

The Frank Slide: The Mountain That Walked

The town of Frank, Alberta lies east of Crowsnest Pass in the shadow of Turtle Mountain. The Aboriginal people here always feared Turtle Mountain, which they called “The Mountain That Walked.” On April 29, 1903, that legend came true.

Early that morning, the residents of Frank woke to a thundering roar as Turtle Mountain collapsed. In just 90 seconds, 82 million tonnes of limestone broke away, shattered into boulders, and hurtled down the mountain slope at a speed of over 140 kilometres per hour. The debris swept across the valley, covering roads, railways, homes, and farms. In moments, 76 people lost their lives, 23 were injured, and 17 miners were trapped inside a mine shaft. Seventy-five percent of the homes in Frank were crushed, and nearly 2 kilometres of the Canadian Pacific Railway was completely destroyed. It was the biggest landslide in North American history.

What Caused the Frank Slide?

The most likely explanation is that a combination of factors resulted in the massive movement of rock down Turtle Mountain.

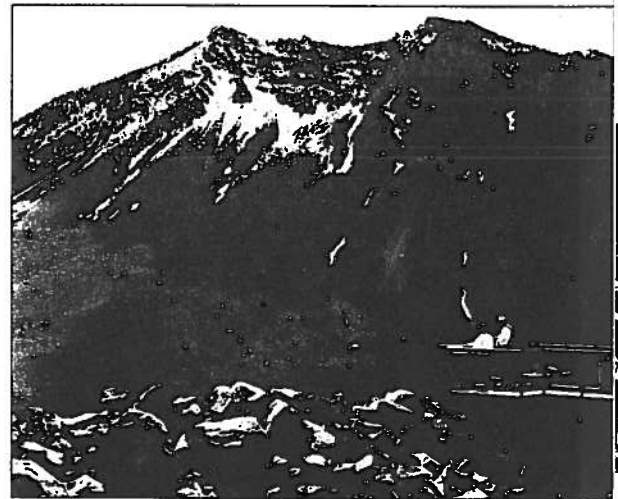
Coal mining inside the mountain was certainly a contributing factor. The portion of Turtle Mountain that collapsed was directly above the coal seam that was mined prior to the slide. Between 1901 and spring 1903, more than 250 million tonnes of coal were removed from the mine, resulting in **subsidence** that weakened an already unstable natural formation.

Geologists today believe that the Frank Slide was caused primarily by the unstable structure of Turtle Mountain. Over years, tectonic forces folded the layers of the mountain—consisting of limestone, conglomerate, sandstone, shale, and coal—into an arch (see the diagram on the next page). Initially, the layers were squeezed into a gentle fold—an **anticline**. But as tectonic pressures increased, a **thrust fault** developed under the fold. Following the erosion of the rock layers from the summit of the mountain, and the resulting changes in pressure, deep fractures appeared along the folded crest of Turtle Mountain. This created a path for water to seep into the mountain’s core. It infiltrated between sedimentary rock layers and dissolved the limestone. The erosive action of water in the summit cracks helped to weaken the mountain.

Ice may then have provided the trigger for the slide itself. Less than a week before the slide, unusually warm weather melted large amounts of snow, and water poured into the mountain’s summit fissures. Then, on the night of April 28, temperatures plummeted. A rapid drop in temperature would have caused any water in the cracks near the peak to freeze quickly, causing the crevices to expand and become susceptible to frost shattering, which likely triggered the slide.



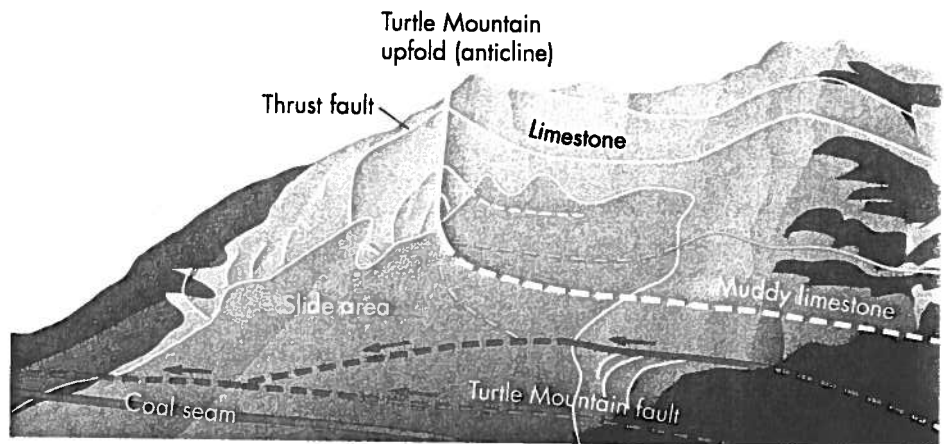
A row of coal miners' houses hours after the slide



Today, visitors can view Turtle Mountain and the slide area from the Frank Slide Interpretive Centre.

subsidence
the sinking of land

thrust fault
a fracture in layers of rock, caused by movement and pressure, in which a lower layer is pushed up and over another



Turtle Mountain Today

The town of Frank now sits northwest of its original site, but 6000 people still live within the shadow of the “Mountain That Walks.” Dozens of small rockfalls tumble down Turtle Mountain each spring—activity that is actually beneficial because it removes rock and reduces the amount of materials left to fall. But Turtle Mountain’s deadly threat continues, particularly the subsidence at the base of its southern peak. Geologists interpret this sinking as evidence that the mountain’s foundation is failing, and predict that South Peak will eventually collapse.

To help predict when another slide might occur, researchers have set up sensor systems to track activity within and beneath the mountain. The Turtle Mountain Monitoring Project, administered by the Alberta Geological Survey, coordinates all research conducted on the mountain. Besides enhancing public safety, this project is expected to provide opportunities for significant scientific research and benefits to public education and local tourism.

—Adapted from Michelle Finch, “Frank Slide: When Turtle Mountain Fell,” Suite 101 website, 2007.

THINK IT THROUGH

1. List and explain the factors that led to the 1903 Frank Slide.
2. Do you think another slide could happen again in the future? Give reasons for your answer.
3. You are a resident of the town of Frank who survived the 1903 slide. Write a first-person account describing the events of that night.