

# Putting Together the Pieces of a Puzzle



## LEARNING TIP ◀

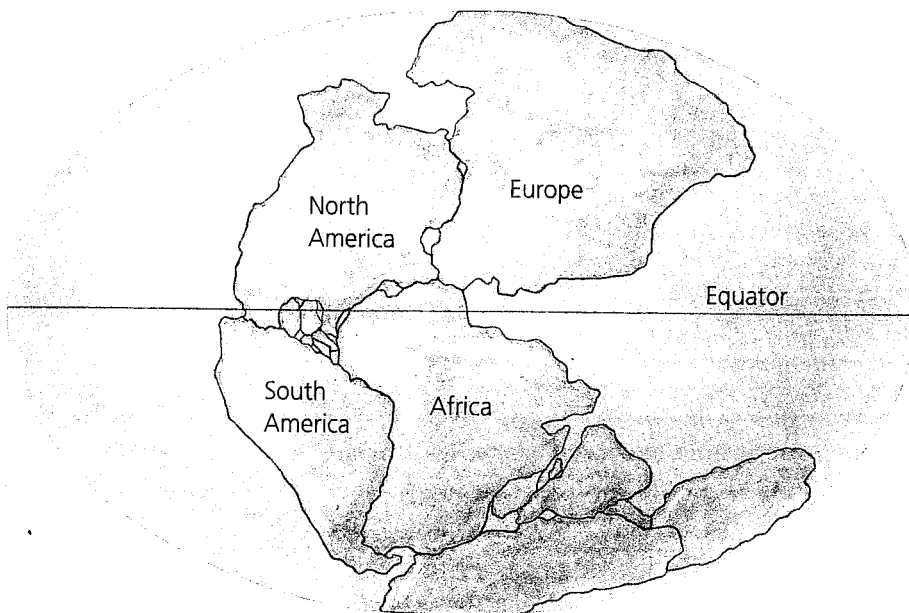
The word "Pangaea" comes from the Greek language and means "all lands."

In December 1910, a young German scientist named Alfred Wegener [VEG-nuhr] wrote in a letter to his girlfriend, "Doesn't the east coast of South America fit exactly against the west coast of Africa, as if they had once been joined? This is an idea I'll have to pursue." Two years later, Wegener presented his hypothesis that, a very long time ago, the continents were all part of one supercontinent he called **Pangaea** [pan-JEE-uh].

The evidence that Wegener used to support his hypothesis came from the shapes of the continents and from fossils, landforms, and an ancient ice age. None of these observations were new. Other scientists had made these observations, but Wegener put them together and came up with a new scientific idea to explain them.

## Shape of the Continents

Wegener observed that South America and Africa seemed to fit together like pieces of a jigsaw puzzle (Figure 1).



**Figure 1**

Were the continents once part of one giant supercontinent?

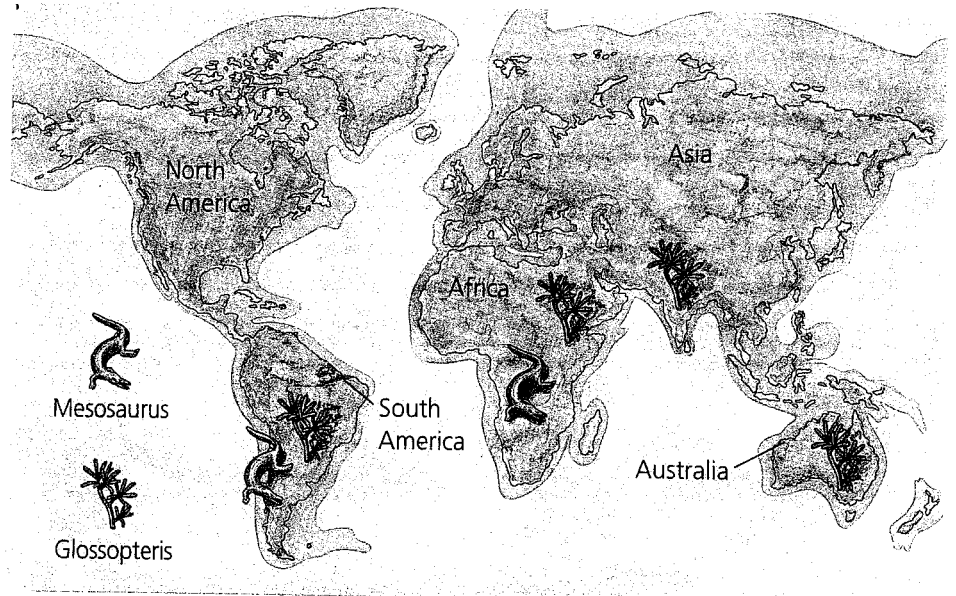


## Fossil Record

Scientists had found fossils of identical plants and animals on different sides of the ocean (Figure 2). These plants and animals could not have travelled across the vast oceans, so they must have lived on the same continent at some time in the distant past. Scientists in Wegener's day hypothesized that there was once a land bridge between the continents, but Wegener disagreed. He thought that the continents had actually been joined.

### ▶ LEARNING TIP

When reading maps, remember to check the legend to find out what the different symbols or colours on a map represent.



**Figure 2**

This map shows some of the fossil evidence Wegener used to support his hypothesis that the continents had once been joined to form Pangaea. Below are actual fossils of Mesosaurus (left) and Glossopteris (right).



## Landforms

Wegener noticed that when he put together the continents in his map of Pangaea, landforms on different continents matched. For example, mountains that run east to west across South Africa lined up with mountains in Argentina. Unusual rock formations and coal deposits in South Africa were the same as rock formations and coal deposits in Brazil. The Appalachian Mountains in the eastern United States matched the highlands of Scotland (Figure 3).

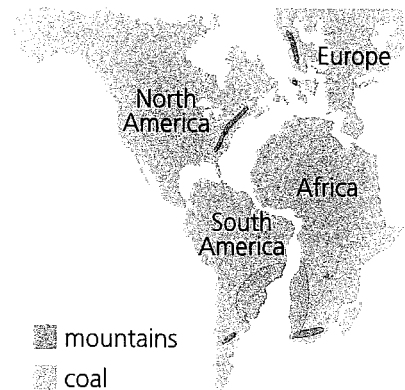
## Ancient Ice Age

Scientists had found striations caused by ancient glaciers along the coasts of both South America and South Africa. The patterns formed by these striations were the same.

Scientists had also found deposits left by glaciers during an ancient ice age. Wegener found that on his map of Pangaea, the continents where this evidence had been found—Africa, India, Australia, and Antarctica—had once fit around the South Pole, where it would have been very cold.

Wegener said that, over time, the pieces of Pangaea separated, forming separate continents. He also said that the continents were still moving, or “drifting.” He called this idea the theory of continental drift.

Imagine Wegener’s disappointment when no one believed him. The main objection to Wegener’s idea was that he could not come up with a good explanation for how the continents “drifted.” Other scientists had difficulty imagining a way that huge continents could move thousands of kilometres.



**Figure 3**

This map of Pangaea shows some of the landform evidence Wegener used to support his hypothesis that the continents had once been joined.

### LEARNING TIP ◀

Always try to connect new information to things you have already learned. For example, think back to what you learned about mechanical weathering by glaciers. Are striations on the rocks caused by ice or by the rocks in the ice?

### ▶ CHECK YOUR UNDERSTANDING

1. What pieces of the puzzle did Wegener have? In other words, what evidence did he have to support his hypothesis that the continents had once been joined to form the supercontinent Pangaea?
2. What pieces of the puzzle did Wegener not have? In other words, what was the weakness in Wegener’s theory of continental drift?