

The Mabul, the Mammoth, and the Mystery



Pfizenmayer and the Siberian Mammoth

In the late spring of 1902, after a grueling four-month journey, Eugene Pfizenmayer and a team of scientist-adventurers made their way toward a freshly eroded ridge about 100 feet above Siberia's Berezovka River, just inside the Arctic Circle. The expedition was so close to their prize that they could smell success — literally. The air was filled with a stench that reminded Pfizenmayer of a badly kept stable blended with freshly slaughtered animals. But the smell was like perfume to him. It was the culmination of a lifelong dream.

For centuries, stories had been told of frozen carcasses of huge, elephant-like animals called mammoths trapped in the tundra of northeastern Siberia. These mammoths, with curved tusks sometimes more than thirteen feet long, were so fresh-looking that dogs ate their meat, and the locals believed that live specimens still roamed somewhere nearby.

The stories weren't merely rumors. Between around 1660 and 1915, a lucrative trade in mammoth ivory prospered over a wide geographical region. Tens of thousands of mammoth tusks — more than half a million tons worth! — were unearthed and exported.

As a young man, Pfizenmayer read with awe the 1846 account by a surveyor named Benkendorf, who had camped along Siberia's Indigirka River. The spring thaw and unusually heavy rains caused the swollen river to erode a new channel. Benkendorf noticed a large object bobbing slowly in the water — “a colossal elephant's head, armed with mighty tusks, with its long trunk moving in an unearthly manner.” Benkendorf and his men tried to pull the mammoth to shore with ropes and chains but soon realized that its hind legs were frozen in the river bottom in a standing position.

Twenty-four hours later, the river bottom thawed and eroded, freeing the mammoth. A team of fifty men and their horses pulled it onto dry land, twelve feet from shore. The thirteen-foot-tall, fifteen-foot-long beast was fat and perfectly preserved. Its “widely opened eyes gave the animal an appearance of life, as though it might move in a moment and destroy with a roar.” They removed the tusks and opened its full stomach containing “young shoots of the fir and pine; and a quantity of young fir cones, also in a chewed state ...” Hours later and without warning, the riverbank collapsed, and the mammoth was carried off toward the Arctic Ocean, never to be seen again.

Now, fifty-five years later, Pfizenmayer was on the verge of finding his own mammoth.

As he and his team rounded the bend, they saw it — first, the towering skull partially covered in flesh, then the brown, shaggy, wirelike hair, some of it twenty inches long. The creature was in an eerie standing position, although its back was humped and its hind legs were rotated forward at the hips into an almost horizontal position. This strange, contorted position was further exaggerated by its raised and spread front legs.

Somehow, Pfizenmayer and his team dislodged the carcass and, for much of the next year, transported it 3,700 miles by sled during a bitterly cold Siberian fall and winter to St. Petersburg, Russia. There, it would become the center attraction in one of the most famous museum exhibits of its time.

But the Berezovka mammoth, as it would become known, would be more than a famous tourist attraction. It would become part of a scientific mystery that persists to this day.

■ The Mystery of the Mammoths

Scientists estimate that millions of mammoths once roamed the grassy steppes of Siberia, Alaska, the Yukon, southern North America, and Europe. Some put the number at ten million in Siberia alone. Then, suddenly, they all disappeared, along with dozens of other large mammals and birds.

“Why did mammoths disappear from the Earth?” one scientist asked. “This question remains one of the greatest unsolved mysteries of all time.”

Another said, “Efforts to understand the mysteries associated with the woolly mammoth have led to an abundance of hypotheses — all with ‘mammoth’ problems.”

A handful of scientists believe they have unraveled the mystery. They claim that the key to understanding the mammoth’s disappearance is the Mabul.

■ The Fountains of the Deep

The Mabul was much more than a big rainstorm. Not only did the “*arubos hashamayim*, windows of heaven” open, but the “*ma’ayanos t’hom rabbah*, fountains of the great deep” also burst through the Earth’s surface (*Bereishis* 7:11).

According to the Malbim, the opening of the “*ma’ayanos t’hom rabbah*” included earthquakes, underground volcanic activity, and eruptions of superheated water on a scale unlike anything the world had ever witnessed. According to Rav Avigdor Miller (*The Beginning*), as well, the “fountains of the deep” referred to a “violent explosion of superheated subterranean materials” hidden in the Earth that caused “innumerable volcanos to go into action on a scale unknown today.” Moreover, he adds, “Volcanos erupted all over the globe. At no time in the subsequent history of the earth could such a vast number of volcanos have been created, and no phenomenon even remotely similar has ever been witnessed. The thousands of burnt-out craters testify to the Great Flood.” These eruptions not only took place above ground, Rav Miller states, “Earthquakes split apart the sea bottom, and volcanos erupted from under the waters. Great masses of fishes were suddenly imprisoned in hot silt or lava and remained in a petrified state.” When the Gemara describes the waters as boiling and viscous (*Sanhedrin* 108b), Rav Miller suggests it includes volcanic lava (as quoted in ArtScroll’s Gemara commentary, *ibid.*).

To begin to imagine what that means, consider the eruption of Mount St. Helens in Washington State in 1980. The initial blast alone released twenty-four megatons of energy! That’s 1,600 times

the scale of the atomic bomb dropped on Hiroshima! Ground temperatures rose as high as 1,300 degrees Fahrenheit. Rivers as far as forty-five miles away became so hot that salmon leaped out onto the banks. The eruption sent a boiling plume of debris and ash into the sky that rose fifteen miles high (over 60,000 feet), into the stratosphere. Volcanic ash crossed the United States in three days and circled the globe in two weeks.

Geologists have created the Volcanic Explosivity Index to measure eruptions. The scale goes from zero, a relatively tiny eruption, all the way up to an eight, a mega-colossal eruption with planet-altering consequences. For reference, the Mount St. Helens eruption was classified “only” as a Level-5 eruption.

What does a Level-6 eruption look like?

■ **Krakatoa, East of Java**

Perhaps the best-known Level-6 eruption took place in 1883.

The volcano was located on Krakatoa, an island in Indonesia, and exploded with a force of 200 megatons! This epic explosion generated the loudest sound in recorded history, shattering sailors’ eardrums forty miles from the blast. Almost the entire island was blown apart. The blast was so powerful that it sent coral reefs on the ocean floor hurtling toward land as if they were asteroids. The blast generated 100-foot-high tsunamis that ravaged the rest of Indonesia. Everybody on the nearby island of Sebesi was killed. In total, about 120,000 people on the surrounding islands died.

And that was not all. The massive amount of ash pumped into the atmosphere blocked out the sun, causing global temperatures to drop by 34 degrees Fahrenheit the following year! Temperatures did not return to normal for another four years!



Krakatoa Today

■ The Year Without Summer

What does a Level-7 on the scale look like? One took place in 1815 on the island of Tambora (also in Indonesia).

All life on the island was obliterated. The explosion shot 400 million tons of volcanic material into the atmosphere atop a plume of ash some thirty miles high! So much material was hurled into the sky that it darkened the sun and spread across the globe, plunging the entire planet into a year-long winter and causing the following year, 1816, to become known as “the year without a summer.”

The ash cloud cooled the planet so much that it snowed in New York and Maine in the middle of June!

■ The Supervolcano

What would happen if a Level-8 supervolcano exploded today? The most likely culprit would be the Yellowstone supervolcano in the United States.

Yellowstone Park is known for its beautiful landscapes and tranquil geysers, but the entire park is hiding a volcano of gargantuan proportions beneath its visitors’ feet. This volcano system contains enough magma to fill the entire Grand Canyon eleven times over!

What would happen if it blew?

A Yellowstone super-eruption could be more than 6,000 times the size of Mount St. Helens! Lava would inundate everything within a radius of forty miles. The states of Wyoming, Colorado, Montana, Idaho, and Utah would be largely buried beneath ten feet of ash. Within 650 miles of the blast, 90 percent of people would be killed — some ten million. Overall, it’s estimated that three-quarters of the U.S. would be plunged into a post-apocalyptic nightmare. And that would just be for starters. Over the coming days, ash would drift across the Atlantic until it also coated Europe.

Of course, Hashem controls everything so we shouldn’t needlessly panic, but thinking about this should remind us to be thankful for things we take for granted, such as the fact that each day the sun rises and the sun sets, that we have a sky over our head, and earth under our feet. (Think about that the next time you say the *berachah* of “*Roka ha’aretz al hamayim* — Who spreads the earth over the waters.”)



The Yellowstone Supervolcano

■ Catastrophic Plate Tectonics

All of the above were individual eruptions. Imagine dozens — maybe hundreds... thousands... of Mount St. Helens-Krakatoa-Tambora-Yellowstone eruptions across much of the globe, continually over 150 days! That's a picture of the Mabul.

According to some scientific opinions, volcanic activity was only part of the global cataclysm. And it wasn't necessarily the *cause* but the *result* of a much greater phenomenon — a massive shifting of the tectonic plates.

The Earth's outer crust, on which all the planet's land and water sit, consists of large, moving pieces of solid rock called "plates." Under these plates is a weaker layer of partially melted rock.

The plates are constantly moving over this

weaker layer. When they crash into or slide under each other (a process called subduction), they can trigger earthquakes, volcanic eruptions, and tsunamis.

The most powerful earthquake ever recorded in Japan, and the fourth largest in history, was a magnitude 9.1 earthquake that occurred in 2011. This earthquake was caused by an undersea movement of tectonic plates about forty-five miles east of the Japanese coast. The sea bottom rose about twenty-three feet, and the resulting earthquake triggered a devastating tsunami that rose 133 feet above sea level and traveled inland for six miles.

During the Mabul, the world's massive oceanic plates may have subducted under the land masses, triggering earthquakes and volcanic eruptions and generating cycles of tsunamis that brought megatons of water and sediment onto land, wiping out every living creature in their paths and burying them in the muddy layers. Although the *pesukim* describe how the water levels rose until the mountains were covered, this does not preclude tsunamis from having been a contributing factor to the destruction. The cycles of tsunamis could have contributed to the increasing water levels, with each wave pushing further inland, and over time, the cumulative effect may have resulted in the rising and eventual sustained level of water described in the *pesukim*.

■ A Cosmic Cataclysm

According to Chazal, the Mabul may have been not only a global catastrophe but also cosmic. The Tanna Rebbi Yehoshua stated that the stars and planets stopped functioning normally during the Mabul. This made it cosmic in the most literal sense (*Bereishis Rabbah* 25:2). Rebbi Eliezer disagreed. In his opinion, the stars continued functioning normally, but their effects were no longer detectable on Earth; only from the perspective of life on Earth did the stars stop functioning normally.*

The point here is not necessarily to identify the mechanisms that comprised the Mabul but to convey that it was a one-of-a-kind event of such terrifying, awe-inspiring power that nothing can compare to it. It was a global event of cataclysmic proportions unparalleled in history.

And this leads us back to our mammoths (which, by the way, the Malbim also mentions in his commentary to *Bereishis* 8:22).

■ Unbiased Science

Most scientists today are fully invested in a secular-atheistic mindset that colors many of their conclusions. Science operates based on axioms and educated guesses, which ideally should be abandoned if they don't stand the test of time. In reality, though, axioms often persist long after they remain unproven or are even disproven. The reasons vary, but all scientists have their biases (some conscious, some not) and belong to an academic world that would punish them with the loss of standing and even their jobs if they interpreted evidence in ways that radically overturned the academic orthodoxy, i.e., the axioms upon which their field of study stands.

However, some scientists are more open-minded. When it comes to our subject, they maintain that the evidence points to a global flood that rearranged and shaped our world rapidly in a matter of months. These are scientists with advanced degrees who base their conclusions on hard scientific evidence.

One of the fruits of their research is a scientific solution to the mystery of the mammoths. There's more than one theory in this arena, but let's start with an idea commonly called the "Quick Freeze."

* Perhaps the latter opinion can be understood in light of the Malbim's comment that the Earth tilted on its axis to its current 23.5 degree angle; more on that below.

■ The Quick Freeze

In this theory, the “*ma’ayanot t’hom rabbah*, fountains of the great deep,” consisted of superheated water from deep beneath the Earth. This water, which was about half the water now in our oceans, was originally in interconnected subterranean chambers miles below the Earth’s surface. On the day of the Mabul, Hashem caused these chambers to collapse, forcing the water to explode upward violently with an energy release — according to the calculations of one physicist — exceeding the explosion of ten billion hydrogen bombs!

These fountains shot out far above the earth. Just the spray alone from these enormous fountains produced torrential rains such as the world had never experienced before or ever would. Some of the water jetted so high that it reached the stratosphere where the average temperature is -60°F. There it froze into supercooled ice crystals and then fell back to Earth.

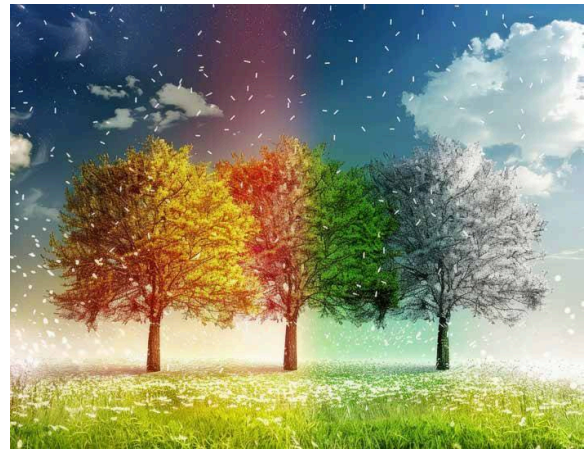
This caused a gigantic “hailstorm” where tons of cold, muddy ice crystals fell onto grazing animals like the mammoths, quickly suffocating them, burying them, and then freezing them where they stood. Evidence of their sudden death is suggested by the unchewed food found between their teeth and the well-preserved state of their stomach contents.

■ Pole Shift

A related mystery is how millions of mammoths thrived in areas that are barely habitable today. A single large woolly mammoth would require 400 to 650 pounds of food per day as well as thirty-five to fifty gallons of water daily. Today, Siberia is a barren, blizzard-scourged wilderness. How could the animals have endured the extremely cold winters? What would they have eaten? Where would they have found enough water to drink? The only type of environment able to sustain the enormous appetites of so many herds is in a warm climate with lush vegetation.

The Quick Freeze theory addresses that. There is evidence that the weather around the globe before the Mabul was uniform and mild, even tropical from north to south. (Various *midrashim*, as well as the Malbim, made this assertion long before we discovered this evidence.) Indeed, besides the mammoths, scientists have found the remains of warm-weather animals like hippopotamuses under the Siberian permafrost. In the Quick Freeze scenario, all the animals and vegetation were grazing peacefully in a temperate environment when suddenly the giant hailstorms descended, instantly dropping the temperature to well below zero and freezing them in their place. It happened so fast that they died before they could even swallow the food in their mouths.

Some suggest that the Earth shifted on its axis during the Mabul. Today, our planet is tilted at an angle of 23.5 degrees. This gives us our seasons — winter, spring, summer, and fall. (See the Malbim to *Bereishis* 8:22.) The theory goes that as the fountains of the deep were erupting, the Earth slowly rolled. Originally, places like Siberia and Alaska were at temperate latitudes (similar to the north-central United States today). The shift moved them to their present positions and sent the mammoths to their icy graves.



■ Mild Ice Age Theory

Not all these scientists agree with the Quick Freeze. According to this second line of thought, the mammoths died hundreds of years *after* the Mabul — but their demise was also part of the dynamics set in motion by the Mabul.

This approach assumes two factors. First, that the oceans were much warmer than they are today. This would have been the natural result of the worldwide volcanic eruptions, especially underwater ones. Today, the average water temperature in the Arctic is about 30 degrees Fahrenheit, but it's estimated that volcanic activity may have raised it to 80 degrees or more, which is enough for a pleasant swim.

Although the oceans would be warm, the continents would be cool due to all the volcanic ash and dust in the stratosphere blocking the sun. This would have made regions like Siberia livable and even potentially lush with vegetation for centuries afterward. This could have produced an abundance of grassy feeding grounds for the mammoths. These animals would have been descendants of the elephant-like ancestors on the *Teivah*. As the offspring of the first pair spread from the mountains of Ararat, some may have migrated to Africa and Asia, while others headed north to Siberia. With warm winds off the warm Arctic Ocean producing a tolerable climate and rich grassland, the mammoth population may have grown to as much as ten million. (Based on African elephant populations today, which can double in size in ten to twenty-five years, it's been estimated that there could have been a billion mammoths in only 300 years! Even with predation and less-than-ideal environments, there could easily have been millions of mammoths in Siberia within centuries after the Mabul.)

Then the climate began to change. This took place gradually as the oceans cooled. The once-temperate climate turned increasingly inhospitable. The Ice Age (the one and only one) set in. The Siberian winters became even colder than they are today. Windstorms and blowing dust covered the land. Many mammoths and other animals died, but others found pockets of livable areas where glaciers never reached. (Geological evidence points to the fact that some northern areas, such as parts of Alaska, did not have glaciers. This is a problem for secular Ice Age computer models, which indicate that all northern areas would have been covered in glacial ice, not just parts. Yet the evidence says otherwise.)

However, the climate continued to change for the worse, producing fierce storms even in places that had been more or less habitable. The livable areas kept shrinking, yet the surviving mammoths were trapped. At the same time, enormous dust storms arose. These would have been similar to the Dust Bowl era in the Midwest United States in the 1930s, when intense storms buried houses and barns. Cattle suffocated from the dust in a matter of hours. The same would have happened to the mammoths. Some may even have died standing, braced by the dust around them. Indeed, this would explain the Berezovka mammoth. Inside its carcass, scientists found silt and mud, suggesting that it had suffocated in a dust storm.

■ The Awesome Mabul

Going into the scientific details of these and similar theories is beyond the scope of this article. So, too, are the reasons why those who advocate the post-Mabul mammoth demise reject the Quick Freeze theory and vice versa. Indeed, the purpose here is not to promote scientific theories at all. Rather it is to illustrate the reality of the Mabul and help us draw better mental pictures of what it actually was.

Picture Noah and all the animals in the *Teivah* floating on a world completely covered with water. A world that was completely dark twenty-four hours a day, seven days a week, for an entire year, as Rashi says (*Bereishis* 8:22). A world where fountains of water from miles underground jetted out from ruptures in the Earth's surface miles high into the stratosphere. A world where volcanoes the size of Mount St. Helens and larger erupted across the globe and under the water. A world where the tectonic plates suddenly and violently crashed into each other, broke apart, and shifted hundreds of miles, causing earthquakes and tsunamis of a magnitude unlike anything ever witnessed. A world where mountains the size of Everest rose from the oceans (see *Ha'amek Davar*, *Bereishis* 7:19). (Note: Fossilized sea creatures like clams have been found on Everest and at the top of other mountains.)

The Mabul story consists of only a few *pesukim*, and it's usually something we read quickly. Hopefully, this short article has helped us create a better picture of this absolutely unique historic event and the awesome power of *HaKeil*, *HaGadol*, *HaGibor*, *v'haNorah* Who orchestrated it.

■ Volcanos and the Mabul

Although one might object to my descriptions above of the Mabul involving multiple and massive volcanic eruptions, note that I am not asserting this as fact and that I'm merely presenting the opinions of the Malbim and Rav Miller. I believe Rav Miller simply built upon what others had said before him, which is something a *gadol baTorah* is entitled to do. Rav Miller was certainly a zealous guardian of the Mesorah.

The Malbim, in his time, was considered innovative. Few if any *gedolim* before him incorporated the science of his day as he did into his classic *peirush*. In his case, it was necessitated by the rise of Haskalah, evolution, and the like, which plagued the Jews of his generation.

Rav Miller, too, was born in a world where the challenges to *emunah* were great — in many ways, even greater than the century before. As *mashgiach* in a major yeshiva, he dealt with the questions of countless *talmidim*. He wrote his first book, *Rejoice O Youth* — where he discussed things like evolution and contemporary science — explicitly for those very *talmidim*. And then, he expanded his ideas of Torah and science (and other topics) in his many following books (specifically written in English to reach the widest number of “perplexed” Jews). Rav Miller had to learn the science of the times to know what to answer the *apikorus* — the *apikorus* in his *talmidim* and in ourselves, as he would frequently say.

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