Transposing the term X^n to the left-hand side and extracting the nth root of the two members of the resulting inequality, we find

$$X \leqq \frac{\alpha}{2^{1/n} - 1}.$$

The roots of largest absolute value X are restricted by the double inequality

$$\alpha \leqq X \leqq \frac{\alpha}{2^{1/n} - 1},$$

where α denotes the largest of the quantities

$$| a_1 |, | a_2 |^{1/2}, \cdots, | a_n |^{1/n}.$$

The inequality $X \geqq \alpha$ was noted by R. D. Carmichael and T. E. Mason,* who observed also that the lower limit is reached if the equation is

$$(x + \alpha)^n = 0.$$

It is also evident that the upper limit found above is reached if the equation is

$$2x^n - (x + \alpha)^n = 0.$$

HARVARD UNIVERSITY,
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CERTAIN NON-ENUMERABLE SETS OF INFINITE PERMUTATIONS.

BY PROFESSOR A. B. FRIZELL.

(Read before the American Mathematical Society April 10 and December 28, 1914.)

1. THE simplest element of a permutation is the pairing of one of the objects permuted with a number indicating its place in the permutation. Such a pairing may be called a *primitive element* and denoted by (i, n), where n is the object and i the number of the place assigned to it. In this paper the objects will all be numbers, finite or transfinite.

2. Permutations of finite sets are simply collocations of primitive elements. They are conveniently denoted by ex-

* BULLETIN, vol. 21 (1914), pp. 14–22; in particular p. 20.