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CONTINENTS & OCEANS

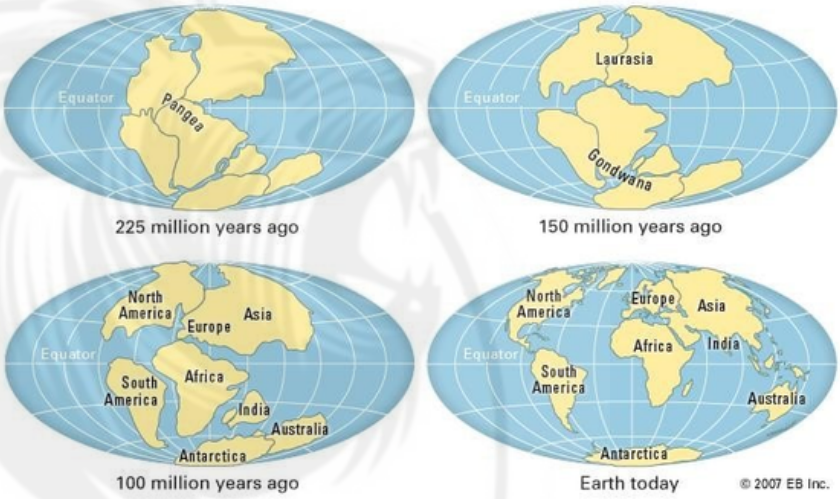


Continents and Ocean

- In 1912, **Alfred Wegener** gave Continental Drift Theory.
- First proposed by **Abraham Ortelius** in 1596
- All of the modern day continents had previously been clunk together in a supercontinent called **Pangea** and the water body is called **Panthalassa**.

Evidences

1. Jig-Saw Fit
2. Fossil Deposits
3. Placer Deposits (Gold Deposite)
4. Botanical Evidences
5. Rocks of Same age Across the Oceans
6. Tillite Deposits (Evidence from Glaciation)



Tillite Deposits as similar to india found in 6 other continents.

Reason of Continental Drift

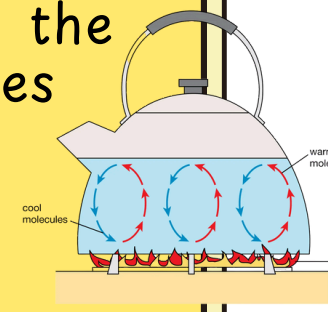
1. Tidal Force

As Suggested by Alfred Wegener

2. Polar Fleeing Force

- Actual reason was later given by **Arthur Holmes in 1930**
- Continental drift occurs due to the movement of tectonic plates, which is driven by **convection cells** in the earth's mantle.

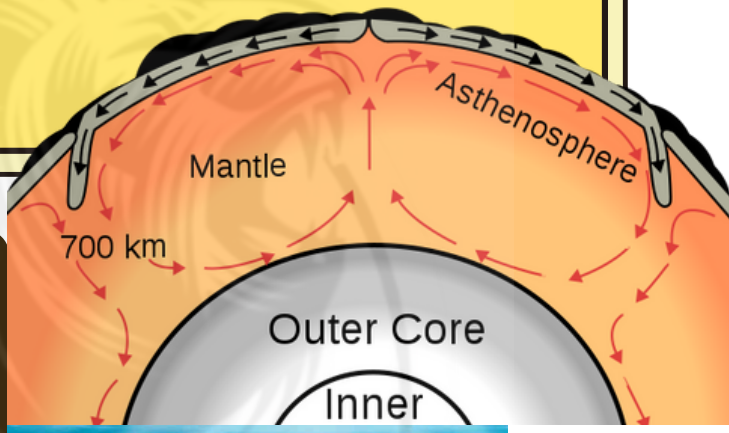
The heat that drives convection cells in the Earth's mantle and plate motion comes mainly from **three** sources:



1.Radioactive decay of elements.

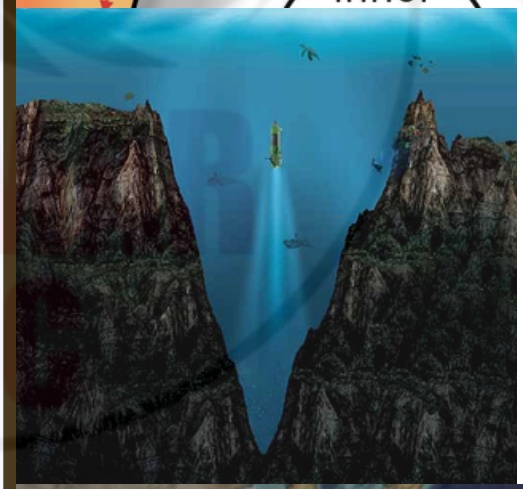
2. Residual heat from the earth's formation when gravitational energy was converted into heat.

3. Latent heat released by the solidification of the Earth's core as it cools down.

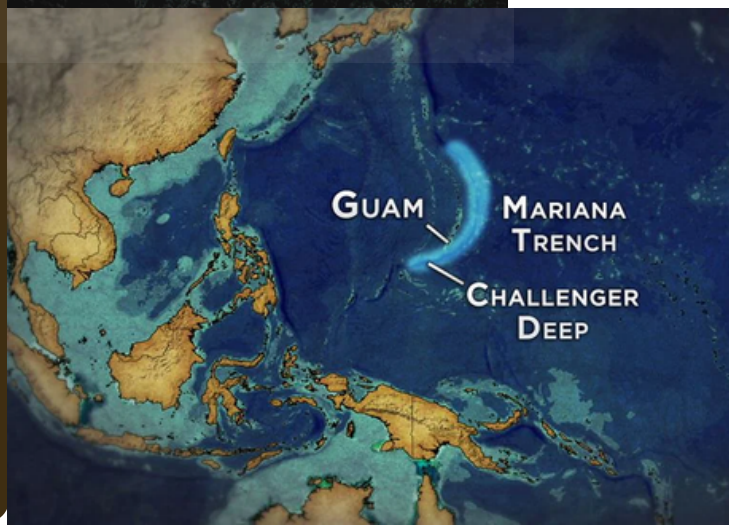


Facts :

- Mariana Trench is the deepest part of the Pacific Ocean (11 km).
- Challenger Deep is the deepest known point in Mariana Trench.
- Atlantic Ocean is the Busiest ocean. Sargasso Sea is a unique region in the Atlantic Ocean, which is a borderless sea (brown algae Sargassum is seen here).



Mariana Trench

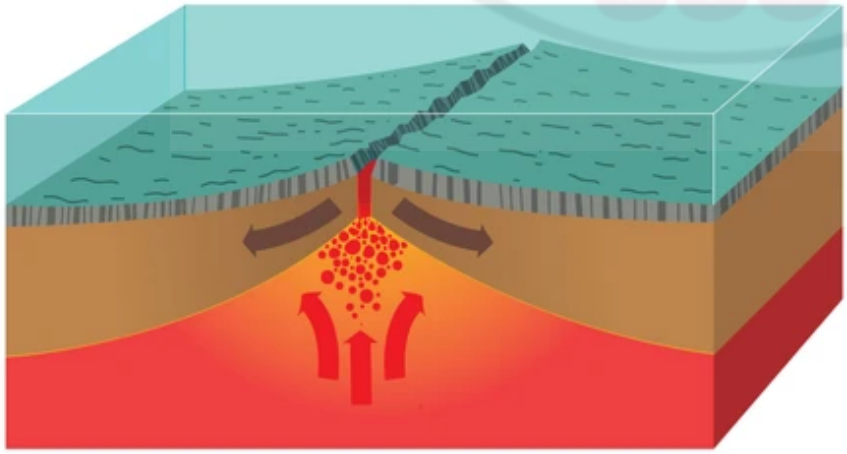


Milankovitch Theory

- It describes the collective effects of changes in Earth's movement on its climate over thousands of years.
- In 1596, **Abraham Ortelius's** work, "Thesaurus Geographicus", first suggested that Earth's continents were not always in their current locations.

Seafloor Spreading

- In 1962, **Harry H. Hess** gave Seafloor spreading Theory.
- It is a process by which new oceanic crust is formed at mid-ocean, due to divergent plate boundary. The magma erupts from beneath pushing the older crossed away from the ridge in the centre.



- Oceanic Crust is younger than Continental Crust
- The age of oceanic Rocks increases as you move away from mid ocean ridge
- Rocks equidistant from Mid oceanic ridge is of same age.
- Oceanic Crust and Mantle have same composition that is **Si and Ma.**

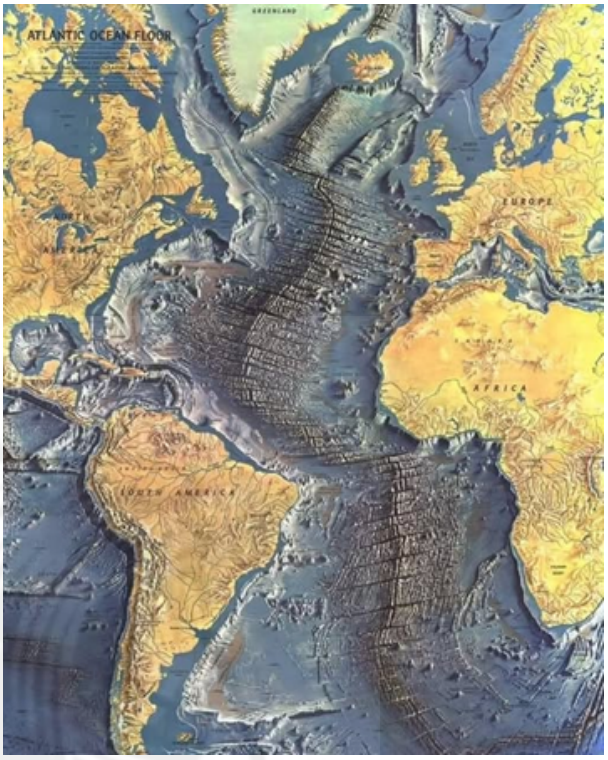
Relief Features are of two types :

Major Relief Features:

1. Continental Shelf
2. Continental Slope
3. Continental Rise
4. Abyssal Plain / Deep Sea Plains

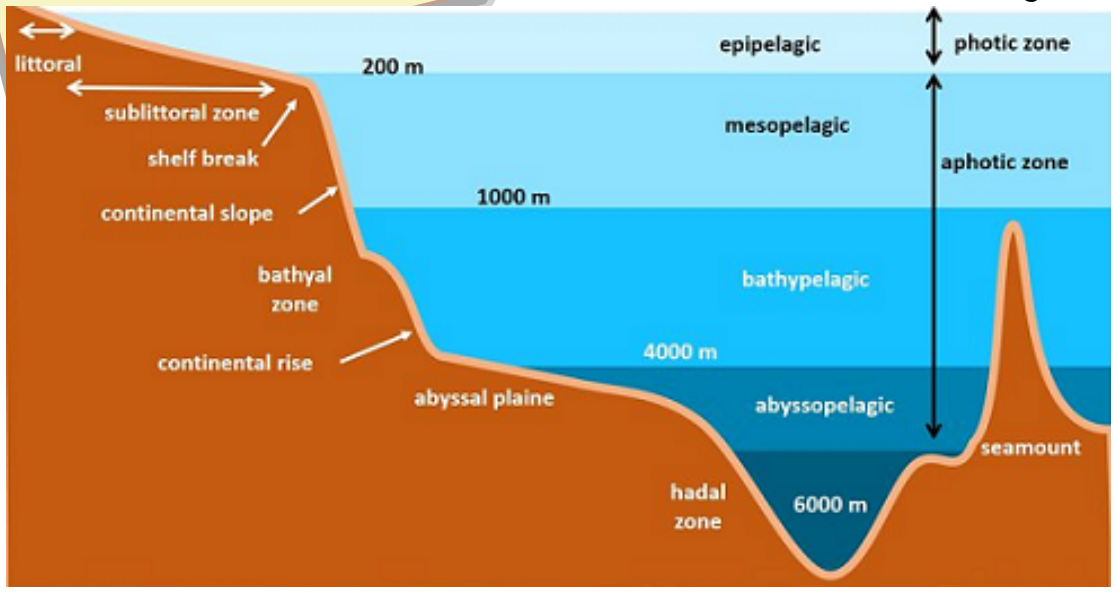
Minor Relief Features:

1. Seamount
2. Guyot (flat topped seamount)
3. Mid-Ocean Ridge
4. Trench
5. Coral
6. Atoll, etc.



- Continental shelf is the Shallowest part of the ocean, having a gradient of 1° or less.
- The gradient of Continental Slope region varies between 2-5°.

- The Mid-Atlantic Ridge is a Mid Ocean Ridge located along the floor of Atlantic Ocean and part of the longest relief feature in the world.
- It got created due to divergent plate boundary.



Corals



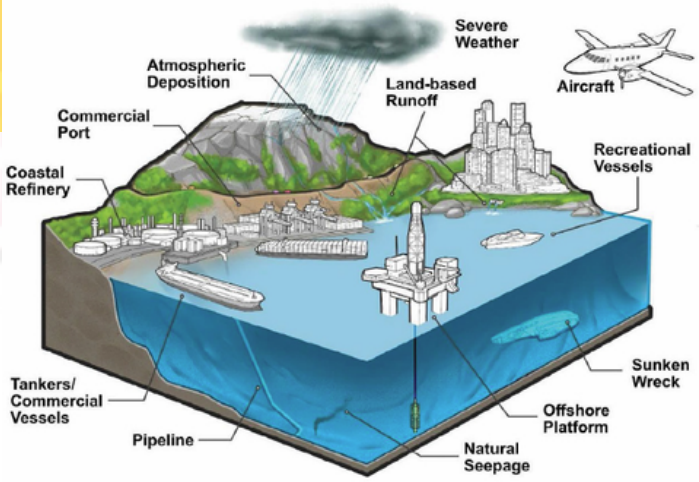
- Corals are marine organisms known as "Rainforest of Sea"
- They exist in symbiotic relationship with Zooxanthella algae.
- They secretes $CaCO_3$ that provides protection to the algae and in return the algae make food for the corals.
- The corals exist in colonies.

Favourable Conditions Required for corals to survive

- Saline water (They Cannot survive in fresh water)
- Sunlight
- Clear Water
- Temperature (They required Moderate Temperature, 20°-32° C)

Coral Bleaching

- When water is too warm, corals will expel the algae (Zooxanthella) living in their tissues, causing the coral to turn completely white.
- Climate Change is a major key factor in this change.



Facts

- Petroleum is extracted from Continental Shelf (start of Ocean basin and is very narrow)
- Siberian Shelf in the Arctic Ocean is the widest Continental Shelf (1500 km wide).
- West Coast of South America is the narrowest continental shelf.
- Great Barrier reef in Australia is the largest barrier reef (Colony of Corals) in the world.

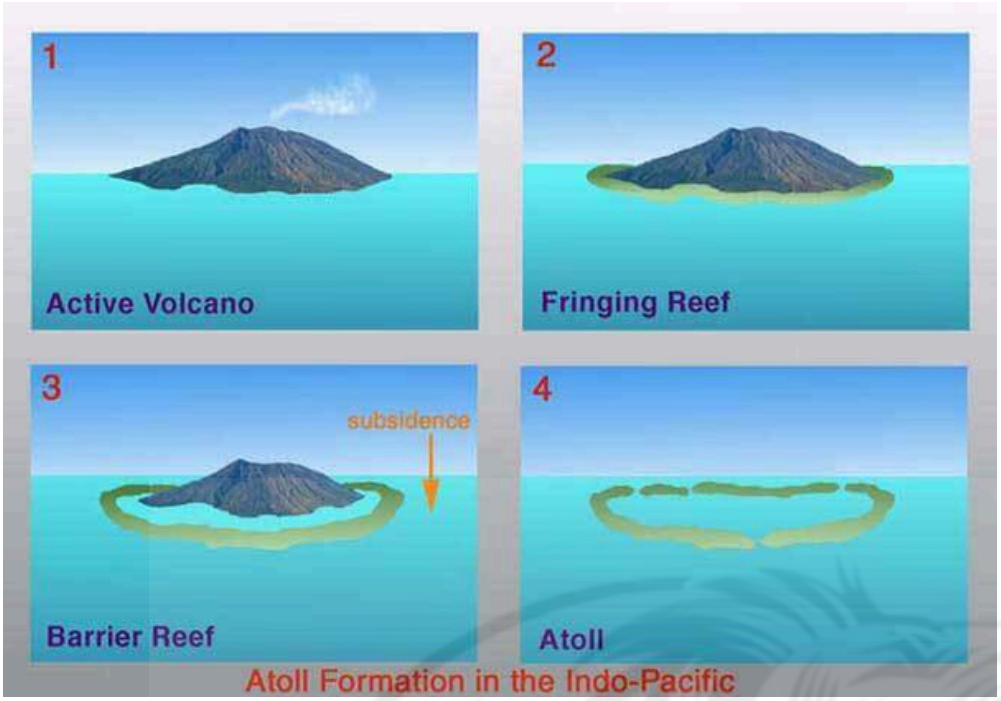
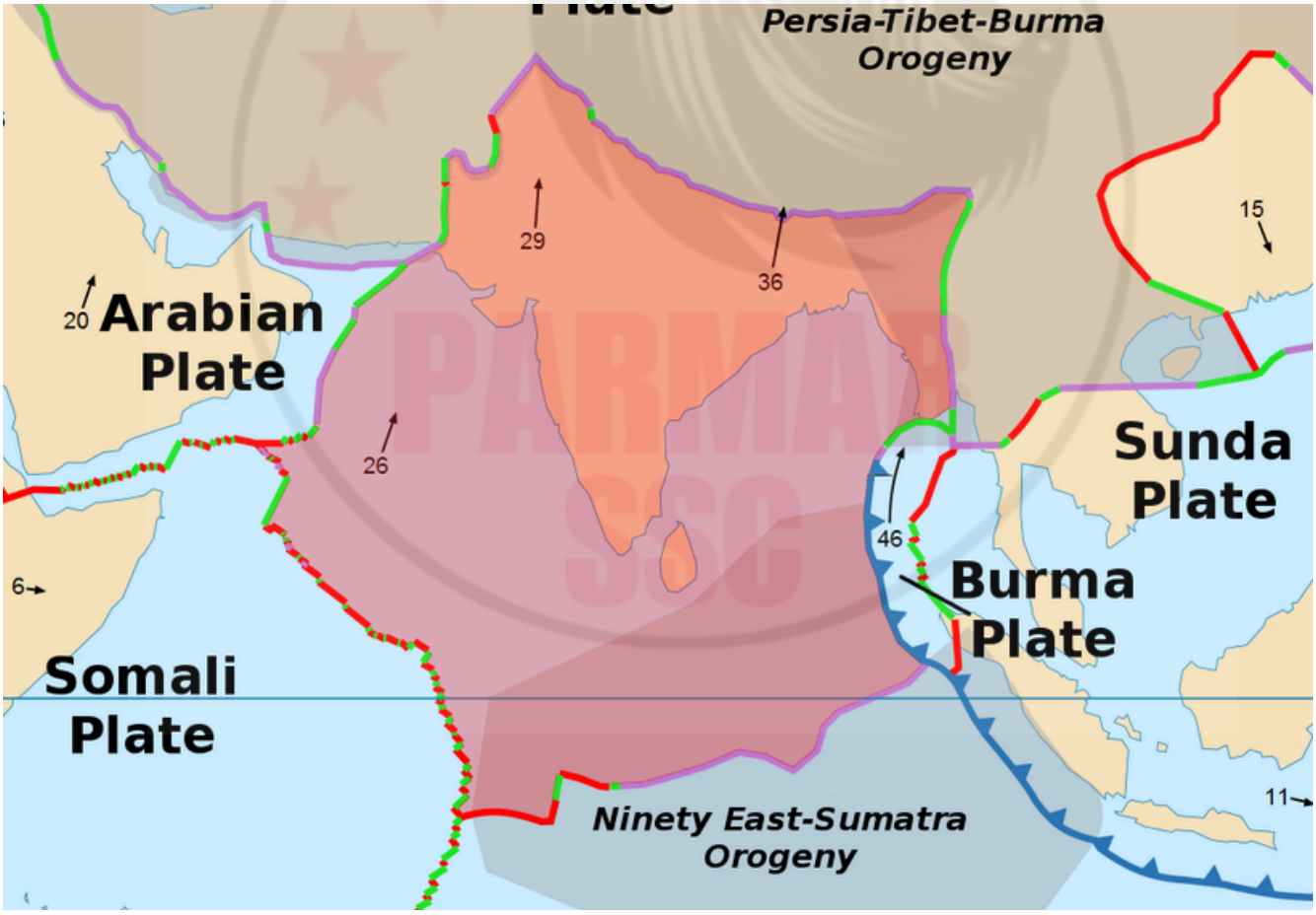


Figure : Atoll Formation



- Andaman & Nicobar island is extension of Arakan Yoma
- Andaman & Nicobar island is created by subduction of Indian Plate under Burma Plate.
- Lakshadweep is mainly formed by Corals but there are more corals in Andaman & Nicobar than Lakshadweep.