



TESLA Life and Legacy - Colorado Springs

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— Colorado Springs —

By the end of the 1890s, Tesla had come to the conclusion that it might be possible to transmit electrical power without wires at high altitudes. There the air was thinner, and therefore more conductive.

A friend and patent lawyer, Leonard E. Curtis, on being advised of Tesla's work, offered to find land and provide power for the research from the El Paso Power Company of Colorado Springs. The next supporter to come forward was Colonel John Jacob Astor. With \$30,000 from Astor, the inventor prepared at once to move to Colorado and begin building a new experimental station near Pikes Peak. Joining Tesla were several assistants who were not fully informed of the inventor's plans.

Arriving at Colorado Springs in May 1899, Tesla went to inspect the acreage. It was some miles out in the prairie. He told reporters that he intended to send a radio signal from Pikes Peak to Paris, but furnished no details.

In the midst of Colorado's own incredible electrical displays, Tesla would sit taking measurements. He soon found the earth to be "literally alive with electrical vibrations." Tesla came to think that when lightning struck the ground it set up powerful waves that moved from one side of the earth to the other. If the earth was indeed a great conductor, Tesla hypothesized that he could transmit unlimited amounts of power to any place on earth with virtually no loss. But to test this theory, he would have to become the first man to create electrical effects on the scale of lightning.

The laboratory that rose from the prairie floor was both wired and weird, a contraption with a roof that rolled back to prevent it from catching fire, and a wooden tower that soared up eighty feet. Above it was a 142-foot metal mast supporting a large copper ball. Inside the strange wooden structure, technicians began to assemble an enormous Tesla coil, specially designed to send powerful electrical impulses into the earth.

On the evening of the experiment, each piece of equipment was first carefully checked. Then Tesla alerted his mechanic, Czito, to open the switch for only one second. The secondary coil began to sparkle and crack and an eerie blue corona formed in the air around it. Satisfied with the result, Tesla ordered Czito to close the switch until told to cease. Huge arcs of blue electricity snaked up and down the center coil. Bolts of man-made lightning more than a hundred feet in length shot out from the mast atop the station. Tesla's experiment burned out the dynamo at the El Paso Electric Company and the entire city lost power. The power station manager was livid, and insisted that Tesla pay for and repair the damage.

For nine months Tesla conducted experiments at Colorado Springs. Though he kept a day-to-day diary that was rich in detail, the results of his experiments are not clear. One question has never been definitively answered: Did Tesla actually transmit wireless power at Pikes Peak?

There are some reports that he did transmit a signal several miles powerful enough to illuminate vacuum tubes planted in the ground. But this can be attributed to



Colorado Springs and Pikes Peak, circa 1900



Experimental station



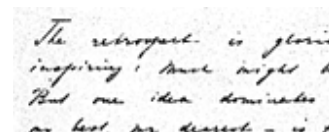
Tesla seated by coil



Illustrations of earth pump



Bulb glowing in ground



Letter to American Red Cross

Take a closer look at a
Tesla coil.

conductive properties in the ground at Colorado Springs.

Another approach pursued by Tesla was to transmit extra-low-frequency signals through the space between the surface of the earth and the ionosphere. Tesla calculated that the resonant frequency of this area was approximately 8-hertz. It was not until the 1950s that this idea was taken seriously and researchers were surprised to discover that the resonant frequency of this space was indeed in the range of 8-hertz.

A third approach for wireless power transmission was to transmit electrical power to the area 80-kilometers above the earth known as the ionosphere. Tesla speculated that his region of the atmosphere would be highly conductive and again his suspicions were correct. What he needed was the technical means to send electrical power to such a high altitude.

One night in his laboratory, Tesla noticed a repeating signal being picked-up by his transmitter. To his own amazement, he believed that he was receiving a signal from outer space. Tesla was widely ridiculed when he announced this discovery, but it is possible that he was the first man to detect radio waves from space.

A great deal of mystery still surrounds Tesla's work at Colorado Springs. It is not clear from his notes or his comments exactly how he intended to transmit wireless power. But it is clear that he returned back to New York City fully convinced that he could accomplish it.

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