The Age of the Earth

Zoology 475

Joseph Farnsworth

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The fundamental question asked by many is how old is the earth and how do we know. This question is generally answered in two separate ways. The first, and presently the most common, is that the earth is about 4.5 billion years old. This is what is taught in elementary schools and shown by geologists. The second answer is based on the Bible and faith, the earth is about 6,000 to 10,000 years old. This comes from strict interpretation of Genesis and was once the only answer and has been going through a revival in the past 20 years.

Within this question are questions about the geologic column and if it is a realistic view of the earth's history. Did The Great Flood of Noah occur and create many of the grand formations on earth, e.g. the Grand Canyon, the Rockie Mountains? Is radiometric dating accurate in dating the beginning of the formation of the earth? Different dating methods: accumulation of metals in the oceans, decay of the earth's magnetic field.

The critics, defined as the creationist, do attempt to answer all these questions. The age of the earth is answered by both sides, yet the hardest part to sort through is how we know these things. Each side seems to try to answer the questions and often point out why the other side is wrong. It is as if there is constant bickering and fighting between the two.

The creationists spend much time refuting the methods that

are used by evolutionary scientists. They find ways that radiometric dating is wrong and how inaccurate the methods are and find the inconsistencies used. The creationists have found their own ways to date the earth, including using the amount of minerals in ocean and claim to date the earth by the decay of its magnetic field. Creationist authors promote that the fossil record was produced by a global flood (Eglin 15).

Radiometric dating is the main method scientists use to date rocks. There are several of these methods and all use pretty much the same basic ideas, but use different isotopes. For example, potassium-40 decays to argon-40; uranium-238 decays to lead-206 via other elements like radium; uranium-235 decays to lead-207; rubidium-87 decays to strontium-87; and so on (Batten). These techniques are used find isotope concentrations which can be measured very accurately. An amount of each element is measured and using different equations and the half-life of each, one can estimate the minimum age of the given rock (Brush p. 43).

These methods depend on the following assumptions found in Batten's article.

1. The starting conditions are known (for example, that there was no daughter isotope present at the start, or that we know how much was there).
2. Decay rates have always been constant.

3. Systems were closed or isolated so that no parent or daughter isotopes were lost or added.

These are also confirmed by Brush in his work (Brush p.43).

In research in 1830, using helium and comparing it to the amount of uranium and thorium in rocks, at least one rock – “Stillwater Norite” from Montana – was found to have the age of more than 1.8 billion years old. This is consider to be the lower limit for the age of the earth (Brush p.43). This method of using helium is not considered the best method. The methods involving the use of lead are considered to be more satisfactory. Huran Monazite gave a rock an age of 2.57 billion years (Brush p,44). In 1946, Arthur Holmes and F.G. Houtermans figured the earth to be 2.9 +/- 0.3 billion years old (Brush p.45). However in September 1953, Clair Patterson and F. Houtermans announced that the age of the earth is 4.5 +/- 0.3 billion years(Brush p.46).

The question has been raised of whether or not the earth can be dated from the decay of its magnetic field. G. Brent Dalrymple wrote about this in an article in 1983. He wrote this to counter Thomas G. Barnes’ conclusion about the age of the earth based on the decay of the magnetic field. Barnes believed, “That the decrease in the dipole moment . . . is due to freely decaying currents in the fluid iron-nickel core of the earth.” (Dalrymple p.124) He calculated the half-life for the

presumed decay of the field to be 1400 years. With these calculations, it appears that the origin of the earth is much less than 20,000 years ago. More specifically, he claimed, the earth must be less than 10,000 years old (Dalrymple p.125).

Dalrymple explains the scientific understanding of what the magnetic field really is. He wrote, “The earth’s magnetic field, however, is not a perfect dipole; it is irregular in shape and constantly changing. ... It is important to understand that the dipole field is not a real field at all. Rather it is an idealized mathematical model that best fits the real field.” (p.125,126) Scientist have observed over years that the field is moving. Most importantly, they have discovered that the earth’s magnetic field reverses polarity. Through measurements of lava and other rocks, scientist can measure magnetism with laboratory instruments and can determine characteristics of the magnetic field (p. 127). Polarity transitions can take about 1000 years, but the strength may be reduced for as much as 20,000 years until the new polarity state becomes established. This is what Barnes talks of. Dalrymple does not disagree that the dipole has recently decreased, but he does write that Barnes overlooks all the facts and that his hypothesis is incorrect. Dalrymple’s last sentence answers the main question, “There are no properties of the magnetic field that, by themselves, can be used either to date the earth or to place any limits on the

earth's age." (p. 132)

A common creationist's argument is that the great Noah's flood created the geologic time column and because it was the flood and not time, the earth cannot be 4.5 billion years old. Leonard Soroka and Charles Nelson took on this argument. They suggested three possible models of how the earth could have been flooded: rainfall model, hydrothermal springs model, and comet impact model. With each model they showed why each one could not possibly work. A few points from each will be discussed.

The Rainfall Model: (Soroka p.135)
The amount of water needed to cover the earth is 4.4 billion cubic kilometers more water than already exists. The atmospheric pressure would have to be 840 times higher than it is now. The atmosphere would have to have 99.9 percent water vapor, which would make it impossible for a human to survive.

Hydrothermal Springs Model: (Soroka p.135-6)
This assumes the water came from within the earth's surface. Problems include, that the water would most likely be the same temperature as the rocks near it, creating water at temperatures of about 1600 degrees. As water would get to the surface, it would superheat the atmosphere, killing any passengers on the "ark".

Comet Impact Model: (Soroka p.136-7)
Either a frozen comet could have brought the needed water, but that would make it 2100 km wide and the impact would cause the

release of energy equivalent to 12 trillion megatons of TNT. We would know if this happened because it would have left behind obvious evidence. The second way would be that small comets could hit the oceans causing waves to cover the land and mountains constantly. This, however, would require 150 comets creating temperatures on earth of about 2000 degrees.

These models show that by natural means, the flood mentioned in the Bible would be impossible. They did write in their abstract, “Since miracles cannot be predicted and are not susceptible to any sort of check or proof, they have no place in the science curriculum.” (Soroka p.135) To me, these scientists believe in God, but wanted to show that the flood, as spoken of in the Bible, should not be taken literally and not taught in schools as a part of the formation of the earth.

The critics of an old-earth, the young earth creationists, try hard to combat science and its findings. Ray Bohlin in “The Grand Canyon and the Age of the Earth” tries to focus on lacking layers of the geologic column or radiometric dating. His arguments do not seem direct and clear. I think I was more confused after reading his paper than sure of what he wrote. Often, the writers will “forget” to mention printed reports on research that proves their ideas wrong. One example of this is that Brush mentioned that no one has examined the precision of radiometric dating as critically as Donald McIntyre and that the

creationist do not site his work(Brush p.48).

When I read Gish's work, "The Challenge of the Fossil Record", I almost believed him when he wrote, "Recent publications have exposed weaknesses and fallacies in radiometric dating methods…" (Gish p.51). When I looked at the references that he wrote of I changed my mind. He wrote of Whitcomb, Morris, Cook, and Slusher to only name a few – all known anti-evolutionist/creationist.

Often, in the science papers I read (Dalrymple and Brush), the authors mentioned things being omitted in later works by creationist authors. Brush mentions this about a book written by Slusher (Brush p.49). I was entertained that the scientist could easily show what the creationists "forgot" to mention or twisted. I think that many of the creationists will write papers knowing that the majority of people do not care enough to check references and research the topics well.

I believe that current scientific data show that the earth is about 4.5 billion years old. The radiometric dating, if correct shows the age of the earth. Dalrymple easily showed that the magnetic field could not be used to date the earth.

At times, I thought the creationists had good arguments, but when I really thought about it, the science outweighs the creationist arguments. I would like to know more about radiometric dating and find out if it is true that many readings

are thrown out before an “acceptable” one is found (Gish). In the Grand Canyon, supposedly the Cardenas basalt layer was aged at 1 billion years while the lava flow on top of the canyon was dated to 1.3 billion years old (Bohlin). I would like this question answered.

The scientist pretty much believe that there is not much more to find. They may find better and more precise ways to use radiometric dating by eliminating error. Creationist hope to find something that will disprove the fossil record or prove that the Flood occurred. Beyond this, I think that the question has pretty much been answered.

I personally am not sure about this topic. I understand the scientist’s views and what has been shown, but I also know that to God, nothing is impossible. I look forward with anticipation to the day that the Lord will sit down and explain all things unto us. My study of science and evolution has not changed my faith or made it waver. It only creates an appetite to learn more and study more.

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