

Worksheet

Control of Nature: Cooling the Lava

The eruption came out of nowhere. Earthquakes had not even alerted the people who lived on the island of Heimay (part of Iceland). Even Icelandic seismologists thought nothing of them. Then it happened, on January 23rd, 1973 -- a new volcano erupting awakened the country.

The sounds that accompanied the eruption were equivalent to low-pitched roars. Then the volcano exploded violently, sending molten rock hurling into the air. Nearly all of the island's residents were evacuated to the mainland. For months the volcano would spill constant streams of lava (liquid or molten rock) over its edge engulfing the countryside adjacent to the volcano. Its slow and steady progress began to approach the village on Heimay. What worried the people of the island the most was that the volcano's lava migrated toward the harbor. It threatened to fill the harbor, which, was the center of the economic life of this fishing community.

On the third day of the eruption, there was a sudden onrushing of the lava and twenty-three houses and a large fish plant were engulfed in a single night. It was astonishing to see what an essentially liquid body of rock would destroy in its path.

Cooling the lava was Thorbjorn's idea. That such a feat had not been tried, let alone accomplished, in the known history of the world did not burden Thorbjorn, a physicist, who had reason to believe it could be done. During a previous eruption, Thorbjorn watched lava approach the sea. He had noticed the lava flow to the beach and then follow the coastline for a long distance. "The sea cooled it," he explained. "Then lava ran along the cooled wall. I wondered could anything similar be done by man?" (McPhee, p. 104)

The people on Heimey reasoned that buildings could be rebuilt, but if they lost the harbor it would be gone forever, and with it their livelihood. The Icelanders therefore sprayed seawater on the lava to try to slow or stop its movement. It was the largest effort ever exerted to control volcanic activity. More than 19 miles (30 km) of pipe and 43 pumps were used to deliver sea water at a rate of up to 1.3 cubic yards per second. By the end of the eruption, the people in Iceland had pumped 8 million cubic yards (6 million cubic meters) of water onto the flow.

The molten lava was about two thousand degrees Fahrenheit. Where the lava came in contact with the water it changed states from liquid to a solid, creating a wall of chilled lava to dam the flow. The water hitting the lava produced billows of steam. By early May, about 300 buildings had been engulfed in the lava despite the effort to try and restrict the lava flow.

Not only did the tremendous efforts save the port they actually improved it. The residents returned to rebuild their town and even use the heat from the cooling lava to construct a heating system. One scientist from Iceland said, "If we hadn't done something, I very much doubt that we would be here now. (McPhee p.178)

