

Entropy

Life is a two edged thing. The second law of thermodynamics, says that in the material world energy of all kinds disperses or dissipates from higher concentrations to lower ones, if it is not hindered from doing so. The dispersal occurs at a predictable rate. The measurement of this rate of dispersal is called entropy.

The implications of this law are profound. It encompasses both life and death. On the one hand, life as we know it would not be possible without a stable and predictable rate of dispersal of energy from higher to lower concentrations. On the other, the inevitability of such a flow makes it certain that the world as we know it will one day come to an end. To give an example, the sun, the most concentrated form of energy in our solar system will continue to radiate its energy to lower concentrations at a steady rate till its concentration is "equalised".¹ The steady dispersal of the sun's energy gives rise to life on earth. The fact that this dispersal will cease once the concentrations are equalised means that life sustained by this dispersal must end some day.

To the scientist, entropy is a means for measuring this law and, consequently, for describing the processes that sustain life. To a lay person like me entropy can also be viewed as the rate at which order turns to chaos, assuming that "life" is order and "death" (or, the end of life) is chaos. In other words, entropy is chaos. Or, entropy is the potential for chaos that inherent in all "order". Or, entropy is the rate at which order turns into chaos.

In a paper titled *Entropy Is Simple -- If We Avoid The Briar Patches!* Professor Frank L. Lambert, Professor Emeritus (Chemistry) Occidental College, Los Angeles has severely criticised all those who use entropy in the manner described above. He complains bitterly about the simplistic and inaccurate use of both, the second law and of the concept of entropy to create what he calls falsehoods about entropy as "disorder" or, as a measure of chaos. He gives myriad examples from everyday life, illustrating chemical (or thermodynamic) entropy, to justify his critique of philosophical entropy. To quote: "entropy change has to do with *energy* spreading out, not with pretty patterns." This sentence encapsulates the professor's scorn for the non-scientific use of the term, i.e. to describe a descent from "order" to "disorder".

While the professor is quite right to distinguish between scientific entropy as a measure of the rate at which heat is dispersed in a given process (or, thermo-dynamics) and, entropy as weltanschauung, his refusal to recognise the philosophical implications of the second law is in keeping with the short sightedness of modern science (and scientists). In fact, the professor's approach is perfectly consistent with why the world is in the parlous state that it is in; with those who run the world refusing to recognise the existence of entropy at all levels of existence and activity.

¹ Though not used in the strict scientific sense, the expression is nevertheless accurate since it is predicated that as the sun cools its matter will spread (the sun will expand), thereby heating up the solar system till the entire solar system is encompassed within the sun's ambit, resulting in an equalisation of temperatures.

For example, the idea links up to a common thread of decline and decay found in most notions of existence. The Indian view speaks of existence being divided into four Yugs (ages, or periods). The first yug is depicted as an elephant standing on four legs; which loses a leg in each succeeding yug. The first period - Sat yug - (age of truth or 'true age') was the best (closest to perfection, or godhead) while the fourth period, Kali yug, which is supposed to be currently on, is the worst. The in between periods are called Treta and Dwapar yugs, respectively.² At the end of each cycle of existence lies a "destruction" called 'Pralay', which also marks the beginning of a new cycle. In the assurance of renewal lies the mystery for which modern science has no answers, i.e. what happens after the sun's energy runs down, ending existence as we know it?

Of course, the world view suggested by entropy is the opposite of what modernity would have us believe, i.e. that human beings are on a linear path of growth, expansion, betterment and progress.³ Perhaps this is why professor Lambert is reluctant to see the connection between the 2nd law and life. However, an example from a place somewhat closer to the professor's heart than mythology would seem to confirm what it suggests. Modern biology says that aging (and, therefore, death) is intrinsically connected to cell duplication, which is part of the metabolic process in all life. Apparently, each time the cell replicates itself the mitochondria, which are energy generators at the level of the cell, are weaker than in the previous version of the cell. In other words, at the cellular level entropy can also be measured by the strength of the Mitochondria contained in a cell. Ultimately, when the Mitochondria cease to be effective generators of power, the cell dies out. Once again, a paradigm of existence that starts out from a state of "perfection" (or order) and tapers down to death (or chaos).

This view of entropy also yields acceptable (and logical) results when applied to the social sciences. In the Sat yug of the legends, justice was a purely voluntary affair. In other words, the age was characterised by the voluntary acceptance (by the concerned parties) of the verdict of a judge or an arbitrator on a dispute. On the other hand, in the Kali yug, justice cannot be had without enforcement, and frequently cannot be had at all. Thus, notwithstanding the many tall claims made by (or on behalf of) the current regime of 'rule of law' justice, we are worse off than before in terms of justice. The point needs no proof or elucidation since it is obvious that ideal justice should not need enforcement; since the two notions – justice and enforcement – are antithetical to each other. The moment enforcement enters into the picture "justice" is diminished for both, the victim and the victimiser. Entropy at work yet again!

Despite living in the age of relativity, quantum mechanics and more, modernity continues to be governed by a mechanistic world view. Even scientists whose work in cutting edge areas (like professor Lambert's) brings an element of direct/ physical proof about the current view of reality into their lives, continue to subscribe to mechanistic world views at subterranean levels. Seeing this it is easier to understand why the politicians, business persons and the host of other opinion makers continue to cling to this wholly destructive

² Depicted as an elephant with three legs and two legs, respectively.

³ Even if we are on such a path, modernity's view on it is not correct. Further, by 'we' here I mean existence and not human beings.

world view; but not easier to accept. The worst aspect of modernity is the fact that it continues to gain millions of converts each year. Millions of poor, third world-ers who are admitted to the “benefits” of modernity – education, jobs and technology – drop their holistic mindsets, and embrace modernity, every year. And, this is dubbed as “progress” by almost everyone concerned, including most of the “alternate” peoples of the world.⁴

Yet again, on the other hand, perhaps it is people like me, who refuse to accept that mindless destructiveness can be beneficial to existence (or even to mankind), who are the real moderns; and, therefore, wrong. For, in the Kali yug it is ordained that the world will move towards its own destruction. What else can it be but the virus of modernity to want to stop this from happening? Perhaps it would be easier for us to fight this infection if its latest versions held out the promise of a renewal, like mythology. Unfortunately, however, faith is still a requirement for this belief. Entropy is not enough.

⁴ On the other hand, the millions who are already admitted to these benefits are so seduced by them that even those who “see” through the farce of modernity continue to cling to its “benefits.