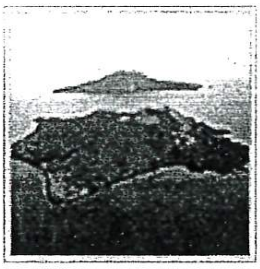
(1)

Tambora
Indonesia
1815

Casualties: 70,000-92,000
Major Cause: Starvation

Tambora unleashed its fury over two weeks in April in the most explosive and lethal series of eruptions in recorded history. The blasts propelled rock and ash perhaps 25 miles into the sky above the island of Sumbawa. Volcanic gases, including sulfur dioxide, combined with moisture in the air to form vast toxic clouds that soon gave rise to acid rain. Roughly 10,000 people were killed immediately, and tens of thousands more died of starvation and disease in subsequent months. Tambora's impact was global, as volcanic ash and aerosols rose high into the stratosphere, filtering out sunlight and heat. Abnormally cold weather the following year caused crop failures as far away as Europe. In New England, snow fell in July and August, and 1816 became known as the "year without a-summer."

(2)

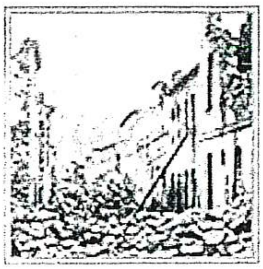


Krakatau
Indonesia
1883

Casualties: 36,000-40,000
Major Cause: Tsunamis

The force of this eruption on the small, uninhabited island of Krakatau was so great that much of the volcano, and two-thirds of the island itself, collapsed into the sea, triggering 120-foot waves that devastated neighboring islands. One eyewitness wrote, "the coasts of Java, as those of Sumatra, were entirely destroyed....The villages and trees had disappeared; we could not even see any ruins, for the waves had demolished and swallowed up the inhabitants, their homes, and their plantations....This was truly a scene of the Last Judgment." The island chain then called the Dutch East Indies, now Indonesia, has suffered many such scenes. It has more active volcanoes than any other country, and since 1600, these volcanoes have killed more than 160,000 people. That figure represents nearly half of the world's recorded volcano fatalities.

3

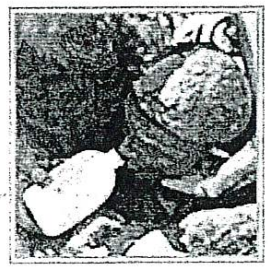


Mont Pelée
Martinique, French West Indies
1902

Casualties: 30,000
Major Cause: Pyroclastic Flows

There were clear signs in the spring of 1902 that Pelée threatened the nearby city of St. Pierre. For weeks heavy ashfalls blanketed the city, and small earthquakes shook the region. Clouds of sulfurous gas hung in the air, and birds fell dead from the sky. A boiling-hot mudflow had even streamed down the mountainside, burying a sugar refinery and its workers. Yet authorities in the French colonial government discouraged evacuation of St. Pierre because they feared it might tip an upcoming election toward the socialist opposition. On the morning of May 8, following a powerful explosive eruption, a turbulent cloud of superheated gas and rock fragments called a pyroclastic flow careened down the mountainside at nearly 300 miles per hour. It hit the city with the force of a hurricane, engulfed it, and set it ablaze within seconds. Astonishingly, only one of an estimated 30,000 inhabitants, a prisoner jailed in an underground cell, was known to have survived.

4

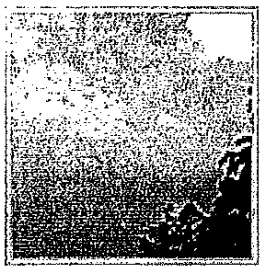


Nevado del Ruiz
Colombia
1985

Casualties: 23,000
Major Cause: Mudflows

As with the disaster at Mt. Pelée, the shocking loss of life caused by this eruption might have been averted if government authorities had heeded warnings. Colombian scientists monitoring Nevado del Ruiz had cautioned town leaders of Armero about the volcano's increased activity and even radioed urgent messages on the night of the eruption. But no systematic efforts were made to evacuate the sleeping town of 28,000. The authorities likely assumed that the town, roughly 45 miles from the volcano's crater, was out of harm's way. Before dawn the next morning, however, two and a half hours after the start of the eruption, a volcanic debris flow called a lahar buried Armero. The explosive eruption had rapidly melted much of the volcano's snow-covered glacier, sending water surging down canyons—picking up soil, volcanic ash, and red-hot rock as it went. More than three-quarters of the town's citizens perished.

5



Unzen
Japan
1792

Casualties: 15,000
Major Cause: Landslides, Tsunamis

The worst volcanic disaster in Japan's history occurred in the Unzen volcano complex on the island of Kyushu. Accounts of the day tell of a massive avalanche of rock that hurled down Unzen's Mount Mayuyama. The landslide, probably a pyroclastic flow of hot ash and debris, swept through the ancient Shimabara City, killing as many as 10,000 people. As debris plunged into the sea and tremors shook the region, a series of tsunamis arose to kill thousands more and destroy roughly 3,000 houses along the coast. In June 1991 Unzen awoke from a 200-year slumber to again release enormous clouds of ash and rock, killing dozens of people. On Mount Mayuyama today, above a rebuilt and densely populated Shimabara City, an ampitheater-shaped scar from the 1792 landslide is a sobering reminder of Unzen's potential danger.

6

Laki
Iceland
1783

Casualties: 9,000
Major Cause: Starvation

In June 1783, a 16-mile-long fissure began opening up across the flanks of the Laki mountain ridge in southern Iceland. The fissure, marked by 300-foot cones of ash and debris, spewed out vast quantities of lava for months. Ultimately, about three and a half cubic miles of lava gushed from the fissure and spread across 200 square miles, burying farms and churches in the sparsely populated countryside. More lava poured onto Earth's surface than in any other eruption in recorded history. No one died directly from the lava flows, but the volcanic gases released at Laki had devastating consequences. A bizarre blue fog, made of sulfuric acid aerosols, hovered over Iceland for weeks and even wafted to Europe. Toxic gases and altered weather patterns caused the greatest famine in Iceland's history, known as the "Haze Famine."

(7)

Vesuvius
Italy
1631

Casualties: 3,500
Major Cause: Pyroclastic Flows

Because it preserved so many details of the ancient Roman world in volcanic ash, the eruption of Vesuvius in A.D. 79 is better known. But the eruption of 1631 killed roughly the same number of people in a similarly gruesome way. A monk, watching from a safe distance, observed seven "streams of lava" shooting out from the volcano's southwestern flank and flowing toward the Bay of Naples. These lava streams were actually pyroclastic flows that ripped through three towns before reaching the bay. Most of the casualties were in Torre del Greco, where civic officials hesitated too long before ordering the town evacuated. Today, Vesuvius remains active and, with nearly three million people living in its shadow, is the most dangerous volcano in Europe.

(8)

Mt. Pinatubo
Philippines
1991

Casualties: >700
Major Cause: Pyroclastic Flows

The eruption of Pinatubo in June 1991 could easily have been among the worst volcanic disasters in history. Only one other eruption in the 20th century released more volcanic material, and Pinatubo's explosive fury coincided with a typhoon that showered rain-soaked ash throughout the region. But unprecedented cooperation among Earth scientists monitoring the volcano, American and Philippine military authorities, and the Philippine government lead to the efficient evacuation of roughly 85,000 people before the volcano's climactic eruption on June 14. In the days that followed, the total number of evacuees rose to about 250,000. Scientists had closely watched the volcano from its first rumblings in April, carefully assessed the hazard zones, and predicted the most violent blasts with remarkable accuracy. Despite all-out efforts to evacuate the threatened population, the eruption directly killed between 200 and 300 people, and many others perished as roofs collapsed under the weight of heavy ash falls. Yet at least 20,000 people—and perhaps thousands more—were saved by the evacuation.

Mount Merapi, is a conical volcano located on the border between Central Java and Yogyakarta, Indonesia. It is the most active volcano in Indonesia and has erupted regularly since 1548. Its name means Mountain of Fire. It is very close to the city of Yogyakarta, and thousands of people live on the flanks of the volcano, with villages as high as 1700 m above sea level.

Although smoke can be seen emerging from the mountaintop at least 300 days a year, several eruptions have caused fatalities. Hot gas from a large explosion killed 43 people in 1994, mostly in the town of Muntilan, west of the volcano. Another large eruption occurred in 2006, shortly before the Yogyakarta earthquake. In light of the hazards that Merapi poses to populated areas, it has been designated as one of the Decade Volcanoes.

(9) **Mount St. Helens** is an active stratovolcano located in Skamania County, Washington, in the Pacific Northwest region of the United States. The volcano is located in the Cascade Range and is part of the Cascade Volcanic Arc, a segment of the Pacific Ring of Fire that includes over 160 active volcanoes. This volcano is well known for its ash explosions and pyroclastic flows.

Mount St. Helens is most famous for its catastrophic eruption on May 18, 1980, at 8:32 am PDT, which was the deadliest and most economically destructive volcanic event in the history of the United States. With little warning, an earthquake of magnitude 5.1 triggered a massive collapse of the north face of the mountain. It was the largest known debris avalanche in recorded history. The magma inside of St. Helens burst forth into a large-scale pyroclastic flow that flattened vegetation and buildings over 230 square miles. Over 1.5 million metric tons of sulfur dioxide was released into the atmosphere. Fifty-seven people were killed; 250 homes, 47 bridges, 15 miles (24 km) of railways, and 185 miles (298 km) of highway were destroyed. The eruption caused a massive debris avalanche, reducing the elevation of the mountain's summit from 9,677 ft (2,950 m) to 8,365 ft (2,550 m) and replacing it with a 1-mile (1.6 km) wide horseshoe-shaped crater.[3] The debris avalanche was up to 0.7 cubic miles (2.9 km3) in volume.