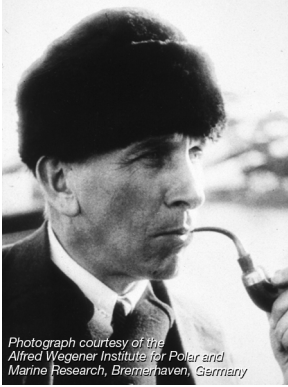


19.2 Alfred Wegener

Alfred Wegener was a man ahead of his time. He was an astronomer and a meteorologist, yet his greatest work was in the field of earth science. His theory of plate tectonics is widely accepted today. Yet, in 1912 when he proposed the idea, he was ridiculed. It took fifty years for other scientists to find the evidence that would prove his theory.

The young man



Photograph courtesy of the Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

Alfred Wegener was born in Berlin in 1880. He was the son of a German minister who ran an orphanage. As a boy, he became interested in Greenland, and as a scientist, he went to Greenland several times to study the movement of air masses over the ice cap.

This was at a time when

most scientists doubted the existence of the jet stream. Just after his fiftieth birthday, he died there in a blizzard during one of his expeditions.

Wegener graduated from the University of Berlin in 1905 with a degree in astronomy. Soon, however, his interest shifted to meteorology. This was a new and exciting field of science. Wegener was one of the first scientists to track air masses using weather balloons. No doubt, he got the idea from his hobby of flying in hot air balloons. In 1906, he and his brother set a world record by staying up in a balloon for over fifty-two hours.

The search for evidence

In 1910, in a letter to his future bride, Wegener wrote about the way that South America and Africa seemed to fit together like pieces of a puzzle. To Wegener, this was not just an odd coincidence. It was a mystery that he felt he must solve. He began to look for evidence to prove that the continents had once been joined together and had moved apart.

Fossils of a small reptile had been found on the west coast of Africa and the east coast of South America. That meant that this reptile had lived in both places at the same time millions of years ago. Wegener figured that the only way this was possible was if the two continents were connected when animals were alive. They could not have traveled across the ocean.

Geological evidence

There was also geological evidence. The rock structures and types of rocks on the coasts of these two continents were identical. Again, Wegener could find no explanation for how this could have happened by accident on opposite sides of the ocean. The rock structures had to have been formed at the same time and place under the same conditions.

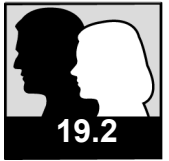
A study of climates produced other evidence. Coal deposits had been found in Antarctica and in England. Since coal is formed only from plants that grow in warm, wet climates, Wegener concluded that those land masses must have once been near the equator, far from their locations today.

Ridiculed and rejected

Wegener explained that all of the continents had been part of one large land mass about 300 million years ago. This super-continent was called Pangaea, a Greek word that means “all earth.” It broke up over time, and the pieces have been drifting apart ever since. Wegener compared the drifting continents to icebergs.

Wegener’s peers called his theory “utter rot!” Many scientists attacked him with rage and hostility. Wegener had two main problems. First, he was an unknown outsider, not a geologist, who was challenging everything that scientists believed at the time. Second, he was not able to explain what caused the continents to drift. While there seemed to be evidence to show that they had indeed moved, he could not identify a force that made it happen.

About fifty years after Wegener proposed his theory, a scientist named Harry Hess made a discovery about sea floor spreading that seemed to support Wegener’s ideas. As a result, the theory of plate tectonics was finally accepted by most scientists.



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Reading reflection

1. Explain the significance of Greenland in Wegener's life.
2. What world record did Wegener set in 1906?
3. Why could Wegener be called an interdisciplinary scientist? Identify the fields of science of which he was knowledgeable.
4. Explain how the fossil of a small reptile provided evidence to help prove Wegener's theory of drifting continents.
5. How did the discovery of coal deposits in England and Antarctica strengthen Wegener's argument?
6. **Research:** In his search for evidence to support his theory of drifting continents, Wegener studied the rock strata in the Karroo section of South Africa and the Santa Catarina section of Brazil. He also studied the Appalachian Mountains in North America and the Scottish Highlands. Use a library or the Internet to research these areas. What evidence do they provide for Wegener's theory? Share your findings with the class.
7. What were the two main problems that Wegener faced when he tried to convince others that his theory of drifting continents was valid?
8. **Research:** Wegener and some colleagues drew maps of what they thought the world looked like at different times as the super continent broke up and the continents drifted apart. Use a library or the Internet to find pictures of these maps. Make a poster displaying Wegener's vision of the world at:
 - 300 million years ago (Pangaea)
 - 225 million years ago (Permian period)
 - 200 million years ago (Triassic period)
 - 135 million years ago (Jurassic period)
 - 65 million years ago (Cretaceous period)
 - Today