106

The Pitfalls in the Radioactive Dating Methods—The Radiocarbon Dating Method

Reference has already been made to the results of radiocarbon "dating" which are evidence of the acceleration of radioactive and nuclear decay during the Creation Week and the Flood. However, further discussion of this "dating" method is warranted here, because it has become widely used in archaeology and other studies to apparently supply absolute "dates" for events supposedly within the past 30,000-40,000 years. The materials so "dated," of course, correspond to the period covered by biblical history, as well as more recent dates, bearing directly upon the question of the dates of the Flood and other related events.

The radiocarbon method was first developed by Willard F. Libby in 1946. Since then, thousands of radiocarbon "dates" have been determined for a great variety of archeological and recent geological materials in many different laboratories. The formation of radiocarbon (carbon-14, the radioactive isotope of ordinary carbon) by cosmic radiation was first discovered, however, by Serge Korff, an authority at that time on cosmic rays. He describes the carbon-14 dating method as follows:

> Cosmic ray neutrons, produced as secondary particles in the atmosphere by the original radiation, are captured by nitrogen nuclei to form the radioactive isotope of carbon, the isotope of mass 14. This isotope has a long half-life, something over 5,500 years. By the application of some very well thought-out techniques, Libby and his colleagues have actually not only identified the radiocarbon in nature, but have also made quantitative estimates thereof. Since this carbon in the atmosphere mostly becomes attached to oxygen formed carbon dioxide, and since the carbon dioxide is ingested by plants and animals and is incorporated into their biological structures, and further, since this process stops at the time of the death of the specimen, the percentage of radiocarbon among the normal carbon atoms in its system can be used to establish the date at which the specimen stops metabolizing.[1]

1 S. A. Korff, 1957, The origin and implications of the cosmic radiation, *American Scientist*, 45: 298.

There can be no doubt that this constitutes a very ingenious dating tool, provided of course that the inherent assumptions are valid. There are two basic assumptions in the carbon-14 dating method.[2] First, the cosmic ray flux has to have been essentially constant, at least on a scale of centuries. Second, the carbon-14 concentration in the carbon dioxide cycle must remain constant. To these two basic assumptions we should add the assumption of the constancy of the rate of decay of carbon-14 atoms, the assumption that dead organic matter is not later altered with respect to its carbon content by any biologic or other activity, the assumption that the carbon dioxide contents of the ocean and atmosphere has been constant with time, the assumption that the huge reservoir of oceanic carbon has not changed in size during the period of applicability of the method, and the assumption that the rate of formation and the rate of decay of radiocarbon atoms have been in equilibrium throughout the period of applicability. However, every one of these assumptions is highly questionable in the context of the events of creation and the Flood.

Nevertheless, it has been maintained that the method has been verified beyond any question by numerous correlations with known dates. However, closer investigation reveals that where historical dates are well established, back beyond about 400 BC, the radiocarbon "dates" increasingly diverge, as they also do from tree-ring dates.[3] Thus, it is obvious that any genuine correlation of the radiocarbon method with definite historical chronologies is limited only to some time well after the Flood and the dispersion of people from the Tower of Babel. The major assumptions in the method would therefore appear to be valid for this period. This does not prove their validity for more ancient times, the periods in which we would infer that the assumptions are very likely wrong due to conditions in the atmosphere and biosphere being different from today, and, therefore, their datings would also be wrong.

Attempts to apply the carbon-14 method to produce earlier "dates" have been called into serious question by geologists, archaeologists, and other scientists. Of particular concern has been the danger of contamination of samples by external sources of carbon, especially in damp locations. Hence, the radiocarbon method has been sharply criticized:

> In appraising C 14 dates, it is essential always to discriminate between the C 14 age and the actual age of the sample. The laboratory analysis determines only the amount of radioactive carbon present….However, the laboratory analysis does not determine whether the radioactive carbon is all original or is in part secondary, intrusive, or whether the amount has

2 J. L. Kulp, 1952, The carbon 14 method of age determination, *Scientific Monthly*, 75: 261.

3 S. Bowman, 1990, *Radiocarbon Dating*, London: British Museum Publications, 16-18; Faure and Mensing, 2005, 617-619.

been altered in still other irregular ways besides by natural decay.[4]

As the radiocarbon method became more widely used, questions of contamination of samples become more acute, especially with the discovery of modern organisms with unexpectedly lower levels of carbon-14 equivalent to anomalously old "ages," including modern mollusk shells from river environments yielding radiocarbon "ages" in the range of 1,010 to 2,300 years,[5] and snails living in artesian springs with carbon-14 contents equivalent to an "age" of 27,000 years.[6] As a consequence of the increasing problems with the radiocarbon method, skepticism began to be more openly expressed:

> C 14 dating was being discussed at a symposium on the prehistory of the Nile Valley. A famous American colleague, Professor Brew, briefly summarized a common attitude among archaeologists towards it, as follows:
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> "If a C 14 date supports our theories, we put it in the main text. If it does not entirely contradict them, we put it in a footnote, and if it is completely "out of date" we just drop it."
>
> Few archaeologists who have concerned themselves with absolute chronology are innocent of having sometimes applied this method, and many are still hesitant to accept C14 dates without reservations.[7]

A further decade of radiocarbon "dating" only served to make the criticisms more intense:

> In the light of what is known about the radiocarbon method and the way it is used, it is truly astonishing that many authors will cite agreeable determinations as *"proof"* for their beliefs.…
>
> Radiocarbon dating has somehow avoided collapse onto its own battered foundation, and now lurches onward with a feigned consistency. The implications of pervasive contamination and ancient variations in carbon-14 levels are steadfastly ignored by those who base their arguments upon the dates.

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4 E. Antevs, 1957, Geological tests of the varve and radiocarbon chronologies, *Journal of Geology*, 65: 129.

5 M. L. Keith and G. M. Anderson, 1963, Radiocarbon dating: Fictitious results with mollusk shells, *Science*, 141: 634-635.

6 A. C. Riggs, 1984, Major carbon-14 deficiency in modern snail shells from southern Nevada Springs, *Science*, 224: 58.

7 T. Säve-Söderbergh and I. U. Olsson, 1970, C 14 dating and Egyptian chronology, in *Radiocarbon Variations and Absolute Chronology*, Proceedings of the Twelfth Nobel Symposium, I. U. Olsson, ed., Stockholm: Almqvist & Wiksell and New York: John Wiley & Sons, New York, 35.

> The early authorities began the charade by stressing that they were "not aware of a single significant disagreement" on any sample that had been dated at different labs. Such enthusiasts continue to claim, incredible though it may seem, that "no worse discrepancies are apparent." Surely 15,000 years of difference on a single block of soil is indeed a *gross* discrepancy! And how could the excessive disagreement between the labs be called insignificant, when it has been the basis for the reappraisal of the standard error associated with each and every date in existence?
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> Why did geologists and archaeologists still spend their scarce money on costly radiocarbon determinations? They do so because occasional dates *appear* to be useful. While the method cannot be counted on to give good, unequivocal results, the numbers do impress people, and save them the trouble of thinking excessively. Expressed in what *look* like precise calendar years, figures *seem* somehow better—both to layman and professional not versed in statistics—than complex stratigraphic or cultural correlations, and are more easily retained in one's memory. "Absolute" dates determined by a laboratory carry a lot of weight, and are extremely helpful in bolstering weak arguments.…
>
> No matter how "useful" it is, though, the radiocarbon method is still not capable of yielding accurate and reliable results. There *are* gross discrepancies, the chronology is *uneven* and *relative*, and the accepted dates are actually *selected* dates. "This whole blessed thing is nothing but 13th-century alchemy, and it all depends upon which funny paper you read."[8]

The presence of detectable carbon-14 in fossils, which according to the uniformitarian timescale should be entirely carbon-14-dead, has been reported from the earliest days of radiocarbon "dating." For example, a published survey on all the "dates" reported in the journal *Radiocarbon* up to 1970 commented that for more than 15,000 samples reported: "All such matter is found datable within 50,000 years as published."[9] The samples involved included coal, oil, natural gas, and other allegedly very ancient material. The reason these anomalies were not taken seriously is because the measuring technique used in the early decades of radiocarbon "dating" had difficulty distinguishing genuine low intrinsic levels of carbon-14 in samples from the background cosmic radiation. Thus, the low carbon-14 levels measured in many samples, which according to their location in the geologic record ought to have had no carbon-14 in them, were simply attributed to the background cosmic radiation. However, the complication of

8 R. E. Lee, 1981, Radiocarbon: Ages in error, *Anthropological Journal of Canada*, 19 (3): 9-29, 1981. (Reprinted in the *Creation Research Society Quarterly*, 19 (2): 117-127; quotes are from pages 123 and 125).

9 R. L. Whitelaw, 1970, Time, life, and history in the light of 15,000 radiocarbon dates, *Creation Research Society Quarterly*, 7 (1): 56-71.

the background cosmic radiation infusing the carbon-14 measurements was overcome with the advent of the accelerator mass spectrometer (AMS) technique in the early 1980s. Nevertheless, over the past 25 years, organic samples from every level in the Cambrian-Recent portion of the geologic record were still found to contain significant and reproducible amounts of carbon-14 when tested by the highly sensitive AMS method. In hindsight, it is almost certain that many of the earlier radiocarbon analyses were indeed recording low levels of carbon-14, also intrinsic to those samples.

About seventy AMS carbon-14 measurements that were published in the standard radiocarbon literature between 1984 and 1998 demonstrate that significant levels of carbon-14 are routinely found in organic material. According to the conventional uniformitarian timescale, these samples should have been entirely devoid of any carbon-14 because they are supposedly older than 100,000 years.[10] Additionally, AMS radiocarbon analyses were obtained on fossilized wood from Tertiary, Mesozoic, and upper Paleozoic strata that have conventional uniformitarian ages ranging from 32 to 250 million years.[11] All fossilized wood samples yielded significant quantities of carbon-14, equivalent to radiocarbon "ages" of between 20,000 and 45,000 years. With a half-life of only 5,730 years, after one million years (or 175 half-lives) the amount of carbon-14 expected would be so small as to exclude even a single carbon-14 atom being left from a beginning mass of carbon-14 equal to the mass of the earth itself! Thus, the presence of any intrinsic carbon-14 in these fossilized wood samples, that are supposed to be 40-250 million years old, represents a profound challenge to the uniformitarian timescale, because the measured carbon-14 limits the ages of these fossilized woods to merely thousands of years.

It is now common knowledge, even in the standard radiocarbon literature, that organic samples from every portion of the Phanerozoic (Cambrian-Recent) geologic record display detectable amounts of carbon-14 well above the analytical threshold of the AMS equipment. This has come about because samples claimed to be millions of years old, which should have contained no

10 P. Giem, 2001, Carbon-14 content of fossil carbon, *Origins*, 51: 6-30; J. R. Baumgardner, A. A. Snelling, D. R. Humphreys and S. A. Austin, 2003, Measurable ^{14}C in fossilized organic materials: Confirming the young earth Creation-Flood model, in *Proceedings of the Fifth International Conference on Creationism*, R. L. Ivey, Jr., ed., Pittsburgh, PA: Creation Science Fellowship, 127-147; Baumgardner, 2005, 587-630.

11 A. A. Snelling, 1997, Radioactive "dating" in conflict! Fossil wood in ancient lava flows yields radiocarbon, *Creation Ex Nihilo*, 20 (1): 24-27; A. A. Snelling, 1998, Stumping old-age dogma: Radiocarbon in an "ancient" fossil tree stump casts doubt on traditional rock/fossil dating, *Creation Ex Nihilo*, 20 (4): 48-51; A. A. Snelling, 1999, A dating dilemma: Fossil wood in ancient sandstone, *Creation Ex Nihilo*, 21 (3): 39-41; A. A. Snelling, 2000, Geological conflict: Young radiocarbon dating for ancient fossil wood challenges fossil dating, *Creation Ex Nihilo*, 22 (2): 44-47; A. A. Snelling, 2000, Conflicting 'ages' of Tertiary basalt and contained fossilized wood, Crinum, central Queensland, Australia, *Creation Ex Nihilo Technical Journal*, 14 (2): 99-122; A. A. Snelling, 2008, Radiocarbon in "ancient" fossil wood, *Acts & Facts*, 37 (1): 10-13; A. A. Snelling, 2008, Radiocarbon ages for fossil ammonites and wood in Cretaceous strata near Redding, California, *Answers Research Journal*, 1: 123-144.

carbon-14 atoms, have been used as "procedural blanks" in the AMS equipment during analytical runs to determine presumed background carbon-14 levels due to sample preparation procedures in the labs, and any other contamination of the equipment. Consequently, most radiocarbon laboratories have been at pains to thoroughly investigate potential sources and various contributions of supposed contamination to the presumed carbon-14 background in their AMS systems,[12] and have been searching for specific materials to use as procedural blanks that contain as low a carbon-14 background level as possible.[13] However, even when the utmost care has been taken in the preparation of procedural blanks, which are regarded as "radiocarbon-dead" because of their presumed Precambrian age, detectable levels of carbon-14 well above the AMS instrument threshold have still been detected and reported.[14]

Invariably this supposedly anomalous detected carbon-14 in these procedural blanks has been claimed to be "contamination," which has led to the admission that there appears to be a "radiocarbon barrier" of 55,000-60,000 "radiocarbon years" for the apparent "ages" of even supposedly "ancient" samples, no matter their supposed ages. However, it can be argued that instrument error can be eliminated on experimental grounds as an explanation for the alleged contamination in these supposedly "ancient" "radiocarbon-dead" organic samples, which have, nonetheless, yielded significant carbon-14 measurements.[15] Similarly, it has also been shown that contamination of the carbon-14-bearing fossil material *in situ* is unlikely, but theoretically possible, and is a testable hypothesis. Furthermore, while contamination during sample preparation is a genuine problem, the literature has shown it can be reduced to low levels by proper laboratory procedures. Thus, it must be concluded that the carbon-14 detected in these organic samples from the geologic record would most likely have originated from the organisms themselves from which the fossilized materials were derived. Because most of this fossil carbon seems to have roughly the same amounts of carbon-14, it is clearly a logical possibility that all these fossil organisms had lived together on the earth at the same time.

In order to test all these earlier findings, more recent studies were undertaken to analyze ten coal samples representative of the economic important coalfields of the United States, and five diamonds from African kimberlite pipes.[16] Three of the coal samples were from Eocene seams, three from Cretaceous seams, and four from Pennsylvanian seams, yet the average carbon-14 values from these coal

12 J. S. Vogel, D. E. Nelson and J. R. Sothern, 1987, ^{14}C background levels in an accelerator mass spectrometry system, *Radiocarbon*, 29: 323-333.

13 R. P. Beukens, 1990, High-precision intercomparison at IsoTrace, *Radiocarbon*, 32: 335-339.

14 M. I. Bird, L. K. Ayliffe, L. K. Fifield, C. S. M. Turney, R. G. Cresswell, T. T. Barrows and B. David, 1999, Radiocarbon dating of 'old' charcoal using a wet oxidation, stepped-combustion procedure, *Radiocarbon*, 41 (2): 127-140.

15 Giem, 2001.

16 Baumgardner et al, 2003; Baumgardner, 2005.

samples over each of these three geological intervals were remarkably similar to one another, around 50,000 years, even though the uniformitarian ages range from 40 million years to 350 million years. The diamonds chosen for analysis came from underground mines where contamination would be minimal. In any case, being the hardest natural mineral, diamonds are extremely resistant to contamination via chemical exchange with the external environment. Furthermore, the diamonds chosen are regarded by uniformitarian geologists to have formed in the earth's mantle between one and three billion years ago, so they should have definitely been "radiocarbon-dead." Nevertheless, they still contained significant levels of carbon-14, well above the detection threshold of the AMS equipment, but virtually equivalent to the carbon-14 values found in fossilized organic materials from the Precambrian portion of the geologic record.[17] Given the supposed antiquity of these diamonds, and their source deep inside the earth, one possible explanation for these detectable carbon-14 levels is that the carbon-14 is primordial. However, if this were the case, the apparent "age" of the earth itself would only be less than 55,000 years!

The radiocarbon "dates" equivalent to the significant levels of carbon-14 detected in fossilized wood, coals, diamonds, and other "ancient" fossil carbon are, of course, calculated on the assumption that the decay rate of carbon-14 has been constant throughout earth history. However, if, as other evidence cited previously indicates, there were brief episodes of accelerated nuclear decay during Creation Week and the Flood, then much of the carbon-14 in these materials would have been generated during these periods, making the radiocarbon "dates" grossly enlarged. In any case, with a date for the Genesis Flood of only about 4,500 years ago, which is less than the carbon-14 half-life, one would expect that today there would still be detectable carbon-14 in the plants and animals buried and fossilized in that cataclysm. Furthermore, a huge amount of carbon from living organisms would have been buried during the Flood cataclysm to form today's coal seams, oil shales, and oil deposits, probably most of the natural gas, and some fraction of today's fossiliferous limestones. Estimates for the amount of carbon in this inventory suggests that the biosphere just prior to the Flood would have had, conservatively, greater than 300 to 700 times the total carbon that resides in the biosphere today.[18] The living plants and animals in the pre-Flood world would have contained most of this biospheric carbon, with only a tiny fraction of the total resident in the atmosphere. Furthermore, the vast majority of this carbon would have been normal carbon-12 and carbon-13, since even in today's world only about one carbon atom in a trillion is carbon-14.

All radiocarbon "ages" are also calculated on the assumption that before the

17 Baumgardner, 2005.

18 R. H. Brown, 1979, The interpretation of C-14 dates, *Origins*, 6: 30-44; Giem, 2001; G. R. Morton, 1984, The carbon problem, *Creation Research Society Quarterly*, 20: 212-219; H. W. Scharpenseel and T. Becker-Heidmann, 1992, Twenty-five years of radiocarbon dating soils: Paradigm of erring and learning, *Radiocarbon*, 34: 541-549.

plant or animal died it contained approximately the same ratio of radiocarbon to ordinary carbon that is present in living things today. However, prior to the Flood, the ratio of radiocarbon to ordinary carbon would have been much lower than it is at present, even if we assume that the total number of atoms of carbon-14 was similar to what exists in today's world. Assuming that is the case, this carbon-14 was distributed uniformly throughout the biosphere, and the total amount of carbon in the biosphere was, for example, 500 times that in today's world, then the resulting ratio of radiocarbon to ordinary carbon would have been 1/500 of today's level. Of course, this is only a very tentative estimate due to the large uncertainty in knowing the total amount of carbon-14 in the pre-Flood world. The short time span of less than 2,000 years between creation and the Flood would not have been sufficient to generate the same amount of carbon-14 by cosmic rays in the atmosphere as what we find in today's world, even with today's magnetic field strength. A stronger magnetic field in the past (discussed later) would have provided more effective deflection of charged cosmic ray particles, and thus there would have been even less carbon-14 generated in the atmosphere in the past.

On the other hand, there may well have been some significant amount of carbon-14 generated during the early part of the Creation Week, as a consequence of the large amount of accelerated nuclear disintegration of radioactive elements such as uranium and the resulting neutron interactions with nitrogen-14.[19] Indeed, it is possible to calculate how much carbon-14 might have been generated by neutron interactions early in earth history, because diamonds contain significant levels of nitrogen-14, and were formed early in the earth's history deep inside the earth. Such calculations show that neutron interactions would not have been capable of producing anywhere near the significant carbon-14 levels measured in deep-earth diamonds, even as a consequence of accelerated radioactive and nuclear decay.[20] On the other hand, the acceleration of radioisotope decay would have only marginally increased both the decay of carbon-14, and consequently the reduction of the carbon-14 inventory produced by the accelerated neutron interactions with nitrogen-14. However, the accelerated neutron interactions would not have prevailed in increasing the carbon-14 levels to those measured in the deep-earth diamonds. Therefore, if the total mass of carbon-14 in the pre-Flood world was not much greater than that in our present world, then the carbon-14 decay over the span of 4,500 years since the Flood catastrophe reduces that pre-Flood level by a factor of 0.6. Therefore, the carbon-14 to total carbon ratio of 1/500 of today's level 4,500 years ago would display today as a ratio of less than 1/800, which is exactly the carbon-14 level measured in the deep-earth diamonds and other organic carbon from the pre-Flood world, as is well documented in the standard radiocarbon literature.

19 R. Zito, D. J. Donahue, S. N. Davis, H. W. Bentley and P. Fritz, 1980, Possible subsurface production of carbon-14, *Geophysical Research Letters*, 7 (4): 235-238.

20 J. R. Baumgardner, 2005.

After the Flood cataclysm it was necessary for the carbon-14 to total carbon ratio to have increased dramatically and rapidly by a factor on the order of 500 to reach its present-day value. Not only would carbon-14 production in the atmosphere have increased immediately after the Flood, due to the decreasing strength of the earth's magnetic field (discussed later), but the presence of high levels of crustal neutrons arising from the accelerated nuclear decay during the Flood would have converted substantial amounts of crustal nitrogen to carbon-14, most of which would have been oxidized to carbon dioxide and eventually escape to the atmosphere. The striking carbon-14 differences measured in the shell of a single snail specimen confirms that large spatial and temporal variations in the carbon-14 to total carbon ratio did indeed exist during the interval immediately following the Flood cataclysm.[21] Furthermore, the equilibrium condition between the generation and decay of carbon-14, which has to be assumed in making any age calculation by the radiocarbon method, would obviously not be applicable for quite a long time after the Flood cataclysm. Even with the marked increase in the rate of formation of carbon-14 as a result of the Flood, and of the decreasing strength of the earth's magnetic field, it would still have taken many years for the total amount of carbon-14 in the biosphere's carbon inventory to build up to the equilibrium condition where generation and decay of carbon-14 would be equal. This would mean that some organisms living in those early years and centuries after the Flood would have only received a proportionately smaller amount of carbon-14 into their systems than those organisms living in later times. Of course, as the radiocarbon production increased as time went on, the present equilibrium rates would have been reached.

This is why radiocarbon "dates" for the last 2,000 years seem to show a generally good correlation with historically verified artifacts and specimens, although of course, there would still be many discrepancies and a larger margin of error the further back in time comparisons are made. However, for early post-Flood dates, the levels of contained carbon-14 would be such that, if "ages" were then calculated on the basis of the present equilibrium conditions and rates, they would be very much older than their real-time ages, with the amount of error increasing progressively with the age of the material. This is also the case with the organic material buried during the Flood cataclysm, including the plant material buried and fossilized to form coal, which still contains significant, relatively high levels of carbon-14. Ages for this Flood-deposited organic material calculated on the basis of present equilibrium conditions and rates would yield incorrect, much older "ages." Thus, the biblical framework of earth history, including the Flood cataclysm and the recovery of the biosphere from that event, adequately explains the data from carbon-14 studies, accounting for the agreement with historically-dated recent events, but at the same time indicating that earlier unverified datings must be too high, as would be inferred from the biblical records. Furthermore, the fact that Eocene, Cretaceous, and Pennsylvanian coal seams, which in

21 M.-J. Nadeau, P. M. Grootes, A. Voelker, F. Bruhn, A. Duhr and A. Oriwall, 2001, Carbonate ^{14}C background: Does it have multiple personalities?, *Radiocarbon*, 43 (2A): 169-176.

uniformitarian terms are dated at 40 to 350 million years old, all contain similar (essentially identical) significant levels of carbon-14, when in uniformitarian terms there should be no carbon-14 in them at all, is testimony to this fossilized plant material all having been buried at the same time during the Flood cataclysm only 4,500 years ago.

Consequently, it is abundantly clear that the data from all the radioactive methods of geochronometry, properly understood, harmonize perfectly with the biblical records and inferences associated with the creation and the Flood. These events must be dated at only some thousands of years ago according to the Bible. Even the presence of significant detectable levels of carbon-14 in deep-earth diamonds, that in uniformitarian terms are "dated" at 1-3 billion years old, is in fact testimony to the earth only being thousands of years old. So evidence that has been brought against the biblical testimony has now been shown rather to harmonize quite satisfactorily with the biblical record. In fact, it would seem highly probable that no method of geochronometry has been devised that permits determination of dates earlier than the Flood, since all such geological and geophysical processes were profoundly disturbed and altered by the events of that global cataclysm. The Scriptural description is that "the world that then was, being overflowed with water perished" (2 Peter 3:6), and the context shows that this statement comprises the total earth! The only possible way in which men can *know* the true age of the earth is by means of divine revelation!