Zbl 223.10005
Erdős, Paul; Turán, P.
On some problems of a statistical group theory. V. (In English)
Period. Math. Hung. 1, 5-13 (1971). [0031-5303]

[Part IV, Acta math. Acad. Sci. Hungar. 19, 413-435 (1968; Zbl 235.20004).]
Let S_n be the symmetric group of n elements. It is well known that the number of conjugacy classes of S_n is $p(n)$ the number of partitions of n. Let H be an element of S_n $O(H)$ its orders which only depends on the conjugacy class of H. $P(H)$ denotes the greatest prime factor of $O(H)$. The authors prove the following theorem: For almost all H (i.e. for all H except for $o(p(n))$ of them) we have

$$|P(H) - \left(\frac{\sqrt{6n}}{2\pi} \log n - \frac{\sqrt{6n}}{\pi} \log \log n \right) | < \omega(n)\sqrt{n}$$

where $\omega(n)$ tends to infinity as slowly as we please. [See also the authors, Acta. Math. Acad. Sci. Hung. 18, 151-163 (1967; Zbl 189.31302).]

Classification:

11P82 Analytic theory of partitions
20P05 Probability methods in group theory
05A17 Partitions of integres (combinatorics)
20B35 Subgroups of symmetric groups
20B30 General theory of symmetric groups
00A07 Problem books