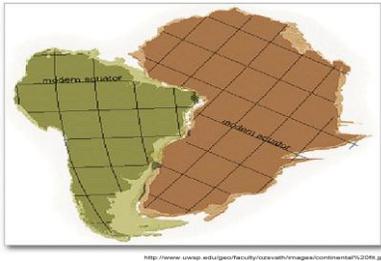
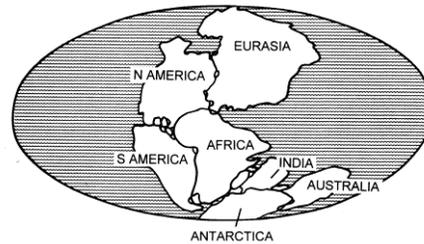


Continental Drift and Plate Tectonics

- ❖ If you take a look at a globe, you can see that if we were to squish the land all together, most of the continents seem to fit together like a puzzle. For example, the west African coastline seems to snuggle nicely into the east coast of South America and the Caribbean sea. (see picture below)



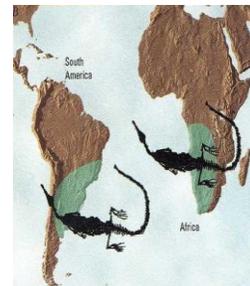
Eastern Coast of South America 'Snuggled Up' to
Western Coast of Africa



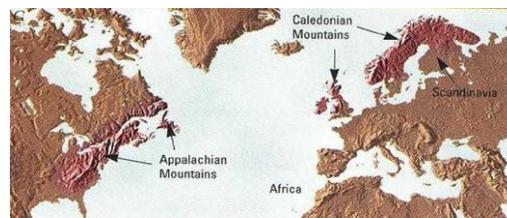
Pangaea (meaning "all lands")

- ❖ In 1915 Alfred Wegener proposed that all the continents were once all one (see above) in a single massive continent called *Pangaea* (meaning "all lands") → over time they drifted apart to their current spots → Pangaea was intact until about 300 million years ago, then began to break up
- ❖ Wegener had **four** main pieces of evidence (or reasons why he believed his theory was true):
 1. The **jigsaw fit** of the continents, especially South America and Africa

2. If we go far enough back in our fossil records we find **fossils** that are the same on both sides of the Atlantic. Eventually, the fossils start to differ from each other, suggesting they were geographically separated.



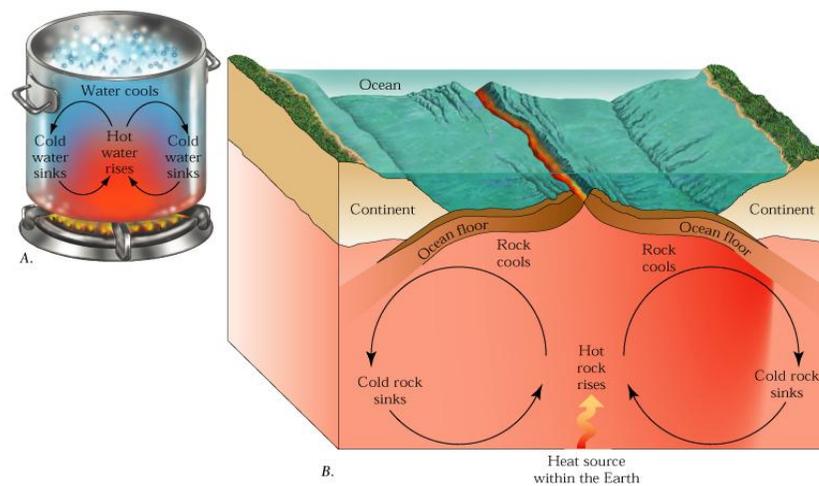
3. **Geologic evidence:** mountains have the same age and structure on both sides of Atlantic.



4. **Ice sheets** covered parts of Africa, India, Australia and South America 250 million years ago. How could this happen in places that are so warm today?



- ❖ So, Wegener's idea of **continental drift** made SENSE but was missing an explanation of how the continents could drift across the earth's surface → **He knew they moved, but could never prove HOW they moved!**
- ❖ It wasn't until the 1960s that the theory of **plate tectonics** was advanced to explain how the continents could separate; a Canadian by the name of J. Tuzo Wilson played an important part in the development of this theory.
- ❖ It was Tuzo Wilson who came up with the **Theory of Plate Tectonics** → that the plates are floating on the mantle (magma) and different **convection currents** moves the plates around (think boiling water moving the lid...)



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- ❖ **How do convection currents power the plate movements? Key concept: hot air rises, cool air falls.** So, magma rises up from the radioactive core, carrying heat to just below the thin crust of the earth. When the magma starts to cool, it falls back down into the centre of the mantle, creating a cycle of moving magma. As the magma moves, it drags the crust (or plates) along with it.

