

## Does Evolution Violate the 2<sup>nd</sup> Law of Thermodynamics?

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The 2<sup>nd</sup> law of thermodynamics states that energy in an isolated system goes from a state of usable energy to a state of less usable energy. This can be also associated with complex systems deteriorating to disorder. Entropy is a term associated with this law and it is a measure of the disorder. So, with time entropy must increase, or in other terms, the disorder must increase. Everything moves from a high potential to a low potential. A battery fully charged has an abundance of electrons on one side creating a negative terminal. On the opposite side, there is an equal amount of protons creating a positive charge. Thus, we have electrical potential which is capable of doing work. The same can be applied to every form of energy. Although this law applies to energy, it also is applicable in every field of science, including chemistry, biology, astronomy, etc. Since evolution requires an increase in ordered systems, beginning with basic chemicals and gradually developing over time to the complex living organism that we see today, the 2<sup>nd</sup> Law has been used to challenge biological evolution. However, many see no conflict because of the term in the definition requiring an isolated system. The earth, receiving virtually all the energy from the sun, does not constitute a closed system.

An example used many times is a car engine. As it receives energy from the gas tank (like the sun pouring in energy to the earth), the combustion of the fuel is converted to heat, expanding the mixture in the combustion chamber and pushing the piston down. This motion is converted to rotating kinetic energy through the crankshaft. The kinetic energy is less (or as the 2<sup>nd</sup> Law states "must be less") than the energy from the fuel flowing into the engine due to heat loss. This illustration can be taken all the way to the wheels, with each step resulting in a loss of usable energy, due to heat, friction, electrical loads, pumps etc. But this system continues to work, because the gas continues to flow into the engine replenishing the energy being lost. This same scenario applies to the earth. The sun constantly floods the earth with electromagnetic energy, which is converted mostly through photosynthesis to other forms. Even though there is a loss of energy in the process, there is an abundant supply. It may be noted that by expanding the system to include the sun, just as we could include the fuel tank in a car, the system will eventually run down. Granted, the energy contained in the Sun is enormous, and will use an insignificant reduction in energy in our lifetime, the point is that it will follow the 2<sup>nd</sup> Law and decrease.

Those who express this reasoning are really misunderstanding why the 2<sup>nd</sup> Law is violated by biological evolution. We really need to look at this system from two perspectives. First, we will examine this law from a perspective of energy and then from a perspective of order.

We have already shown that the Earth is not a closed system. We need to look out farther. Our solar system is essentially a closed system with negligible amounts of energy coming in from the outside. But let's go farther and consider the entire universe. The theory of evolution defines the universe as a finite system that started as a cosmic

egg that exploded approximately 15 billion years ago. Since that time, the universe has been expanding. By this definition, the universe is a closed system. Since the beginning, usable energy is diminishing, moving from a high potential energy level to equilibrium. To understand this, we could compare this to a hot cup of coffee in a closed room. Considering the room as a closed system, the heat energy would transfer to the surrounding air until the heat reaches equilibrium. There has been no loss of energy, only a movement from high energy to low energy. The heat leaves the cup of coffee, allowing the coffee to cool off. At the same time, the heat entering the air warms the air up. This process continues until the temperature reaches equilibrium where both are the same temperature. At this point, there is no more potential or useful energy and the system is dead. This is exactly what is happening in the universe, and it is commonly referred to as a heat death where there is no more useful energy to do any work. The entire universe is dying. I am not trying to make a dooms day prediction - the energy potential is enormous and will not reach this heat death for a very long time. I am only making a point of direction.

Instead of looking into the future to a certain heat death, let's look back into the past. Just as the energy potential must diminish with time, we can conclude that the potential must have been greater yesterday, last year and last century. In other words, this energy potential must increase as we look back in time. Going back to the example of the battery, we could charge the battery to its full potential. Suppose it is possible to move all of the electrons from the positive side to the negative side. This would create a maximum potential. In other words, there is a limit as we go back in time. The same is true for the universe. The farther we go back into time, the greater the potential energy is to the point where we can not get a greater potential. In other words, not only is the universe heading to an ultimate "heat death", it also had to have a beginning, where the potential was at a maximum. Again, I am not trying to indicate any time frame, only that there has to be a beginning and an end.

Let's look at another example that would help us understand. Let's consider a wind up clock. As the clock runs, the energy in the spring diminishes. This energy is transmitted to the various gears and eventually to the hands and eventually lost. In other words, there is an end when the clock will run down. We can also conclude that there was a beginning when the clock was fully wound up. Keep in mind that I am considering this clock as a closed system with no possible energy coming in from the outside. This creates a puzzling problem. If the 2<sup>nd</sup> law of thermodynamics predicts this beginning and end and that over time the energy in this closed system must run down, and then it begs the question, how did it get charged up in the first place? The answer is really quite simple. It is impossible for the system to charge itself up, there has to be someone outside the closed system that put the energy into the system. The clock can not wind itself up.

When we apply this concept to the universe, we have already concluded that there must be a beginning and an end and during the process of time the potential energy must diminish. So how did the universe "get charged up" in the first place? Again, natural laws forbid the system to charge it self up, so the only conclusion requires the energy to

come from outside the system. You might say a supernatural power or God put the system into motion.

At this point, some may ask, who created God? There actually are a couple of ways to answer this. Going back to the wind up clock, the energy would come from myself as I wind up the clock, which means that I have to have more energy than the clock. In the same manner, we would have to conclude that God would have to have more energy than is in the universe. So where did God come from? Well, one answer would be that there had to be a bigger God to provide God the energy to put into the system. But who created this bigger God? Again that answer is relatively easy. There had to be a bigger, bigger God who gave the energy to the bigger God who gave the energy to God to put into the universe system. We could keep going with continually bigger Gods until we reach infinity. This ultimately tells us that there has to be an infinitely powerful God. The second explanation is somewhat easier. Rather than the series of bigger Gods, there could be just one infinitely powerful God. And in my opinion, this makes much more sense.

The second point is the complex order in living systems. Complex systems do not grow in complexity; they deteriorate, losing functionality, until they can no longer function properly. Let's take the example of an automobile again. Over time, the automobile will deteriorate and begin to break down. When there is a problem, we could easily take it to a shop and have it fixed. But what if I chose to take it to a zoo instead and allowed the monkeys to work on it. There would be no question that the monkeys have a lot of energy, but they lack the needed intelligence. Once we understand that all things deteriorate, we can ask how we get a new car. Automobiles are not produced by hurricanes or tornados, but intelligent beings who carefully orchestrated every aspect of the manufacturing process.

In order to create complex systems, raw energy is not sufficient. The earth is not a closed system; we receive virtually all of our energy from the sun. But you have to have a way to capture, store and convert the energy, such as in the case of the automobile. You can pour all the gasoline, gunpowder or anything else you want into the car, but unless you have some type of mechanism to harness that energy, you are not going to get any useful work or produce any functional product. In biology, sunlight is captured by plants and through the process of photosynthesis converted to energy. This new form of chemical energy, through the process of digestion is used by animals and man to sustain life. The system works great, because all the complex mechanisms are in place. But can the energy from the sun explain the origins of these mechanisms? The automobile works, because of an intelligent designer who created the system to harness the energy and convert it to a useful byproduct. Having an abundance of sunlight, or lightening to producing huge electrical discharges will not produce any constructive by product. If all we need to produce complex order is energy, why do we not see hurricanes, tornados, and thunder storms producing complex systems that have a specific function? Raw energy is insufficient to create order. There must be an intelligence factor.

One of the claims of evolutionists is that Intelligent Design can not be observed. When we think of the origin of life, this is absolutely true. However, the same can be said of evolution. We have never observed life forming from non living matter. But what we can look at is what we observe today. There are literally billions of examples of complex systems being formed today, all as a result of intelligent processes. However, I challenge anyone to document a complex system being formed from raw energy and natural processes.

There is another very important aspect of Intelligent Design. The concept of function before form is fundamental to the design industry. Virtually everything that has ever been made was formulated in the mind of individuals. The design process begins with determining the function or purpose. Then everything revolves around this purpose. This purpose is not determined by the object being created, but by the creator. In contrast, random chance events do not have a designated purpose.

If I tell you only part of the evidence and you believe it, you have not been taught, you have been indoctrinated. If I tell you all the evidence and you make a decision, then you have been taught.