

# The 2<sup>nd</sup> Law of Thermodynamics Refutes Evolution!

## Part 2

By Duane D. Miller<sup>1</sup>

### Introduction

The second law of thermodynamics states that an isolated system will become more disordered with time. In regards to the first article “The 2<sup>nd</sup> Law of Thermodynamics Refutes Evolution Part 1”<sup>2</sup> I stated the universe was an isolated system thus the naturalistic process of transformation of the universe from simple to complex which is required by evolution is in direct contradiction to the second law. Centuries before these scientific concepts and principles were developed, God revealed in the Bible that He created the universe as a functioning whole with order and complexity from the beginning and as a result of sin the universe is now running down. (Hebrews 1:10–12, quoting Psalm 102, Isaiah 51:6, Romans 8:19–22) I believe the basic Law of matter/energy is in perfect harmony with Scripture and contradicts the total concept of evolution. Recently I had someone email me questions concerning the second law of thermodynamics and mutations. In this paper I would like to explain further my reasons for disbelieving in evolution comes not only because of theological reasoning (the Bible) but also from observing the world we live in today. I have summarized the questions from the email below:

### Question Summary

1. Does an increase in entropy necessarily mean and increase what is generally regarded to be chaos (i.e. degrading things and randomness).
2. Why does losing energy to the environment make the thing that lost energy increasingly degraded and random?
3. The universe is a closed system and its temperature and energy will eventually even out to the point where no work is achieved, however how does this disprove the idea that mutations conferring a survival advantage will be passed along the bloodline resulting in the species surviving?

These three questions necessitate the breaking of this article into two sections. The first section will address the first two questions dealing with entropy, energy and its relation to molecular systems. The second section will address the issue of mutations and its relationship with the theory of evolution through random variation.

### Entropy and Energy

I want to begin by discussing the topic of energy and its interaction with molecules. I specialize in spectroscopic methods therefore I will provide some background of energy and its interaction with matter from a spectroscopic perspective. Following the background information will be a discussion section tying the information together in the hopes of understanding why when energy is added to non-living systems entropy

increases which is contrary to the idea that life could have formed by random processes. Furthermore, I will explain how the second law of thermodynamics is fundamentally different in the hopes that I can answer questions #1 and #2.

## **Background**

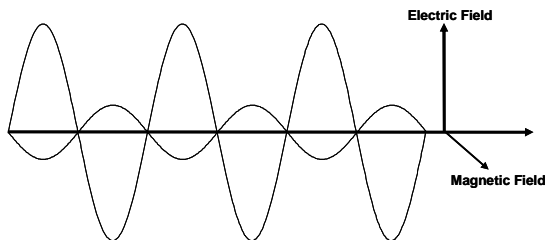
Back in the mid 20<sup>th</sup> century, there was a theory that was proposed and generally accepted by biologists that life evolved from organic molecules in the primitive oceans. This process, commonly known as “Abiogenesis”<sup>7</sup> or “Chemical Evolution” has some difficulties which have not been solved to date. Haldane<sup>3</sup>, Bernal<sup>4</sup>, Calvin<sup>5</sup>, and Urey<sup>6</sup> published research attempting to support the model supposing, with the correct mix of chemicals and energy, life would be produced spontaneously. The abiogenesis problem is so serious that most evolutionists today are uneasy with this field of research. Most researchers hesitate about stating in public the origin of life is a mystery but freely admit they are baffled. Such public statements could possibly open the door to religious fundamentalists, and possibly undermine future research funding.

Alexander Ivanovich Oparin in his book, *The Origin of Life*,<sup>8</sup> postulated that life may have evolved from organic molecules through random processes. The theory held that life evolved when organic molecules in primitive oceans were energized by forces such as lightning, ultraviolet radiation, meteorites, deep-sea hydrothermal vents, hot springs, volcanoes, or electric discharges from the sun. The theory ends by stating only the correct mix of chemicals and energy would have produced life.

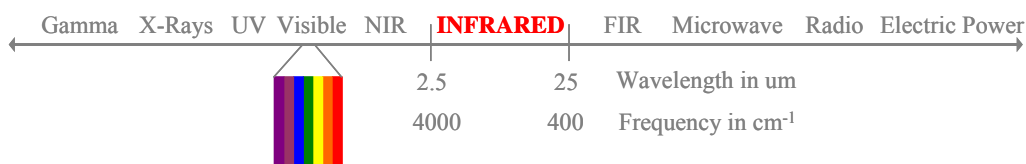
I want to discuss the energy that is required to spontaneously produce life, according to the abiogenesis theory. I will not address the topic “meteorites causing the origin of life” because this would suppose evolution occurred from some extra terrestrial source. I will however address the topic of electromagnetic radiation because this falls within my field of expertise.

With energy coming from the sun, researchers have concluded the earth is an open system. The energy which comes from the sun is in the form of electromagnetic radiation, see Figure 1. The form of electromagnetic energy that comes to the earth, which the layman understands, is in the form of light energy. Light comes in the form of electromagnetic waves but not all of these waves are the same size. We see colors because we are viewing different wavelengths. As shown in Figure 2, visible light, sunlight appears to be colorless (white light) but it is a combination of many colors or wavelengths of light. Visible light is only a small fraction of the energy the earth receives from the sun. Figure 2 shows that light is a very small fraction of the electromagnetic radiation spectrum and other radiation comprises a larger part of the spectrum ranging from radio waves to cosmic rays. Infrared rays for example (more commonly known as heat rays) is invisible but like visible light can pass through empty space. Another form of energy that comes from the sun is ultraviolet radiation (UV). UV radiation can damage the skin and produce skin cancer if it is not filtered by some means such as sun block or the melanin in our body’s skin which naturally protects against damage. UV radiation also can break chemical bonds and thus is a field of research today as for example the field of photo catalysis.

The reason I mention these forms of electromagnetic radiation is because UV, sunlight, and infrared radiation are the primary sources for the breaking down and damaging living systems such as aquatic plants. Everything on this planet is composed of little more than 100 basic building blocks called “elements,”<sup>9</sup> each with its own unique character. Some atoms can exist alone such as the heavier elements like uranium, however most atoms are joined together to form molecules. Molecules being the smallest building blocks of any substance form compounds. Compounds are made of identical molecules, each with the same combination of atoms. For example, water is made up of two hydrogen atoms and an oxygen atom. Some molecules are made of hundreds of atoms such as polymers.



**Figure 1** Electromagnetic radiation which propagates through space as two oscillating fields oriented perpendicularly to each other.



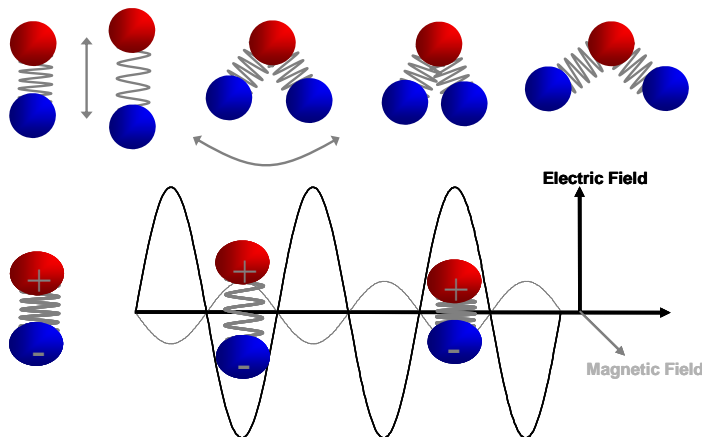
**Figure 2** Electromagnetic Radiation spectrum; Shorter wavelengths = higher energy; Gamma, X-Rays: Ionize atoms, break bonds; Ultraviolet, Visible: Break bonds, ionize molecules; Near to Far Infrared: Excite molecular vibrations; Microwave to Radio: Increase motion (heating).

Polyethylene for example is a chain of 50,000 molecules of a simple hydrocarbon, ethane. All of these molecules are made up of atoms which are linked by chemical bonds. These bonds are capable of stretching and bending with the absorption of energy which allows for the science of spectroscopy. In this same way we can use this to understand how bonds break and decompose as the result of added energy.

The central core of an atom contains protons and neutrons and is surrounded by a cloud of electrons; two or more atoms bond together by sharing these electrons. These molecular bonds have their own natural frequency; that is if the molecular bond is allowed to vibrate freely, it always tends to vibrate at the same rate. Furthermore, chemical groups will vibrate at the same rate, similarly to a bell that produced the same musical note, vibrating at the same frequency time after time. Similarly, chemical groups will vibrate at the same frequency due to their structure. This is the fundamental basis for the interpretation of the infrared spectra in molecular spectroscopy. Electromagnetic radiation can interact with the molecular bond by stretching and compressing the bond as shown in Figure 3. Atoms interact with electric field of the electromagnetic wave, stretching or compressing the bond.

The reason I am discussing these fundamental concepts deals with the idea that electromagnetic radiation increases the vibrations between atoms in a molecule. The energy (wavelength) is absorbed and is related to the strength of the bond in the molecular structure and environment. If sufficient energy is added it is possible for the atoms to achieve enough kinetic energy to break the bonds thus becoming disordered.

Furthermore, molecules can be envisioned as being comprised of balls (atoms) connected by springs (bonds) in constant motion. The absorption of infrared radiation (energy) sets the molecules into vibrational or rotational motion, or a combination of the two. Due to the strength of the bond type and the masses of the atoms it connects, only certain discrete frequencies of vibration or rotation are allowed and these frequencies correspond to the frequencies of the radiation which are absorbed.



**Figure 3** Simple Model: Charged Balls and Spring  
Atoms interact with electric field of EM wave, stretching or compressing bond. Resonance at frequency (wavelength) that matches molecular characteristics. Light intensity decreased from increase in molecular vibrations

### Discussion

The reason I have gone into such great detail is to help facilitate understanding that energy in the form of infrared radiation, visible light, and UV radiation all interact with matter and is firmly established in science. In part one<sup>2</sup> on the Second Law of thermodynamics I mentioned energy from the sun simply facilitates the process of decomposition increasing entropy. I made this claim because living systems tend to maintain themselves by consuming and removing material from their environment (food and waste), not to mention organizing themselves such as the production of proteins and nucleic acids in DNA. When the living system dies, this process of maintenance is no longer functioning. Therefore, energy added to such a system will simply break molecular bonds facilitating the process of decomposition. What I am saying is that non-living systems tend towards disorder rather than order under the influence of electromagnetic radiation.

The topic of decomposition brings me to the next topic, the “irreversible thermodynamic process” and its relation to entropy. There are a large number of naturally occurring processes which are unidirectional. The irreversible thermodynamic process is one that is not unidirectional. An example of an irreversible process can be seen by burning a piece of paper and oxygen. The reverse process is impossible; it is not possible to bring the paper back after having been burned. Another example is dropping an egg; there is no process which is possible that would be capable of reassembling the egg back to its previous state. Therefore, and irreversible thermodynamic process is a

process for which it is impossible by any means to restore everywhere the exact initial states once the particular process has taken place.

The second law of thermodynamics deals with the direction in which processes occur in nature. The best way to understand the second law is by looking at entropy from a microscopic viewpoint. Let's suppose an insulated container is partitioned into two volumes. The one volume contains Avogadro's number of ideal gas molecules where the other volume contains a vacuum. When the partition is removed, the gas expands into the other volume not performing any work. This is called an adiabatic process that accomplishes no work. The temperature of the gas does not change however the pressure of the gas decreases by half. This process is clearly irreversible because the molecules will not automatically arrange themselves back to their initial state. There were two researchers L. Boltzmann and J. W. Gibbs who developed statistical means for expressing the disorder of these molecules in a quantitative way. This was accomplished using statistical methods to calculate the number of different ways the molecules could arrange themselves within the two volumes. In the process of calculating the internal energy of the gas, there are two quantities, work performed and entropy ( $dU = TdS + PdV$ ). Since there is no work performed in this process, the only contribution to the internal energy is the entropy of the system. This is where the idea/concept that entropy is the measure of disorder in a system arises. The connection was established by Boltzmann between entropy and the number of different ways the molecules could distribute themselves by the following equation.

$$S = k \ln(\Omega)^{10} \quad (1)$$

S = entropy

k = Boltzmann's constant

$\Omega$  = number of different ways the microscopic particles can be arranged "states"

Here entropy is expressed mathematically as a measure of disorder of irreversible process. For more information on the derivation of entropy from a statistical perspective I recommend "Statistical Mechanics" by McQuarrie.<sup>11</sup> The natural logarithm, formerly known as the hyperbolic logarithm, is the logarithm to the base e, where e is equal to 2.718281828459. As disorder/randomness increases, Entropy also increases being a function of the natural logarithm according to equation (1). This is how an increase in entropy means there is an increase in randomness of irreversible processes such as molecular decomposition. (Note: Entropy is proportional to disorder/randomness by a nonlinear function) Loosing energy to the environment is also an irreversible process; in the same way, when a non-living system is heated, or irradiated with electromagnetic radiation it will decompose without outside influence (experimenter, designer, etc).

Therefore, when energy is added to non-living systems entropy increases which are contrary to the idea that life could have formed by random processes such as abiogenesis. Next is section two of this paper, which addresses the issue of mutations and evolution.

## Mutations and Evolution

First of all I would like to talk a little bit about the third question posed in the email to me concerning the universe and mutations:

### **Question #3**

The universe is a closed system and its temperature and energy will eventually even out to the point where no work is achieved, however how does this disprove the idea that mutations conferring a survival advantage will be passed along the bloodline resulting in the species surviving?

I believe this question is ill posed in the sense of the universe being a closed system and attempting to understand mutations within a given species. In part one on the second law of thermodynamics; I explained the experimental necessity for closed systems was to observe the Second Law of thermodynamics in action. Temperature and energy evening out to the point where no work is achieved is an end state of the universe and has no application to what we are observing today. Remember, I am trying to explain why evolution could not have happened by abiogenesis. What I want to do is discuss what we know, and see here on earth, not something we have to guess about somewhere else in the universe. (i.e. such as extraterrestrial life)

Mutations within a species are not a topic of argument amongst creationists. It is the idea that mutations facilitate an increase in information resulting in evolution between species which is the point of disagreement. To answer the question about whether mutations give survival ability to the subsequent bloodline, I have to agree, mutations within a species can add advantages to the future generations within a particular species. I do not agree however that mutations add to the genetic information leading towards new species. There is no evidence in the literature which provides evidence of such happening. However, what we do find in the literature are the classic claims that mutations prove evolution without explaining the details of the particular mutation. When the details are elucidated, it becomes evident the process of evolution has not taken place. Classic examples are when certain organisms lose genetic information and yet gain some type of functionality or survival benefit as was the case for bacterial resistance to antibiotics.

Winged fruit flies are another example where scientists have utilized radiation to cause errors in DNA replication and certain chemicals to produce mutations. These mutations can indeed be passed down to future generations of fruit flies. These experiments have produced mutations with flies that have shorter wings, very short wings, curled wings, spread apart wings, miniature wings, and even legs where antennae were once located. These are simply errors in the genetic coding of these simple flies and do not demonstrate evolution in any form. By the way, natural selection would eliminate these mutations, reversing the fruit fly to the original state. In other words, the process that Darwinists claim provokes evolution (natural selection) is actually a conservative process which primarily eliminates the “freaks” in the stock, assuming that mutation has no survival advantage.

In order to make evolution happen for the purpose of validating the theory of evolution, evolutionists need to have some kind of genetic code machine which can increase the quantity and quality of genetic information present within a given species.

Mutations are simply a typographical error that occur which has no ability to compose new genetic sentences and thus no ability to facilitate the process of evolution at all.

There is something I would like to show you concerning the biases or corruption found in the scientific community. Most people do not realize evolutionists fall into the same group as is claimed of creationists. If the average layman would stay informed on the current state of the literature in evolutionary theory while having a critical eye of what is written it would become apparent the real nature of the problems surrounding the argument on origins. The nature of the problem deals not with the evidence as much as it is a belief system that needs to be overcome. I will illustrate this from a recent article that has been published in Science magazine<sup>12</sup> July 2006. For those who do not know, Science magazine is one of the top peer reviewed journals in the scientific community, furthermore, almost any researcher would dream of publishing within its pages.

A recent article in science magazine discusses some of the continuing problems with the theory of evolution. While reading the article “Darwin for All Seasons<sup>13</sup>,” I noticed the author (Szathmary) gives a lot of examples of difficulties to Darwinian thought; these difficulties include problems with the origin of replicators, life, sex, not knowing how the first cells become organized, and the full scenario for the origin of the genetic code all pose problems to the theory of evolution. However, these do not seem to be mountains that are impossible to overcome to Szathmary. Szathmary uses words like “seems to be like” as satisfactory answers, with the hopes of future research solving these very obvious problems. What really caught my eye was when Szathmary said and I quote: “this century may cast a shadow on many previous ones if one of our old hopes comes true: finding extraterrestrial life.” I had to stop and reread the paragraph for this is absolutely unbelievable. Some researchers, men of science, are hoping for the discovery of extra terrestrial life to help prove evolution to be true. The question I have to ask is if extraterrestrials were the ones involved in life on this planet how is this not a process of design? Creationists claim God designed all that we see today (on this planet and in this universe) and this position is held as unscientific. However, a major scientific magazine publishes a paper endorsing “panspermia” (the position that life came from outer space) and that belief is considered scientific. This is the bias/corruption I am referring too; it is a typical hypocritical action that that leads one to question the sincerity of the scientific community in its search for empirical truth versus a belief system.

Another interesting observation I would like to make concerning the article<sup>13</sup>; towards the beginning Szathmary mentions that a geneticist must be a Darwinist, then continues by mentioning the tools of modern science such as bioinformatics, genetics, statistics, and molecular biology, all of which Darwin had no knowledge of these areas of science and technology. Szathmary claims geneticists need to be Darwinists, however, the fact that Darwin had no knowledge of these sciences demonstrates to me that a geneticist does not need to hold to darwinianism in order to perform good empirical research.

The point I wanted to make by giving these examples from science magazine is that one of the top research journals in secular science will publish opinions on the hope of the discovery of extraterrestrials to confirm evolutionary theory without asking for revision in peer review clearly demonstrates a bias. No matter how outlandish the claim, as long as one holds to the priori that evolution is how life come about on this planet the publication is accepted. However, if a creationist were to make the claim that God

created, it is immediately determined to be unscientific no matter what amount of empirical evidence is available or how thoroughly the research is performed (i.e. classical methods of observation and experimentation are adhered to).

## **Conclusion**

I have given several examples where mutations are not helpful in the process of evolution. Since natural selection can only choose from what is there, evolutionists must have faith that somehow mutations provide the new raw material for living things to evolve into other more complex life-forms having new structures and functionality. I have demonstrated in the literature how scientists are not above having faith, even to having **blind faith** in the hope of finding extraterrestrial life to explain how life evolved here on earth.

There are two dominate views of history, one that is evolutionary and one that is biblical. While we look at the big picture, research published in leading peer reviewed journals to mutations, the one question that we should be asking ourselves is which of these two world views best explains what is happening here on this planet. Instead of observing massive information gaining mutations we are observing massive amounts of information loosing mutations. This loss of information, results in a downward trend of death and decay which I related to the second law of thermodynamics as a measure of disorder and our universe which is on a path towards a minimum state of energy. These devastating effects of mutations, death, decay, and increasing disorder should remind us of the curse in Genesis chapter 3 from the bible. When man disobeyed God not only did man but all of creation fell under the curse of death. Those who place their faith in Jesus Christ, the creator, can look forward to a new heaven and a new Earth where there will be no more pain, death, disease, or suffering. The ultimate question is who will you trust? Do you trust in the Bible, God's Holy word, and Jesus Christ? Or will you place your trust in a hopeless, endless cycle of death where we have neither purpose, nor hope in our lives? I hope and pray you will trust in the Lord!

**Joshua 24:15 ... but as for me and my house, we will serve the LORD.**

## Reference & Notes

1. Reviewers, I would like to thank my reviewers for the much needed critique, review, and comments. (Reviewers: Sergio and Lisa)
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