

Continental Drift Theory

Introduction

Continental Drift Theory is the story of one connected continent—the continents were once one.

The story begins in **1910–1912**, when **Alfred Wegener**, a German meteorologist, studied the Earth's climate and later conducted research in Antarctica. He found fossils of plants and reptiles in Antarctica—organisms that could not easily be explained by the continent's present-day cold environment.

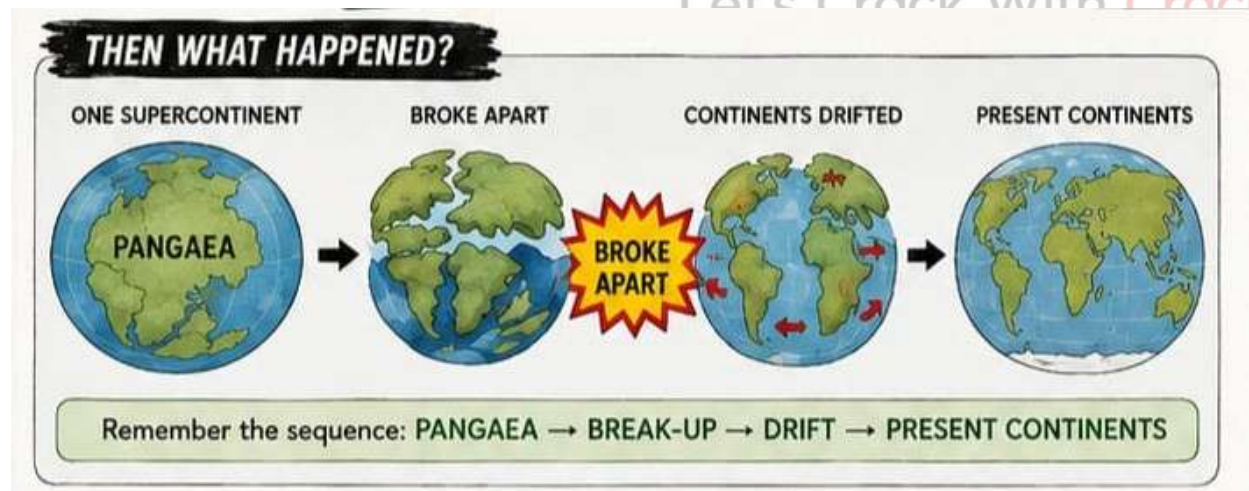
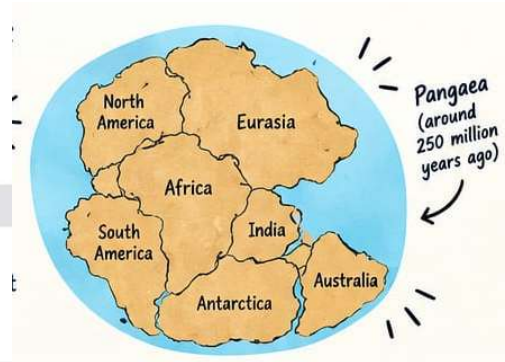
This mystery led him to think that the continents must have been together in the past. Thus, he proposed the **Continental Drift Theory in 1912**.

Pangaea and Panthalassa

Alfred Wegener suggested that the present-day continents were once joined together as a single supercontinent called **PANGAEA**.

- **Pan** = All
- **Gaia** = Earth
- **Pangaea** = All Earth

Pangaea was surrounded by a single vast ocean called **PANTHALASSA**.



Evidence in Support of Continental Drift Theory

1. Matching of Continents — Jigsaw Fit

The coastlines of Africa and South America, particularly those facing the Atlantic Ocean, show a remarkable jigsaw-like fit.

Significance: This suggests that these continents may have been joined together in the past.



2. Continuity of Mountain Belts

Mountain belts and geological structures on opposite sides of the Atlantic Ocean show remarkable continuity. For example, geological structures in eastern North America can be correlated with those in western Europe.

Significance: These similarities suggest that mountain belts now separated by the Atlantic Ocean may once have formed a continuous geological system.



3. Palaeontological Evidence

The discovery of identical fossils on continents that are now widely separated provides strong evidence for past continental connection.

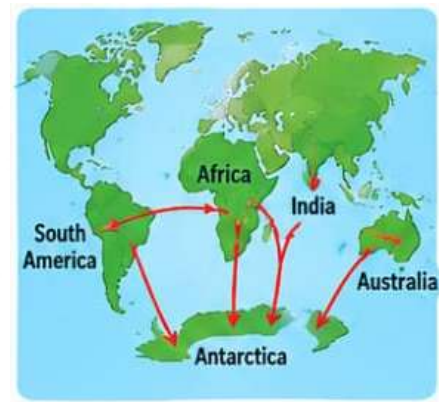
Significance: The distribution of identical fossils is easier to explain if these continents were once connected.

Fossil Organism	Nature	Geographic Distribution	Significance
Mesosaurus	Freshwater reptile	Eastern South America & Southwestern Africa	Unable to swim across thousands of miles of saline ocean.
Lystrosaurus	Land-dwelling reptile	Africa, India, Antarctica	Terrestrial herbivore incapable of transoceanic migration.
Cynognathus	Triassic land reptile	South America & Central Africa	Strongly suggests shared contiguous habitats.
Glossopteris	Seed fern flora	India, South Africa, Australia, Antarctica, South America	Found across cold southern continents, proving past physical link.

4. Biological Evidence

Similar terrestrial organisms are found on continents that are now separated by oceans.

Significance: The distribution of these organisms is easier to explain through past continental connection than by assuming that they crossed vast oceans.



5. Placer Deposits

Rich placer deposits of gold are found along the Ghana coast of West Africa, while the source rocks containing gold-bearing veins are found in Brazil.

Significance: The presence of related mineral deposits on continents now separated by the Atlantic supports the idea that these landmasses were once connected.



6. Tillite Deposits

Tillite, a sedimentary rock formed from glacial deposits, is found in India, Africa, South America, Australia and Antarctica. The distribution of these deposits suggests that these continents experienced similar glacial conditions in the past.

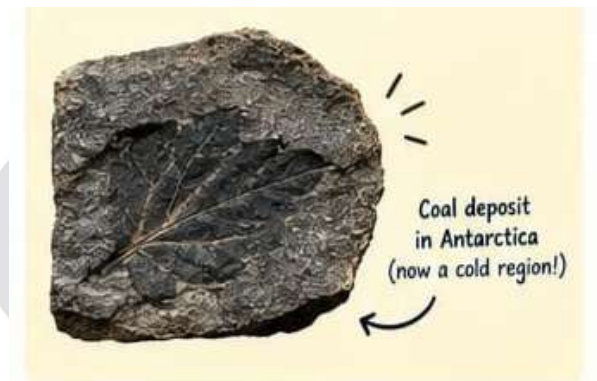
Significance: The evidence is easier to explain if the southern continents were once joined together and located closer to the South Pole.



7. Distribution of Coal Deposits

Coal deposits are found in regions such as India, Antarctica, Australia and South Africa. Coal forms mainly from abundant vegetation in warm, humid conditions.

Significance: The presence of coal deposits in present-day Antarctica and other high-latitude regions suggests that these continents had different climatic conditions and positions in the past.



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Critical Evaluation

Although Wegener presented several convincing pieces of evidence, his theory had an important weakness:

He explained WHAT happened, but failed to convincingly explain HOW it happened.

Wegener proposed that continents moved through the oceanic crust under the influence of:

- Pole-fleeing force
- Tidal force

However, these forces were considered insufficient to move the continents.

Later Development

Later, the development of the **Theory of Plate Tectonics** provided a convincing mechanism for continental movement through:

Mantle Convection → Seafloor Spreading → Plate Movement

Conclusion

Although Wegener could not explain the mechanism of drift, his theory laid the foundation for the modern Theory of Plate Tectonics and revolutionized the study of physical geography.