[Lesson 534]

[1090L]

[645 words]

Sixty-Nine Days to Freedom

A length of 2,300 feet is equal to almost 1/2 mile. In relative terms, if eight football fields were placed adjacent to one another, they would cover about ½ mile in length. Now, imagine that they were placed into the earth, end-to-end, 2,300 feet underground. The San Jose mine was located in the Atacama desert of Chile, in South America. When it collapsed on August 5, 2010, 33 miners were trapped at this precise depth. By Day 50, they had survived below the ground, longer than anyone in the history of mining accidents. On Days 68 and 69, all 33 miners were rescued; astonishingly, there were no casualties. What caused this disaster, and how were the miners able to withstand life for over two months below ground? It took a combination of luck, resourcefulness, communication, and technology.

The mine is located in one of the driest places on Earth; the Atacama has been used by NASA as a staging ground to simulate conditions on the planet Mars. Since 1889, people had been chipping away at the San Jose mine for gold, iron, and copper, and by 2010, its depth was nearly equal to the height of the tallest building in the world. For this reason, an intricate series of roads (complete with road signs and rules, as with a street) and spaces had formed over time, carving out spaces that made the mine something like a miniature city. The main road, known as the Ramp, zigzagged from the mine's entrance to its depths.

Survivors of that fateful August day recall that a sound resembling a skyscraper crashing to the ground. A gargantuan piece of stone known as diorite—the height of a 45-foot-story building and twice the weight of the Empire State Building—had fallen, obstructing the Ramp and sending pieces of rock, stone, and dust sweeping throughout the caverns. The trapped miners, many of whom were veterans, debated their chances of survival. They immediately recognized that the diorite was too massive for machinery to remove it.

Meanwhile, frantic rescue efforts began drilling boreholes **affixed** with listening probes to identify survivors. After 17 anxious days, the rescue teams discovered a note that the miners had attached to one probe. "Estamons bien en el refugio los 33," it read—"All 33 of us are well inside the shelter." Despite their dire circumstances, for two weeks, the trapped men had rationed what food they had: small amounts of mackerel and tuna, and water, approximately 300 Calories per day. By congregating in a room in which fresh air was pumped from the mine's surface, the group was able to remain healthy. When they read the note, some of the rescuers sobbed. Nobody expected that all 33 miners would still be alive.

By late August, rescue teams were able to provide fresh food and water to the survivors, as well as clean clothing, medical supplies, bed, and other equipment. Communications between the rescue team and the survivors continued. This proved critical to both the rescue operation and the survivors' **morale.** On August 29, each man had the opportunity for a 20-second conversation with his family members. The group also sent vital video updates of mine conditions to the workers at the surface.

Since mine tunnels were blocked, rescue efforts focused on drilling shafts to lift each survivor to the surface. Three machines drilled into the earth simultaneously. The trapped miners helped by clearing debris from the ever-widening shaft, and unloading deliveries of supplies. Families and friends of the 33 miners had camped at the site, sending messages and gifts to their loved ones. Once the shaft was ready, a capsule would lift each man to freedom.

Finally, on October 13, the rescue capsule—painted to resemble the Chilean flag—was mission-ready, and the first of the 33 miners evacuated. After almost 24 hours, every survivor was successfully lifted to surface and reunited with their families.

adjacent *adj.* near or next to

Chile is adjacent to Peru, Bolivia, and Argentina.

affixed *v.* attached to or joined physically

Hailey affixed the license tag to her dog's collar.

morale *v.* a person's or group's state of mind or spirit

After we planted trees outside of the school, I sensed a shift in everyone's morale.

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