



RESEARCH ARTICLE

Flood, Fire, and Ice: How a Global Flood started Volcanism which Sparked an Ice Age that Shaped Human Diversity

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Young-Earth creationists propose that a catastrophic global flood roughly **4,500–5,000 years ago** reshaped the planet. We argue that the rapid subduction of the oceanic crust during this event led to **runaway plate tectonics**, generating intense **volcanism** around the world. Massive volcanic eruptions lofted ash, aerosols, and gases into the stratosphere, darkening the skies and cooling the Earth – the beginning of the ice age. In Noah’s global flood model, **Noah’s ark** landed in the Middle East, and migrated south to where a warm **Fertile Crescent** allowed them to repopulate the world and eventually built the tower of Babel. However, a small group early on migrated north into harsh, snowy landscapes. Removed from the main population, these people experienced intense environmental stress and today they are known as **Neanderthals**.

Modern science confirms that volcanic eruptions release immense quantities of sulfur dioxide, heavy metals, and radionuclides that can damage DNA. For instance, Martins et al. (2012, *Environment International*) reported increased DNA damage in residents living near the Furnas volcano in the Azores. Reviews such as *Frontiers in Public Health* (2024) and *Frontiers in Environmental Science* (2022) have confirmed that exposure to volcanic gases such as radon, sulfur dioxide, and heavy metals can cause **DNA strand breaks, oxidative stress, and heritable mutations**. Research in *Frontiers in Cell and Developmental Biology* (2023) on cadmium exposure has also shown **multi-generational epigenetic effects**, confirming that heavy-metal rich volcanic emissions could affect germ cells directly.

Mutations from Volcanic Environments

The **geographic overlap** between many Neanderthal habitation zones and areas of volcanic activity is striking. For instance, parts of southern Italy, the Caucasus, and Central Europe—rich in Neanderthal remains—are also volcanically active and contain **iridium anomalies** left from heavy fallout. Studies show:

- DNA damage has been observed in humans living in volcanically active areas such as the Azores (Martins et al., 2012).
- Volcanogenic heavy metals (arsenic, cadmium, lead, mercury) are mutagenic, damaging DNA and even crossing the placenta to affect germ cells (Frontiers in Environmental Science, 2022; Frontiers in Cell and Developmental Biology, 2023). A review of human health effects notes that these metals accumulate in organisms and **cross the blood-brain barrier and placental barrier**, generating **free radicals** that **damage DNA**, proteins and lipids. Such trans-placental exposure means heavy-metal-induced mutations can reach developing germ cells. Studies in rodents show that **cadmium exposure during pregnancy** changes DNA methylation in germ cells, disrupts histone modifications, reduces sperm quality and alters hormone production. Such findings suggest that inhaling volcanic metals could accelerate mutation rates in isolated human populations.
- Radon gas, common in volcanic regions, and even in caves causes rapid point mutations and sometimes even deletions in DNA, with implications for germline integrity (Lopes et al., 2016; WHO review, 2016). An environmental health review explains that radon in volcanic settings releases **alpha particles** that **break DNA strands** in respiratory epithelial cells; inhabitants exposed to volcanic radon show increased **mutations associated with carcinogenesis**.
- A study titled: Living Under the Volcano: Effects on the Nervous System and Human Health by Alicia Navarro-Sempere adds that radon and heavy metals emitted by volcanoes are transported long distances by wind, meaning populations hundreds of kilometres away may still inhale mutagenic fumes.

These data fit the interpretation that Neanderthals, living under long-term volcanic ash clouds, accumulated mutations faster than their Fertile Crescent contemporaries.

How do we know that Neanderthals really lived under these kinds of conditions? The evidence is surprisingly strong. One of the biggest factors was volcanic activity. In fact, many Neanderthal groups lived right in the path of massive eruptions, such as the Campanian Ignimbrite (CI) eruption in southern Italy. Scientists have found widespread layers of volcanic ash, both visible and microscopic, across the regions where Neanderthals and other early hominins lived. These tiny ash particles, called *cryptotephra* (**microscopic volcanic ash**), have even been detected in caves and rock shelters that Neanderthals once used as homes (Lowe et al., 2012).

The CI super-eruption sent ash (tephra) across >2,200 km eastward into the Russian Plain and >1,000 km south as far down as the northern African coast. (Fitzsimmons et al. 2013). Smith et al. (2016) mapped ultra-distal dispersal of CI tephra (beyond ~1,500 km), showing that fine glass particles from co-ignimbrite plumes reached extremely far distances. The Magnitude of the CI eruption paper (Silleni et al. 2020) describes the CI tephra deposit as “the most widespread volcanic deposit” in Eurasia, and neanderthals were right in the midst of it. These studies confirm that volcanic ash from CI was indeed deposited over broad regions that overlap known Neanderthal sites. Other such examples of ash deposits exist all over as well, we will now review some of these regions that also link not only Neanderthal, but other early hominins like erectus and heidelbergensis who had the same fate as they did.

Discovery of cryptotephra at Arma Veirana & Riparo Bombrini, Italy.

A recent paper reports **cryptotephra layers** found in **Middle–Upper Paleolithic** layers at Arma Veirana and Riparo Bombrini (Italy), linking them to broader geographic tephra correlations. (Discovery of cryptotephra at Middle–Upper Paleolithic sites, Arma Veirana and Riparo Bombrini, 2020).

CI-Y5 cryptotephra in the Lower Danube / Balkan region

In *Neanderthals on the Lower Danube* (Borić et al., 2022), the authors note the presence of **CI-Y5 cryptotephra** in a cave site along the Danube, used by hominins. This acts as a chronostratigraphic marker linking volcanic fallout to the occupation layers. (Borić et al. 2022).

Revised AMS and tephra chronology in Spain

Cullen et al. (2021) presented a revised AMS and tephra chronology for a Late Middle Palaeolithic Spanish site, showing volcanic ash in the stratigraphy and aiding in tephrostratigraphic correlation. While not always explicitly “cryptotephra,” the identification of fine volcanic ash layers in such Iberian contexts suggests that microscopic ash was incorporated in occupation layers (Cullen et al. 2021). This study validates that even in Spain, Neanderthals who lived there were also affected. Most of the ash cloud from Italy eruptions would have blown to the north and east, not towards Spain.

Review of cryptotephra methods and occurrences in archaeology

In *Cryptotephra: the revolution in correlation and precision* (Davies et al., 2015), the authors survey many instances where cryptotephra has been detected even in archaeological contexts. Many of these cases overlap periods with Neanderthal occupation, emphasizing how cryptotephra can link volcanism with human habitation layers (Davies et al. 2015).



Figure 1. Red Dots are known neanderthal locations and the gray triangles are volcanic ash locations.

Volcanoes are also capable of releasing iridium, as evidenced by hot-spot systems like Kilauea and Piton de la Fournaise (Olmez 1986; Zoller et al. 1983; Finnegan et al. 1988; Toutain et al. 1989). **Koeberl (1989)**: found iridium enrichment in volcanic dust from blue ice fields. This shows that volcanic dust can carry iridium in measurable amounts under some conditions. **Lindström et al. (2021)**: traced volcanic emissions from Central Atlantic magmatism and found **mercury and iridium anomalies** in associated sediments. This evidence then provides a plausible mechanism for iridium fallout in volcanic ash clouds so we can look at locations where neanderthals lived and see if we find any iridium anomalies. loe. And behold we find such examples as well.

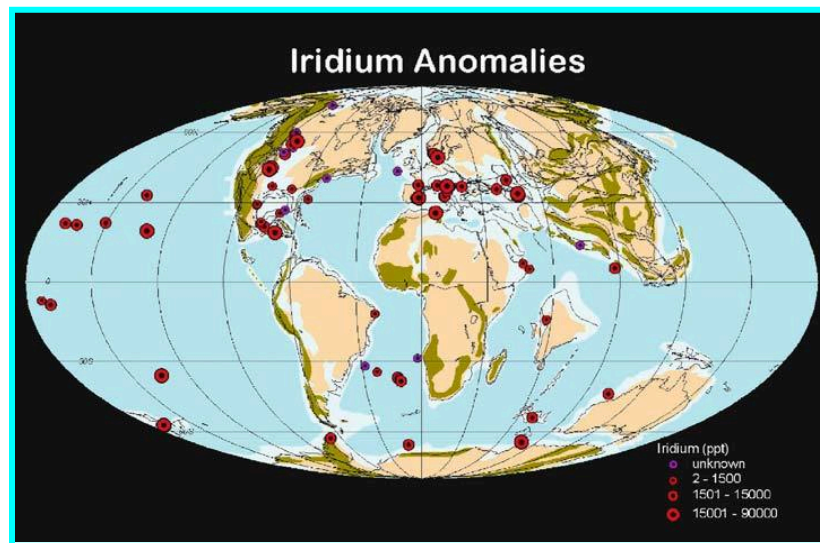


Figure 2 shows iridium anomalies exist exactly where neanderthals lived and congregated. Another piece of evidence that shows they were under volcanic conditions that would have led to a rapid mutation rate and eventual extinction.

Volcanic iridium emission supports the hypothesis that this fallout evidence could have been part of the volcanic debris environment experienced by those populations. While we know neanderthal lived during an ice age, tying the volcanic nature into the model is what best explains early small population groups that were hyper-mutating and why it was so different even for different populations in different geographical locations.

All of this evidence from the coast of Spain to the east passed china we find volcanic debris in areas where Neanderthal and Denisovan lived. This is strong evidence for my proposal that volcanic debris being a top contender as to why these small people groups were hyper mutating. Stacking that with drinking water from surrounding rocks high in radioactive elements and the fact these people groups were often forced to hunt and cook their meat for calories also leaves the possible glycation damage as a possibility for adding even more mutations compounding the issue.

While we have not tested the biological germline effects yet of this type of diet, it is biologically plausible that eating highly glycated foods could contribute to germline mutations, particularly in males, although direct causal evidence in humans is still being studied. What we do know is that high intake of these foods increases the systemic burden of Advanced Glycation End-products (AGEs), which are known to cause DNA damage through oxidative stress.

Now let's add that radiation, chemicals, and harsh conditions are known to elevate mutation frequencies (Rodarte-Ramón & Mortimer (1972); Sankaranarayanan, 2006) and as Budinsky 2025 points out in his article titled; The Genetics of Neanderthals Fits the Bible, Not Deep Time - SFT 2025, that *“Environmental stressors: caves, low UV exposure and vitamin D deficiency, radiation mutations, cave-borne chemicals and post-Flood conditions amplify this.”* He also points out that hypermutation is documented today – Families show 2–7× higher germline mutation rates due to DNA-repair defects or environmental exposures (Kaplanis et al., 2022). This provides a direct mechanism for accelerated Neanderthal mutation loads. These bursts are not hypothetical—they are empirically documented.

Mutation Rates: Not All the Same

Evolutionary dating methods assume all humans mutate at the same speed. They take evolutionary assumptions of common ancestry and build a mutation rate around the fossil evidence that is dated using radiometric dating. This method is known as the phylogenetic mutation rate, it relies heavily on assumptions. A key assumption behind this method is that, on average, mutations accumulate at a steady pace (sometimes referred to as a “molecular clock”). Another assumption is that many of these mutations are neutral—that is, they do not strongly affect survival or reproduction—so they can provide a kind of baseline rate of change across populations. Yet observed germline pedigree mutation rate studies show otherwise:

- Parsons et al. (1997, *Nature Genetics*) found a very high mtDNA substitution rate in the general population — **1 mutation every 17 generations**.
- The same study found much slower rates among Amish families — **1 mutation every 80 generations**.

A high observed substitution rate in the human mitochondrial DNA control region

	No. of families	Sample type	Country of origin	Comments	Point mut. observed*	Total no. of meioses
Present study	33	blood	Sweden	Families selected for different genetics studies No classical mt diseases	0	228
Howell <i>et al.</i>	4	blood + fibroblasts	England	Four families with a mt disease (LHON)	1	81
Soodyall <i>et al.</i>	5	blood	Tristan da Cunha	A single island population with 5 lineages of mixed ancestry	0	108
Parsons <i>et al.</i>	73	blood	USA	Samples from Natl. Inst. of Health and Mental Health Mixed ancestry	4	121
Parsons <i>et al.</i>	5	blood	England	Samples from Forensic Science Centre	1	32
Parsons <i>et al.</i>	40	cell lines	USA	Reformed Amish families	0	80
Parsons <i>et al.</i>	16	cell lines	USA	Samples from the Centre d'Etude Polymorphisme Humaine, Pedigrees from Utah	1	94

Sample source	mtDNA lineages	Generations	Mutations	Rate per generation	Rate pooled by type
AFDIL family references	73	121	7	0.0578 1/17	blood samples 0.052 1/19
'Oxford' families	5	32	1	0.029 1/32	
Amish families	40	80	1	0.013 1/80	cell lines 0.011 1/87
CEPH families	16	94	1	0.011 1/94	

Figure 3. Parsons *et al* 1997 showing the slow mutation rate of Amish families.

This demonstrates that **mutation rates vary dramatically between populations**, undermining the assumption that Neanderthals look “ancient” simply because they have more mutations.

Neanderthals as a Post-Flood People Group

Archaeological studies support that they lived in **very small groups of 10–20 individuals**, far below modern human tribal sizes. For example:

- *Science Magazine* (2003, “Rethinking Neanderthals”) noted that Paleoanthropologists generally agree Neanderthals lived in groups of **10 to 15 including children**.
- *Anthropology News* (2021, “Ten Things Archaeology Tells Us about Neanderthals”) reported that high-resolution sites confirm groups “**likely contained no more than 20 individuals.**”

Such small numbers in harsh lands made them highly vulnerable to genetic drift, gene flow, inbreeding, and many different environmental stresses.

The Limits of Small Populations

One of the strongest pieces of supporting evidence comes from **population modeling**. Krist Vaesen and colleagues (2019, *PLOS One*) ran simulations of small Neanderthal populations and found that even without competition from *Homo sapiens*, extinction was inevitable in less than **10,000 years**. Smaller starting populations (10–50 individuals) often collapsed in **500–2,000 years**.

Demographic modelling shows rapid extinction of small populations

Vaesen et al. (2019) simulated Neanderthal populations of 50–1,000 individuals and assessed the effects of **inbreeding, demographic fluctuations and Allee effects**. The authors concluded that even if Neanderthals were identical to modern humans in their cognitive, social and cultural traits, **small population size alone** posed a considerable risk of extinction. Their results showed that reproduction-related Allee effects (e.g., when **25 % or fewer females reproduced**) could drive populations of up to **1,000 individuals** extinct; when combined with stochastic fluctuations, **all modelled populations** went extinct within **10,000 years**.

The authors concluded: *“Our results indicate that the disappearance of Neanderthals might have resided in the smallness of their population(s) alone.”*

◆ Estimated Average Time to Extinction of Neanderthals (Based on Simulation Models)		
Population Size (N ₀)	Extinction Trigger	Average Extinction Time (Years)
10–15	Inbreeding alone	< 500 years
25–50	Inbreeding alone	~500–1,000 years
50–100	Inbreeding alone	< 2,000 years
500–1,000	Inbreeding + Allee effects	~2,000–4,000 years
5,000	Inbreeding + stochasticity	~4,000–6,000 years

Figure 4. showing how little time neanderthal, denisovan, heidelbergensis and erectus could have possibly lived based on population sizes.

It does not end there. Degioanni et al. (2019, *PLOS One*) explored how small changes in survival and fertility could lead to extinction. They found that reducing young infant survival by only **0.4 %** yields extinction in **~10,000 years**. A **1 % reduction** in survival leads to extinction in **about 6,000 years**, and a **1.5 % reduction** causes extinction in **less than 2,000 years**. Slight decreases in the fertility rate of first-time mothers also caused the population to **drop to zero** within **4,000–10,000 years**. Degioanni et al. confirmed Vaesin et al and showed that even a low **0.4% annual reduction in fertility** among young Neanderthal women would have caused extinction within **10,000 years**.

Critics

Critics have stated that neanderthals and other early hominins did not exclusively live in caves, so it is not a viable argument for hyper-mutation. This fact removes the fact that they did not need to live full time in caves to be affected by them. They could have chosen to live in them just in winter which is still enough time to have harmful effects. This also removes the fact that they would still have been consuming water that is flowing over these rocks and possibly even well water which sources would have all been contaminated. The evidence to back this claim up is that when we overlay maps of known radioactive exposed rocks, they line up perfectly where early hominins lived.



Image 1. This image from AAAS Science shows the location of hominin skull discoveries in Africa.

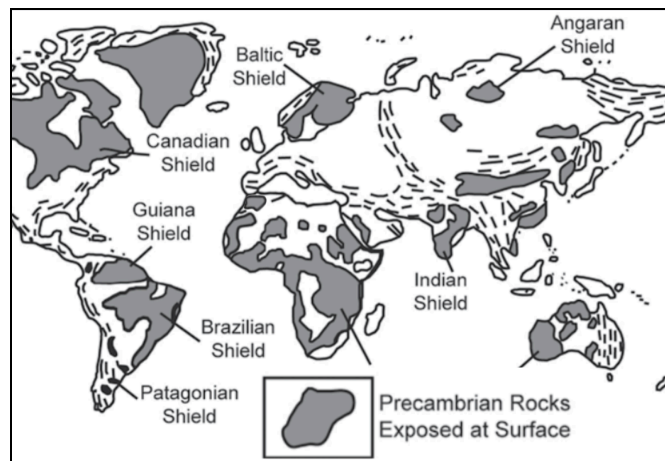


Image 2. This image shows exposed precambrian rocks. The most common Precambrian rock types are metamorphic rocks such as gneiss and schist, and igneous rocks including granite, granodiorite, and gabbro. These types of rocks have higher radioactivity. Image source;

<https://project.geo.msu.edu/geogmich/precambrian.html>

The following image is an overlay of the two images to show you that ALL of the known hominins lived in these locations. Validating Buskinsky 2025 hypothesis and model for early hominin hyper-mutation via exposure to more radioactive rocks.

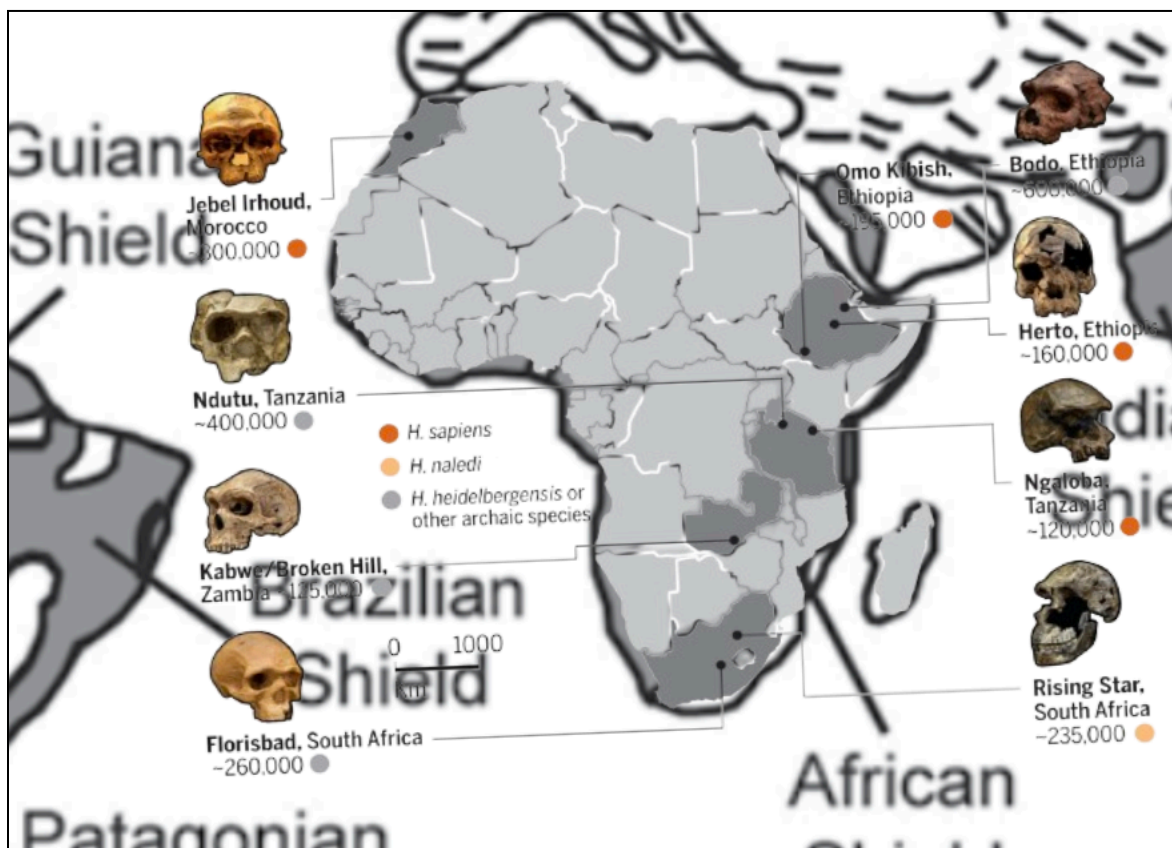


Image 3. Known hominin fossil skulls overlaid image 1 over image 2 to show that all ancient man lived on exposed radiogenetic pre-cambrian rocks.

Online critics have also said that neanderthals probably just lived in larger population sizes so this would not have been a problem. Experts would disagree however.

A Smithsonian review notes that **paleoanthropologists generally agree** Neanderthals travelled in groups of about **10 to 15 individuals**, counting children; the evidence is based on limited skeletal remains and the small size of rock shelters (Rethinking Neanderthals, Smithsonian magazine 2003). The article points out that top predators such as lions and wolves also live in small groups.

Anthropology News summarises high-resolution archaeological sites and concludes that **Neanderthal groups likely contained no more than 20 individuals** (Anthropology-news, Ten Things Archaeology Tells Us about Neanderthals 2021) and a reconstruction of Neanderthal family life states that they travelled in groups **smaller than 30**, most likely around **10–15 people including children**.

Archaeological evidence indicates that Neanderthals rarely, if ever, lived in large groups. These studies confirm that Neanderthals could **not have persisted for even 10,000 years**. So how could they have possibly lived for **400,000 years** as often claimed?

These small bands imply **low population density** across Europe and western Asia, causing **inbreeding** and **genetic drift** and **gene flow**. Under a Young-Earth timeline, Neanderthals and Denisovan and even Erectus were descendants of people who migrated from the Middle East and became small tribal populations with little population growth with hard living conditions during the harsh volcanic winter. These small groups inbreeding often would amplify the effects of environmental mutagens.

What would we expect to see if this was true and a few eventually migrated back to the larger population in the Middle East? Well they would have bred with them of course since they were not a different species and they would have had viable offspring and we would expect this to have happened in the middle east where we say Babel was since that is where the majority of the population existed and neanderthal after many generations could have eventually migrated back to this area. Low and behind this is exactly what we find.

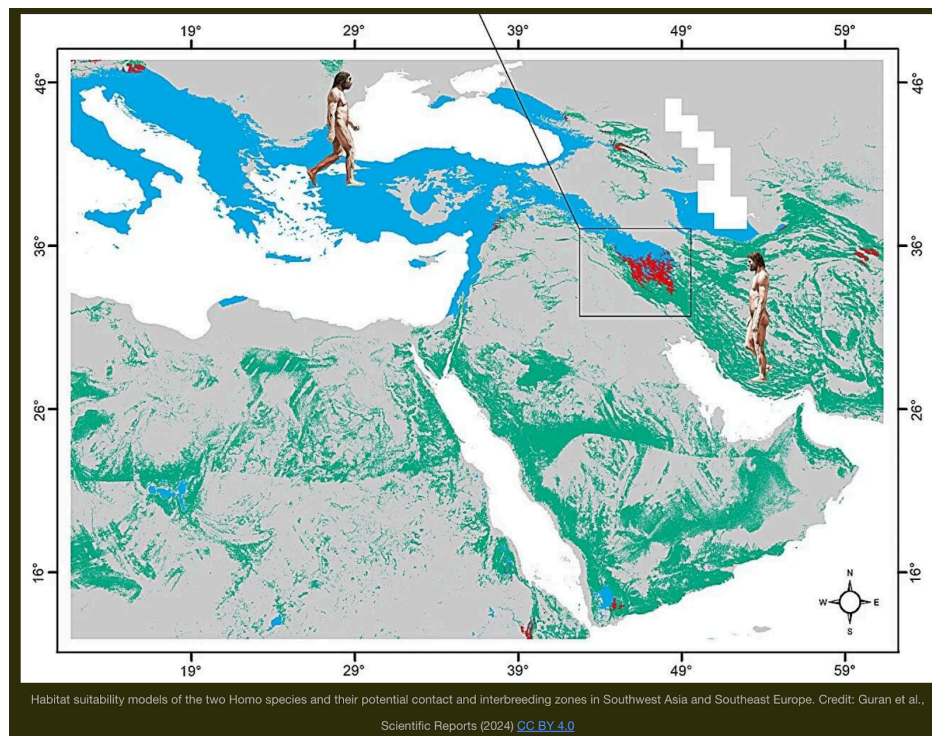
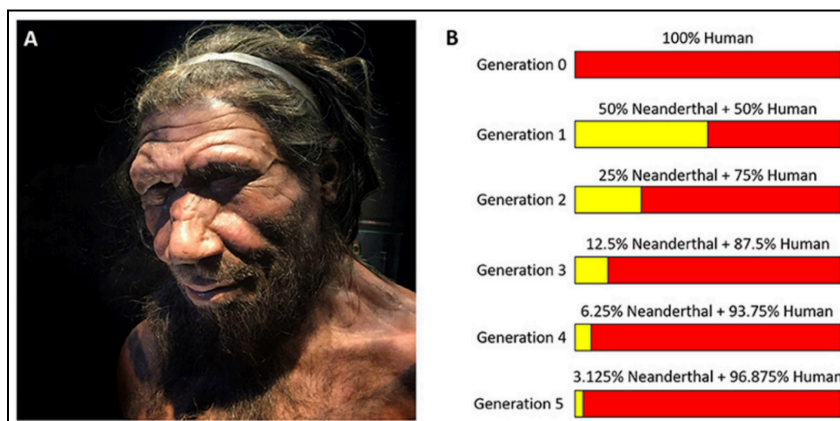


Image 4. This image really isolates the region that neanderthal and homo-sapiens re-populated. Image source: <https://www.nature.com/articles/s41598-024-70206-y>

Neanderthal DNA in Modern Humans

Another puzzle is the presence of Neanderthal DNA in all modern humans. Early evolutionary models predicted that Africans would have **no Neanderthal DNA** since no Neanderthal fossils have **never been discovered in Africa**. Yet Princeton University researchers (2020) demonstrated that Africans also carry Neanderthal ancestry. This all fits better with a post-Flood, single-origin human model.

Further, Kelley Harris & Rasmus Nielsen (2016, *Genetics*) showed that Neanderthal DNA in modern humans declined sharply within the first **10–20 generations** (roughly 200–600 years) after interbreeding, before stabilizing at the low levels we see today.



Conclusion

The reality is, we do not have any germline pedigree mutation rate studies for homo erectus, denisovan, heidelbergensis or neanderthal. But since we know they could not have existed for even over 2,000 years based on their known population sizes, then our model better explains their high level up mutations based on hypermutation. The exact reason for their rapid mutation rate is still speculative but theories like this help broaden our view on what could have caused this artifact.

When combining the effects of volcanism, small independent groups, accelerated mutations, and rapid genetic drift and gene flow, the story of the Neanderthals and other archaic hominins aligns neatly with a post-Flood biblical framework. Neanderthals were not a separate species lasting hundreds of thousands of years but a short-lived branch of humanity, living under extreme conditions, whose legacy remains only as a small trace in our genomes.

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