GEOGRAPHY

Geomorphology

- Origin and evolution of Earth
- Geological Time Scale
- Interior of the Earth
- Types of Rocks
- Earth movements
- Continental Drift Theory
- Sea Floor spreading
- Plate Tectonics theory
- Vulcanism
- Geomagnetism
- Earthquakes
- Tsunamis
- Exogenic movements
- Landforms

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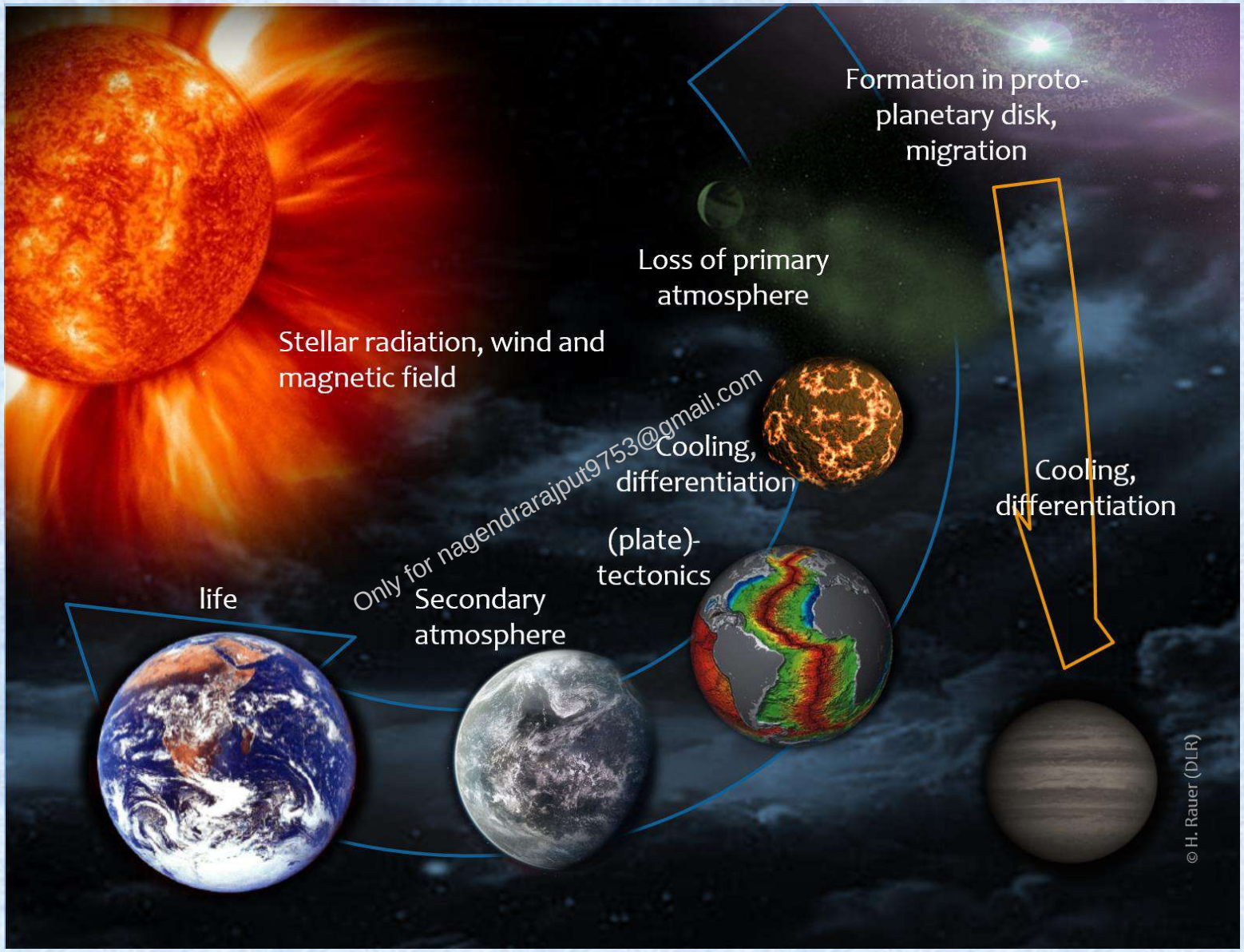
Origin and Evolution of Earth



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Origin and Evolution of Earth

Hot and volatile

Density separation

Condensation

Differentiation

Early atmosphere

Degassing

Volcanic eruptions

Condensation of water vapour

Formation of oceans

Blue Green Algae

Flooding of atmosphere with Oxygen

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2017	How does the Juno Mission of NASA help to understand the origin and evolution of the Earth ? (150 words)	10

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Geological Time Scale

Geological Time Scale

Eons	Era	Period	Epoch	Age/ Years Before Present	Life/ Major Events
	Cainozoic (From 65 million years to the present times)	Quaternary	Holocene	0 - 10,000	Modern Man
			Pleistocene	10,000 - 2 million	Homo Sapiens
		Tertiary	Pliocene	2 - 5 million	Early Human Ancestor
			Miocene	5 - 24 million	Ape: Flowering Plants and Trees
			Oligocene	24 - 37 Ma	Anthropoid Ape
			Eocene	37 - 58 Million	Rabbits and Hare
			Palaeocene	57 - 65 Million	Small Mammals : Rats – Mice
	Mesozoic 65 - 245 Million Mammals	Cretaceous		65 - 144 Million	Extinction of Dinosaurs
		Jurassic		144 - 208 Million	Age of Dinosaurs
		Triassic		208 - 245 Million	Frogs and turtles
	Palaeozoic 245 - 570 Million	Permian		245 - 286 Million	Reptile dominate-replace amphibians
		Carboniferous		286 - 360 Million	First Reptiles: Vertebrates: Coal beds
		Devonian		360 - 408 Million	Amphibians
		Silurian		408 - 438 Million	First trace of life on land: Plants
		Ordovician		438 - 505 Million	First Fish
		Cambrian		505 - 570 Million	No terrestrial Life : Marine Invertebrate
Proterozoic	Pre-Cambrian 570 Million - 4,800 Million			570 - 2,500 Million	Soft-bodied arthropods
Archean				2,500 - 3,800 Million	Blue green Algae: Unicellular bacteria
Hadean				3,800 - 4,800 Million	Oceans and Continents form – Ocean and Atmosphere are rich in Carbon dioxide
Origin of Stars	5,000 - 13,700 Million			5,000 Million	Origin of the sun
Supernova				12,000 Million	Origin of the universe
Big Bang				13,700 Million	

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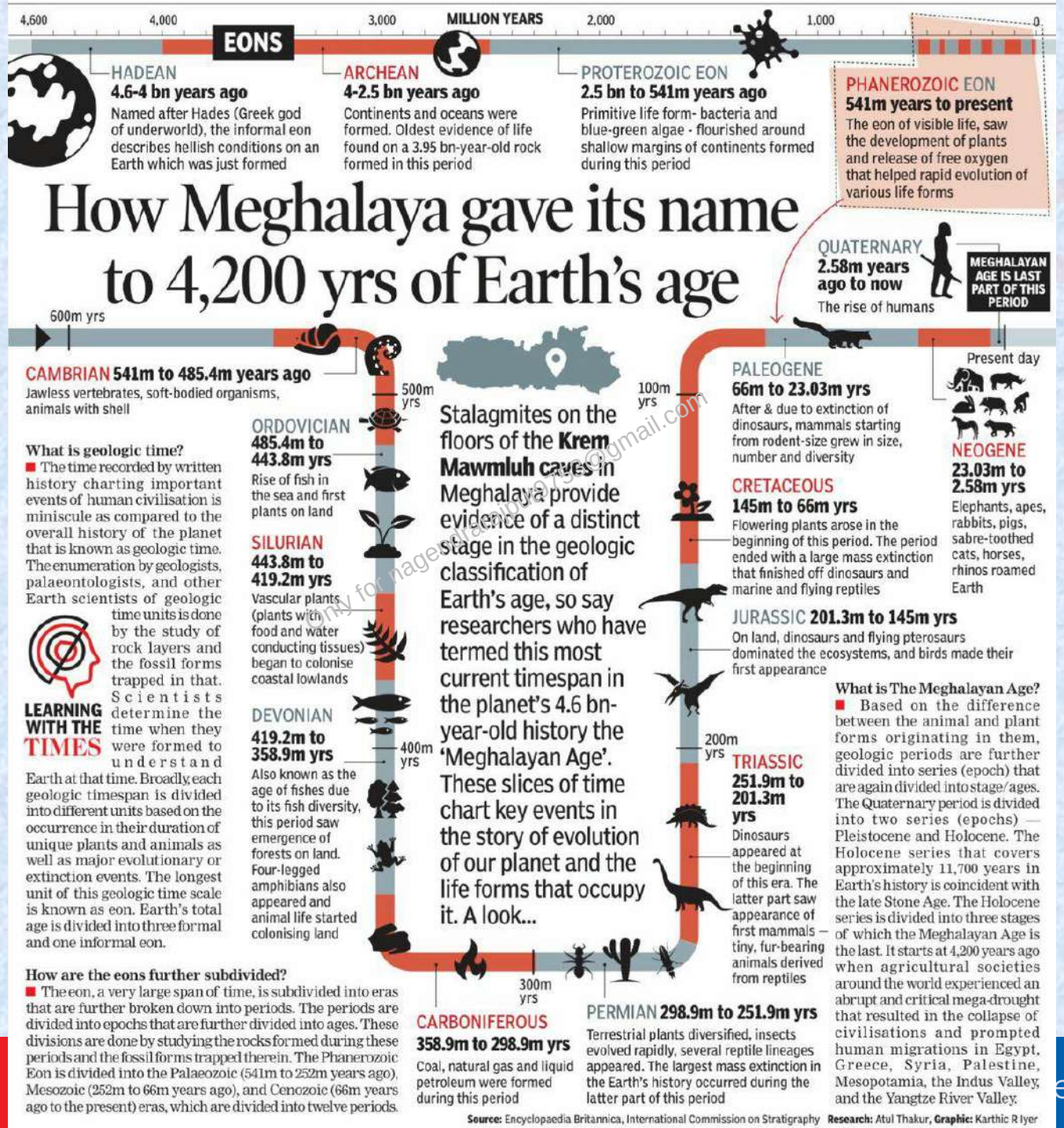
Geological Time Scale



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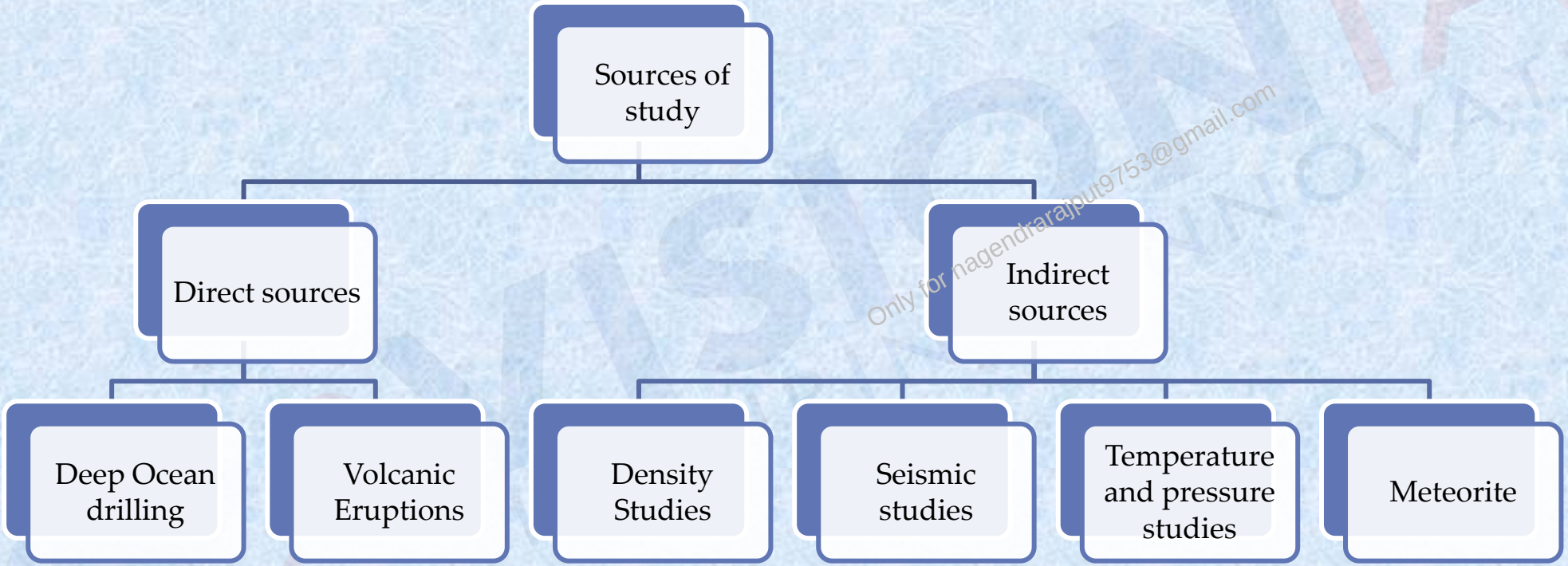

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Interior of the Earth

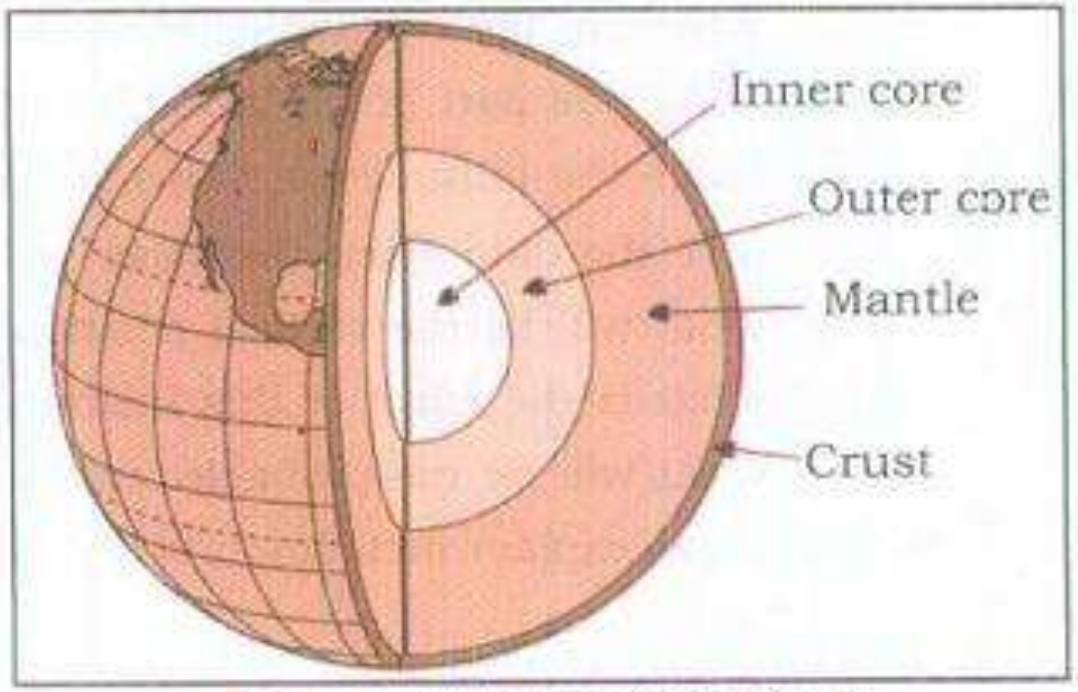
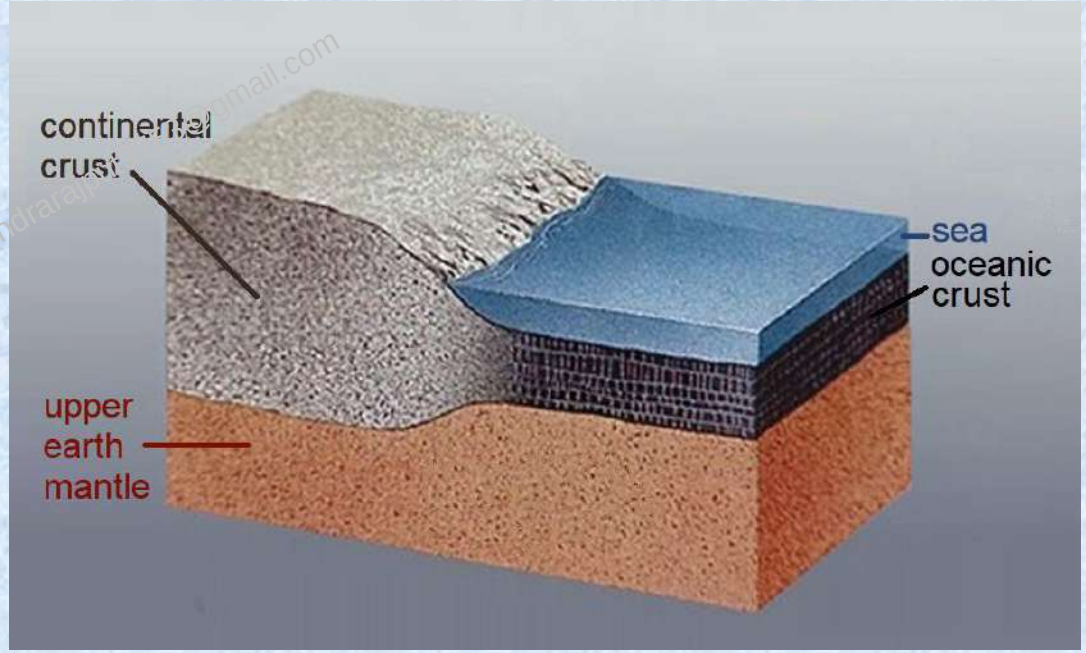


Fig. 5.1. Structure of the Earth



Chemical divisions

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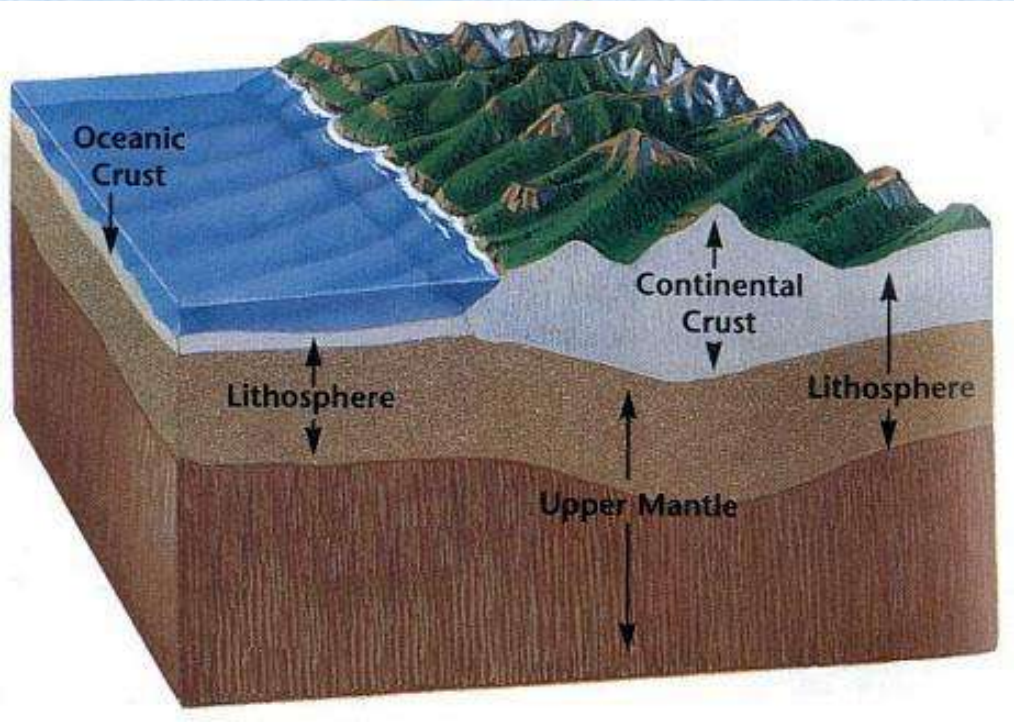
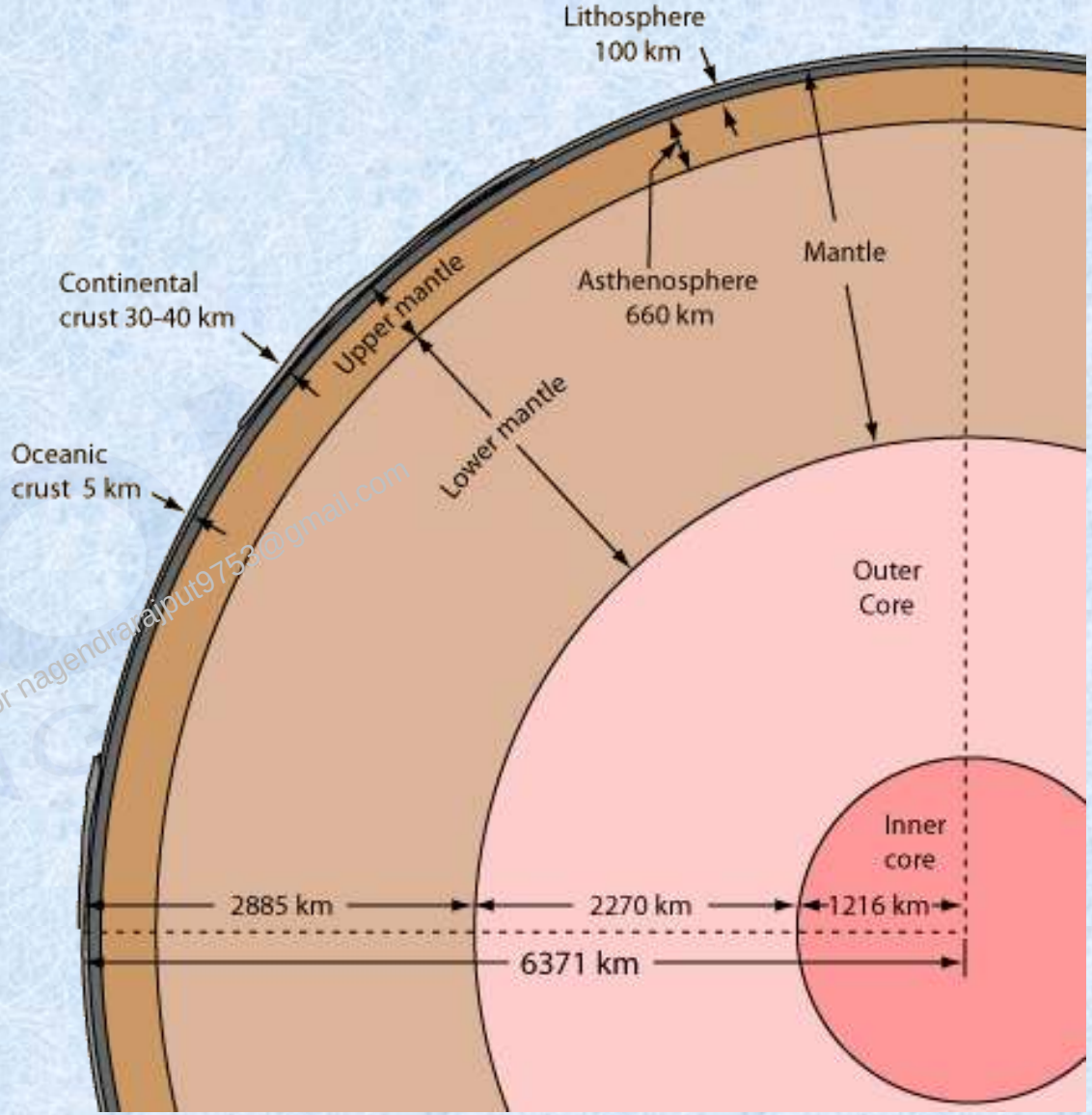
Interior of the Earth





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Physical divisions

Table 5.1 : The Major Elements of the Earth's Crust

Sl. No.	Elements	By Weight(%)
1.	Oxygen	46.60
2.	Silicon	27.72
3.	Aluminium	8.13
4.	Iron	5.00
5.	Calcium	3.63
6.	Sodium	2.83
7.	Potassium	2.59
8.	Magnesium	2.09
9.	Others	1.41

Element (Entire earth)	%
Iron	35
Oxygen	30
Silicon	15
Magnesium	13
Nickel	
Sulphur	

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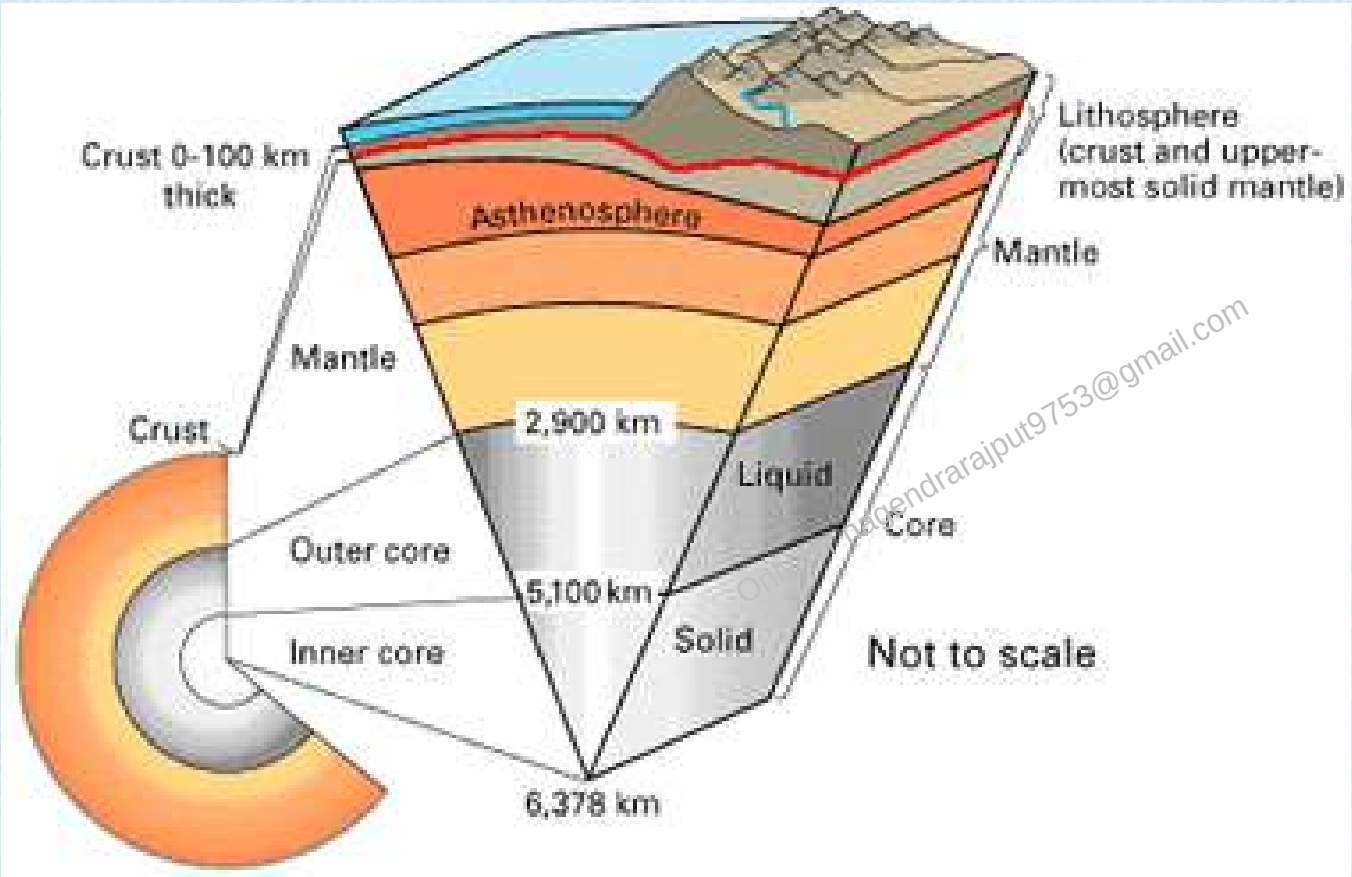

Discontinuities

Types of Rocks

Table 7.1. Difference between Rocks and Minerals

Rocks	Minerals
1. Rocks are aggregates of mineral elements.	1. Minerals are solid inorganic substances occurring naturally.
2. A rock has no definite chemical composition.	2. Minerals have a definite chemical composition.
3. Minerals are organised to form rocks.	3. Elements are organised to form compounds which are known as minerals. An element is a pure substance.
4. Three chief types of rocks are *Igneous*, *Sedimentary* and *Metamorphic*.	4. Four chief mineral groups are *silicates*, *carbonates*, *sulphides* and *metallic* minerals.
5. Basalt, granite, sandstone, slate and quartz are some important types of rocks.	5. Iron, silicon, magnesium, nickel, calcium, potassium, sodium are abundant minerals of the earth.

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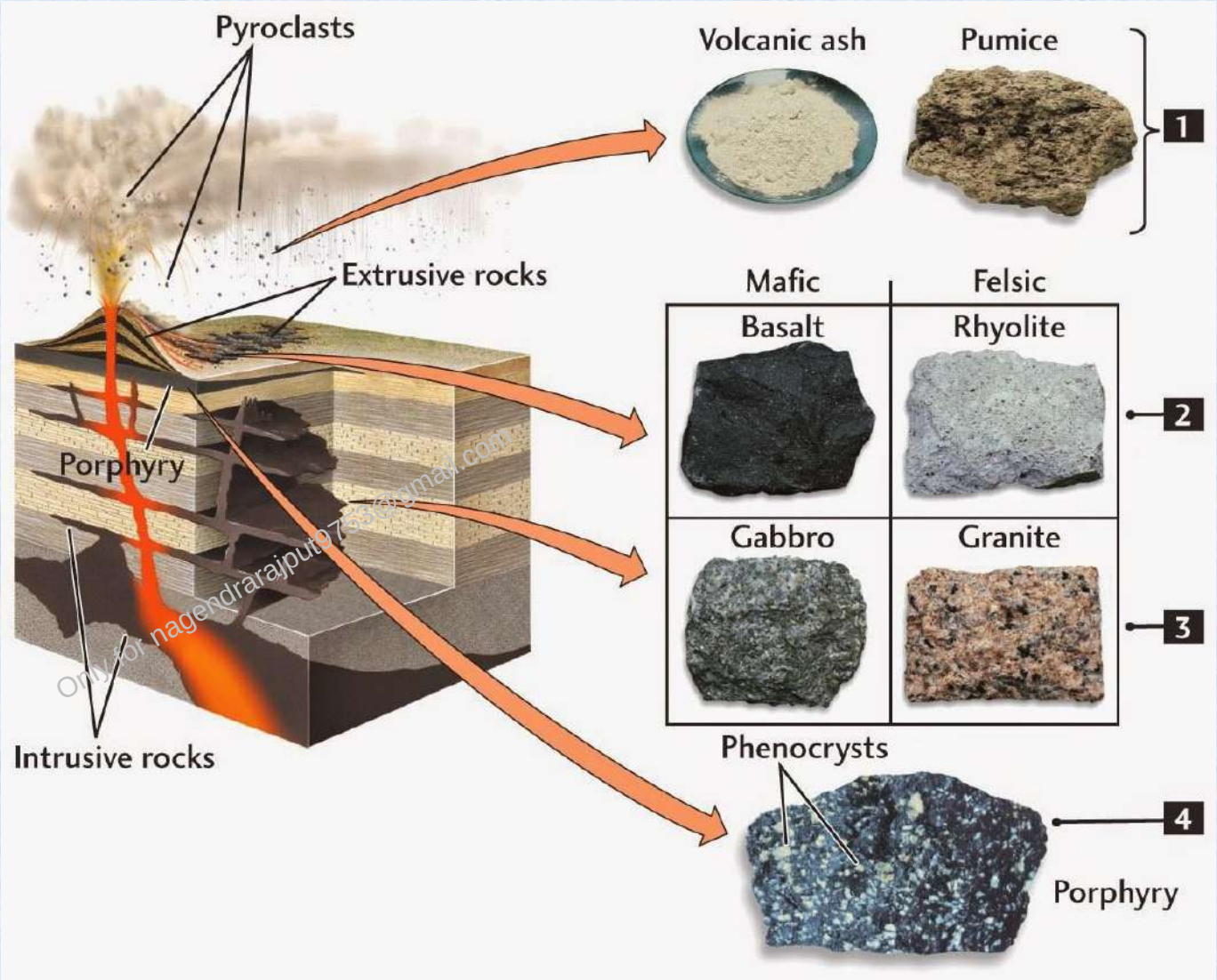
Types of Rocks



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2022	Describe the characteristics and type of primary rocks.	10

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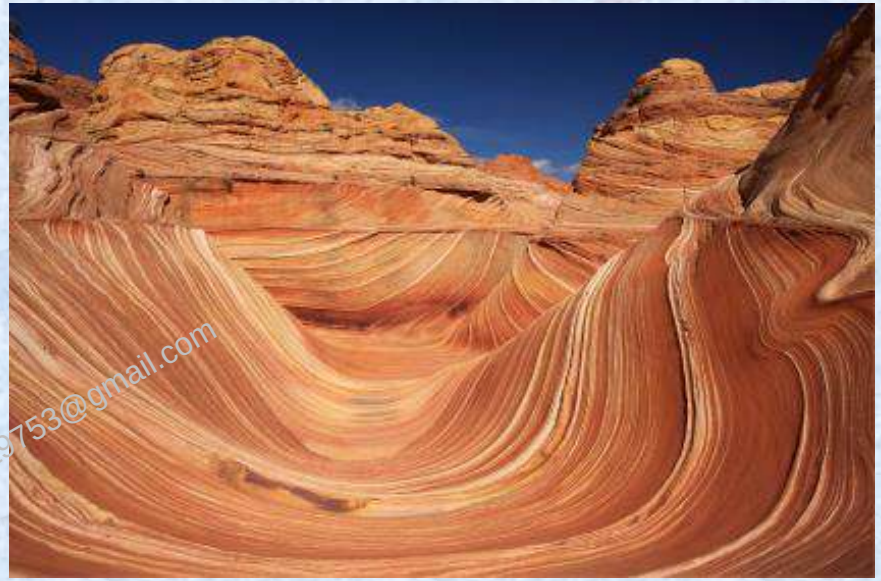
Types of Rocks



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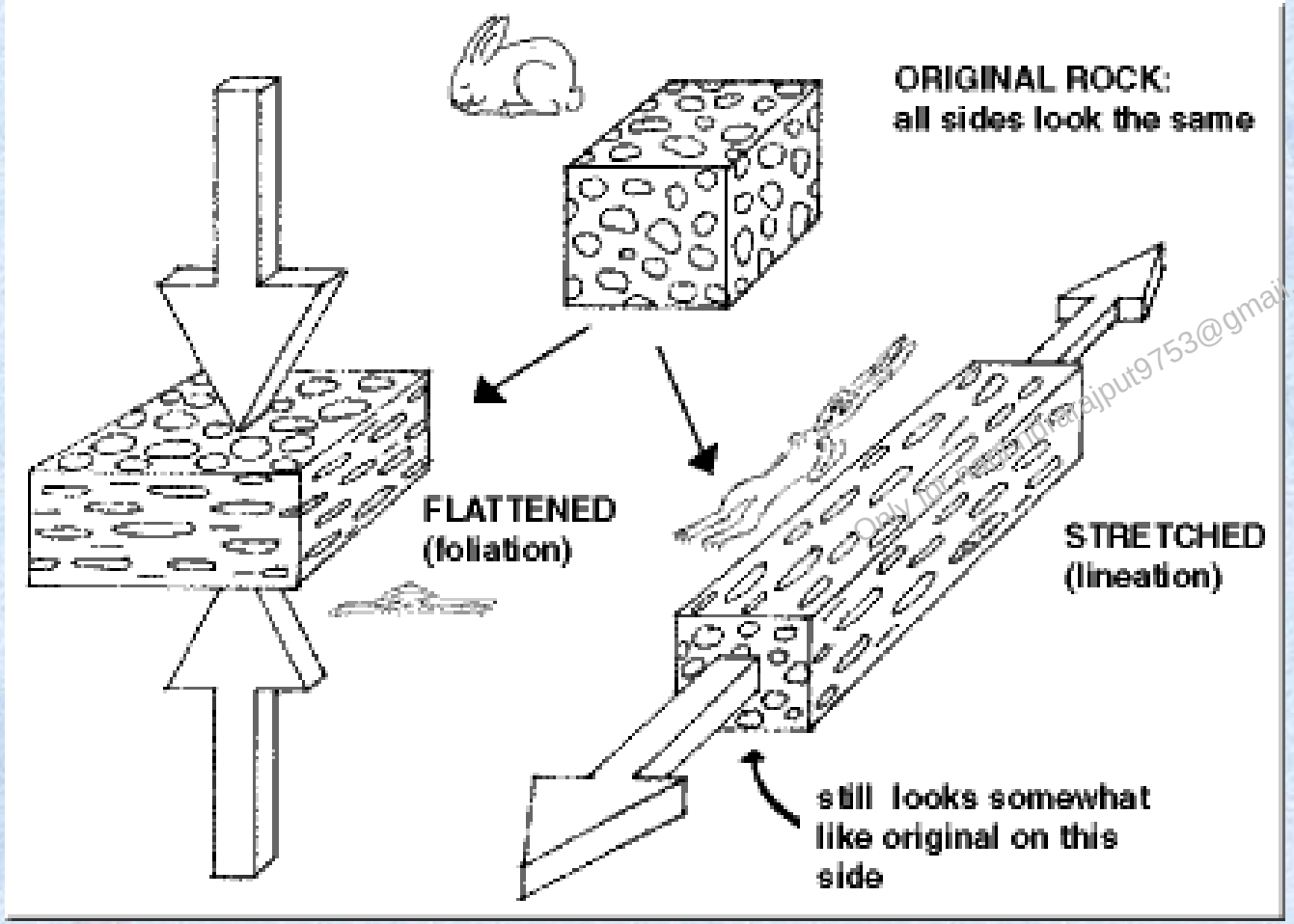
Sedimentary Rocks

Types of Rocks



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Types of Rocks

Lineation Quartz

Non foliated Quartz

Foliated Gneiss

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Types of Rocks

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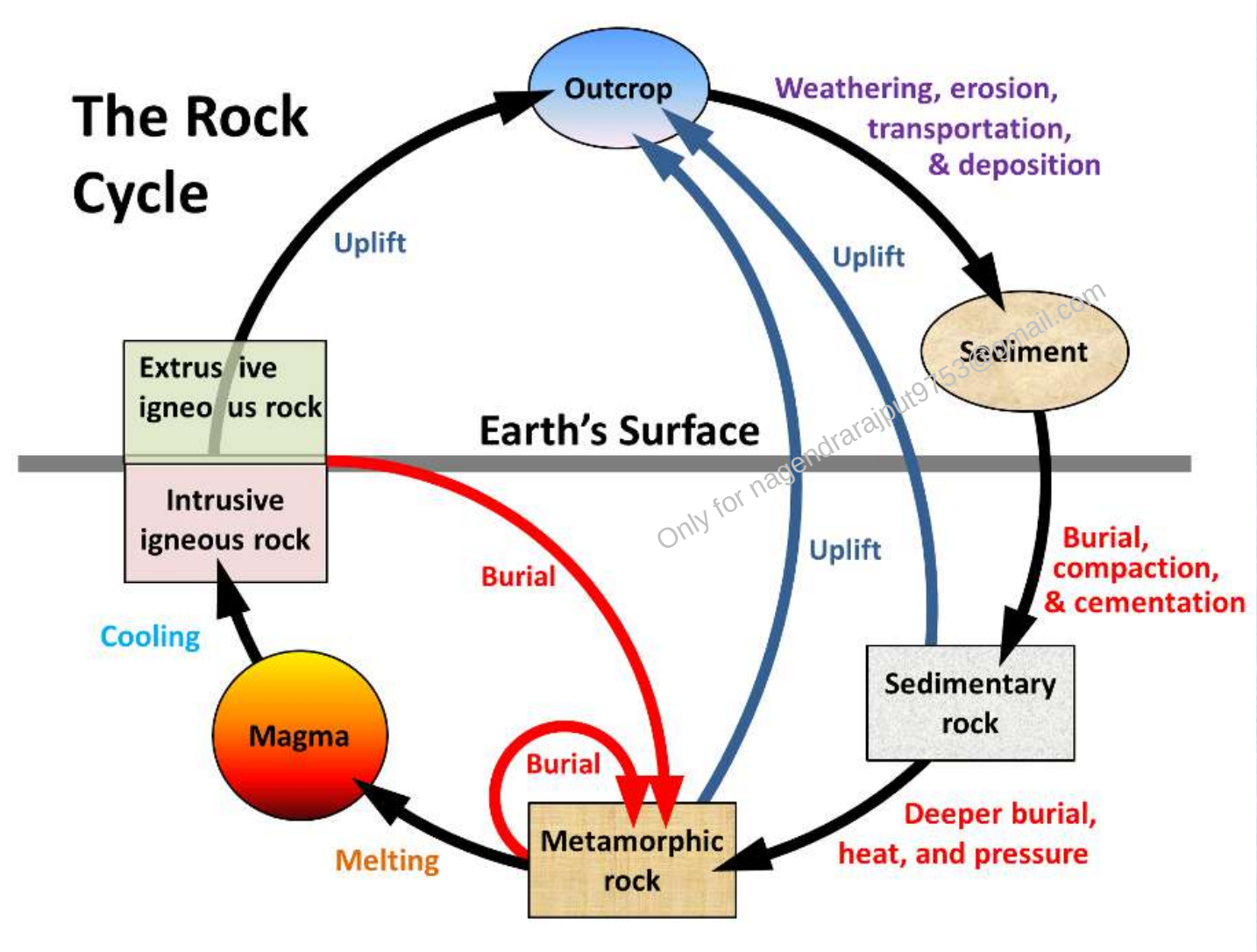

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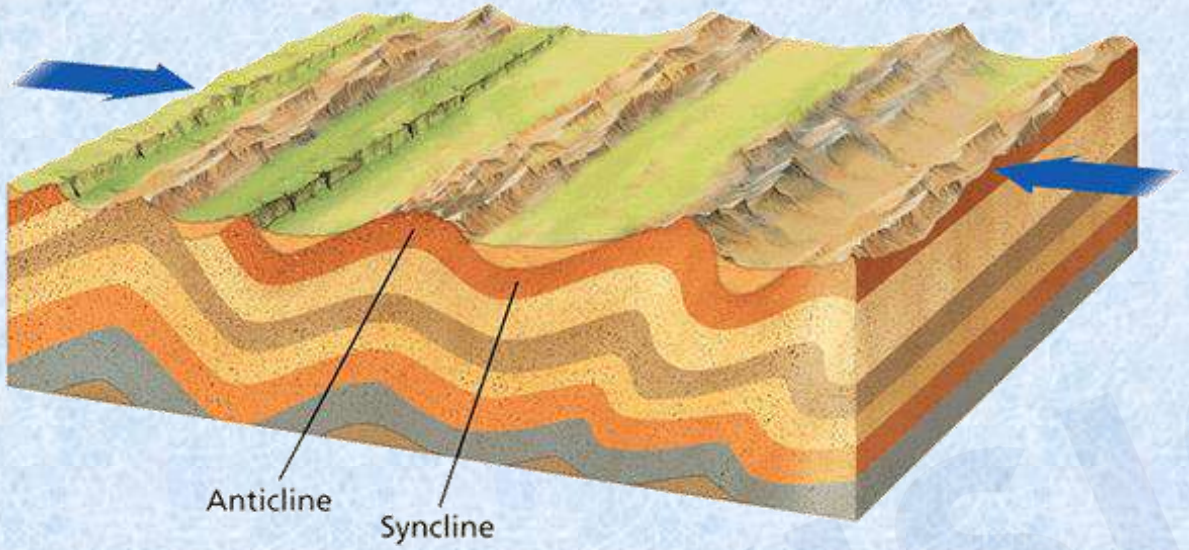
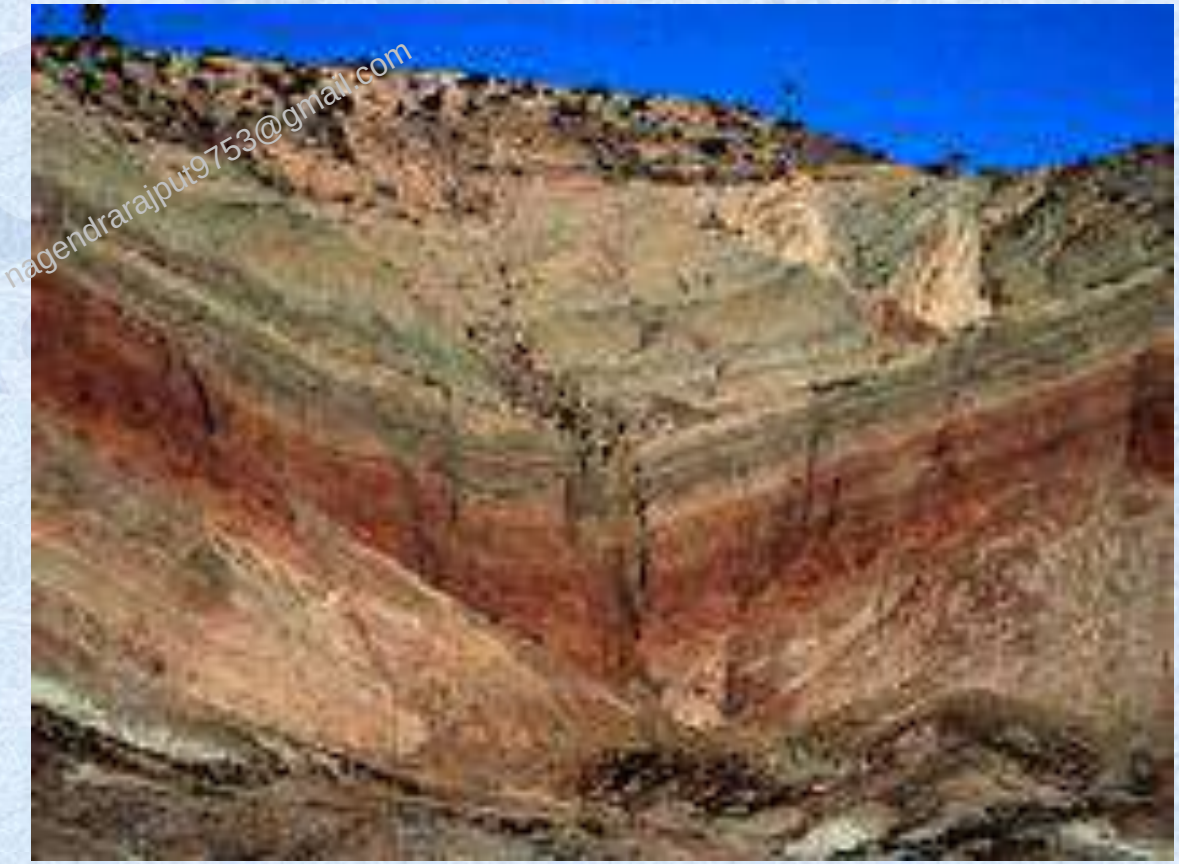
Earth's Movements





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Earth's Movements

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Earth's Mo

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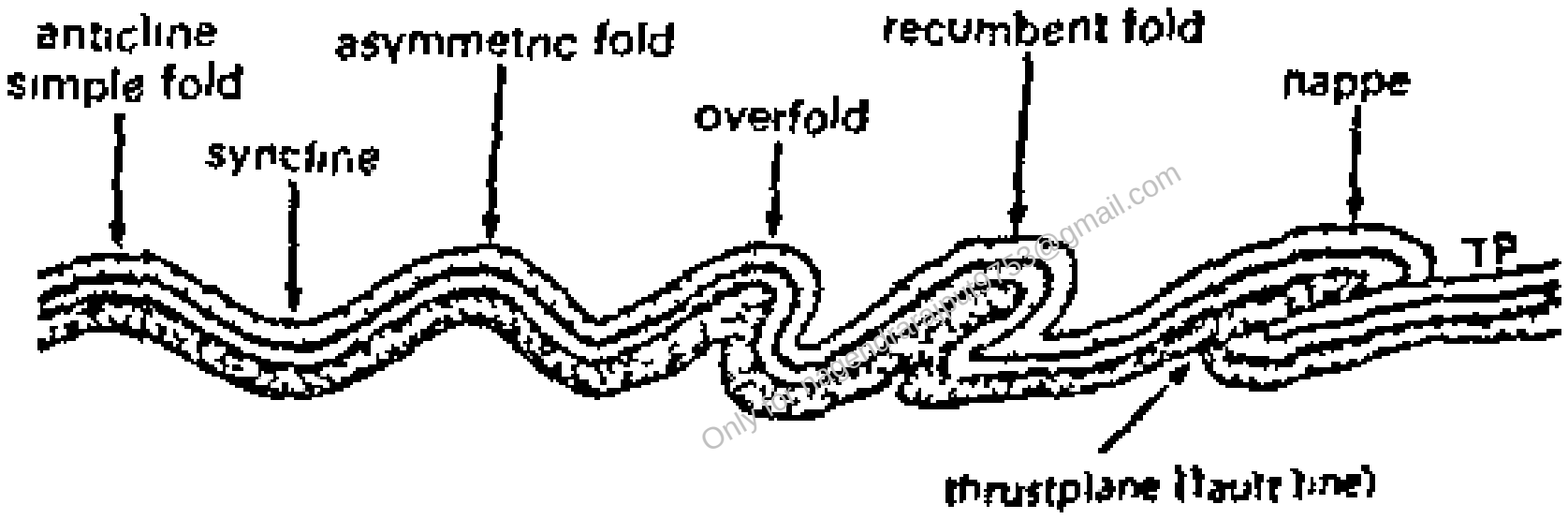

Fig. 19 Types of folding

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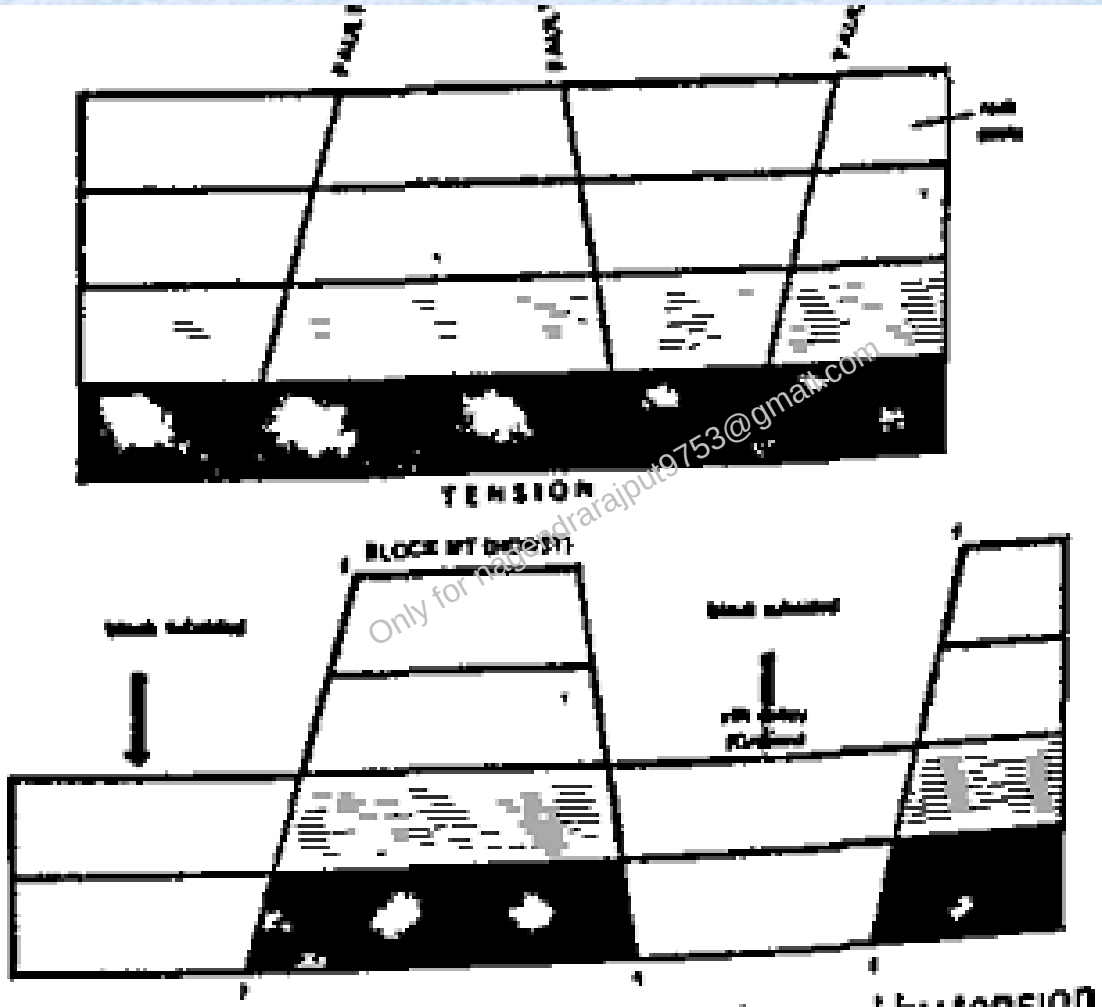

21 (a) Block mountain (horst) formed by tension when faults develop

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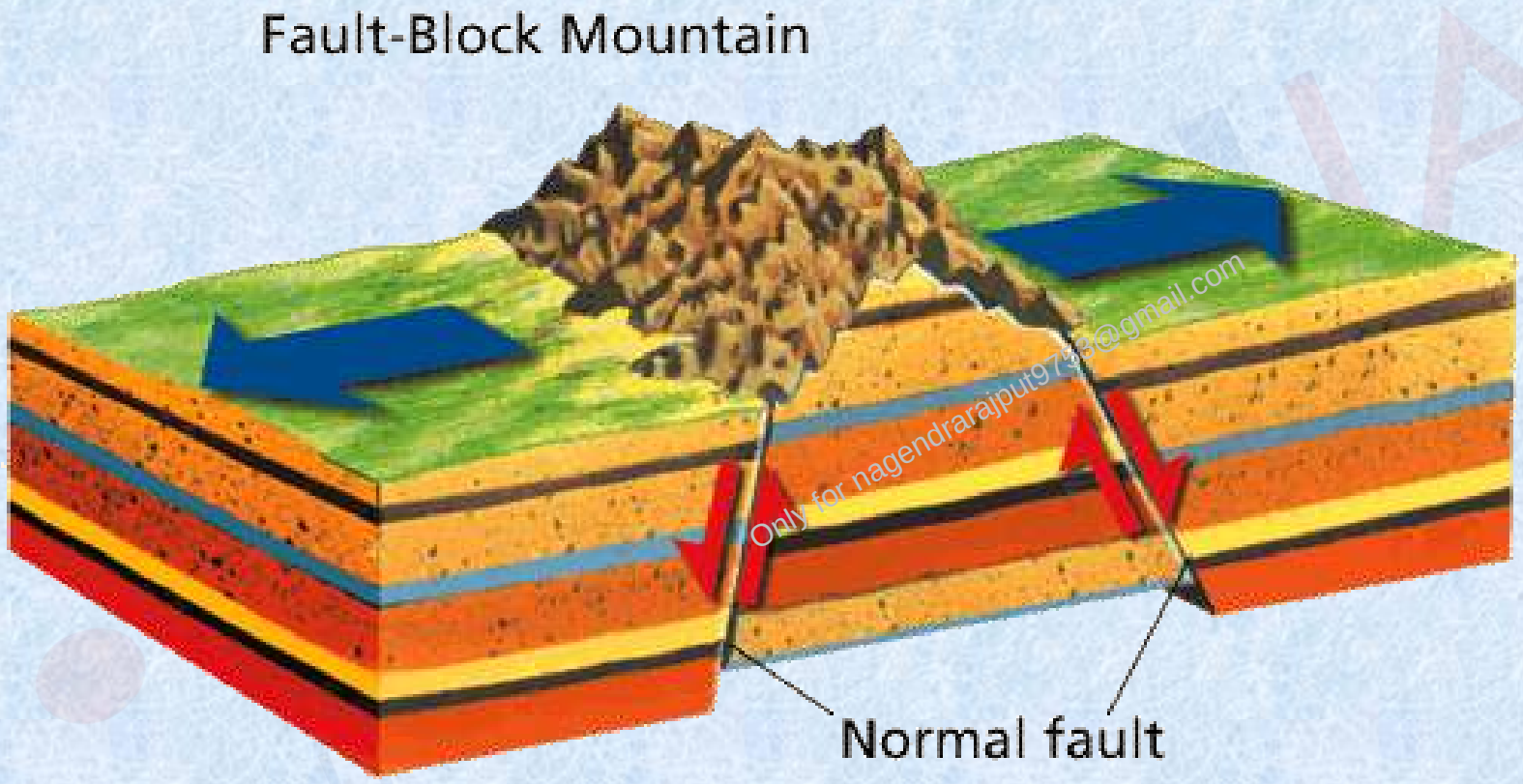

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Earth's Movements

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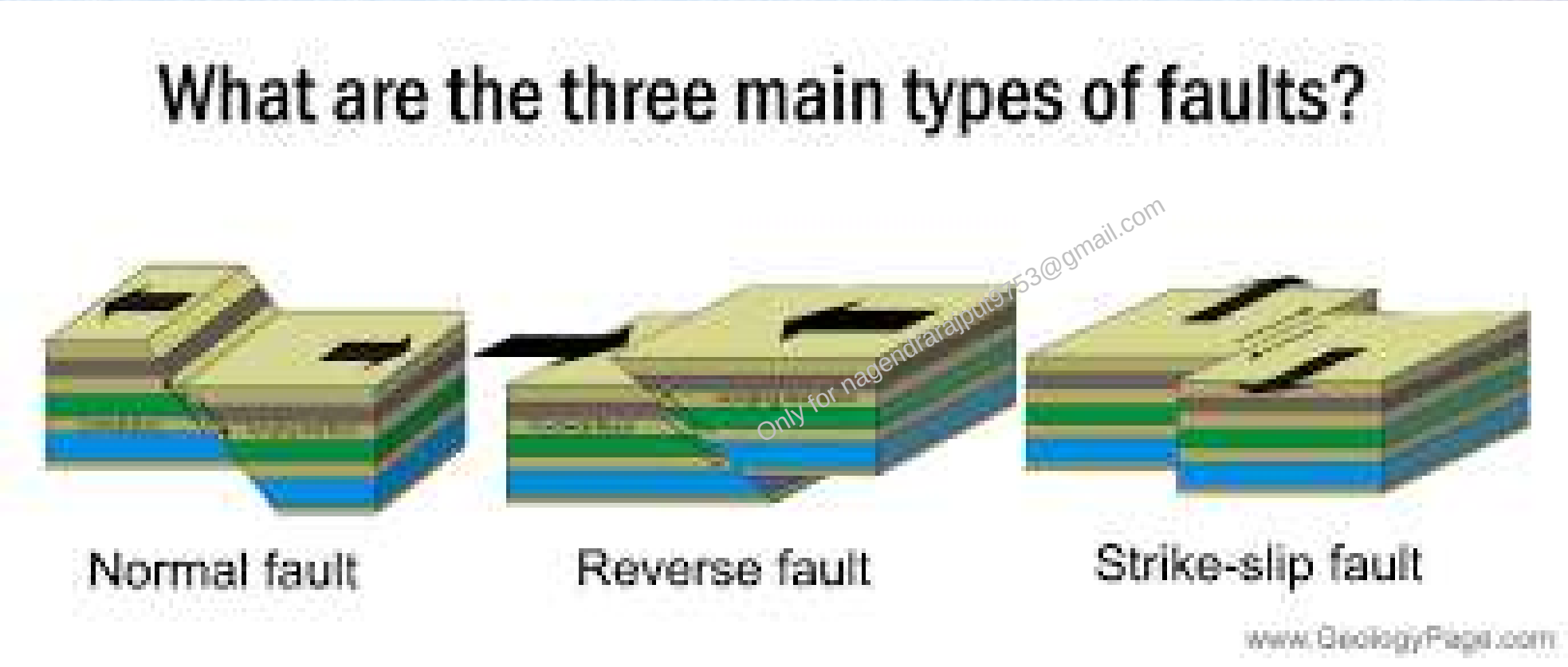

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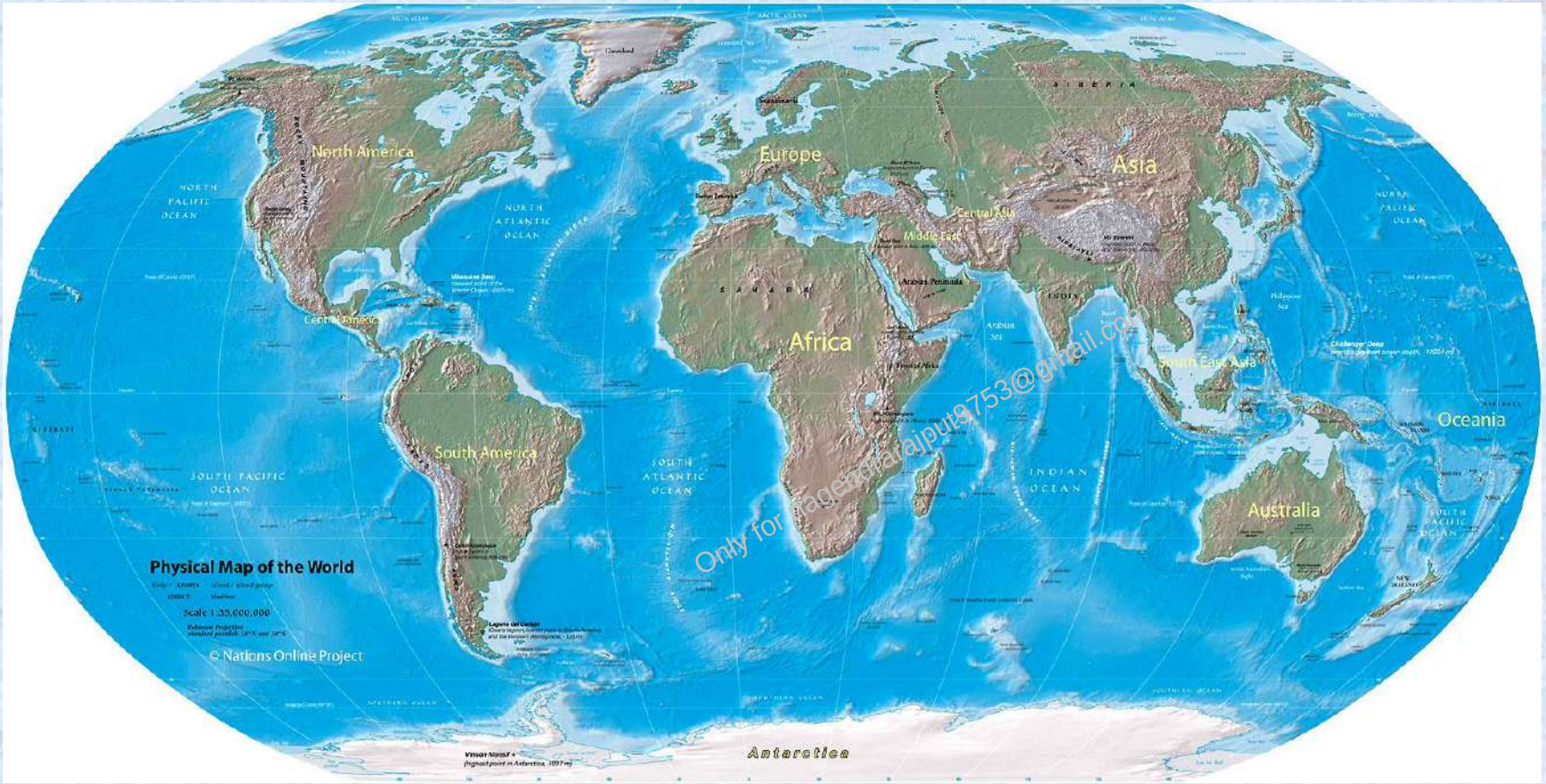
Continental Drift Theory



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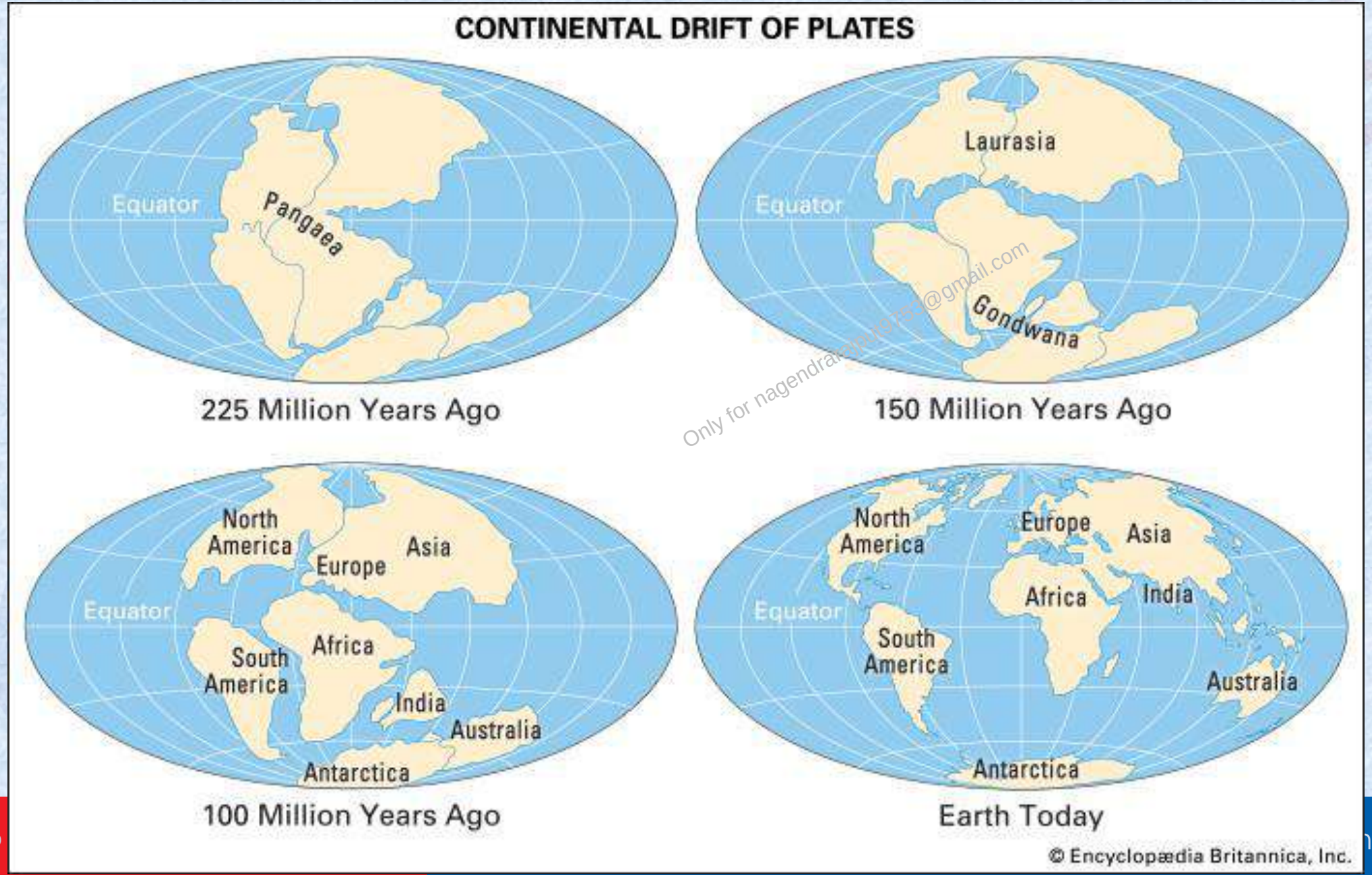

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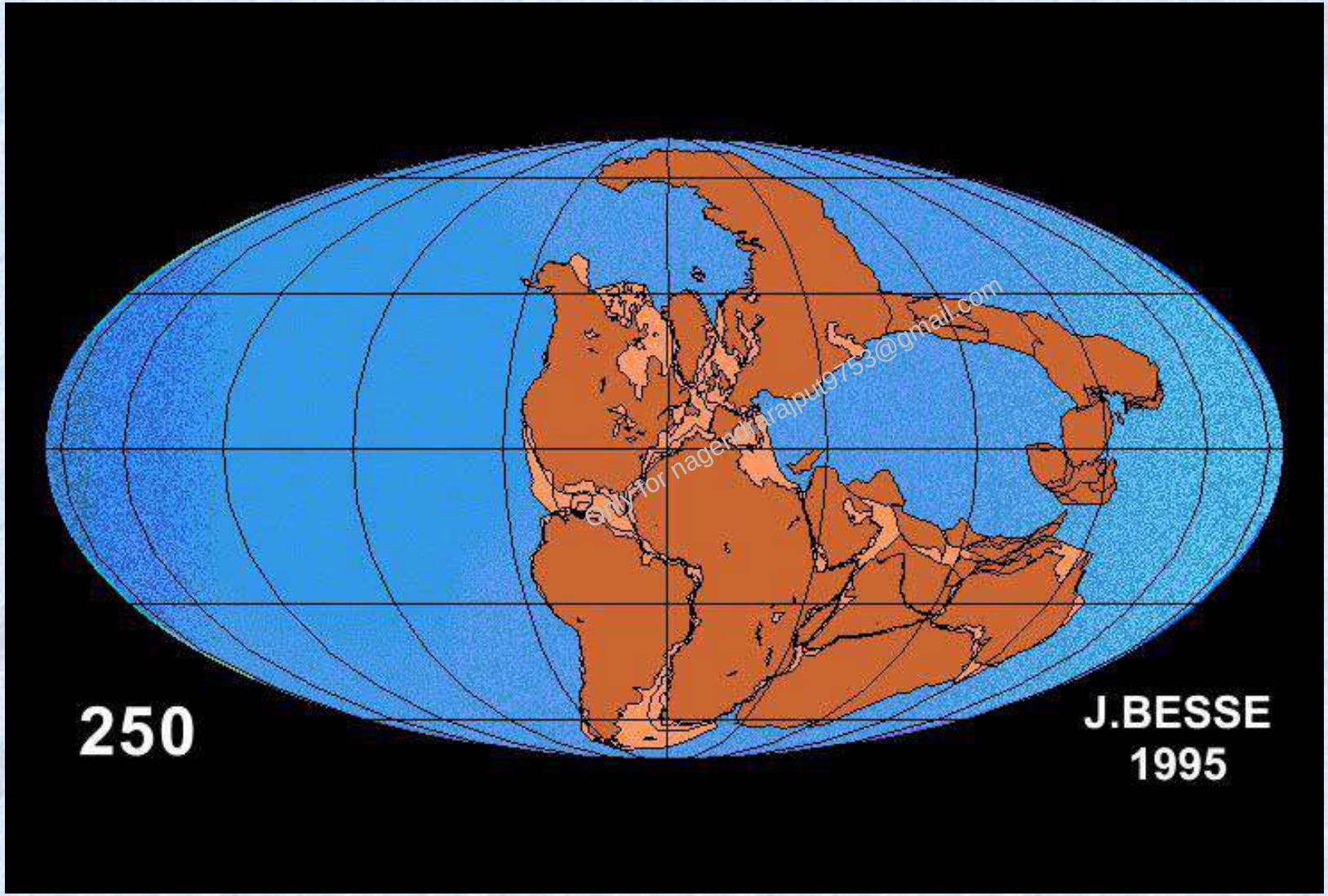

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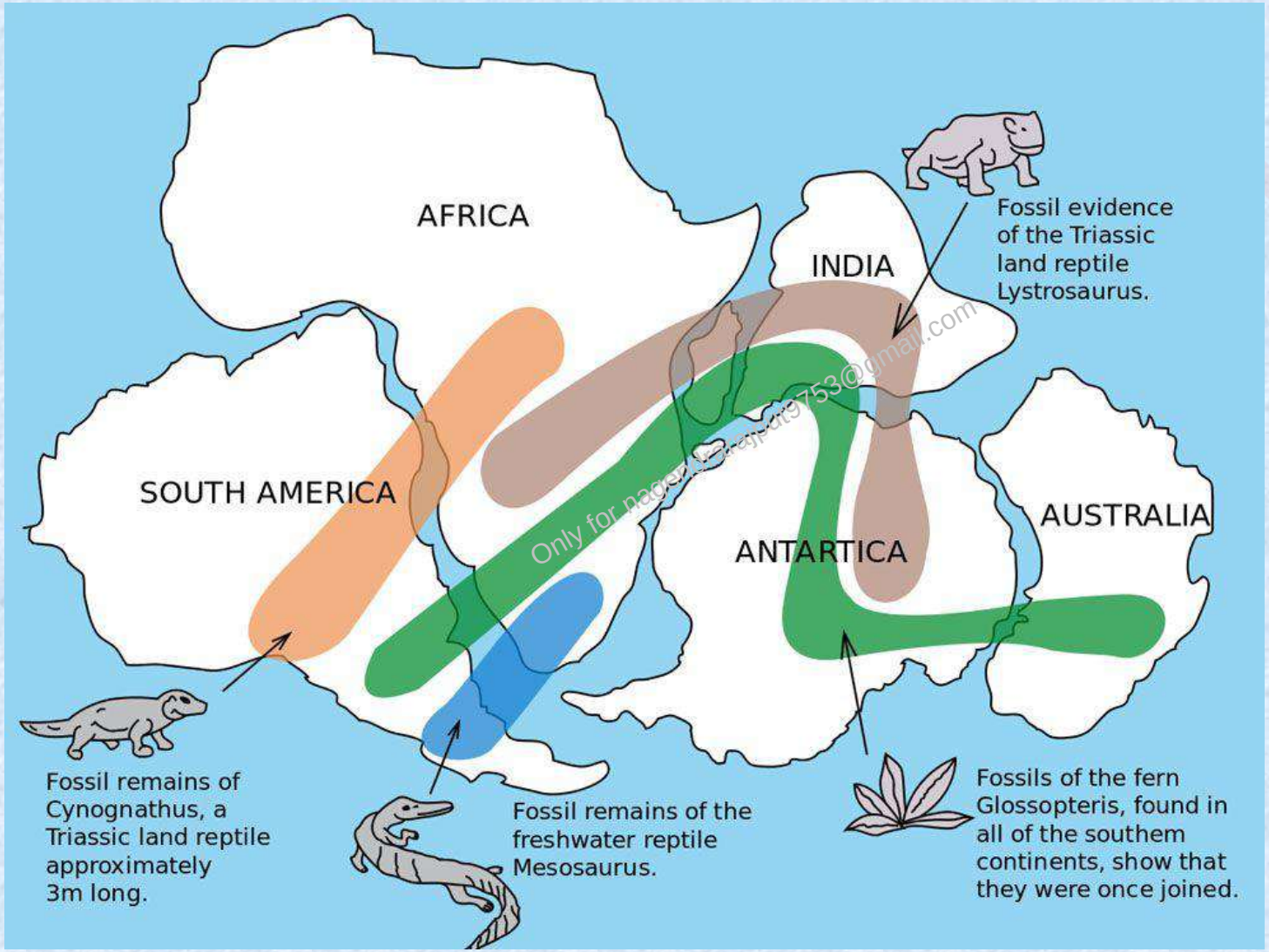
Continental Drift Theory



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2013	What do you understand by the theory of continental drift? Discuss the prominent evidences in its support.	5

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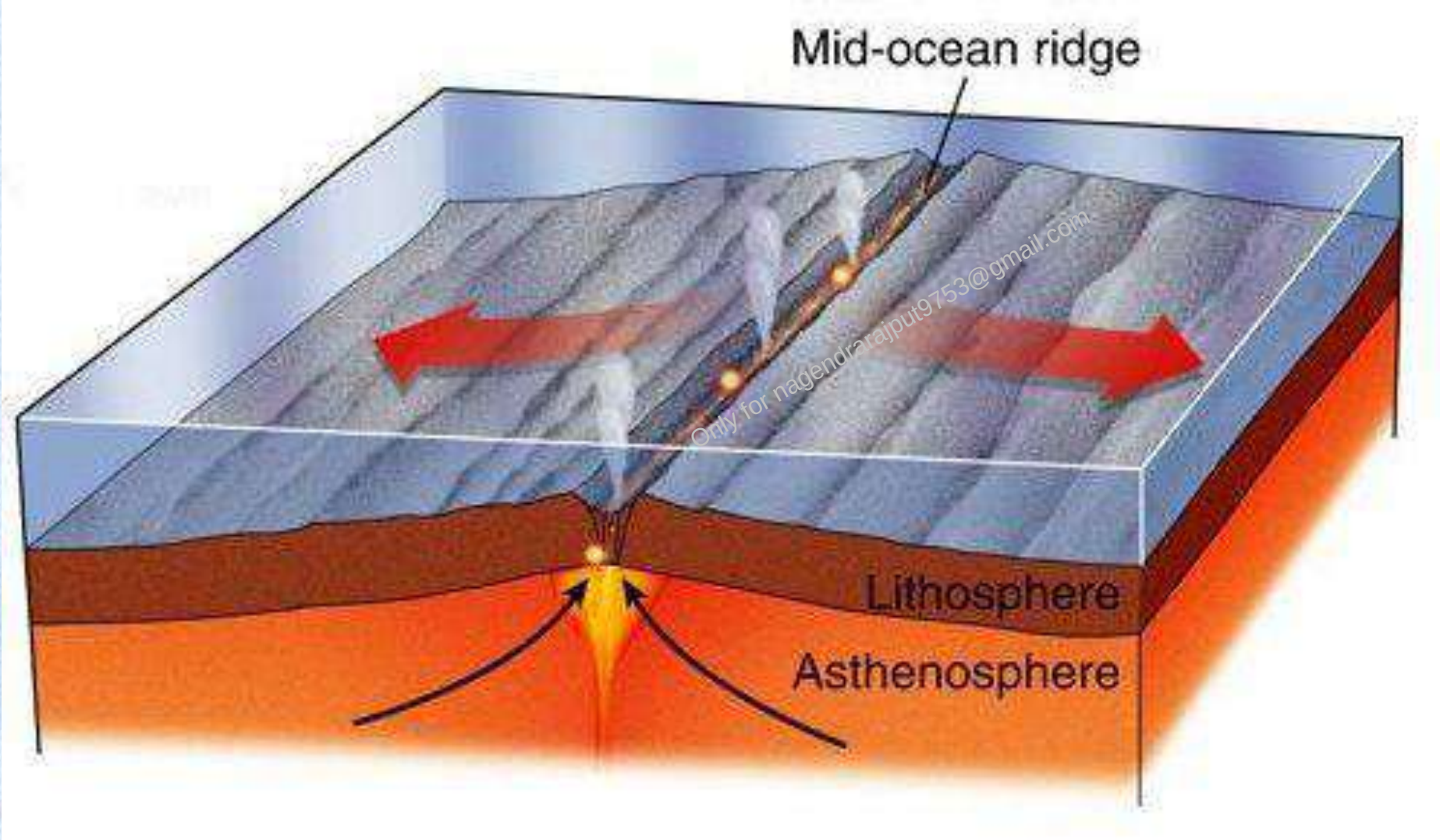
Sea floor spreading



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Sea floor spreading

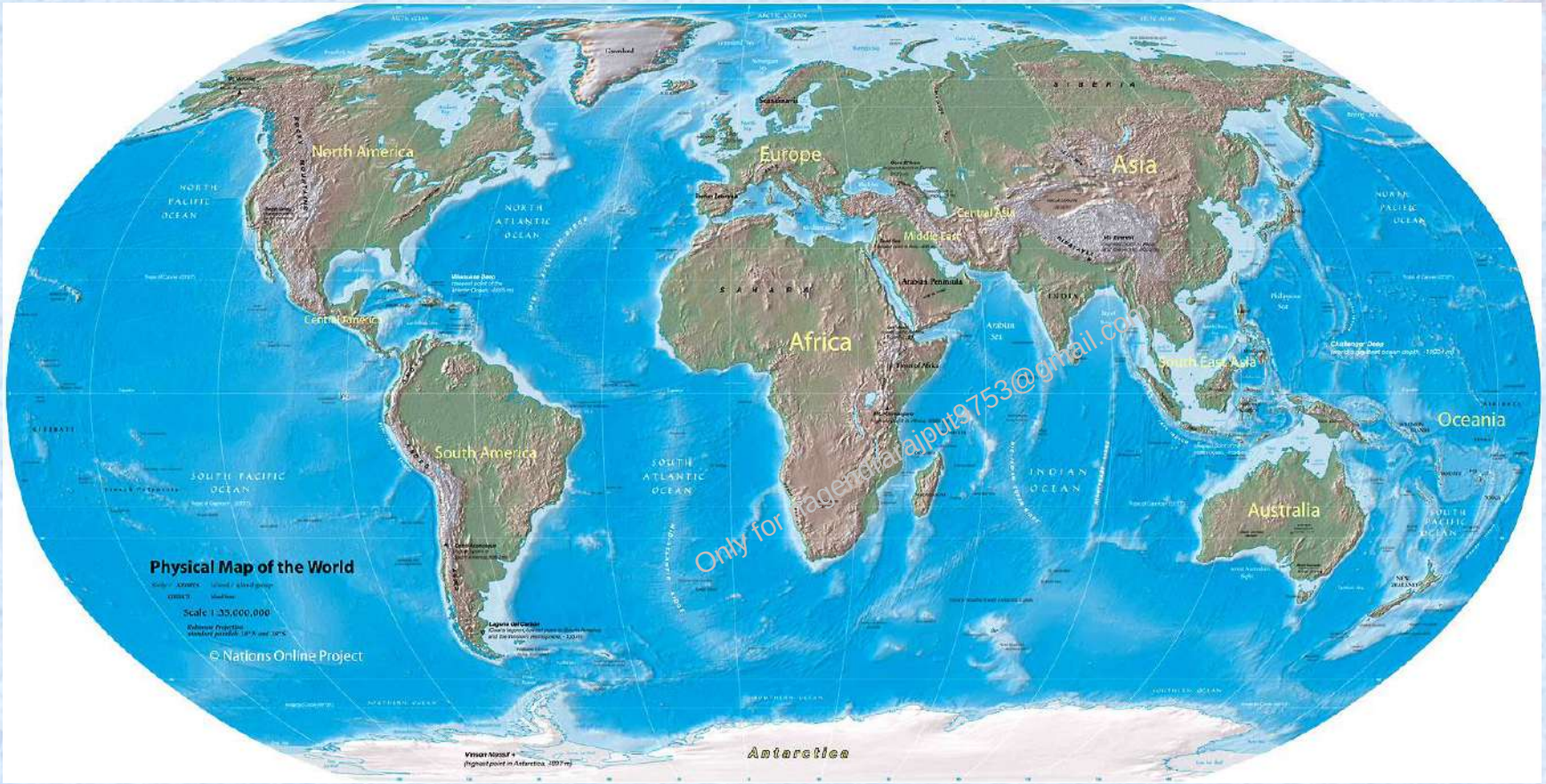

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Plate Tectonics Theory

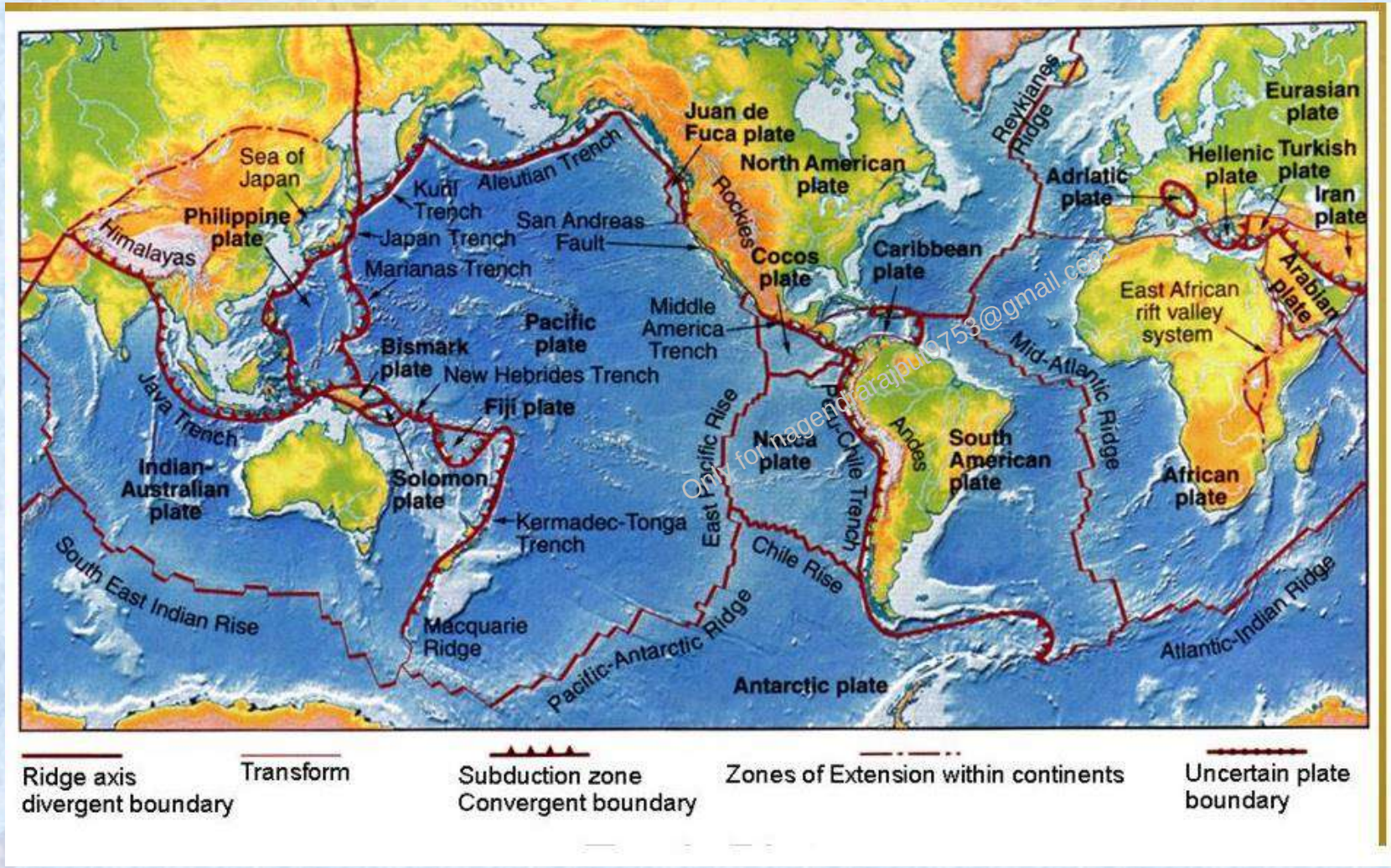

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Plate Tectonics Theory

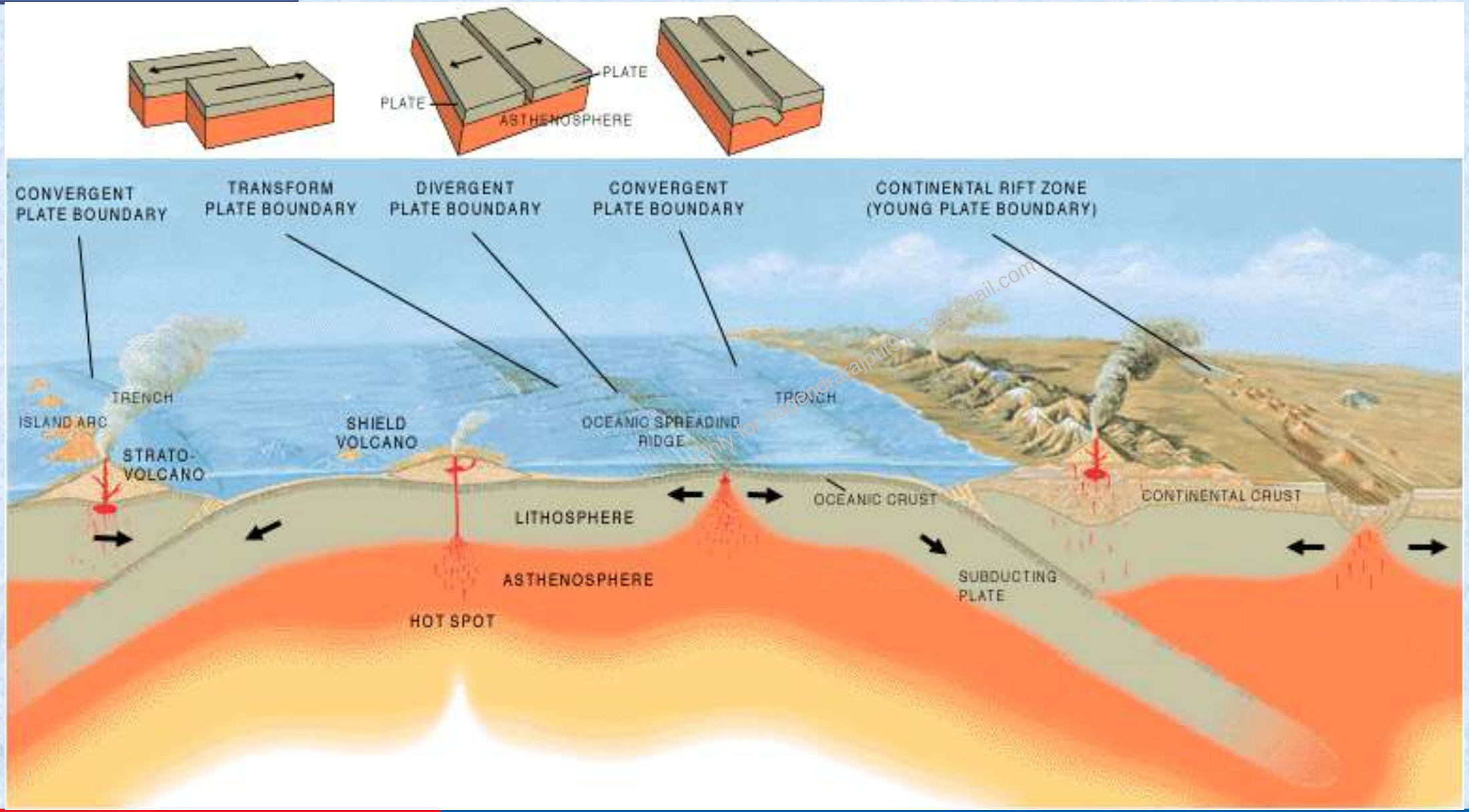

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Plate Tectonics Theory

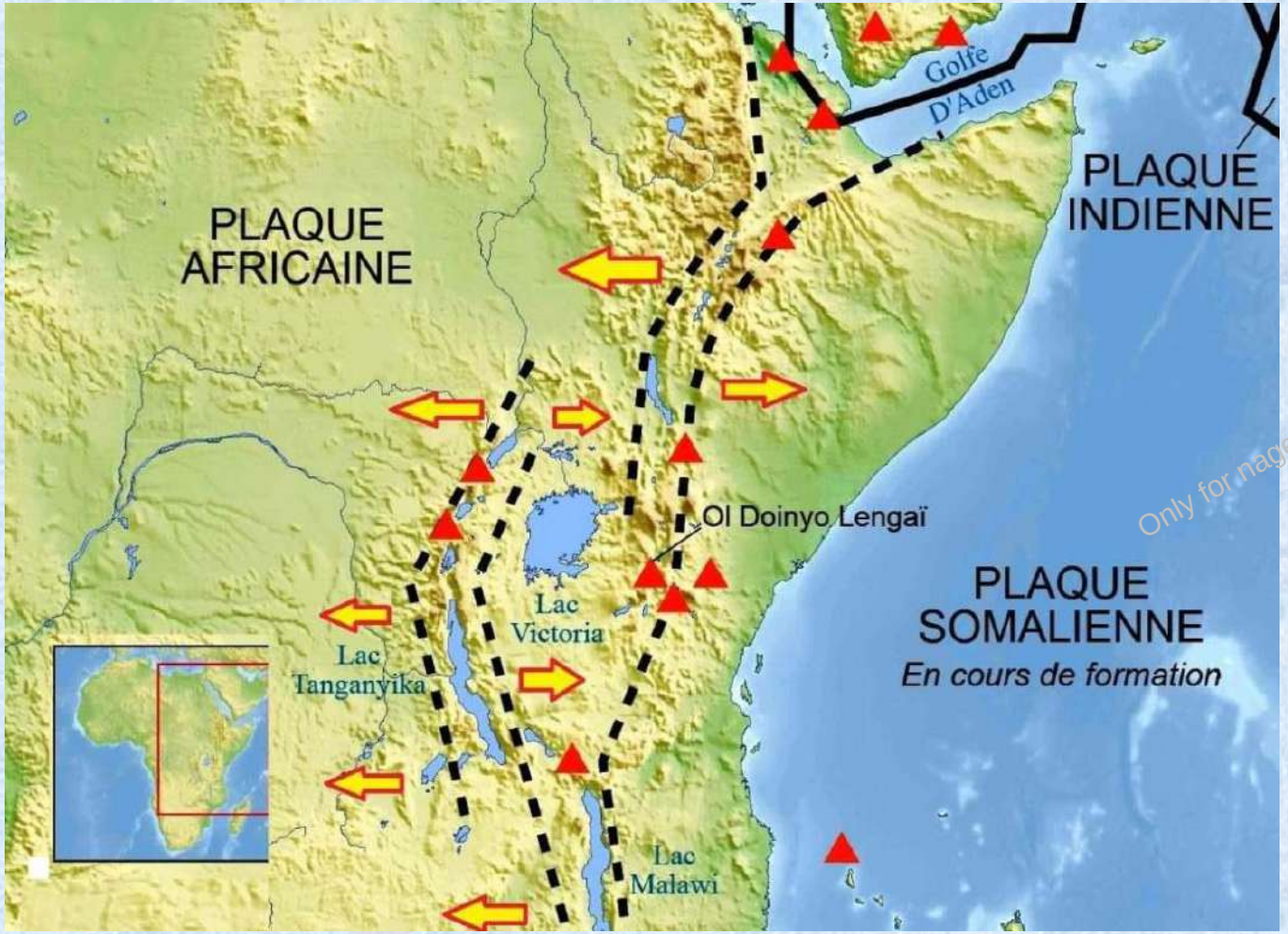

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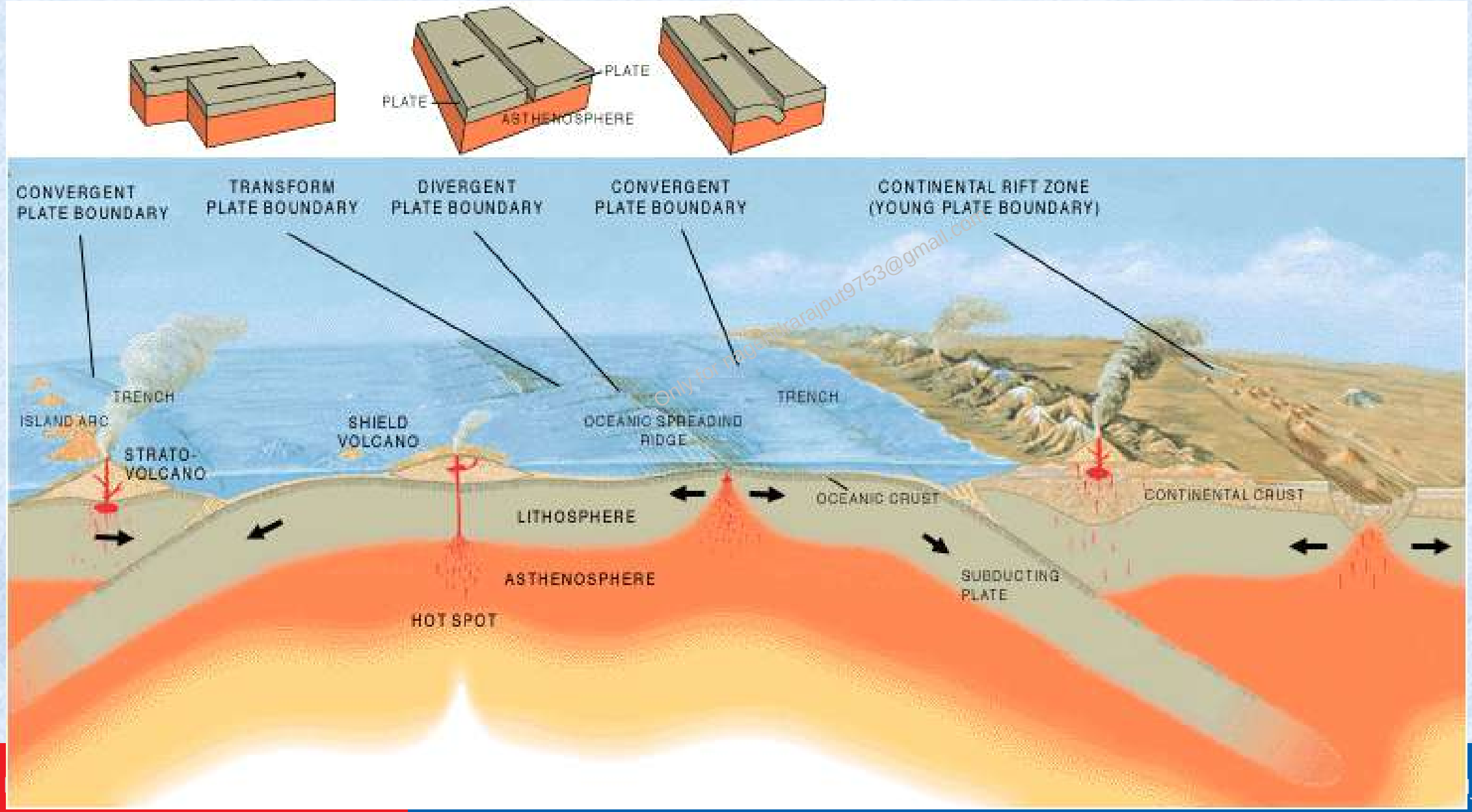
Plate Tectonics Theory



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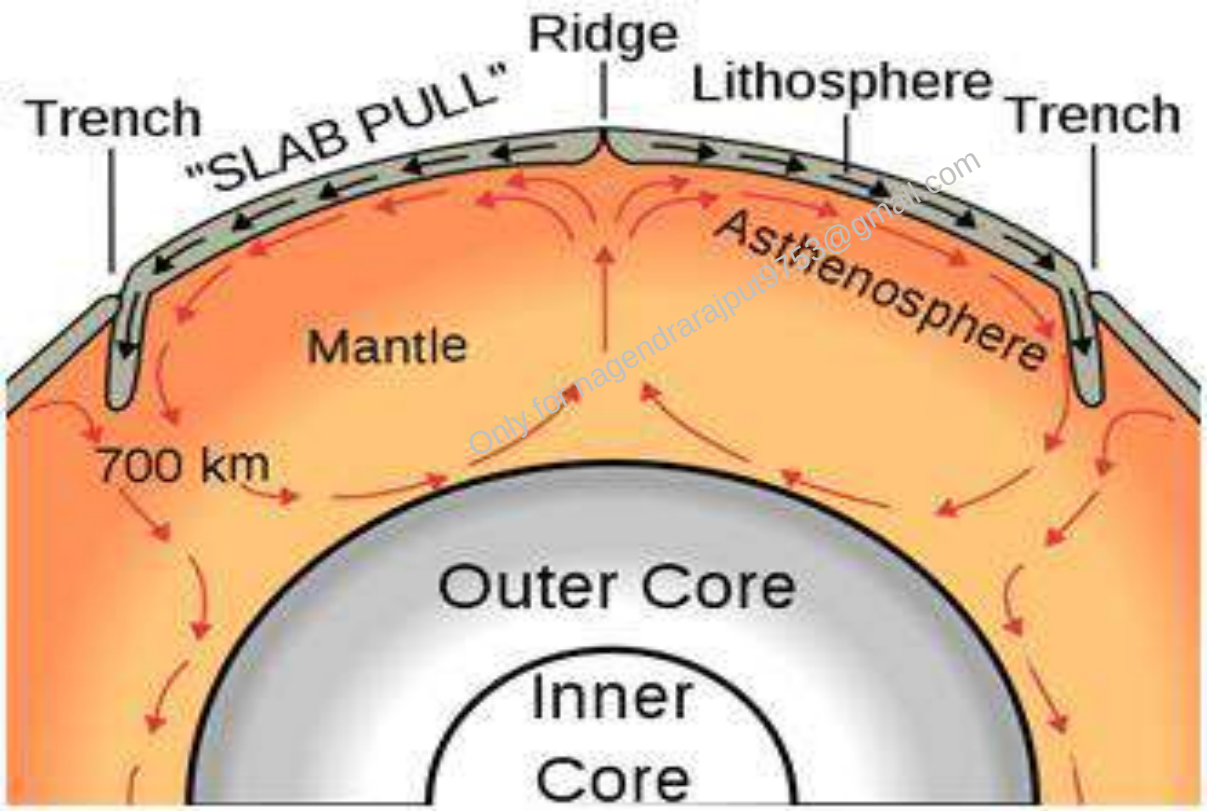

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Plate Tectonics Theory

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Plate Tectonics Theory

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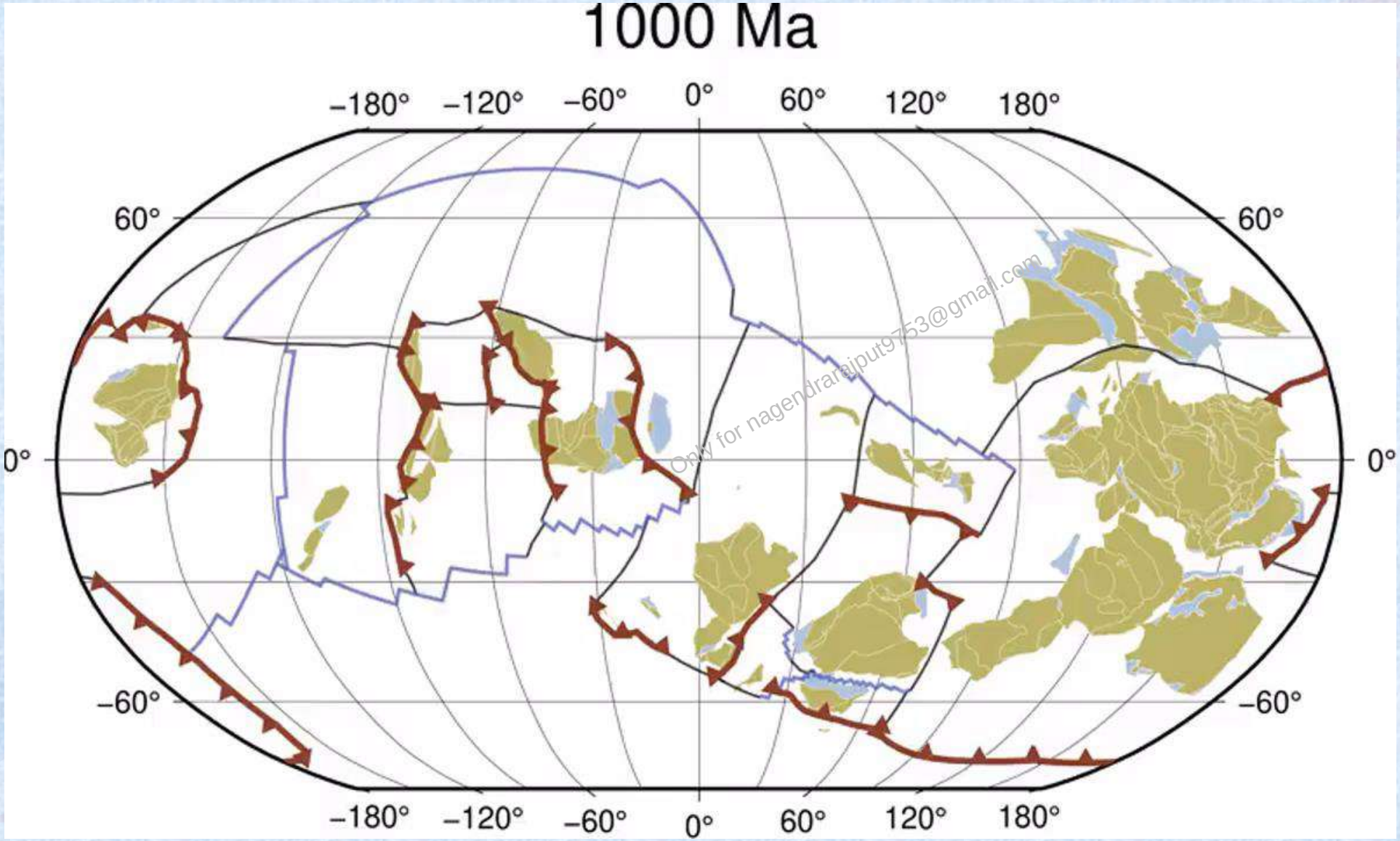

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2014	Why are the world's fold mountain systems located along the margins of continents? Bring out the association between the global distribution of fold mountains and the earthquakes and volcanoes.	10
2014	Explain the formation of thousands of islands in Indonesian and Philipines archipelagos.	10
2018	Define mantle plume and explain its role in plate tectonics.	10

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2020	**Discuss the geophysical characteristics of Circum-Pacific Zone.**	**10**
2021	**Briefly mention the alignment of major mountain ranges of the world and explain their impact on local weather conditions, with examples.**	**15**

Vulcanism

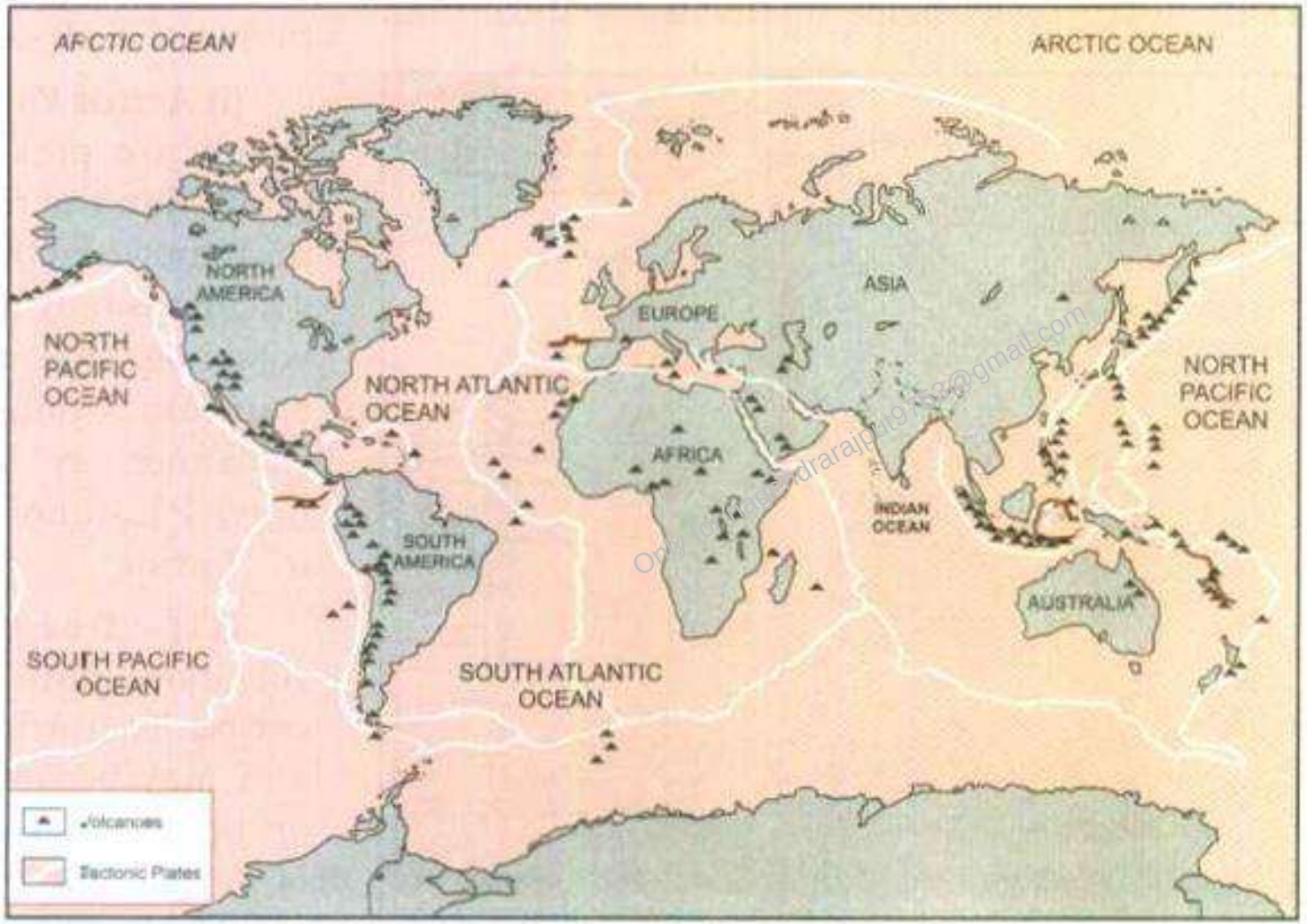

Fig. 8.1. Tectonic plates and distribution of volcanoes

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Vulcanism

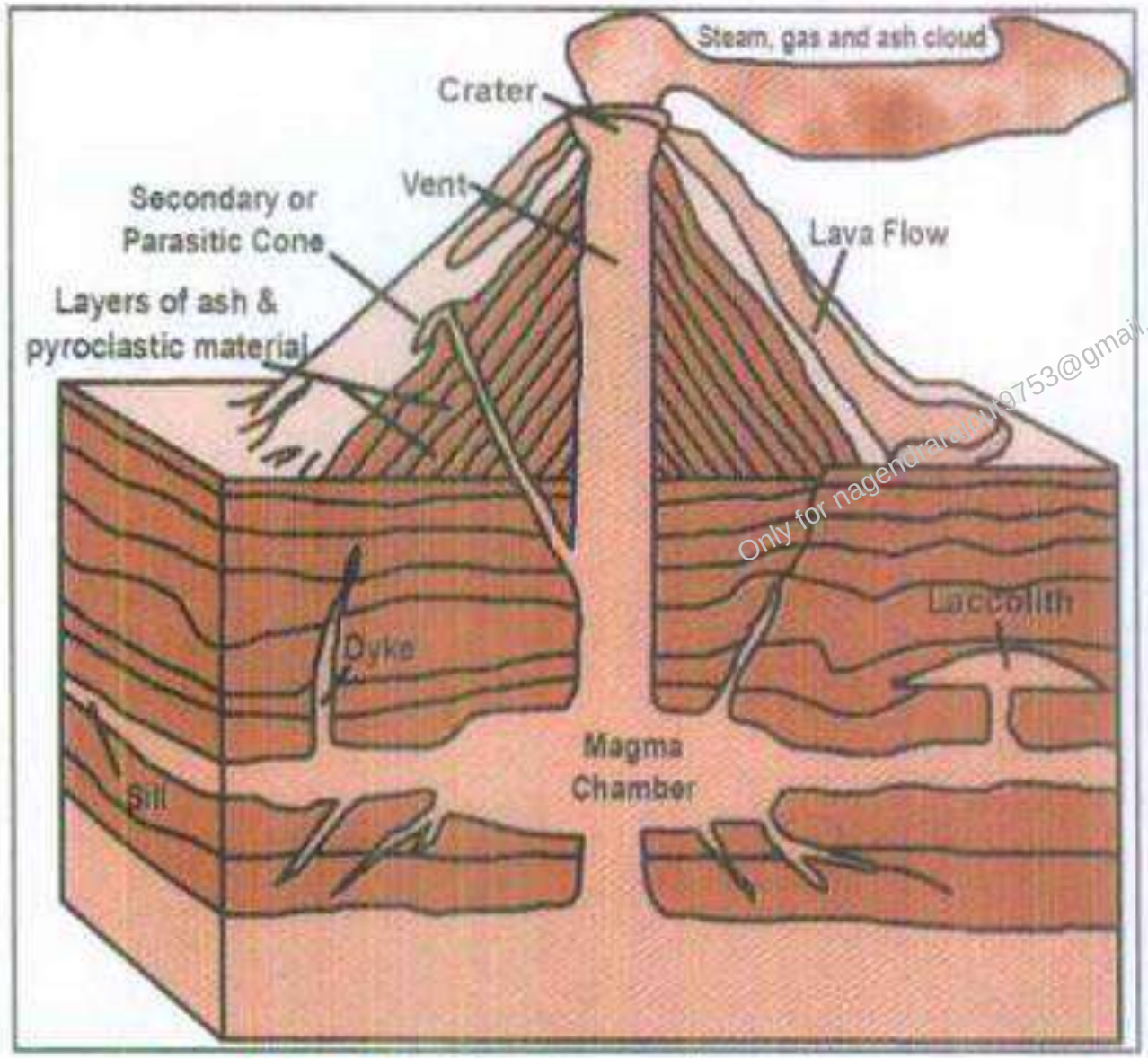

Fig. 8.2. Structure of a volcano

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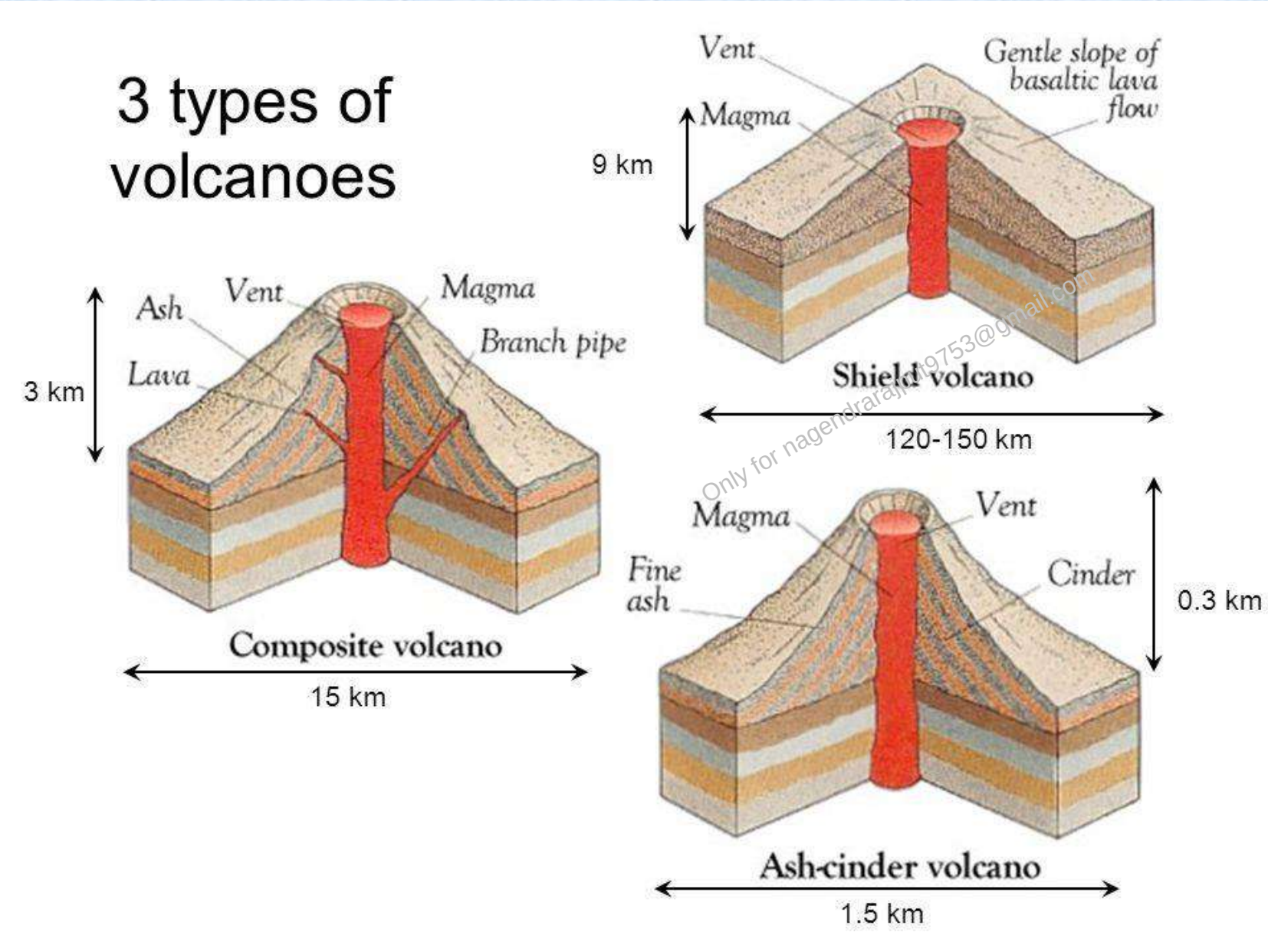

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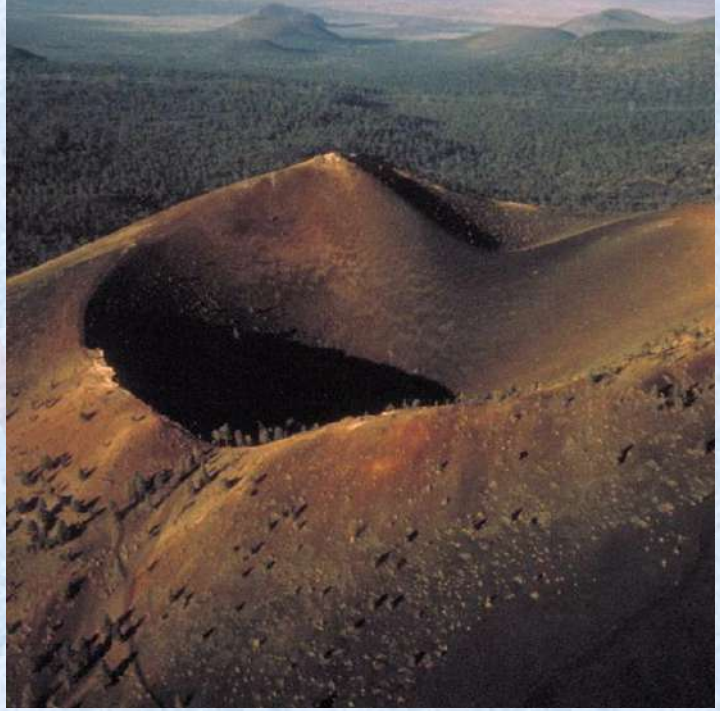

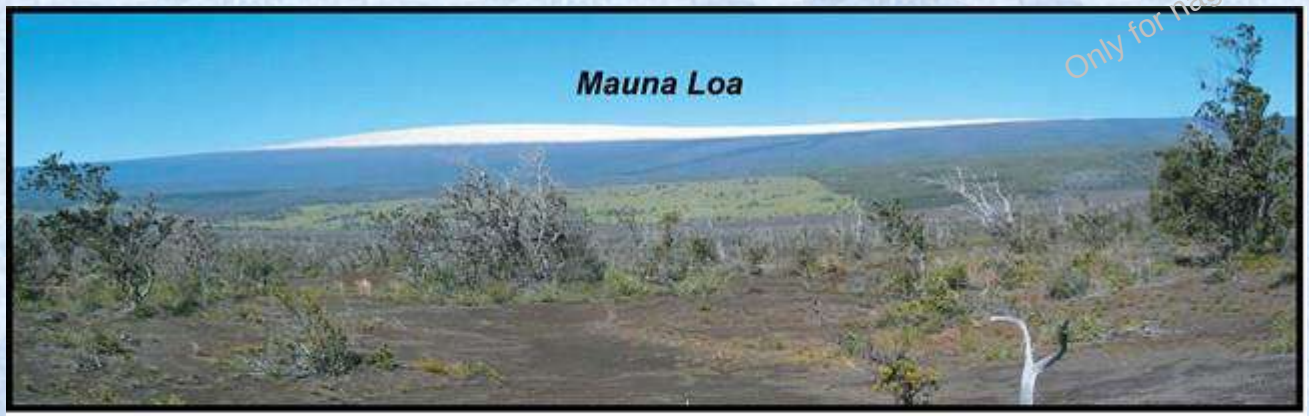

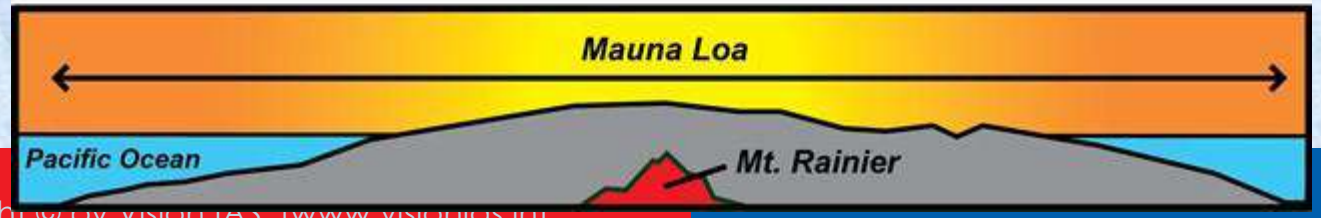

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Vulcanism

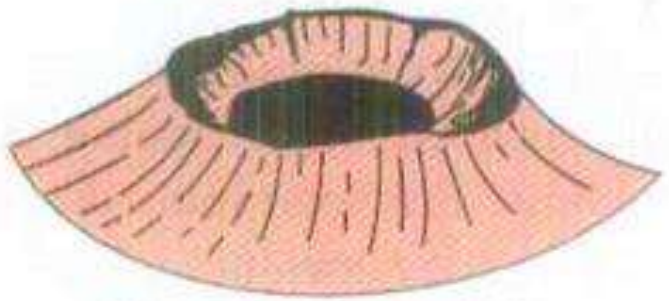

Fig. 8.4. Crater Lake

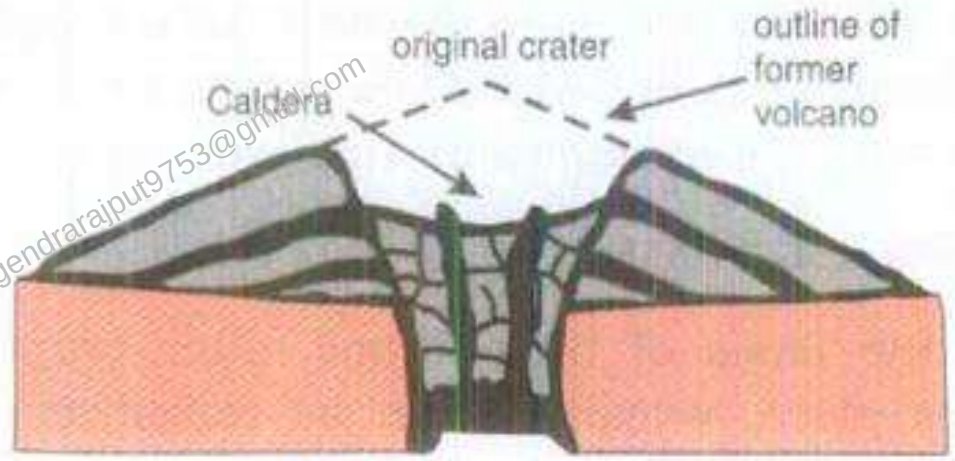

Fig. 8.6. A caldera

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Vulcanism

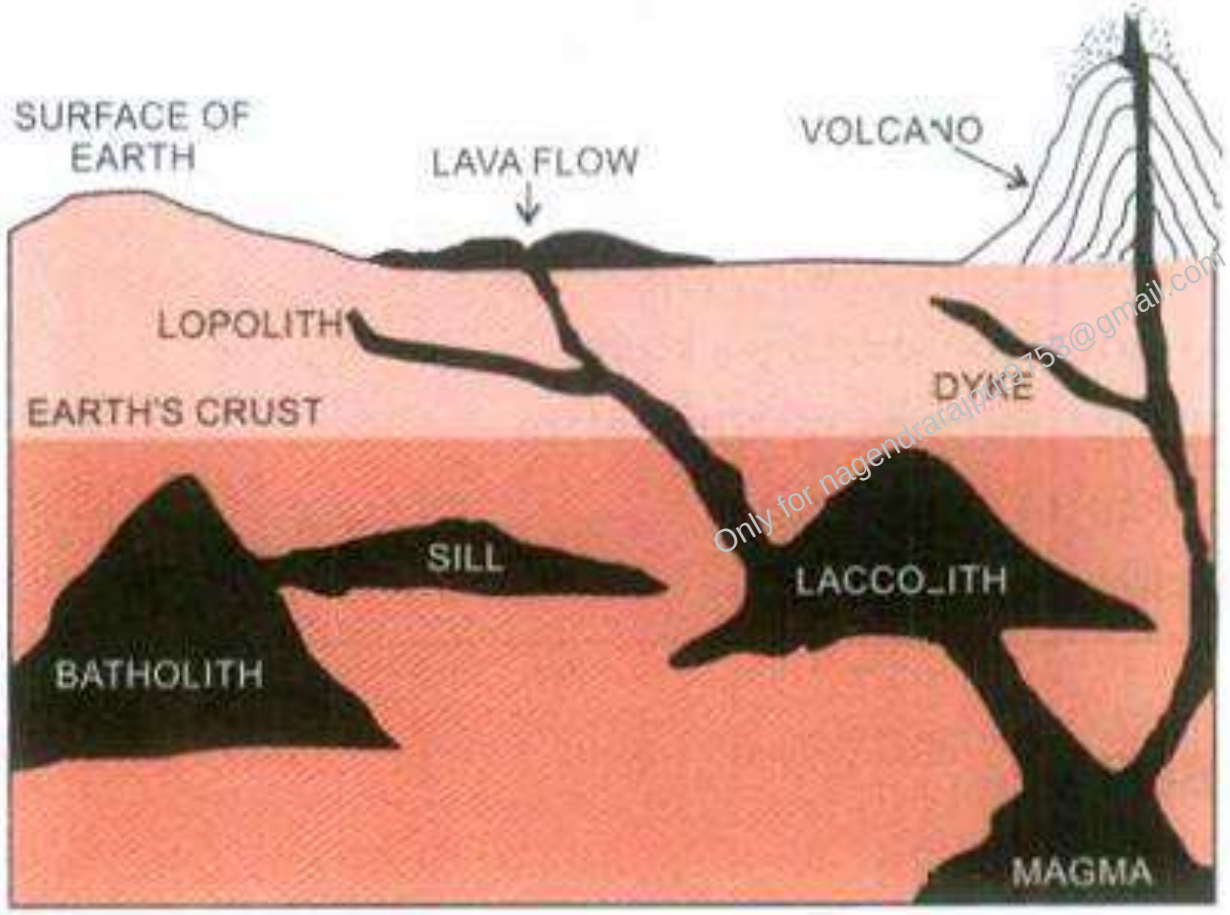

Fig. 8.8. Intrusive Landforms

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Vulcanism

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2021	**Mention the global occurrence of volcanic eruptions in 2021 and their impact on regional environment.**	**10**

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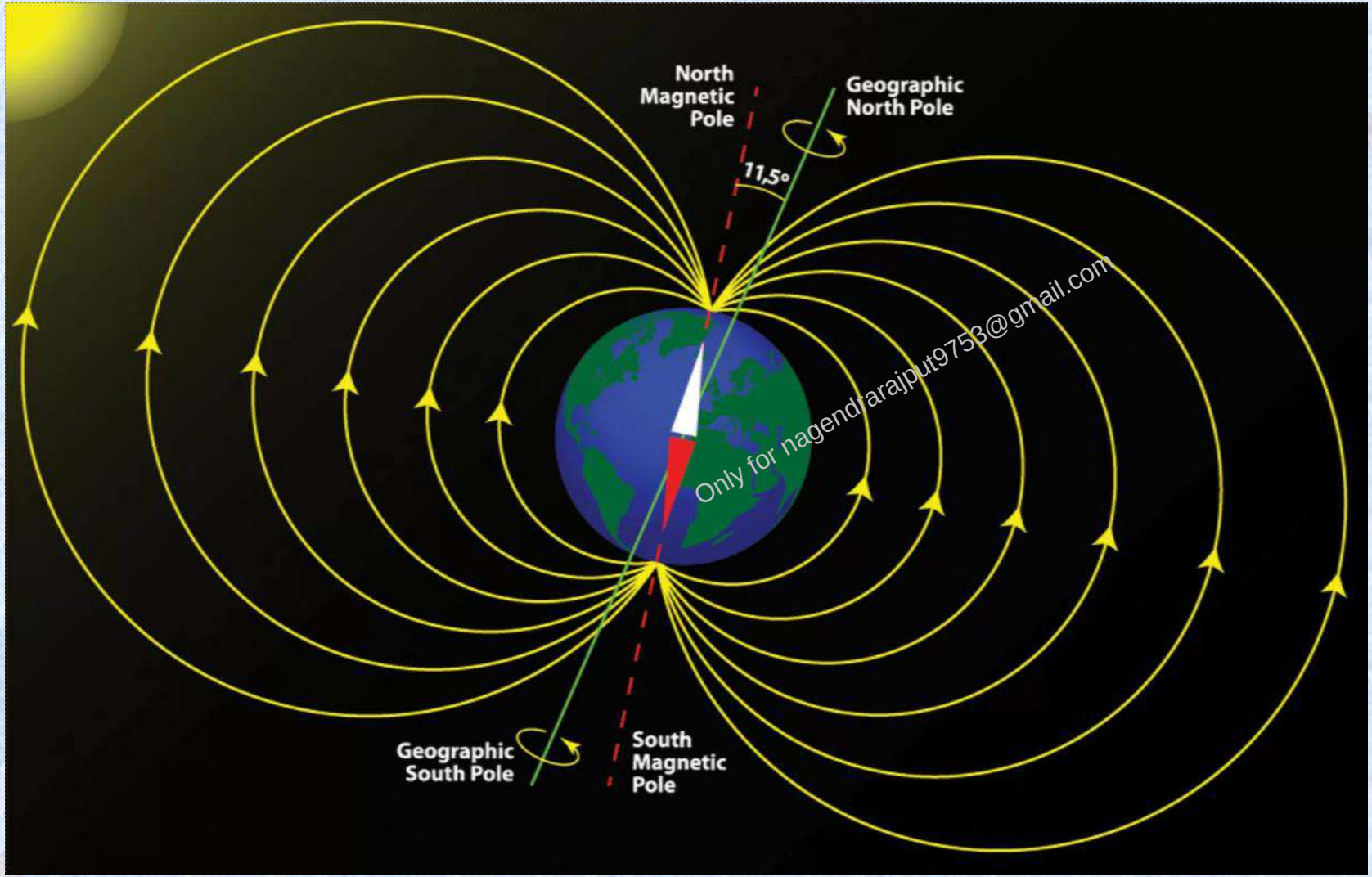
Geomagnetism



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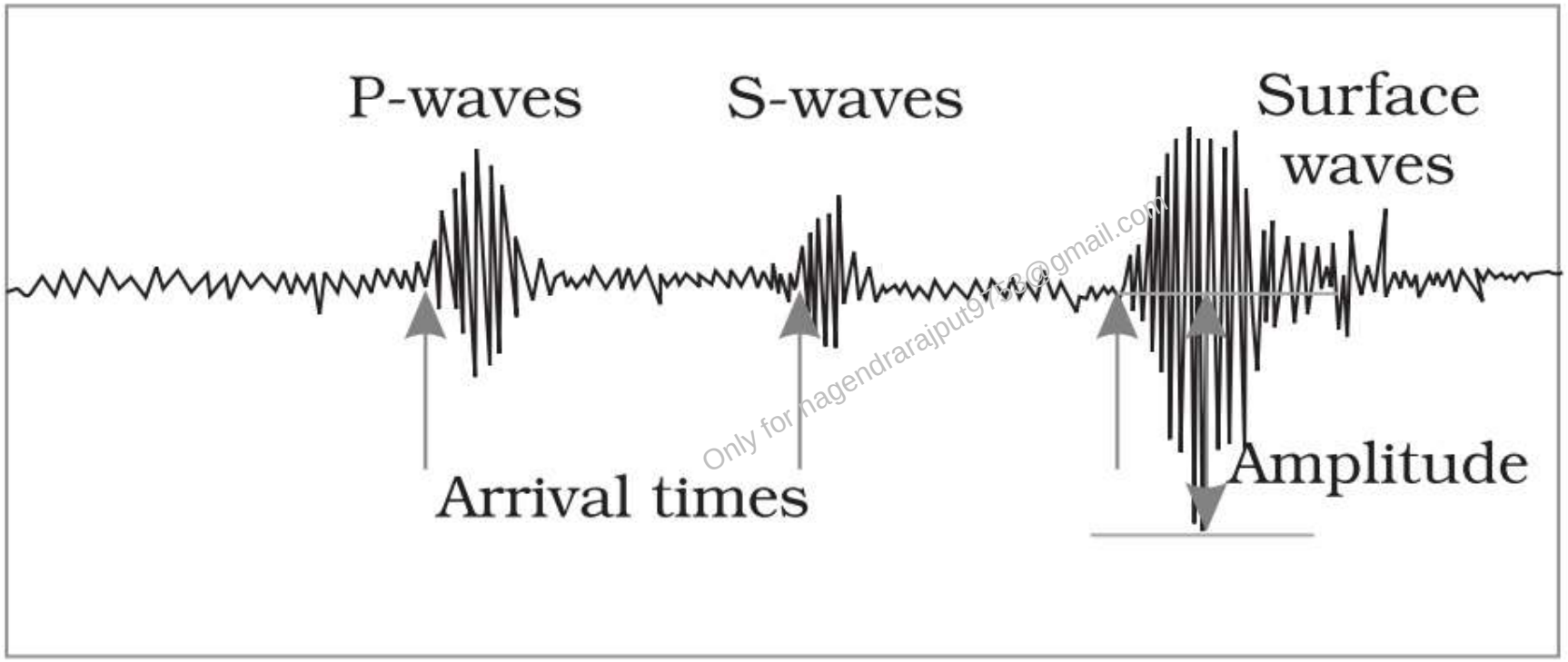

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Figure 3.1 : Earthquake Waves

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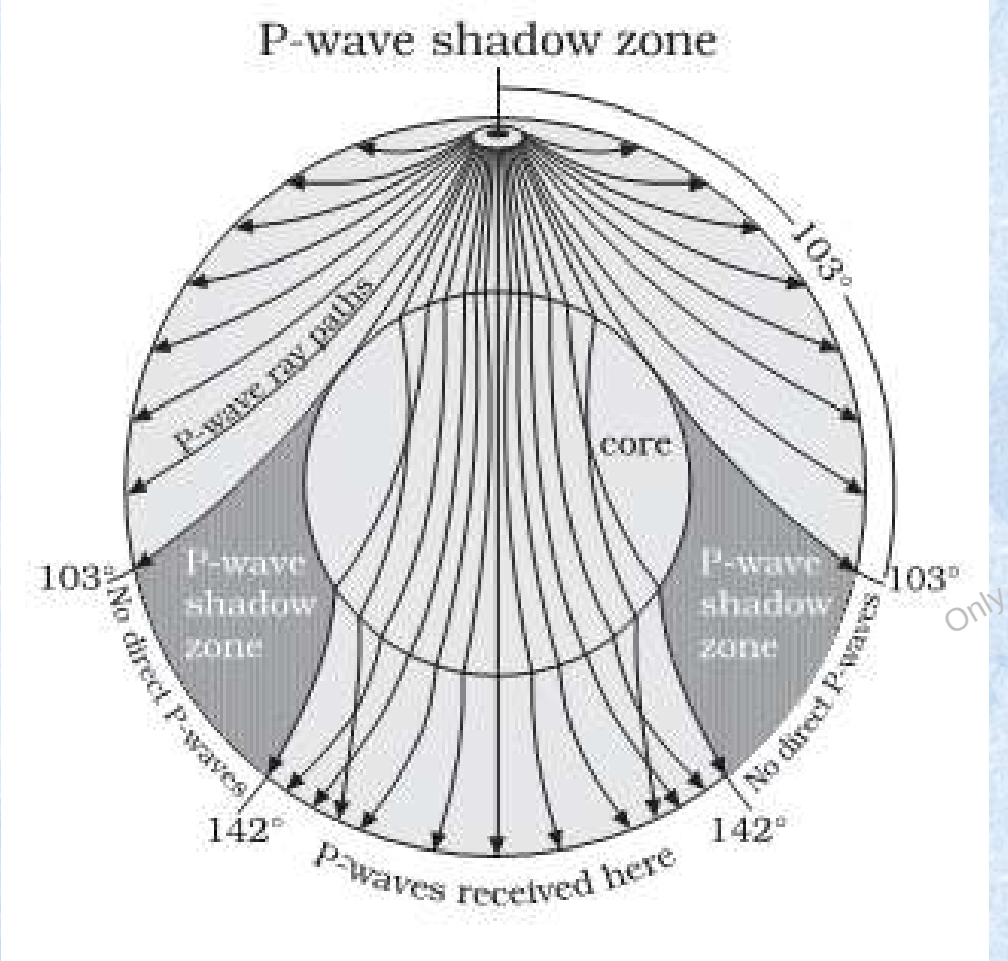

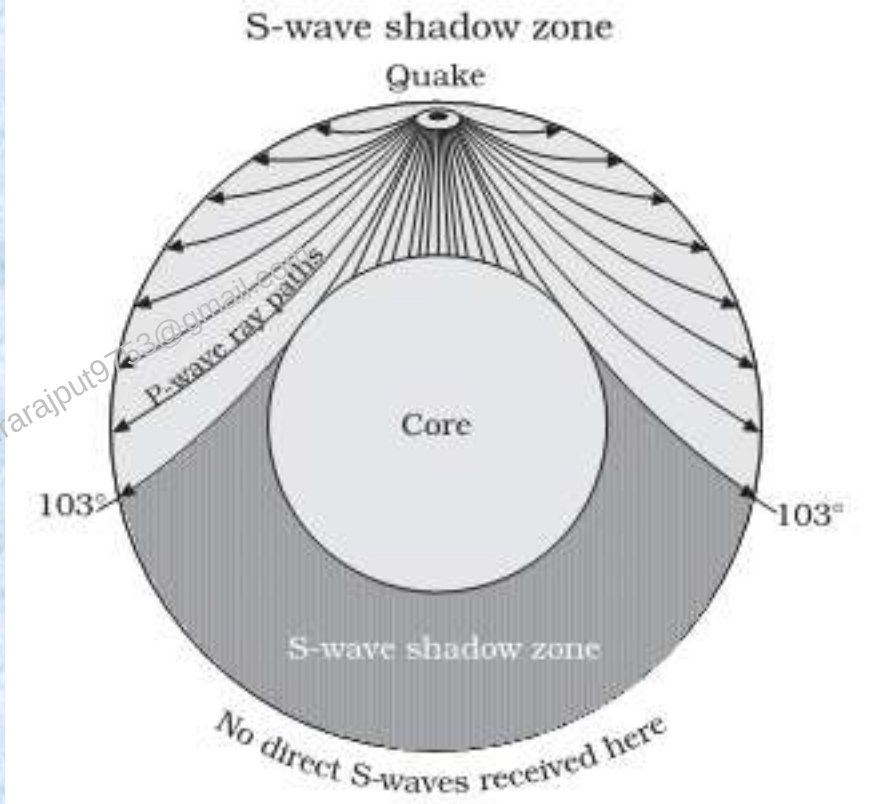

Figure 3.2 (a) and (b) : Earthquake Shadow Zones

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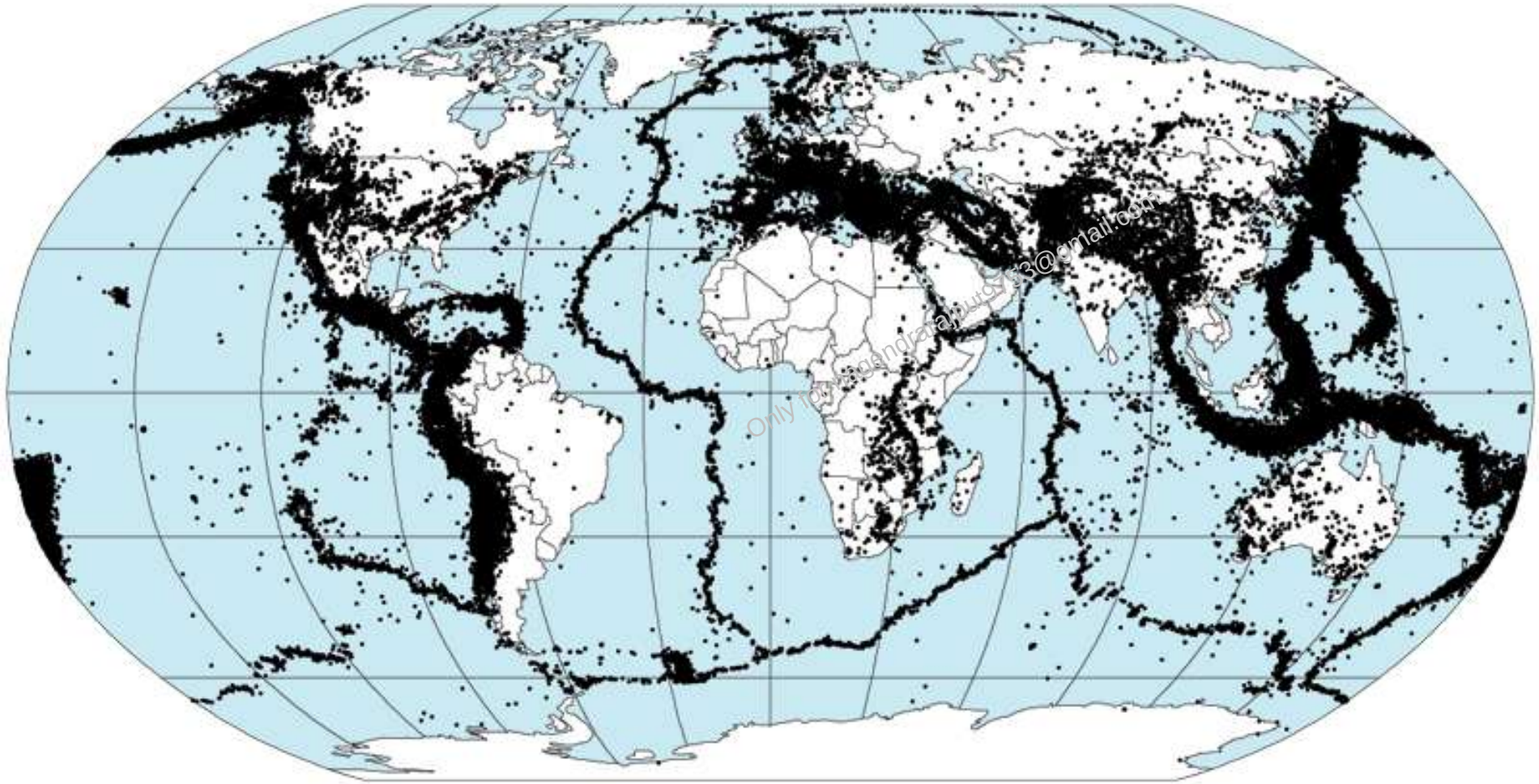
Preliminary Determination of Epicenters
358,214 Events, 1963 - 1998



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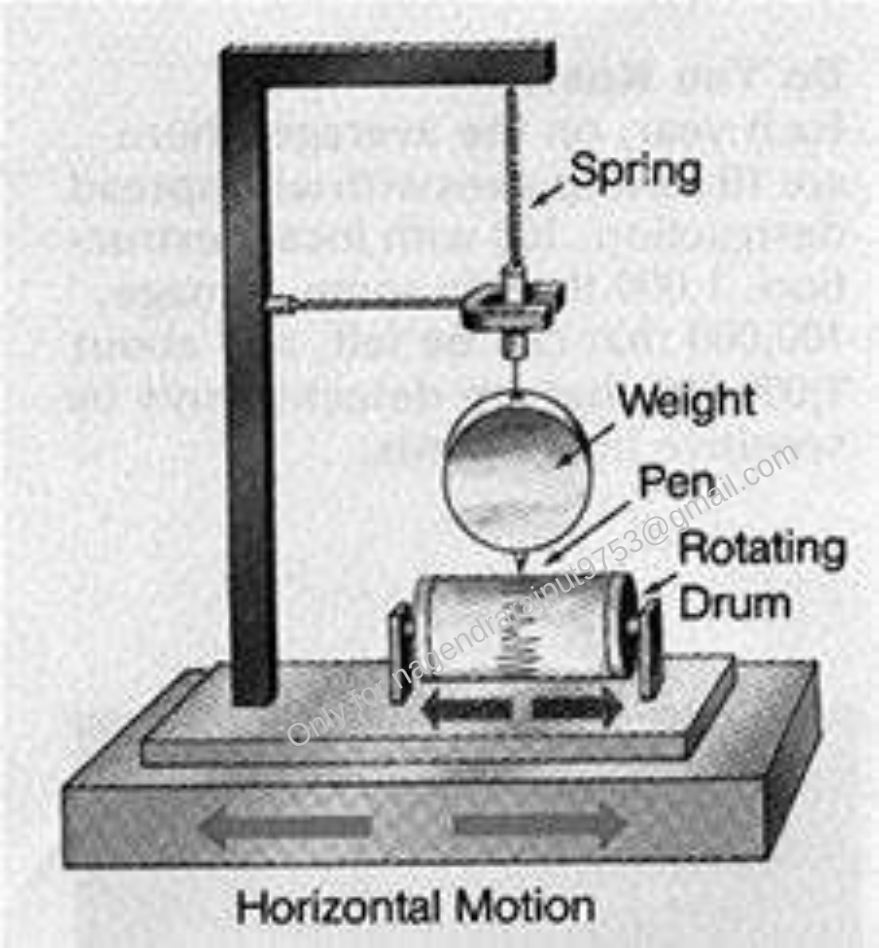

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https://www.youtube.com/watch?v=T0AEtX-uPLA

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Tsunamis

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https://www.youtube.com/watch?v=xyKgamjegtQ

Indian Ocean Tsunami
https://www.youtube.com/watch?v=oMhVHM6WwWQ&t=219s

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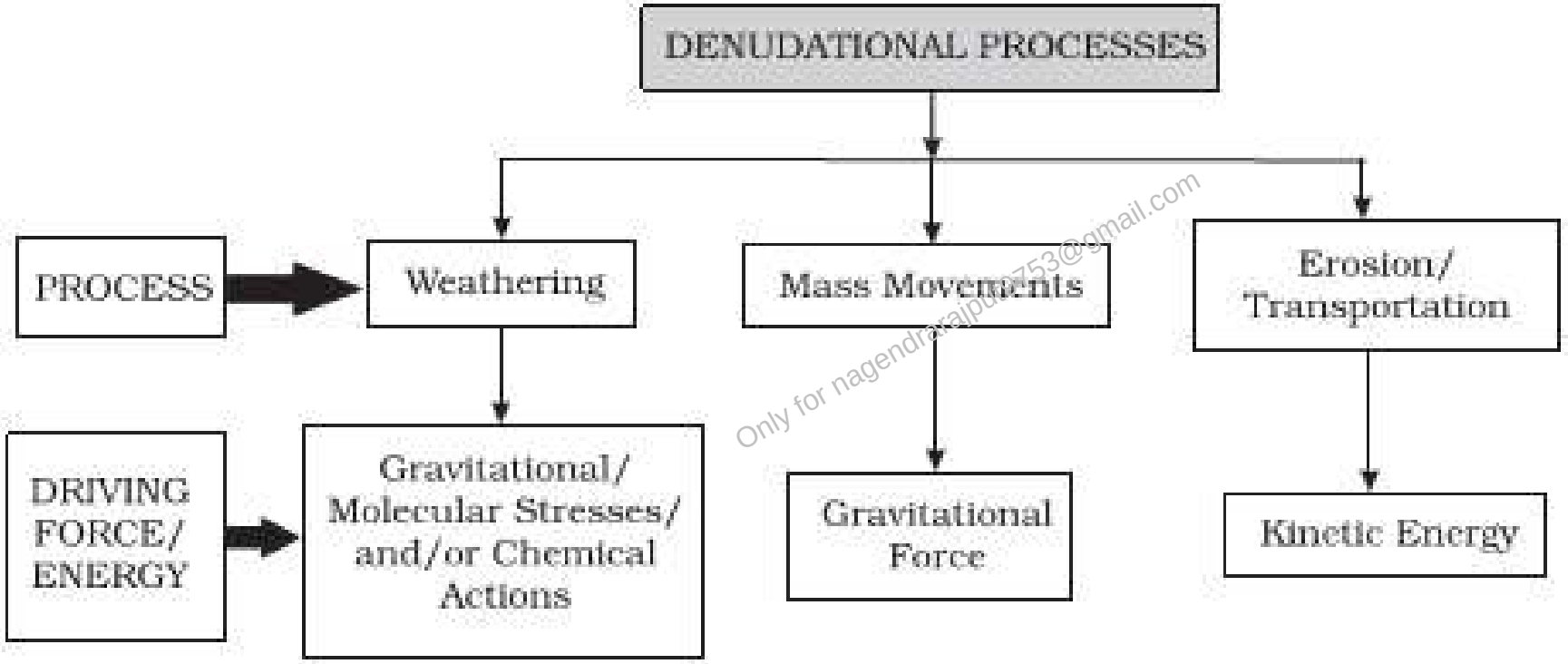

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Figure 6.1 : Denudational processes and their driving forces

Table 11.1. Difference between Mechanical and Chemical Weathering.

Mechanical (Physical) Weathering	Chemical Weathering
1. Disintegration of rocks take place without any change in chemical constituents of rocks.	1. Decomposition of rocks take place with changes in the chemical constituents of rocks.
2. Factors such as temperature, moisture, frost action and wind cause physical break-up of rocks.	2. Temperature, moisture, etc., cause minerals in rocks to either dissolve in water or change their composition.
3. It is more rapid in desert climates.	3. It occurs in moist and cold climates
4. Rocks are affected to great depths.	4. It mostly takes place near the surface of the earth.
5. Its agents are temperature and moisture.	5. Its agents are water, oxygen, carbon and various organic acids.

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Exogenic Movements

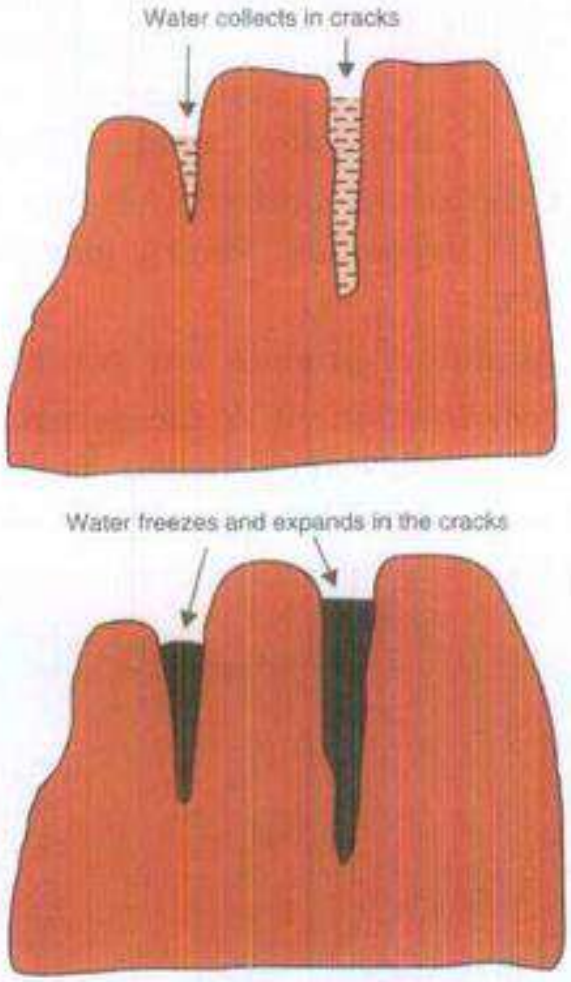
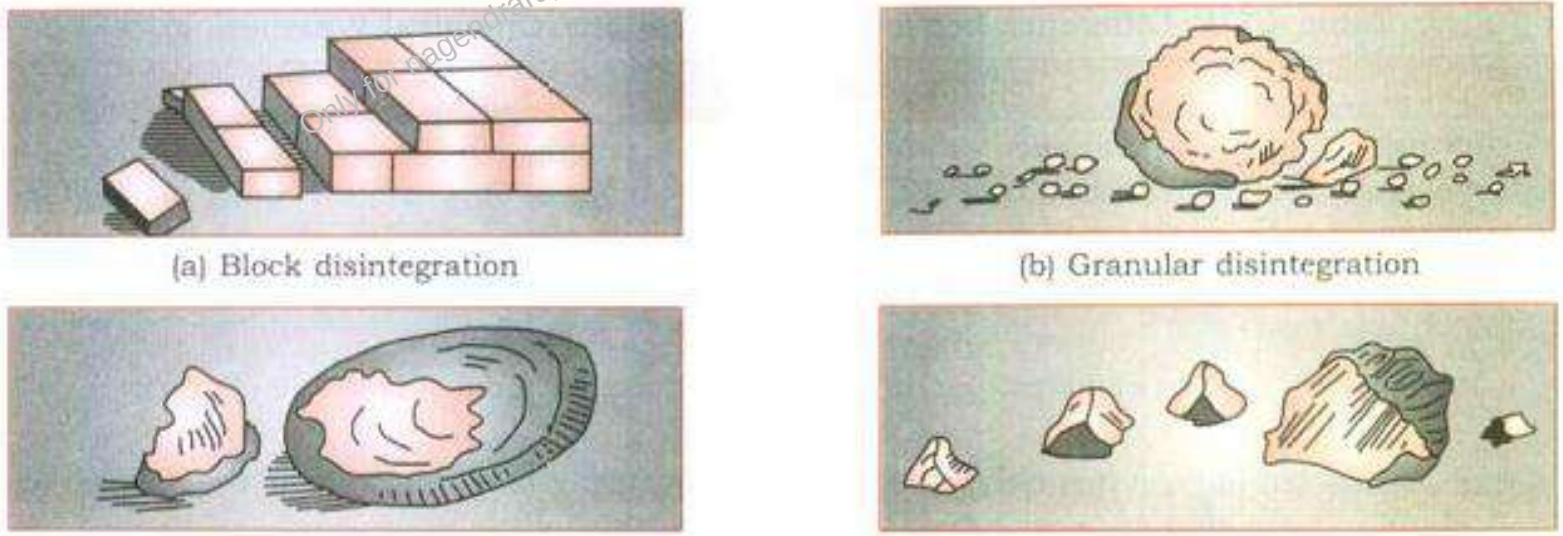


Fig. 11.2. Mechanics of Weathering (Physical Weathering)

Frost shattering



(a) Block disintegration

(b) Granular disintegration

(c) Exfoliation

(d) Frost Action

Fig. 11.3. Types of Mechanical Weathering

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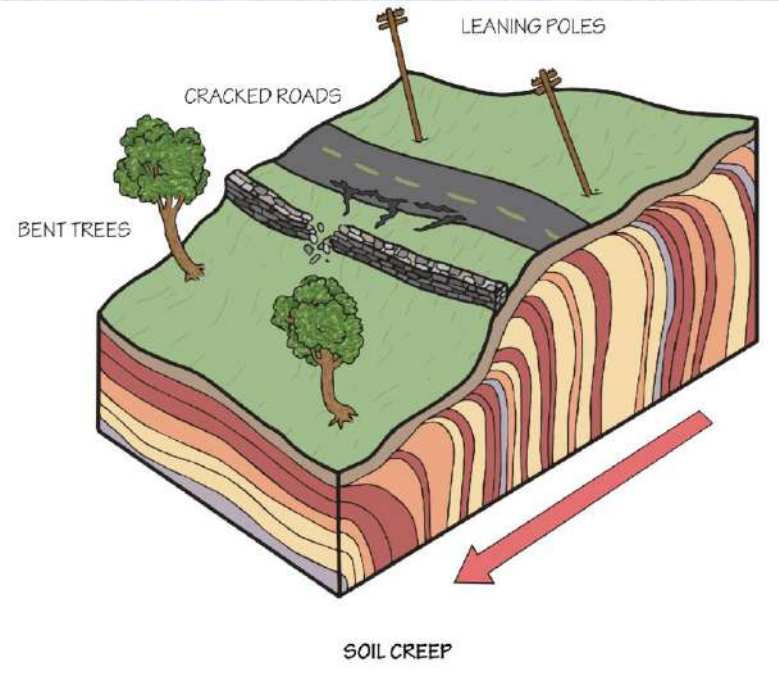
Exogenic Movements



Solifluction

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Exogenic Movements

Land slide

Earth flow

Mud flow

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Exogenic Movements

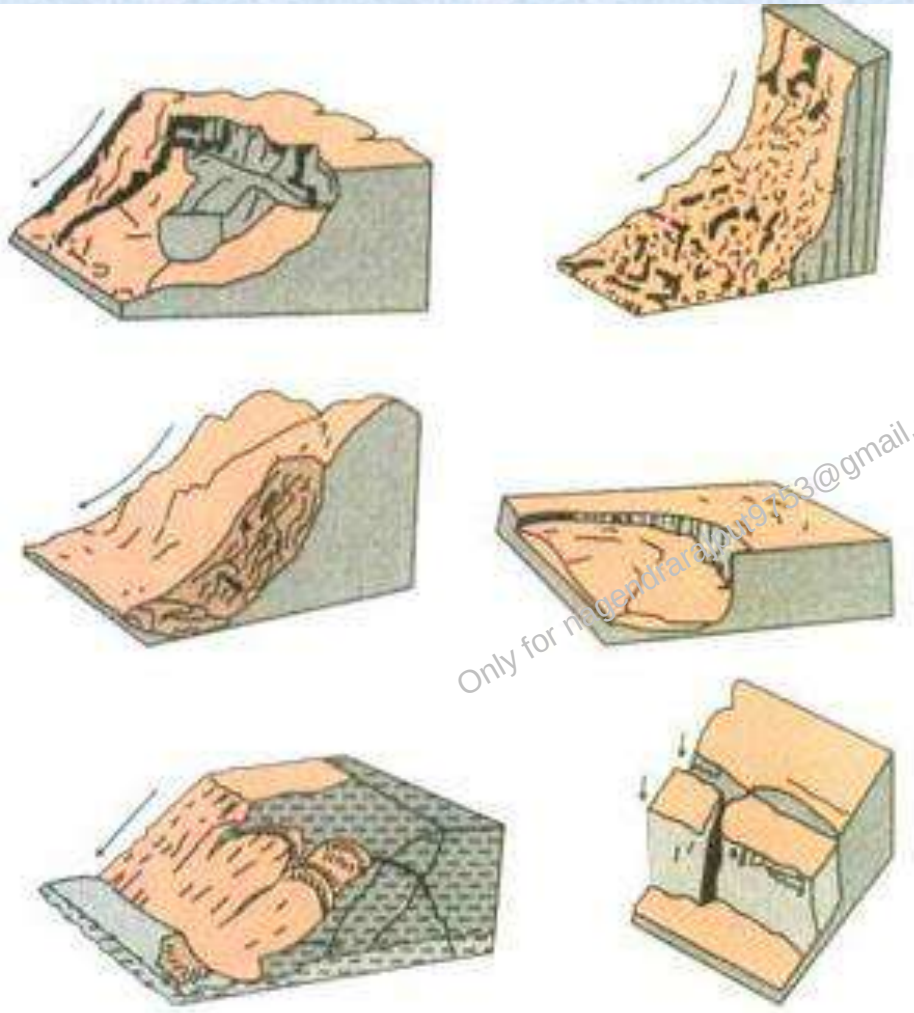

Fig. 11.5. Slopes and movement of soil

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2013	Bring out the causes for more frequent occurrence of landslides in the Himalayas than in the Western Ghats.	5

2016	“The Himalayas are highly prone to landslides.”Discuss the causes and suggest suitable measures of mitigation.	12.5

2021	**Differentiate the causes of landslides in the Himalayan region and Western Ghats.**	**10**

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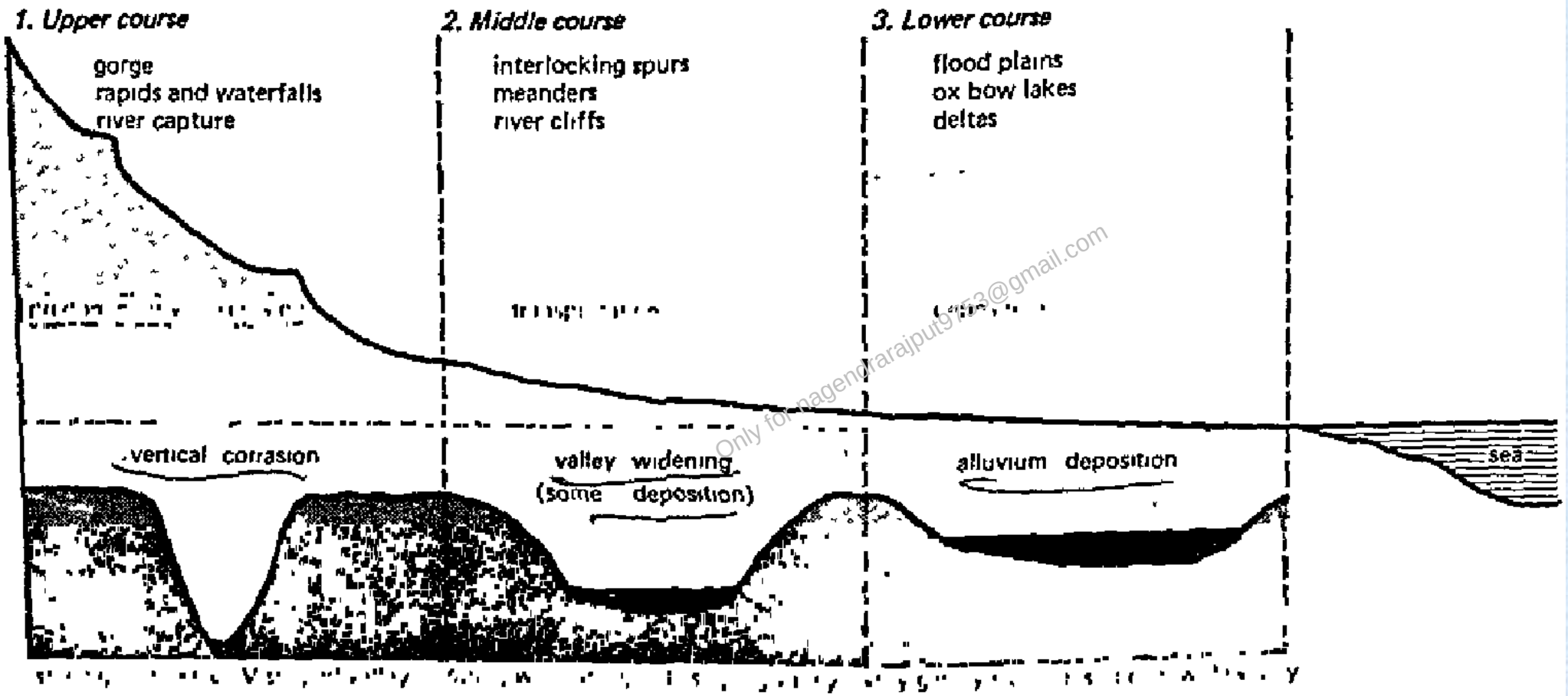

Fig.36 The graded long profile and typical cross section of a river from source to mouth

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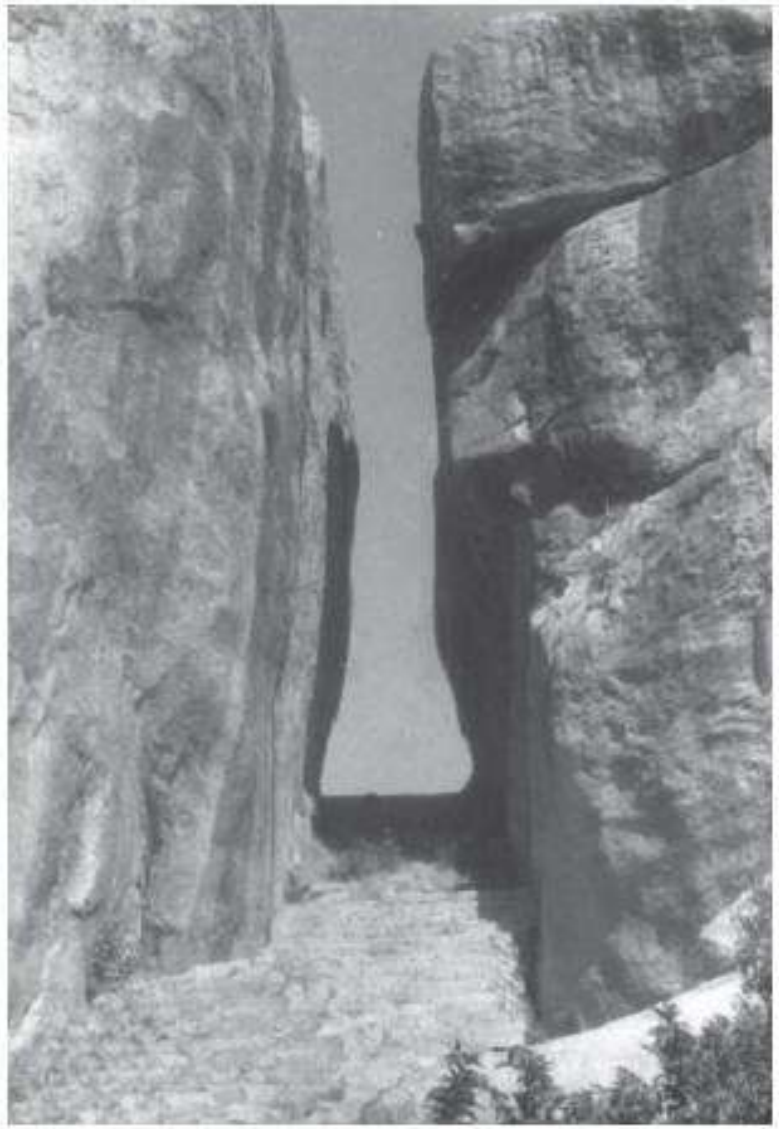

Figure 7.1 : The Valley of Kaveri river near Hogenekal, Dharmapuri district, Tamilnadu in the form of gorge

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Figure 7.2 : An entrenched meander loop of river Colorado in USA showing step-like side slopes of its valley typical of a canyon

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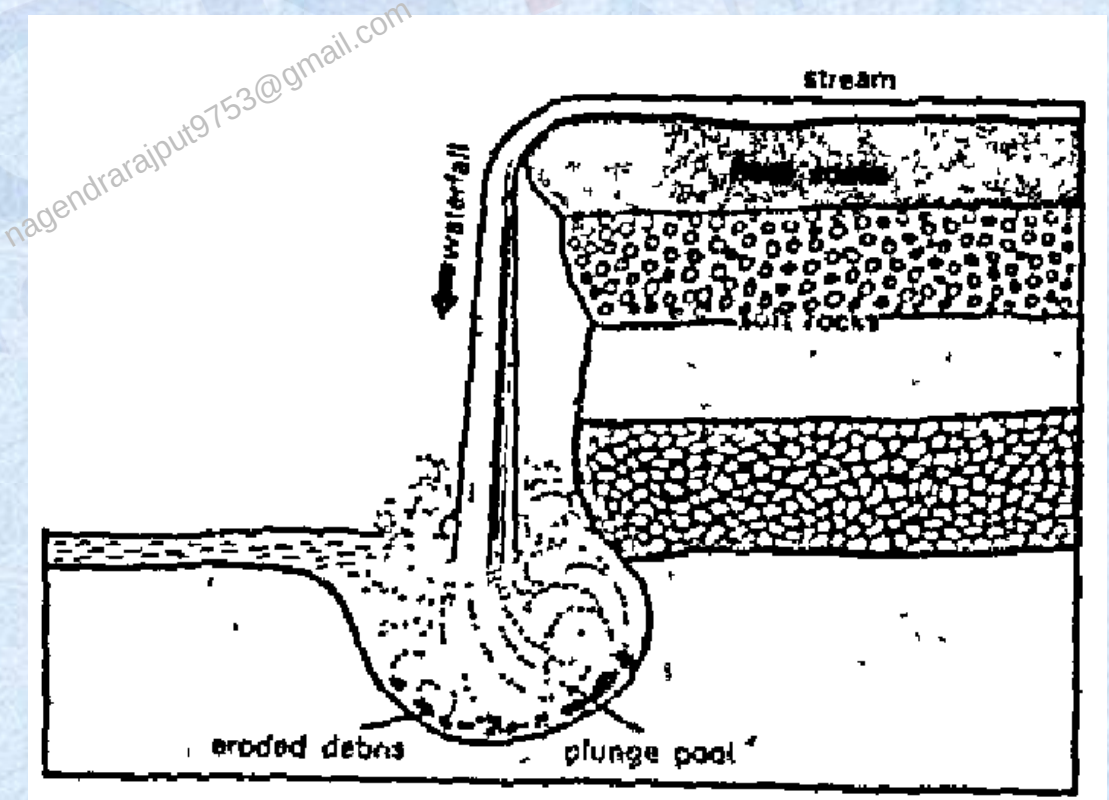

Fig 39 A waterfall with plunge pool

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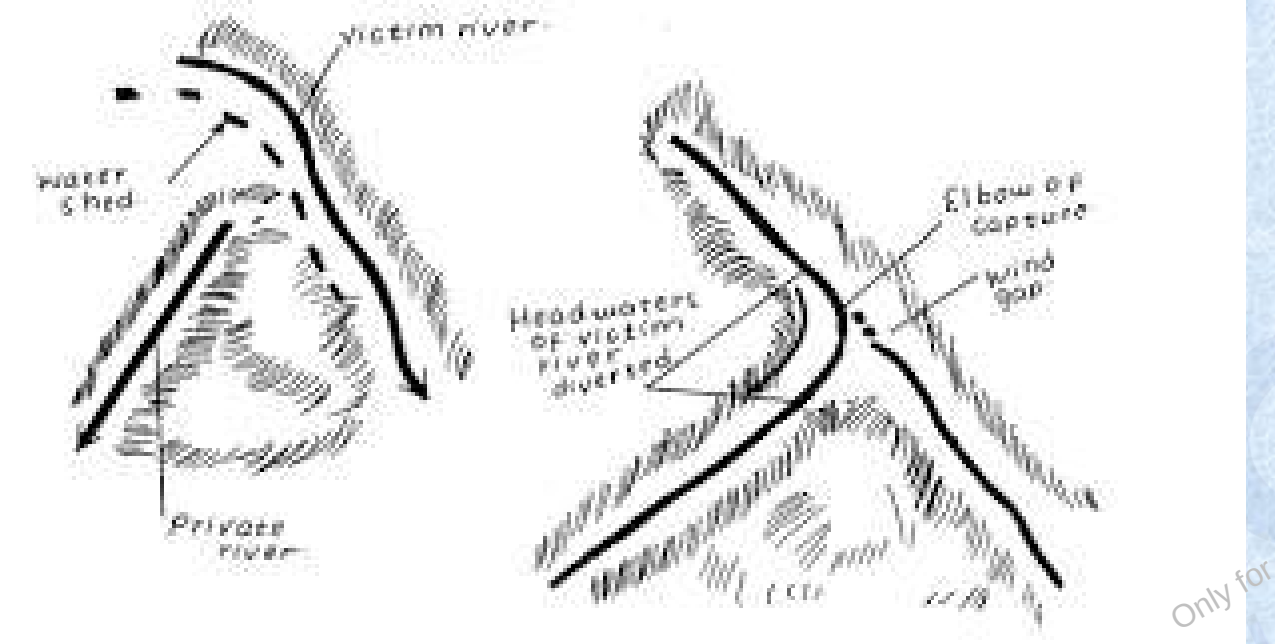

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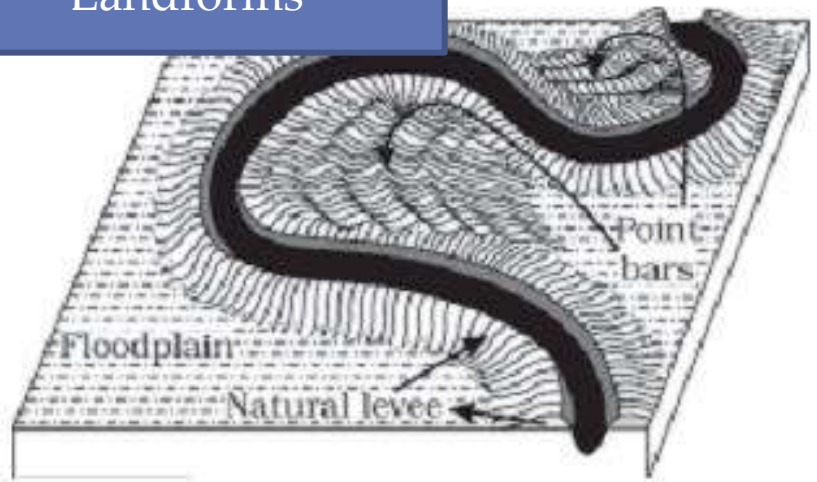

Figure 7.6 : Natural levee and point bars

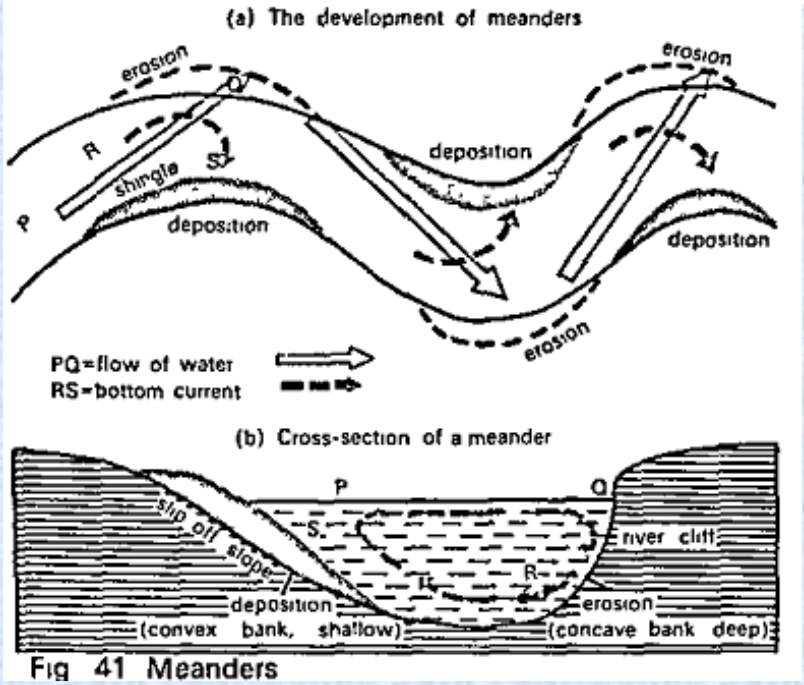

Fig 41 Meanders

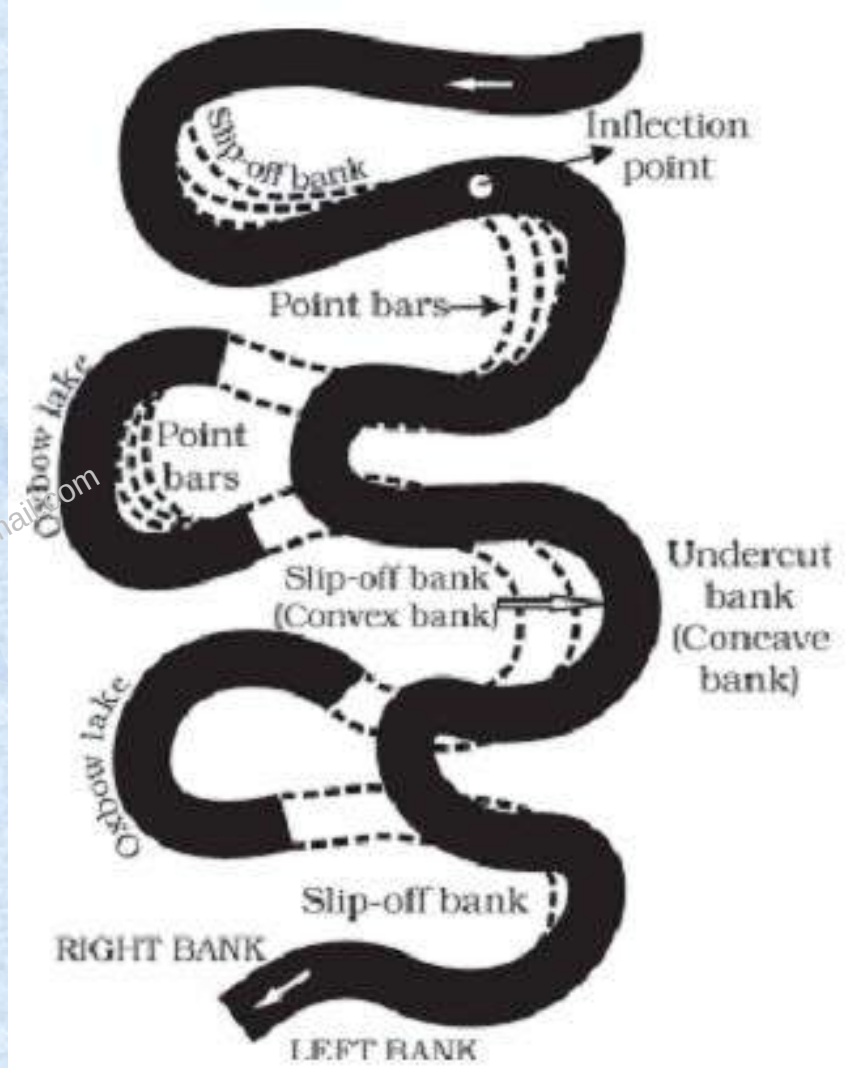

Figure 7.8 : Meander growth and cut-off loops and slip-off and undercut banks

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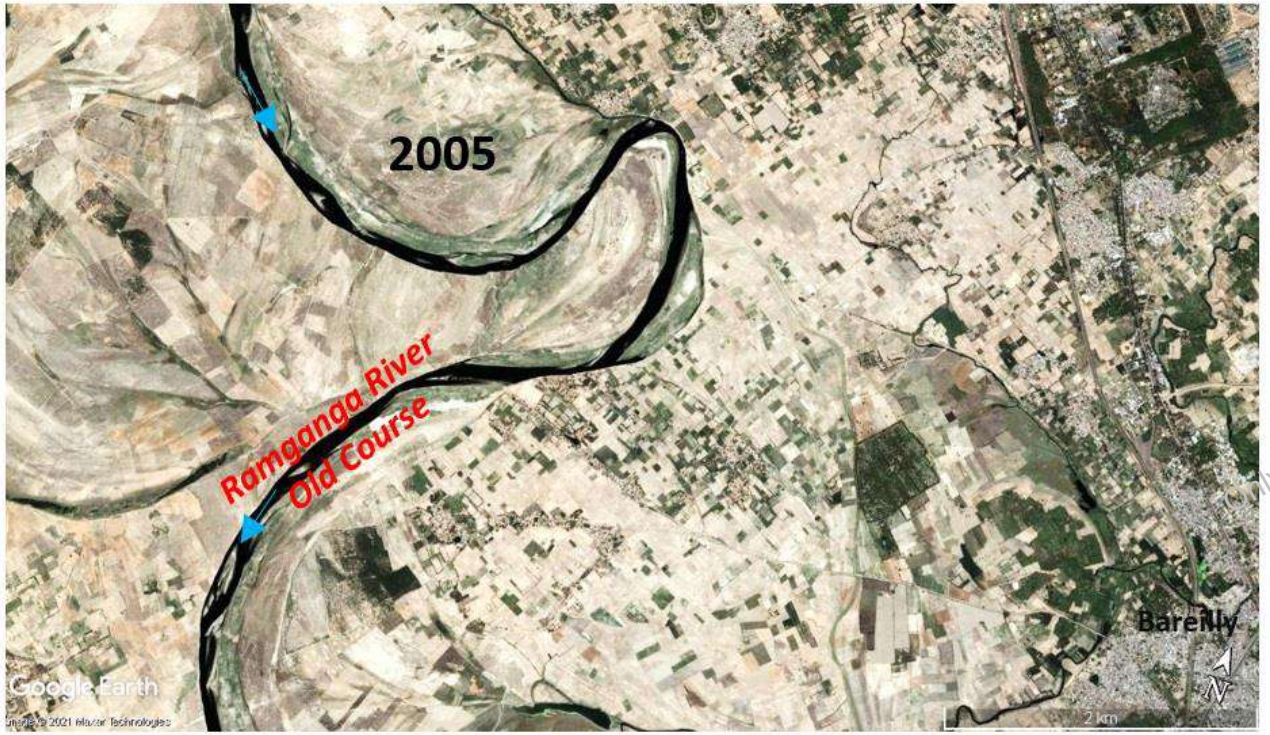

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Figure 7.5 : A satellite view of part of Krishna river delta, Andhra Pradesh

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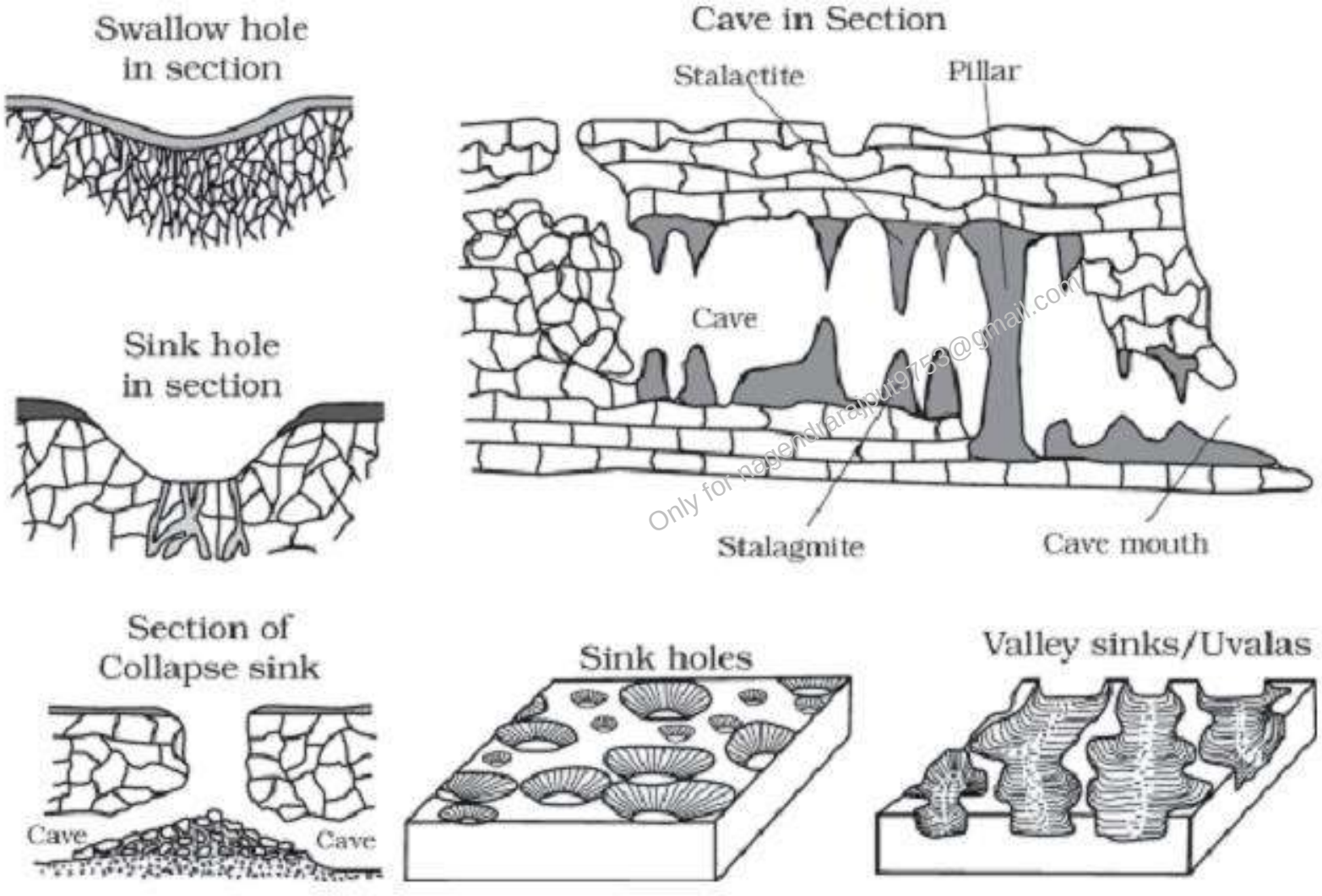

Figure 7.10 : Various karst features

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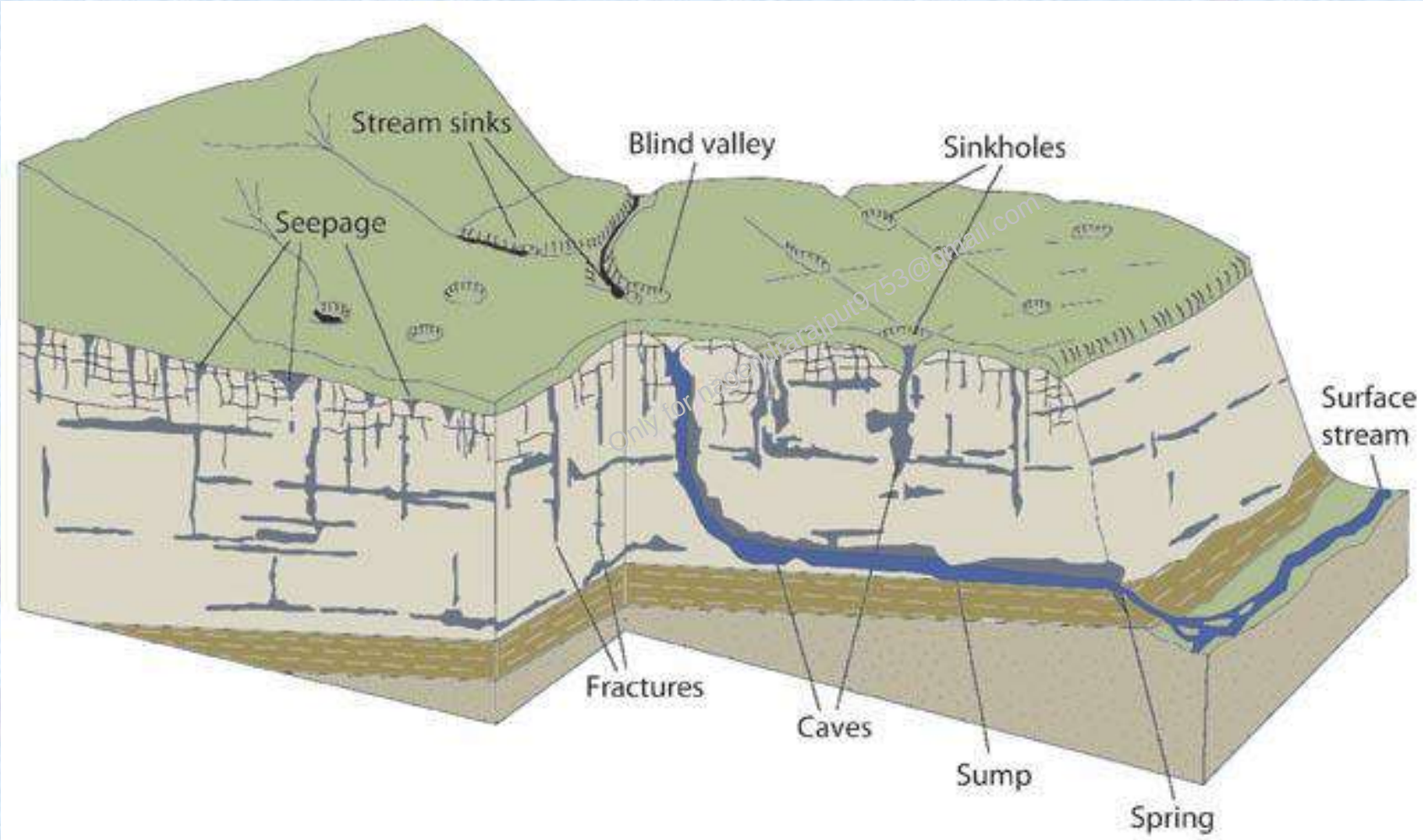

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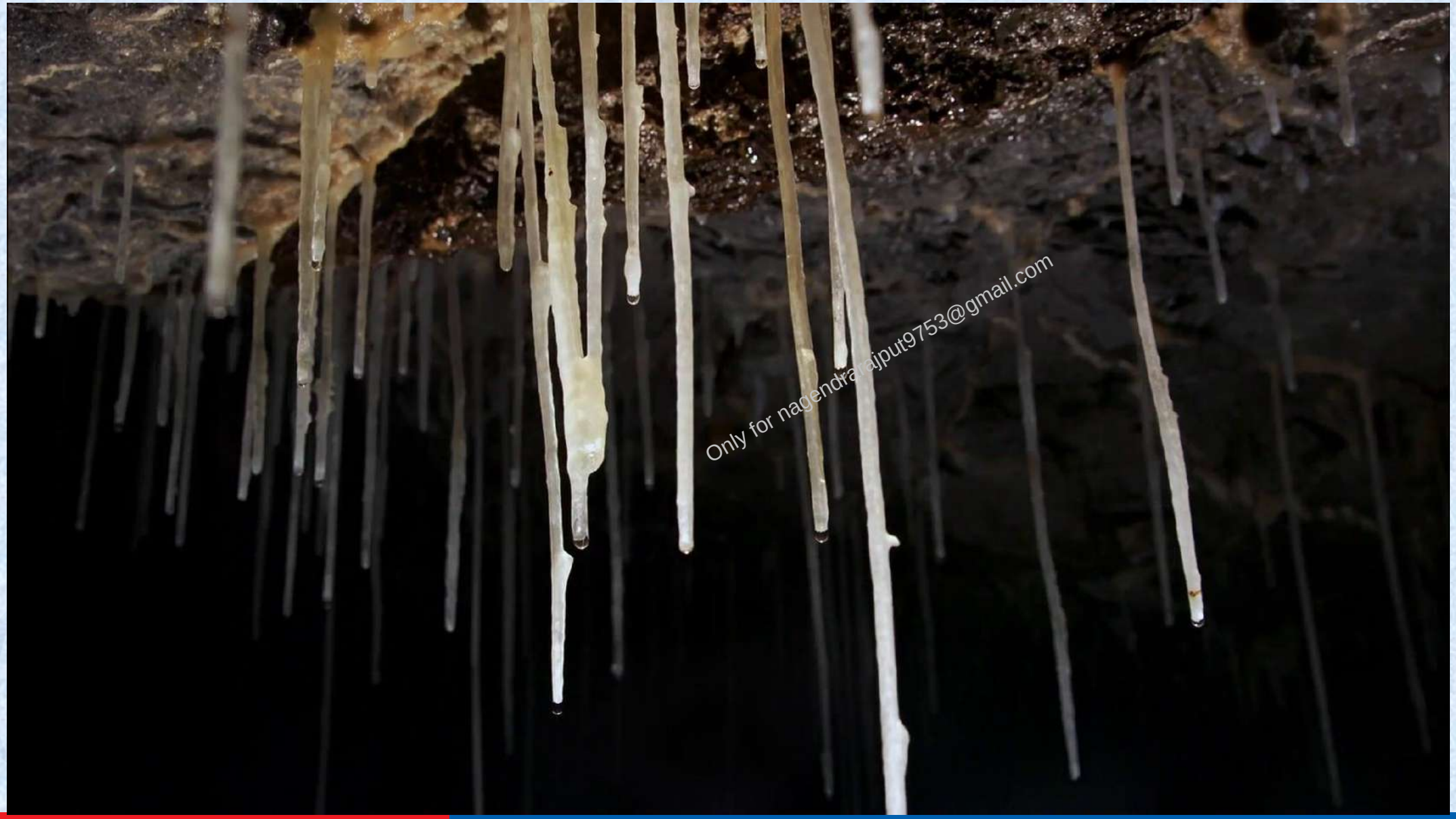

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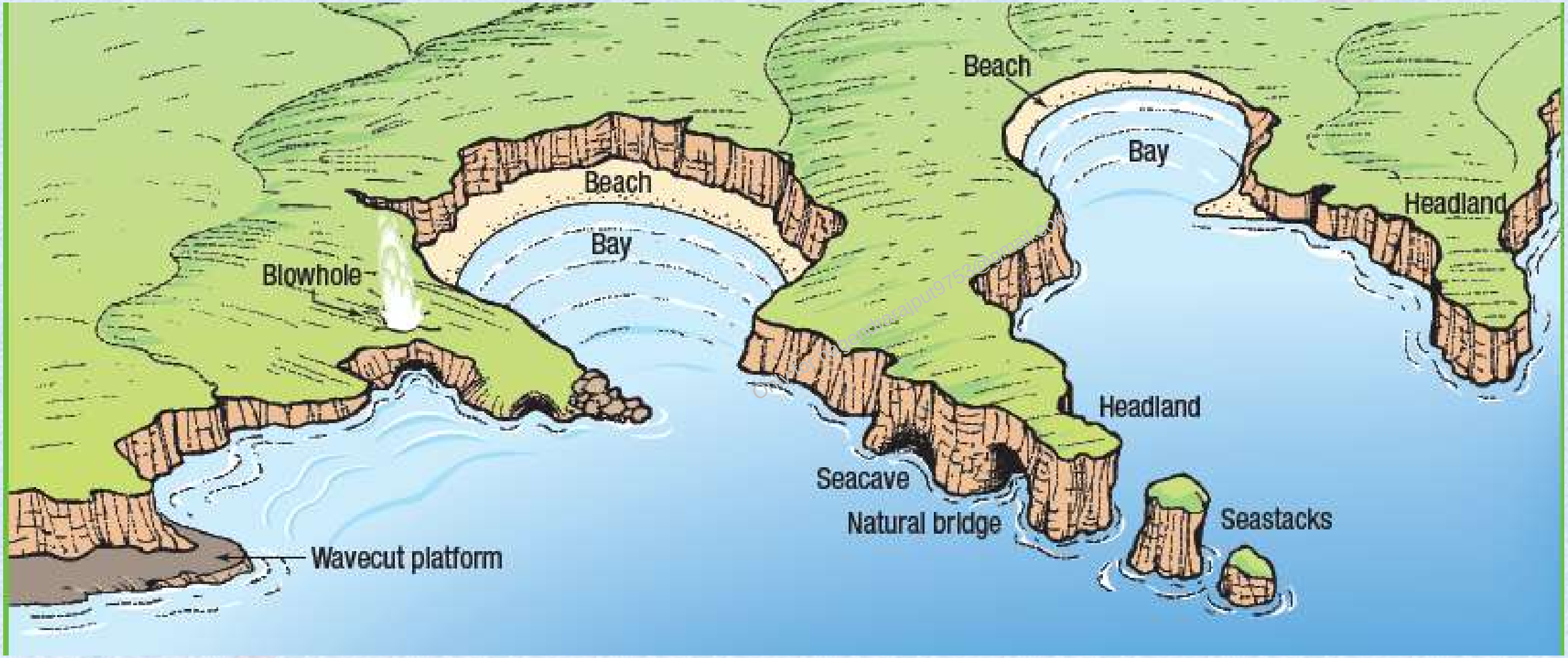
Beach
Bay
Blowhole
Beach
Bay
Headland
Headland
Seacave
Natural bridge
Seastacks
Wavecut platform

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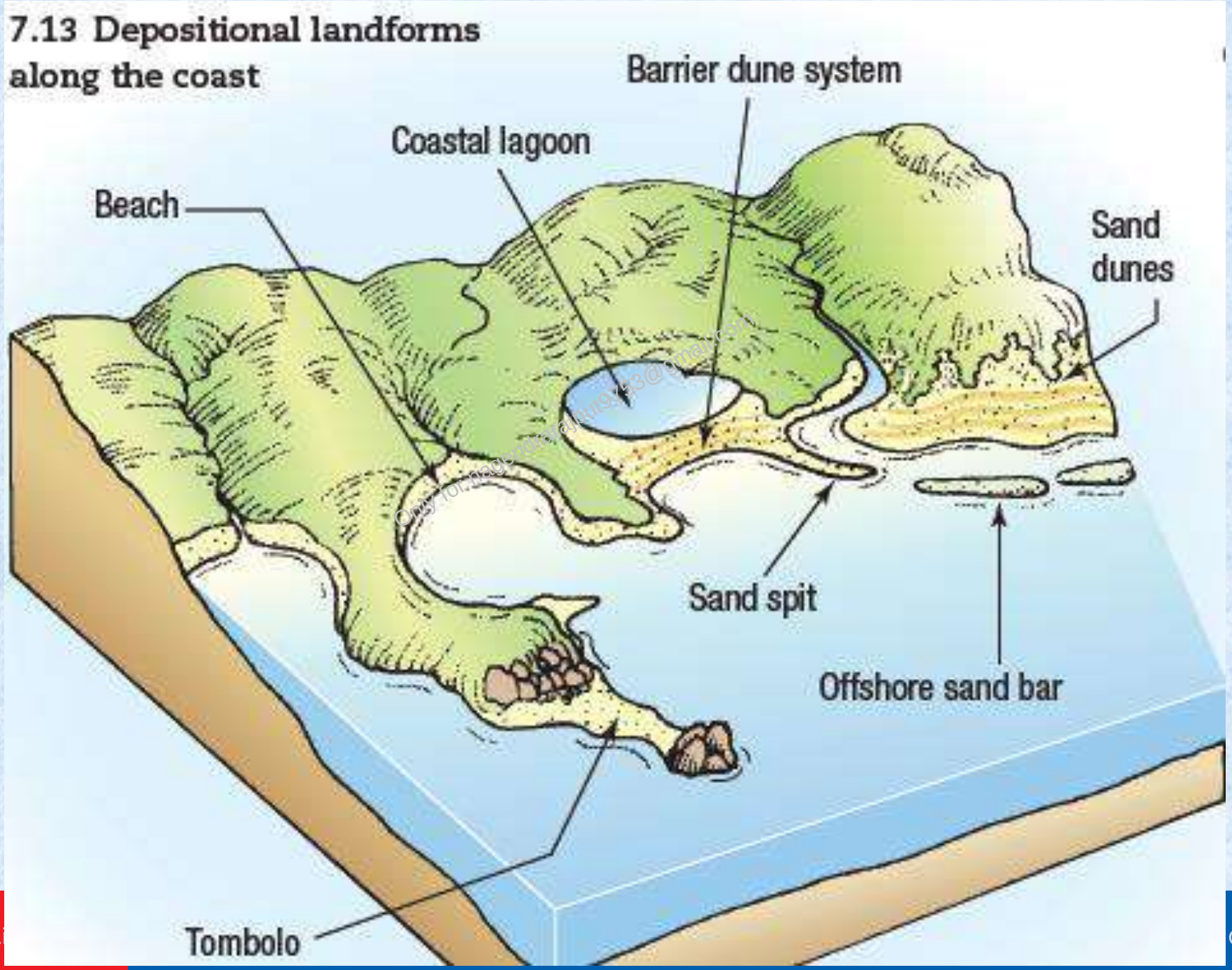

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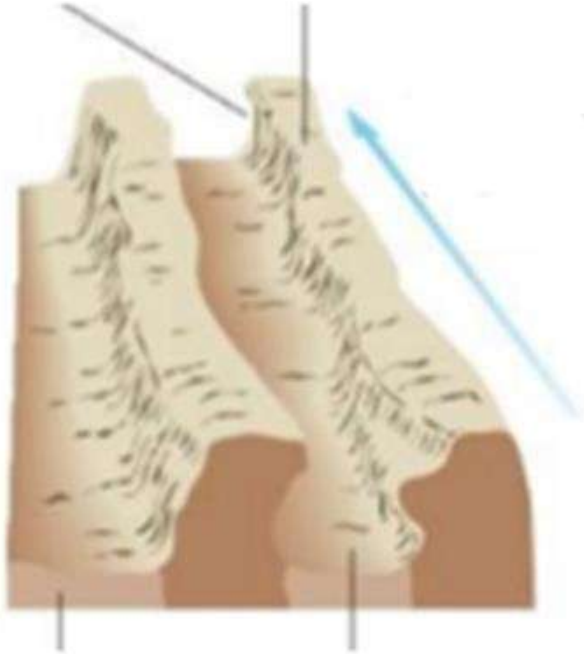

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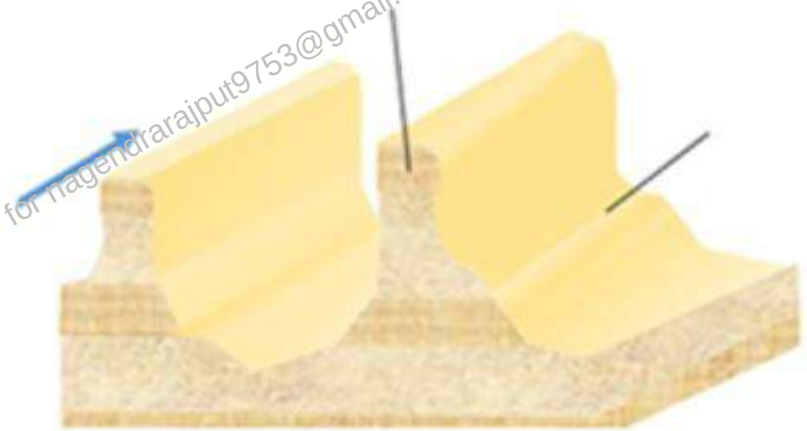

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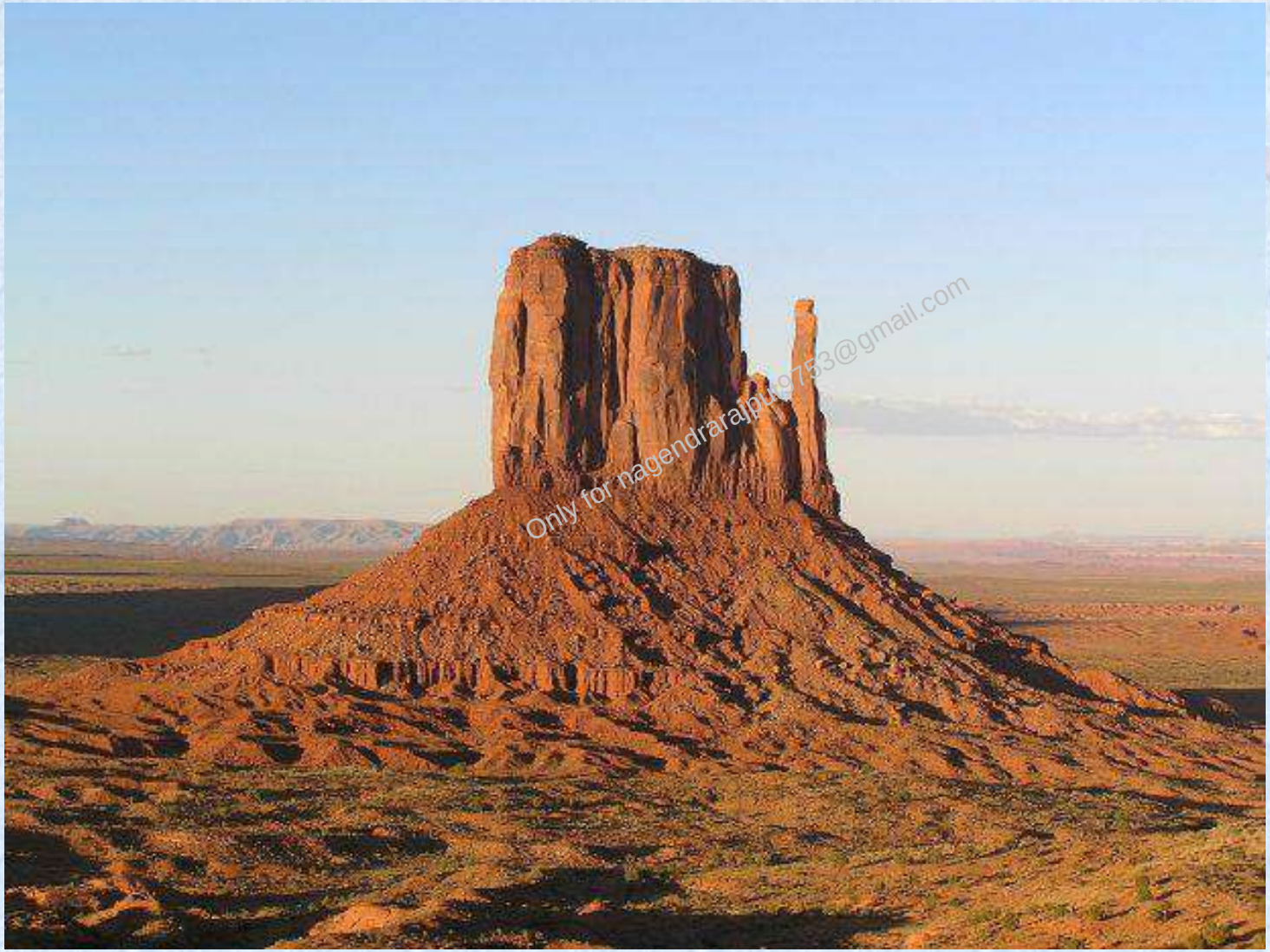

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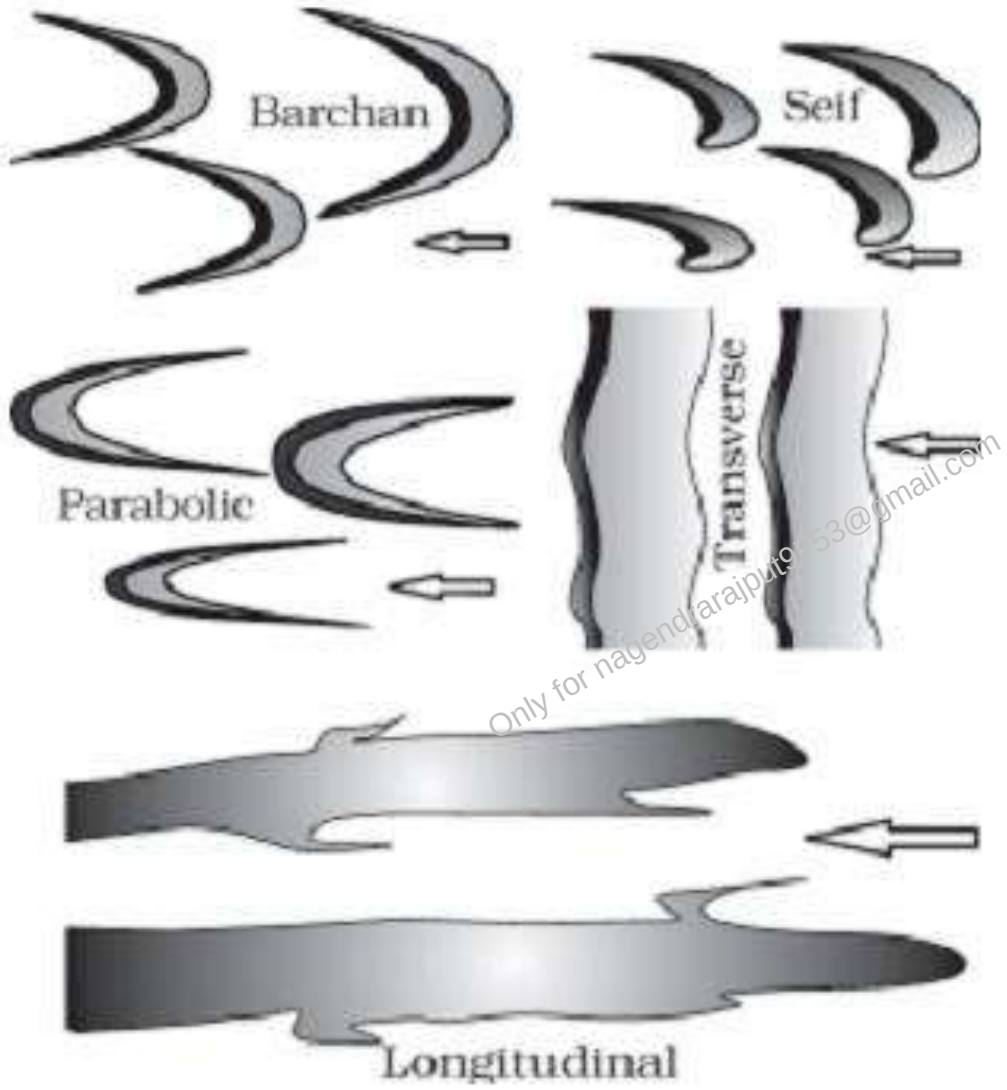

Figure 7.16 : Various types of sand dunes
Arrows indicate wind direction

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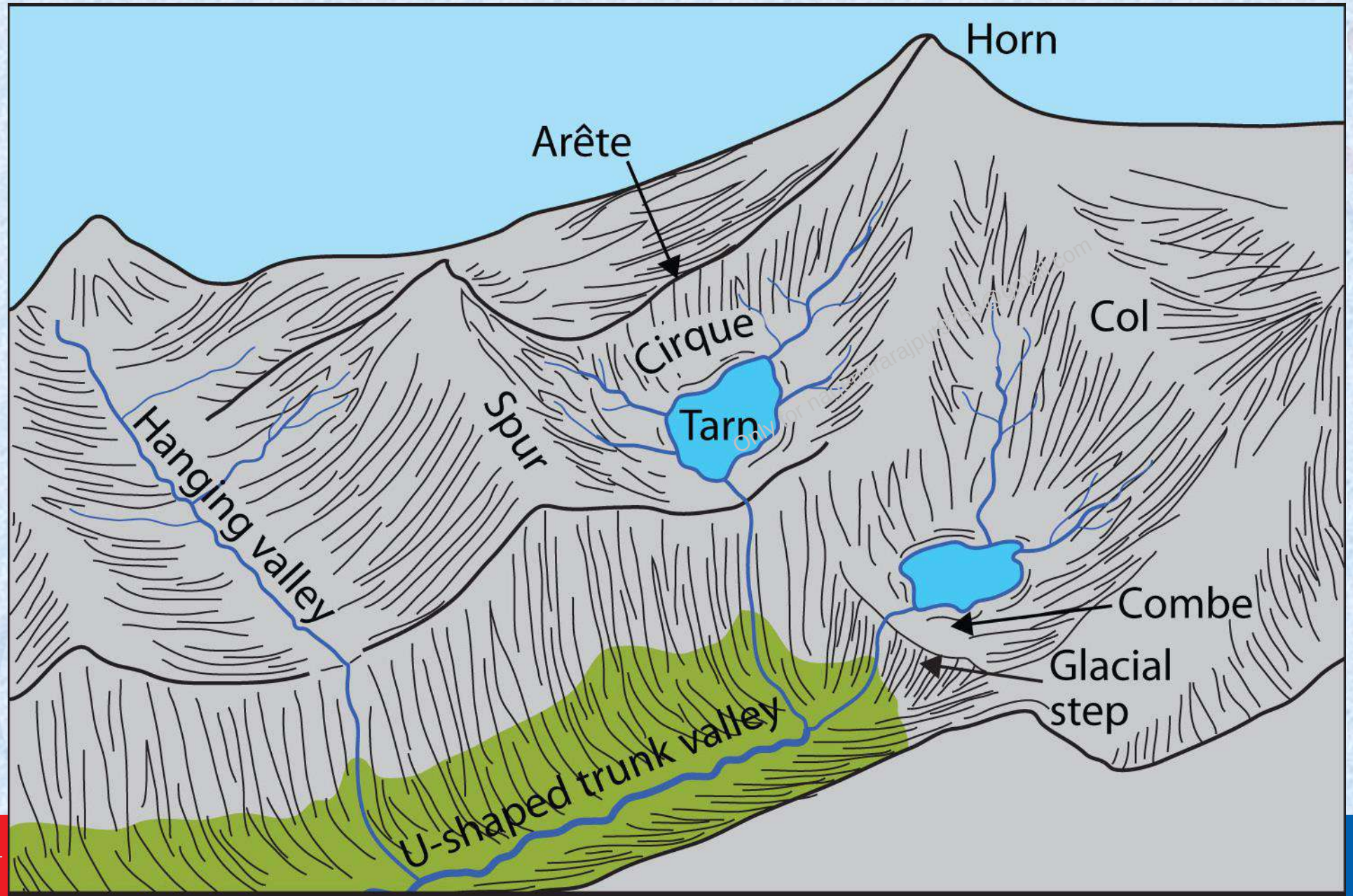
Horn
Arête
Cirque
Tarn
Spur
Hanging valley
Col
Combe
Glacial step
U-shaped trunk valley

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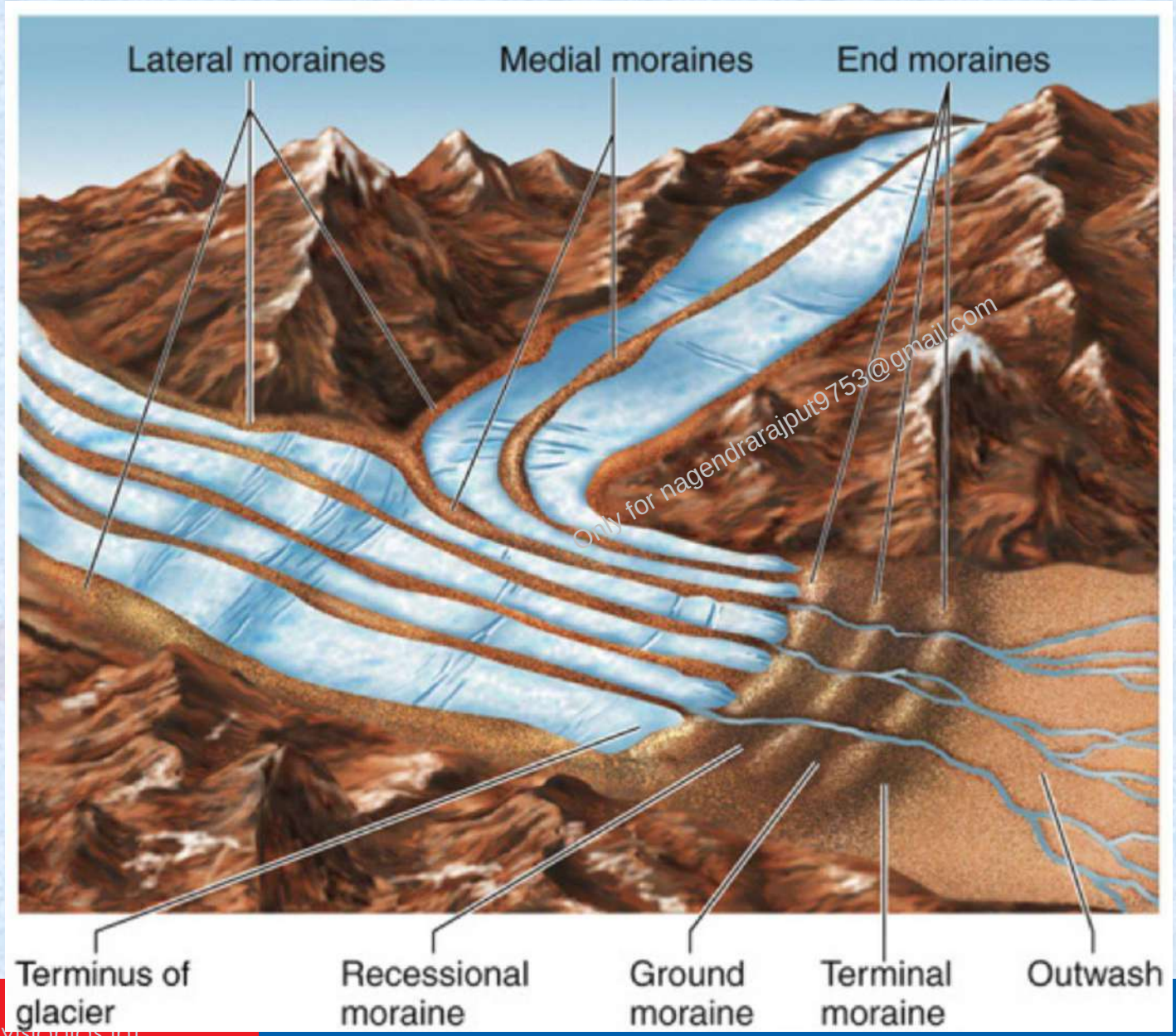

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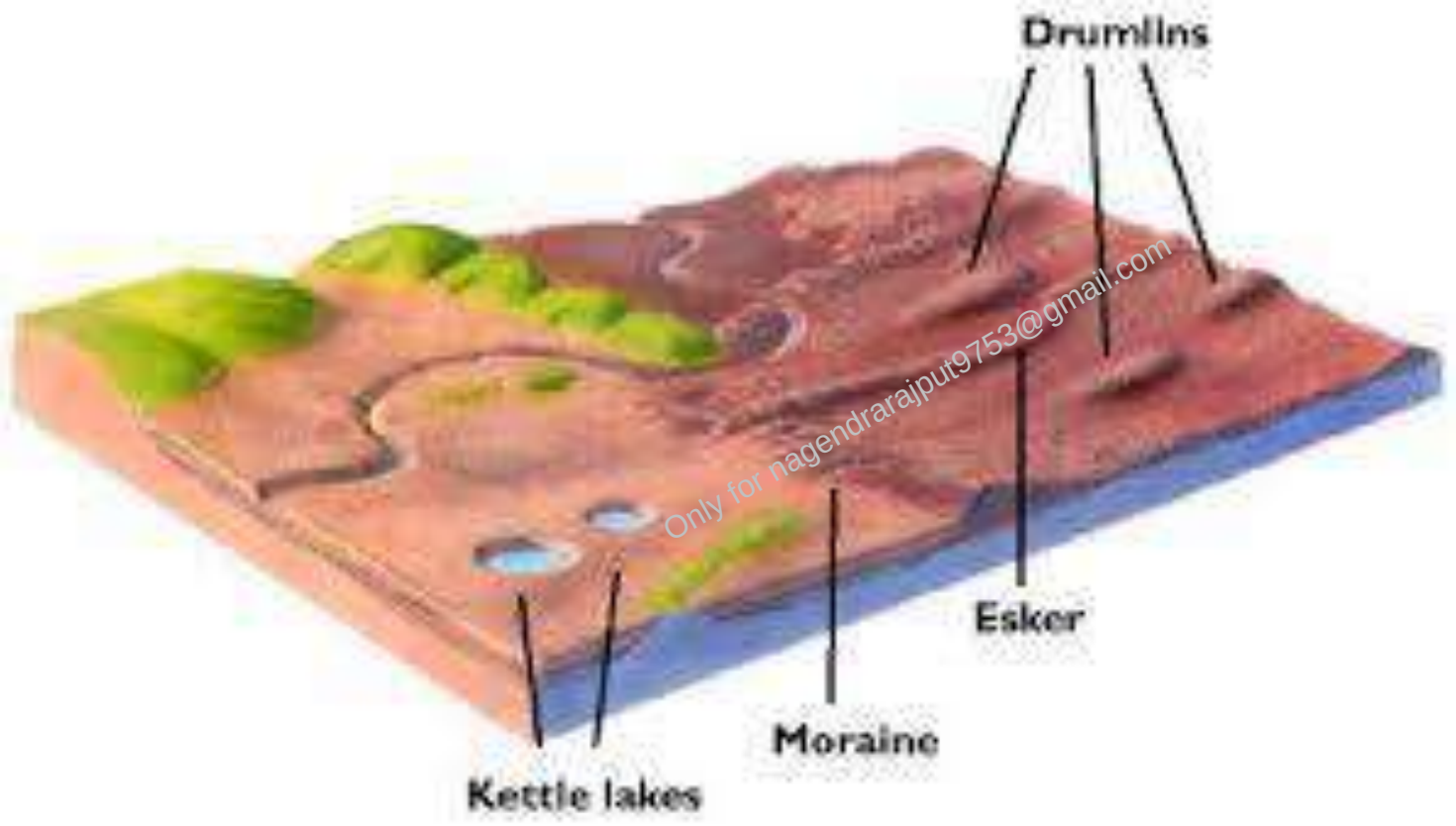

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