

Can the relative timing of radioisotope dates be applied to biblical geology?

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The idea of using relative radiometric dating as a template for biblical earth history mostly sandwiches 4.567 billion years of uniformitarian history into 377 days of biblical earth history. In such a relative dating scheme, large bolides would impact during Creation Week and dinosaur tracks would occur during the Recessive Stage of the Flood, resulting in contradictions with biblical expectations. Radiometric dates are unlikely to be precise enough to be used as an absolute biblical timescale. The appeal to a relative timescale does not deal with previous creationists' arguments on the problems of radiometric dating either. Fission track dates are too variable to be used for an absolute biblical timeframe. The dating fiasco over Leakey's skull 1470 shows that radiometric dates have a large range and that all dates, especially 'wrong' dates, are not published. The assumption in relative dating that the pre-Flood/Flood boundary is near the very late Precambrian does not fare well under scrutiny. Many aspects of Precambrian sedimentary rocks show features expected from the Flood and not from the Creation Week. The idea that there were three periods of crustal formation caused by episodes of supercontinental spreading and collision during a few hours of Day 3 does not seem warranted.

Creationists reject the old ages of radiometric dating schemes. In recent years, however, some have proposed that these old radiometric dates can be used in a relative sense for absolute biblical earth history. Representative of this position is John Baumgardner:

“When applied with care, radioisotope methods represent a powerful tool for creationist research, primarily as a means to establish the correct chronology of events in the earth’s physical past A key implication is that the relative chronology of the geological record, as worked out with considerable investment of resources by the secular earth science community, including tens of thousands of man-years of effort, can in large measure be utilized immediately by young-earth creationists.”¹

A similar approach is advocated by Russell Humphreys² and Andrew Snelling.³

Like any other idea, especially those in their early stages, this concept needs careful scrutiny from presuppositional, logical, and empirical points of view. Obviously, if these scientists are correct, then the uniformitarian geological timescale and the radiometric dates which support it would be of immense use to creationists, as long as an accurate and precise conversion scale for each method was available. It would be easy then to date events on the early earth, including the Flood, and even its subdivisions, perhaps even down to the day.

The contrary is also true. If this idea is accepted uncritically and attracts the meagre resources of the creationist community, and then proves erroneous in any fashion, then its use would be both a resource drain and an intellectual error. In this paper I evaluate this idea and offer comments

specifically with reference to Baumgardner’s article, as it is the most recent and detailed statement of the relative radiometric dating concept.

Asymmetry of the two versions of earth history

A complicating factor in applying secular radiometric dates to biblical history is the asymmetry of the two versions of earth history. Secular history emphasizes naturalism and uniformitarianism; there is no creator and slow processes over millions of years rule geological history. In sharp contrast, biblical earth history includes two distinct periods of rapid, catastrophic activity, including varying degrees of miraculous divine activity that was responsible for the vast bulk of the rock record. In other words, there is no simple compression conversion that will fit the 4,567 Ma of secular history into the 6,000 years of biblical history, of which only 377 days (the Creation and Flood) are significant geologically.

The first period of rapid activity was the Creation Week, in which the cosmos was miraculously created and earth was shaped and filled in six days. The second period was the Flood, which occurred over the space of 371 days. During that event, geological activity reshaped the earth’s crust, laid down the bulk of the sedimentary and fossil records, and changed the continents and ocean basins. Uniformitarians propose that earth’s geological history evolved over billions of years by natural non-catastrophic processes. Its sequence of events is clearly contradictory to Genesis 1–11. Therefore, biblical history is strikingly non-linear as compared to secular history (figure 1).

If secular radiometric dates can be used to constrain the details of biblical history, then the conversion of old dates to young dates must take into account this qualitative difference between the two histories. The conversion of dates marking geologic activity must be able to be calibrated to those 377 days of defining events, or 0.017% of the total time available in biblical history.

If these creationists wish to argue that these two great peaks of geological activity correspond to two peaks of accelerated nuclear decay, they must explain how this two-fold variation in conversions—between the dates at the time of creation and the Flood and between the dates for the rest of biblical history—fit the equations of nuclear decay.

Biblical issues

Both Baumgardner and Snelling make assumptions about the earth's past outside of the Bible that drive their version of natural history and our ability to date its details by converting secular dates. One assumption is that the chronostratigraphic timescale is reliable. This allows them to claim the pre-Flood/Flood boundary is at or near the base of the Cambrian, and remain confident that this correlation point is valid all over the earth. Both also assume a catastrophic version of plate tectonics as the driving mechanism of the Flood. The validity of the chronostratigraphic timescale and catastrophic plate tectonics have both been argued in the creationist literature and need not be revisited here. Suffice it to say that building forensic models on top of existing forensic uncertainties reduces our confidence in the final theory.

Baumgardner uses his faith in secular stratigraphy to derive a relative ratio of radiometric decay; 4 Ga of accelerated decay during creation and 500 Ma of accelerated decay during the Flood. How do these conclusions fit with the Bible's testimony and inferences?

Impact events present one problem. Impact craters are present both in Precambrian rocks of most 'ages' and in Phanerozoic rocks—most notably the Cretaceous Chicxulub impact and the Cenozoic Chesapeake Bay impact.⁴ In Snelling's view, Precambrian impacts must have occurred between Day 3 and the Flood. In Baumgardner's, they would have occurred mostly before Day 3. But the sun, moon, and other solar system bodies were not created until Day 4. Thus, the Late Heavy Bombardment (LHB), which uniformitarians correlate to early Precambrian impacts, could not have occurred prior to Day 4, since the impacted bodies were not in existence. The LHB also likely did not occur before the end of the Creation Week, at which time God pronounced His creation "very good".

Biblically, then, solar system impacts are likely limited to after both the Creation Week (or at least after Day 4)

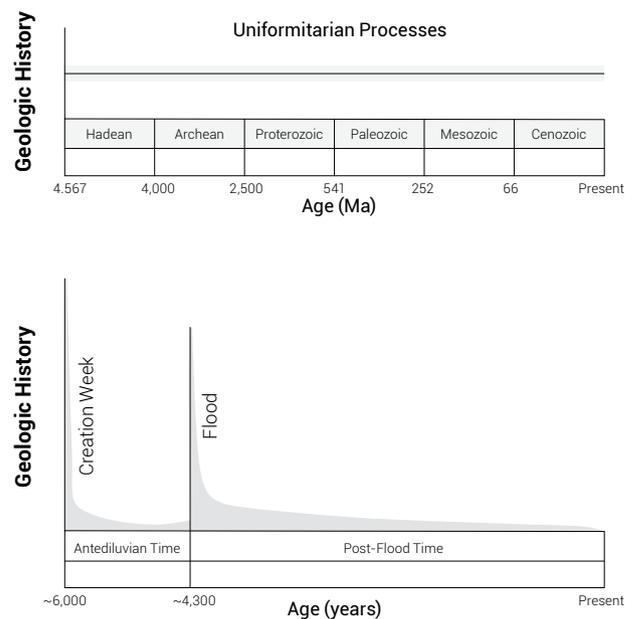


Figure 1. Biblical history (bottom) and secular natural history (top) demonstrate a marked asymmetry of geologic events. Uniformitarianism spreads events across billions of years, illustrated by dark line, within energy limits illustrated by grey error bar. But biblical history concentrates crucial geological events in 377 days, or less than 0.02% of time. Note cartoon requires significant horizontal exaggeration just to show the peaks in the formation of crustal features, and the rock and fossil records. Correcting secular dates to young dates must account for this asymmetry of activity.

and the Flood. If the craters on the moon can be used as an analogue for earth impacts, and the LHB affected the entire solar system,⁵ then the timing must have been even later than Creation Week, since the purported pre-Fall impacts would have killed animals prior to the Curse. It is most likely, then, that the LHB and other impacts did not begin until after the Fall. That narrows the range down from the Fall until the Flood. But secular scientists date the LHB at 3,500–4,000 Ma. If we convert these dates to young dates within biblical earth history, then the radiometric evidence supports the LHB before Day 4 by relative dating! This is clearly not possible. It is more likely that the LHB occurred after Creation Week. Also, since even a small fraction of these impacts would have destroyed life on earth, it is even more likely that the vast majority of these impacts occurred during the Flood.⁶

The logic of relative dating (and its accompanying faith in the chronostratigraphic timescale) follows the timescale in dating the events of the Flood, but there are contradictions. Thus, the Paleozoic is the 'early Flood', the Mesozoic is the 'middle Flood', and parts of the Cenozoic are the 'late Flood'. Snelling states, "Many amphibians and reptiles were actively leaving footprints on the surfaces of the sediments being deposited during this middle to late

stage of the Flood.⁷⁷ He also states elsewhere that Mesozoic strata, which include the majority of amphibian, reptile, and dinosaur tracks, were deposited late in the Flood.⁸ But when compared to biblical history, this scheme fails. According to the Bible, *all* air-breathing land animals were dead by Day 150, and most likely died earlier. There were no animals available to make tracks during the Recessive Stage of the Flood. If we accept the Flood narrative, this means that the Mesozoic represents the rising stage of the Flood within its first 150 days. This suggests two possibilities: (1) that the deposition of the sedimentary record was highly non-linear with practically all sediments deposited early in the Flood and (2) that significant amounts of sediments were eroded during the Recessive Stage. This in turn suggests that the uniformitarian timescale is not acceptable as a relative chronology of the Flood, or to the revolutionary idea that time is not the key to interpreting the rock record.⁹

We can't trust absolute or relative dates and dating methods

Humphreys makes much of the plot of radiometric dates over time,² originally collected by Woodmorappe.¹⁰ It shows a roughly linear relationship between dates and the stages of the geological timescale (figure 2). However, a closer look reveals that the dates vary by around 200 Ma and include outliers that are billions of years too old! One example of an outlier is the 1.3 Ga Rb-Sr isochron age for lava that erupted after the Flood on the northwest rim of the Grand Canyon.¹¹ It is obvious that the precision of relative dates is far from satisfactory to be used for absolute biblical dates.

But if Woodmorappe's dates are just the *published* 'anomalous' dates, is it not likely that the many other dates, published and unpublished, 'fit' the timescale? This is undoubtedly true for many published dates, but we must also be aware of the tendency for data selection that chooses dates to be published based on their fit with expected ages.^{12,13} Furthermore, there is no compilation of raw dates discarded by labs and/or researchers. It is a reasonable question to ask what a large-volume blind test would reveal about the consistency of dates and the timescale.

Different methods show systematic differences in returned dates,^{14,15} but documented problems and assumptions, including model ages, whole-rock ages, and even mineral isochron ages¹⁶⁻¹⁹ leave relative dating in doubt. Snelling concludes:

“There are many problems with each of the radiometric dating methods. These are admitted by the conventional geologic community in their own papers and textbooks, yet they fail to draw the common sense inference that these methods are highly questionable at best Though reluctantly admitted, the problems

are usually ignored because radiometric methods are thought to be at least generally correct, in spite of the fact that these anomalies defy and disprove the very assumptions foundational to the methods All these considerations taken together emphatically show that the radiometric dating methods are fatally flawed and cannot yield the valid absolute ages claimed by those who require the millions of years to prop up their belief in long, evolutionary ages of earth history.”²⁰

If radiometric dating is fatally flawed and cannot produce valid absolute ages, how are the same dates valid in a relative sense? For many decades, creationists have been finding flaws with radiometric dating in general. Baumgardner states that creation scientists of the 1980s and 1990s did not understand the issues well enough. How so? We need to carefully examine the proposal to use radiometric dates in a conversion to young ages.

Baumgardner mentions how fission track dates agree with K-Ar radiometric ages on the Peach Spring Tuff and a tuff within the Jurassic Morrison Formation of southeast Utah.²¹ He argues that this agreement justifies relative dating. However, an examination of fission track data in the RATE book²² shows that indeed the dates for the

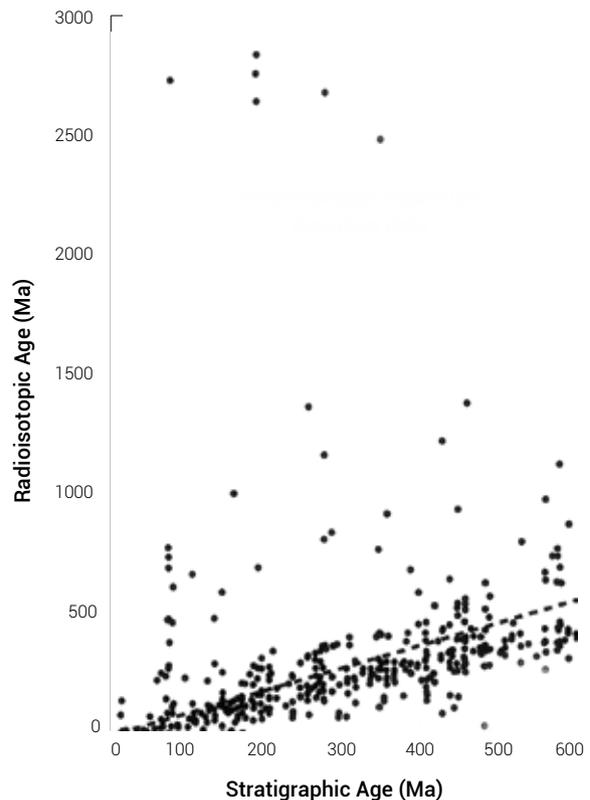


Figure 2. Deviation of published radioisotope ages of samples related to their published ages according to the geological column (dotted line) (refs. 2 and 10).

Peach Spring Tuff are tightly constrained, and do agree reasonably closely with the radiometric dates. We wonder if circular reasoning wasn't used to get the Peach Springs dates to agree. Circular reasoning is a common problem in uniformitarian earth science (see below). However, the fission track dates published in the second RATE book for the Morrison Formation varied from less than 100 Ma to over 1 Ga.²² Fission track dates on two tuffs in the middle Cambrian Tapeats Sandstone and Muav Limestone at Grand Canyon, thought to be about 520 Ma old, ranged from near 0 to about 900 Ma old. Practically all were younger than the conventional date. Although fission tracks do show that accelerated fission has occurred sometime in earth history, this does not mean that relative conventional dates would be accurate. We need much better precision in fission track dating to construct a biblical timescale.

'Wrong' dates are rarely published. Those that are published are usually found out to be 'wrong' after the fact as stratigraphic theories change. The lack of *all* the data is an obstacle to knowing if relative dating is possible. Problems with the dating of Richard Leakey's skull KNM-ER 1470 suggest a need for caution. Marvin Lubenow documented this problem.²³ K-Ar and ⁴⁰Ar/³⁹Ar dates on a volcanic tuff associated with the skull combined with dates from paleomagnetism, fission tracks, and the biostratigraphy of elephants provided an initial age range of about 2.6–3.0 Ma for skull 1470. But paleoanthropologists claimed the skull was younger, so it was 're-dated'. The same methods then returned a new date of 1.6–1.8 Ma! But during the 10-year controversy, it turned out that a wide variety of dates had been obtained, but were either not published or de-emphasized. These included published dates of 0.5, 4.11, 6.9, 7.46, 8.43, 17.5, and 212–230 Ma. It is not known if other unpublished dates were obtained. This is one example of how radiometric and biostratigraphic dates that have been reported have been manipulated to support a particular belief system, and likely represents the tip of the iceberg. These dating methods are easily manipulated and are *not* independent. Stratigraphers today typically combine a variety of methods to reach a desired date or to support the timescale.²⁴ But the lack of one reliable clock makes all the unreliable ones suspect.

Knowing the Flood boundaries is essential to relative dating (but not to diluvial geology)

Making sense of relative dates and converting old dates to young ones, especially in light of the temporal asymmetry of the Flood, is crucial to the whole enterprise. Earth's history extends over 6,000 years. The Flood, which produced the bulk of the sedimentary rock record, comprises only one of those years. Thus, advocates of relative dating must know



Figure 3. 'Stromatolites' from the Mesoproterozoic Belt Supergroup along the Dearborn River in the Rocky Mountain Front, Montana.

when to convert old dates to years of non-Flood history, and also to days of Flood history. Thus, the location of the pre-Flood/Flood boundary becomes crucial.

Baumgardner assumes the Flood began in the very late Precambrian.²⁵ He sees that as an anchor point separating the antediluvian rock and the fossil record from the Flood. He also concludes that the post-Flood boundary is in the Pliocene, which is fairly close to my assessment of the situation. In uniformitarian terms, the Flood then ranges from 541.0 Ma to between 5.33 and 2.69 Ma.²⁶ That leaves the first 4,026 Ma of the geologic column as pre-Flood history. It appears that Baumgardner assigns the Precambrian rock record to the first three days of creation. Snelling places only the Hadean²⁷ and Archean, dated from 4,567–2,500 Ma, in the first three days.⁷ He thinks the Paleoproterozoic (2,500–1,600 Ma) represents events of Day 4, and the Mesoproterozoic (1,600–1,000 Ma) records those of Day 5. He also believes that there were no significant catastrophes that killed animals during these eras.

If we accept these proposals, an immediate problem crops up with bolide impacts. Earth's largest known impacts, the 250–300-km Vredefort impact crater and the 200-km Sudbury impact, dated around 2 Ga old, would have occurred during the first three days of creation in Baumgardner's scheme²⁸ but during Day 4 in Snelling's. Another 24 known impacts exist in the Precambrian crust.²⁹

Later Precambrian impacts would still be placed before Day 3 by Baumgardner, but later in the Creation Week by Snelling. Both authors must explain the record of animal death in the Precambrian, which would then be associated with the “very good” environment of the finished creation.

This location near the Precambrian/Cambrian contact for the pre-Flood/Flood boundary can be questioned. The idea is supported by five criteria.^{30–32} However all five are equivocal.³³ The first is the paleontological discontinuity between Precambrian single-celled organisms and Cambrian metazoans. However, the range of metazoans has been extended back to the Neoproterozoic, and possibly to 1,700 Ma in China.³⁴ This would place the death and burial of multi-celled animals in the Creation Week, according to Baumgardner. Other fossil problems exist. Precambrian microfossils, dating as far back as 3,500 Ma, are found in thick strata that appear to have been deposited catastrophically. Both Baumgardner and Snelling would place these on Day 3. Were they created and killed prior to the end of the Creation Week? The same problem exists with stromatolites (figure 3), which also extend back that far. If stromatolites were formed by biological processes, how could they have both formed and died on Day 3? One solution to the problem is if ‘stromatolites’ in the sedimentary rocks do not represent the stromatolites we find in the present world but were really inorganic deposits.³⁵ All these factors present problems for the supposed paleontological discontinuity at the Precambrian/Cambrian boundary. If this discontinuity marks the beginning of the Flood, it could also reflect those conditions: intense turbulence, heat, volcanism, metamorphism, impacts, or acidic water. These

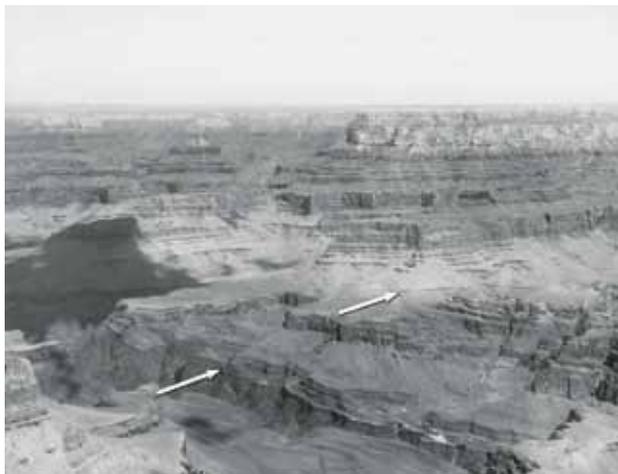


Figure 4. The Great Unconformity of the Grand Canyon (upper arrow) above another nearly-flat unconformity between Precambrian sedimentary rocks, dipping downward toward the right, and the igneous and metamorphic rocks below (lower arrow).

other conditions and their effect on this boundary should be explored.

The second criterion is the erosional discontinuity caused by the regional scouring at the beginning of the Flood. A cited example is the Great Unconformity at Grand Canyon.³⁰ But the creation of regional unconformities could have occurred at other times during the Flood, especially in its early days. Also, antediluvian topography would have had a significant effect. Even in the Grand Canyon, the example is not clear because beneath Precambrian sedimentary rock is another unconformity separating the Precambrian sedimentary rocks from the igneous and metamorphic rocks below (figure 4). It is possible that this latter unconformity represents the onset of the Flood.

The third criterion is a time discontinuity, but a time gap is an interpretation, not an observation. Time gaps are subjective and can be influenced by uniformitarian assumptions. Sedimentologists have shown that unconformities can represent nothing more than changes in flow parameters, rather than long times of non-deposition.³⁶

The fourth criterion is a sedimentary discontinuity, defined by fining upward sedimentary sequences. An example in the Grand Canyon is the Sixtymile Formation, the top of a 4 km succession of Precambrian sedimentary rocks, and the Cambrian Tonto Group, consisting of the Tapeats Sandstone, Bright Angel Shale, and Muav Limestone. However, a variety of sedimentary conditions, such as waning currents, can result in such fining upward sequences, and these are not diagnostic of the beginning of the Flood, since waning currents are expected frequently during the Flood. It is not beyond the realm of possibility that coarsening upward sequences could have marked the beginning of the Flood in certain locations, such as in deep water that started off with slow currents.

Even at the type location of the Grand Canyon, there is another problem with placing the boundary at the base of the Sixtymile Formation. Overlying the Precambrian strata and the Great Unconformity, up to 5.0 km of Paleozoic and Mesozoic sediments were deposited. Most of the 2–3.5 km of Mesozoic strata were removed by vigorous sheet erosion near the end of the Flood,³⁷ though its thickness must be extrapolated from the Grand Staircase (figure 5). These thick Paleozoic and Mesozoic sedimentary rocks show little deformation throughout the whole sequence. It is likely that they were laid down *after* the initial, highly catastrophic onset of the Flood and represent relatively calmer depositional conditions over a wide area that did not undergo deformation, possibly between Day 40 and 150. The more violent early stage of the Flood may be represented by the tilted Precambrian rock.

The fifth is the tectonic discontinuity of greatly increased activity representing the onset of the Flood. But, tectonic



Figure 5. The Grand Staircase in southern Utah is the southern limb of an anticline and represents 2 to 3.5 km of sheet erosion over the whole Grand Canyon area.

activity could occur at any time in the Flood, especially very early in the Flood, as well as just after Day 150 when the vertical tectonics that formed the present day continents, and ocean basins began. Furthermore, there is evidence of significant tectonic activity in the Precambrian such as deep basement rifts and basins.³⁸ Therefore, until we have a better understanding of the placement of the pre-Flood/Flood boundary, relative dating will not yield precise dates for the Flood, and the proposals of both Baumgardner and Snelling need further work.

What is the nature of Precambrian rocks?

Baumgardner considers practically all Precambrian rocks as dating to the Creation Week. In addition to the problems cited above, the nature of the Precambrian rocks argues against their formation in the Creation Week by accelerated uniformitarian scenarios. There are many different lithologies that do not appear to fit into the Creation Week. These include: banded iron formations (BIFs) throughout the Precambrian,³⁴ carbonates, dolomites, salt, gypsum, and chert. Many of these are found during the Paleozoic, which suggests a common source in the Flood.

Even unusual Phanerozoic Flood rocks are found in the Precambrian.³⁴ Black shale, containing 3–15% organic carbon, is found in both.³⁹ Why would high organic shale be deposited during Creation Week, especially before the end of Day 3 in Baumgardner's scheme? Quartz arenite is another unusual type found in both Precambrian and Phanerozoic sections. It is almost pure quartz sandstone, with greater than 95% quartz, that is very well sorted and highly rounded.⁴⁰ It

likely formed by intense turbulence over large areas, the kind of action one would expect very early in the Flood. Quartz arenite in the late Precambrian and early Paleozoic suggests that the lower Flood boundary is well down in the Precambrian. Phosphate rich rocks are another type found in both eons,³⁴ even straddling the Precambrian/Cambrian boundary.⁴¹ This also suggests the basal Cambrian is not the beginning of the Flood.

Raindrop imprints provide strong evidence that Precambrian sedimentary and metasedimentary rocks are from the Flood. They occur in the Precambrian in the Uinta Mountains⁴², India⁴³, Norway⁴⁴, and South Africa.⁴⁵ Some of these locations have multiple stratigraphic levels of raindrop imprints. One such site is the late Archean Ventersdorp Supergroup, conventionally dated at 2,700 Ma, before the end of Day 3 in both Snelling's and Baumgardner's relative dating scheme. It is possible that these

imprints are not from rain but from water or fluid escape. However, the size distribution of the Archean raindrop imprints in South Africa (figure 6) has recently been favourably compared to raindrop imprints today and from experiments of falling water drops of known sizes and fall velocities.^{46,47} So, as seen from figure 6, the marks are likely real raindrop imprints and not escape structures. Since rain did not fall at least until after man was created (Genesis 2:5, 6) and some even speculate until the Flood,⁴⁸ raindrop imprints indicate that the sediments were laid down after the Creation Week. Since many Precambrian sedimentary rocks were deposited in deep troughs or basins in significant thicknesses, it is unlikely that they date before the Flood, since the antediluvian is considered a time of benign geological activity.⁷ If so, even the late Archean sedimentary rocks represent Flood deposition.

Based on the work of Kent Condie,⁴⁹ Baumgardner asserts that episodic U-Pb dates in zircons indicate three periods of rapid continental crust growth correlating to 2,700 Ma, 1,900 Ma, and 1,200 Ma.⁵⁰ Since he believes that the continental crust was created on Day 3 with 4 Ga of earth history unfolding in hours, this supports his relative timing. But why should creationists accept uniformitarian stories and try to say this is how God created? There is nothing in the Bible that suggests three stages of crustal formation at creation of the dry land on Day 3. Since these secular dates are also closely tied to Precambrian plate tectonic episodes, then are we also to believe that Day 3 included multiple episodes of supercontinental spreading and collision? Even some secular researchers believe that these U-Pb dates are not related to crustal growth at all but preservation biases.^{51,52} There is



Figure 6. Fossilized raindrop imprints from the 2.7 Ga old (according to uniformitarian dating) Archean Ventersdorp Supergroup (from Cassata and Renne, ref. 47, p. 323).

apparently contradictory information, with neodymium isotopes favouring continuous crustal growth while hafnium and oxygen isotopes in zircons favoured episodic growth at 3,300 Ma and 1,900 Ma.⁵³ If there is such a lack of clarity in uniformitarian estimates of continental crust growth rates, then creationists should be cautious in accepting their proposals. Finally, the creation events are a grand display of God's miraculous power. It is entirely possible that forensic analyses based on current providential constraints (i.e. natural laws) do not even apply.

Thus, speculations should be evaluated carefully. For example, Baumgardner believes that Day 3 reflects God's causing the chemical differentiation of earth, crystallizing the core and mantle, and allowing partial melting of the mantle and the upward ascent of magma that formed the crust.⁵⁴ But God is not bound by uniformitarian theories; He could have formed it all instantaneously without differentiation and crystallization in a time sequence. Baumgardner also claims that the continental crust has been little metamorphosed, but actually there are large volumes

of metamorphic rocks in the Precambrian, including greenstones, quartzite, gneiss, and schist. Another issue is that the various dates on Precambrian crust would have been affected by events in the Flood, including further accelerated radiometric decay and may not mean anything as far as a timescale for Day 3.

We can speculate in a forensic manner about the rock record, but the boundaries of our speculation must be those of Scripture. It alone provides a completely accurate, if abbreviated, description of those events.

Summary and conclusion

I believe that there are too many issues and questions involved in using radiometric dates in a relative sense to provide absolute biblical history. The radiometric and fission track dates are not accurate enough to provide a precise chronology of biblical earth history. This is shown by issues such as anomalous dates, different dates by different methods on the same rock, and the tendency to accept only good dates that agree with assumptions. All the problems that creationists have pointed out over the years need to be explained. The assumption in relative dating that the pre-Flood/Flood boundary is in the very late Precambrian is also questionable; much more work needs to be done on this issue. Moreover, Precambrian sedimentary rocks provide evidence they were deposited in the Flood.

Therefore, accepting radiometric dates in a relative sense creates a number of conundrums for the timing of events in biblical earth history. For example, bolide impacts seem to fit in better during the Flood and not during Creation Week as relative dating would tell us. Dinosaur tracks occurred early in the Flood and not in the middle or late in the Flood.

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