THE KNOWN FINITE SIMPLE GROUPS.

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THE list of systems of simple groups given in the BULLETIN for May, 1897, may be enlarged by the addition of a number of new systems determined by the writer during the past two years. By request a table has been constructed which should aid in the determination of the status of a newly discovered simple group. The first part of the table gives the orders of all simple groups of order less than one million which are included in the various systems except the first. In extending the table to the orders between one million and one billion, I have excluded, for the sake of brevity, the simple groups $LF(2,p^n)$ of type (3) having the orders

$$(p^{2n}-1)p^n \quad \text{for } p=2,$$

$$\tfrac{1}{2}(p^{2n}-1)p^n \quad \text{for } p>2.$$

But it is readily determined whether or not a given number N is of one of these two forms. Indeed, if q^s be the largest power of a prime contained in N, it must equal p^n or p^n+1. Hence, if q^s-1 be a power of a prime, then $p^n=q^s-1$; in the contrary case, $p^n=q^s$.

The calculations have all been made in duplicate ; furthermore, care has been taken to include all orders coming within the assigned limits of the table.

In the following systems of simple groups, p denotes a prime number, m and n denote integers, each subject only to the limitations given.

(1) $$p,$$

(2) $$\tfrac{1}{2}n\,! \quad (n>4),$$

(3) $$LF(m,p^n)\equiv\frac{1}{d}(p^{nm}-1)p^{n(m-1)}(p^{n(m-1)}-1)p^{n(m-2)}\cdots(p^{2n}-1)p^n$$

where $p^n>3$ if $m=2$. Here d denotes the greatest common divisor of m and p^n-1.