

UP
CLOSE

Cause and Effect

As you read this article, look for the many effects caused by the eruption of one volcano.

LOOK FOR WORD NERD'S
8 TERMS IN BOLD



The WORLD That

Two hundred years ago,
an unknown volcano caused
death and destruction around
the world **BY LAUREN TARSHIS**



CRANIO

Changed the World

Ten-year-old John Hoisington stared in shock out the window of his family's Vermont farmhouse. It was June 8, 1816. Summer was just two weeks away. Yet outside, a wild winter snowstorm was raging.

Nearly a foot of snow covered the fields the family had planted only weeks before. The family's vegetable garden was buried. The apple and pear trees shivered in the freezing wind, their delicate buds coated with ice.

Like most people in 1816, the Hoisingtons grew almost everything they ate. Practically every bite of the family's food came from the farm, from the corn in their morning porridge to the chicken and potatoes in the supper-time stew. John saw the look of fear in his father's eyes as they watched the snow swirling outside. This storm would kill all of their crops. There would be little food for the family or their animals.

How would they survive?

What John and his family didn't know was that during that strange summer of 1816, similar weather disasters were unfolding throughout New England—and the world. Snow destroyed thousands of other East Coast farms, from Virginia up to Maine. Snowstorms and floods struck France, England, Ireland, and Switzerland. There were **droughts** and floods in India and killing frosts across northern China.

At the time, people struggled to understand what had caused the weather to change so wildly. Were witches to blame?

It is only now, nearly 200 years later, that scientists have finally solved the mystery. Very likely John Hoisington and his family would have been astonished to learn the truth: The cause of their family's suffering was an event that took place a year earlier and 10,000 miles away from their farm.

It all started with a volcano called Mount Tambora.

A Ruined Land

Mount Tambora sits on the island of Sumbawa, which today is part of the nation of Indonesia. In 1815, perhaps 50,000 people lived on Sumbawa, a beautiful land of rushing streams, gentle hills, and thick jungles. Looming over the northern side of the island was Mount Tambora, a quiet mountain dotted with villages and rice farms. Nobody had any reason to



Above: Many European painters unknowingly captured Tambora's effects. This painting, by J. M. W. Turner, is of Mount Vesuvius. But experts believe that the color of the sky was inspired by what Turner must have seen over England in the years after Tambora's eruption.

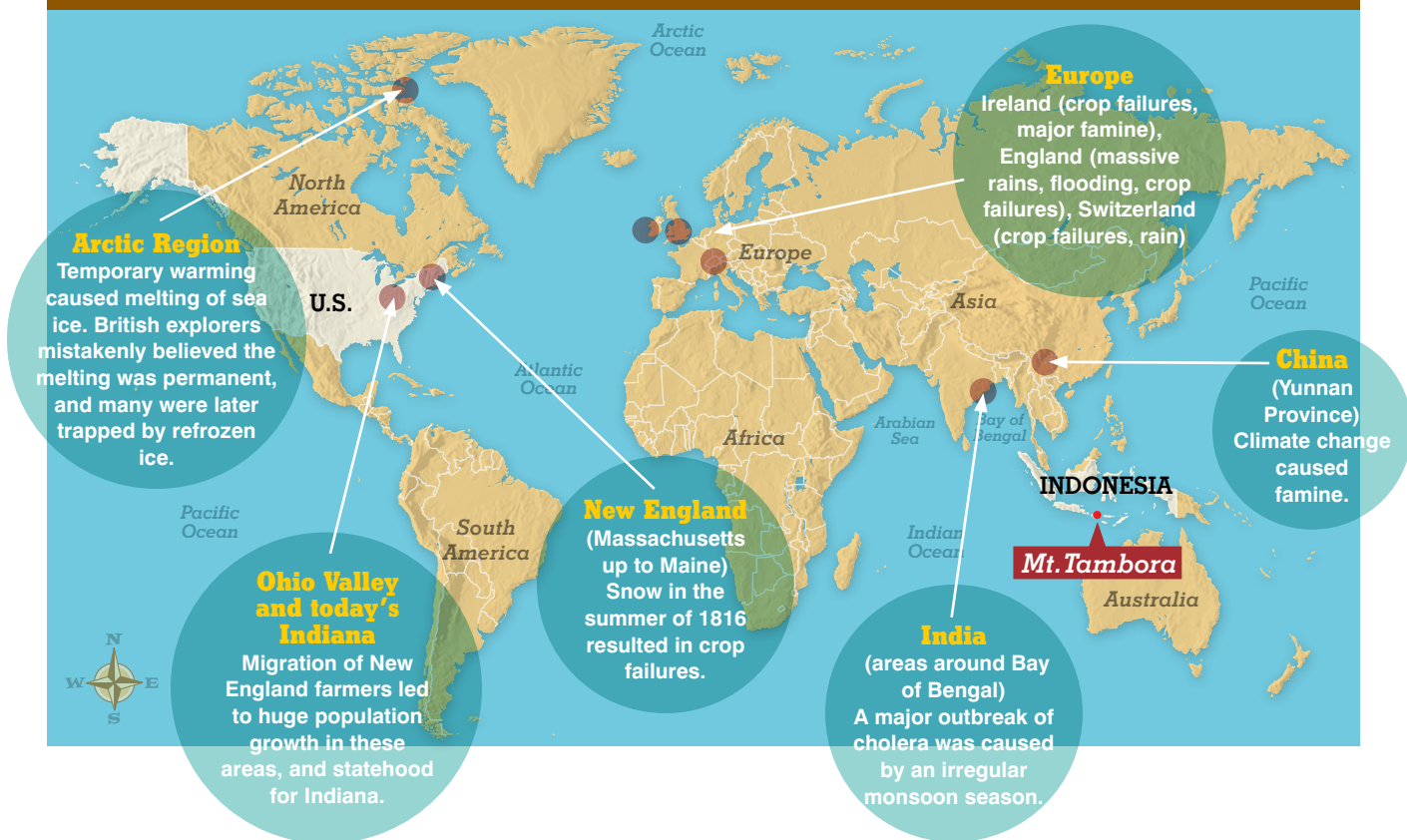


The book *Frankenstein* was partly inspired by Tambora. Author Mary Shelley (above) wrote the novel in stormy Switzerland during the endless gloom of the summer of 1816.



The Eruption Felt Around the World

From India to the Arctic, Tambora's volcanic cloud caused misery



suspect that the peaceful mountain was in fact a volcano, that underneath its velvety green slopes were snaking tunnels filled with lava and explosive gases. Like many volcanoes, Tambora looked like an ordinary mountain and had been **dormant**—quiet—for centuries. But on April 5, 1815, Tambora woke up.

The first eruption shook the island and sent up great **plumes** of fire and ash. But that was nothing compared with what would come five days later, on April 10.

Kaboom!

The volcano exploded with terrible fury, spewing out great towers of fire. A tremendous cloud of gas and ash shot high into the sky. The day turned midnight black, but the mountain glowed red as rivers of lava gushed down the slopes. The eruption went on for more than three days, a deadly storm of fire, gas, ash, and rock. In the eruption's terrifying final stage,

a wave of flames and gases swept down the mountain at speeds of 400 miles per hour. This **pyroclastic surge** devastated everything in its path.

Ignored and Forgotten

The eruption instantly killed at least 12,000 people living on and around Mount Tambora. Ash and lava ruined the island's soil and poisoned its rivers and streams. Rice paddies were destroyed. No fruits or vegetables would grow. There were no fish to catch; almost every animal had been killed. Trapped without food on their ruined lands, more than 90,000 people on Sumbawa and the nearby island of Lombok slowly starved to death.

The eruption of Tambora in 1815 was the most deadly and powerful volcanic eruption in human history. Its explosive energy was 10 times stronger than that of Krakatoa, history's

Comparing Volcanoes

Scientists measure the power of volcanic eruptions on a scale of 0-8, with 8 being the most powerful and 0 being the least powerful. Here is how some major eruptions rated.

Vesuvius
Italy
79 A.D.

5

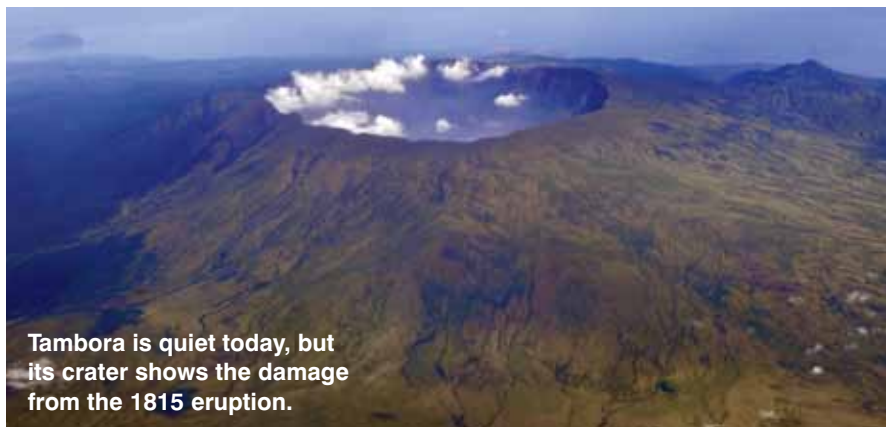
Tambora
Indonesia
1815

7

most famous volcano, which erupted in 1883, also in what is now Indonesia.

And yet, incredibly, few people outside the blast zone learned about this terrible disaster. The people of Sumbawa and surrounding islands led simple lives. Few of them had any connections to far-off lands like Europe or the Americas. Some British sailors witnessed the eruption. But news and information traveled very slowly in 1815. The only way to get a letter (or a person) across oceans was on a sailing ship. The voyage from Sumbawa to New York or London would have taken perhaps four months. Eventually, reports of the eruption did make it back to England, but few people paid attention. Somehow, the deadliest volcano in history was ignored by most of the world—and then forgotten.

What people *were* paying attention to a year later, in 1816, was the terrible weather—snowstorms in the summer, floods that turned wheat fields into lakes, frosts that blackened millions of acres of farmland around the world. Farmers up and down the East Coast lost their crops. In Europe, farmers grew desperate. In Paris, mobs of people broke into warehouses where grain was stored, risking their lives to steal sacks of flour. In China, starving families could no longer feed their children. Floods in India triggered an outbreak of a disease called cholera, which killed millions.



Tambora is quiet today, but its crater shows the damage from the 1815 eruption.

Solving a Mystery

In 1816, not even the most brilliant scientists would have believed that these weather problems were somehow connected—that all these disasters had been caused by the eruption of a volcano few had heard of. Little was known about **climate** or volcanoes. But today, scientists know that volcanoes can have a major impact on weather worldwide. They have learned by studying recent volcanic eruptions, like Mount Pinatubo in the Philippines.

Scientists monitored every phase of Pinatubo's eruption in June 1991. It was not as powerful as Tambora. But the eruption was monstrous, one of the most powerful since Krakatoa.

Using satellites and computers, scientists tracked the volcano's huge eruption cloud as it rose into the sky. Most volcanic clouds quickly **dissipate**—break apart and fade away. But in a very powerful eruption, the cloud rises so high that it mixes with water and other gases in the **stratosphere**. It turns into a foam and remains high in the sky. Scientists observed Pinatubo's

Krakatoa
Indonesia
1883

6

Mt. St. Helens
USA
1980

5

Pinatubo
Philippines
1991

6



Artifacts like these pieces of pottery have been unearthed from the ruins on Tambora's slopes.

cloud as it spread across the world. Like a layer of sunscreen slathered across the sky, the cloud blocked out some of the sun's heat and light. Temperatures dropped, and storms became more violent. It took three years for Pinatubo's foamy haze to clear. Tambora's cloud would have been even bigger, its effects more devastating. Indeed, like an invisible beast, Tambora's cloud hovered in the sky for about three years. By the time the climate returned to normal, as many as 30 million people had died from Tambora's effects.

And many more lives—like the Hoisingtons'—had been forever changed.

John and his family survived the loss of their crops. But they gave up their farm and moved west to Ohio. They started their trek in June 1817, traveling in an oxcart piled with their possessions.

Tens of thousands of other New England farmers made similar journeys, all driven west by the hardships of 1816. It was one of the biggest **migrations** in U.S. history. Most migrants went to Ohio, Indiana, and Illinois.

The Hoisingtons' 1,000-mile journey took three months. John's older sister Sabrina recorded the trip in her diary. She described the family's meeting with American Indians, long days of slogging through mud, and some enjoyable visits with friends they met along the way. They arrived in Ohio in August and were soon settled in to life on their new farm.

Meanwhile, 10,000 miles away, the volcano that had nearly destroyed their lives went back to sleep, sitting in silence to this day—until it wakes again. 🌋

WRITE TO WIN

Imagine you could send a letter through time, explaining to the Hoisingtons what caused the strange weather of 1816. In your letter, tell them how Tambora affected people around the world. Send it to "Tambora Contest" by October 15. Ten winners will each receive a copy of *Eruption!* by Elizabeth Rusch. See page 2 for details.

FIND AN
ACTIVITY
ONLINE!

