

Much-inflated carbon-14 dates from subfossil trees: a new mechanism.

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Artificially-inflated ^{14}C dates have been found to occur when trees absorb 'infinitely old' carbon dioxide released into the atmosphere from local, volcanogenic, subterranean sources. This is not to be confused with wood contamination because the carbon is firmly locked within the wood fibres. A similar effect has long been recognised with the fictitious 'built-in' carbon-14 dates that occur in molluscs when they absorb 'infinitely old' carbon from carbonate rocks. In addition, creationists recognise that the global atmospheric buildup of ^{14}C after the Creation and Flood would have produced artificially-old carbon-14 dates. However, the widespread emanation of ^{14}C -free volcanogenic carbon dioxide after the Flood would have further inflated the carbon-14 dates of tree rings in a systematic manner in many parts of the world.

The carbon-14 dating method is based on the assumption that tiny amounts of radioactive ^{14}C , produced as cosmic rays hit nitrogen in the upper atmosphere, become incorporated within the bodies of living things. After death, generally no new ^{14}C can enter the body, nor can any ^{14}C leave. Instead, the ^{14}C gradually disappears from the body by undergoing radioactive decay. This occurs at a half-life of approximately 5,700 years. By assuming that ^{14}C in the present atmosphere, and hence in the organism at the time of death, was essentially the same in the past, and that a closed system has existed since the death of the organism, we can compute how many half-lives of ^{14}C have passed, and hence how many years have elapsed, since the organism died.

Based on these uniformitarian assumptions, dates up to about 40,000 years are believed to be attainable. But even under these assumptions, there is ample evidence that carbon-14 dating has serious problems. According to conventional geology, the ^{14}C in once-living objects older than about 100,000 years should have all gone, yet we frequently find objects supposedly **millions** of years old that contain measurable quantities of carbon-14.¹ And even conventionally-believable dating results are often discarded if they conflict with some preferred hypothesis.²

Alternative global-biospheric conditions

Creationist scientists are willing to leave these uniformitarian mental boxes and thus have studied carbon-14 dating from a decidedly **non**-uniformitarian viewpoint. One creationist model³ envisions the Earth created some six thousand years ago, the Flood about 1700 years thereafter and ^{14}C building up either after Creation or after the Flood. Because most living objects buried during the Flood contained very little ^{14}C when they died, they already possessed inherited carbon-14 dates (usually at infinity, but sometimes at a few tens of thousands of years, as discussed earlier¹). Post-Flood organisms successively acquired less extreme 'built-in' carbon-14 dates at the time of death until they eventually converged upon 'real-time' ages a few thousand years ago.⁴

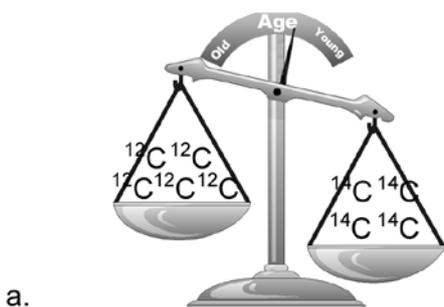
An additional mechanism for spuriously-high carbon-14 dates

It turns out that there is another mechanism, probably active after the Flood, that creates greatly-exaggerated carbon-14 dates. Unlike the earlier-discussed global processes, it operates at the local level (relative to each living thing), and is particularly successful at altering the ^{14}C content of living trees. Let us consider its revolutionary implications.

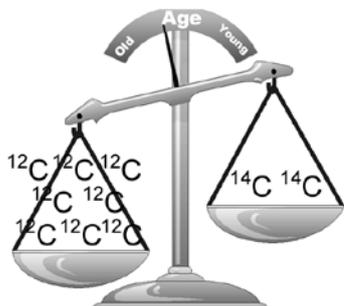
For the longest time, it had been supposed that, given standard assumptions, carbon-14 dates from properly-decontaminated wood are virtually foolproof. After all, a tree grows a ring each year, and no new structural material is subsequently added to the ring. When newer, mobile, material is leached away by chemicals, the remaining structural wood fiber undoubtedly contains only the carbon (and hence ^{14}C) that it contained during the year that the ring formed. And, so the reasoning continues, since closed-system conditions are almost guaranteed and since trees get their carbon from the CO_2 in the air, and not from the soil,⁵ each ring must reflect the ^{14}C concentration in the atmosphere when it formed.

The key word in the above-described set of assumptions is 'air'. Trees absorb whatever carbon dioxide gas is within their vicinity. In the absence of other sources, the only source of CO_2 is the atmosphere. But what other source could there possibly be? One source is volcanogenic gases. And, since deep subterranean carbon usually had no prior contact with the atmosphere, it has zero ^{14}C and therefore an infinite carbon-14 age. Now, consider a tree that imbibes half of its CO_2 from the air and the remaining half from local volcanogenic gases. Its concentration of ^{14}C at time of death is only half that of the ambient atmosphere, and hence it dies having a 'built-in' carbon-14 age of 5,700 years (one half-life).

Tuscany, Italy, is probably the first place where 'inherited' carbon-14 dates on wood were described.⁶ These dates,



a.



b.

a. The ratio of ^{14}C and ^{12}C is measured to calculate the ‘age’ of matter. b. If the tree imbibes its carbon from a lower ^{14}C source than the general atmosphere (e.g. takes up CO_2 from volcanic gases) then the ratio will be higher in ^{12}C than usual and therefore show an incorrect old ‘age’.

much too old to be attributed to any past civilization in Italy, were determined from timbers located several kilometers from a volcano. Since that report, other examples of this phenomenon have surfaced from all over the world.⁷ A recent, detailed study⁸ has shed further light on the dynamics of this process. Particularly interesting is the fact that these ‘bad’ carbon-14 dates do not occur haphazardly, but to the contrary:

‘The pattern of ^{14}C depletion in the annual rings is remarkably consistent between all three of the trees cored, suggesting that either changes in CO_2 flux are occurring homogeneously across the entire area of the tree kill, or that trees integrate CO_2 flux very well over relatively large areas.’⁹

Under the right conditions, inherited carbon-14 dates can therefore mimic ‘real’ ones.

^{14}C depletion after the Flood

All the foregoing examples are infrequent, and localized. But the situation must have been very different for some time after the Flood. A great deal of ‘infinitely-old’ carbon dioxide must have been percolating from the depths, all over the world, and over considerable geographic regions, as a result of residual volcanic activity, upper-mantle activity, etc. As the growing plants and trees absorbed much of this ^{14}C -free CO_2 flux, they necessarily acquired quasi-homogenous ‘built-in’ carbon-14 dates—not as an exception, but

as a rule. A large fraction of the ‘very old’ carbon-14 dates we presently obtain by routine use of the carbon-14 dating method may therefore owe to this mechanism in addition to, or instead of, the earlier-discussed buildup of global atmospheric ^{14}C since the time of Creation or the end of the Flood.³ Clearly, this volcanogenic CO_2 mechanism deserves further study.

References

1. Gien, P., Carbon-14 content of fossil carbon, *Origins* 51:6–30, 2001. For a variety of technical reasons discussed in the paper, these occurrences cannot, at least for the most part, be explained away as contamination.
2. Woodmorappe, J., *The Mythology of Modern Dating Methods*, Institute for Creation Research, El Cajon, p. 41, 1999. This, of course, is also true of the dating methods used to obtain much older dates than those presumably obtainable by the carbon-14 method.
3. Brown, R.H., Radiometric dating from the perspective of Biblical chronology; in: Walsh, et al. (Eds), *Proceedings of the First International Conference on Creationism*, Vol. 2, pp. 42–57, 1986. For example, suppose that the Flood was 5,700 years ago, during which time a living thing died containing a ^{14}C content 0.125 times that of living things today. At the moment of its death, it already had a ‘built-in’ carbon-14 ‘age’ of 17,100 years (three half-live periods ‘built in’: $0.5 \times 0.5 \times 0.5 = 0.125$). Owing to the fact that another half-life of time has actually passed since the Flood, that once-living thing now has a ^{14}C that is 0.0625 that of presently-living things, and a total apparent carbon-14 age of 22,800 years.
4. I do not discuss the significance of several-thousand-year tree-ring chronologies and their calibration of carbon-14 dating. This is a separate issue.
5. Note that this contrasts with subfossil molluscs, which often have anomalously-high carbon-14 dates, as reported in earlier creationist literature. The mollusc, unlike the tree, may have additionally absorbed some carbon from dissolved limestone, which has no ^{14}C . Thus the mollusc, at the time of its death, has a shortage of ^{14}C relative to the atmosphere, and hence a fictitiously-high age.
6. Saupe et al., A possible source of error in ^{14}C dates, *Radiocarbon* 22(2):525–531, 1980.
7. Olsson, I.U., Experiences of ^{14}C dating of samples from volcanic areas, *PACT* 29:213–223, 1990.
8. Cook et al., Radiocarbon study of plant leaves and tree rings from Mammoth Mountain, CA: a long-term record of magmatic CO_2 release, *Chemical Geology* 177:117–131, 2001.
9. Cook et al., Ref. 8, p. 126.

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