In this talk we will consider fibrations with fiber A^n, i.e. flat affine morphisms $\phi\colon X \to Y$ such that every fiber is reduced and isomorphic to affine n-space A^n. The basic question is the following (it goes back to a paper of Dolgachev-Weisfeiler from 1974): *Is every fibration with fiber A^n a fiber bundle, i.e. locally trivial in the étale topology?* The answer is yes for $n = 1$ and Y normal and for $n = 2$ and Y a smooth curve, but completely open in general. We will report on some recent developments and will describe a new unified approach to the problem which implies and partly generalizes the results known so far. There are also some interesting applications of our new methods to the automorphism group of affine n-space and to the linearization problem.