Theodore Modis on Chaisson's "A Singular Universe of Many Singularities: Cultural Evolution in a Cosmic Context"

The concept of Φm is the best attempt at rigorously quantifying complexity that I have seen, albeit with shortcomings, e.g. no one will accept that bicycle riding is ten times more complex than violin playing or that a jet engine is 1000 times more complex than a mammalian organism! My attempt to quantify complexity (discussed in the second part of my essay) is only in relative terms and is based on data that may be subject to subjective judgment. Of course there must have also been some subjective estimates in Chaisson's data, for example, in the calculation of Energy Rate Densities of hunter-gatherers, agriculturists, industrialists, etc., which may mask a leveling-off of the straight-line trend of the 0 data points in Fig. 20.3, similar to the visible leveling-off of the X data points. These leveling-offs are evidence that we are dealing with S-curves and combined with the acknowledged leveling-off of the two early curves in Fig. 20.2, reinforces the general conclusion that exponential trends of Phi are in fact early parts of S-curves.

Chaisson is being conservative. He modestly says that "I sense, but cannot prove, that information is another kind of energy" while he could have easily argued that information content is proportional to entropy which is equal to Q/T (heat over temperature), which IS energy. He also says that the drawn curve of the shaded area of Fig. 20.2 is the compound sum of multiple S-curves, but stops short of using S-curves to extrapolate it into the future. In fact he refrains from committing himself to any future eventuality one way or another. (One would have welcomed at least an educated guess from such an expert!)

Having spent most of my career with S-curves I can see in Chaisson's Fig. 20.3 that the two "S-curves" depicted by the dashed and dotted lines determine the shape of the late part of the third "S-curve" labeled society on Fig. 20.2. Furthermore, these two curves in Fig. 20.3 have life cycles that become shorter with time (acceleration effect). Life cycles getting shorter is evidence for saturation. As I mention in my essay there is a fractal aspect to S-curves. A large-scale S-curve can be decomposed to smaller constituent S-curves the life cycles of which become shorter as we approach the ceiling of the envelope curve (see also publication http://www.growth-dynamics.com/articles/Fractal.pdf). I can then conjecture that the line labeled society in Fig. 20.2 is an S-curve that presently finds itself beyond its midpoint, i.e. experiences a progressive slowdown of its rate of growth. An imminent slowdown in the rate of growth of Phi (and complexity) corroborates a similar conclusion in my essay.