

Ikosaeder" (1884), page 18, to prove that the icosahedron-group of rotations is simple does not apply. The alternating substitution group of degree 68 is such an instance. The number of substitutions of the form  $abc$  is

$$\frac{68 \cdot 67 \cdot 66}{3} = 100232,$$

and

$$1 + 100232 = 9 \cdot 7 \cdot 37 \cdot 43.$$

The diophantine equation

$$1 + 100232\alpha + \dots = d$$

has in this case at least the following three solutions:

$$(\alpha, \beta, \delta, \dots; d) = (1, 0, 0, \dots; 1), (1, 1, 1, \dots; \frac{68!}{2}), \\ (1, 1, 0, \dots; 100233).$$

Since every alternating group whose degree exceeds four is simply isomorphic to a number of other simple groups, this instance proves that the given test is insufficient with respect to simple groups which are not alternating. The subgroup  $\Gamma_n$  of Professor Moore's article and its constituent groups are clearly such simple groups, if we take for  $G_n$  the given alternating group.

GEORGE A. MILLER.

December 28, 1894.

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#### BRIEFER NOTICES.

LOBACHEVSKY MEMORIAL VOLUME: 1793-1893. *Celebration of the one hundredth anniversary of the birth of N. I. Lobachevsky.* [In Russian.] Kazàn, University Press, 1894. Folio, 212 pp. With a portrait of Lobachevsky.

IN addition to a detailed account of the three days' celebration in honor of Lobachevsky, held at the University of Kazàn in November, 1893,\* this volume contains the letters and telegrams of congratulation received by the university, and some of the addresses and papers read on this occasion. Professor Suvòrov gives a somewhat popular exposition of the meaning of non-Euclidean geometry, while Professor Smirnov discusses the same subject rather elaborately from the philosophical point of view. The other papers are historical: Mr. Iznòskov speaks of Lobachevsky's activity as a member of the Kazàn Agricultural Society; the president of the university,

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\* See *Bulletin of the New York Mathematical Society*, vol. 3, p. 201.