

Review of: "A Law for Irreversible Thermodynamics? Synergy Increases Free Energy by Decreasing Entropy"

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Potential competing interests: No potential competing interests to declare.

Having recently read several papers from the authors, I felt I had a proper background to do this revision. My earliest readings of the works dates back to earlier literature studies back to the mid-nineties starting with interesting ant studies.

Some of the statements in this are much clearer/stronger as compared to some of the previous statements - interesting - but some of my concerns from reading previous papers are still valid.

First of all, I have to state that I am myself working in a tradition of ecology that is very trans-multi-inter-disciplinary in approach. Hence I am very tolerant, understanding and sympathetic with the attempts made here. So these I have no problems.

Meanwhile, considering the problems I've had myself and the criticism raised towards me and my colleagues for our attempts to extend FFE-thermodynamics to biology and ecology I have to be critical in this sense too. Critics have been raised from many sides. In particular from traditional biologist and ecologists who simply react to a postulated mechanist angle presented by imposing thermodynamics to life. But also, from prominent physicists where I have participated in a number of conferences where people in spite of being open to discuss this topic also have been very critical.

First of all, there is the problem stemming from the fact that most scientists will take that stance that entropy does not have any definition under such conditions.

So basically, I do miss some more precise definitions of the "entropies" that have been taken as proxies here. At best equations stating relations and what microstate units that have been used in calculations - as most of the analyses seem to view the systems from an angle of statistical thermodynamics/mechanics.

Some of the systems books, music, societal systems are so far away from classical thermodynamics that it means, we must be working with something else. The only fact we seem to have is that we work with isomorphic expression, - but eventually that they are not identical entropies (therefore my previous plural use of the word).

What indeed remains interesting - to me increasingly over the years - is that there seems to be some universal? common tendencies in the phenomenological behavior of the systems. This may tell us more about self-organizational principles and optimization of open systems than other observables, - although not being reducible or identical to classical entropy (at least in my view).

Need some reflections on this built-in controversies that need to be overcome to establish a common platform for a future dialogue.