

The entwining snake is reborn

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Many of the most fascinating and rewarding mathematical results are associated with connecting disparate concepts and areas. The links Richard Laver establishes in [L1] and [L2] clearly fulfill this criterion. (The papers under review will be cited as [L1]–[L4], [D1]–[D4], [St], [Do1]–[Do2], and [DJ] in the order listed above.) While algebra and set theory nowadays yield many interactions, Laver's coupling of large cardinals with discrete (and even finite) algebraic binary objects seems to remain unchallenged in its uniqueness.

On a naïve level there is even a temptation to regard the connections as something nearly mystical: on one hand there are non-trivial elementary embeddings of a rank R_λ into itself—a faithful copy of the (mathematical) reality within its own limits; on the other hand there stands the left distributive law

$$x \cdot (y \cdot z) = (x \cdot y) \cdot (x \cdot z),$$

a strikingly simple algebraic expression of self-similarity. Indeed, it is natural to regard self-similarities as mappings, and a binary operation that embodies the self-similarity can be expected to exhibit a great diversity of such mappings that can be derived from it in a direct way. Self-similarities are mathematically endomorphisms, and the binary operation \cdot is left distributive if and only if the left translation $x \mapsto a \cdot x$ is an endomorphism for every a .

Patrick Dehornoy connects free left distributive systems to the braid group B_∞ , and this made the subject even more prone to mystical interpretation: the entwining snake that is reborn.