Biogeosciences Discussions

Biogeosciences Discuss., referee comment RC4
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Reply on RC2

William Martin (Referee)

Referee comment on "Comment on “Fundamental molecules of life are pigments which arose and co-evolved as a response to the thermodynamic imperative of dissipating the prevailing solar spectrum” by K. Michaelian and A. Simeonov (2015)" by Lars Olof Björn, Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-135-RC4, 2021

I disagree. The critical comment by Björn should be published. On entropy, I can recommend a paper by Battley, a biologist who measured entropy changes in biological systems for decades: L. D. Hansen, R. S. Criddle, E. H. Battley, Biological calorimetry and the thermodynamics of the origination and evolution of life. Pure Appl. Chem. 81, 1843–1855 (2009). There we can read that the measured changes in entropy in biological systems are always zero or close to zero and that because cells are organized in a spontaneous process, no energy input is required to maintain the structure or organization of cells. If one is to get into entorpy in living systems, one has to look at the literature where it is quantified, not asumptions about what it should be. Overall the best aspect of this discourse was the paper by Björn, which is apparently not going to see the light of day. Oh well. With physicists and geoexperts around, who needs biologists when it comes to life? Next time I go to the doctor I'll ask for an equation. Battley's discussion of entropy and information is a classic, I highly recommend it (search the text for Gedankenexperiment). I would have thought that the journal (and Michaelian) would be happy that someone mentions the 2015 paper in 2021.