

Name \_\_\_\_\_ Class period \_\_\_\_\_

## THE CONTINENTAL DRIFT THEORY

In 1915, Alfred Wegener, a German Meteorologist first proposed his theory of CONTINENTAL DRIFT. His theory states that the continents have and will continue to change positions of the face of the Earth. He proposed that about 220 million years ago, all of the present-day continents were joined together in a supercontinent called PANGAEA. Pangaea slowly broke apart, first into two smaller continents, one northern and one southern. The great northern continent was called LAURASIA, the southern was called GONDWANALAND. These continents were said to have existed about 135 million years ago. Since then, the continents have continued to drift, ending up in their present day configuration.

### **Wegener cited three major types of evidence to support his theory:**

**JIGSAW CONTINENTS:** Simply stated, the continents look like they could fit together like the pieces of a jigsaw puzzle. Look closely at the continents, especially at South America and Africa. Can you see how they might fit together? Granted, this is a simple observation, but sometimes, the simplest arguments are the most convincing.

**FOSSIL EVIDENCE:** Wegener found some unusual fossils in his travels. These fossils were unusual because they didn't always seem to belong in the places that he found them.

### **TROPICAL FERNS IN ANTARCTICA**

Alfred found some fossilized tropical ferns called Glossopteris, that had been extinct on Earth for millions of years. When they did exist on this planet, they were only located in warm, tropical areas near the equator. These fossils that Alfred found were located in the glacial ice pack of Antarctica! Wegener knew that if Antarctica were to have always occupied its present position of the globe, near the south pole, the ferns could never have grown there, since we know that the poles of a planet are always going to be cooler areas. The presence of fossils in what is now such a frigid area is a pretty clear indicator that at one point in the past, Antarctica must have occupied a latitude that would be warm enough to allow these tropical ferns to thrive.

### **WORLD WIDE ANIMAL AND PLANT DISTRIBUTION**

Isolated environments tend to give rise to unique species. A classic example is modern day Australia. The unique, marsupial forms of life there have only been able to achieve dominance because of Australia's relative isolation from the rest of the world. Australian life forms are not normally seen in other parts of the world because of the barrier presented by the ocean surrounding this island-continent. Wegener's reasoning is that if the continents have always been so separate and distant from one another, then each

would have developed a collection of fairly unique animals native only to it. What we see, however, is that the animal and plant species in existence on Earth is nowhere near as unique and isolated as we expect it should be. Animals and plants are relatively similar in North America and Europe, for example. How could all those animals and plants cross the vast oceans to populate two continents so far apart? Wegener's answer was that at one time the continents were connected, and the animals and plants spread throughout the land. When the continents split up, some plants and animals ended up on both continents.

**GEOLOGIC EVIDENCE:** Wegener noted similar looking mountain ranges in South America and Africa. Rock samples from the coastlines confirm that these mountain ranges have identical mineral and rock composition, and identical ages. Translation, the ranges were once connected, only to be split up by the separating continents. Similar geology was found to exist between Europe and North America, as well as other locations around the globe. This seems to indicate that these landmasses were joined together in the past.

Wegener's theory of Continental Drift was never very widely accepted by the scientific community of the time. Wegener was unable to come up with a mechanism for his theory. He wasn't able to explain HOW something as large as a continent would move, or what force was capable of moving it. In fact, many of Wegener's fellow scientists believed that there was NO force on Earth which could plow something as large as a continent through the ocean beds.

The mechanism was later discovered to be the CONVECTION CURRENTS located in Earth's mantle. This discovery and new information about the way Earth works was incorporated into a more modern version of the continental drift theory. This modern version, nearly universally accepted is called the PLATE TECTONICS THEORY.

1. Pangaea, the super continent existed \_\_\_\_\_ million years ago.
2. Where did Wegener find Glossopteris fossils? \_\_\_\_\_
3. What was the first piece of evidence for continental drift mentioned? \_\_\_\_\_
4. Name 2 continents with similar rock formations. \_\_\_\_\_
5. What was the proof for continental drift found within the Earth's mantle?  
\_\_\_\_\_
6. What barrier prevents life forms from Australia from appearing in other places?

