1100-13-209 **Raymond T Hoobler*** (rhoobler@ccny.cuny.edu). *Rethinking Picard-Vessiot theory.* Preliminary report.

Let $A$ be a $\Delta$ algebra containing $\mathbb{Q}$, and $(E, \nabla)$ a finitely generated $A$ module with a connection. We first show that the constant frame functor, $\mathcal{CF}_E$, from $A, \Delta$ algebras to abelian groups given by

$$\mathcal{CF}_E\,(B) = \{\mathbb{B}/\mathbb{B} \text{ is an ordered basis of } E \otimes_A B \text{ consisting of constant vectors}\}$$

is (co)represented by an $A, \Delta$ algebra; that is, there is an $A, \Delta$ algebra $CF_E$ such that $\mathcal{CF}_E\,(B) \underset{\approx}{\rightarrow} Hom_{A,\Delta \text{ alg}}\,(CF_E, B)$ for all $A, \Delta$ algebras $B$. If $A^{\Delta}$ is an algebraically closed field, we then easily construct the associated Picard-Vessiot extension and show it is a principal homogeneous space for an affine algebraic group. This then leads naturally and directly to the PV Galois theory. This approach also transfers immediately to parameterized PV theory and difference PV theory. An extension to the case when $A^{\Delta}$ is not a field will also be discussed. (Received February 08, 2014)