

Living in the Past

Historical perspective



Professor of electromagnetism

In April 1820, while setting up an experiment on his table preparing for his lecture, professor Hans Christian Oersted demonstrated (not by accident, as some insist) that electric current through a wire causes a needle in a nearby compass to deflect. The significance of this discovery was recognized almost immediately, and others in the scientific community began reproducing Oersted's experiment and publishing subsequent findings.

Today, many of us recognize the simple experiment with a battery, wires, and a compass from elementary school. Back in 1820 the idea was quite game-changing, and led to the development of the [transformer](#), the electric motor, and [Tesla's coil](#). These devices ushered in the [Second Industrial Revolution](#), which automated a huge amount of manual factory and farm labor and improved the global economy. And radio waves are completely reliant on electromagnetism.

Hans was quite the prodigy. At age 12, he began helping his pharmacist father, sparking an early interest in chemistry. At age 16, Hans passed the University of Copenhagen's entrance exam. By age 19, he graduated with a degree in pharmacology, and at age 22 earned his PhD. By age 29, Hans was named a professor of physics at the University of Copenhagen.

The result of Oersted's experiment came to be known as [Oersted's Law](#), which essentially states that ***an electric current creates a magnetic field***, and leads to five basic conclusions:

- *The magnetic field lines encircle the current-carrying wire (in the direction dictated by the [right-hand rule](#))*
- *The magnetic field lines lie in a plane perpendicular to the wire*
- *The magnetic field direction reverses if the current direction is reversed*
- *The strength of the field is directly proportional to the magnitude of the current*
- *The strength of the field at any point is inversely proportional to the distance of the point from the wire*

The idea that Oersted was the first to demonstrate a magnetic field created by an electric current was challenged, due to an experiment by Gian Romagnosi in 1802. Today, however, we know that Romagnosi's experiment did not involve a flowing electrical current, but observed motion in a magnetic needle, likely due to built-up static charge.

Hans had always been fascinated by science in general, but chemistry in particular. He was the first to isolate aluminum as an element, he isolated the sharp-tasting chemical in peppers, and was the first to coin the term [Thought Experiment](#), a scientific proof process often attributed to Albert Einstein.

The [CGS](#) unit for ***magnetic field strength*** (the [oersted](#), symbol "Oe") was named in honor of Hans's ground-breaking work.

