1078-08-73 **F. E.J. Linton*** (`fejlinton@usa.net`), Dept. of Math/CS, Wesleyan Univ., Middletown, CT 06459. *On Iterated Tensor Products in Varieties.* Preliminary report.

Eleven years ago, at a March AMS meeting in Columbia, SC (cf. [1]), I brought up Pierre Grillet's old example (cf. [2]) of three tiny semigroups—bands, all—for which $(A \otimes B) \otimes C$ and $A \otimes (B \otimes C)$ cannot be isomorphic, one being finite while the other is infinite.

Here we go a little further: we exhibit three tiny semigroups—all bands, again (indeed, all the same band)—for which not only is neither of the associations assigning

trilinear maps $\langle A, B, C \rangle \to X$

to

bilinear maps $\langle A \otimes B, C \rangle \to X$

or to

bilinear maps $\langle A, B \otimes C \rangle \to X$

a bijection in general, but the sets of trilinear maps to which those two sorts of bilinear maps give rise need not be the same.

Thus, the two iterated tensor products $(A \otimes B) \otimes C$ and $A \otimes (B \otimes C)$ and a simultaneous three-fold tensor product $A \otimes B \otimes C$ are all fundamentally different one from another, a development that may well leave those with vested interests in the associativity of tensor products reeling.

[1] F.E.J. Linton. *On the Associativity of Tensor Products in non-Entropic Varieties.* A.M.S. Abstract #963-08-201.

[2] Pierre Antoine Grillet. *The Tensor Product of Semigroups.* Trans. Amer. Math. Soc. **138**, 1969, pp. 267-280. (Received November 21, 2011)