Ben Franklin's Lightning Rod And Experiments With Electricity

By Nathan Shepard

Electricity comes from the Latin word *electricus,* which means *produced from amber by friction,* due to amber's ability to accumulate static electricity easily.

Always interested in scientific studies, Benjamin Franklin, an American scientist, planned a way to reduce the smoke that comes out of chimneys and invented, in about 1744, the Franklin stove, which put out more heat with less smoke; furthermore, his stove used less fuel to work properly. Mr. Franklin also invented the Rocking Chair, a widely-used invention, and Bifocals that work for both near-sighted and far-sighted people.

In 1747 Mr. Franklin began his electrical experiments. Because he wanted to prove his theory of lightning, he himself performed his celebrated experiment with the kite in 1752, in which he coaxed the electricity from a lightning bolt to jump down a string into a metal key. This affirmed the accuracy of his "one-fluid" theory that explains the two kinds of electricity, positive and negative, which attract each other. In a thunder cloud, strong air currents push negative charges to the bottom and positive to the top. Because of the negative charges, positive charges collect on the ground. These charges attract each other, and they cause a spark, lightning. The lightning travels either from the negative charges in the bottom of the cloud to the positive charges higher in the cloud or to the positive charges on the ground.

In recognition of his impressive scientific accomplishments, Mr. Franklin was given honorary degrees from the University of St. Andrews and the University of Oxford. In 1753, he was awarded the Royal Society of London's Copley Medal for work in the field of experimental science.

In 1752, Benjamin Franklin invented the Lightning Rod. He discovered that buildings and houses can be protected from lightning with rods extending to the ground from a point above the highest part of the roof. This rod forms an easy path for the lightning to strike, so that the lightning doesn't actually hit the building itself. During a strike, the electric current from the lightning flows from the rod through a wire into the ground where it disperses.

Unlike buildings that are protected by lightning rods, present-day power lines are protected against lightning by a similar invention called the lightning arrester. It consists of a small gas-filled gap between the power line and ground wire. Normally, this gas is difficult for electricity to pass through; however, lightning's huge electric discharge can cause the gas to ionize, and the gas and wire become good conductors of electricity. Consequently, the lightning has an easy path to the ground.