Age of the Earth (Radioisotope dating vs Alternative Methods)

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# Introduction

The topic chosen here is “Age of the earth (radioisotope dating vs. alternative methods)”. There are two common viewpoints regarding the age of Earth. The old-earth view defines the age by utilizing different dating methods. While the young-fearth view is explained in the Bible and utilizes the rings on the dead wood of the oldest trees to determine the approximate age of Earth. This paper discusses both the viewpoints in detail, along with their comparison and contrast.

## Old-Earth Secular View

 As mentioned above, the old-earth secular view uses different dating methods to determine the age of the earth. The age of the earth can be determined using numerous methods. The most common methods, however, are radiometric dating, and relative dating.

**Alternative Methods**

The relative dating method is dependent on the layering of rocks to determine the age. The major assumption in this method is that the lower layers of rock were deposited before the higher levels. However, this process can only be utilized if all the layers are deposited in a continuous manner over a large area or have been found in one specific location. Another fundamental assumption in determining the age of a rock is that the age of the surrounding rocks is known. The geologists determine the age of surrounding rocks using so-called ‘absolute’ methods (Wiens, 2002).

**Radioisotope Dating**

The process of finding the age of a specimen using the ratios of different isotopes formed as a result of radioactive decay is referred to as Radioisotope Dating. Different radioactive isotopes of numerous elements are present in a particular kind of rock. The ratios of parent and daughter isotopes can be measured in a rock but this ratio does not represent the age. One has to take into account, some assumptions on the ratios of isotopes to infer the specific dates. Most common isotope pairs that are used to determine the age of earth include, Potassium-Argon (K-Ar), Rubidium-Strontium (Rb-Sr), Lead-Lead (Pb-Pb), and Uranium-Lead (U-Pb). However, the most common dating method is ‘carbon dating’, but it can be utilized only on the things which contain carbon and were alive once (DeYoung, 2005).

Radiometric dating involves the natural decaying phenomenon of the radioactive elements. These elements decay, with time, to form different isotopes. The starting element is considered as the parent, while the last isotope (end-product) is known as the daughter. To understand this process completely, one should have basic knowledge about the ‘half-life’ of atoms. Half-life is the time taken by one-half of the parent atoms to decay to the daughter atoms. The calculation of half-life, however, demands certain things to be known, first. This method of determining the age may not be true as it is based on the following assumptions (DeYoung, 2005):

1. The decaying rate of the radioactive elements is known and there is no change in it since the formation of rock.
2. The individual quantities of both the parent and daughter isotopes in a rock remain the same.
3. The initial quantities of both the daughter and parent isotopes in a rock are known.

However, there are some problems associated with these assumptions. Regarding the first assumption, there is no possible way to determine if the decaying rate of isotopes was constant or not. The decay rates of most of the radioactive elements are constant today and are independent of any external conditions like pressure and temperature, but this does not indicate that the rate always remained constant. ‘Radioisotopes and the Age of The Earth’, commonly referred to as ‘RATE’ is a science group which have discovered accelerated decay rates at some point(s) in the past. The reason for uncertainty of the second assumption is that it does not consider the natural phenomenon like the diffusion of gases, and different weather conditions. Hence, it can be said with certainty that there is no possible way to determine the removed or added amounts of parent or daughter products in rock over the long period of millions of years. The last assumption cannot be considered credible because it does not consider the possibility of the inheritance of isotopes from the surrounding rocks (Wiens, 2002).

The results of radiometric dating have shown that the age of Earth lies between 4.5 and 4.6 billion years. The geologists of the current age are trying to mitigate the errors, but the major differences recorded in the actual and calculated ages of known rocks suggests that the method of radiometric dating is unable to give the correct and ‘absolute’ dates (Wiens, 2002).

**Young-Earth View (Using Tree rings to determine Age)**

The oldest living things on planet Earth are Bristlecone pines. And the age of the oldest tree, located in the mountains of Nevada and California, has been predicted to be four thousand, six hundred (4,600) years old (Taylor, 1992). The age of trees can be determined by the number of rings on them, however, the rate of increase in the rings is not constant, and for this particular reason, one cannot relate them to the years. The age of the Earth written in the Bible is close to the age of the oldest (4,600 years of age) tree (Morris, 2006).

**Comparison of the viewpoints**

The above-mentioned viewpoints are entirely different in their approaches. However, they do have the following similarities:

* The results provided by both methods are not supported by a universal scientific approach so far. The old secular method involves dating methods which have its own assumptions. While the young earth view, that considers the oldest tree on the planet to calculate its age is also not proven to be scientifically credible.
* Both of the approaches utilize the natural phenomenon for determining the Earth’s age. The old secular view uses the decaying of radioactive elements, while the young earth view uses the rings found on the dead wood of trees.

**The contrast of the viewpoints**

The two viewpoints, explained above have the following major differences:

* The old secular method is a mathematically proven method (but based on some assumptions), while the young earth view is merely the belief (on the teachings of the Bible).
* The old secular method is diverse, as it involves dating which is of many kinds. While the method proposed by the young-earth view is simply based on the observation.

**Conclusion**

Apart from the discussed methods, there are numerous methods to determine the age of planet Earth, as well as, the Solar System. However, the correct way of utilizing any method is to take into account its assumptions and infer the related facts, accordingly. The importance of understanding the assumptions cannot be denied, as if one is unaware of the assumptions of a particular method, he can be deceived quite easily. In the present case, as both of the methods involve some assumptions, one can’t be sure about any perspective. The strong believers will consider and uphold the view represented by the Bible. However, the atheist and/or scientific communities will prefer the old-earth view as it involves calculations. However, as the dates presented by the old-earth view are originated from the methods involving multiple suppositions, one must not consider them accurate.

**References**

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