In the 1930's Leonard Carlitz described the first Drinfeld module associated to the polynomial ring $\mathbb{F}_q[T]$ with coefficients in a finite field with $q = p^t$ elements (p rational prime). Carlitz was able to express in an elementary fashion the associated exponential function (nowadays called "the Carlitz exponential") which is an entire $\mathbb{F}_q$-linear function. An interesting property of this exponential is that its Taylor expansion has only non-zero terms of the form z^{q^i} for $i = 0, 1, \ldots$. By using the logarithmic derivative of this function, Carlitz was able to prove an analog of Euler's famous result on the values of the Riemann zeta-function at even integers. Then, using the denominators of the above exponential, Carlitz created a "factorial" element $\Pi(j)$ based on the q-adic expansion of j. He then introduced what we call "Bernoulli-Carlitz" elements BC_i (i.e., certain rational functions in $\mathbb{F}_q[T]$) and proved a very mysterious "von Staudt" result of the following form : a prime f divides the denominator of BC_i if and only if
1. $q^{\deg f} - 1$ divides i.
2. the sum of the p-adic digits of i must equal $\deg(f)t(p-1)$.
(where t is defined above by $q = p^t$).
While the first condition is very classical, the second is highly mysterious. In the "characteristic p world" of Drinfeld modules, one works with arbitrary A (arising from any global field over $\mathbb{F}_q$ and any closed point ∞) of which $\mathbb{F}_q[T]$ is the simplest example. Carlitz's results were the first in a long chain of results making $A/\mathbb{F}_q$ look very much like the integers numbers (for what concerns the existence of L-series, gamma functions, modular forms, periods etc.). In this, the work is adjoint to the notion of making the integers look very much like $A/\mathbb{F}_q$ via the "field" $\mathbb{F}_1$ which lies "below" $\mathbb{Z}$.... The polynomial ring $\mathbb{F}_q[T]$ is Euclidean like the integers but is not a good representative of general A with non-trivial class number. For instance, it appears that the "trivial zeroes" of zeta functions have a very interesting non-classical behavior for general A. Calculations due to D.Thakur and J.Diaz-Vargas show that this behavior occurs for $-i$ where i has bounded sum of p-adic digits. So one is drawn to Carlitz's second condition above. Experiments done with LHC (= Long Hard Calculations!) may give us clues as to what to expect for a general von Staudt result as well as deeper insight into the behavior of these char p valued functions.