Plate Tectonics

Events of 1960 lead to discoveries across the globe. Paleomagnetism studied by Vine Mathews, Sea floor spreading explain by Harry Hess become evidences for the movement of earth surface. Various geographers discovered phenomena's like volcanism fold mountain formation etc, combine effect of these geographers led to the synthesis of plate tectonics. It is divided into 2 parts.

1. Geomatic Part

2. Kinematic Part

Geomatic Part: This part deals with types of plates. J.T Willson divided earth into 6 major crystal blocks and more than 20 minor blocks. He coins the term plates for these crystal blocks. On the basis of size, there are 2 types of plates, 1. Major and 2. Minor plate.

Strahlar and Strahlar in 1984, drew a map of plates including north American, south American, Eurasian plate, African plate, Indo-australian plate and Atlantic plate. Map also represented minor plate like-laska, cocos, somalain, Arabian, Phillipeans etc.

On the basis of presence of water 2 types of plates

1) Continental Plate

2) Oceanic Plate

Continental Plate is composed of SIAL having lesser density whereas oceanic plate mainly composed of SIMA having greater density.

On the basis of plate movement, there are 3 types of plate boundaries.

(1) Convergence – Where 2 plate converges, also called as destructive plate boundaries.

(2) Divergence- Where 2 plate move away from each other, called as constructive plate boundaries

(3) Transform or Conservative boundaries: When 2 plates move anti parallel to each other.

KINEMATIC: This part deals with the movement of plates. Movement can occur in 3 ways.

1) Convergence- It is called as destructive movement and can occur in 3 ways.

a) Continental-Oceanic Convergence- When 2 plate converges against each other denser plate sub duct under lighter plate. Oceanic plate being denser sub duct under continental plate. The

convergence between these plates leads to the compression of sediments resulting the formation of Fold Mountains.

Because of the subduction of oceanic plate friction is produced between continental and ocean at the point of contact. Moreover the radioactivity prevailing in asthenosphere increase the temperature to extent of oceanic plates, start melting. Thus molten material accumulates under the surface. It erupts leading to the formation of volcanism or volcanos.

For example- Western coast of South America has folded mountain. Andy and Volcanic peaks like cotopaxy, Chinborozo and Rocky.

(b) Continent- Continent Convergence (C-C)

When 2 plates collided, heavier part of the continental plate which is oceanic sub ducts till the oceanic surface is not consumed. In C-C convergence neither of the plate subducts because of similar density. Thus folded mountains are formed in C-C convergence. The 2 surfaces come close to each other and because of friction produced due to convergence causes a wielding effect. Hence 2 plates joined each other.

For example- Western part of the Eurasian plate.

For example: Indian plate being continental plate is converging with Eurasian plate. It has lead to the formation of Himalayas. As it is C-C convergence no volcanic peaks are found.

c) Oceanic-Oceanic convergence- (O-O)

It’s a rare event. O-O convergence can lead to the convergence of deposits on the ocean floor leading to the formation of sea mounts, guyots (Plateau like structure on ocean botton).

In case of divergence- When 2 plates move away from each other, a gap is created which is filled by molten materials rising from asthenosphere.

The Accumulation of molten materials along the boundary of divergence leads to the formation of ridges (any rise portion of surface)

Eg.- Mid atlantic ridge and sea floor spreading because diverge two continental plate.