms G' of G, then the group of cogredient isomorphisms G'' of G', and so on we finally come either to identity or to a group that has no invariant operators except identity, and is therefore simply isomorphic with its group of cogredient isomorphisms. The groups for which this process leads to identity are classified according to the number of these successive groups of cogredient isomorphisms.