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## 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 the best way to view 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](mailto:wayne@creationanswers.net).

More information on Wayne Spencer's education and publications can be found on the [creationanswers.net](http://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. In this issue I feel I must report some important and exciting things going on in science. The main article on Carbon-14 reports on research from a group of creationist scientists with the Institute for Creation Research. This article may become the first in series of articles on Radiometric dating techniques. Another important thing going on just as this newsletter is sent out is the arrival of the Cassini spacecraft at the planet Saturn. This will begin a few years of exciting discoveries at Saturn. I have looked forward to the Cassini mission for years. I would welcome suggestions for future newsletter topics from anyone reading this.

As for my personal situation, I am still unemployed and underemployed as of this writing. Things have been slow for Good Computing Services, my PC support and repair business. I recently passed tests for another computer certification, called A+. Though I've had more job interviews recently, I still have not had any job offers. I keep looking and hoping in God to work things out. Though life has not been easy, my health is good and spiritually I feel things are going well.

I hope you and your family are having a good summer. God bless and Godspeed.

Wayne Spencer, M.S., Physics

### *Carbon-14 and the Age of the Earth*

Radiometric Dating techniques are used to calculate the age of certain types of materials which have radioactive atoms

within them. Many items of historical significance have been dated using radioactive Carbon-14, thus many people have heard of "Carbon-14 dates" reported occasionally in the news. Recent research from creationists has uncovered exciting evidence that the Earth is only several thousand years old, as the Bible implies, rather than 4.5 billion years old as evolutionary science says.

### Basics on Radiometric Dating

Before delving into the details of the Carbon-14 evidence, some introduction to radiometric dating is in order. There are many radioactive elements used by scientists to date rocks and other materials. In dating rocks, Earth scientists only attempt to date igneous rocks, such as basalt, which is solidified lava from volcanic eruptions. Sedimentary rocks are never dated using radiometric dating, though fossils can sometimes be dated. The rocks brought back to Earth from the Moon were dated with the Uranium/Lead technique and other techniques that used a variety of other radioactive elements.

Carbon is an especially important element because so many biological molecules are made from it in living things. In any sample of Carbon, a small percentage of the Carbon atoms are different in that they have one or two extra neutrons in the nucleus. Normal Carbon is Carbon-12, which has six protons and six neutrons in the nucleus. These different forms of the same element are known as isotopes. If a Carbon isotope has one extra neutron it is called Carbon-13. If it has two extra neutrons it is known as Carbon-14. The extra neutrons make the nucleus unstable, meaning that any time the nucleus of the isotope may change, giving off energetic particles.

There are several types of nuclear changes, any of which would be considered to be "radioactivity." The most common form of radioactivity is called alpha decay, where the nucleus ejects a particle

consisting of two protons and two neutrons (known as an alpha particle, which is essentially a Helium atom without its electrons). Carbon-14 decays by a process called Beta decay, in which an electron is ejected from the nucleus. Note that it is totally unpredictable when a specific atom will decay. However, in any sample that might be studied or dated, there are very large numbers of atoms. For large numbers of atoms, laboratory measurements tell us there is a very predictable rate of decay for any given radioactive isotope. After a Carbon-14 isotope changes, it is no longer Carbon but it has become a stable Nitrogen-14 atom.

Everyone has heard of the term "half-life," which has to do with how quickly or slowly a sample of a radioactive isotope decays. In Carbon-14 decay, the unstable Carbon-14 atom (C-14) is referred to as the parent and the Nitrogen-14 atom is known as the daughter. In some radioactive decay processes, such as for Uranium-238, once the U-238 isotope decays, there is a long series of other unstable isotopes before you finally come to a stable one that does not decay (Lead-206).

The half-life of Carbon-14 is 5,730 years. This means that every 5,730 years, there will be half as many C-14 atoms. Some other radioactive isotopes of other elements have very short half-lives such as in minutes or even microseconds. Others such as Uranium-238 have half-lives in billions of years. The half-life figure is not an age figure, it expresses a rate of decay. So, the fact that Uranium has a half-life in billions of years says nothing about how old the Earth is in itself. It just means Uranium decay is very very slow.

Carbon-14 dating, often called radiocarbon dating, has been done for years and the techniques for it have been much refined. To date an object with C-14, the concentrations of C-14, C-12, and other isotopes are measured as precisely as possible. In the process extensive precautions have to be taken to ensure that

Carbon which is not from the sample does not contaminate the sample. The most precise method for Carbon dating today is known as AMS, for Accelerator Mass Spectrometry. In this type of device, Carbon isotopes are ionized so they can be influenced by a strong magnetic field. Since C-14 is more massive than C-12, it is bent by the magnetic field less. This is how the different isotopes are separated. If there is so little Carbon-14 that it cannot be detected by the AMS equipment, then that would mean the sample should be older than about 90 or 100 thousand years.

Carbon dating laboratories do not generally try to date a sample that is believed to be older than around 40,000 years. Why not date objects all the way back to 90,000 years? Scientists generally believe that there are contaminants that enter into the sample, limiting the radiocarbon method to 40,000 years. This assumption regarding contaminants is now seriously called into question due to research from a team of young-earth creation scientists with the Institute for Creation Research, in California. This research project, known as R.A.T.E., now has strong evidence that what scientists generally assume is unexplained contaminants could be Carbon-14 that has not yet decayed since Creation or Noah's Flood.

#### Intrinsic Carbon-14

At the Fifth International Conference on Creationism (ICC) in 2003, Dr. John Baumgardner presented an exciting lecture on Carbon-14. Over the years many samples of Carbon from a wide range of fossils and various materials have been dated using radiocarbon dating. They have been found to still have measurable Carbon-14 in them, though by evolutionary age assumptions they should be more than 100,000 years old. In 100,000 years of time, any material with Carbon should have no C-14 left. In the past, techniques for measuring C-14 were not as precise and

scientists were not as skilled in preventing contaminants from throwing off the measurements. Thus it has been assumed for years that there was a "residual" C-14 or "Carbon-14 background" that was just an unidentifiable contaminant.

Dr. Baumgardner and three other authors from the RATE group show that there is intrinsic C-14 still present that cannot be contaminants. Baumgardner and colleagues list 90 cases in the scientific literature where C-14 was measured to be present even though the samples would be over 100,000 years in age by evolutionary uniformitarian age assumptions. These 90 examples include a wide range of types of samples, including marble, commercial graphite, various shells from fossils, carbon dioxide gas, wood, anthracite coal, petroleum (cracked), natural gas, whale bone, and technical grade Calcium Carbide ( $\text{CaC}_2$ ).

Some of these sample materials would be classified as Precambrian in age by geologists (very old). Yet they all showed measurable Carbon-14; amounts were approximately 0.014 to 0.71 percent of the modern C-14/C-12 ratio. The ICC 2003 paper reports that graphite (one form of pure carbon) considered Precambrian in age (over 545 million years) typically contains 0.05 percent modern carbon. This is true when the graphite formed under metamorphic (heat/pressure) conditions without oxygen where the carbon could not come from living things. In his lecture at the 2003 ICC, Dr. Baumgardner said that an announcement had just come out from C-14 dating of Precambrian diamonds from South Africa. Diamonds are crystals made up of pure carbon. These diamonds originally formed at great depth inside the Earth, probably about 200 km. Radioactive carbon was found in these diamonds at levels 100 times more than the minimum detectable! Because these are diamonds which lock Carbon into the crystal structure and because of the depth they came from, this means there's just no possibility of contamination.

Carbon dating laboratories often subtract a value of about 0.07 percent modern carbon (pmc) when they publish their dating results. This 0.07 is believed to represent the unidentified contaminants, but the RATE research group argues it is intrinsic C-14 still present from creation or the Flood.

In a number of cases the low concentration of C-14 was still present in spite of drastic efforts to remove and prevent contaminants. Carbon dating laboratories have worked for years now at refining their procedures in order to eliminate contaminants and thus get an accurate precise measurement of only C-14 that is intrinsic to the sample and not from some other process. Some may assume that particles from the Sun and cosmic rays from space generate some of this background radioactive carbon. But that just is not possible for many of the samples that have been studied.

The ICC 2003 paper points out some interesting examples of this "anomalous C-14" in samples believed to be over 100,000 years old. Authors from the Leibnitz Laboratory at a University in Keil, Germany, published results of carbon dates of a number of shell fossils dated Pleistocene (120,000 years) by radioactive Uranium/Thorium dating methods. Some of their fossils were taken from a core sample from the tropical Atlantic ocean off the Northwest coast of Africa. These cores, taken out by drills, were dated at 455,000 years. The authors did find C-14 in their samples, including cases where they took their sample from both the inside and outside of certain shells. After finding this, they decided to do more measurements using much more special procedures to attempt to eliminate what they believed was contamination. These included special gas techniques, use of hydrochloric acid, and breaking open the shells to take carbon from the interior of the shell. These special efforts did not significantly change their

results. The German authors conclude their paper with the following:

*"The apparent ages of biogenic samples seem species related and can be reproduced measuring different individuals for larger shells or even different sediment cores for foraminifera. Although tests showed some surface contamination, it was not possible to reach lower C-14 levels through cleaning, indicating the contamination to be intrinsic to the sample. . . . So far, no theory explaining the results has survived all the tests. No connection between surface structure and apparent ages could be established."*

*From Radiocarbon, 43:2A (2001), pp. 169-176.*

#### **New tests on U.S. coal samples**

The RATE research group is made up of a number of young-Earth creationist scientists with Ph.D.'s in geology, physics, and atmospheric science. After finding abundant examples of anomalous C-14 in the scientific literature like the example above, the RATE group also had other samples of their own tested. The U.S. Department of Energy keeps samples of major U.S. coal seams in a Coal Sample Bank at Pennsylvania State University. The RATE team obtained 10 coal samples from the Coal Sample Bank and sent them to one of the leading AMS carbon dating laboratories in the world. These samples come from eight different states from Utah to Texas to Pennsylvania and they are from a variety of depths in the rock record. According to the geologic column used by evolutionary geologists, three of these samples would be classified as Eocene, three as Cretaceous, and four as

Pennsylvanian. (To see a geologic column chart, go to [creationanswers.net](http://creationanswers.net), click on Teaching Helps, then on the link for the Geologic Column Table.) These samples are stored using special procedures that keeps them from being exposed to air. Then at the AMS laboratory, elaborate sample preparations are used to test the samples in the accelerator apparatus.

The AMS laboratory used in these tests has developed procedures to determine one of the lowest "background C-14" values of any AMS dating laboratory. The lowest value they could obtain is  $0.071 \pm .009$  pmc. This is measured on a sample that should not have any C-14 and it is considered to be a "blank." It is as close to no C-14 as the laboratory can get. A value slightly larger than this is thus subtracted from the measured values to give the final results. The values that result after this "background" is subtracted ranged from 0.14 to 0.54 pmc. To put this in perspective, the laboratory estimates that the error introduced by their measurement procedures is on the order of 0.0004 pmc. What all this means is that there is a high degree of confidence in the measurement results.

### Carbon-14 and Noah's Flood

But what do the results really mean? Taking the laboratory results at face value according to evolutionary age assumptions, these samples would range in age from 40 to 60 thousand years in age, and the samples came from coal seams that would be considered 40 to 350 million years old. If the coal seams are millions of years old, there should be no C-14 left because so many half-lives would have passed.

Consider that the global Flood of Noah's time would have removed vast quantities of carbon from living things (as they died) and put this carbon into rocks and fossils. Thus, the rocks and fossils laid down by the Flood should contain much more carbon than what is used in all living things today. We know this from what is

known about Earth's rocks and fossils. The Earth before the Flood supported life far better than today's Earth.

The RATE team estimates there was roughly 100 times the carbon in the pre-Flood Earth. Because the same C-14 atoms that began decaying before the Flood continued decaying after the Flood, this means the proportion of C-14 compared to C-12 was about 1/100th of what it is today, in the pre-Flood world. In fact the pre-Flood proportion of C-14 could have even been less than this. One reason for this is that there are reasons to say Earth's magnetic field was stronger at the time of the Flood, which would have been about 4,500 years ago. Today we know C-14 is produced in Earth's atmosphere when cosmic rays cause Nitrogen-14 atoms to be converted into unstable C-14 atoms. If Earth's magnetic field was stronger it would slow down this process because it would deflect more cosmic ray particles away from Earth.

Summing up the results of C-14 measurements, we can say that from 0.05 to 0.5 pmc is found in materials that should be "C-14 dead." If the proportion of C-14 was one hundred or one thousand times less in the pre-Flood world, calculations show this leads to amounts of C-14 remaining today that are roughly the same as what has been reported from Carbon dating laboratories. So, this makes a young Earth of just several thousand years make sense and it would resolve the contradiction between what the C-14 dates say and what old age geologic dates of the (carbon bearing) rocks say.

The C-14 results above give promise of being able to correct C-14 dates to a young time scale in a way that makes physical sense of the data. It also is consistent with much that has been learned from creationist geology research. Moreover, it explains something that has been a mystery for some time—**why is there still C-14 if the Earth is old?**

There is another way that the C-14 measurements from the coal samples support a young-age Flood viewpoint. The

RATE team averaged the 10 results from the coal samples in terms of the major geologic rock types they were found in. This leads to averages of 0.26 pmc for Eocene, 0.21 pmc for Cretaceous, and 0.27 pmc for Pennsylvanian coals. Rocks of these classifications would differ by up to over 250 million years in age from Eocene to Pennsylvanian strata according to evolutionary geologists. But the fact that all these layers have roughly similar amounts of C-14 agrees nicely with the idea that much of the rock record was produced in the global Flood described in Genesis. From the old Earth perspective, why would rocks from these three periods still have about the same amount of C-14?

The RATE research effort is continuing. Their work may prove to be very important in answering a number of interesting technical questions about radiometric dating techniques. Their own C-14 measurements of coal samples have agreed well with the scientific literature. A young-age creation perspective explains what is usually considered to be an unidentified contaminant as intrinsic carbon that argues for Earth being only several thousand years old. The RATE research group is investigating the possibility that either at Creation or at the Flood or both there was a period of accelerated radioactive decay. The RATE results on Carbon-14 may give important insights into other radioactive decay processes as well.

If you would like to read the entire technical paper on this subject written by the RATE research team, it is available on Dr. Baumgardner's web site. Go to <http://globalflood.org/papers/2003ICCc14.htm>

### **The Cassini Mission to Saturn**

In October of 1997 a spacecraft known as Cassini-Huygens was launched from Cape Canaveral in Florida. The Cassini spacecraft's official arrival at Saturn is on July 1, 2004 as it actually flies through the rings of Saturn. The Cassini-Huygens

mission is one of international cooperation. Huygens is the name of a probe that will leave the Cassini orbiter and descend into the atmosphere of Saturn's unique moon Titan. The Huygens probe will be released from the orbiter on Christmas Eve of 2004, to begin a long slow descent into Titan. The Huygens probe has been built by the European Space Agency. The Italian Space Agency, Agenzia Spaziale Italiana, also contributed, providing radio equipment. Titan is the only moon in the solar system with a significant atmosphere, being even more dense than Earth's.

The Cassini mission has had a total cost of \$3.27 billion, of which \$2.6 billion has come from the United States. Cassini has also pioneered new technologies and is one of the largest planetary spacecraft ever built. Cassini has had a long trip to Saturn. Saturn lies about twice as far from Earth as Jupiter (far enough for radio signals to require up to 85 minutes one way). Plans are for Cassini to orbit Saturn for four years. No doubt much will be learned about Saturn and its moons. Cassini should be able to study eight of Saturn's 31 moons in its planned mission. It began by photographing Saturn's moon Phoebe on June 11, 2004. Phoebe's picture is shown below. There are sure to be surprises ahead for planetary scientists. I look forward to seeing what God has made. For updates, go to <http://saturn.jpl.nasa.gov>.

