The Heart of Erebus
by Stephen Whitt

Just off the continent of Antarctica is Ross Island. The tiny spot of land is home to a strange and lovely mountain named Erebus (er-uh-buhz). Near the mountain’s peak are some of the most unusual formations found anywhere on the planet. There are caves carved from ice, frozen columns of steam, and sharp, jagged, black rocks, poking up from beneath the ice. Smoke and steam fill the air. Sometimes the ground rumbles beneath your feet. Steaming, red-hot rocks might fly over your head and crash onto the ice all around you.

As you might guess, this isn’t an ordinary mountain. Erebus is a volcano. It is the most-southern active volcano in the world! Scientists live and work near the volcano’s summit at a place called the Mount Erebus Volcano Observatory. Dr. Philip Kyle is one of these scientists. He wants to understand what this volcano can tell us about Earth’s insides.

Living and Working on a Volcano

How do scientists like Dr. Kyle get to Erebus? First, they travel to Antarctica and a research station called McMurdo. From there, it isn’t that far to Ross Island and the volcano. While they are there, they live and work on the side of the volcano itself!

The research station, called MEVO for short, is just two simple huts. One hut is for living and working. The other is used as a workshop and a place to store equipment. Helicopters and snowmobiles take scientists from the station most of the way to the crater rim. Then they walk the remaining short distance. But this short trip up the sides of Erebus transports the scientists into what must seem like a different world.
Walking on the Edge of a Different World

First there are ice caves, carved out by hot steam escaping from vents in the volcano’s sides. Dr. Kyle says the caves are great places to explore and photograph, and they stay surprisingly warm. Next are the towering pillars of frozen steam. Hot steam escaping directly into the air can freeze and create a sort of reverse icicle pointing toward the sky. Some of these steam pillars are enormous, and last for many years.

But the real wonder is inside the volcano’s crater itself. There you’ll find a lake of molten rock! This lava lake sometimes spits out “lava bombs,” or rocks that whiz overhead when a pocket of gas suddenly bubbles up from inside the lake.

An Unusual Volcano

Erebus is unusual in many ways. The rocks found there are like rocks found near volcanoes in Africa. But this seems strange. How can a volcano in Antarctica be like volcanoes thousands of miles to the north?

Volcanoes like Mt. Erebus and its African cousins arise from long cracks in the Earth called rifts. These cracks form when the land is stretched and torn by forces from below. Think of the way dough might stretch and even split if you pull it from two sides, and you’ll have a good picture of a rift in the Earth. The volcanoes in Africa arise from a place called the Great East Africa Rift Valley. Mt. Erebus rises out of a similar rift. However, this crack in the Earth’s crust is covered year-round by sea and ice.

Flesch-Kincaid RL = 5.5
The Fiery Heart of a Volcano

It’s not just the African cousins that make Erebus unusual. The lava lake also makes Erebus unique, Dr. Kyle says. There are only a few volcanoes on Earth that have one. For the scientists, the lake is like a window into the Earth’s insides.

The lake is made up of molten rock called magma. The lake bubbles and sometimes shoots out lava bombs. Scientists study the lake to learn about what’s happening inside the volcano. Deep below is a place called the magma chamber. Dr. Kyle calls it “the heart of the volcano.” It’s this heart that he most wants to understand.

Liquid Rock and Solid Ice

How can a place as cold as Antarctica have volcanoes that erupt? The heat of volcanoes has nothing to do with the weather. Instead, a volcano’s heat comes from deep inside the Earth. There the temperature is hot enough to melt rock. When the magma finds a crack or a weak spot in the Earth’s crust above, it pushes its way up to the surface.

Weather doesn’t affect the volcano, but it does affect the scientists who work there. Storms can cause 100-miles-per-hour winds! The high altitude also affects the scientists. The higher you go in the atmosphere, the thinner the air gets. This makes it harder to breathe and can even make you sick. The scientists deal with this by moving up the volcano in stages. They spend several days at a lower camp and then slowly move higher and higher. This gives their bodies time to adjust to the conditions.

Even though it is a hard place to work, Dr. Kyle is looking forward to the next field season. It will be his 37th on the mountain! He’s most excited about a new way of
“looking” inside the volcano using explosions. The explosions create waves that travel through the mountain and bounce off whatever might be inside. It’s a little like the sound waves bats and dolphins use to find objects in the air and water. The scientists hope that this will help them “see” inside the magma chamber. It would give Dr. Kyle his first real look into the heart of Erebus.

Glossary

altitude – the height above sea level
magma – melted rock beneath the Earth’s surface
rift – a large crack in the Earth’s surface that forms when the land is stretched and torn
transport – to move from one place to another
unusual – not ordinary