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ROCKY MOUNTAIN CREATION FELLOWSHIP

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THE PRESIDENT'S CORNER

The Book of True Hypotheses – Part 1

There are many things we can understand from the Biblical text. For example, the author of Hebrews explains, it is “By faith we understand that the universe was formed at God’s command ...”. And indeed, we can read in Genesis 1 that God *spoke* everything into existence. Therefore, when one mixes the Scriptural testimony with faith—when one believes the Biblical text—understanding will be gained.

But understanding can also be gained in matters not directly addressed by the Biblical text. Proverbs 25:2 says “*it is* the glory of God to conceal a thing: but the honour of kings *is* to search out a matter.” This honor may have been given to “kings” originally, simply because they were the only people of their times who had access to time, resources, and authorities sufficient for searching out matters. Certainly, early scientists of the last half-millennium tended to be of nobility or wealthy inheritance. But seeing that now-a-days the average person has greater access than the kings of old, it seems this scripture could apply to anyone who believes God has placed something out there to be found.

Of course these concealed things could be spiritual mysteries of Scripture; but Proverbs 25:2 does not require that. For example, the laws of nature have been concealed historically, apparently to all generations right up until truly scientific investigations were commenced in the 1500’s by certain Bible believing Christians.

Therefore, the laws of nature could very well be among the things God has concealed eventually to be searched out. Moreover, since we are made in His image, it follows that we can (in the words of Johannes Kepler) “think His thoughts after Him”. This answers a “hard” question from secular physicists: why can the logic of mathematics be used to describe physical law?

In fact all of the early men of science were Biblical creationists, fundamentally basing their work on Scriptural Truth: they believed the Bible, which is the sole text of all history explaining that there is only one Creator God, the one Law-Giver, Who upholds creation by His unchanging Word. And this upholding Word might appear to us as a set of natural laws, which transcend space and time, just as God’s Spiritual Laws; they do not change from location to location nor from time to time. God’s physical laws remain consistent so that they can be studied, observed, and tested. Without this understanding, science would not be possible.

There are then many statements of Scripture that lend themselves to scientific inquiry and verification. Ecclesiastes 1:7 describes the hydrologic cycle, which has become verifiable¹ with the recent advent of global-scale measurement and observation capabilities. In another example, Genesis 1 refers to time, space, matter, and energy. These fundamental quantities of physics were

unknown until Sir Isaac Newton—a Biblical Creationist and brilliant scientist—applied them in his equations of Newtonian Mechanics.

In both of these cases, the Bible provided not only 1) the firm foundation of all scientific investigation (as we have just been discussing), but also 2) fundamental Biblical statements utilized as true hypotheses in successful scientific investigations, where the predictions from the hypotheses comported with observation. These two points are evidence that the Biblical text is not only true but represents the “ultimate standard” as described on pages 154 - 158 of Jason Lisle’s book, *The Ultimate Proof of Creation* (Copyright 2009, May 2015 printing).

In fact, I would contend that no *verifiable* statements of the Biblical text—and there are many—have ever been contradicted in observation. And this constitutes powerful scientific verification of the whole Bible. It is therefore reasonable to conclude that the Biblical text contains many additional true statements that potentially could be used successfully as hypotheses in future scientific investigations!

Rob Bracken

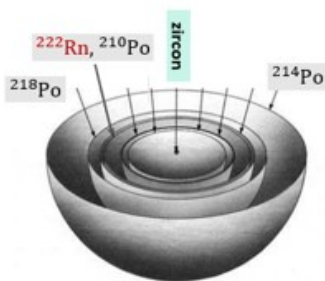
Rob Bracken
PRESIDENT

Accelerated Nuclear Decay and Radiohalos, Part 2

... But exactly how is it that the existence of polonium halos requires a Flood-year episode of accelerated nuclear decay?

Aqueous Transport

The generation of *secondary radiohalos*, meaning the ^{218}Po , ^{214}Po and ^{210}Po halos,¹ necessarily depends on *aqueous transport* because the Po-halo source nuclides must regroup elsewhere, displaced from the primary U-halo source. And *water* (the “universal solvent”) is the only carrier at hand – assuming it is *moving*, of course. But the only daughter product in the uranium series that is significantly soluble (under pressure) and thus significantly transportable is the noble gas radon-222.



With a half-life of 3.8 days (mean life² of 5.5 days), some of the ^{222}Rn atoms, being inert and therefore “slippery,” can diffuse (escape) out of the **zircon** grain that houses the uranium inclusion before decaying to ^{218}Po ($^{222}\text{Rn} \rightarrow ^{218}\text{Po} + \alpha$). Hydrothermal water, *produced as magma crystallizes into granite*, flushes out of the pluton, forcing itself through the sheaves of mica, carrying off the ^{222}Rn escapees. Then, radon-222’s unstable progeny (poloniums, leads and bismuths) are produced by decay in-stream and carried along as cations in solution until they are persuaded to drop out. With realistic in-situ flow rates in mica being 5 cm/day or less, these short-lived isotopes³ do not travel very far.⁴

Then, the Po-halo source nuclides, as metal cations, accumulate a few millimeters to a centimeter away at impurities for which they have affinity, precipitating as sulfides (*e.g.*, PoS and Bi_2S_3) and/or chlorides (*e.g.*, PoCl_4 and BiCl_3). Sulfides of lead are less likely to form, being relatively soluble; in fact, polonium halos often exhibit bubbles at their radio-centers, as noted in Part I, because the stable end-product, a sulfide of ^{206}Pb , dissolves away. Regardless, there would necessarily be some transport as radon-222 first. (Illustrations adjacent and above, minus annotations, are taken from *Creation’s Tiny Mystery*.)

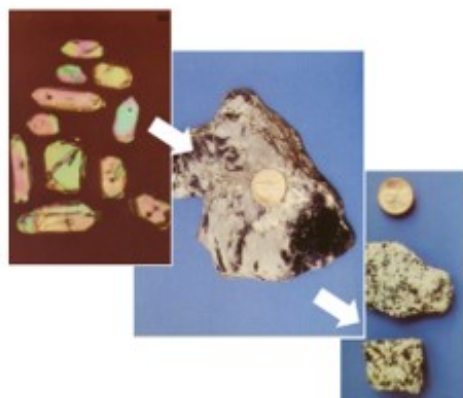
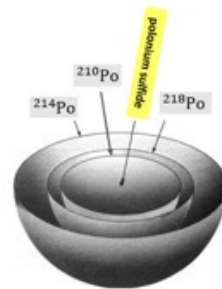
**CREATION’S
TINY MYSTERY**



Robert V. Gentry

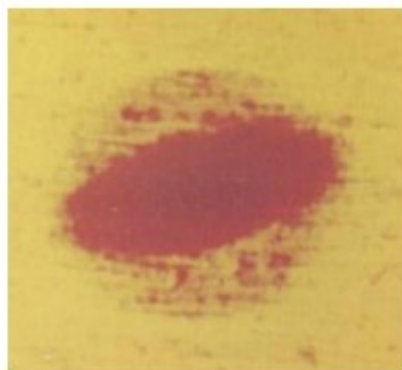
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The three-ring polonium-218 halo is rare (Snelling, 2005, 116-118) because ^{218}Po 's 3-minute half-life allows little time for its cation $^{218}\text{Po}^{2+}(\text{aq})$ to find an impurity before decaying away ($^{218}\text{Po} \rightarrow ^{214}\text{Pb} + \alpha$). For the two-ring polonium-214 halo, the 164- μs half-life of ^{214}Po being so short argues for precipitation of its beta-decay parent $^{214}\text{Bi}^{3+}(\text{aq})$ rather than itself. The one-ring polonium-210 halo is the most common (Snelling, 2005, 116-118) arguably because it is the last decay in the chain ($^{210}\text{Po} \rightarrow ^{206}\text{Pb} + \alpha$) which maximizes time in transport (as $^{210}\text{Bi}^{3+}$ and/or $^{210}\text{Po}^{2+}$) to find an impurity and precipitate at a ^{210}Po radio-center. In any case, the essential role of moving water to effect a displacement of the polonium rings from their uranium radio-center argues against a non-magmatic origin for halo-bearing granitic rocks in general⁵ because living, moving water, *sourced and pressured by the granite's crystallization*, is absent.

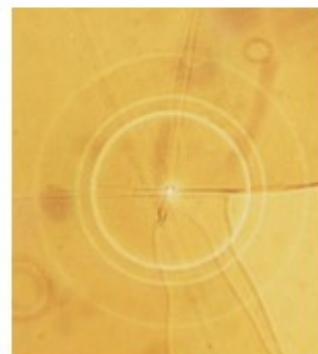


Nearby uraninite inclusions – in zircons, in mica, in granite – forming their own halos and producing radon-222 (some of which leaks out of the zircons) – provide the only sufficient source for these polonium halos. At those realistic in-situ flow rates ($\lesssim 5 \text{ cm/d}$), water cannot transport enough uranium in aqueous solution (presumably as UO_2^{2+} from veins of uranium ore) to supply polonium radio-centers given its low solubility ($\sim 1 \text{ ppm}$). Moreover, only one in 6.5 billion uranium-238 atoms decays in a year (on average) at today's rate. *Thus, the water would have to move through an undisturbed rock matrix at absurdly high flowrates for an absurdly long time to produce polonium halos.* This is true even assuming

excess radon (*i.e.*, greater than if radon is in decay equilibrium with uranium) per the world maximum measured for groundwater (77,500 pCi/L). This is true even where there are cracks (microfractures) accommodating faster flow rates than occur between mica's sheaves. No matter what, *accelerated nuclear decay is necessary*. For the general case in mica (polonium radio-center not on a microfracture), *the requisite ~ 500 million daughter nuclides per Po-halo must be sourced by nearby uranium in amounts that can support this count*; that is, multiple proximate uraninite *inclusions* – in the solid state not merely in solution – *undergoing accelerated decay*. Since U-halos in granites generally have all eight rings including the three parent by poloniums, while also sourcing displaced radio-centers to make Po-halos, only a fraction of the radon-222 daughters that are produced leak out of any given zircon. In case this slipped you by, the zircon is *not* a closed system, though it roughly approximates one. (Specimen photos are from *Creation's Tiny Mystery*.)

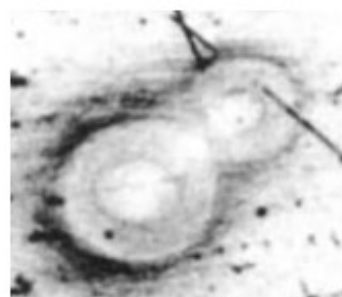


Importantly, the occurrence of Po-halos along visible microfractures *where aqueous transport is self-evident* argues strongly for the *same* where microfractures are absent and the conduit between sheaves of mica is not so apparent (being in the same plane as the halo's cross section and the natural thin section). Likewise, the polonium-210 halos found in coalified wood from the Colorado Plateau demand aqueous transport, with the uranium externally sourced by necessity



(not being indigenous to trees unlike it is to granite) via uranium-saturated water from adjacent ores. Again, aqueous transport in one case argues against its absence in another.

Interestingly, the polonium halos in woody coal are generally elliptical, including some dual, superimposed halos, one squashed (elliptical) and one not, which speak to rapid compaction as well as a common age for strata that are millions of years apart by conventional dating.⁶ That is, these strata obviously share the same (short) geological history given this unusual, shared marker. Presumably aqueous transport would have ceased once the strata compacted and the water was squeezed out, but the decay of ^{210}Po and its (spherical) halo-making alpha emissions would continue until the radio-center was exhausted. (Photos are from *Creation's Tiny Mystery*.)



Moreover, the U-halos found in coalified wood (image is from *Creation's Tiny Mystery*), even apart from their Po-halo progeny, support the idea of transport-via-escaping-radon. Dubbed “embryonic” (misnomer!), *these U-halos lack polonium rings*, as well as having little if any of the final daughter product lead-206. This author argues that both these attributes reflect the lack of containment: there is no zircon surrounding the uranium deposit to keep (hinder) its radon-222 from leaving the radio-center. In general, a U-halo’s polonium rings being fainter than usual⁷

would indicate lack of containment, whether the zircon is just leaky (like in biotite) or nonexistent (like in coalified wood, shale, fluorite, etc.). So, while it is tempting to quote the young age implied by a low lead-to-uranium ratio as evidence for the youth of these woody U-halos and their strata, each halo itself testifies to at least a hundred million decays⁸ making the U-halo bearing strata “old” in decay counts, the first alpha decay in the chain ($^{238}\text{U} \rightarrow ^{234}\text{Th} + \alpha$; $t_{1/2} = 4.5 \text{ Ga}$) being the bottleneck at today’s rates. It is still the Po-halos, being sourced by but displaced from their ancestral uranium, that require an episode of accelerated decay to explain their existence, which in turn means these strata from the Colorado Plateau are young.

It is worth highlighting the implicit discordance for a halo-bearing index granite conventionally dated at 33 Ma (Snelling, 2005, p. 118). Remember: U-halos require between a hundred million and a billion years to form (at today’s rate), which is an order of magnitude more geologic time than this tertiary rock has got (in conventional terms). It is also worth highlighting the presence of these halos so high in the geologic column: halo formation being tied to a Flood-year episode of accelerated nuclear decay, this supports a Flood-sediment boundary in the late Cenozoic at the Neogene-Quaternary boundary.⁹

The comparatively rare thorium halo deriving from its decay chain ($^{232}\text{Th} \rightarrow ^{208}\text{Pb} + 6\alpha + 4\beta^-$) is the only other type of halo (to this author’s knowledge) that has been identified definitively and catalogued (Snelling, 2005, pp. 116-118) besides the U-halo and its three partial/secondary Po-halos. Like uranium, thorium (as thorianite ThO_2 , presumably), is found in zircons so one *might* expect to find partial/secondary halos for its polonium daughters (^{216}Po and ^{212}Po) too, but interestingly, thorium’s radon (^{220}Rn) is much shorter-lived with a 55.6 second half-life compared to the 3.8 days for uranium’s radon (^{222}Rn). It would seem, by the nonexistence of thorium’s polonium halos, that *thorium’s radon cannot diffuse out of the zircon in appreciable amounts before decaying*, meaning thorium’s poloniums remain locked inside the zircon. This being the case, one might expect higher lead-to-parent ratios for thorium radio-centers ($^{208}\text{Pb}/^{232}\text{Th}$) than for uranium radio-centers ($^{206}\text{Pb}/^{238}\text{U}$), giving lower apparent ages for U-halos than Th-halos (if comparably developed), not unlike how the “embryonic” U-halos in coalified wood have low apparent age compared to granite’s “mature” U-halos; however, this effect would only amplify the discordance stemming from thorium-232’s greater half-life ($t_{1/2} = 14 \text{ Ga}$) and attributable to accelerated nuclear decay, as described in Part I. In any case, the lack of partial/secondary halos from ^{232}Th also supports the transport-via-escaping-radon model.¹⁰

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THE BIG SECRET OF

by Ed Johlman, FOUNDATIONS E

Many around the world have accepted evolution as a “truth” unearthed by modern science. A good number of born-again Christians are included in that group. They should not be. In the first article in this series¹ I provided clear evidence that evolution theory is an idea born in the minds of ancient men. Long before modern scientific study there was the belief that God was not the creator of life. Instead, humans evolved from fish, whales, cows . . . well, you name it.

Why would “modern” thinkers such as Erasmus Darwin (1731-1802) to James Hutton (1729-1797) to Charles Lyell (1797-1875) to Charles Darwin (1809-1882) side with the concept of evolution over the Genesis account of special creation? It was generally understood that “abiogenesis” (life from non-life) was not possible, though a few believed that rotting beef could turn into maggots, and dust and dirt could mutate into mice.

Francisco Redi (1626-1697) is considered the founder of experimental biology. He performed a simple experiment in 1668 to disprove abiogenesis.² First, he placed a raw piece of beef in an open jar (left side Fig. 1). The open beef attracted flies. Maggots appeared on the beef. Many concluded the decomposing beef turned into maggots which would support abiogenesis. Next, Redi placed a cover over a new jar containing a fresh slice of beef (middle Fig. 1). Flies could not get to the beef. No maggots appeared. Redi concluded rotting beef did not mutate into maggots. Critics complained maggots could not grow because the sealed jar cut off their air supply. So Redi placed a fine mesh cover over a new jar of beef (right side Fig. 1). The mesh allowed air to circulate into the jar. Flies were attracted to the jar by the beef aroma but flies were kept at bay by the mesh. Maggots grew on the mesh and not in the beef! Redi concluded maggots were not a product of decaying beef, but of fly larvae. These experiments provided evidence against abiogenesis.

Louis Pasteur’s (1822-1895) famous 1861 experiment had the same result. He filled a flask with nutrient-rich beef broth and boiled it to kill any microorganisms it might contain (top Fig. 2). He designed a flask with a special neck that prevented air from contacting the broth. Nothing grew in the broth. Next, he repeated the process but left the flask open to the air. Bacteria grew in the broth (bottom Fig. 2).

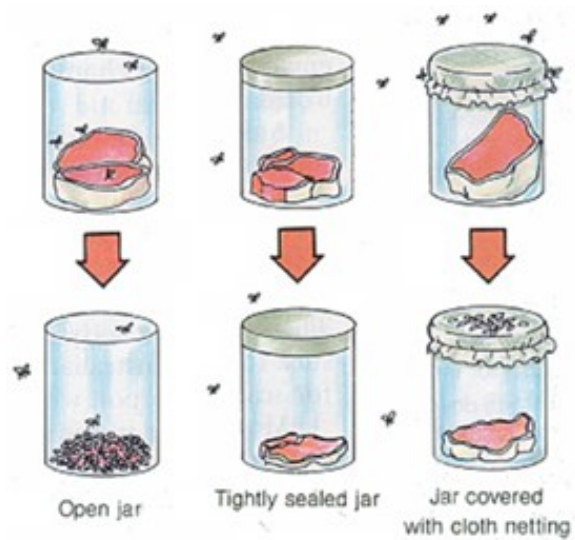


Figure 1 - Redi's experiment

Pasteur correctly concluded that microorganisms in the air settled into the beef broth and were the source of the bacteria. The nutrients in the broth did not mutate into bacteria.

Hutton, Lyell and Darwin would have known of Redi and Pasteur's work. (Pasteur conducted his experiment 2 year after “Origin of Species” was published but 10 years before “Descent of Man.”) Why would those men ignore the body of experimental science and choose to support an ancient theory that was contrary to abiogenesis? In reality . . . their motivations had nothing to do with science and had everything to do with their personal attitudes and desires.

C.S. Lewis wrote this to a friend in 1951:

“What inclines me now to think you may be right in regarding [evolution] as the central and radical lie in the whole web of falsehood that now governs our lives is not so much your arguments against it as the fanatical and twisted attitudes of its defenders.”³

What are those “fanatical and twisted attitudes”? Let's start with the words of Aldous Huxley, the grandson of Thomas Huxley who was known as Charles Darwin's “Bulldog” because of his tireless promotion of evolution.

“I had motives for not wanting the world to have meaning . . . The philosopher who finds no meaning in the world is not concerned exclusively with a

EVOLUTION, Part 2

Editor and RMCF Board Member

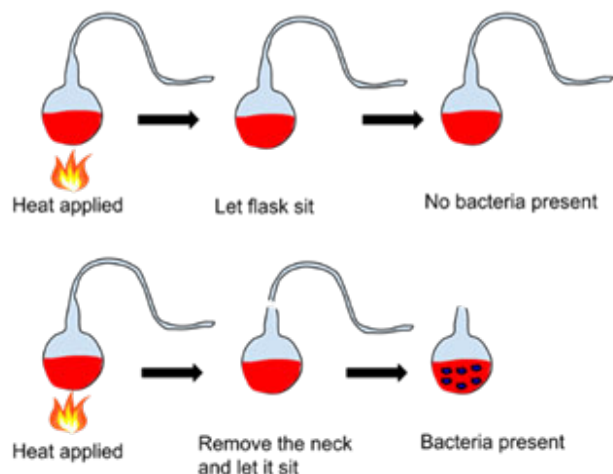


Figure 2 - Pasteur's experiment

problem in pure metaphysics; he is also concerned to prove there is no valid reason why he personally should not do as he wants to do . . . the philosophy of **meaningless** was essentially an instrument of liberation. The liberation we desired was simultaneously liberation from a certain political and economic system and liberation from a certain system of morality. **We** objected to the morality because it interfered with our sexual freedom . . . ”⁴

Note the use of “we” - his peers also wanted their moral freedom. Huxley’s “meaningless” refers to evolution. Chance mutations of non-living materials speak of randomness, lack of purpose and therefore no accountability for behavior. Standards of morality crumble . . . and the door is opened to promiscuous behavior on many levels. It is no coincidence that the key early promoters of evolutionary theory in the 1700’s and 1800’s were immoral men who had several lovers and children born through them.

Moral freedom wasn’t their only goal. The following quote by Richard Bozarth is disturbing but presents the real goal of evolutionary theory. It is not about science. Evolution is a direct attack on Christianity, original sin and our Savior Jesus Christ.

“Christianity is – must be! – totally committed to the special creation as described in Genesis, and Christianity must fight with its full might, fair or foul, against the theory of evolution. It becomes

clear now that the whole justification for Jesus’ life and death is predicated on the existence of Adam and the forbidden fruit he and Eve ate. Without the original sin, who needs to be redeemed? Without Adam’s fall into a life of constant sin terminated by death, what purpose is there to Christianity? None.

“Christianity has fought, still fights, and will fight science to the desperate end over evolution, because evolution destroys utterly and finally the very reason Jesus’ earthly life was supposedly made necessary. Destroy Adam and Eve and the original sin, and in the rubble you will find the sorry remains of the son of God. Take away the meaning of his death. If Jesus was not the redeemer who died for our sins, and this is what evolution means, then Christianity is nothing!”⁵

Those are the “twisted and fanatical” attitudes of evolution’s defenders! Christians are not fighting “science” to the desperate end over evolution. In reality, evolution is not science. We are fighting the philosophy and religion of evolution, which has led many away from the God of the Bible. It has also led many Believers away from fully trusting God’s Word.

Keep that which is committed to thy trust, avoiding profane *and* vain babblings, and oppositions of science falsely so called: which some professing have erred concerning the faith. 1 Timothy 6:20 KJV

In summary, this is the Big Secret of Evolution:

Evolution is an ANCIENT CONCEPT
that many are trying to JUSTIFY
with a SCIENTIFIC VENEER
to indulge their SIN NATURE
without GUILT or CONSCIENCE.

Are all those who follow evolution aware of the Big Secret? Are they all “twisted and fanatical”? No. But everyone, particularly Christians, should be aware of what they are defending when they reject “all the counsel of God” (Acts 20:27), which includes Genesis 1-11, in favor of an ancient concept promoted by “men of corrupt minds, and destitute of the truth” (1 Timothy 6:5). Where should our trust be? It should be in the God who made us and gave his only begotten Son to save us from the very things evolution was designed to promote.

FOOTNOTES are on middle of Page 11

UNCOVERING THE TRUTH ABOUT CREATION

CONFERENCE

COMING TO DENVER
APRIL 22-23, 2021



The Speakers:



Dr. Randy Guliuzza



Dr. Tim Clary



Dr. Brian Thomas

The Topics:

Great Answers to Three Key Questions About Origins

Adam, Not Apes

The Truth about the Global Flood

Continuous Environmental Tracking

Do Dinosaurs Support Evolutionary Theory?

Why the World Looks So Young

**WATCH THIS SPACE FOR MORE INFORMATION or GO TO
www.denversocietyofcreation.org/special%20events.htm**

A portrait of Bob Enyart, a man with grey hair and glasses, wearing a dark jacket over a striped shirt. He is smiling and looking slightly to the right.

Bob Enyart—A Tribute

by Fred Williams

Co-Host of Real Science Radio and RMCF Board Member

Bob Enyart, one of the original founders of RMCF and a true giant in both the YEC and pro life communities, passed away in September from COVID. I was a co-host with Bob on Real Science Radio for 15 years and 700 shows. My first experience with Bob was via his popular TV show where he would regularly take on atheists of all kinds. He also appeared on HBO's Bill Mahr, Fox News' Hannity and Colmes and the Bill O'reilly show, and was regularly on local news for his pro-life advocacy.

I met Bob in person at an 'age of the earth' debate where he and a professor from Maranatha took on a local Reasons to Believe chapter of old-earth Christians. As Bob liked to playfully say, you know who won the debate by the side that sells it! It was not long after we met that Bob asked me to join him weekly on his radio show, which was the honor of a lifetime. We originally called the show Real Science Friday as an alternative to NPR's Science Friday. This eventually drew the ire of NPR and a lawsuit due to our show's rise in podcast search rankings. Instead of a prolonged fight, we decided to change the name to Real Science Radio, all the while gladly accepting the national publicity that came as a result of the NPR lawsuit!

I was also with Bob at his last public event in San Antonio where we defended the truth of Genesis at an ex-Jehovah Witnesses conference. So my time with Bob started with defending Genesis, and ended with defending Genesis.

Bob was always a pleasure to be around, always very humble and gracious, and always witnessing! I also just loved Bob's sense of humor. And without a doubt he is the wisest man I have ever known. Many know of the epic ideas Bob came up with in the realm of creation and science. Literally one day before his family first came down with COVID, I texted Bob the following in response to his double-slit, distant starlight theory:

Fred Text to Bob: "Haven't stopped thinking about what you uncovered, it's big time epic! Hard to think of a bigger show in RSR history. Told Ryan about it last night. Imo you need to publish triality and this, maybe in same article, ASAP."

Bob's lighthearted reply: "Okay Fred, you're the boss. I'll get to work on it!"

"Hard to think of a bigger show in RSR history" - Bob left us with a bang!

Time-Temperature Window¹¹



Halos cannot form above the annealing temperature of the medium, which for mica is $\sim 150^{\circ}\text{C}$ ($\sim 420\text{ K}$). In fact, annealing is routinely used to erase fission track damage from a zircon gemstone. With the U-halos sourcing the Po-halos, this means that uranium and polonium halos formed simultaneously after crystallization and sufficient cooling of the granite. While the clock for the uranium system is set (or the hourglass is flipped) when the zircon crystallizes around the uraninite at $\sim 800^{\circ}\text{C}$ (mica crystallizes around the zircon soon thereafter, at/below $\sim 700^{\circ}\text{C}$), none of the subsequent alpha emissions can make their scorch marks in the surrounding mica until the pluton's temperature has dropped below – and stays below – the annealing temperature. In other words, *the granite's cooling profile presents a severe time-temperature window on the coupled process.*



The decay rate of ^{222}Rn is what determines the time frame: allowing one half-life (about four days) to elapse from the point at which the hydrothermal waters are released by the cooling granite ($\sim 385^{\circ}\text{C}$) until mica's annealing temperature is reached ($\sim 150^{\circ}\text{C}$) leaves about **three days** in the temperature profile's tail¹² for a three-ringed ^{218}Po -halo to form around an impurity/accumulation site before flow grinds to a halt when the



temperature drops too low ($\sim 75^{\circ}\text{C}$). This description accommodates the previously noted in-situ flow rate in mica ($\lesssim 5\text{ cm/d}$) as long as the proverbial apples (Po-halos) do not fall too far (within a few millimeters to a centimeter) from the proverbial trees (U-halos). But U-halos and Po-halos, *unlike* an orchard and its grounded apples, develop *simultaneously*, one pixel (or series of pixels) at a time.¹³ Thus the longest half-life in the uranium series sets the pace for both. Without accelerated decay, the primary U-halo radio-center cannot supply the secondary radio-center with remotely enough daughter nuclides in those three days to make a polonium halo. In fact, chances are good not even one uranium-238 nuclide would decay in three days.

Conclusion

The polonium halos that pepper earth's granitic rocks at the microscopic level – not unlike biotite specks do at the macroscopic level – testify to a Flood-year episode of accelerated nuclear decay (as do multiple other lines of evidence), as well as a magmatic origin for granites, and a simultaneous cooling mechanism local to each halo as it forms and commensurate with its own heat production. In turn, accelerated nuclear decay testifies to God's supernatural tweaking of the nuclear glue (residual strong force) with the possible purpose of effecting the reduction in mankind's lifespan as decreed and described in Genesis.

¹ A ^{218}Po halo is famously pictured on the book jacket for Gentry, Robert V., *Creation's Tiny Mystery* (Third edition), Earth Science Associates, 1992. Used in accordance with federal copyright (fair use doctrine) without implying endorsement of copyright holder.

² Mean life is somewhat greater than half-life: $\tau_{\text{mean}} = (\ln 2)^{-1} t_{1/2}$.

³ Lead-210 ($t_{1/2} = 22\text{ y}$) is the only isotope in the U-series after radon-222 with a half-life longer than a few days, besides polonium-210 ($t_{1/2} = 138\text{ d}$) which decays last in the chain. Both these isotopes must have experienced some accelerated decay but especially the ^{210}Pb given the constraints of time and temperature for halo formation explained later in this article.

⁴ Snelling, A.A., Radiohalos in Granites: Evidence for Accelerated Nuclear Decay, in RATE Vol II, edited by Vardiman, Snelling and Chaffin, Institute for Creation Research and Creation Research Society, 2005.

⁵ Metasomatic granite, though not magmatic, is understood to be the exception rather than the rule for granitic rocks. Any created granite, though not necessarily magmatic, is limited to basement (Precambrian) rock on the basis of depositional sequencing.

⁶ Snelling, A.A., *Earth's Catastrophic Past*, Vol 2, pp. 893-894, Master Books, 2018.

⁷ Outer rings are *normally* fainter because intensity drops with the radius-squared. Thus the ^{214}Po ring normally has only $(12.8\ \mu\text{m}/34.6\ \mu\text{m})^2 \approx 14\%$ the intensity of the ^{238}U ring.

⁸ That is, between 100 million and a billion, with underdeveloped halos at the low end and overdeveloped ones at the high end. Granted, a halo's degree of development is difficult to gauge, especially in coalified wood where halos are more blobs than rings.

⁹ <https://www.icr.org/article/offshore-cenozoic-coal-confirms-n-q-flood-boundary/>

¹⁰ Likewise, ^{235}U 's radon (^{219}Rn) is even shorter-lived, precluding an exit by diffusion to spawn halos from its polonium daughter (^{215}Po). Also, uranium is only 0.7% ^{235}U (vs. 99.3% ^{238}U) meaning its fission tracks are too few to manifest as rings.

¹¹ Snelling, A.A., Radiohalos in Granites: Evidence for Accelerated Nuclear Decay, in *RATE Vol II*, edited by Vardiman, Snelling and Chaffin, Institute for Creation Research and Creation Research Society, 2005.

¹² Assuming an exponential profile $T/T_0 = e^{-kt}$, it follows that $\frac{150}{385} = e^{-k(4d)}$ so $t_{75^\circ\text{C}} - t_{150^\circ\text{C}} = (4d) \frac{\ln(800/75) - \ln 800/150}{\ln(385/150)} \approx 3d$.

¹³ Pixelated Apple copyright: <https://pixlr.com/stock/creator/stockunlimited>



Dr. Barbara Helmkamp earned an engineering degree in Physics from Colorado School of Mines (1986) and a Ph.D. in Physics from Louisiana State University (1995). Between undergraduate and graduate studies she worked as a petrophysical engineer for the Shell Companies in New Orleans. Barbara taught part-time (secondary science and math including Algebra I) at St. Mark Lutheran School (Lutheran Church-Missouri Synod) in Houston from 2005-2008. She completed a course of study in theology for Lutheran school teachers, including Old Testament, New Testament and Church History, through Concordia University Texas (2007). From 2010-present, Barbara has taught part-time (Physics and Chemistry lectures and labs) at Credo Academy, which is a large, board-run, secondary home school co-op in Lone Tree, Colorado. Barbara finds much joy in secondary Christian education, knowing that the forgiveness of sins in Jesus Christ is cherished above all.

FOOTNOTES TO "THE BIG SECRET OF EVOLUTION, PART 2":

¹ See the Nov-Dec 2021 Issue of Foundations.

² Remember that the basis of experimental science is to have an idea (theory) and then perform experiments to disprove it. Experimental results that fail to disprove the idea lends support to the possibility the idea might be right but does not PROVE the idea is true. We can never experiment enough to be absolutely certain that any idea is 100% true. In Redi's case, he proposed life cannot originate from non-life and set up his 1668 experiment to disprove that.

³ C.S. Lewis letter to B. Acworth (1951), father of Richard Acworth, of the Creation Science Movement, in files of latter, as reported by Ronald Numbers in *The Creationists* (New York: Adolph Knopf Co., 1992), 458 pp.

⁴ Aldous Huxley, "Confession of a Professed Atheist," Report: Perspective on the News, vol. 3 (June 1966), p. 19. From an article by Helming, "An interview with God." The quote was edited here solely due to space limitations.

⁵ Bozarth, G. Richard, "The Meaning of Evolution," American Atheist (February 1978), pp. 19,30.

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the heavens and the earth,
the sea and all that is in them.
Exodus 20:11

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