

Effects of Noah's Flood on Carbon Dating

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Noah's Flood and the Fall of Adam¹

A question that all Christians, all members of the Church of Jesus Christ of Latter-day Saints, and, specifically, scientists, have or should have, is, was Noah's Flood a real event of ancient times? And if so, was it a universal flood in that it covered, simultaneously, the entire face of the earth so that even the mountain tops were covered with water? If the answer to this question is, yes, then, what impact did it have on the earth and on interpretation of scientific observations in the earth? To address these questions, some doctrinal foundations are needed.

Consider first the effects of the Fall of Adam as described by Nephi in the Book of Mormon:

And now, behold, if Adam had not transgressed he would not have fallen, but he would have remained in the garden of Eden. And all things which were created must have remained in the same state in which they were after they were created; and they must have remained forever, and had no end. And they would have had no children; wherefore they would have remained in a state of innocence, having no joy, for they knew no misery; doing no good, for they knew no sin. But behold, all things have been done in the wisdom of him who knoweth all things. (2 Ne 2:22-24)

The Fall affected the whole of creation, not just Adam and Eve. Prior to the fall, there was no death, no imperfection. The earth was in a paradisiacal state to which it will return at the time of the Second coming of Christ at the beginning of the Millennium as stated in the 10th the article of faith:

We believe in the literal gathering of Israel and in the restoration of the Ten Tribes; that Zion (the New Jerusalem) will be built upon the American continent; that Christ will reign personally upon the earth; and, that the earth will be renewed and receive its paradisiacal glory. (PofGP Articles of Faith, vs 10)

President Russell M. Nelson reinforced this point with this statement:

¹Lee H. Pearson, "Doctrinal Fortifications against Darwinian Evolution," by Joseph Smith Foundation, Published February 20, 2017, Updated October 29, 2017, <http://www.josephsmithfoundation.org/papers/doctrinal-fortifications-against-darwinian-evolution/>.

The plan [of salvation] required the Creation, and that in turn required both the Fall and the Atonement. These are the three fundamental components of the plan. The creation of a paradisiacal planet came from God. Mortality and death came into the world through the Fall of Adam. Immortality and the possibility of eternal life were provided by the Atonement of Jesus Christ. The Creation, the Fall, and the Atonement were planned long before the actual work of the Creation began. (Russell M. Nelson, in *The Ensign*, May 2000)

The Fall, then marks the beginning of the existence of a fallen, mortal world, including all of its plant, animal, airborne, and marine inhabitants and establishes the age of the earth in its mortal state to be about 6000 years. The millennium, when it comes in the beginning of the seventh thousand-year period of the earth since the Fall, will undo some of the effects of the Fall.

Q. What are we to understand by the sounding of the trumpets, mentioned in the 8th chapter of Revelation?

A. We are to understand that as God made the world in six days, and on the seventh day he finished his work, and sanctified it, and also formed man out of the dust of the earth, even so, in the beginning of the seventh thousand years will the Lord God sanctify the earth, and complete the salvation of man, and judge all things, and shall redeem all things, except that which he hath not put into his power, when he shall have sealed all things, unto the end of all things; and the sounding of the trumpets of the seven angels are the preparing and finishing of his work, in the beginning of the seventh thousand years—the preparing of the way before the time of his coming. (D&C 77:12)

Additionally, when Adam was placed on the earth in the Garden, he was the first man as stated in scripture recorded in the Book of Moses. There were no “pre-Adamic” men.

And I, the Lord God, formed man from the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul, the first flesh upon the earth, the first man also; nevertheless, all things were before created; but spiritually were they created and made according to my word. (Moses 3:7)

President Harold B. Lee provides this commentary:

I was somewhat sorrowed recently to hear someone, a sister who comes from a church family, ask, "What about the pre-Adamic people?"

Here was someone who I thought was fully grounded in the faith.

I asked, "What about the pre-Adamic people?"

She replied, "Well, aren't there evidences that people preceded the Adamic period of the earth?"

I said, "Have you forgotten the scripture that says, 'And I, the Lord God, formed man from the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul, the first flesh upon the earth, the first man also . . .'" (Moses 3:7.) I asked, "Do you believe that?"

She wondered about the creation because she had read the theories of the scientists, and the question that she was really asking was:

How do you reconcile science with religion? The answer must be, If science is not true, you cannot reconcile truth with error. . . . (President Harold B. Lee, Ensign, December 1972)

Herein lays another challenge equal in magnitude to that of believing in the Universal Flood. Do we believe that the Fall occurred with all its changes and ramifications; do we believe that Adam was the first man; and do we believe that the millennium initiated by the Second Coming of Christ, will yet come? Peter foresaw what he calls "scoffers" that will come in the latter days who will deny both the Flood and the Second Coming:

Knowing this first, that there shall come in the last days scoffers, walking after their own lusts, And saying, Where is the promise of his coming? for since the fathers fell asleep, all things continue as they were from the beginning of the creation. For this they willingly are ignorant of, that by the word of God the heavens were of old, and the earth standing out of the water and in the water: Whereby the world that then was, being overflowed with water, perished: But the heavens and the earth, which are now, by the same word are kept in store, reserved unto fire against the day of judgment and perdition of ungodly men. (2 Peter 3:3-7)

Clearly, Peter foresaw our day of intellectualism and secular humanism with its world view of the Big Bang and Darwinian Evolution as our creators and natural selection and uniformitarianism as the mechanisms for change. Whereas, the prophets of ancient times and prophets of this Last Dispensation say otherwise placing God as our creator and using the great Flood to "baptize" and cleanse the earth by water and, again, at the Second Coming to baptize the earth by fire. Consider these statements by John Taylor and Brigham Young:

"I would like to know by what known law the immersion of the globe could be

accomplished. It is explained here in a few words: ‘The windows of heaven were opened’ that is, the waters that exist throughout the space surrounding the earth from whence come these clouds from which the rain descends. That was one cause. Another cause was ‘the fountains of the great deep were broken up’—that is something beyond the oceans, something outside of the seas, some reservoirs of which we have no knowledge, were made to contribute to this event, and the waters were let loose by the hand and by the power of God; for God said He would bring a flood upon the earth and He brought it, but He had to let loose the fountains of the great deep, and pour out the waters from there, and when the flood commenced to subside, we are told ‘that the fountains also of the deep and the windows of heaven were stopped, and the rain from heaven was restrained, and the waters returned from off the earth.’ Where did they go to? From whence they came. Now, I will show you something else on the back of that. Some people talk very philosophically about tidal waves coming along. But the question is—How could you get a tidal wave out of the Pacific Ocean, say, to cover the Sierra Nevadas? But the Bible does not tell us it was a tidal wave. It simply tells that ‘all the high hills that were under the whole heaven were covered. Fifteen cubits upwards did the waters prevail; and the mountains were covered.’ That is, the earth was immersed. It was a period of baptism.” (John Taylor, in *Journal of Discourses*, 26:74–75.)

“The earth, in its present condition and situation, is not a fit habitation for the sanctified; but it abides the law of its creation, has been baptized with water, will be baptized by fire and the Holy Ghost, and by-and-by will be prepared for the faithful to dwell upon” (Brigham Young, in Joseph Fielding Smith, *Answers to Gospel Questions*, 4:20).

Are we among the scoffers prophesied by Peter, or are we among the believers? Do we accept and believe the prophets? And do we go about trying to use our knowledge of principles of science to show that the prophets were and are right, or do we contradict them? Or like some, who spend an inordinate amount of time searching for statements, usually in documents from early Church history, until we find an obscure statement with unknown context that says just what we want it to say, in the meantime, passing by a myriad of statements to the contrary.

Some will try to overly dissect the prophet’s words, struggling to determine what is his prophetic voice and what is his personal opinion. In 1982, two years before being called as a General Authority, Brother Russell M. Nelson said: “I never ask myself, ‘When does the prophet speak as a prophet and when does he not?’ My interest has been, ‘How can I be more like him?’” And he added, “My [philosophy is to] stop putting question marks behind the prophet’s statements and put exclamation points instead.” This is how a humble and spiritual man chose to order his life. Now, 36 years later, he is the Lord’s prophet. (Neil L. Andersen, in *The Ensign*, May 2018)

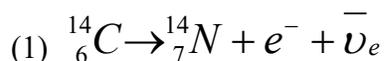
Now, let's suppose that the prophets are right, that there was a Fall, that Adam was the first man and the first flesh also. And let's assume that there was no death in the world before the Fall. This being the case, there can be nothing organic found in the ground from the past that predates the Fall. This may be a hard pill to swallow for those steeped in modern scientific tradition. There will be many questions that arise if we draw this line in the sand, like, what about dating methods that show bones and other organic materials being much older than 6,000 years? What about the fossil record? What about natural selection? Etc., etc. ...

The author is inclined to answer these questions with President Lee's answer, "*If science is not true, you cannot reconcile truth with error...*" Those prone to follow the prophets believe that answers will come in due time if faith and patience are exercised. In our lives, not all questions will be answered, but banking on the word of the prophets will always lead one to truth.

A question in the minds of some is, why does radio carbon dating often yield ages of ancient organic materials to be greater age than 6,000 years? Dates of this magnitude and greater are essentially saying that there was life and death before Adam, that is, before the Fall. This creates a significant dilemma that begs addressing. To address this subject in this paper, a basic description of the radio carbon dating method will be given, followed by a discussion on how this method can be modified to give results consistent with revelation in scripture and from modern day prophets.

Radio Carbon Dating Method²

In nature there are three types (isotopes) of carbon atoms. These are ^{12}C , ^{13}C , which are stable and ^{14}C which is unstable, or radioactive. ^{12}C has 6 protons and 6 neutrons in its nucleus, ^{13}C has 6 protons and 7 neutrons in its nucleus, and ^{14}C has 6 protons and 8 neutrons in its nucleus. ^{12}C is the most common and makes up nearly 98.9% of the carbon content in the atmosphere, followed by ^{13}C which makes up about 1.1% of the carbon in the atmosphere, and then only a trace of ^{14}C . ^{14}C converts to ^{14}N , spontaneously, by emitting an electron (e^-) plus an antineutrino ($\bar{\nu}_e$) as described by the following reaction:



^{14}C , when created in the atmosphere, immediately combines with oxygen to form carbon dioxide, or CO_2 which diffuses throughout the atmosphere and is taken up by plants through photosynthesis. The plants are then consumed by animals and other forms of life. CO_2 also diffuses into the oceans and freshwater lakes, rivers, and streams and is taken up by marine life

²Radio Carbon Dating, Wikipedia, https://en.wikipedia.org/wiki/Radiocarbon_dating

so that eventually all living organisms on the earth contain ^{14}C . ^{14}N is stable nitrogen and makes up about 78% of the atmosphere. Other gasses in the atmosphere include oxygen at 21%, argon at 0.9%, and trace amounts of carbon dioxide, nitrous oxides, methane, and ozone.

Cosmic radiation is constantly bombarding the earth's atmosphere, creating neutrons (n) that react with ^{14}N creating ^{14}C plus a proton (p) according to the following reaction



^{14}C has a half-life of 5730 years, that is, for a fixed number of ^{14}C atoms, half of them will convert to ^{14}N in 5730 years. Half of the remaining ^{14}C atoms will convert to ^{14}N atoms in another 5730 years, and etc., so that the amount ^{14}C drops off monotonically in a predictable manner over time. The two opposing reactions in equations (1) and (2) are assumed to drive the atmosphere towards equilibrium and assumed to have done so sometime in the distant past, leading to a constant $^{14}\text{C}/^{12}\text{C}$ ratio of 1 ^{14}C atom to 10^{12} ^{12}C atoms, that is, one ^{14}C atom per trillion ^{12}C atoms. This ratio is assumed to be constant over time with only minor fluctuations caused by various events such as volcanic eruptions, nuclear bomb testing, and other carbon producing events. The ^{14}C content in living organisms is assumed to be in equilibrium with the atmosphere (or oceans, etc.) until they die at which time the uptake of ^{14}C stops. The age of the organism can then be estimated from the amount of remaining ^{14}C , and more precisely, the remaining ratio, $^{14}\text{C}/^{12}\text{C}$. The math needed to do this calculation is developed as follows:

The starting place for predicting $N = ^{14}\text{C}/^{12}\text{C}$ over time can be written:

$$(3) \quad N = -\lambda \frac{d}{dt} N$$

This is a simple first order differential equation with solution having the form:

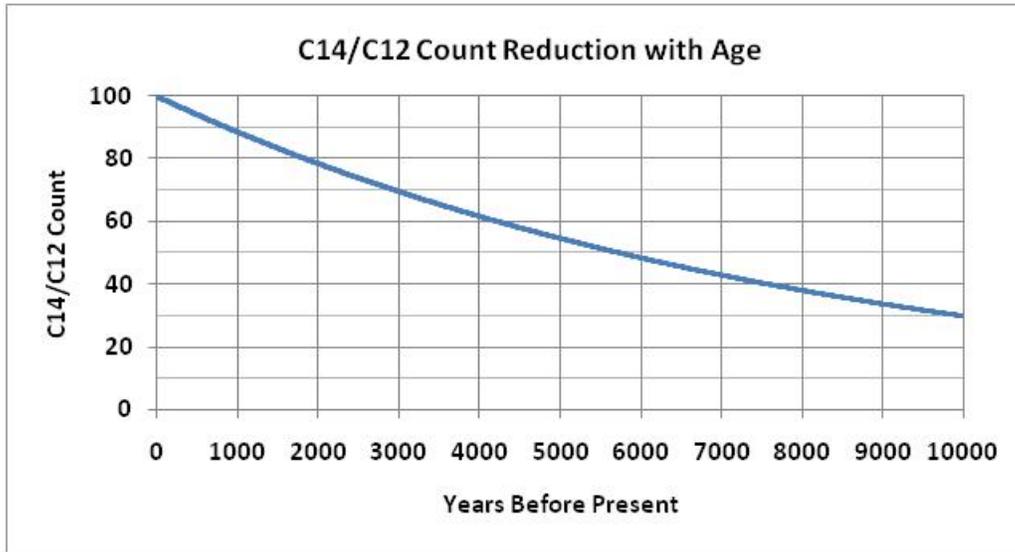
$$(4) \quad N = N_0 e^{-\lambda t}$$

where λ is the reaction rate coefficient and N_0 is the initial count in the deceased organism. For this application it will be assumed that $N_0=100$, meaning that the initial count is 100% of the expected count for $^{14}\text{C}/^{12}\text{C}$ in the atmosphere, or 1 part in 10^{12} . The half-life of 5730 can be used to determine the value for λ of 0.000120968, leading to the final form for equation (4),

$$(5) \quad N = 100e^{-(0.000120968)t}$$

A graph of equation (5) is given in the following figure showing the monotonic drop of $^{14}\text{C}/^{12}\text{C}$

out to 10,000 years.



To find the age of organic materials obtained from the earth, the $^{14}\text{C}/^{12}\text{C}$ count must be measured, then equation (5) must be solved for the time, t , giving an estimated age, that is,

$$(6) t = -(8266.649) \ln(0.01N) \text{ years}$$

Example calculations using equation (6) are shown in the following table.

Count	Age (years)
90	871
70	2949
50	5730
30	9953

Measurements of $^{14}\text{C}/^{12}\text{C}$ are often made that give ages greater than 6000 years. The question again arises, why do we get ages of organic materials that are farther back in time than the Fall of Adam? Can corrections be made to the calculations that produce dates consistent with what we know about the earth from revelation?

Doctrinal Basis for Carbon Dating Corrections

Taking into consideration that the Fall of Adam brought death into the world, not just for man, but for all life, it should be of great interest to find that coal and oil, generally, do not have a radio carbon signature. That is, there is no radio carbon in coal or oil, other than trace amounts that are now believed to have been created by uranium, thorium, and beryllium contamination.³

³Kathleen Hunt, "Carbon-14 in Coal Deposits," *The Talk Origins Archive*, posted May 22,

Uranium and thorium are sources of alpha particles (ionized helium atom) that can impact beryllium nuclei leading to the generation of neutrons, which, in turn, can create ^{14}C by impacting ^{13}C nuclei. Carbon in coal is composed of about 1.1% ^{13}C and 98.9% ^{12}C . The science community now believes that there is no original ^{14}C in coal and oil from the time of burial of the living organisms that created these deposits, but rather was created afterwards by uranium and thorium.⁴ The Darwinian followers believe there was no original ^{14}C in coal and oil because of their extreme ancient date. On the other hand, those that believe in the Fall of Adam and Noah's Flood, and their consequences, would have to conclude that all organisms that died and contributed to coal and oil deposits would have died sometime after the Fall. The most plausible event for causing the simultaneous death and burial of massive amounts of plant and animal life, and contributing to deposits of coal and oil through tremendous pressure, is the Flood. This conclusion leads directly to the postulate that there was no ^{14}C in the atmosphere before the Flood.

In the science community there is some controversy on how coal and oil deposits were formed in the earth. Both of these materials are hydrocarbons and are made primarily of methane (CH_4) and ethane (C_2H_6). Both hydrocarbons have been found not only on the earth but are relatively abundant in space in the form of gas or as a condensed liquid like that found on Saturn's moon, Titan. Another complicating factor is that fossils showing the intricate detail of delicate plants are preserved in coal. The presence of such fossils rules out tremendous heat as part of the coal forming process but does not rule out tremendous pressure. Because fossils like these and the existence of methane and ethane in space, a second theory called abiogenic or abiotic coal (or oil) has been formulated that assumes an inorganic origin of these materials.^{5,6} This theory assumes that hydrocarbons already existed in the interior of the earth and were created when it



was formed. The hydrocarbons are brought to or near the surface of the earth by diffusion and/or by catastrophic events (Noah's Flood). Whether coal was formed by organic or inorganic processes it contains plant remains and should contain ^{14}C if it were present in the atmosphere when the plants were living - but it does not. So, the question remains, how can this be? Returning the discussion of Noah's Flood, consider the information that follows.

2002, <http://www.talkorigins.org/faqs/c14.html>.

⁴ Ibid.

⁵ <http://origeminorganicadopetroleo.blogspot.com/2011/02/normal-0-21-false-false-false-pt-br-x.html>

⁶ <http://unconventionalgeology.blogspot.com/2012/01/origin-of-black-coal.html>

At the end of the Flood, the Lord made a covenant with Noah that he would place a rainbow in the sky as a reminder that he would never send another flood of this magnitude.

And I will establish my covenant with you; neither shall all flesh be cut off any more by the waters of a flood; neither shall there any more be a flood to destroy the earth. And God said, This is the token of the covenant which I make between me and you and every living creature that is with you, for perpetual generations: I do set my bow in the cloud, and it shall be for a token of a covenant between me and the earth. And it shall come to pass, when I bring a cloud over the earth, that the bow shall be seen in the cloud: And I will remember my covenant, which is between me and you and every living creature of all flesh; and the waters shall no more become a flood to destroy all flesh. (Gen. 9:11-15)

The Joseph Smith Translation of the Bible provides more insight into the covenant that God made with Noah.

And I will establish my covenant with you, which I made unto Enoch, concerning the remnants of your posterity.

And God made a covenant with Noah, and said, This shall be the token of the covenant I make between me and you, and for every living creature with you, for perpetual generations; I will set my bow in the cloud; and it shall be for a token of a covenant between me and the earth.

And it shall come to pass, when I bring a cloud over the earth, that the bow shall be seen in the cloud; and I will remember my covenant, which I have made between me and you, for every living creature of all flesh. And the waters shall no more become a flood to destroy all flesh.

And the bow shall be in the cloud; and I will look upon it, that I may remember the everlasting covenant, *which I made unto thy father Enoch; that when men should keep all my commandments, Zion should again come on the earth, the city of Enoch which I have caught up unto myself.*

And this is mine everlasting covenant, that when thy posterity shall embrace the truth, and look upward, then shall Zion look downward, and all the heavens shall shake with gladness, and the earth shall tremble with joy;

And the general assembly of the church of the first-born shall come down out of heaven, and possess the earth, and shall have place until the end come. And this is mine everlasting covenant, which I made with thy father Enoch.

And the bow shall be in the cloud, and I will establish my covenant unto thee, which I have made between me and thee, for every living creature of all flesh that shall be upon the earth.

And God said unto Noah, This is the token of the covenant which I have established between me and *thee*; for all flesh that *shall be* upon the earth.” (JST, Gen 9:17–25)

This covenant with Noah was essentially a renewal of the covenant made with Enoch that has as its principal condition the keeping of the Lord’s commandments and if this condition is kept, Zion could then be established upon the earth. Zion has more than one meaning and includes the City of Enoch, called Zion, which will return in the Latter-days, and the building of a Zion-type people, defined in Moses 7:18 as having “one heart and one mind, and [who] dwelt in righteousness; and there was no poor among them,” and also, in D&C 97:21, Zion is defined as “the pure in heart....”. So, we see that the covenant runs deeper than only that there will be a “bow in the cloud.”

For the context of this paper, a takeaway from the above scriptures is that the Lord offered the rainbow as a token of his covenant to send no more floods that would destroy all life on earth. This covenant is clearly preserved in the Joseph Smith Translation and leads one to believe that there were no rainbows in the sky before the flood. If there had been rainbows, the token would have little meaning and would not be believable as a promise of no more catastrophic floods. The postulate that there were no rainbows before the Flood, therefore, is of great significance and implies that the antediluvian weather and climate conditions were considerably different than the postdiluvian conditions.

Recall that in the account of the creation, the Lord placed water both above and below the “firmament. Consider these quotes:

And again, I, God, said: Let there be a firmament in the midst of the water, and it was so, even as I spake; and I said: Let it divide the waters from the waters; and it was done; And I, God, made the firmament and divided the waters, yea, the great waters under the firmament from the waters which were above the firmament, and it was so even as I spake. And I, God, called the firmament Heaven; and the evening and the morning were the second day. (Moses 2:6-8)

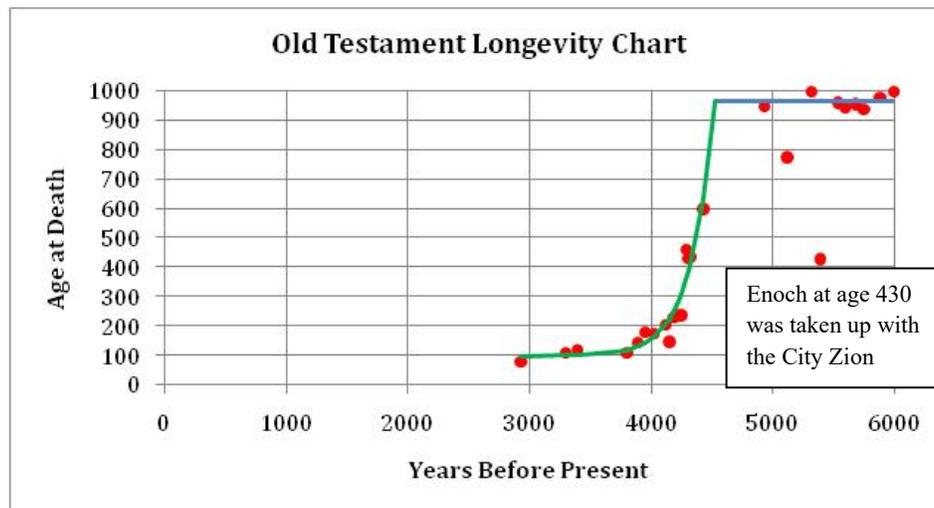
And I, God, said: Let the waters bring forth abundantly the moving creature that hath life, and fowl which may fly above the earth in the open firmament of heaven. (Moses 2:20)

Verse 20 in Moses 2 indicates that the firmament is the place where the fowls fly providing the

clue that the firmament is the atmosphere. So, what about the waters above the firmament? Recall that on the seventh day of the creation, the Lord watered the earth with a “mist” (Moses 3:6). Assume, then, that the earth was not watered by the weather patterns typical of what we see today, but possibly by mists or some process where there were no rainbows in clouds. (Moses 7:28 leaves room for the existence of rain before the Flood.) Assume that this condition persisted until the water above the firmament came down during the forty days and forty nights at the beginning of the Flood. If there was a canopy of water above the firmament, would that not protect the earth and could have created a condition where the temperature was uniform worldwide? And could it not protect the inhabitants of the earth from damaging cosmic radiation that could shorten life expectancies? Looking at the age of man before and after the Flood offers a possible confirmation that significant changes occurred. The table below, followed by a graph shows the age of man from Adam to King Solomon. Joseph Smith corrected some of the antediluvian ages given in the Old Testament in the Joseph Smith translation of the Bible, and these corrections are noted in the Table.

Name	Time of Birth (years BC)	Age at Death *JST (years)
Adam	4000	1000*
Seth	3880	981*
Enos	3750	940*
Cainan	3685	957*
Mahalalel	3600	945*
Jared	3540	962
Enoch	3390	430*
Methuselah	3320	1000*
Lamech	3120	777
Noah	2930	950
Shem	2430	600
Arphaxad	2325	438
Salah	2310	433
Eber	2290	464

Peleg	2250	239
Reu	2210	239
Serug	2190	230
Nahor	2150	148
Terah	2120	205
Abraham	2025	175
Isaac	1952	180
Jacob	1892	147
Joseph	1801	110
Moses	1400	120
Joshua	1300	110
Solomon	931	80



The plot of this data is revealing in that it clearly shows that something changed at the time of the Flood causing life expectancy to drop off nearly exponentially over a period of about a thousand years before coming to an equilibrium condition where life expectancy came to a steady state of about 70 to 80 years. If the cause of this process is related to a sudden increase of cosmic radiation after the Flood, then one could also conclude that the production of ^{14}C in the earth's atmosphere would have also begun at the time of the Flood. Now, using the life expectancy curve as a guide, assume that the content of ^{14}C in the atmosphere came to equilibrium over the same period of about a thousand years. An exponential curve fit to the

postdiluvian life expectancy curve, shown in **green** in the above graph, could then be used as a possible correction to the $^{14}\text{C}/^{12}\text{C}$ content in the atmosphere in the following way:

The exponential curve fit produces

$$(7) \text{Fit}(t) = (0.21)e^{-(0.005157)t} + 98.9$$

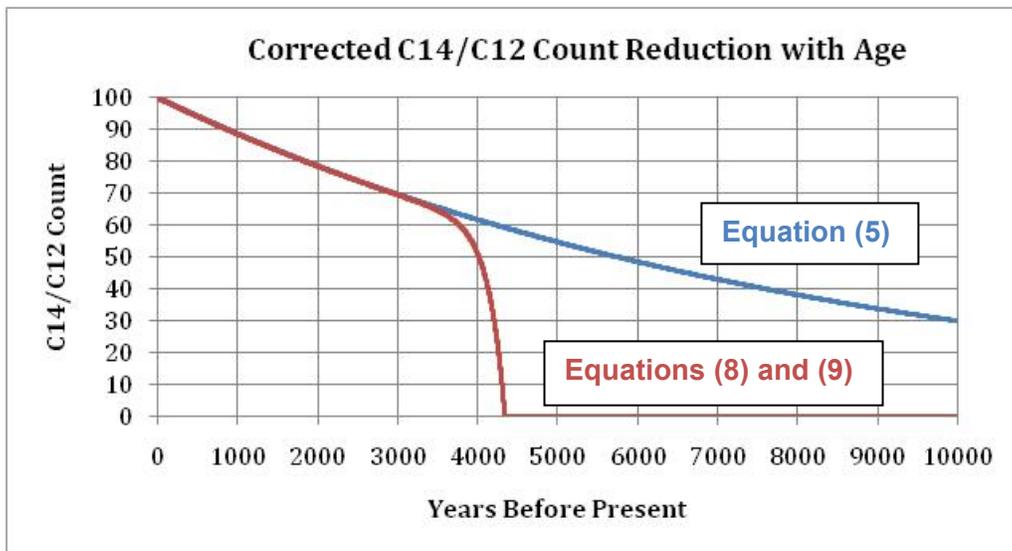
This function is then entered into equation (5) to produce the following corrected expressions for computing $^{14}\text{C}/^{12}\text{C}$ count.

$$(8) N_{\text{corrected}}(t) = \left(1 - (0.21e^{+(0.005157)t} - 98.9)\right) e^{-(0.00012097)t}$$

for $t < 4330$ years (back to Flood)

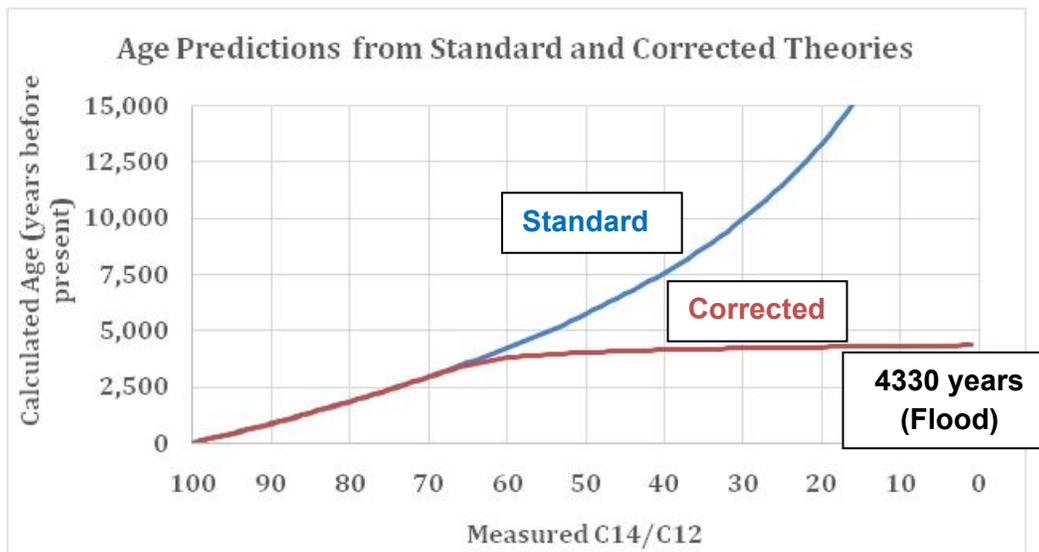
$$(9) N_{\text{corrected}}(t) = 0 \text{ for } t > 4330 \text{ years}$$

Equations (8) and (9) are solved numerically to generate, implicitly, a function like that in equation (6) yielding a corrected age prediction given the measured $^{14}\text{C}/^{12}\text{C}$ count. The Appendix contains the Mathcad solution. The figure below shows the corrected count curve from equations (8) and (9), compared with the standard method, equation (5).



The table below shows some sample calculations from the numerical solution of the corrected age in the Appendix) followed by a graph showing continuous solutions of predicted age out to 10000 years.

Count	Standard Method Age (years)	Corrected Method Age (years)
90	871	859
70	2949	2930
50	5730	4010
30	9953	4201



Note that the corrected theory only gives ages up to the year of the Flood because of the assumption that there was no ^{14}C in the atmosphere until after the Flood. Both standard and corrected methods agree for ages up to about 3500 years before present. This is consistent with the author's observation that carbon dating works quite well up to about that date. The theory presented is based on assumptions that clearly differ from the standard radio carbon dating method and can be considered as a first approximation for a correction to the standard method.

Concluding Considerations

The theory presented herein, with some effort, could be further corrected for variations in $^{14}\text{C}/^{12}\text{C}$ over time where concentration variations are known, but such corrections will only make small quantitative changes in the results with no qualitative change in the conclusions of this work. Hence such adjustments were not deemed important to make the point of this paper.

Some may argue that the conclusions of this paper are not correct because radio carbon dating

has been corroborated and calibrated with tree ring date studies or chronologies (dendrochronology) back to thousands of years before the time of the Biblical Flood and Adam and Eve. However, to make these chronologies, trees of ancient date must be found with overlapping tree ring dates and matching tree ring patterns, and there must be a continuous string of such trees to the most ancient date available. It becomes more and more difficult the farther back in time we go to find such trees. Ancient trees are rare and when they are found, how is one to know the actual age of the tree and if it fits into the chronology of dated trees? To answer this question, scientists use carbon dating to place a given tree into what is thought to be its appropriate timeline. This, then, becomes a circular process because carbon dating is effectively used to help calibrate the carbon dating process.^{5,6} This is like pulling oneself up by one's own bootstraps. Circular arguments don't lead to the truth and are not acceptable where the scientific method is needed to draw conclusions from data. Other difficulties with dendrochronology include:

1. Research has found that during times of greater rainfall that up to five rings can be produced in a given year for some varieties of trees.⁷
2. Tree ring patterns are unique.⁸ Trees growing in the near vicinity of each other may have differing ring patterns.⁹
3. Two published European chronologies have been retracted because of disagreements with later studies even though they were published with great confidence.¹⁰

Other arguments may be formulated, but ultimately, one must answer two underlying questions; 1) was the Fall of Adam a real historical event and 2) was Noah's Flood a real historical event? For those who believe they were actual events of the past, this paper provides a plausible explanation for why the radio carbon dating method is in error for artifacts that date earlier in time than about 3500 years before the present, and how the method can be corrected to make it consistent with scriptural history.

⁵Gerald A. Aardsma, "Myths Regarding Radiocarbon Dating, *Institute for Creation Research*, March 1, 1989, <http://www.icr.org/article/myths-regarding-radiocarbon-dating/>.

⁶B. Newgrosh, "Living with radiocarbon dates: a response to Mike Baillie", *Journal of the Ancient Chronology Forum* 5:59-67, 1992.

⁷Don Batten, "Tree Ring Dating (Dendrochronology)," Creation Ministries International, <https://creation.com/tree-ring-dating-dendrochronology>.

⁸D.K. Yamaguchi, "Interpretation of cross-correlation between tree-ring series," *Tree Ring Bulletin* 46:47-54, 1986.

⁹Don Batten, "Tree Ring Dating (Dendrochronology)," Creation Ministries International, <https://creation.com/tree-ring-dating-dendrochronology>.

¹⁰Rohl, David, *A Test of Time*, Arrow Books, London, Appendix C, 1996.

Appendix

MathCAD Representation of the Numerical Solution to Corrected Dating Equations:

Theory:

$$N = -\lambda \frac{d}{dt} N(t) \quad \text{or} \quad dN(t) = \frac{-N}{\lambda} \cdot dt$$

where $N(t)$ is given by equations (8) and (9) and $\lambda = 1.2097 \times 10^{-4}$. The following steps are taken to solve this equation numerically:

$$N_{n+1} = N_{n-1} - 2 \cdot dt \cdot \lambda \cdot N_n$$

Numerical Solution Forward Calculation:

```
NC14(λ, age, dt) :=
  ntime ← age / dt
  year1 ← 0
  N1 ← N14cor(year1)
  year2 ← dt
  N2 ← N1 - 2 · dt · λ · N14cor(year2)
  for n ∈ 2..ntime
    year2 ← n · dt
    N3 ← N1 - 2 · dt · λ · N14cor(year2)
    break if year2 ≥ age
  N1 ← N2
  N2 ← N3
  N3
```

Numerical Solution Inverse Calculation:

$$N_{\text{meas}} := 30$$

Given

$$0 = |N_{\text{meas}} - N14\text{cor}(\text{age})| \quad \text{age} \leq 4330$$

$$\text{Minerr}(\text{age}) = 4201 \quad \text{years}$$

Standard Method Inverse Calculation:

$$\text{tstd}(N) := -8266.51 \cdot \ln(0.01 \cdot N)$$

$$\text{tstd}(N_{\text{meas}}) = 9953 \quad \text{years}$$