"Some Mathematics for Biological Theories: Randomness and Organisation, as Anti-entropy, in Darwin's Evolution"

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Abstract. Biological theoretizing can be understood in terms of "extensions" of physical theories: add proper biological observables and suitable equations. The issue then is posed on whether these extensions are "conservative", in the sens of Logic.
I will apply this approach to a remarkable analysis by J.S. Gould on the role of randomness in increasing "complexity" in Darwin's Evolution. In particular, we, the humans, are the random complexification of a bacterial world, along a contingent and possible diffusive path. In order to set these remarks and the associated paleontological evidence on mathematical grounds, the notion of anti-entropy, as formalized biological complexity, is presented (a quantification of cellular, functional and phenotypical differentiation). Then Gould's phylogenetic curb is derived as a diffusion equation of biomass over anti-entropy.

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