its degree exceeds 1,000, while the formula $\frac{1}{3}n + 1$ would place the upper limit of transitivity for such groups beyond 300. These illustrations may suffice to exhibit clearly that a much smaller upper limit for the degree of transitivity of a primitive group which is neither alternating nor symmetric results from the use of the present theorem than the one given by $\frac{1}{3}n + 1$, whenever n is large. When $n = 12 = 7 + 5$ the two theorems lead to the same upper limit. This is also true for the cases when n is 8 or 9. Since the groups whose degrees are less than 8 are so well known, it does not appear necessary to preserve the formula $\frac{1}{3}n + 1$ as an upper limit of the degree of transitivity of substitution groups which do not include the alternating group, especially since the theorem proved above is based upon such very elementary considerations.

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THE PERMUTATIONS OF THE NATURAL NUMBERS CAN NOT BE WELL ORDERED.

BY PROFESSOR A. B. FRIZELL.

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LET us tabulate the natural numbers according to the number of their prime factors, viz., the nth row shall consist of the products $\pi(\nu, n)$ of n primes in order of magnitude. Form a new rectangular array wherein the nth column shall be composed of numbers from the nth row of the first scheme but arranged in rows by their column indices ν in the former, so that now the ith row contains those products $\pi(\nu, n)$ for which ν is a product of i primes. We obtain an infinite matrix of series

3, 5, 11, 17, 31, $\cdots$; 6, 9, 14, 21, 33, $\cdots$;
12, 18, 27, 30, 50, $\cdots$; 24, 36, 54, 60, 90, $\cdots$; $\cdots$
7, 13, 23, 29, 43, $\cdots$; 10, 15, 25, 26, 38, $\cdots$;
20, 28, 44, 45, 66, $\cdots$; 40, 56, 84, 88, 126, $\cdots$; $\cdots$
19, 37, 61, 71, 103, $\cdots$; 22, 34, 51, 57, 82, $\cdots$;
42, 52, 76, 92, 116, $\cdots$; 81, 100, 140, 152, 210, $\cdots$; $\cdots$
53, 89, 151, 173, 251, $\cdots$; 46, 69, 111, 121, 161, $\cdots$;
70, 105, 154, 171, 236, $\cdots$; 135, 196, 276, 306, 376, $\cdots$; $\cdots$
. . . . . .

It is proposed to form permutations of the natural numbers