
Creation Answers

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Who does this newsletter?

This newsletter is produced by Wayne Spencer on a Quarterly basis. Its purpose is to bring creation research within the reach of Christians and provide up-to-date reliable information on creation issues. Wayne Spencer is a creation author and former teacher who has presented papers at the International Conference on Creationism and has published in various creation publications, such as the Creation Research Society Quarterly, Creation magazine, the Journal of Creation (TJ), and Origins (from the Biblical Creation Society, UK).

This newsletter is meant to help people plug into creation resources and get informed about creation and evolution. It is provided free of charge on request. Using the free Adobe Acrobat Reader is necessary for viewing the newsletter. There are no restrictions in copying this newsletter or passing it on to others. To request to be placed on the e-mail list, send a request to wspencer@creationanswers.net.

More information on Wayne Spencer's education and publications can be found on the creationanswers.net web site. You'll also find many other resources. <http://creationanswers.net>

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A Personal Note from Wayne Spencer

Greetings,

I would like to welcome people new to my newsletter. I would like to ask again for people to pass this on to others. I lost a few email addresses of people prior to sending my March '09 newsletter because of computer problems.

This year marks the tenth year of the Creation Answers newsletter. I have tried to keep it understandable and not too technical. My goals for it have been to address major issues of origins in a way that helps the average Christian be aware of the best research on Creation topics. I also want to help Christians know of where good sources are for getting answers. In this issue I am addressing the topic of thermodynamics. This has been somewhat controversial among creationists in recent times. I offer cautions against some arguments from creationists but also point out how we can use the topic in favor of a creation view. I relate it to design, which is something seldom done by other creationists to my knowledge. I have avoided getting bogged down in overly technical details for this article. But if someone has technical questions, they are welcome to email me.

I have been fortunate to be writing some articles for the Answers in Genesis website recently. From time to time I may write some nontechnical articles in their "Daily" section. My recent article was called "Why Recent Creation?" This was available on June 16th. [Click here](#) to go there. I also recently spoke on planetary science to the MIOS creation meeting in Dallas.

Wayne Spencer, M.S., Physics

Why is there order rather than nothing?

Philosophers and scientists of the past have asked the question, "Why is there something rather than nothing?" I think its better to ask this as, "Why is there order rather than nothing?" "Something" is not what we see or what we are. "Order" is what we see in the real universe we live in.

Scientists have imagined that there could be many possible universes that play out all possible combinations of possible events. I think the concept of many universes, besides the fact that it contradicts what the word "universe" actually means, is an intellectual copout. I am aware that physicists have a sort of justification for it from the field of Quantum Mechanics. But scientists have suggested many universes so that they don't have to deal with the characteristics of our universe that point to there being an intelligent Creator. Some people like to think that there are so many possible universes somewhere that we just happen to accidentally appear in the one that had the right combination of properties to allow us to be here. There is a beauty and order in the way things are made. Either we are incredibly lucky or the universe is geared to our benefit.

We all have some concept of what "order" means in relation to things in nature. We are perhaps most familiar with the order and beauty in living things. But there are many kinds of order in this universe. There is an order in the nucleus of the atom and in the way electrons are organized in atoms. There is an amazing order in the physical laws of the universe themselves, and their predictable comprehensible mathematical nature. There are many physical constants that affect the atom, the production of energy, the transmission of waves across space or through various materials. Certain atoms or molecules have special properties that we depend on to a particularly great

degree, such as Carbon and Water for example. Life would be impossible as far as we know without the special atomic properties of Carbon and Water.

We also see order in our solar system, our galaxy, and even beyond our galaxy in outer space. Though there are some kinds of unpredictable natural processes, there is an extraordinary amount of order in the universe. We are also able to understand it to a degree. A number of famous scientists have commented to the effect that it is surprising how well we are able to understand how the universe works. If chance and natural processes are all there is to produce a universe for us to live in, why is it so predictable and understandable?

There has long been heated discussions between creationists and evolutionists about the laws of Thermodynamics and how they relate to origins. The laws of Thermodynamics are very important in science and very universal. Trying to apply them to questions of origins however has been a tricky undertaking. The Second Law of Thermodynamics (which I will call 2LOT) has been described loosely as the "law of disorder" or the "law of decay." In years past creationists often brought up 2LOT as an argument against evolutionary ideas. But creationists received some criticism for this, some of which may have been valid. In recent years, creationists have tended to avoid the issue or not use the argument that evolution violates the Second Law. I want to try and clarify this and relate Thermodynamics to intelligent design.

The First and Second Laws

To understand this there are certain important terms to be aware of. There are interchangeable quantities that we deal with in this discussion, work and energy, and energy and matter. Work in physics and engineering is essentially the ability to do something useful with energy. Energy is always used up to accomplish physical work, thus work and energy are interchangeable.

For example a car uses chemical energy from gasoline to produce heat and drive the engine, which converts the heat energy to mechanical energy of motion. So the engine is a device that converts energy from one form to another. In the use of the gasoline to make heat and move the automobile, some energy is wasted. Some heat from the engine always escapes into the atmosphere. There are also other ways in which there is waste, so it is not perfect. One way to look at the Second Law is that its about the wasted energy, the energy that cannot be recovered in a physical process.

Einstein showed us that energy and matter are also interchangeable. But that is really only the case in nuclear processes, such as in the core of a star or in a nuclear power plant. In thermodynamics it is important to define what's happening to the energy and the matter. If a system you are studying has no matter going in or out of it, we say that it is a "closed system." If there is neither energy or matter going in or out of the system, then it is said to be an "isolated system." It's important to understand that if there is a God who created the universe, the universe is not an isolated system. But in the Big Bang model for the universe, many scientists would consider the universe to be an isolated system, at least once it starts. How something came from nothing is always a mystery that Big Bang theory cannot adequately explain. Scientists who do not believe in God exhibit faith as surely as a Christian does in their assumption that the universe could start without a God being present to input energy, matter, and information into it.

Let's return to what happens in a car. Over the course of time, the automobile engine and other parts of the car wear out. The energy that doesn't get converted perfectly into moving the car, has a slightly damaging effect on the parts of the car over time. There is also friction in the workings of the car that also wears out parts over

time. So you can say that the Second Law has to do with how things "run-down."

Since everything seems to "run down" like this, this tends to suggest there was a beginning. The First Law of Thermodynamics also suggests a beginning to the universe. The First Law is often called the conservation of energy. It is understood in the light of Einstein's principle that matter and energy are interconvertible. It says that matter-energy (the sum total of both), cannot be created or destroyed in any physical process, but can only be converted from one form to another. Only God can bring something into existence from nothing. But natural processes and forces can make matter or energy change form. I don't think the First Law means there could not be miracles. Of course, God is not bound by natural laws. I would say He supercedes natural laws when miracles occur.

So if the universe had a beginning and everything runs down over time, how could the universe form into all the order we see? Is this an argument against the Big Bang and evolutionary ideas? Many have said so, including people on both sides of the origins debate. Biological evolution is often thought as being a long process of living things changing into more and more complex forms. In a Big Bang view of astronomy, you might think that there is an upward increase in complexity in how different structures form on different scales. As the Big Bang begins you initially have only energy and subatomic particles (not atoms) and eventually you have large structures that stretch across the universe. For example, stars and planets are believed to form by one set of processes, but galaxies require something somewhat different on a bigger scale. Then there are extremely large structures made up of many galaxies. Galaxies come in clusters, filaments, and even walls. Astronomers are not sure how these vast structures would form, though there are some ideas. You may be able to analyze the thermodynamics of parts of the Big Bang processes but it is

pretty difficult to analyze it on the scale of the whole.

Scientists run into a problem that they are limited in how they can apply the Second Law. It is not really clear in some of the details of biological evolution, whether the changes would be upward increases in complexity or not. The changes in evolution are difficult to relate to thermodynamics, such as increases in height or strength or even intelligence. This makes it hard to come to a clear conclusion about origins and thermodynamics.

I'm dealing with this topic in a very nontechnical simple way here but the Second Law is a quantitative law and it involves calculations regarding the quantity known as entropy. Entropy always tends to increase in any natural process. What tends to happen is that as energy is wasted entropy increases. This is perhaps an oversimplification but generally true. It is not that it is impossible for entropy to decrease. But if the entropy of one system decreases, it must take place at the cost of the surroundings of that system. Entropy is sometimes described as a measure of "disorder." Many experts in thermodynamics almost cringe at this description of entropy. But at least it is true in some situations. Again I am trying not to get bogged down in overly technical definitions.

The Second Law has mainly two different types of definitions, there is the one from Classical Thermodynamics, which is what is studied by engineering students regarding engines, refrigerators, and machines for instance. Then there is Statistical Thermodynamics, which is based on modern ideas about the atom and quantum theory. Classical Thermodynamics and Statistical Thermodynamics are both true but they approach the issue from opposite directions essentially. The Classical approach looks at macroscopic systems like engines whereas the Statistical approach looks at the probabilities of what can happen to large numbers of atoms and

molecules. So the Statistical Thermodynamics approach deals with it from the microscopic (atomic level) rather than from the macroscopic point of view. It is actually the Statistical formulation of the Second Law that relates more to the concept of "disorder" or "randomness" in physical processes. Sometimes people trained in one field of science have trouble discussing thermodynamics and origins with others in other areas of science. This is at least partly because of the different definitions of terms and the different approaches to the subject.

We are able to calculate changes of entropy in various physical processes. But in origins questions we deal with things for which we often cannot do entropy calculations because we just don't know enough and we cannot adequately specify what happens exactly. So, if someone asked what the entropy change was in the formation of a certain protein inside the cell, we can probably calculate the entropy change for that. But, if you ask what is the entropy change in the universe forming in the Big Bang, no one has a clue how to calculate such a thing.

It is similar with biological evolution. Evolutionists cannot totally specify how evolution took place. There has been the long controversy about there being missing transitional forms, missing links, in evolution. But evolutionists say they do know of some transitional forms. Even if you allow evolutionists the transitional forms they say they have, this is not nearly specific enough to be able to calculate something like the entropy change associated with say a single celled bacteria evolving into a jellyfish, or a fish evolving into an amphibian.

What we can say?

So what can we say then about origins considering the Second Law? I would avoid using the Second Law as an argument against evolution except in a case where we can be quantitative about the problem. My rule for myself is that if we cannot be

quantitative about it, we cannot make a valid qualitative argument. This is why I don't often mention Thermodynamics, though I used to do so. On the other hand, there is still something to be said about the Second Law and creation.

In some ways evolutionists and creationists have the same limitations regarding 2LOT. Evolutionists cannot show how the thermodynamics would work in biological evolution. Creationists cannot actually prove that evolution violates 2LOT, at least in many cases. In astronomy, particular problems can be examined quantitatively, star formation for example. Star formation, as I understand it, does not violate the 2LOT. There are other potential problems with the concept, but not the Second Law. I suspect that if we could really specify the problems of origins properly and do the necessary calculations, biological evolution would violate 2LOT at least in some cases. But we often cannot actually show that by calculation. On the other hand, many people, both evolutionists and creationists, have commented about the apparent contradiction between evolution and the Second Law.

Some Christians tend to make an assumption that the Second Law of Thermodynamics began with Adam and Eve's sin. Christians often do this because of their understanding of Romans 8:21, which says, ***"For the Creation was subject to frustration, . . . that the creation itself will be liberated from its bondage to decay and brought into the glorious freedom of the children of God (NIV)."*** In the past I would have agreed with this but I now suspect this is incorrect. Today a number of creationists are moving away from understanding the 2LOT as beginning with the Fall of man. For one thing, it may not fit the context of the above verse. Also, there are a lot of scientific problems created by making this assumption. The Second Law is so pervasive and important in natural processes that it seems doubtful to me that

life could even survive without 2LOT. It may be essential for the biochemistry of the cell. The Second Law is the driving mechanism behind many essential processes we depend on. We need to be careful about assuming that a physical law like 2LOT is a "bad" thing that began with mankind's sin.

Chemical Evolution and Thermodynamics

I would say we do not know exactly what effects Adam and Eve's sin had on nature. We know what Genesis tells us about it but Genesis does not give a technical description of exactly what happened. Genesis only describes the basics of how it was relevant to Adam and Eve. It clearly had effects on living things that made them have to work more to eat. Perhaps God stopped sustaining things in some sense at the Fall.

In chemical evolution, the issue of how the first living cell evolved from chemicals on the early Earth, we can do entropy calculations, at least as reasonable estimates. I think the best work on that subject I am aware of was done in the well known book, *"The Mystery of Life's Origin: Reassessing Current Theories,"* by Thaxton, Bradley, and Olsen. This book includes two chapters related to the thermodynamics of living organisms and the formation of polymers and important biomolecules within cells. The book includes calculations which take into account not just energy but the information content in biomolecules such as proteins and DNA. The conclusion is that there's very low probability that the biomolecules would form naturally because of the special ordered sequences required in the molecules. Thus, I think we definitely can say that for the first cell to evolve from simple chemicals violates the Second Law of Thermodynamics. The first origin of life requires the supernatural because known natural processes and chance are completely and grossly inadequate.

Thermodynamics and Design

There is still more we can say about thermodynamics and creation. Thermodynamics points to intelligent design and the existence of a Creator. I once was in a long discussion on thermodynamics with a nonchristian. After our discussion of thermodynamics and origins he seemed to come to the conclusion that there must be a Creator to be responsible for the order in the universe. I cannot be certain but I do not think he would have said this prior to our conversation. I believe he would have considered himself an atheist.

Years ago when the well known scientists from the Institute for Creation Research were speaking in many universities, they would make an important point about 2LOT and what is necessary for organization of matter and increases in complexity. The Second Law drives things from a state of more information to a state of less information, or from a less probable state to a more probable state. What then is necessary to accomplish the reverse of the 2LOT?

What does it take for matter to organize into something significant? As a general principle for complex arrangements of matter, it takes four things to make order increase and entropy decrease. 1) An open system. Matter and/or energy must be able to go in and/or out of the system you are studying. 2) There must be an energy source of the right kind. Having the wrong kind of energy tends to destroy order rather than enhance it. An energy converting mechanism may be a necessary part of this as well. 3) There must be an information code. DNA is one information code present in cells. 4) There must be a control mechanism to control operations. There is complex and very elaborate molecular machinery in the cell that functions for the purposes of control, assembly, and quality control. This aspect can also be described sometimes as an assembly mechanism. These four necessary things are not actually

part of the Second Law per se, though I believe they are logical consequences of it. They also happen to be things that scientists in the Intelligent Design movement speak of frequently today.

Evolutionists have heard the arguments from creationists on 2LOT. Evolutionists often try to give counter examples of natural processes that lead to order, without believing in a God to create. They imply creationists misuse or misunderstand the Second Law. Evolutionists often give irrelevant examples, such as of the formation of crystals. Crystals can form spontaneously when the right atoms are present under the right conditions. But the formation of a crystal of sodium chloride (salt) does not violate the second law and it does not contain significant information. The molecules in the cell such as proteins, enzymes, and DNA have a large information content that makes them vastly different than a simple crystal. A large crystal of salt is just many sodium and chloride ions in the same arrangement, repeated over and over. Man-made polymers are the same, they have a certain pattern repeated endlessly (not a very complex pattern). But in living cells, there are complex specified arrangements of amino acids or nucleotide bases in specific sequences.

You may be able to say that the reason a salt crystal can form is because of the order God created in the universe on a deeper level. There are many fundamentals of physics that make salt crystals, and many other useful materials, possible. There are the properties of the proton and electron, the electrostatic force (called Coulombs Law), various physical constants that allow the atom to hold together, and the organization of electron energy levels in the atom. You could argue that these all constitute control mechanisms that cause atoms to naturally form into certain structures for our benefit. Physical laws themselves require mathematical design and the atom itself is

designed. This struck me when I was studying graduate level physics working on the electron energy levels in the hydrogen atom. Even in hydrogen, the simplest atom, to fully describe the energy levels is a very significant mathematical challenge for a graduate student. The mathematics that describes fundamental processes in physics could possibly be considered a kind of information code, or design specification. If the atom were not designed, not only could we not exist, but nothing we need to live could exist either. This has been alluded to by a number of well known physicists and astronomers who are not creationists.

There is no explaining the existence of this universe, or the order in it, without a Creator. Even the orderly things that natural forces cause are dependent on a deeper level of order built into atoms and the fundamental properties of the universe.

Hard Evidence for Soft Dinosaur Tissue

In my December 2005 issue of *Creation Answers*, I mentioned evidence from a scientist, not a young-age creationist, of soft tissue found in T-Rex bone. This research comes from the work of a Dr. Mary Schweitzer. Dr. Schweitzer has continued her research and there is even stronger similar evidence now from hadrosaur bone that is thought to be about 80 million years old. How could soft tissue, blood, and other organic soft material survive so long? The evolutionary community has been skeptical of Schweitzer's work. Some challenged her to follow more stringent laboratory methods in analyzing the samples, which she has now done. In 2007 the T-Rex bones yielded more soft material. Schweitzer was able to chemically isolate collagen, an important protein in bone. The collagen was compared to the collagen found in other organisms. The T-Rex collagen was found to be 58% similar to chicken and 51%

similar to newt or frog. These are plausible figures for a dinosaur bone protein.

Now recent work on a hadrosaur bone (believed 80 MY old) involved more careful procedures. Great care was taken to prevent contamination, a better mass spectrometer was used this time, and samples were sent to two other labs for confirmation of the results. In the results, not only was collagen found again, but also two other proteins called elastin and laminin. There were actually eight different types of hadrosaur collagen found, so these results are very strong. A number of amino acids were derived from the proteins examined. Two different techniques were used to identify the collagen to be sure also. The hadrosaur collagen was more similar to the T-Rex collagen than other types of collagen, so this confirms the prior work. There were other soft materials as well though what they are may be less certain. Some materials seemed like blood and hemoglobin.



Figure 1 Graphic from *Answers in Genesis*

Note that even if such materials were hermetically sealed for millions of years in the natural setting (which is not likely), these

proteins would decay over time due to the Second Law of Thermodynamics. Scientists are not really sure how long such materials can last but it defies common sense that these delicate materials would last 80 million years. Thus this points to dinosaurs living on Earth in the not so distant past, as the Bible implies. To read more about this [click to this article](#) on Creation.com.

“Voyage . . .” film screenings

A significant new film is in preparation from Creation Ministries International (CMI) in Australia. The film will be called *“The Voyage that Shook the World.”* They are making a major documentary structured around on-site footage like Charles Darwin’s trip on the H.M.S. Beagle. Though this film is apparently not yet available in the United States, there are some early screenings of it coming up in various cities across the USA. To find the screening nearest you go to

<http://creation.com/cinema-screenings>

Note that there is a screening August 27th in Dallas. After studying the life of Charles Darwin I am very interested in this film. 2009 is called the Year of Darwin because there are many events honoring him around the world. I would also recommend this article telling about the film, Darwin’s life, and the making of the movie: <http://creation.com/charles-darwin-voyage-movie>