

Pits and Pitfalls: The Deepest Holes in the World

Hold on tight as Zman leads you around the world on a fascinating tour of... the world's deepest holes! Humanity has touched the moon and even sent probes to Mars, but how far down have we reached on our own home planet?

Scientists have long been the “toymakers” of our greatest dreams. When humans dreamed of learning more about the distant yet not-so-distant moon, astronomers first found ways to see it better. Then they sent spacecraft to explore it for us. And, finally, they sent men to the moon. They sent unmanned spacecraft to land on Mars, fly by the outer planets and venture deep into the dark, lonely, incomprehensibly large expanses beyond our solar system.

Curiously, the human race has never gone to the same lengths to explore the ground right beneath its feet. The exploration of planet Earth has not advanced nearly as much as that of outer space. As of this writing, 12 humans have walked on the surface of the moon (clocking 238,000 miles on the odometer each way) and nearly 500 people in all have been to space. But nobody has yet visited earth’s mantle, let alone its core.

Why has science found ways to exploit the heights of human technological genius to examine soil on a planet 35 million miles away, but not a simple, practical method for penetrating the earth’s mantle? The answer is that it is apparently easier (and many, many times more thrilling) to send men to the moon than explore the earth’s depths.

Yet, the inner world is as varied and fascinating as outer space. Let us then take a journey to – or at least *toward* – the center of the Earth....

Journey to the Center of the Earth

Throughout history various needs have led people to dig into the surface of the earth. From the need for water to the search for valuable gemstones and precious metals, humans have always been fascinated by that which is hidden from us. The Industrial Revolution (starting in the second half of the 18th century) brought with it the need for ever-growing amounts of fuel and raw materials to power



A hole in the middle of the water: the Monticello Dam in California.

industry. This demand drove human ingenuity searching deeper and deeper below the surface. Coal mines and oil wells have been a fact of life for over 200 years. In fact, oil drilling projects, both at land and in the sea, are the most common form of deep-earth exploration.

The closest we have ever come to the center of the Earth involves a project that began over five decades ago, when Soviet researchers decided to seek a closer look at the Earth’s interior. They undertook a massive dig to discover more about the earth’s outer layers.

The Cold War was at its height, not only politically but in a cultural sense as well. Soviet Russia and the United States sparred to outdo each other in scientific advancement. There was a common sentiment that whoever prevailed in the field of scientific and cultural advancement would have proven that their system – either capitalist or communist – was the “right” one. It was this rivalry that spurred the race to the moon. At the same time, it also spawned a search downward, toward the center of the earth.

Soviet researchers wanted to be the first to catch a glimpse of the hidden layers of the Earth’s crust. By digging down they could examine the planet’s internal structure, perform geological surveys and even bring back samples for further investigation. The



Gigantic drill housing built by the Soviets for their Kola project.

idea was first raised in 1962, but it took several years of preparation before the work could begin. This would be a historic project and it had to be handled properly.

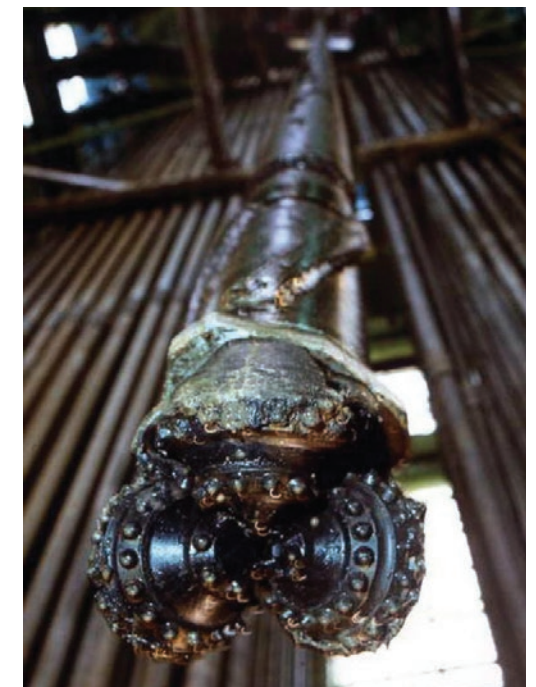
Just reaching a decision on an appropriate site for the work took until 1965 when an area in the Kola Peninsula to the far northwest of Russia was finally chosen, thus giving the project the name “Kola Superdeep Borehole.” Then it took another five years to build the prerequisite buildings and equipment to begin the project. Hundreds of workers and engineers would be involved, and they needed buildings to house them.

Obviously, an unprecedented project like this would require unprecedented equipment. The digging was to be accomplished by a gargantuan drill whose supporting structure towered 200 feet into the air. Special techniques had to be devised. Large-scale digging is usually accomplished using a large drill. As the drill bites deeper into the ground, additional pipes are added to its length so it can reach deeper. In such drills the entire assembly is spun by a powerful engine. But for this mammoth project that method would be totally useless.

Instead, the Soviets devised a special drill in which only the bit turns, while the remainder of the assemblage remains fixed. This was accomplished by hydraulics, forcing fluids under high pressure down a section that ran along the length of the drill

apparatus. Additionally, special tubes were included to collect samples of rock and soil.

Finally, the work began in 1970. The monstrous drill began digging into the earth. As it dug deeper, new sections, each one dozens of feet in length, were constantly added to lengthen the drill. Had these sections been cast of steel, they would have broken under their own weight. Instead



The custom drill bit designed by the Soviets for the drilling project.