JUST for U.S.*

GRADES 4 - 5

*Understanding Science

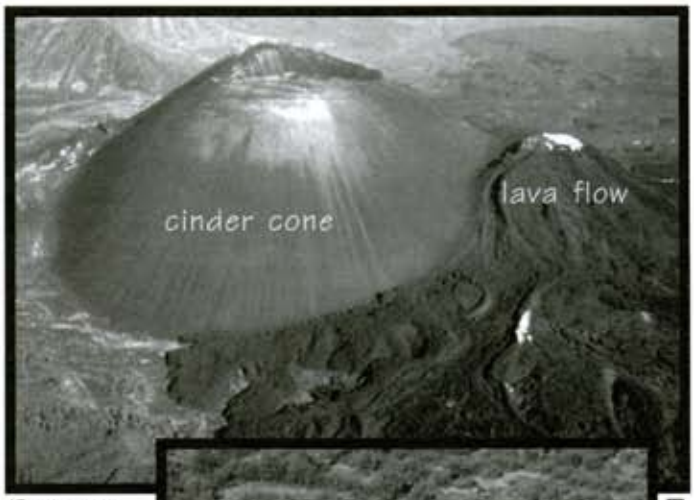
VOLUME 26 • ISSUE 4 2001-2002 Fernbank Science Center • DeKalb County School System ISSN 0742-6526

February 20, 1943

The Mexican earth had been rumbling for two weeks. When Dionisio and Paula arrived to plow their cornfield, they heard a loud noise like thunder. They stared as a hole in the ground grew into a long crack. The ground moved and trees shook. There was a deafening whistle and the smell of sulfur. Dust and smoke rose from the crack. A tree caught on fire. Paula and Dionisio ran for their lives!

That night, glowing rocks flew from the hole and piled up to make a hill called a *cinder cone*. The volcano, Paricutin (par-ee-coo-TEEN) was born. Soon, red-hot lava was pouring from the bottom of Paricutin.

Paricutin kept erupting for eight years. It became a mountain. Finally, the lava buried the village.



Paricutin today.

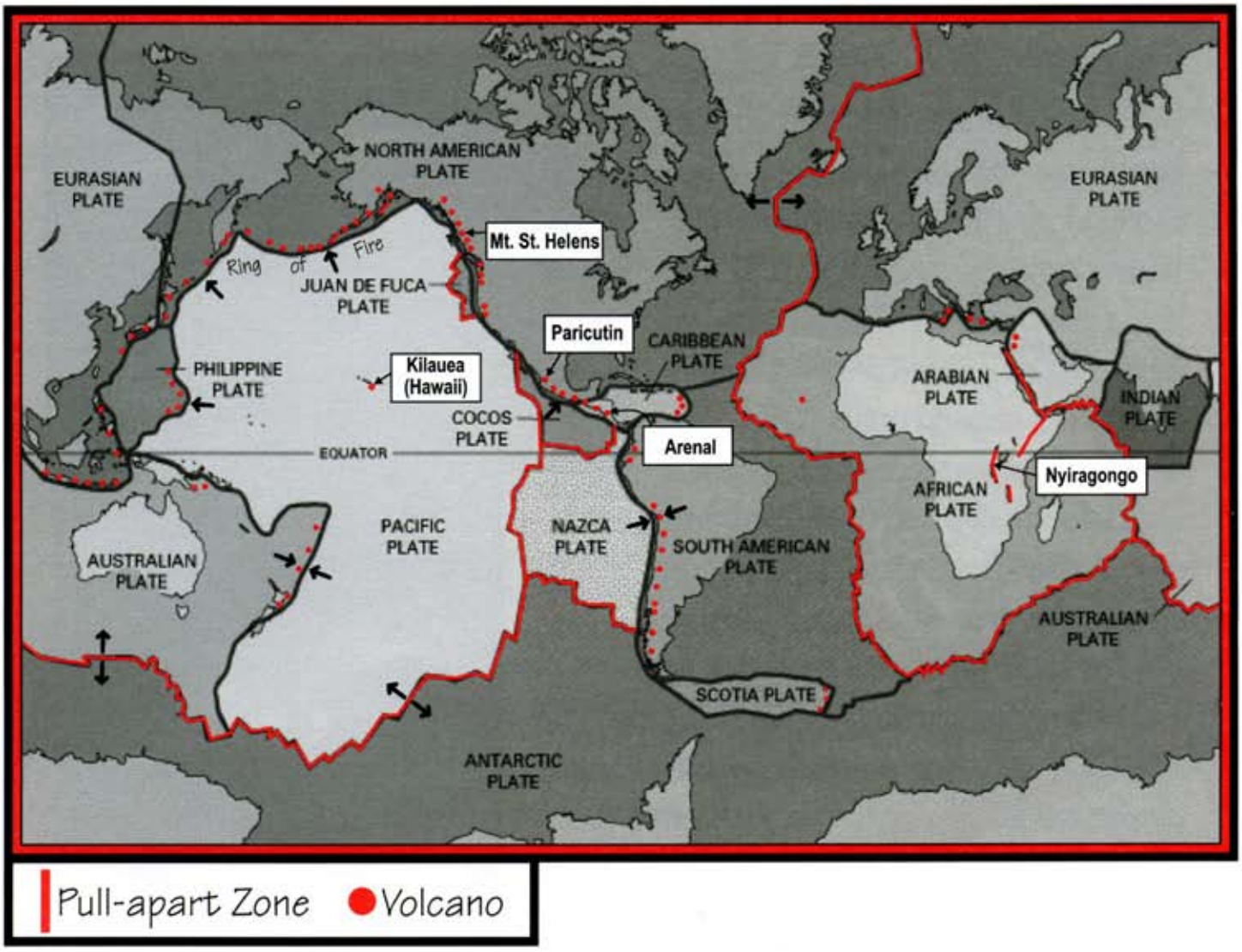
Only the church shows above the lava that buried the village.

Photographs by Katia Krafft, Smithsonian, 1981

What Causes Volcanoes?

Volcanoes have long inspired awe. Areas like the "Ring of Fire," surrounding the Pacific Ocean, are full of volcanoes. Other areas have none. It was not until a few decades ago that geologists, who study the earth, understood why.

We now know that the earth's crust is divided into about 15 plates. The plates move in different directions very slowly - at about an inch a year. At the edges of plates, volcanoes are common. Mexico lies along one edge of the North American plate. That is why Paula and Dionisio found the volcano Paricutin growing in their cornfield.

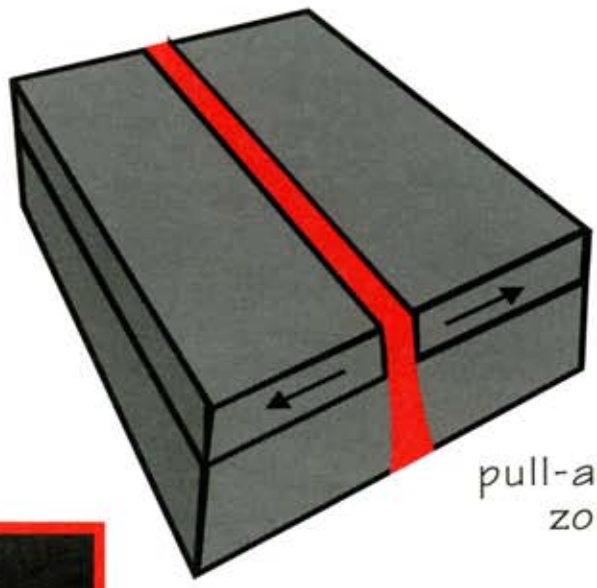


Paricutin story based on James F. Luhr and Tom Simkin, editors, Paricutin, The Volcano Born in a Mexican Cornfield. Phoenix, Geoscience Press, 1993, 427 pp.

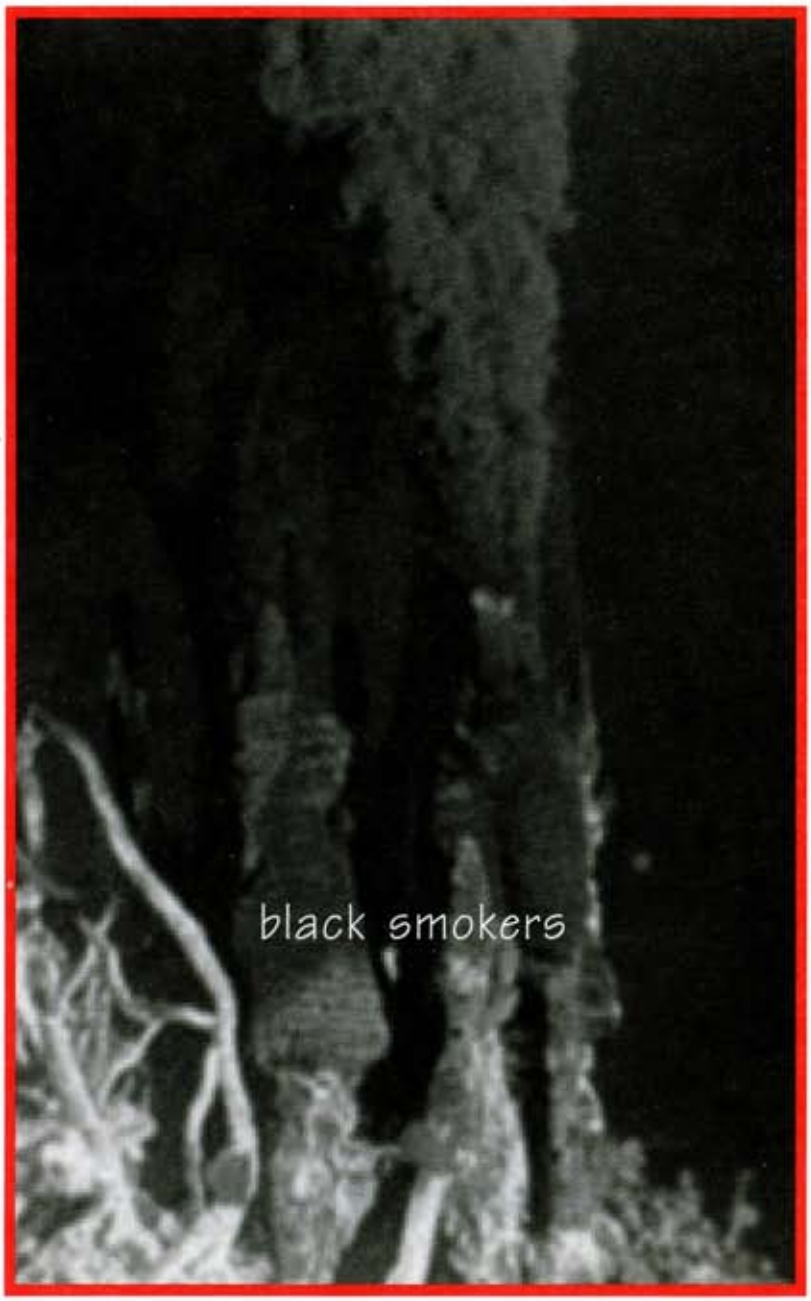
Additional graphics from W. Jacquelyne Kious and Robert I. Tilling, This Dynamic Earth, The Story of Plate Tectonics, 1996, http://pubs.usgs.gov/publications/text/dynamic.html

Pull-apart Zones Cause Volcanoes

Some volcanoes form where plates are pulling apart. Pull-apart zones are usually found on the ocean floor. Lava comes out of long cracks. These cracks can be followed for thousands of miles. Sometimes this underwater system is called the world's largest volcano.



pull-apart zone



black smokers

Photo by Verena Tunnicliffe, University of Victoria, Canada

Pull-apart zones are famous for the black smokers. These are vents of chemicals and hot water. They look like smoking chimneys. Some of the most unusual life on earth is found here.

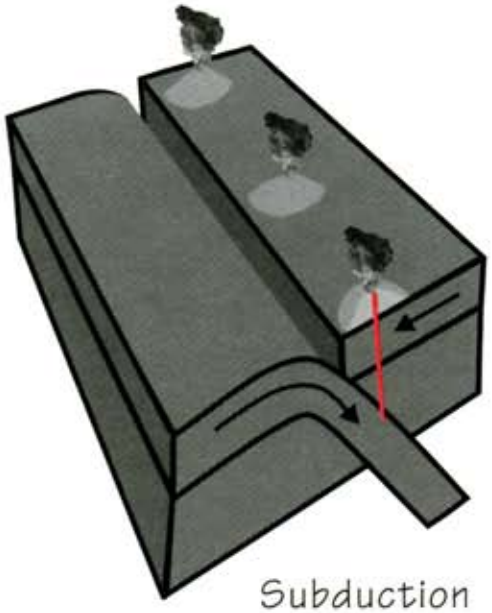
In a few places, pull-apart zones are on land. One pull-apart zone is in East Africa. The African plate is dividing into two plates. This year, people living in Goma, Congo lost their homes. The volcano Nyiragongo was erupting again. The lava flowed right through the middle of town!

Subduction Zones Cause Volcanoes

Volcanoes also form where plates move toward each other. This is called a *subduction* zone. Subduction means "pull under."

The lower plate disappears deep into the earth. When the plate gets about a hundred miles down, part of it melts. The melted part rises back to the surface. It makes a chain of volcanoes. All of the volcanoes in the "Ring of Fire" are caused by subduction.

Subduction makes lava that is thick like hot tar. The lava flows very slowly. Often it stops flowing and gas gets trapped inside. When pressure builds up, explosions happen.



Subduction Zones

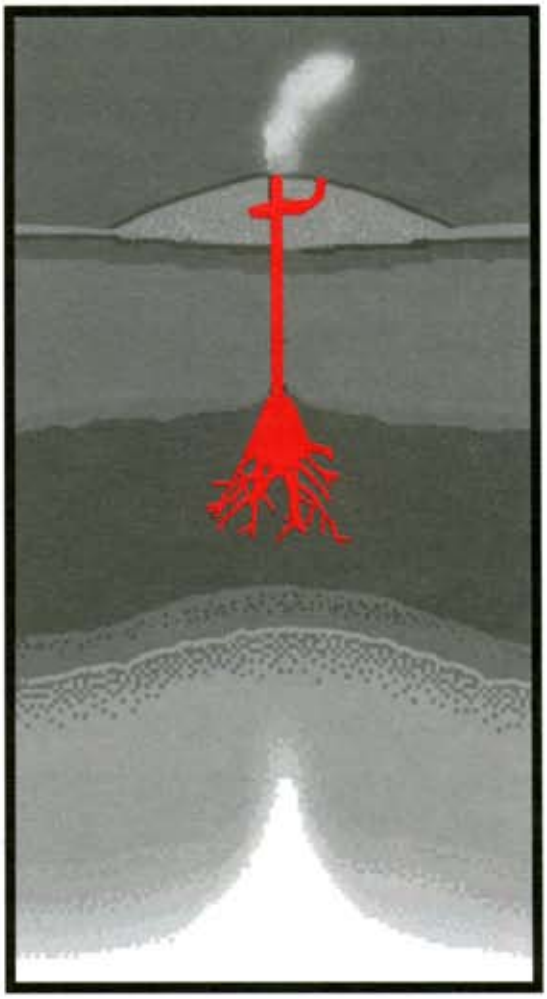
USGS/Cascades Volcano Observatory Photo by Austin Post, May 18, 1980

Subduction caused Mt. St. Helens to erupt in Washington State in 1980. One side of the mountain blew up. The blast blew down thousands of huge trees. The ash cloud rose miles in the air. It traveled around the world.

Hot Spots Cause Volcanoes

Not all volcanoes are caused by plate motion. Some are made by <u>hot spots.</u> A hot spot is an area of melting rock, deep in the Earth's mantle. The hot liquid rises. It melts a hole through the plate at the surface.

All volcanoes in Hawaii are caused by one hot spot. The lava is very runny. It makes pretty fountains. When it flows, it can travel many miles. Because pressure does not build up, Hawaiian volcanoes do not explode.



USGS Photo by J.D. Griggs, 31 January 1984

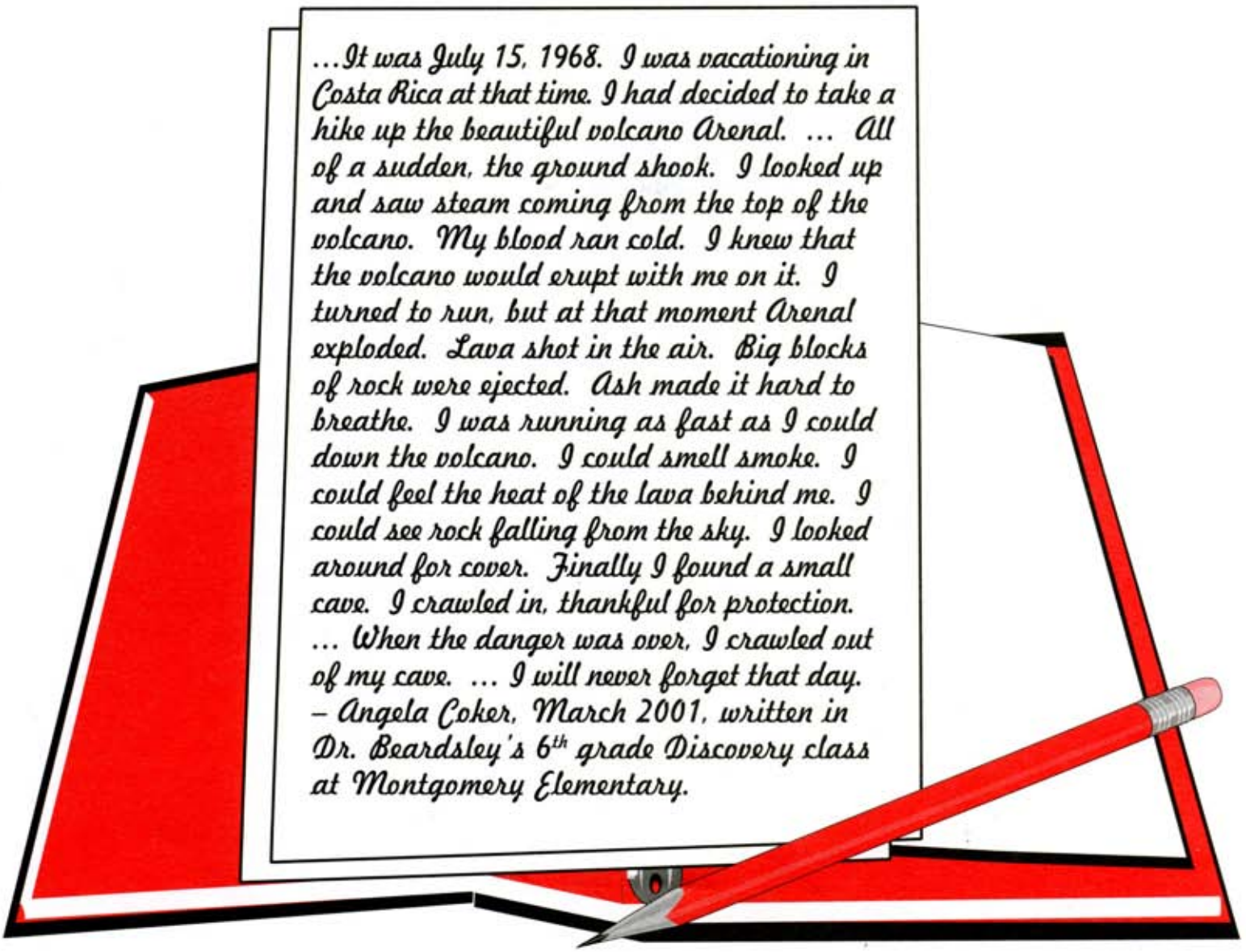
Photo by Bill Witherspoon, July 1989

This is the rim of the volcano Kilauea (kil-ah-oo-AY-ah). Hawaiians once believed a goddess lived here. They called her Pele (PAY-lay). Even today, some people leave flowers and incense here for Pele.

Write a volcano story!

1. Learn about one volcano. Use the library or the "Volcano World" website at **http://volcano.oregonstate.edu/**
2. Try to imagine yourself at the volcano. What happened? What did you see, hear, and smell? How did you feel? How did you stay safe?
3. Write a story. Draw a picture of the volcano in your story.

Volcano Story by a Sixth Grader



...It was July 15, 1968. I was vacationing in Costa Rica at that time. I had decided to take a hike up the beautiful volcano Arenal. ... All of a sudden, the ground shook. I looked up and saw steam coming from the top of the volcano. My blood ran cold. I knew that the volcano would erupt with me on it. I turned to run, but at that moment Arenal exploded. Lava shot in the air. Big blocks of rock were ejected. Ash made it hard to breathe. I was running as fast as I could down the volcano. I could smell smoke. I could feel the heat of the lava behind me. I could see rock falling from the sky. I looked around for cover. Finally I found a small cave. I crawled in, thankful for protection. ... When the danger was over, I crawled out of my cave. ... I will never forget that day.
– Angela Coker, March 2001, written in Dr. Beardsley's 6th grade Discovery class at Montgomery Elementary.

*Just for Us** was written by Bill Witherspoon with graphics by Sheila Ward.