

Creationism and the Second Law of Thermodynamics

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In his book, *The Face That Demonstrates The Farce of Evolution*, evangelist Hank Hanegraaff (better known as radio's The Bible Answer Man) states:

“While the law of energy conservation [the 1st law of thermodynamics] is a blow to the theory of evolution, the law of entropy is a bullet to its head. Not only is the universe dying of heat loss, but according to entropy—also known as the second law of thermodynamics—everything runs inexorably from order to disorder and from complexity to decay. The theory of biological evolution directly contradicts the law of entropy in that it describes a universe in which things run from chaos to complexity and order. In evolution, atoms allegedly self-produce amino acids, amino acids auto-organize amoebas, amoebas turn into apes, and apes evolve into astronauts.”

“Mathematician and physicist Sir Arthur Eddington [*The Nature of the Physical World*, 1930] demonstrated that exactly the opposite is true: The energy of the universe irreversibly flows from hot to cold bodies. The sun burns up billions of tons of hydrogen each second, stars burn out, and species eventually become extinct. While I would fight for a person's right to have faith in science fiction, we must resist evolutionists who attempt to brainwash people into thinking that evolution is science. Evolution requires constant violations of the second law of thermodynamics in order to be plausible. In the words of Eddington, ‘If your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation.’ ” [1]

This one-sided explanation of the Second Law of Thermodynamics (SLT) is typical of the creationist viewpoint. In their never-ending quest to demolish the theory of evolution, creationists begin by presenting a false premise in order to establish a false conclusion. However, in this case, Mr. Hanegraaff has given us *several* false premises, the first one being that the “law of energy conservation is a blow to the theory of evolution.” Unfortunately, he doesn't elaborate for us as to *why* this is so. What he calls the “law of energy conservation,” we call the First Law of Thermodynamics, which is stated by Borchardt as the Fifth Assumption of Science (“matter and the motion of matter can neither be created nor destroyed”) [2]. How is this a “blow” to the theory of evolution? As to entropy being a “bullet to its head,” this statement (obviously intended to be compelling and convincing) disintegrates under scrutiny.

Hanegraaff's first mistake is his reliance on the statements of Sir Arthur Eddington. Ironically, Eddington was a proponent of the theory of *stellar* evolution! And Eddington's supposed "demonstration" that "evolution requires constant violations of the 2nd law" is erroneous; he demonstrated no such thing.

Hanegraaff assumes that Eddington's statement referring to "your theory," is a reference to the theory of evolution. He then presumes that Eddington's adherence to the SLT is irrefutable.

But, a quick glance at Eddington's record helps shed some light on his reliability. According to Glenn Borchardt, Eddington was "ever on the lookout to spread indeterminism". [3] In a June 10th, 2007 review of Arthur I. Miller's book *Empire of the Stars*, David Loftus writes of Eddington:

"Perhaps the saddest aspect of the story is not Chandra's humiliation in 1935 and subsequent lonely career, but Eddington's pathetically comical search, after so many milestone discoveries, for a "fundamental theory" of everything that led to an obsession with the "seven primitive constants of physics," the number 137 and its connections to Kabbalah, and an attempt to calculate the total number of electrons and protons in the universe! In this pursuit, he fudged equations, introduced false figures, and fooled with Einstein's theory to get the results he wanted." [4]

Hanegraaff's fondness for Eddington wanes because of Eddington's interpretation of "chance" events. Hanegraaff dismisses the use of "chance" as an explanatory tool. Ironically, in this instance, Hanegraaff and Borchardt are in agreement (though for different reasons). Borchardt elaborates on Eddington's view of chance:

"Eddington promulgated the ridiculous notion that, given enough time, and enough monkeys and typewriters, the monkeys would eventually type all the great books. By "chance" they would eventually hit all the keys in the correct sequence." [3]

On page 181 of his book, Hanegraaff correctly says: "Chance as an ontological entity does not exist. So, when it is appealed to as an agency of cause, it is utterly impotent and meaningless." [5]

Unfortunately, Hanegraaff's dismissal of chance leads him to conclude that the only alternative is creationism. Borchardt clarifies that the opposite of creationism is *not* chance, but conservation; which brings us back to that pesky First law again! Conservation is critical to evolution, rather than being a "blow" to it. It describes how various forms of matter in motion are transformed into other forms of matter in motion—exactly what evolution is all about.

Hanegraaff also doesn't want us to believe that evolution is science, but rather "science fiction." This misleading characterization is the result of Hanegraaff's lack of understanding of exactly what the SLT is. And he embarrasses himself further by declaring:

"Rather than humbling themselves in light of the law of entropy, evolutionists dogmatically attempt to discredit or dismiss it. First, they contend that the law cannot be invoked because it merely deals with energy relationships of matter, while evolution deals with

complex life-forms arising from simpler ones. This, of course, is patently false. As a case in point, contemporary information theory deals with information entropy and militates against evolution on a genetic level. While in an energy conversion system entropy dictates that energy will decay, in an informational system entropy dictates that information will become distorted. As noted in *Scientific American* [1971], ‘It is certain that the conceptual connection between information and the second law of thermodynamics is now firmly established.’ Furthermore, it is boldly asserted that entropy does not prevent evolution on earth since this planet is an open system that receives energy from the sun. This, of course, is nonsense.” [6]

Here, creationists are in lock-step when it comes to citing erroneous sources. For example, in 1988, creationist Duane Gish said the following in a debate with Dr. Ken Saladin regarding the SLT:

“Here's what Dr. [Isaac] Asimov has to say about the Second Law of Thermodynamics. He says and I quote, ‘Another way of stating the 2nd Law, then, is, the universe is constantly getting more disorderly.’ ” [7]

As in the case of Eddington, quoting Asimov proves unsupportive. In *Science on Trial*, Douglas J. Futuyma cites a scathing quote by Asimov, where he says that the creationist argument from the SLT is “an argument based on kindergarten terms [that] is suitable only for kindergartens.” [8] So, here, creationists have two distinct reasons not to cite Asimov as a source: (1) Dr. Asimov’s description of the 2nd Law is incorrect, and (2) Asimov’s comment about the creationist argument is only tantamount to mudslinging.

A post on the TrueOrigin website by Timothy Wallace, sums up the creationist perception:

“The debate between proponents of evolutionism and creation scientists concerning thermodynamics seems likely to continue without end. This is not because the laws of thermodynamics (and their ramifications) are subject to debate or relativistic interpretation, but because a handful of dogmatic evolutionists continue to vocally and energetically deny the truth concerning a simple matter of scientific knowledge.”

“The second law presents an insurmountable problem to the concept of a natural, mechanistic process: (1) by which the physical universe could have formed spontaneously from nothing, and (2) by which biological life could have arisen and diversified (also spontaneously) from a non-living, inanimate world. (Both postulates form essential planks in the platform of evolutionary theory in general.)”

“While many highly qualified scientists who number themselves in the camp of evolutionism are candid enough to acknowledge this problem, the propagandists of evolution prefer to claim the only “problem” is that creationists “misunderstand” real thermodynamics.”[9]

To say that “creationists misunderstand real thermodynamics” is not simply a preference created by propagandists. Indeed, creationists also misunderstand the *assumptions* necessary to avoid statements such as “The second law presents an insurmountable problem to the concept of a natural, mechanistic process.”

The conventional (but inaccurate) response to such criticism was exemplified by Jacob Bronowski in *The Ascent of Man*:

“The elements are being built up in the stars constantly, and yet we used to think that the universe is running down. Why? Or how?”

“In 1850 Rudolf Clausius put that thought into a basic principle. He said that there is energy which is available, and there is also a residue of energy which is not accessible. This inaccessible energy he called entropy, and he formulated the famous Second Law of Thermodynamics; entropy is always increasing. In the universe, heat is draining into a sort of lake of equality in which it is no longer accessible.”

“That was a nice idea in 1850, because then heat could still be thought of as a fluid. But heat is not material any more than fire is, or any more than life is. Heat is a random motion of the atoms.

“It is *not* true that orderly states *constantly* run down to disorder.

“It is a *statistical* law, which means that order will *tend* to vanish. But statistics do not say ‘always’. Statistics allow order to be *built up* in some islands of the universe (here *on earth*, in *you*, in *me*, in the *stars*, in *all sorts of places*) while disorder takes over in others.” [10]

While attempting to explain the SLT with all good intentions, Bronowski also begins with beginning assumptions that lead creationists astray. He is unaware of the Assumption of Complementarity, which states that (in an infinite universe) “all things are subject to divergence and convergence from other things” [11].

Therefore, the final stumbling block against the creationist position is demonstrated by Jonathan Sarfati who, writing for Answers in Genesis, inaccurately says:

“An *isolated system* exchanges neither matter nor energy with its surroundings. The *total* entropy of an isolated system never decreases. The universe is an isolated system, so is running down.” [12]

Dr. Sarfati incorrectly assumes that “isolated systems” exist, that energy is motion, and that the universe is finite. And worse, his last two statements contradict each other.

So, it now becomes clear why the misconception of the SLT is so pervasive, and why even the most astute evolutionists have trouble avoiding it: it is the belief that the universe is an isolated system. It is the notorious Big Bang Theory that is at the basis of all the confusion.

But, as Glenn Borchardt explains in his essay *Resolution of the SLT-Order Paradox*:

“At one extreme, the SLT was said to predict the eventual ‘heat death’ of the finite, expanding universe. As with all paradoxes, however, the solution simply involves a change in beginning assumptions. The paradox dissolves if one considers the universe to be infinite. Then, the SLT is a law of divergence; its complement is a law of convergence.” [13]

In other words, the SLT has a complementary law that works in reverse when the universe is assumed to be infinite. Both the Second Law of Thermodynamics and Conservation are reiterations of Newton’s First Law, in which he describes that all portions of the universe (which he believed to be infinite) are to be considered as matter in motion.

Creationists have committed a double-whammy by ignoring the flip-side to the SLT and beginning their assumptions with a finite universe. And Mr. Hanegraaff committed a third whammy when he said that evolutionists claim that “atoms ‘self-produce’ amino acids.” If he understood the Infinite Universe Theory, he would understand that matter is never “self-produced.”

Unfortunately, there may, indeed, be evolutionists who make this claim; just as there are evolutionists who maintain we live in a finite, Big-bang universe. Therefore, one can hardly blame creationists for drawing erroneous conclusions. They have taken their cue appropriately from “mainstream” scientists, whose indeterministic interpretations leave unnecessary wiggle-room for the otherwise uninformed creationists.

As univironmental determinists, it is our responsibility to set the record straight. The evolution-creationism debate is endless and pointless because each side uses opposed presuppositions. Hanegraaff’s logic may be impeccable, but his starting assumption, like many of the assumptions of his mainstream critics, are religious, not scientific. Once the proper fundamental assumptions are chosen, the debate becomes moot [13].

References

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- [2] G. Borchardt, *The Scientific Worldview* (Lincoln, NE: iUniverse, 2007)
- [3] *Ibid*, p. 49
- [4] D. Loftus, *California Literary Review* (<http://calitreview.com/199>, 2007)
- [5] H. Hanegraaff, *The Face*, p. 181
- [6] H. Hanegraaff, *The Face*, p. 85
- [7] D. Gish, *Saladin/Gish II Debate*, *The SecularWeb*, 1988
(http://www.infidels.org/library/modern/ken_saladin/saladin-gish2/gish1.html)
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- [10] J. Bronowski, *The Ascent of Man* (Boston/Toronto: Little, Brown and Company, 1973, pp. 347-348)
- [11] G. Borchardt, *The Scientific Worldview*, p. 73
- [12] J. Sarfati, *Answers in Genesis* (<http://www.answersingenesis.org/Docs/370,2000>)
- [13] G. Borchardt, *Resolution of the SLT-order paradox* (*Proceedings of the NPA*, 2008, p. 1)
(<http://scientificphilosophy.com/Downloads/SLTOrder.pdf>)