



Plate Tectonics—Proof That Wegener Was Right

The first scientific theory to suggest that Earth's continents were once in different positions than they are now was Alfred Wegener's theory of continental drift. Looking at a map of the world, Wegener noticed something that interested him: the east coast of South America and the west coast of Africa looked like they might fit together like pieces in a puzzle. He then read about the work of some other scientists who suggested that South America and Africa were once connected by a strip of dry land called a land bridge.

Testing his idea

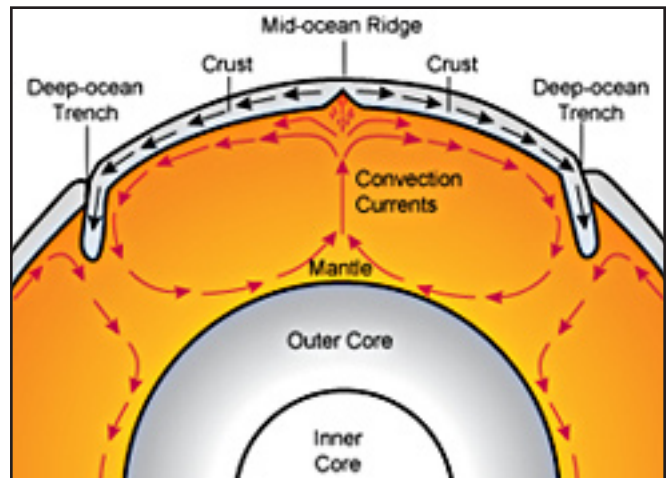
Inspired by these findings, Wegener began looking for evidence to support his idea: that the continents were not fixed in place but rather had moved over time. Using evidence that included matching coastlines, shared rock and fossil types, and mountain ranges of the same age, he explained that places that are today far away from one another were at one time connected.

Why scientists doubted him

In Wegener's mind, he had proven his theory. However, few experts in the field of geology at the time accepted that continents could move. After all, how could they push through Earth's solid crust? Because Wegener had not explained what caused the continents to move, his theory did not receive much support while he was still alive.

New evidence answers questions

By the late 1960s, a group of scientists had developed a new theory based on evidence that had been collected since Wegener's death in 1930. It answered questions that Wegener's own theory had not. First, the scientists suggested that a transfer of heat caused the



United States Geological Survey (USGS)

Scientists finally figured out what was responsible for moving the continents—the convection currents seen in this illustration. This discovery supported Alfred Wegener's work, even though he had already died.

continents to move. This heat starts deep inside the Earth, rises to the surface, and returns underground in a circular pattern. The scientists also learned that Earth's crust is constantly being created and destroyed. This explained what happens to the crust as the continents drift.

According to the new theory, crust is created at underwater mountain ranges called mid-ocean ridges. Crust gets destroyed at deep-ocean trenches, which are long and narrow ditches in the seafloor where pieces of crust are forced together.

Proof that Wegener was right

With these new pieces of evidence, scientists explained the driving force behind continental drift that had been missing from Wegener's theory. By extending Wegener's original ideas, we now know that our planet's crust is broken into a dozen major pieces, called plates. Even though we may not notice it, these plates are in constant motion—or drifting, as Wegener put it. The name given to the new and improved theory is "plate tectonics"—with "tectonics" being the study of Earth's structure.