Division algebras and separable subfields. Preliminary report.

If $D/F$ is a division algebra (finite dimensional) and $K/F$ is a Galois maximal subfield then this forces $D/F$ to be a crossed product, which is a strong constraint on the algebra structure of $D$. Generic separable $K/F$ have Galois group the symmetric group $S_n$ (i.e. the Galois group of its Galois closure) but one can ask whether there are algebraic consequences of $D/F$ having maximal $K/F$ where the Galois group of $K/F$ is smaller than $S_n$ (but bigger than order $n$). With the machinery we develop we answer questions about the asymptotic behavior of $(KaK)^m$ and characterize when $aK$ consists entirely of $n$ power central elements. This is joint work with Eli Matzri, Louis Rowen, and Uzi Vishne. (Received January 26, 2015)