
Creation Answers

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Who does this newsletter?

This newsletter is produced by Wayne Spencer of Creation Education Materials 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.

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 Wayne at wayne@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

Hello, again, to all reading this newsletter. God has helped in my personal situation in that I have been working in a contract job that will end on October 4th. However, the pay is less than half of what I used to make. I am thankful for friends who have prayed and others who have tried to help in my job search. So, I am still struggling but in a better situation than when my last newsletter went out. I will need to find another job since my current contract position is ending.

In my business, Good Computing Services, I've begun offering web hosting and web site design. I am currently working on a web site design for a nonprofit association of fire fighters. I'm enjoying this. If your church or organization would like to get a web site and you do not know how to go about it, contact me.

I now have my own dedicated web server, which is used for the creationanswers.net web site as well as my business site (<http://goodcomputing.biz>) and will be used for other sites that I will maintain in the future. You may have noticed some things display faster as a result of my new server. Because the creationanswers.net site was moved from a Windows server to a Linux server, there were many links and filename references that had to be fixed. This was due to case-sensitive filenames. If you notice any bad links let me know. Having my own web server may allow me to expand the functionality of my web site. It will also mean that some audio files will no longer run directly from the server in Windows Media Player. However, you can download the audio files to your computer and then open them with Windows Media

Player. The Real Player will however run from my server, to provide streaming audio. I currently do not have any Realaudio files, though I do have some mp3 files.

In this issue, the article on Radioactivity and the Age of the Earth will give some general background for understanding future articles on radioactive decay. There are exciting new findings from creationist research related to radioactive decay. I will address some of these in upcoming newsletters. The short article on God Didn't Make DNA Junk addresses how recent research is changing our understanding of DNA. The new ideas from DNA research provide important answers to some arguments often made by evolutionists. Finally, a new paper from a creationist is compelling me to concede a mistake in one of my previous articles.

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Radioactivity and The Age of the Earth

Radioactive Decay is a term referring to a variety of processes in which the nucleus of an atom changes. These changes are spontaneous and random, for any given atom. That means an atom that can decay can change at any time and there is no way to predict when. But, for a sample that we can measure in a laboratory (which has many many atoms in it), the overall rate that the radioactive atoms change is known from experimental measurements. How the atom changes is something that can be determined and measured very precisely.

Radioactive age dating techniques begin with very carefully separating the radioactive elements from the sample. Then the concentrations of several isotopes related to the decay process are measured very precisely. (Isotopes are different forms

of the same element, such as Carbon-12 and Carbon-14. The numbers 12 and 14 in this notation are the total of the number of protons plus the number of neutrons in the nucleus of the atom. Isotopes have the same number of protons but vary in how many neutrons they possess in the nucleus.) After the amounts of the various isotopes are determined a mathematical extrapolation is made that gives an age figure for the sample. The age is determined based on the assumption that radioactive elements would have decayed at the same rates in the past as they do in the present, when studied in today's laboratories.

Most radioactive decay involves one of four processes: 1) alpha decay, 2) beta decay, 3) electron capture, or 4) positron emission. In alpha decay, the atomic nucleus gives off what is called an alpha particle, which consists of two protons and two neutrons. An atomic nucleus is essentially Helium without its electrons, so it quickly turns into Helium as it picks up electrons from other atoms. In beta decay, one of the neutrons in the nucleus comes apart, and this ejects an electron out of the nucleus. In the process, the nucleus gains one proton from the neutron that came apart. In electron capture, an electron orbiting the nucleus gets "captured" by the nucleus. In positron emission, the nucleus ejects a positron, which is a small particle like an electron except that it is charged positively and it spins opposite an electron. Positron emission involves a proton being changed into a neutron, a positron, and a neutrino.

Radioactive decay can be harmful to living things because the charged particles given off by the radioactive material ionizes matter and can cause chemicals in the body to break down. All matter has a small proportion of radioactive atoms in it. The energy given off by the charged particles and the concentration of the radioactive substances determine how dangerous they are to living things.

To give one example of a radioactive "clock," let us look at Potassium-Argon decay

(or K-Ar decay using symbols from the Periodic table). This process is used frequently in dating basalt rock, from lava flows. Potassium exists in three isotopes, K-39, K-41, and K-40. It turns out that 93% of Potassium is K-39, 7% of it is K-41, and these isotopes are both stable, so they do not undergo radioactive decay. But, a small percentage, 0.0117% of Potassium is K-40. K-40 decays by three different processes, beta decay, positron emission, and electron capture. The last two of these produce Argon-40. This is what is referred to in Potassium-Argon dating (or K-Ar dating). In this process, Potassium-40 is referred to as the parent isotope and Argon-40 is referred to as the daughter isotope.

In the case of Potassium-40 decay, the half-life of K-40 is 1.25 billion years. The half-life is not an age figure, though it is measured in years. The half-life is the time for half of the Potassium-40 atoms to break down into Argon-40 and the other particles that come from the process. No matter how much of it there is, it will take 1.25 billion years for half of the K-40 atoms to decay. This means that the decay process is very slow for K-40. K-Ar dating is often used in dating lava flows. There are a number of radioactive isotopes used to date rocks. These include Uranium-Lead, Samarium-Neodymium, Rubidium-Strontium, as well as Potassium-Argon.

There are some important questions to ask about radioactive dating methods. Geologists and planetary scientists take radioactive dating techniques as reliable and accurate. They are also understood to give confirmation that Earth's rocks are millions and billions of years old. Note that assuming evolution, the age of the Earth and solar system is believed to be 4.6 billion years. To understand what is reliable and what is not reliable about these dating techniques, we must ask the following questions:

- 1) Are the assumptions valid?
- 2) Are the equations and theories correct?

- 3) Are the laboratory procedures adequate?
- 4) Are the results reliable?

Constant Decay Rate

First of all, we will consider the assumptions of radioactive (or radiometric) dating. A primary assumption is that the decay rate is a never-varying constant for each radioactive isotope. This is widely believed because the decay rate can be measured with great precision and it is very repeatable. There have been attempts to cause the decay rate to vary in laboratory experiments. Experiments have been able to show minor variations in the decay rate of some isotopes. But as a rule, the decay rate is very constant and predictable. Recent Research from a team of creationist scientists is beginning to call this assumption into question, however. This research effort is known as RATE, which is an acronym which stands for Radioactivity and the Age of The Earth.

Unusual times in history such as the Creation week and the time of Noah's Flood may have involved accelerated radioactive decay. Though I have felt reluctant to accept this idea, I am now becoming more open to it as a result of the recent research results. More will be said about accelerated decay in future newsletters. Though in laboratory measurements we find radioactive decay rates constant, there now appears to be evidence suggesting they were not constant at all times in the past. This new evidence may be very helpful in reconciling many facts with a Biblical view of history.

Closed System

The second major assumption of radioactive dating techniques is that the materials undergoing radioactive decay are a closed system. This means that to do the age calculation you assume no natural processes other than radioactivity was occurring that would throw off the calculation. To understand how this is a problem, imagine a large hour glass with sand in it. Say that you turn over an hour glass to start

the sand running down to the bottom, then leave the room. When you come back, you see half of the sand in the top and half in the bottom so you assume that one-half hour has passed (assuming we have a true 1-hour hour glass). But what if someone you didn't see came in while you were out of the room and they took the top off of the hour glass and took some sand out of the top, then placed the top back on before you came back in? This would make it look like more time had gone by than had actually transpired. You might see the top part of the hour glass and think more time had gone by than was actually the case.

This illustration is similar to what happens sometimes with radioactive dating techniques. It turns out that there are a variety of geological processes that can remove some of the parent isotope or add to the daughter, thus making the age results too large. Note that geologists are very careful about where they get samples for radioactive dating analysis. Some types of rock formations would never be dated with radiometric dating techniques because geologists know they would not get meaningful results. The problems come when there are geological processes affecting the samples that are not known or are not accounted for in the age calculation.

For instance, in the decay of Uranium to Lead, the Uranium mineral can dissolve in water (from rain or ground water) and so rain can remove some of the parent isotopes, making the rock age come out too large. Though it also is possible for processes to make the age results too small, that problem appears to be easier to detect and relatively unusual. Another example is in K-Ar decay. Argon gas is often trapped in molten rock that comes up from the Earth's mantle. This gas can throw off K-Ar age calculations since Argon from the mantle is a nonradioactive source of an element that would be assumed to only come from radioactive decay. Creationist geologist Andrew Snelling has written technical papers demonstrating this.

I believe that the assumption of a closed system is the biggest problem with radioactive dating methods. Though scientists are aware of many processes that can interfere with the results, there are still others that creationist research is elucidating. Assuming an old age for Earth (and the planets) sometimes leads scientists to fail to look for certain types of processes. Young age creationist scientists are bringing new perspectives to the research and are discovering very surprising things. I think this greatly strengthens the case for a young Earth and solar system.

Initial Concentrations Known

Radioactive dating calculations have to make some assumptions about the initial concentrations of the radioactive isotopes that are being studied (such as the parent and daughter). This has to do with when the radioactive "clock" started. For instance, the time when a rock hardened containing radioactive Potassium would be the start of the age "clock" for K-Ar decay. This problem also becomes important in dating organic materials from living things with Carbon dating. In a Biblical view of history, there was a world-wide Flood. Noah's Flood drastically reduced the amount of carbon in the Earth that was found in living things due to all the living things that died in the Flood (plant and animal). This and other effects would drastically change the concentration of radioactive Carbon-14 on the Earth in Noah's Flood. This has led scientist John Baumgardner to calculate a young age for the Earth and in the process show how Carbon-14 ages can be corrected. (See the June 2004 issue of this newsletter for more on Carbon-14 dating.)

The assumptions inherent in radioactive dating methods are sources of systematic error that lead to age calculation results that are too large. The second question to ask about radiometric methods is "Are the equations and theories correct?" I do not feel there is any significant problem with our understanding of the physics of

radioactive processes. There is some controversy among physicists about why radioactive decay occurs in the first place. This is something we don't really know, but we do know how to describe how it happens, and we know what the effects of it are. As Christians we should respect the good science even in this subject, even though some inconsistent and inaccurate results are obtained from it.

The third question to ask is about the laboratory procedures. Are they adequate to provide valid results? I think they are, as long as the results are interpreted properly. In the past there have been claims by some who worked in radioactive dating laboratories that there were improprieties in what age results were published. Some have claimed that though actual age results obtained varied over a wide range of ages, only the ages that were believed to be correct from old age assumptions were published. There are times when the pressure to publish values accepted by the scientific community has probably outweighed proper procedure, though I have found it difficult to find real documentation of these claims.

On the other hand, the chemical and other processing procedures in radiometric dating laboratories has been much refined over the years. The experimental procedures in this work are extremely precise. So, I think we should have a degree of respect for the careful work in these laboratories. In the laboratories, it is actually ratios of concentrations of the various isotopes that is measured. Then the age is calculated, based on certain assumptions. Rather than just dismissing these age results, we should bring a new approach that explains the data better. I believe creationists are beginning to accomplish this.

The fourth question to ask about radioactive dating is "Are the results reliable?" This can be viewed from several different angles. In some cases, the dates from the radiometric age completely

contradicts what is known from historical information or what is known from the geological setting. Creationists have documented some dramatic examples of this in the Grand Canyon, for instance. In other cases, when multiple radioactive dating methods are used on the same samples, using different isotopes, the results can be totally inconsistent. (There will be more on these examples from the Grand Canyon in future newsletters.) More information can be found on the ICR web site at <http://www.icr.org/pubs/imp/imp-178.htm>

Over the years young age creationists have documented many examples of radioactive methods giving inconsistent results. On the other hand, it is also true that there are cases where three or four radioactive methods all agree with each other very well. Note that four radiometric dates can agree and all be wrong if there is a systematic error that affects them all.

Evolutionist scientists and geologists have long challenged young age creationists by bringing up many technical issues related to radioactive dating methods. Though there has long been reason to question radioactive dating results, creationists are now coming to new answers that are exciting for Christians. The young age point of view is often seen as irrational and those who believe it are considered ignorant by people in the sciences. It is time for Christians to become more aware of the excellent research from young age creationists on this important topic. This research is confirming a Biblical view of history, making the Earth about 6 to 8 thousand years old. Future newsletters will have more on radioactive dating methods.

God Didn't Make DNA Junk

Today great progress is being made in the field of genetics and cell biology as a result of the Human Genome Project and related research. In reading some recent papers from creationists on this subject I have learned what to me underscores how

really “fearfully and wonderfully made” we really are (Psalm 139:13-14). New discoveries seem to go against some long-held evolutionary assumptions.

We have understood for years that the DNA molecule in the cells of our bodies contains an information code that determines how we are put together. Scientists have understood for decades that DNA contains essentially templates for constructing the proteins that make up our bodies. One thing most people do not know is that the part of DNA which provides an information code for proteins is actually a small part of the total. In mammals it is estimated that the part of DNA that codes for proteins (called the coding DNA) is only about 3% of the DNA molecule. So, what about the other 97% of it?

Evolutionists believed for years that the 97% (in human DNA) is a functionless leftover of evolution. Thus the portion of DNA that doesn't code for proteins has been called “Junk DNA.” It was assumed that there was no other function for this portion of DNA. Evolution claims that random mutation and natural selection explains the origin of living things, without divine input. There is similar non-coding DNA for many other organisms, though the proportion of it varies. Over the years some stretches of non-coding DNA were found to have a useful function. In recent years, much more has been learned about how cells use the non-coding DNA.

In the DNA molecule, the coding DNA is not one contiguous sequence, but the sequence is in segments, with a section of non-coding DNA between the coded sequences. Scientists are now finding that the gene sequences can be so spread out along the DNA molecule that it is difficult for them to identify which parts make up the gene sequence. Also, even in the non-coding sections, often referred to as “introns” or as “intergenic DNA,” there are short sequences that are used in a variety of ways. The term “gene” refers to a segment of protein-encoding DNA. A gene

is analogous to a word in a sentence. The meaning of a word is determined by the context in which it is used. Similarly, how a gene is used depends on the “context” of what non-coding sections are found near it. This is a very new idea. For years scientists thought that where a gene was in the DNA molecule didn't matter. Scientists also have used the term “pseudogenes” to describe DNA sequences that have been thought to be basically defective copies of protein-coding DNA. Scientists are now finding functions for these pseudogenes. The pseudogenes may not be defective copies after all.

You may remember from your science classes that messenger RNA, or mRNA, is a precursor used copy a DNA molecule. Today, there are several new types of RNA scientists are learning about, including noncoding RNA, double-stranded RNA, molecules called “microRNA,” and antisense RNA. All these have complex functions related to controlling and regulating how DNA is used in the cell. Basically, God has put in place elaborate controls in the cellular machinery and in the DNA molecule itself. These controls have a variety of important purposes in living things. Some scientists are suggesting that the “Junk DNA” may really be the key to what makes us unique and complex as human beings.

The picture from genetics and molecular biology is looking much more complex than was believed for years. I think an intelligence (a divine one) far beyond ours engineered it. It's like for years scientists had only read 3% of the book but now they are beginning to unlock the details in the remaining 97%. For more information on this topic, I would recommend “Junk DNA Indicted,” by creationist John Woodmorappe, in the journal TJ, published by Answers in Genesis, Vol. 18, Number 1, pp 27-33.

A Correction Regarding Job 38:31

In the June 2003 issue of this newsletter I made a statement that I'm afraid I must correct. In the article, "A *Biblical Approach to Astronomy, Part 2*" I referred briefly to Job 38:31. In the NIV, this verse says, "Can you bind the beautiful Pleiades? Can you loose the cords of Orion?" I made the following statement in the above article which I now am convinced is not correct:

"This seems to accurately acknowledge the difference between a gravitationally bound star cluster and a constellation, whose stars are not gravitationally bound together."

In a recent issue of the journal TJ, creationist physicist John Hartnett writes an excellent paper about the Pleiades cluster and this verse from Job (see Vol. 18, Number 2, 2004). Though in the past it was believed that the Pleiades star cluster was gravitationally bound, modern astronomy has shown it to be unbound. The Pleiades cluster (which contains about 500 stars) is expanding, but it will not break up in the future as far as we can tell. The stars in it are just near each other and moving in the same direction. The Pleiades and some other constellations are mentioned in several passages in the Old Testament.

The Orion nebula is found in the night sky in the constellation Orion. This constellation is the familiar "bow-tie" like group of stars. The Hubble Space Telescope discovered a number of stars in what is now known as the Orion Nebula Cluster, or ONC. This is a cluster of about 1000 stars and research indicates it is gravitationally bound. Hartnett points out that naturalistic theories from astronomers are currently not able to explain the origin of bound star clusters like this.

So, the Pleiades is actually technically unbound and there is a significant bound cluster in the Orion nebula. Thus the facts from astronomy do not support what I was implying. I had read

and heard differing opinions on the Pleiades cluster but I think Hartnett's paper provides the proper documentation.

John Hartnett in the above article also makes some Biblical arguments for Job 38:31 not addressing specifics about these star clusters. This verse is apparently a difficult one to translate from the Hebrew. The point of the verse in context is about God's complete sovereignty. Though I always understood this, I thought that it was also incidentally giving some astronomical information that Job would not have known. Though I meant well, this was actually taking Scripture out of context in a minor way. I regret this mistake. We must be careful about reading more into the text of Scripture than is warranted.