

Refutation of YouTube video: “Have Critics Lorence G. Collins and Ken Wolgemuth REALLY Refuted Andrew Snelling on Radiohaloes?”

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November 23, 2024

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In the “Standing For Truth” channel, a YouTube video (22 minutes long) with the title **“Have Critics Lorence G. Collins and Ken Wolgemuth REALLY Refuted Andrew Snelling on Radiohaloes?”** is provided and can be viewed by a Google search using this title. In this video Donny Budinsky presents a discussion of the following two articles. The first is an article published on October 1, 2021 by Andrew Snelling that is titled: **“Radiohalos – Solving the Mystery of the Missing Bullets”** that was earlier featured in Answers Magazine on April 9, 2014. See: <https://answersingenesis.org/age-of-the-earth/radiohalos-solving-the-mystery-of-the-missing-bullets/> The second is an article that I wrote on January 10, 2021, after reading the article in the Answers Magazine, with the title:

“Radiohalos—Solving the Mystery of the Missing Bullets – Origin of Po halos Revisited.” See: [Nr69Radiohalos.pdf](#) In this article I pointed out my study of polonium halos (Po-halos). See this article and link: **“Origin of Polonium Halos”** [Collins&Collins.pdf \(csun.edu\)](#) The polonium halos are the same as what Snelling calls “radiohalos.”

In this video it is pointed out that some young-Earth creationists say that accelerated decay of uranium (U-238) occurs during the one-year of Noah’s flood and that this acceleration is so great that it would be the equivalent of 500 million years of decay crammed into this one year. If that were true, however, so much heat would be generated that the whole Earth would melt and destroy not only Noah’s ark but also Noah and his family. Moreover, this accelerated decay would also produce lots of helium, but such high amounts of heat would have driven off the helium such that all of it should be gone. But lots of helium atoms are still present in the granites that contain Po-halos. Furthermore, the high heat would have obliterated the Po-halos. On the basis of these two relationships, Snelling argues that the rate of decay equivalent to 500 million years of decay cannot be correct. Instead, he proposes a different model in which regular “garden-varieties” of granite exist, and these varieties evolve through time such that younger granites have more water that facilitates the formation of Po-halos during the one-year of Noah’s flood and that super cooling occurs to allow the Po-halos to form and not be obliterated.

Snelling argues that the decay of uranium during the one-year of Noah’s flood produces three kinds of Po-halos, and they consist of three rings for Po-218, two rings for Po-214, and one ring for Po-210 in contrast to the eight rings found around a

uranium atom that is decaying. See image diagram in the **Appendix** for these four kinds of halos and their decaying kinds of isotopes. An example of a Po-214 halo with two rings in biotite is shown in **Figure 1**.

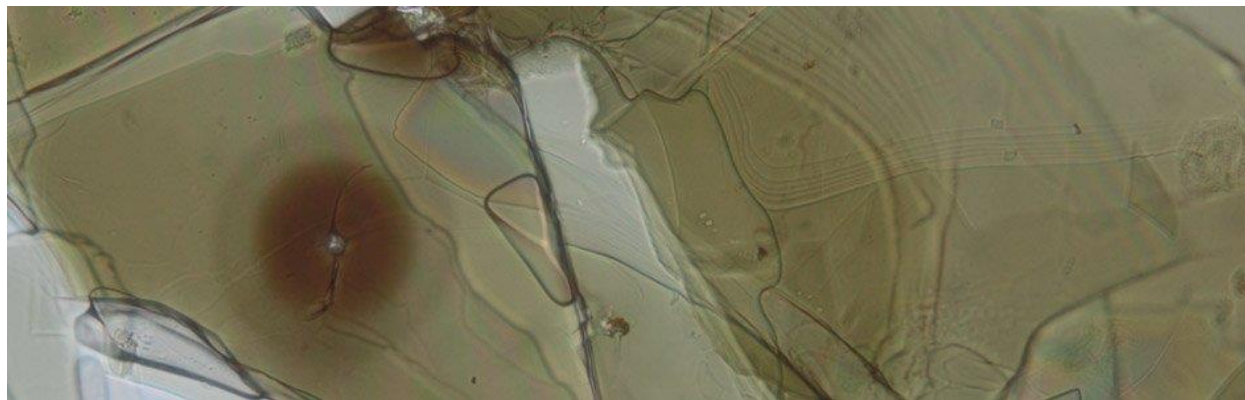


Figure 1. Image of a Po-214 halo in biotite.

Snelling recognizes that huge numbers of Po-halos are formed in biotite where concentrations of uranium occur in calcite veins near Bancroft, Canada, for example, but he says his model is restricted to regular “garden-variety” kinds of granite that are not associated with uranium ores. As said above, however, in his model, that the Po-halos are formed only in the one-year time of Noah’s flood and would be created where hydrothermal fluids exist and supercooling occurs. But producing the number of Po-halos in such kinds of granite in just one year still results in an accelerated decay although not that produced in 500 million years of time. Unfortunately, he does not explain during the video how supercooling is possible to preserve the Po-halos.

What Snelling does not realize is that the regular “garden-variety” granites are crystallized from melts (magma) and that small percentages of uranium (U-238) in these melts crystallize

inside tiny zircon crystals to produce U-halos. See image in the **Appendix**. The U-halo is the result of the decay of alpha particles (helium nuclei with a mass of 4) in 8 steps of decay to produce daughter radioactive isotopes until the final step of lead (Pb-206) is formed that is a stable element without further decay. The alpha particles, shooting out from the decaying uranium and other isotopes, are like tiny cannon balls that damage the lattice of biotite that encloses a zircon crystal so that it produces a “glass” that is seen in cross-polarized light as a black halo around a tiny zircon crystal. See **Figure 2**.

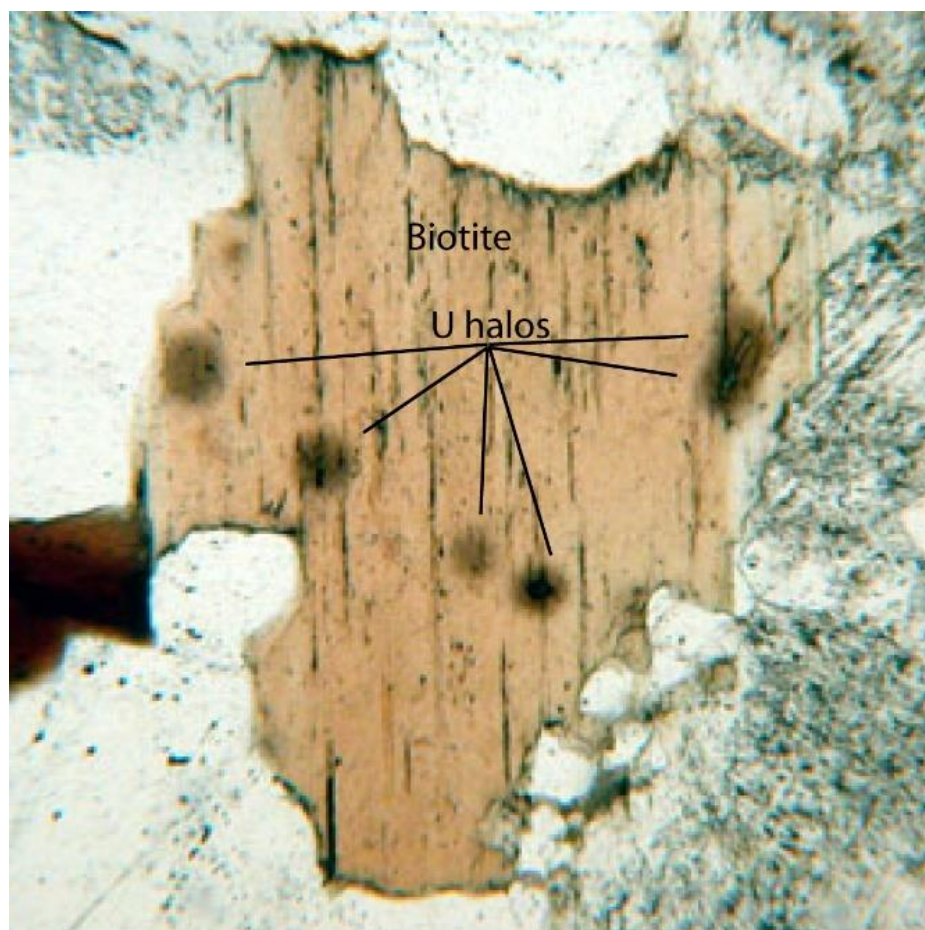


Figure 2. U-halos around tiny zircon crystals in biotite (brown) in granite crystallized from magma.

The granite masses that do not contain uranium ore-concentrations, but which have Po-halos in biotite, do NOT contain tiny zircon crystals with U-halos. Moreover, such granite that contains Po-halos also commonly contains myrmekite (**Figure 3**).



Figure 3. Myrmekite (center of image). An intergrowth of quartz (white; tapering in thickness to become black) inside sodic plagioclase feldspar (light gray) and projecting into K-feldspar (gray; left side and top of image). Plagioclase that is part of the myrmekite but outside and away from the K-feldspar is quartz free. Biotite (brown). Image is at 40x power.

Granite that contains myrmekite is formed at temperatures below melt conditions by chemical replacement processes

(metasomatism) in which a former already crystallized biotite-hornblende diorite is micro-fractured so that hot hydrous fluids can bring in Si and K and subtract Ca, Mg, and Fe. In that process the introduced Si replaces all of the hornblende with quartz and some of the biotite with quartz. Released K from replaced biotite and additional K coming from a deep source replace some of the relatively calcic plagioclase to form the K-feldspar (either orthoclase or microcline) while other parts of the relatively calcic plagioclase are recrystallized as more sodic plagioclase. Locally in a few places, directions of diffusion and replacement by K to form K-feldspar and by Na to form more sodic plagioclase are in opposite directions, but the introduced K and Na are moving toward each other in their replacement processes. Where that happens, the residual Si, Al, and Na in the altered lattices between the two feldspars are not in balance such that too much Si is in the lattice to form only sodic plagioclase feldspar, and this Si forms the quartz vermicules in the myrmekite (**Figure 3**). The amount of myrmekite that forms in such metasomatic granite generally ranges from 0.1 to 1.0 volume percent and is commonly not reported in a published article about the petrography of a granite being studied because many granite petrologists have been taught that myrmekite has no real significance when it actually is a clue to vast chemical and mineralogic changes in a rock.

Images of these various replacement stages are shown and described in the following article and link where the kind of granite that is formed is a metasomatic (replacement) granite. See: **“K-, Na-, and Ca-metasomatism – characteristics of replacement textures associated with feldspars and ferromagnesian silicates and the formation of coexisting rim,**

wartlike, or ghost myrmekite.” [Nr56w.pdf](#) This article is a summary of research from a website with 61 articles at this link: MYRMEKITE AND METASOMATIC GRANITE, ISSN 1526-5757 [MYRMEKITE](#)

Failures of the Snelling Model

The problems that make the Snelling model faulty are the following seven items.

First: not realized by Snelling is that the accelerated decay of U-238 atoms, *in the narrow one year's time* of Noah's flood, would raise the temperature of the newly formed chemical composition of the granite that is derived from the diorite to be above the melt condition for the granite, and myrmekite would **NOT** form. That is, the granite would crystallize from a melt (magma), and in that case, either the quartz and feldspar would form separate non-intergrown crystals or they would occur in intergrowths of quartz and feldspars in graphic textures, but the quartz would not be in tapered vermicules inside plagioclase feldspar that occurs in myrmekite (**Figure 3**).

Second: in this kind of metasomatic granite that contains Po-halos in biotite, the original uranium that was once scattered in lattices in the crystals in the biotite-hornblende diorite will have left the system and gone out with the subtracted Ca, Mg, and Fe. Therefore, none is crystallized in zircon crystals in the recrystallized biotite that is a host for Po-halos as shown in **Figure 2**.

Third: it must be realized that in order for the biotite-hornblende diorite to be converted and recrystallized into the minerals found in granite, each stage of the replacement (metasomatism) and recrystallization processes plugs the system

with newly formed crystal lattices because the replacement processes are not “mass for mass” but “volume for volume” in which the newly formed K-feldspar, sodic plagioclase, and quartz crystals have lower densities and expanded crystal lattices than in the hornblende and relatively calcic plagioclase being replaced by these three minerals. Therefore, when the system is plugged, there is no further movement of fluids possible or diffusion of radioactive neutral radon atoms or polonium ions. That is, repeated earthquakes to cause new micro-fracturing must occur to open up the system for further and progressively continued chemical, elemental, and mineralogical modifications, and such earthquakes are likely events that occur in time frames of thousands of years and not during the one year of Noah’s flood.

Figure 4 shows an image of biotite where a fracture once existed in which neutral radioactive Rn-222 atoms and ions of Po-218, Po-214, and Po-210 were moving and shooting out alpha particles on both sides of the fracture to begin the process of converting the biotite lattice into a glass until locally concentrations of Po-210 atoms to 10 to the ninth power were reached to produce a Po-210 halo (black circular dot). This number of Po atoms are necessary before the crystal lattice is damaged sufficiently to make a Po-halo visible. The broad extended darker area in the image toward the Po-210 halo is a trace of the former micro-fracture and shows where alpha particles were shot out into the biotite to damage its lattice while radioactive Rn and Po were in transit. A faint barely visible trace of lattice damage by the decay of Po-214 atoms occur in parallel alignment to the micro-fracture just below the white quartz grain. Black circular dot is a Po-210 halo.

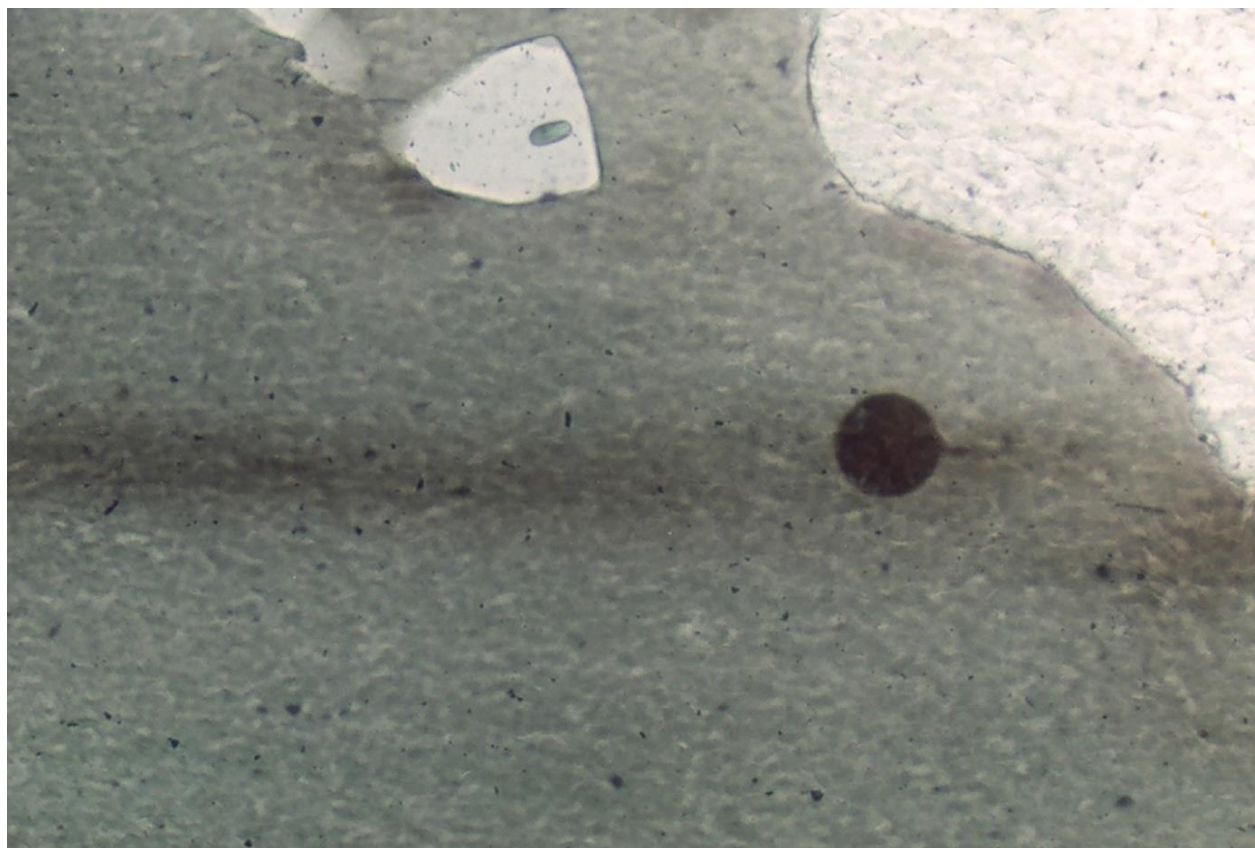


Figure 4.

Such paths are not commonly seen because the micro-fracturing of biotite normally occurs in the plane of the flat sheet structure of the biotite lattice and is not seen in a thin section because the viewer is looking at right angles to this plane where the diffusion of atoms occurred in a micro-fracture.

Fourth: if U-238 atoms have accelerated decay even during the one-year of Noah's flood, why aren't the decay rates of all other radioactive elements, such as radioactive K-40 and Th-232 also accelerated? Moreover, how can a large Noah's storm lasting six months on the Earth's surface cause radioactive U-238 atoms 3 kilometers below the Earth's surface to suddenly

have accelerated decay? If this were possible, we would expect very large hurricanes today or in the geologic past to do that, and there is no such evidence to support that possibility because measuring ages by radioactive decay schemes are consistently accurate through time in the geologic column.

Fifth: the clincher that refutes the Snelling model is that he does NOT realize that the regular “garden-variety” granite that contains the Po-halos was once an *already-crystallized* biotite-hornblende diorite that was crystallized at depths below the Earth’s surface, likely more than 3 kilometers. Such depths are necessary in order to form its relatively coarse crystals that slow cooling requires, and that cooling time is likely measured in millions of years because of the very slow heat flow in the Earth’s upper mantle and crust. Then, this solidified diorite has to be uplifted to a level where the temperature is below melt-conditions but where brittle deformation is possible to cause micro-fracturing to allow the hot hydrous fluids to enter and modify the mineral and chemical compositions of the diorite to that found in granite. The metasomatic granite can actually have a crystal texture that looks the same as that found in granite crystallized from magma because it inherits the former igneous texture of the diorite during the replacement process. Finally, the modified diorite that is now granite must be further uplifted, and the overlying crustal rocks be eroded away before samples can be collected to see that the granite contains Po-halos. It is clear that all these combined processes must occur in much more than 6,000 years, which Snelling and other young-Earth creationists want to be the age of the Earth.

Sixth: Finally, it is not surprising that lots of helium still remains in the metasomatic granites that contain Po-halos

because the decays of U-238 and its daughter radioactive atoms that continue on to Po-218, Po-214, and Po-210 are constantly emitting alpha particles that are helium nuclei. Also, I am repeating for emphasis that Snelling does not realize that the creation of large volumes of regular “garden-variety” granite masses that contains Po-halos in the short interval of just one-year of Noah’s flood causes a heat problem to occur. The only way that this problem can be solved is for Snelling to realize that Po-halos do not form quickly but take thousands of years of repeated earthquakes to create micro-fractures that keep the system open, so that not only K and Si can be added and Ca, Mg, and Fe be subtracted, but also so that enough Po ions are concentrated in a given site in a biotite crystal that Po-halos can be formed that can be seen. These extra thousands of years provide enough time for the heat to migrate toward the Earth’s surface and keep the granite cool enough so that Po-halos are preserved. Otherwise, there is no way for Snelling scientifically to produce supercooling in the one-year of Noah’s flood.

Seventh: Another fact that Snelling does not realize is that, not only is myrmekite coexistent with the Po-halos in the metasomatic granites, but also associated lamprophyre dikes as well as volcanic lavas with the same lamprophyre compositions. That is, these lamprophyres are rich in Ca, Mg, and Fe atoms that were carried out of the system where the metasomatic granites and the Po-halos were formed, and some are K-rich because incoming extra K that formed the granites went out with the escaping Ca, Mg, and Fe. Who of the young-Earth creationists have been aware of this lamprophyre association? Snelling certainly does not report this observation. See my

studies of different myrmekite-bearing geologic areas with lamprophyres in these two articles and links.

Origin of lamprophyres associated with myrmekite-bearing granitic rocks [Nr60Lamprophyre4.pdf](#)

Geologic consequences of a global Archean ocean – the Big Hurricanes Theory [Nr116Archean30.pdf](#)

At any rate, all the evidence presented in this article clearly indicates that the Earth is older than 6,000 years.

In passing, Donny Budinsky mentions that John Baumgardner found traces of C-14 in diamonds which is supposed to be added evidence that the Earth is 6,000 years old. But traces of C-14 are also found in coal and dinosaur bones. Baumgardner does not seem to realize that the instruments in the laboratories where C-14 dating is done are all contaminated by modern atoms of created C-14 that cannot be eliminated. Therefore, such C-14 that occurs in diamonds does not indicate a young age of the Earth.

Appendix

