1039-11-46 **Daniel Allcock** (allcock@math.utexas.edu), Department of Mathematics, 1 University Station C1200, Austin, TX 78712, and **Jeffrey D. Vaaler*** (vaaler@math.utexas.edu), Department of Mathematics, 1 University Station C1200, Austin, TX 78712. *A Banach space determined by the Weil height.*

Let $\overline{\mathbb{Q}}^{\times}$ denote the multiplicative group of nonzero algebraic numbers. Write $\mathrm{Tor}\{\overline{\mathbb{Q}}^{\times}\}$ for its torsion subgroup, and $\mathcal{G} = \overline{\mathbb{Q}}^{\times}/\mathrm{Tor}\{\overline{\mathbb{Q}}^{\times}\}$ for the quotient group. The absolute logarithmic Weil height is well defined on $\mathcal{G}$ and induces a metric topology in this group. We show that the completion of this metric space is a Banach space over the field $\mathbb{R}$ of real numbers. We further show that this Banach space is isometrically isomorphic to a co-dimension one subspace of $L^1(Y, \mathcal{B}, \lambda)$, where Y is a certain totally disconnected, locally compact space, $\mathcal{B}$ is the σ-algebra of Borel subsets of Y, and λ is a certain measure satisfying an invariance property with respect to the absolute Galois group $\mathrm{Aut}(\overline{\mathbb{Q}}/\mathbb{Q})$. Some applications and related open problems will also be discussed. (Received February 28, 2008)