

Giant bears did not scratch lines in Devils Tower, a volcano made them

By Scientific American, adapted by Newsela staff on 03.19.15

Word Count **570**



A view of Devils Tower. Photo: Wikimedia Commons

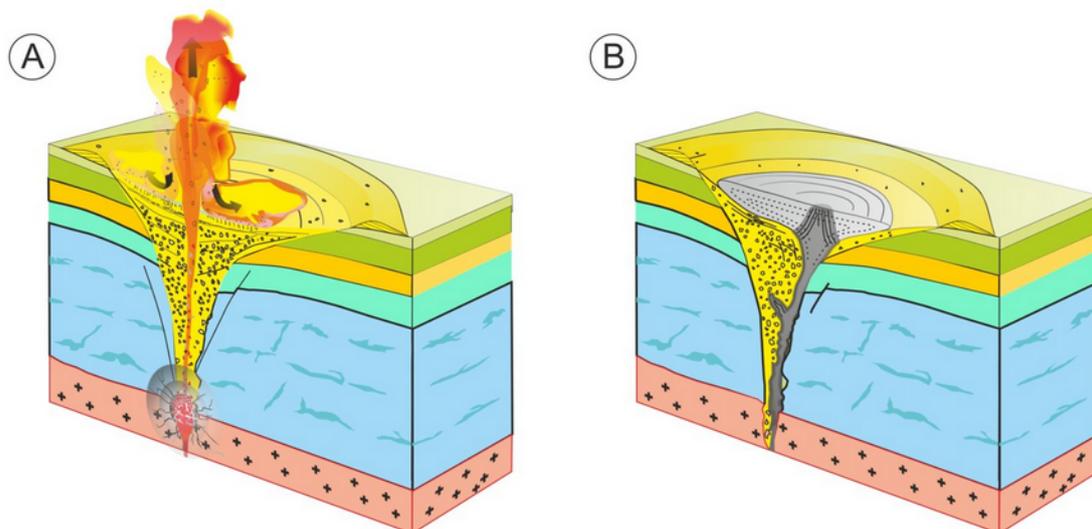


Illustration of a maar-diatreme eruption with the portion of the lava dome representing Devils Tower shown in dark gray. Credit: Modified from Závada, Dědeček, Lexa, and Keller. *Geosphere*

For Native Americans, Devils Tower is sacred. Their legends say that giant bears scratched it trying to climb to the top.

Scientists have a different explanation. They say the lines along the sides of Devils Tower are not claw marks from big bears. Instead, the lines are actually the edges of columns of rock from a long-ago volcano. The columns formed as the lava cooled and shrank, cracking apart.

Many Theories

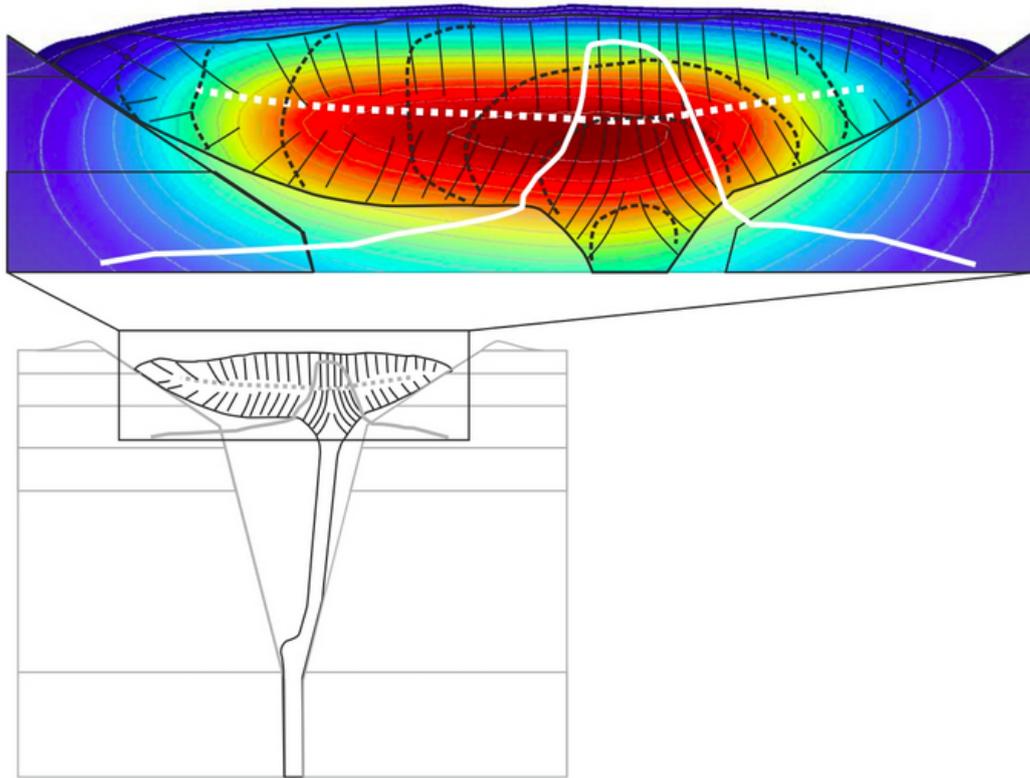
How did Devils Tower in Wyoming form? Did it form below ground or as part of a violent volcanic eruption?

Scientists have many theories. Devils Tower is a butte, which is a lonely hill with steep sides and a flat top. It stands nearly 1,300 feet tall today. Devils Tower was created 49 million years ago. Some scientists think that lava was squeezed to the surface between underground layers of rock. Others say the lava came from an underground volcano.

Prokop Závada is a geologist in Eastern Europe. Geologists study rocks and how the Earth was formed. He and other geologists became interested in the mystery of Devils Tower. They found a clue in another butte. It is located in the Czech Republic, his country. The Czech butte is similar to Devils Tower, although it is more rounded and covered with trees.

How The Lava Flowed

The researchers think that the Czech butte was formed by a type of volcano. It is called a maar-diatreme. This type of volcano blasts a crater into the Earth's surface. After the blast, lava filled the crater, acting like a plug. Wind and rain chipped away at the edges of the lava plug. Eventually only its core remained. The two buttes are very much alike. The Czech team decided to see they were formed in the same way.



Computer simulation of a cooling body of lava shaped like one of the plaster models. The thin, solid black lines indicate the shape of the columns that would form. A profile of Devils Tower is overlain, in white. Credit: Modified from Závada, Dědeček, Lexa, and Keller. *Geosphere*

The scientists looked at the shape of the Devils Tower columns. They also studied the position of minerals within the columns of rock in the side of the butte.

The government's National Park Service is in charge of Devils Tower. The service allowed the researchers to collect one rock from Devils Tower to test.

The scientists discovered that near the rock's base, tiny needle-shaped minerals are straight up and down. That makes sense. The lava flowed upward before it hardened. Closer to the top, the tiny needle-shaped minerals turn on their sides.

Models Of Volcanoes

Next, the researchers made models of volcano explosions. They mixed tiny minerals into soft plaster. They squeezed the material upward through a cone full of earth and rock.

When the plaster hardened, the researchers cut the cone open. They examined the inside. They measured which way the minerals faced just as they had done at Devils Tower.

The columns of Devils Tower matched the pattern exactly. Závada and his team made an important discovery. They realized an underground volcano also caused Devils Tower.

Other Answers? Maybe

Bernard Housen is with Western Washington University. He was not involved in the study. He said the study made sense. Yet, there can be other answers. He said the government let scientists take too few rock samples to know for sure. The government wants to make sure the rock formation is saved. Yet, that means scientists cannot get more samples to study from Devils Tower.

Scientists might be able to study other buttes near Devils Tower. They were likely formed in the same way — without the help of giant bears.

Quiz

- 1 Which sentence BEST explains the main idea of the article?
 - (A) The Devils Tower in Wyoming is very tall and has steep sides with marks that were made from the claws of big bears.
 - (B) Scientists are not sure about how the Devils Tower in Wyoming formed, but some think it was formed by a volcano.
 - (C) Scientists who are studying the Devils Tower were allowed to collect and test one rock from the tower.
 - (D) It is fun to make models of volcanoes, like the model researchers made of the Devils Tower.

- 2 Which paragraph from the section "How The Lava Flowed" describes what is being shown in the pictures labeled A and B?

- 3 Which sentence is the BEST summary of the section "Models Of Volcanoes"?
 - (A) Researchers made models of volcanoes to help them answer questions about what caused Devils Tower.
 - (B) Researchers discovered that models of volcanoes are difficult to make.
 - (C) Researchers made models of volcanoes using a variety of materials that came from Devils Tower.
 - (D) Researchers made models of volcanoes that produced dangerous explosions.

- 4 What is the MOST likely reason the article includes a photograph of Devils Tower?
 - (A) to show the unusual formation of columns of rock on the tower
 - (B) to show exactly how big the tower is
 - (C) to show the types of trees that grow around the tower
 - (D) to show why bears like to climb the tower

Answer Key

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Paragraph 5:

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