

**B.A. PART - 1 ( PHYSICAL GEOGRAPHY : PAPER - 1 )**

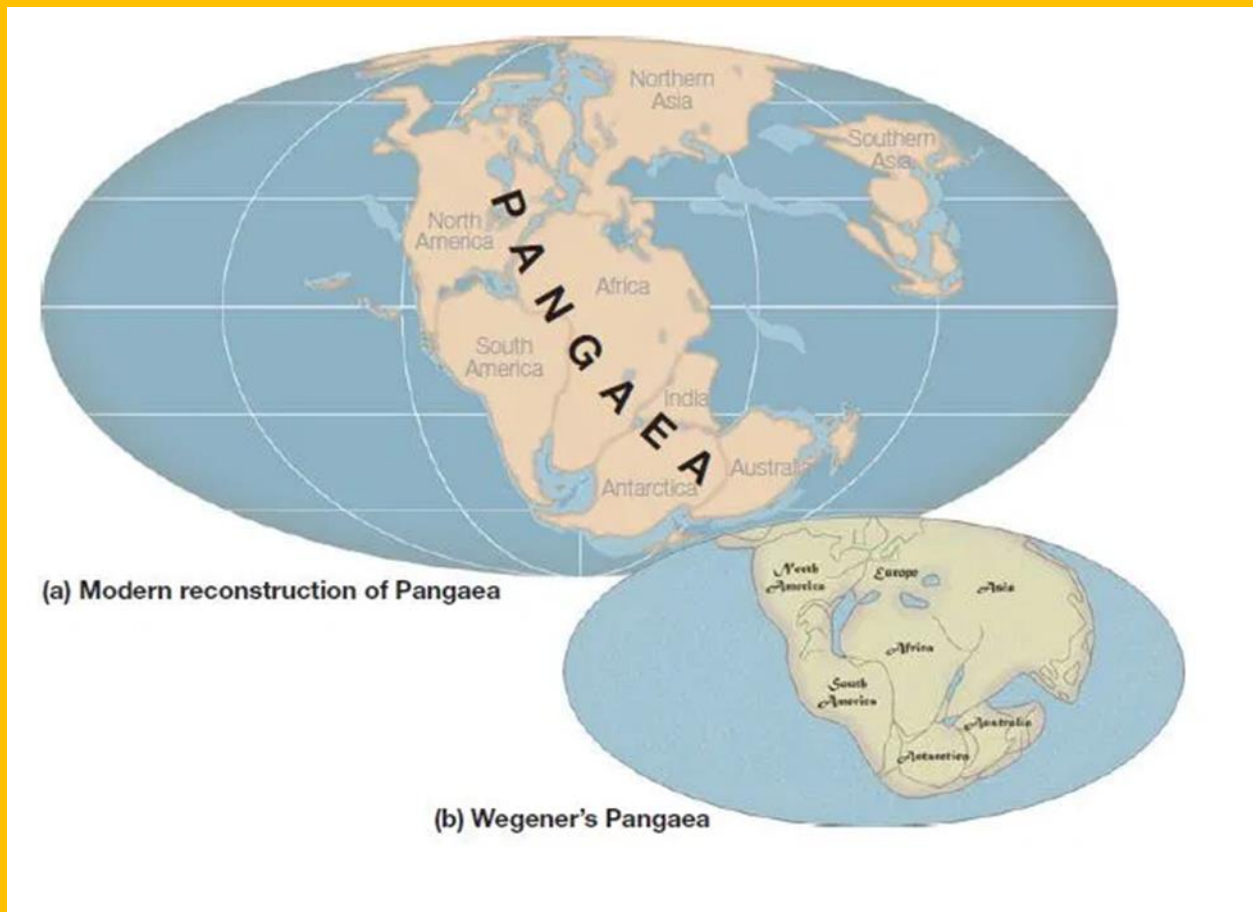
**TOPIC : CONTINENTAL DRIFT THEORY**

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During the second and third decades of the twentieth century, the notion of continental drift was revived, most notably by the German meteorologist and geophysicist Alfred Wegener.

- Continental drift theory was proposed by Alfred Wegener in 1912.
- It was first put forward by Abraham Ortelius in 1596 before fully being developed by Albert Wegener.
- The theory deals with the distribution of the oceans and the continents.
- According to Wegener's Continental Drift theory, all the continents were one single continental mass (called a Super Continent) – Pangaea and a Mega Ocean surrounded this supercontinent. The mega ocean is known by the name Panthalassa.
- Although Wagners initial theory did not cover mantle convection until Arthur Holmes later proposed the theory.
- The supercontinent was named Pangaea and the Mega-ocean was called Panthalassa.
- According to this theory, the supercontinent, Pangaea, began to split some two hundred million years back.

- Pangaea first split into 2 big continental masses known as Gondwanaland and Laurasia forming the southern and northern modules respectively.
- Later, Gondwanaland and Laurasia continued to break into several smaller continents that exist today.



## **EVIDENCE SUPPORTING THE CONTINENTAL DRIFT THEORY**

1. **The Matching of Continents (Jig-Saw-Fit)**
  - The coastlines of South America and Africa fronting each other have a remarkable and unique match.

- In 1964, Bullard created a map using a computer program to find the right fit of the Atlantic margin and it proved to be quiet.



## 2. Rocks of the Same Age across the Oceans

- The radiometric dating methods have helped in correlating the formation of rocks present in different continents across the ocean.
- The ancient rocks belts in the coast of Brazil match with those found in Western Africa.
- The old marine deposits found in the coasts of South America and Africa belong to the Jurassic Age. This implies that the ocean never existed before that time.

### 3. Tillite

- It is the sedimentary rock made from glacier deposits.
- The Gondwana system of sediments from India is recognized as having its counterparts in 6 different landmasses in the Southern Hemisphere.
- Counterparts of this series are found in Madagascar, Africa, Antarctica, Falkland Island, and Australia not to mention India.
- At the base, the system has thick tillite signifying widespread and sustained glaciation.
- Generally, the similarity of the Gondwana type sediments evidently shows that these landmasses had exceptionally similar origins.
- The glacial tillite gives clear evidence for palaeoclimates and the drifting of continents.

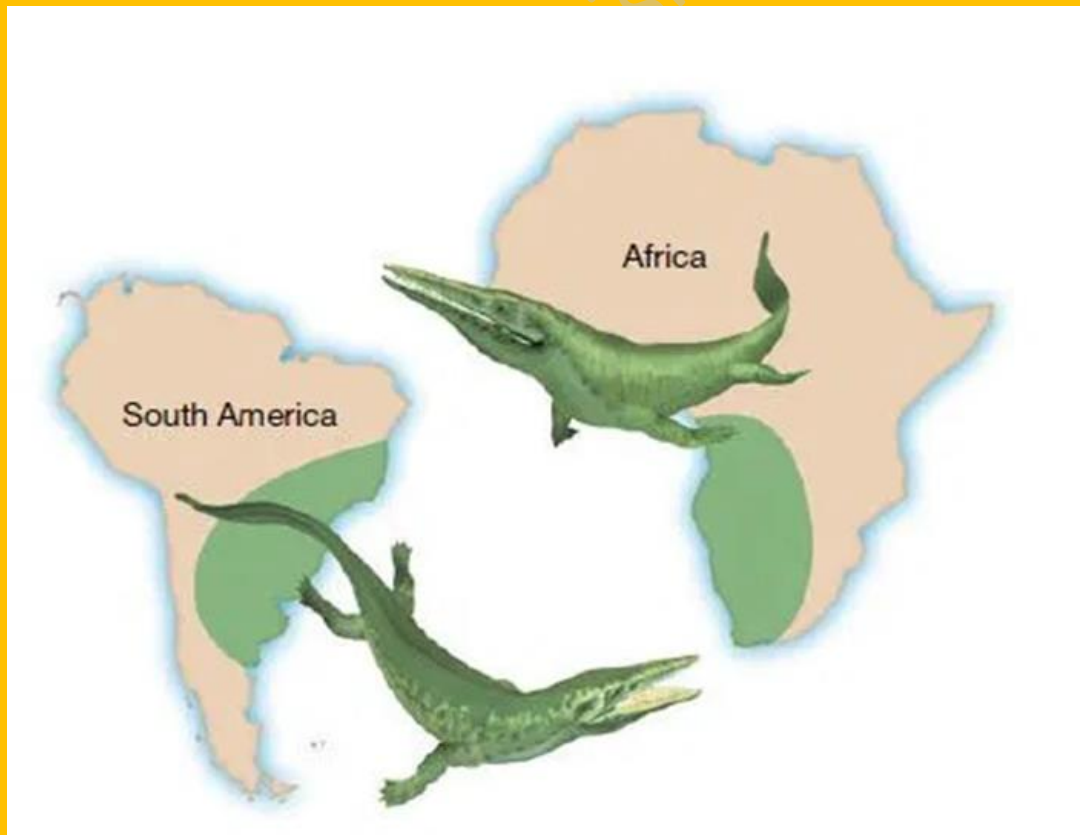
### 4. Placer Deposits

- The presence of abundant placer deposits of gold along the Ghana coast and the complete lack of its source rocks in the area is a phenomenal fact.
- The gold-bearing veins are present in Brazil and it is evident that the gold deposits of Ghana in Africa are obtained from the Brazil plateau from the time when the two continents were beside each other.
- The widespread distribution of Permo-Carboniferous glacial sediments in South America, Africa, Madagascar, Arabia, India, Antarctica and Australia was one of the major pieces of evidence for the theory of continental drift.

- The continuity of glaciers, inferred from oriented glacial striations and deposits called tillites, suggested the existence of the supercontinent of Gondwana, which became a central element of the concept of continental drift.

### 5. Distribution of Fossils

- The interpretations that Lemurs occur in India, Africa and Madagascar led to the theory of a landmass named “Lemuria” connecting these 3 landmasses.
- Mesosaurus was a tiny reptile adapted to shallow brackish water.
- The skeletons of these creatures are found in the Iraver formations of Brazil and Southern Cape Province of South Africa.



## FORCE FOR DRIFTING

- Wegener proposed that the movement accountable for the drifting of the continents was instigated by tidal force and pole-fleeing force.
- The polar-fleeing force relates to the rotation of the earth.
- The shape of earth
- The second force that was proposed by Wegener, the tidal force.
- Though, most of the scholars considered these forces to be totally insufficient.

## CRITICISM OF CONTINENTAL DRIFT THEORY

- (1) Earth's crust was believed to be too rigid to permit such large-scale motions—after all, how could solid rock plow through solid rock?
- (2) Further, Wegener did not offer a suitable mechanism that could displace such large masses for a long journey.

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