

Woodmorappe's Billion-fold Distortion of ^{187}Re Radioactive Decay or How Young-Earth Creationists Misapply Conditions in the Cores of Hot Massive Stars to their 'Genesis Earth'

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INTRODUCTION

Because radiometric dating refutes their antiquated biblical interpretations, young-Earth creationists (YECs) are desperate to undermine the validity of these methods. One popular YEC scheme for attacking radiometric dating is to claim that God increased radioactive decay rates during the 'Creation Week', the 'Fall of Adam and Eve' and/or 'Noah's Flood'. Under this imaginative scenario, YECs believe that rocks that are only a 'few thousand years old' would quickly accumulate abundant radioactive daughter products that would make them 'appear' millions or billions of years old. However, if such radiation bursts would occur, one can only wonder if any rocks would escape destruction through melting, and how Adam, Eve and Noah ever escaped the enormous amounts of heat.

YECs (like John Woodmorappe [a pseudonym]) frequently search the literature for any shred of information that they can distort to challenge the consistency of radioactive decay rates. In [Billion-fold Acceleration of Radioactivity Demonstrated in Laboratory](#) Woodmorappe misuses studies by Bosch et al. (1996), Kappeler et al. (1989) and other researchers to argue that increases in radioactive decay rates were feasible during the 'Creation Week.'

In his web article, Woodmorappe mentions that the decay rate of rhenium-187 (^{187}Re) may increase by a billion-fold under 'special conditions,' that is, if the element is in a 'plasma state.' Woodmorappe admits that for the decay rate of ^{187}Re to increase by a billion-fold, all of

the electrons must be removed from the Re atom. However, Woodmorappe does not appropriately stress that stripping off all of the electrons from any massive atom requires A LOT of energy - quantities of energy, that only occurred during the Big Bang or presently in the interiors of very, very hot stars. Woodmorappe does not tell us the temperatures that are required to remove all of the electrons from a ^{187}Re atom. However, he later admits that accelerating the lutetium-176 (^{176}Lu) decay rate would require an environment with a MINIMUM temperature of 200 million degrees Kelvin (K). This is about 13 times hotter than the core of the Sun!!

MIRACLES PILED UPON MIRACLES TO GET RID OF THE HEAT

Most YECs quote Genesis 1:1-2 and argue that the Earth started out as a watery chaos. For example, Humphreys (1994, p. 32) describes the Universe as beginning as a giant ball of liquid water in the vacuum of space. Not only must the water have been miraculously created from nothing, but additional miracles would have been required to keep the water in a liquid phase in the vacuum of space.

Next, Humphreys (1994, p. 33) claims that the core of the liquid water became hot and dense, which would probably be similar to Woodmorappe's imaginary hot plasma. So, how did the mass of the Universe go from being cool liquid water in a vacuum to a >200 million K plasma in one day and then cool back to low temperatures to form an Earth that could support life later in the week? Of course, skeptics and rationalists have no reason to ask these questions. This is the 'Creation Week' and there's no limit to the number and types of miraculous excuses that can be invoked by imaginative YECs. While YECs see nothing wrong with God heating and cooling the Universe in just a few days, from a scientific point of view, all of these miraculous hot and cold brews seem highly implausible and unnecessary. Where is the evidence for these miracles and how do YECs determine when to invoke magic and when to rely on the laws of chemistry, physics and biology? Furthermore, why should we invoke any miracles, when science has done a good job of explaining the origin of elements through the Big Bang, nuclear fusion in stars and supernovae without relying on flimsy miracles? (See Faure, 1998 and Delsemme, 1998 for more information on the origin of elements.)

Woodmorappe admits that only a few hours during one 24-hour creation day are not enough time to produce an adequate amount of osmium-187 (^{187}Os) from the decay of ^{187}Re even in his hot plasma. The half-life is still 30 years for $^{187}\text{Re}^{75+}$, which lacks any electrons. To supposedly solve this problem, Woodmorappe invokes Humphreys' weakening of the nuclear force during the 'Creation Week.' However, why is this necessary? If miracles are needed to cool a $>200,000,000$ K plasma to the Garden of Eden in only a few hours, why not just invoke a few more *ad hoc* Gosse miracles to eliminate the Os deficit? Why bother with any scientific limitations during the 'Creation Week' or even during the 'Flood', when a few more miracles can eliminate any problems with chemistry, physics, biology and geology? Of course, the more miracles YECs use, the more mythological and the less rational and scientific they become.

In contrast to the groundless and unending miracle-invoking of YECs, scientists have found natural explanations for the chemistry of the Universe that don't need to be propped up with unsupported miracles and myths. As examples, the Big Bang helps to explain the current H/He ratio of the Universe (Delsemme, 1998, p. 21-23; Harrison, 2000, p. 392-394). The [neutrino problem](#) in the Sun has been recently solved without invoking the YEC 'young contracting Sun' or Genesis. Also, nuclear fusion in massive stars explains the Oddo-Harkins rule, why the Earth has more oxygen-16 than oxygen-17, and why iron is more abundant on Earth than manganese or cobalt (Faure, 1998, p. 11-20). Why invoke magic when it's not necessary? Why invoke miracles when there's no proof of them?

HOW DID OSMIUM-187 GET INTO TERRESTRIAL MOLYBDENITES?

When attacking Re-Os dating, Woodmorappe ignores another critical issue. How did ^{187}Re rapidly decay to ^{187}Os in rocks whose mineralogy and chemistry indicate that they were NEVER hotter than 1000C? Although Re and Os have similar chemical properties, Re tends to concentrate more in crystallizing molybdenite (MoS_2) ores than Os (Dalrymple, 1991, p. 98; also see Pearson et al., 1995, p. 959). Grain relationships and other textural and chemical data clearly indicate that molybdenites grow in igneous or hydrothermal rocks (for example,

Jebrak and Doucet, 2002). For example, the following [photograph](#) shows silvery molybdenite crystals embedded in a pegmatite. The coarseness of the crystals indicates that they grew deep within the Earth and were not the product of molybdenite falling from the sky and into lava pools. Typical intimate cross-cutting relationships between molybdenites and surrounding minerals are discussed at this [website](#). In another [photograph](#), molybdenite crystals are embedded in quartz. Also, molybdenite occurs as veins in [ore deposits](#). Cross-cutting relationships dictate that the veins came after the matrix solidified. How could ^{187}Re undergo a billion-fold acceleration in radioactive decay at super high temperatures without vaporizing and destroying the surrounding molybdenite and other minerals? Clearly, Woodmorappe cannot explain away extremely ancient Re-Os dates from terrestrial molybdenite crystals because the chemistry, textural and mineralogical properties of the molybdenites and their host rocks demonstrate that they formed and existed at temperatures many orders of magnitude too cold to produce accelerated ^{187}Re decay.

RADIATION ISN'T A HEALTH THREAT??

Finally, when discussing the acceleration of radioactive decay rates and the 'Fall of Adam and Eve,' Woodmorappe makes the following poorly worded and nonsensical statement:

'Radioactive decay does not, of course, have anything in comon [sic] with the death and decay of sentient beings.'

Obviously, people that have been poisoned from exposure to radioisotopes would disagree with this statement. Nevertheless, I am not going to accuse Woodmorappe of having a 'duck and cover' attitude towards the dangers of radiation. I would guess that Woodmorappe is really trying to say that the supposed increases in radioactive decay rates during the 'Creation Week' had nothing to do with the 'forbidden fruit affair' that supposedly occurred sometime later. Nevertheless, other YECs (e.g., [Humphreys](#)) have proposed 'post-Creation Week' radiation bursts, which supposedly occurred right after the 'Fall of Adam and Eve' and/or during 'Noah's Flood.' Of course, such radiation bursts could have easily sterilized and/or melted the planet. Woodmorappe's allies even admit that any increases in radioactive

decay rates would have threaten terrestrial life (Vardiman, 2000, p. 3). In response to these obvious threats, Humphreys (2000, p. 340) argues that somehow the 'Flood' waters and the thick walls of the ark would have protected Noah and his crew from the radiation. Even if this were true, Noah would not have been protected from the volcanism that would have resulted from the radiation burst. Although I have not done any energy calculations, it would not surprise me if the release of 4 billion years worth of heat from the decay of ^{40}K , ^{235}U , ^{238}U , ^{87}Rb , and scores of other radioactive isotopes in less than one 'Flood' year would have melted the Earth's crust and mantle. (Also, see the following [web essay](#) [in Adobe Acrobat] for discussions of YECs' other numerous heat problems during the 'Flood'.)

CONCLUSIONS

Woodmorappe's citation of a 'billion-fold' decay rate for ^{187}Re is completely irrelevant to the formation and accumulation of ^{187}Os in terrestrial molybdenite deposits. His claims for accelerated ^{187}Re and ^{176}Lu decay rates in 'Creation Week' plasmas must still be propped up with cheap, anti-scientific and untenable miracles. That is, in his zeal to undermine radiometric dating, Woodmorappe is fraudulently applying processes in the cores of hot and dense stars to conditions that could never have existed on our life-bearing planet.

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