

August 2015

## Carbon-14 in Dinosaur Bones Challenges Evolution Theory and Supports Genesis Flood Account

By Jeff Gift, PhD

**Z**ugzwang (German for “compulsion to move,” pronounced [ˈtsuːktsvaŋ]) is a situation found in chess and other games wherein one player is put at a disadvantage because they must make a move when they would prefer to pass and not to move. The fact that the player is compelled to move means that his position will become significantly weaker. A player is said to be “in zugzwang” when any possible move will worsen his position<sup>1</sup> (see Figure 1, for example).

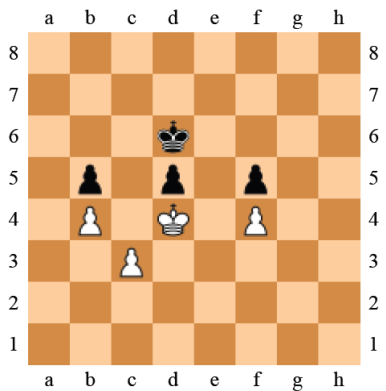


Figure 1 – According to Glen Flear, Black is in zugzwang because black must move and will eventually lose the game.<sup>2</sup>

This article will explain how recent events, including the announcement of dinosaur soft tissue<sup>3</sup> and carbon-14 (C-14) in the otherwise ordinary bones of major classes of dinosaurs collected from museum shelves and throughout the geological column, may have placed evolutionists in a zugzwang-like position with respect to their long-held beliefs concerning the origin of life. In other words, like a chess player in zugzwang, they will

<sup>1</sup> Soltis A (2003a) *Grandmaster Secrets: Endings*, Thinker's Press, Davenport, IA.

<sup>2</sup> Flear G (2004) *Starting Out: Pawn Endgames*, Everyman Chess, London

<sup>3</sup> Bertazzo S, Maidment SCR, Kallepitis C, Fearn S, Stevens MM, Xie H (2015 Jun 09) Fibres and cellular structures preserved in 75-million-year-old dinosaur specimens. <http://www.nature.com/ncomms/2015/150609/ncomms8352/full/ncomms8352.html> Accessed 2015 Jul 19

now be compelled to move (investigate dinosaur bones) in a manner that can only weaken their position.

### **Dinosaur Soft Tissue, a Common Phenomenon**

The June 9, 2015 announcement of dinosaur soft tissue in *Nature Communications* by scientists from Imperial College London is not entirely new news. Soft tissue in dinosaur bones has been reported for over a decade now (see Bob Enyart's list of journal papers at <http://kgov.com/dinosaur-soft-tissue>). However, as is well documented in a recent Creation Evolution Headlines article,<sup>4</sup> this study contains more than a dozen noteworthy aspects that make it particularly compelling relative to previous soft tissue findings. Here, I want to highlight several characteristics of this study that contribute to placing evolutionists in the inescapable, zugzwang position, compelled to move in ways that weaken their position.

- *The authors of this announcement have no ties to creationist organizations, making their findings more compelling to the broad community of secular scientists that are generally very “tight-knit” and inflexible with respect to their evolutionary beliefs.*
- *The authors used ordinary, common bones from museum specimens, noting that they examined eight dinosaur bones from the Cretaceous period, “...none of which are exceptionally preserved.”* The fact that soft tissue reports can no longer be passed off as exceptions will make these findings more difficult to ignore.
- *The bones displayed no external indicators of what was inside.* They noted that “Incredibly, none of the samples showed external indicators of exceptional preservation and this strongly suggests that the preservation of soft tissues and even proteins is a more common phenomenon than previously accepted.” This “common phenomenon” claim is sure to draw interest and is bound to compel more research in this area.

<sup>4</sup> Creation Evolution Headlines (2015 Jun 10) Dino soft tissue confirms creationist prediction <<http://crev.info/2015/06/dinosaur-soft-tissue-surprise/>> Accessed 2015 Jul 19

- *Their findings confirmed* previous findings of blood cells in fossils by Dr. Mary Schweitzer.<sup>5</sup> The authors report: “The spectra obtained from four different regions of the dinosaur bone containing erythrocyte-like structures are **surprisingly similar to the spectra obtained from emu blood.**”
- *The authors express a great deal of enthusiasm.* Scientific papers tend to be stodgy and understated in tone. These scientists used words like “exciting” and “surprising” to describe their findings.
- *The news media are picking up on the story,*<sup>6</sup> suggesting it may get more traction this time around.
- *Most importantly, they found structures enriched in carbon.* They write, “Elemental analysis using energy dispersive X-ray spectroscopy (EDS) **established that all these structures are enriched in carbon,** in contrast with the surrounding denser tissue/cement.” This raises the possibility of running C-14 tests on the samples.

Thus far, no secular scientist has suggested C-14 dating of these fossils since they believe these fossils to be millions of years old and bones older than about 100,000 years should contain no C-14 due to its 5,730-year half-life. However, they also once believed that dinosaur fossils could not contain soft tissue.

### The Next Move

Having your opponent in zugzwang does not mean that a win is inevitable. Many potential chess victories end up in a draw because the right moves were not made by the player with the upper hand. Now that scientists understand that soft tissue in dinosaur bone is a “common phenomenon,” the next major concession will be that dinosaur bones contain measurable amounts of endogenous C-14; Because any amount of C-14 in dinosaur bones would effectively topple the geologic column; once this point is conceded, the end game for the theory of evolution is near (see End Game section below). Thus, the right move for creationists at this point is to perform C-14 testing and publish the results, thereby increasing the pressure on (i.e., compelling) secular scientists to do the same. As is explained below in The iDINO Project section, this is exactly what some creation scientists are doing. However, before describing the results of that project, let’s first review how C-14 dating works.

## Carbon-14 Dating

As illustrated in Figure 2, cosmic rays enter earth’s atmosphere in large numbers every day. When they collide with an atom in the atmosphere, they can create a secondary cosmic ray in the form of an energetic neutron. When the energetic neutron collides with nitrogen, a nitrogen-14 (seven protons, seven neutrons) atom turns into a C-14 atom (six protons, eight neutrons) and a hydrogen atom (one proton, zero neutrons). C-14 is unstable (radioactive), with a half-life of 5,730 years.

### Carbon-14 in living things

The C-14 atoms that cosmic rays create combine with oxygen to form carbon dioxide, which plants absorb and incorporate by photosynthesis. Animals and people eat plants (and other animals that have eaten plants) and take in C-14 as well. The ratio of carbon-14 to normal (stable) carbon-12 (C-12) in the air and in all living things is believed to be nearly constant (at equilibrium) at one C-14 for every trillion C-12 atoms.

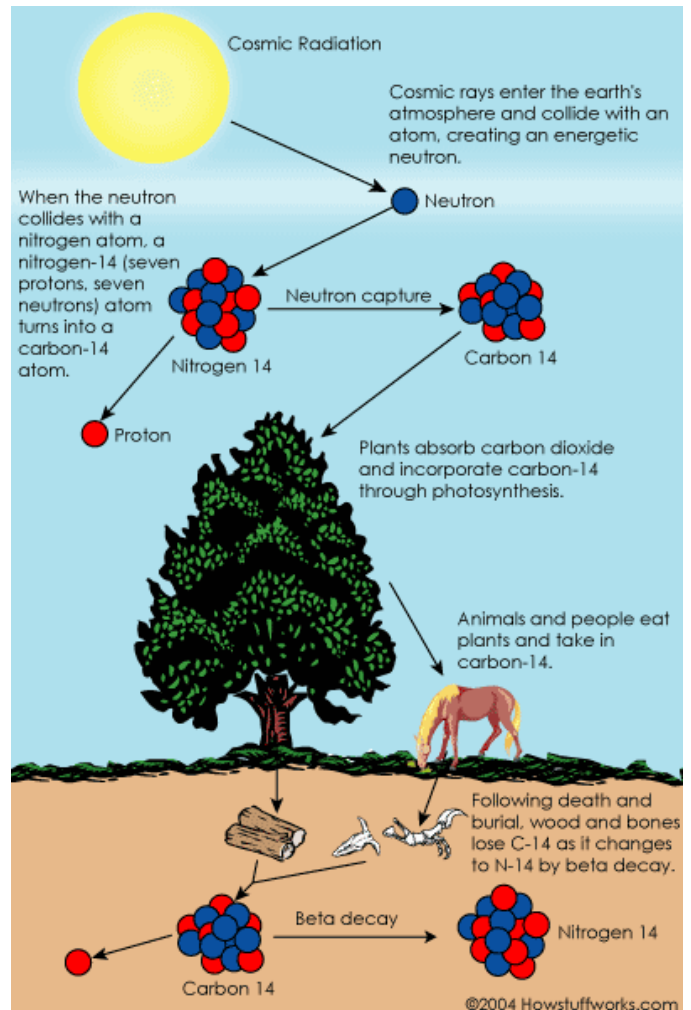


Figure 2: How carbon-14 is made, distributed, and transformed

### Dating a fossil

As soon as a living organism dies, it stops taking in new carbon. The ratio of C-14 to C-12 in the dead organism

<sup>5</sup> Weiland C (1997) Sensational dinosaur blood report! *Creation* 19(4):42-43. Also available at: <http://creation.com/sensational-dinosaur-blood-report>

<sup>6</sup> Creation Evolution Headlines (2015 Jun 09) More dino blood found: Evolutionists in denial. <<http://crev.info/2015/06/more-dino-blood-found/#sthash.u7HSJVi0.dpuf>>

starts to decrease because the C-14 continues to decay with its half-life of 5,730 years and is not replaced, while the amount of C-12 remains constant. If we know the starting ratio in the live organism (assumed to be roughly the same as in living organisms today), the ratio of C-14 to C-12 in a fossil sample can be used to determine its age.

Table 1 illustrates how the ratio of C-14 to C-12 decreases from 100/100 trillion to 3/100 trillion over the course of 5 half-lives or  $5 \times 5,730$  years = 28,650 years. Radiocarbon dating is generally limited to samples no more than 50,000 years old, as older samples tend to have insufficient C-14. However, older dates of 60,000 to 75,000 years have been reported using special sample preparation techniques, large samples, and long measurement times.<sup>7</sup>

Table 1: How a C-14/C-12 ratio yields radiometric dates

Amount of stable C-12	Amount of unstable C-14	C-14/C-12 Ratio	Years Dead	# Half-lives
100 Trillion	100	1/1 Trillion	0	0
100 Trillion	50	1/2 Trillion	5,730	1
100 Trillion	25	1/4 Trillion	11,460	2
100 Trillion	12.5	1/8 Trillion	17,190	3
100 Trillion	6	1/16 Trillion	22,920	4
100 Trillion	3	1/32 Trillion	28,650	5

### The importance of a stable C-14 to C-12 ratio

A critical assumption in C-14 dating is that the ratio of C-14 to C-12 in the atmosphere has always been the same as it is today (1 to 1 trillion). If this assumption is not true, then the method will give incorrect dates. If the C-14 to C-12 ratio in the atmosphere was higher in the past, this method will give dates that are too young. Conversely, if this ratio was lower in the past, the method will give dates that are too old.

### Evidence That C-14 to C-12 Ratio was Lower in the Past

#### The C-14/C-12 ratio has still not reached equilibrium

Dr. Willard Libby, the founder of the C-14 dating method, estimated that if the earth started with no C-14 in the atmosphere, it would take up to 30,000 years to build up to a steady state (equilibrium). Since he believed the world to be billions of years old, he assumed steady state was reached long ago and that this ratio is now constant. However, in his original work, he noted that the atmosphere did not appear to be in equilibrium.<sup>8</sup> Dr.

<sup>7</sup> Walker M (2005) *Quaternary Dating Methods*, John Wiley & Sons, West Sussex. Available at: [http://ww2.valdosta.edu/~dmthieme/Geomorph/Walker\\_2005\\_QuaternaryDatingMethods.pdf](http://ww2.valdosta.edu/~dmthieme/Geomorph/Walker_2005_QuaternaryDatingMethods.pdf). Accessed 2015 Jul 19

<sup>8</sup> Libby W (1952) *Radiocarbon Dating*, Univ. of Chicago Press, Chicago, Illinois, as cited in Riddle (2007 Sep 20)

Libby chose to ignore this discrepancy (nonequilibrium state), attributing it to experimental error. However, the discrepancy has turned out to be very real. The ratio of C-14/C-12 is not constant. The Specific Production Rate (SPR) of C-14 is known to be 18.8 atoms per gram of total carbon per minute. The Specific Decay Rate (SDR) is known to be only 16.1 disintegrations per gram per minute.<sup>9</sup> This suggests two things. First, if it takes about 30,000 years to reach equilibrium and C-14 is still out of equilibrium, then the earth is probably not billions or even millions of years old. Second, if, as the data suggest, C-14 levels have been rising for thousands of years and if this ratio was lower in the past, the method will give dates that are too old.

### C-14 levels were lower in the past, when earth's magnetic field was stronger

The earth has a magnetic field around it that helps protect us from harmful radiation from outer space. This magnetic field is getting weaker.<sup>10, 11</sup> The stronger the field is around the earth, the fewer the number of cosmic rays that are able to reach the atmosphere. This would result in a smaller production of C-14 in the atmosphere in earth's past.

If the production rate of C-14 in the atmosphere was less in the past, dates given using the C-14 method would incorrectly assume that more C-14 had decayed out of a specimen than what has actually occurred. This would result in older dates than the true age of the specimen.

### C-12 levels were higher in the past, prior to the Genesis Flood

What role might the Genesis Flood have played in the amount of carbon? The Flood would have buried large amounts of carbon from living organisms (plant and animal) to form today's fossil fuels (coal, oil, etc.). The amount of fossil fuels indicates there must have been a vastly larger quantity of vegetation in existence prior to the Flood than exists today. This means that the biosphere just prior to the Flood would have contained much more C-12 in living organisms than today, as much as 500 times more.<sup>12</sup> Thus, even if C-14 levels prior

Doesn't carbon-14 dating disprove the Bible? <<https://answersingenesis.org/geology/carbon-14/doesnt-carbon-14-dating-disprove-the-bible/>> Accessed 2015 Jul 19

<sup>9</sup> Sewell C (1999) Carbon-14 and the age of the earth, as cited in Riddle M (2007 Sep 20) Doesn't carbon-14 dating disprove the Bible? <<https://answersingenesis.org/geology/carbon-14/doesnt-carbon-14-dating-disprove-the-bible/>> Accessed 2015 Jul 19

<sup>10</sup> Humphreys DR (1989 Feb 1) The mystery of earth's magnetic field, *Acts & Facts*. 18 (2). Also available at: <<http://www.icr.org/article/292>. Accessed 2015 Jul 19

<sup>11</sup> Roach J (2004 Sep 09) National Geographic News, 9/9/2004

<sup>12</sup> Baumgardner, J (2005). C-14 evidence for a recent global Flood and a young earth, *Radioisotopes and the Age of*

to the Flood were similar to what exists in today's world, the C-14/C-12 ratio would have been much smaller than today.

When the Flood is taken into account along with the decay of the magnetic field and evidence that the C-14/C-12 ratio is still increasing, it is reasonable to believe that the assumption of equilibrium is false and that this ratio was considerably lower in the past. Consequently, any age estimates using C-14, particularly C-14 from before the Flood, will give older dates than the true age. For example, under the current assumption of a 1/1 trillion starting ratio for C-14/C-12, a fossil with a measured ratio of 1/16 trillion would be assigned an age of ~23,000 years (4 C-14 half-lives). However, if the true starting ratio was 1/8 trillion, the fossil would be 5,700 years old (1 C-14 half-life).

### **The iDINO Project**

The Creation Research Society (CRS), an organization of Biblical creation scientists since 1963, present in the spring 2015 issue of their peer-reviewed *CRS Quarterly* (51:4) the results of their iDINO project: an investigation into soft tissue remains in dinosaur bones.<sup>13</sup> This CRS publication was prepared and printed before the announcement in *Nature Communications* discussed above. As described in a June 18 *Creation Evolution Headline* article<sup>14</sup> and a June 25 report by Creation Ministries International,<sup>15</sup> the momentous announcement reported in this CRS issue is that measurable C-14 has been found in dinosaur bones. Brian Thomas and Vance Nelson report:

Measurable amounts of radiocarbon have been consistently detected within carbonaceous materials across Phanerozoic strata. Under **uniformitarian assumptions**, these should **no longer contain measurable amounts of radiocarbon**. Secularists have asserted that these challenging finds originate from systematic **contamination**, but the **hypothesis of endogenous radiocarbon should be considered**. Assuming these strata were largely deposited by the Noahic Flood occurring within the time range of radiocarbon's detectability with modern equipment under uniformitarian assumptions, we hypothesized that fossils from **all three erathems**, including dinosaur fossils, should also contain measurable

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the Earth, Vol. 2, Institute for Creation Research, Santee, California, 2005, 618.

<sup>13</sup> CRSQ 2015 Journal 51(4) <<https://creationresearch.org/index.php/extensions/crs-quarterly/s5-frontpage-display/item/117>> Accessed 2015 Jul 19

<sup>14</sup> Creation-Evolution Headlines (2015 Jun 18). Carbon-14 found in dinosaur bone. <<http://crev.info/2015/06/c14-dinosaur-bone/>> Accessed 2015 Jul 19.

<sup>15</sup> Thomas B (2015 Jun 25) Dinosaur proteins and radiocarbon wreak 'Jurassic World' havoc. <<http://creation.com/radiocarbon-jurassic-world-havoc>> Accessed 2015 Jul 19

amounts of radiocarbon. Consistent with this hypothesis, **we report detectable amounts of radiocarbon in all 16 of our samples**. Attempts to falsify our hypothesis failed, including a comparison of our data with previously published carbon-dated fossils. We conclude that **fossils and other carbonaceous materials found throughout Phanerozoic strata contain measurable amounts of radiocarbon that is most probably endogenous**.

The prediction by Thomas and Nelson that they would find radiocarbon in dinosaur bone was based on long-standing published reports of measurable radiocarbon in coal, diamonds, and other materials assumed by evolutionary geologists to be millions of years old.<sup>16</sup> They gathered 16 samples from 14 fossil specimens of fish, wood, plants, and animals from throughout the geologic column, Miocene to Permian, from all three eras: Cenozoic, Mesozoic, and Paleozoic. Samples came from a variety of locations throughout the globe, including Canada, Germany, and Australia. About half were from dinosaur bones (7 specimens). All samples were prepared by standard processes to eliminate contamination, then were submitted to a lab for atomic mass spectrometry (AMS).

Thomas and Nelson continue:

Unexpectedly, all 16 samples submitted for measurement contained C-14. We found measurable amounts of <sup>14</sup>C in all 14 of our dinosaur and other fossils. Moreover, we found surprising consistency in these data, which range from approximately 17,850 to 49,470 radiocarbon years ....

As discussed previously, "radiocarbon years" do not necessarily indicate true ages of specimens because calibration depends on assumptions about atmospheric conditions in the past. It was not the goal of the project to date the specimens, but just to see if any radiocarbon remained.

Their results compare favorably with 4 other laboratories that have published radiocarbon presence in specimens thought to be millions of years old. Those reports yielded radiocarbon ages in the same finite range, regardless of whether the specimens are labeled as being from the Cenozoic, Mesozoic, or Paleozoic era.<sup>14</sup>

Since the radiocarbon ages are orders of magnitude younger than believed, and consistent in upper and lower limits regardless of locale of assumed era, the authors conclude that all the geologic strata with their

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<sup>16</sup> They may have also been encouraged by previous reports. See Spears J (2013 November) Radiocarbon Dating of Dinosaur Fossils. Triangle Association for the Science of Creation Newsletter. <<http://tasc-creationscience.org/content/radiocarbon-dating-dinosaur-fossils>> Accessed 2015 Jul 19



fossils must have been laid down in a short period, as described in the Genesis flood account.

### End Game

To date, secular scientists have resisted testing for C-14 in dinosaur soft tissue, even when offered substantial compensation. In 2006, Bob Enyart, a creationist radio host with a keen interest in objects containing C-14 that should have none, conducted an interview with Jack Horner, the inspiration for the scientist in *Jurassic Park*, and consultant on all the Spielberg dinosaur movies. Mr. Enyart offered to pay Dr. Horner's organization \$20,000 plus expenses if they would have the soft tissue that had already been reported in his *T. rex*, tested for C-14. Dr. Horner refused, stating, "The spin they [creationists] can get off of it, doing it, is not going to help us." Clearly he was not "in zugzwang." He did not feel "compelled to move" in a manner that would weaken his position.

However, the situation today is different. At the time of Mr. Enyart's 2006 interview with Dr. Horner, there was limited evidence of soft tissue, primarily from one laboratory, and virtually no evidence of C-14 in dinosaur fossils to compel him. However, now that the world's leading secular science journal *Nature* has reported that soft tissue in dinosaur bones appears to be common, scientists on both sides of the origins aisle will be "compelled" to race one another to find more of it. And because the tissue is likely to contain abundant carbon, as reported in the June 9, 2015 *Nature Communication* article,<sup>3</sup> it will be difficult for them to resist testing it for C-14, particularly given the growing list of creation laboratories that are reporting endogenous C-14 in dinosaur fossil tissue.

Though it may take more time than it took for secular scientists to accept the claims of soft tissue in dinosaur bones, once even one secular scientist concedes that endogenous C-14 can be found in dinosaur fossils, the end game will be near. Combined with geologic evidences for the Genesis Flood (see [answersingenesis.org/the-flood/geologic-evidences-for-the-genesis-flood/](http://answersingenesis.org/the-flood/geologic-evidences-for-the-genesis-flood/)) and gaps in the geologic column (see [icr.org/article/gaps-geologic-column/](http://icr.org/article/gaps-geologic-column/)), reports of any amount of endogenous C-14 found in dinosaurs will collapse the geologic column, with its "age of dinosaurs" ending millions of years ago, to as little as one year (Fig. 4). A paradigm shift could eventually take place where scientists begin to accept, or at least consider, the likelihood that the geological column and the fossils in it do not represent millions of years of erosion and evolution, but the outcome of a catastrophic flood event. ☞

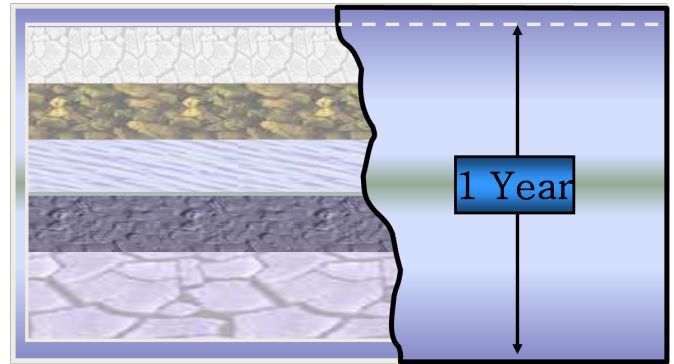


Figure 4: C-14 dating of fossils and geologic evidence suggest that a catastrophic flood made the rocks and fossils in a short period of time, not "geologic ages"

### COMING EVENTS

**Thursday, August 13, 7:00 pm, Providence Baptist Church, 6339 Glenwood Ave., Raleigh, Room 240**

Topic: What Is the Human Race and What Are Proper Race Relations? Our society is continuing to deal with the questions above with heightened tensions. Mark Stephens, MCS will show a current DVD and lead a discussion on race and racism to help us better understand these from a creation and creation science perspective. Another objective is to help us cope more appropriately with these racial and social issues from a Biblical and objective creation science perspective in contrast to secular actions.

Please come out and bring guests. Get informed to properly discern human race and race relations for the benefit of our nation and the world!