A THEOREM CONCERNING SIMPLY TRANSITIVE PRIMITIVE GROUPS*

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The theorem here presented has evolved by easy stages from a paragraph in Jordan's *Memoir on primitive groups.*† In the discussion of a particular class of simply transitive primitive groups, he showed that the degree of a doubly transitive constituent of the subgroup leaving one letter fixed cannot be greater than the sum of the degrees of all the other transitive constituents.

THEOREM. *Let H be the subgroup that fixes one letter of a simply transitive primitive group. If one of the constituents of H is a doubly transitive group of degree m, there is in H a transitive constituent whose degree is greater than m and divides $m(m-1)$.*

Let G, of degree n and of order nh, be the given simply transitive primitive group. Let H, the subgroup of G that leaves the letter x fixed, be denoted by $G(x)$.

Let it be assumed: (1) that $G(x)$ has exactly k similar‡ doubly transitive constituent groups: A on the letters $a_1, a_2, \cdots, a_m$; B on $b_1, b_2, \cdots, b_m$; $\cdots$; K on $k_1, k_2, \cdots, k_m$; (2) that $G(a_1)$ has $k-1$ doubly transitive constituents: B_1 on $b_1, a_2, \cdots, a_m$; C_1 on $c_1, b_2, \cdots, b_m$; $\cdots$; K_1 on $k_1, j_2, \cdots, j_m$; (3) that n is greater than $km+1$. These assumptions, when $k=1$, reduce to the hypothesis of our theorem. We wish to prove by induction that there is a transitive

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† C. Jordan, Bulletin de la Société Mathématique de France, vol. 1 (1873), p. 198, §64.

Manning, American Journal of Mathematics, vol. 39 (1917), p. 298; Transactions of this Society, vol. 20 (1919), p. 66; *Primitive Groups*, 1921, p. 83; Transactions of this Society, vol. 29 (1927), p. 821, §8.

‡ Manning, Transactions of this Society, vol. 29 (1927), p. 821, §8.