Precambrian explosive volcanism was mainly in the Creation Week, followed by some in the initial Flood

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Most Precambrian explosive volcanism likely occurred in the early days of Creation Week before plants and animals were created. The residue of such explosive volcanism in the Precambrian likely occurred in the initial stages of Noah's Flood, when destruction was principally by water.

Good and very good

In Creation Week (Genesis 1) the word 'good' is used in Days 1, 3 (twice), 4, 5, and 6, but not used in Days 2 and 7. After God had surveyed all He had made (the whole creation, including man on Day 6), He then pronounced it 'very good' (Genesis 1:31).

The use of both the words 'good' and 'very good' in Genesis 1 implies shades or degrees of goodness. Something can be very good, good, sort of good, formally good, etc. The creation that God magnificently spoke into being is good. It is good in its specific parts, and it is good as a whole, as an entire system. In fact, in this integrative universal sense, the text informs us that God declared it to be very good.[1] In other words, 'good' signified the completion of a specific creative work, while 'very good' signified the completion of the whole creative work.

Moreover, the earth was formed to be inhabited (Isaiah 45:18). Each day of creation is purposeful, and, by the sixth day, God created humankind in His own image, blessing them and giving them rule over all living creatures. The completion of creation on the sixth day is underscored by the statement in Genesis 1:31 that 'it was very good'.[2]

Creation Week provision

God initially created the earth *ex nihilo* (Genesis 1:1) and then shaped the earth so that by Day 6 it was suitable for man, having soil, minerals, vegetation, and so on. It would be far safer for life-forms if the majority of explosive volcanism occurred during the early days of Creation Week, before plants and animals were created. This is entirely consistent with the order of events in Genesis 1. The land *and* vegetation were formed *and completed* by the end of Day 3, well before God started creating animals on Day 5. Therefore, there is no reason to think that any violent geology indicated in rocks that were created during Creation Week would've impacted the life God made.

As a result, explosive volcanic products may have made excellent soil for antediluvian food crops. Volcanic soils are often very rich in nutrients and hold water well because of their volcanic ash content. In places such as today's Indonesia these soils can be very good for farming.[3] Dispersal of volcanic ash in the early days of Creation Week would have contributed to volcanic soil and this could have been good provision by God to make the antediluvian world fit for habitation by assisting the farming endeavours of the antediluvian population.

Early Creation Week versus early Flood

Strontium isotope trends of the Neoproterozoic (figure 1) indicate enormous continental erosion.[4] I infer that this can be correlated with the erosion of land associated with the Flood's rain.[5] This implies that underlying Archean to Mesoproterozoic crystalline basement and sedimentary rocks can be correlated with early Creation Week. Archean to Mesoproterozoic geology consists predominantly of crystalline basement rocks with relatively thin sediments compared with the Neoproterozoic and Phanerozoic sedimentary cover rocks[6] (figure 2).

Key aspects of Precambrian geology

Subdivisions of the Precambrian geologic record have their own characteristics. It is interesting that there are numerous examples where uniformitarianism does not apply in the Precambrian. These include clusters of radiometric 'ages', lithologies with restricted ages (such as komatiite and banded iron formation), tectonic style (such as permobile Archean versus linear Proterozoic belts, and mountain building) and effects of fluid flow (such as mass flows, and the 'Great Unconformity').[7]

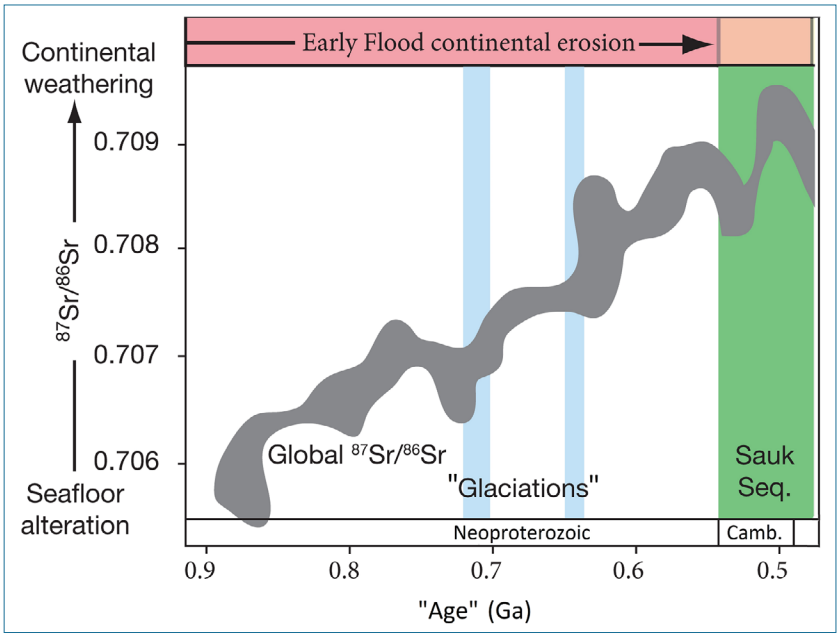

Figure 1. Strontium isotope ratio and sedimentary patterns derived from Neoproterozoic to Cambrian strata (modified from Peters and Gaines[4]). I infer that: 1) the observed increase in Neoproterozoic strontium isotope ratios $^{87}Sr/^{86}Sr$ can be explained by accelerated rates of continental erosion due to the impact of the early Flood's rain on the supercontinent and to associated Pan-African Event tectonism, and 2) the subsequent decline in $^{87}Sr/^{86}Sr$ ratio in post-Cambrian strata may be due to the globe being totally covered with ocean so that the Flood's rain no longer directly impacted the land.[7]

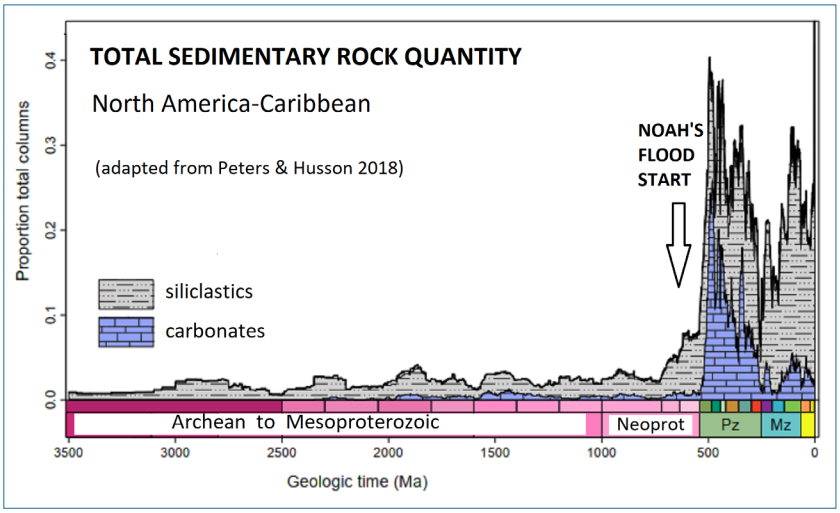

Figure 2. Note the huge increase in sedimentation beginning in the Neoproterozoic. I infer that detritus derived from enormous erosion of the craton (in particular, the Great Unconformity) is consistent with stupendous early Flood rain. (Adapted from Peters and Husson.[6])

"He set the earth on its foundations" (Psalm 104:5a ESV).

Mantle roots of Archean cratons may be considered as the foundations of the earth's crust during Creation Week (possibly on Day 1).[8] The Archean Yilgarn Craton was cratonized around 2,600 Ma (radiometric 'age') by the emplacement of extensive granitoids into pre-existing greenstone and high-grade gneissic belts.[9,10] This is considered to correspond to the Kenoran Event of North America's Superior Province.[11] Only the Archean has komatiite volcanism, and it is from a high-temperature magma.[6] Archean metamorphism is distinctively a low-pressure/high-temperature variety.[12]

The early Precambrian (Archean and Paleoproterozoic) has significant banded iron formation deposits (BIFs), whereas the late Precambrian (Neoproterozoic) BIFs have very small occurrences. All these BIFs are believed to have formed hydrothermally. Neoproterozoic iron formations are found in extensional grabens that are associated with the initial breakup of a supercontinent[13] and are commonly found in association with mafic volcanics.[14]

Geochemical data indicates that Neoproterozoic iron formations result from mixing between a hydrothermal and a detrital component.[14] I infer that the Flood's fountains, which rifted the crust open, would have provided the hydrothermal component,[15] and erosion of land caused by the Flood's rain[5] would have supplied the detrital component. The detrital component includes mixtites,[16] and these interbedded mixtites are considered to represent mass flows early in Noah's Flood.[5]

"And God said, 'Let the waters under the heavens be gathered together into one place, and let the dry land appear.' And it was so" (Genesis 1:9 ESV).

The 1,200–1,100 Ma (late Mesoproterozoic) peak in isotopic and geochemical signatures, identified in Western Australia's Albany-Fraser Orogen, North America's Grenville Province, and global data sets, signifies that the Grenvillian Event represents a unique episode in Earth history.[17] The Mesoproterozoic saw the development of what may have been the biggest mountain belt that ever existed, the eroded remnants of which are found in the Grenville Province of eastern North-America.[18] The Grenvillian Event has been

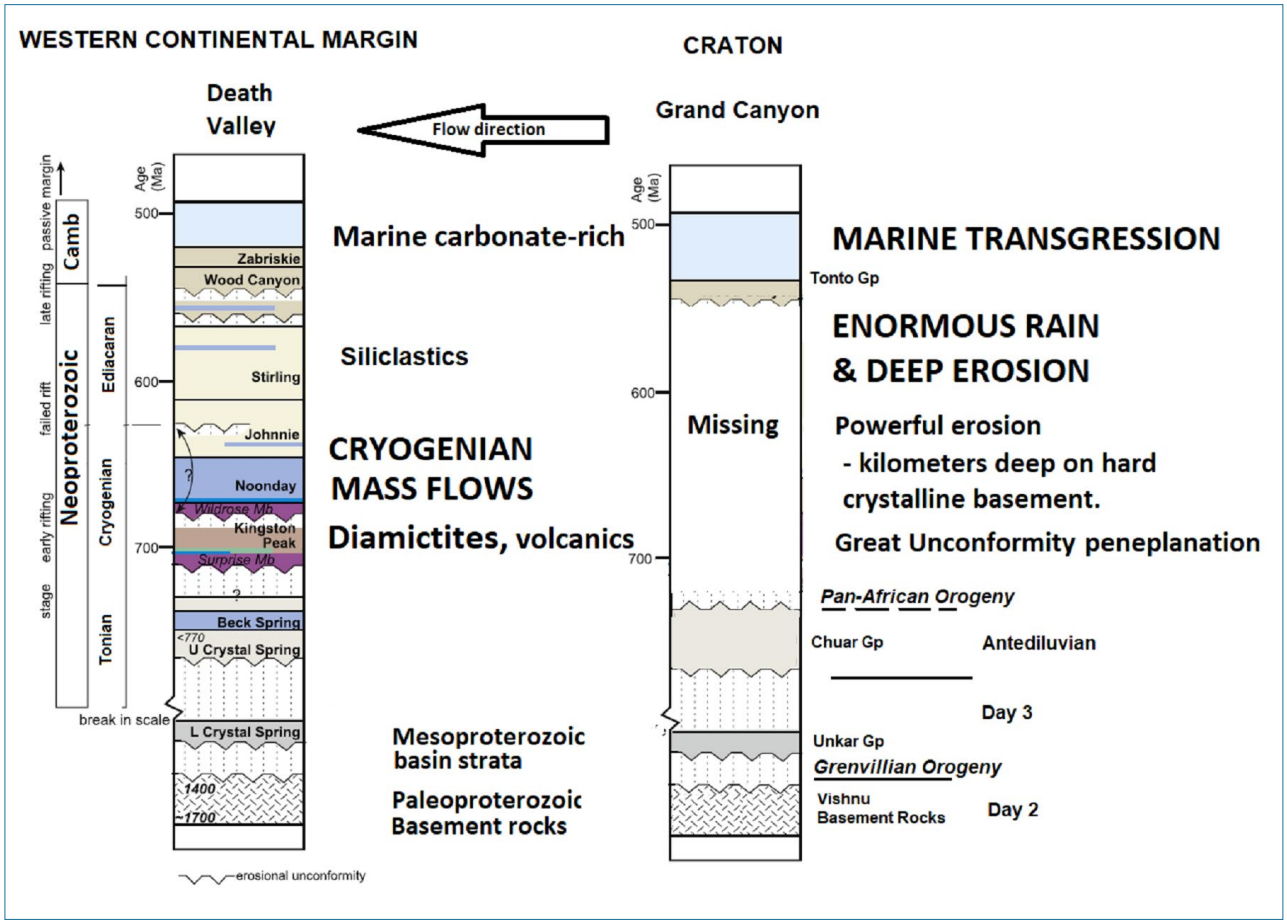

Figure 3. A depth of erosion of 3–5 km has been estimated by the Great Unconformity at the Grand Canyon.[21] This is consistent with a significant missing Neoproterozoic stratigraphic section. (Adapted from Yonkee *et al.*,[22] figure 3, p. 63.)

associated with crustal thickening. This has been correlated with the emergence of land on Day 3 of Creation Week.[7] The Grenvillian and Pan-African tectonic Events have been claimed to be the largest such events in the earth's geological history, based on detrital zircon age data derived from river sands.[19]

Early Flood processes and products

Erosional, age, tectonic, sedimentary, and paleontological discontinuity criteria have been described for the Mojave area of the USA, and the Neoproterozoic Kingston Peak Formation diamictites (figure 3 Death Valley) have been inferred as the beginning of the Flood.[20]

However, to the west, on the continental margin, there is a significant kilometres-thick section of Neoproterozoic detritus. Detrital zircons indicate transport of detritus in that direction. Thus, the erosion of the craton and transport of detritus to the western margin is consistent with the effect of the early Flood's enormous rain. Stratigraphic columns shown here adapted from Yonkee *et al.*[22]

The Mackenzie Mountains of northwest Canada provide an example where the Neoproterozoic strata on the western continental margin is over 10 km thick.[23] This huge thickness of strata is consistent with the effects of Pan-African Event break-up tectonism, active fountains of the great deep and enormous rain in the early Flood year. Discrete stages of the early Flood can be inferred from the stratigraphy of the Mackenzie Mountains.[24]

The judgment of the global Noah's Flood was primarily by water (Genesis 7; 2 Peter 3:6), whereas future global judgment is to be by fire (2 Peter 3:7). Key processes from the commencement of the Flood were fountains bursting forth and rain worldwide for 40 days and nights (Genesis 7:11–12). Geological products can be related to these key processes.

In a model for the early Flood,[25] the vicinity of the Darling Fault Zone in southwestern Australia is considered to be a region where continental crust fragmented and the fountains of the great deep broke open. Rb-Sr and Ar-Ar isotope systems, petrography, and magnetotelluric data all point to a regionally extensive and major hydrothermal event around the Darling Fault. Paleomagnetic data, mafic dykes close

to the Darling Fault, a seismic traverse across the Darling Fault Zone, and intracontinental high-temperature melting suggest a model of Neoproterozoic rifting. This may have been associated with the breakup of a supercontinent. All these pieces of evidence taken together are consistent with the Bible's account of the Flood event initiating as "all *the fountains of the great deep burst forth*" (Genesis 7:11 ESV).

The Pan-African Thermal-tectonic Event is associated with massive global rifting.[26] It has been postulated that episodic rifting events at the margins of North America between 0.8 and about 0.6 Ga record the fragmentation of a Neoproterozoic supercontinent.[26,27] This is consistent with the initial breaking open of the crust with the bursting forth of the fountains of the great deep.

Enormous continental erosion would have taken place due to the impact of the early Flood's rain on the supercontinent and to associated Pan-African Event tectonism. The observed increase in Neoproterozoic strontium isotope ratios $^{87}Sr/^{86}Sr$ (figure 1) has been explained by accelerated rates of erosion during the so-called Pan-African Event, and high crustal erosion rates have been inferred from Cambrian $^{87}Sr/^{86}Sr$ values.[28] The Cryogenian supposed 'glaciations' (figure 1) are instead considered to represent times of massive mass flows due to enormous runoff caused by the colossal rain of the early Flood Year.

The pre-Flood earth surface was destroyed (Genesis 6:13) in the sense of being totally wiped or eroded away (Matthew 24:39). Erosion such as the Great Unconformity and kilometres-deep peneplanation of the Grenville Province mountain belt to its crystalline basement roots[21] are consistent with this destruction.

The Great Unconformity is the most widely recognized and distinctive stratigraphic surface in the rock record around the world (Peters and Gaines, 2012). It is a clear case where uniformitarianism does not apply, since extensive peneplanation surfaces are not forming today, but channel erosion is occurring today. Most Flood geologists point to this widespread erosional discontinuity in the geological record, known as the Great Unconformity, as indicating the Flood's abrupt onset.[29] Continental denudation, enhanced chemical weathering, and changes in global ocean chemistry are indicated by numerous geochemical signatures associated with this boundary. Chemical indicators include Ca^{2+}, glauconite, displasive calcite, silicates, and $^{87}Sr/^{86}Sr$.[4]

Precambrian's lack of major fossil groups

The Precambrian lacks major fossil groups. This is consistent with enormous erosive action of floodwaters.[30] In particular, terrestrial vertebrates (land animals) breathe and have nostrils, and those outside the Ark were 'blotted out' early in the Flood (Genesis 6:7; 7:4, 7:23).

The pre-Flood earth surface was destroyed (Genesis 6:13) in the sense of being totally wiped or eroded away (Matthew 24:39). It is considered that immense erosion of the land and related abrasion was not favourable for preservation of most fossils. It was only once the sea transgressed the land ('Cambrian transgression'[31]) that macrofossils of the 'Cambrian Explosion' had a chance to be formed and preserved. I believe that the Archean to Mesoproterozoic times would have been too harmful to animal and plant life to be from Noah's Flood.

Energy destructive to life-forms

If the totality of the Precambrian huge-scale explosive volcanism's destruction occurred during the Flood, then how would any marine life have survived the great heat, choking ash, poisonous gases (which could have acidified the seas) and so on? The Genesis account does not record marine life entering the Ark but only saved land animals and people. The cumulative Precambrian explosive volcanism may have been too destructive for animals and plants to be preserved as fossils. When Mt Vesuvius erupted, in 79 AD, there were people who perished in a pyroclastic surge's wave of superheated gas and hot ash; their blood boiled and their skulls exploded.[32] Bones of animals and people were burned.[32] The Precambrian lacks evidence of these sorts of remains of animals and people.

Conclusion

Precambrian geology has many features in addition to explosive volcanism, and key aspects have been provided. Numerous geological data provide evidence that can help distinguish Creation Week rocks from Flood rocks. Key aspects are evident in Scripture's record of Creation Week and Noah's Flood. Processes can then be distinguished and correlated with the products (geology) in a consistent sequential manner. I infer that Precambrian explosive volcanism was mainly in the early days of Creation Week, before plants and land animals were created, followed by lesser explosive volcanism in the initial Flood, when destruction was principally by water.

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