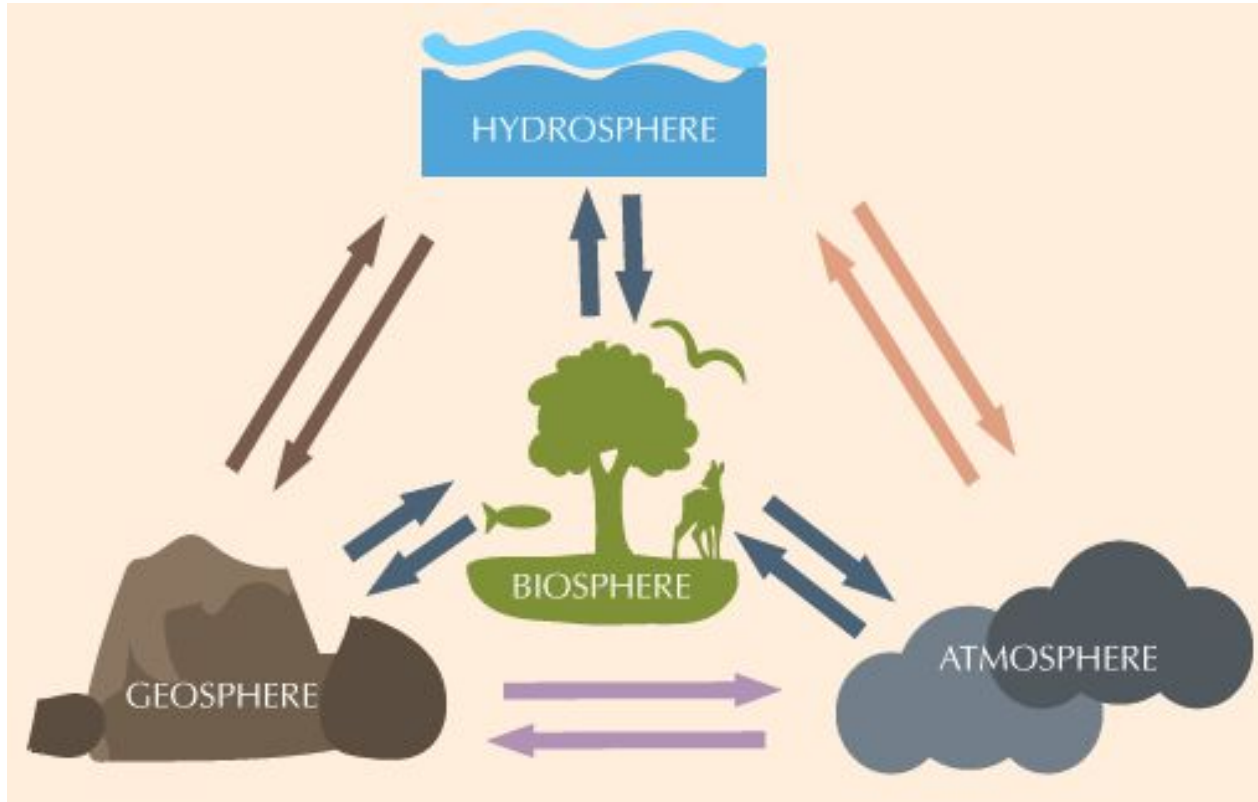


Plate Tectonics

Ms. Larsh

**Model evidence of
Earth's interior to
describe the cycling of
matter by thermal
convection**

Earth's Systems are Interconnected



Recycled Materials

- Water
- Oxygen
- Carbon Dioxide
- Nitrogen
- Carbon
- Earth's Crust

Who Developed the Theory of Continental Drift?

Alfred Wegener published his
Theory of Continental Drift in **1912**



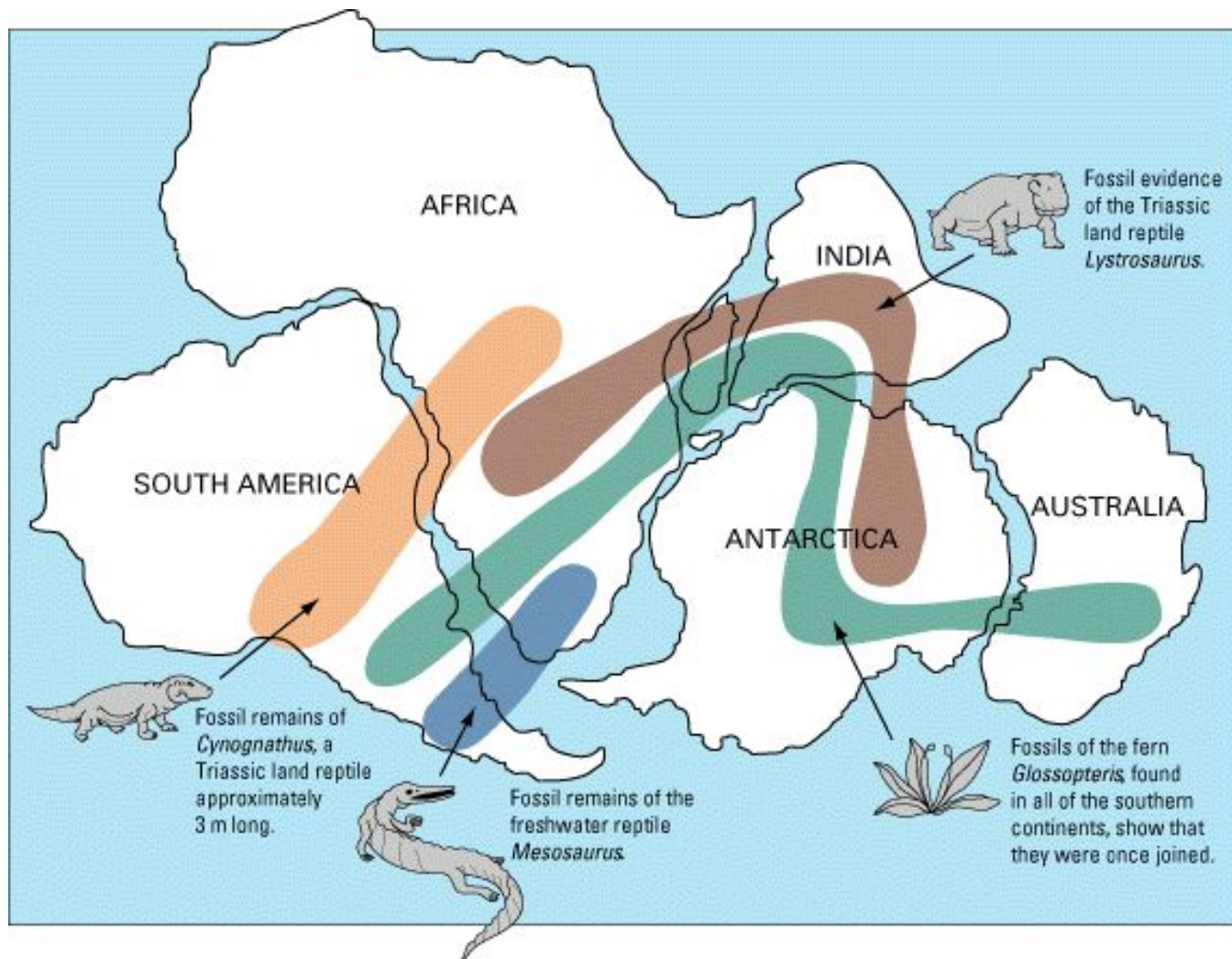
What is the Theory of Continental Drift?

The Theory of Continental Drift proposed that **continents** shift position on Earth's surface

Additionally, it theorizes that at one point, all of the continents were a single land mass, which Wegener named **Pangea**, meaning "*All the Earth*"

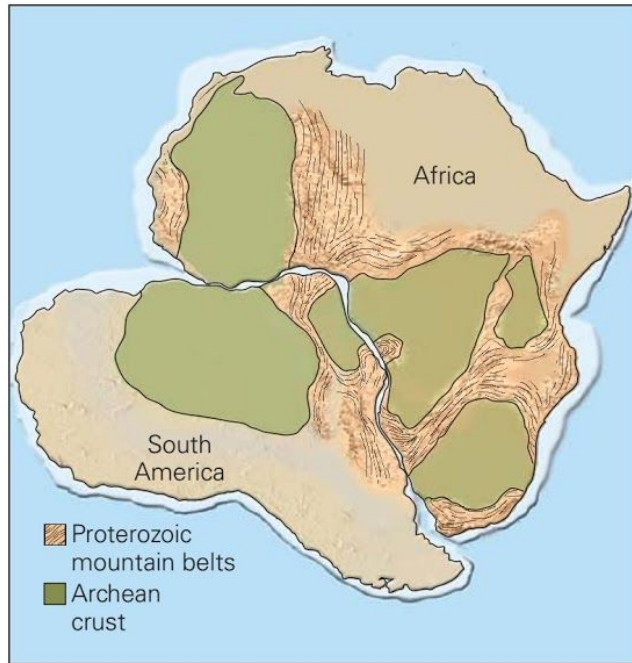
What Evidence Did Wegener Use to Support His Theory?

- Fossils on different continents match up
- Mountain Ranges match up
- Coastlines seemed to fit like puzzle pieces
- Glacial scarring and deposits
- Some fossils could never have survived on the continents they were found on in their current location

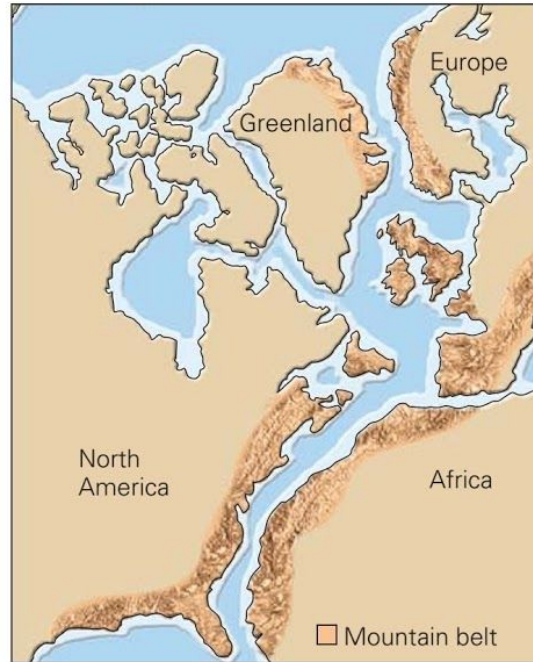


Fossil Evidence

Mountain Range Evidence



(a) Distinctive belts of rock in South America would align with similar ones in Africa, without the Atlantic.



(b) If the Atlantic didn't exist, Paleozoic mountain belts on both coasts would be adjacent.

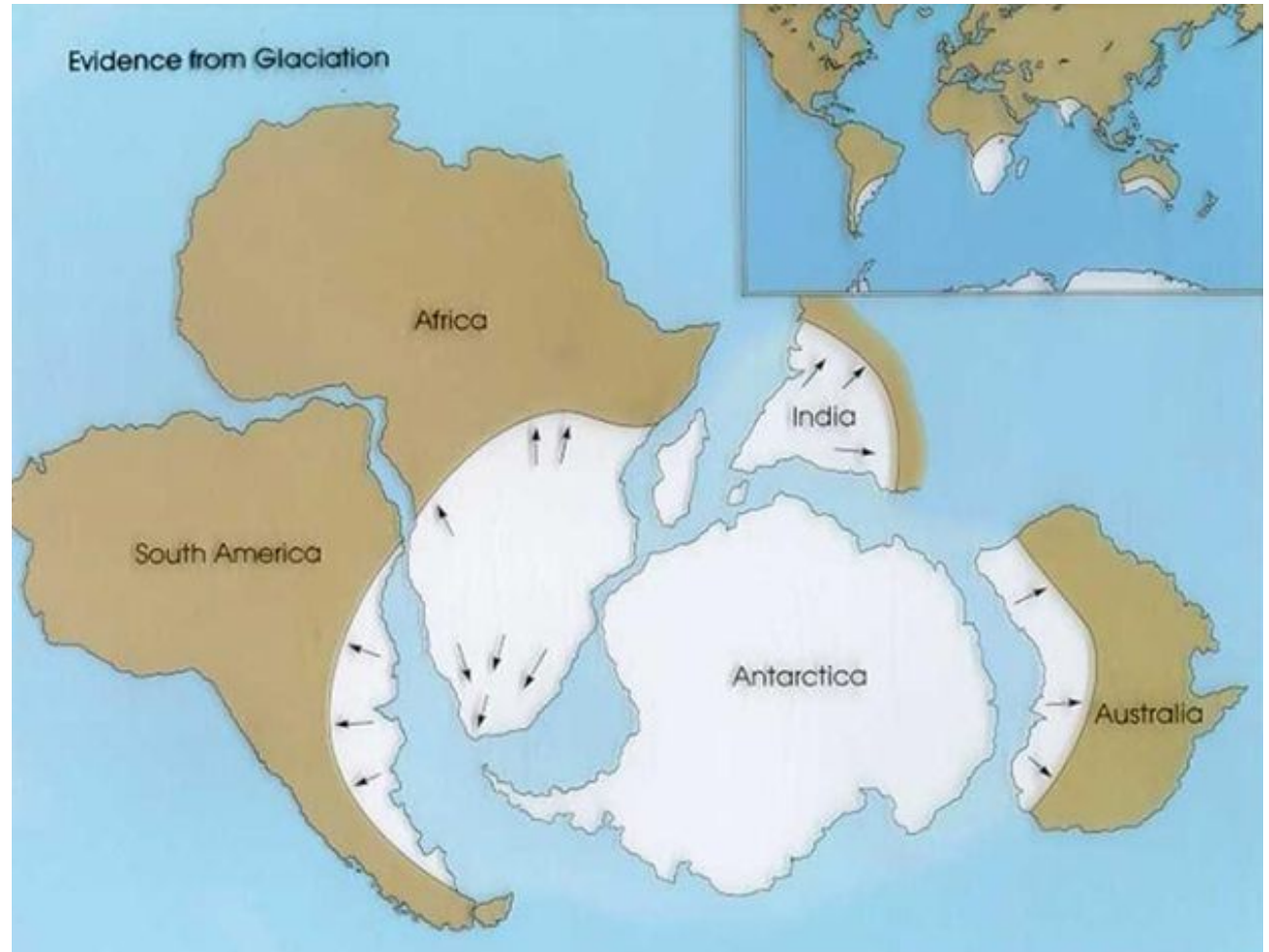


(c) A modern reconstruction showing the positions of mountain belts in Pangaea. Modern continents are outlined in white.

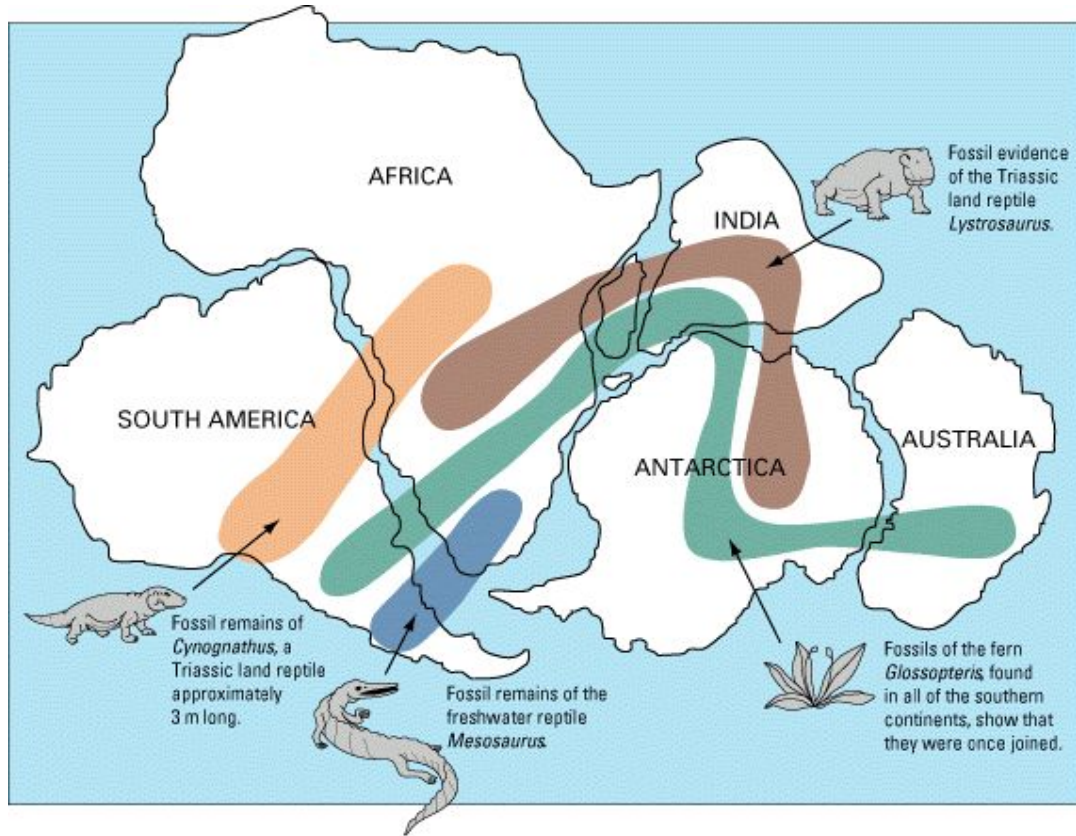
Complimentary Coastlines



Glacial Scarring & Deposits Evidence



Fossil Origin Evidence



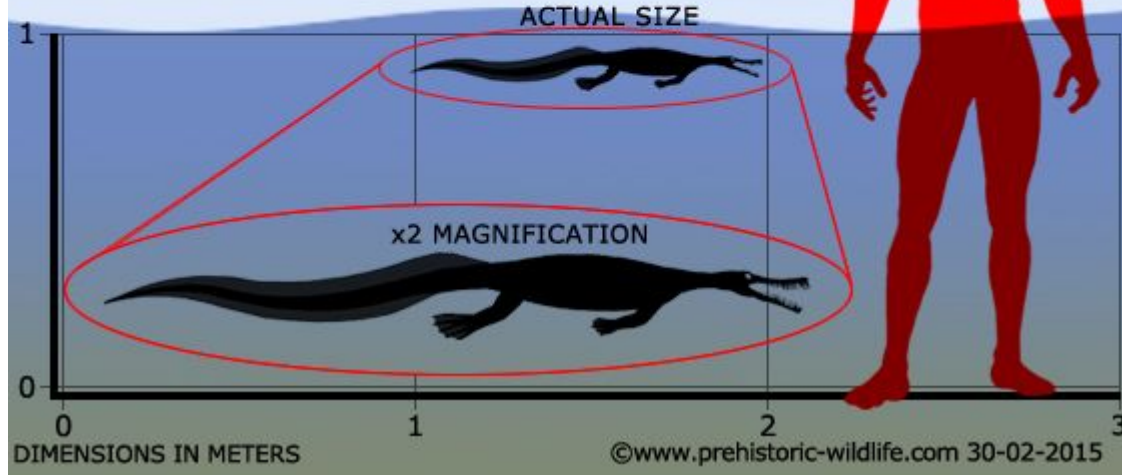
How Could
Tropical Species
Survive in
non-tropical
Environments?

Mesosaurus

1. an extinct small aquatic reptile of the early Permian period, with an elongated body, flattened tail, and a long narrow snout with numerous needle like teeth.



Mesosaurus compared to a
1.8 meter tall person.



Fossils of this Freshwater Reptile found in both South Africa and the lower parts of South America

Glossopteris

1. Meaning “tongue” in Ancient Greek, is the largest and best known genus of extinct order of seed ferns with “tongue-shaped” leaves.



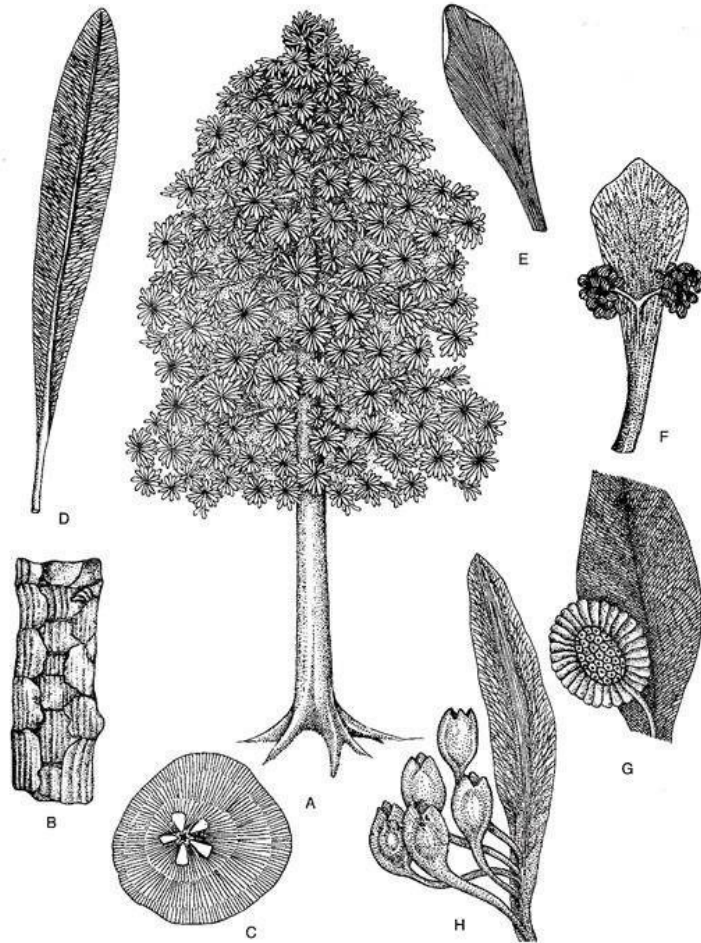


Fig. 1.9 : A. A *Glossopteris* plant, B. *Vertebraria*, C. T.S. of *Vertebraria*, D. *Glossopteris* leaf, E. *Gangamopteris* leaf, F. *Eretmonia*, G. *Scutum lesium* fructification associated with *Glossopteris* leaf, H. *Denkania indica*

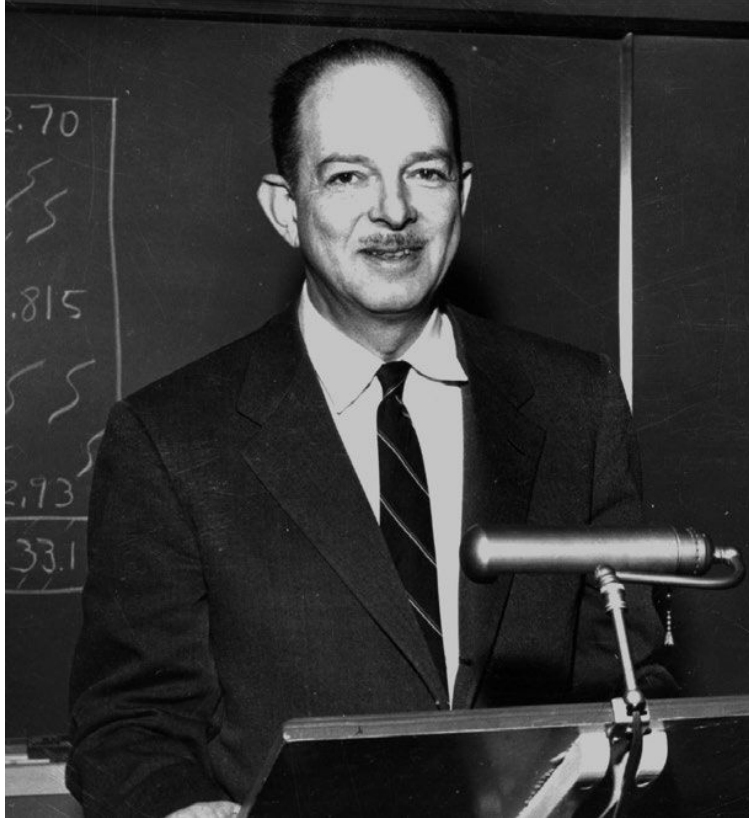
Grew in Temperate
Climates but Fossils
have been found in
Antarctica, Australia,
Africa, & the lower
regions of South
America

The Theory of Continental Drift was not supported until the 1950's, and even then, there was no concrete evidence to give it significant merit

In 1960, geologist Harry Hess from Princeton proposed the Theory of Seafloor Spreading based on his work aboard the USS Cape Johnson & in Submarines during WWII

Since then, additional evidence from the ISS has confirmed that the continents, along plate boundaries, move on average, 1-2 inches per year

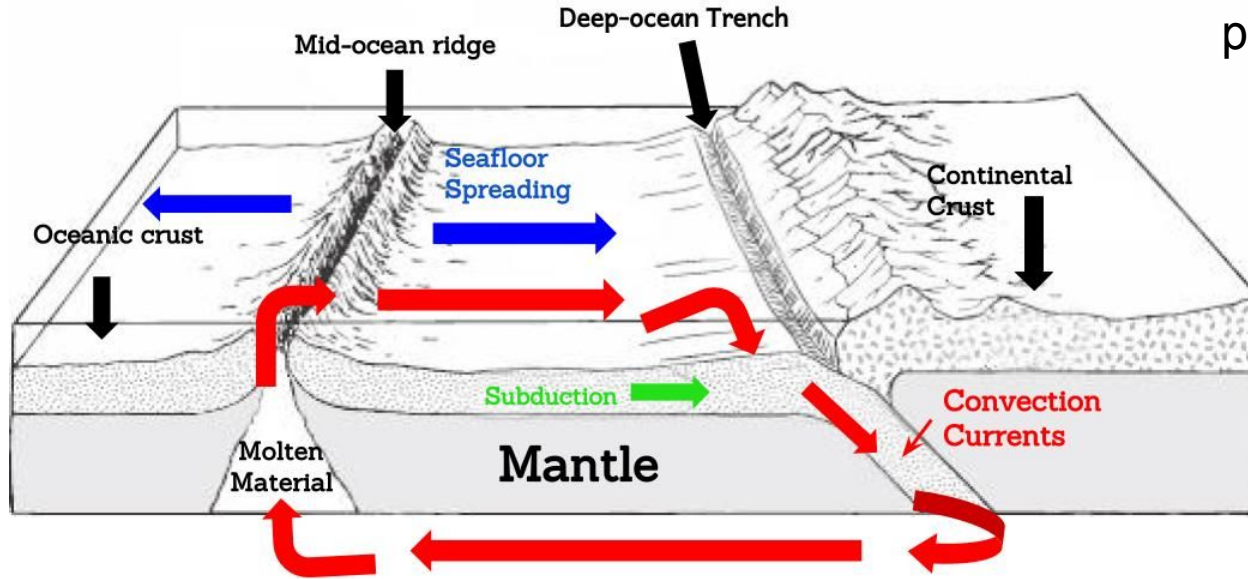
Harry Hess & Seafloor Spreading



Used Sonar to Map out the Ocean Floor

Further evidence to support the Theory of Seafloor Spreading included the use of magnetism and magnetic polarity of new ocean crust

Seafloor Spreading Model



Remember, **Convection Currents** drive every major process on Earth

Seafloor spreading & plate tectonics are powered by convection currents produced by **geothermal energy**