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**Bradley Arthur Waller.** *On a construction of  $C^1(\mathbb{Z}_p)$  functionals from  $\mathbb{Z}_p$ -extensions of algebraic number fields.*

Let  $k$  be any number field and  $k_\infty/k$  any  $\mathbb{Z}_p$ -extension. We construct a natural  $\Lambda = \mathbb{Z}_p[[T-1]]$ -morphism from  $\varprojlim k_n^\times \otimes_{\mathbb{Z}} \mathbb{Z}_p$  into a special subset of  $C^1(\mathbb{Z}_p)^*$ , the collection of linear functionals on the set of continuously differentiable functions from  $\mathbb{Z}_p \rightarrow \mathbb{C}_p$ . We apply the results to the problem of interpolating Gauss sums attached to Dirichlet characters and the explicit annihilation of real ideal classes. (Received September 15, 2014)