Let $G$ be a simple, simply connected algebraic group over an algebraically closed field of prime characteristic $p$ that is not too small. Let $B$ be a Borel subgroup of $G$ with unipotent radical $U$. We discuss recent computations of the third degree cohomology groups of $B$ and its Frobenius kernels with coefficients in a one-dimensional module, as well as related computations of Frobenius kernels of $G$ with coefficients in standard induced modules. This work involves new computations of the ordinary Lie algebra cohomology of the Lie algebra of $U$. (Received September 14, 2015)