

# Review of: "On the Statistical Arrow of Time"

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The author notes the well known fact that the entropy of a dynamical system, and its rate of convergence, depends upon the coarse-grained level of description. He goes on to argue that, because of this dependence, the "arrow of time" should not be considered a fundamental property of Nature but, rather, as a subjective property arising from the "ignorance of the observer."

These issues have, in fact, been well known and well studied since at least the time of Boltzmann and were discussed extensively by Ehrenfest. Notwithstanding, the author is correct to observe that there remains considerable misunderstanding on the subject even to this day. I do not believe the present article, however, adds anything new to the discussion.

I believe a common source of misunderstanding is the use of language such as the "knowledge" or "ignorance" of the "observer." Such anthropic contrivances suggest an arbitrary subjectiveness that goes against one's intuition that there is something objective about the probabilities being assigned. It would be better, I think, to speak instead of the "description of the system," which is of course still arbitrary but an objective choice and not an accident of ignorance. I may, for example, say that I am "at home," "in my bedroom," or "lying in bed," each of which is a different coarse-grained description of my physical state selected for the desired specificity rather than arising any one person's level of ignorance. Such small but important changes in language would do wonders to elevate the conversation. I believe such a change could greatly improve the author's paper as well.