Class - 3rd Sem
Paper - CC7

Date - 19/09/2020
Unit-I-1 (Partial)

Indian Geo-2

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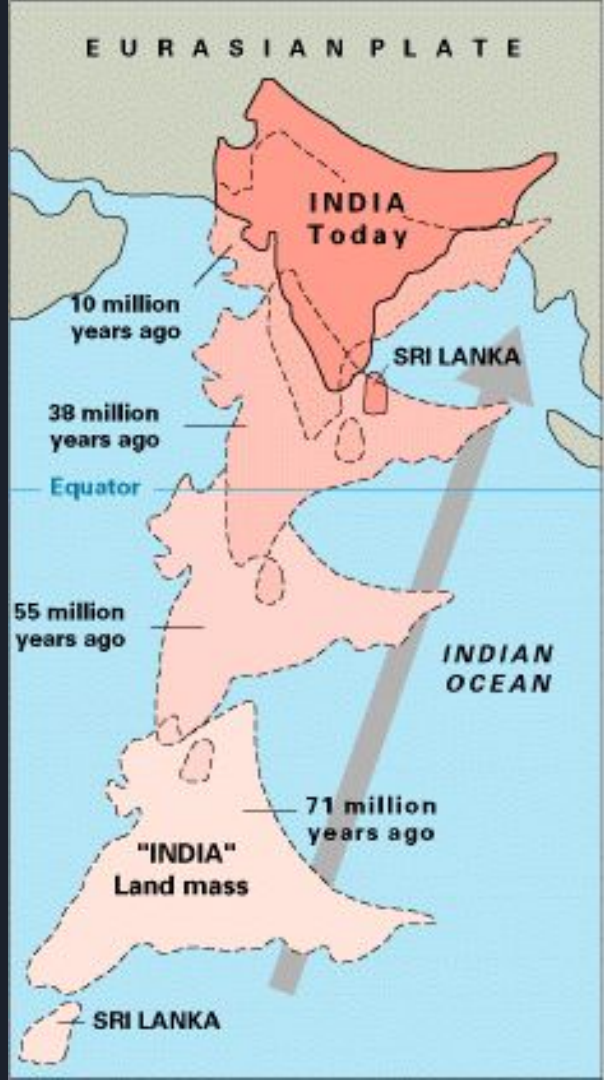
Topic Covered - Himalaya (Stratigraphic and Tectonic)

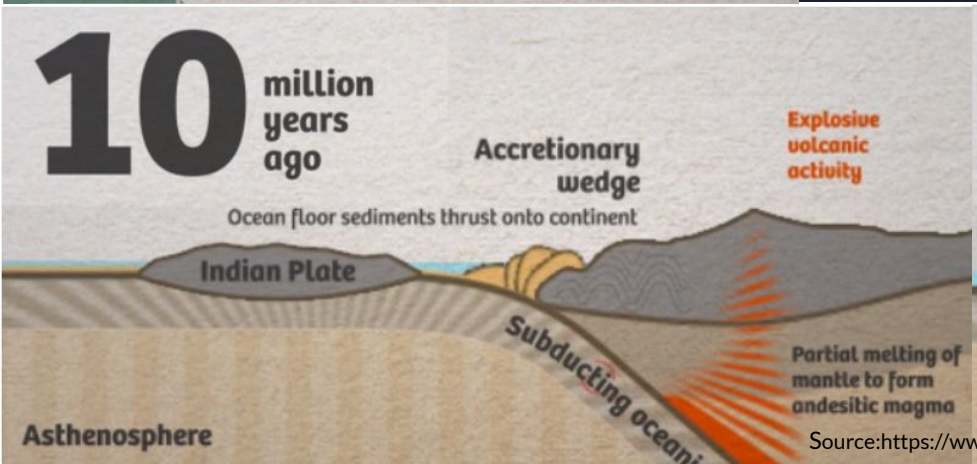
Himalaya: Origin

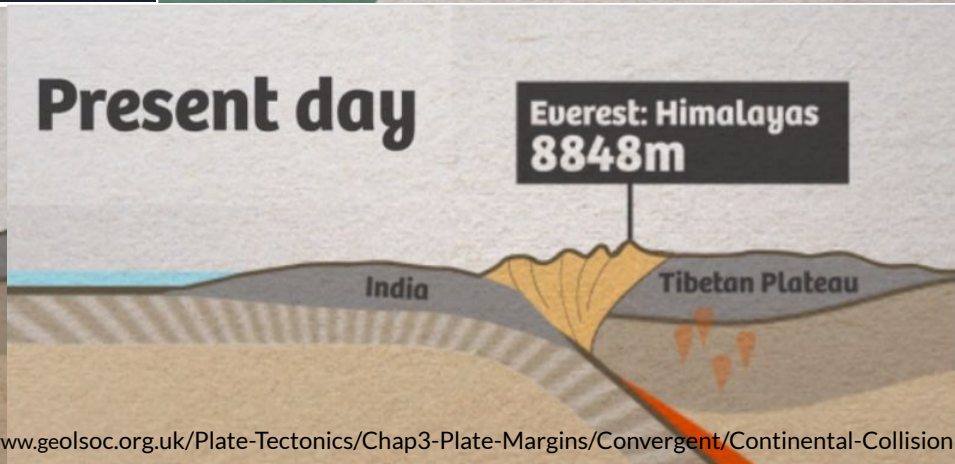
- Convergent Plate Boundary
- Eurasian Plate and Indian Plate
- From Nanga Parvat to Namcha Barwa
- Arakan Yoma Range and Andaman and Nicobar
- Island is also formed due to this collision



Source- https://www.geolsoc.org.uk/Plate-Tectonics/Chap3-Plate-Margins/Convergent/Continental-Collision

Himalaya: Formation





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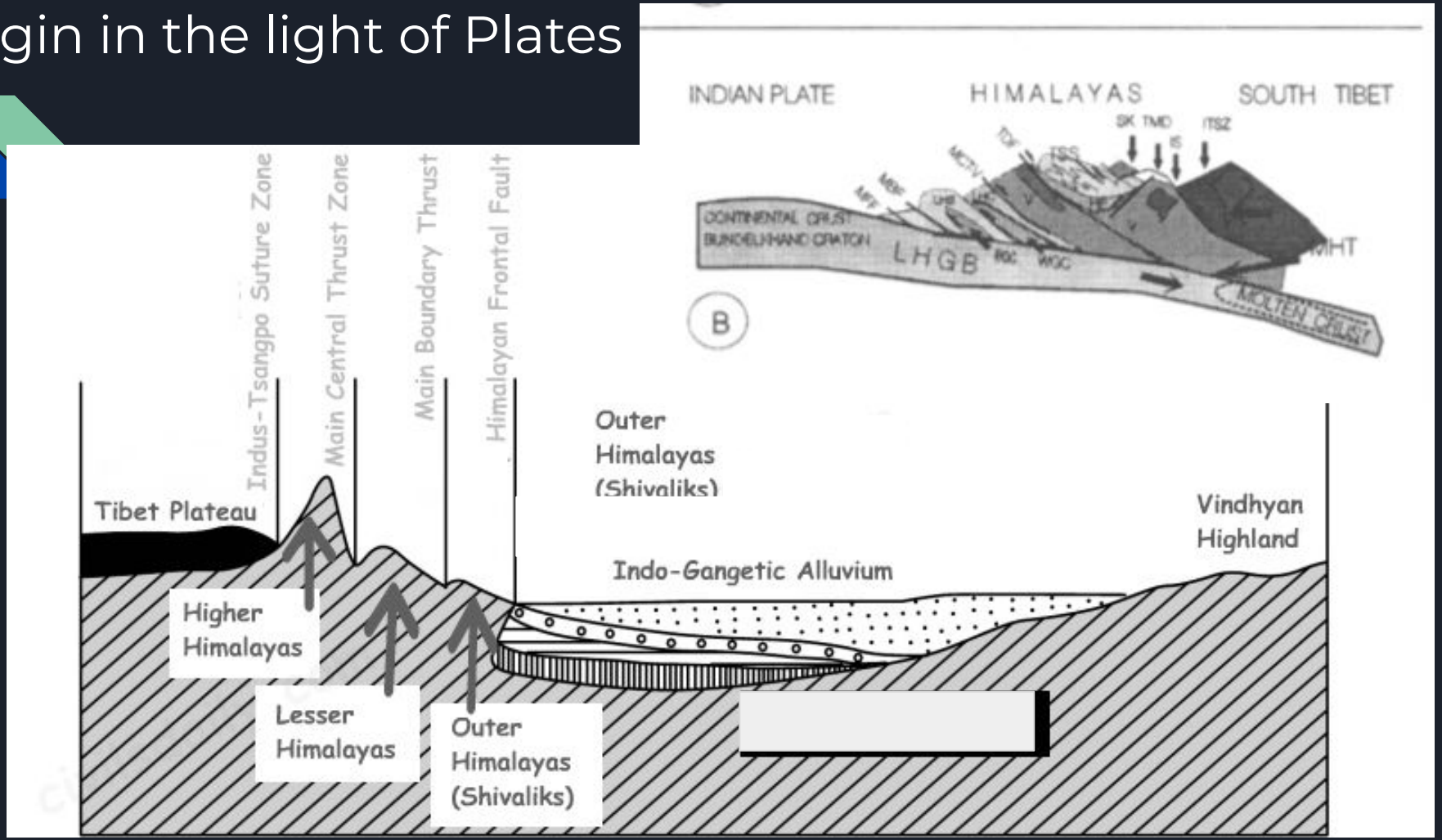
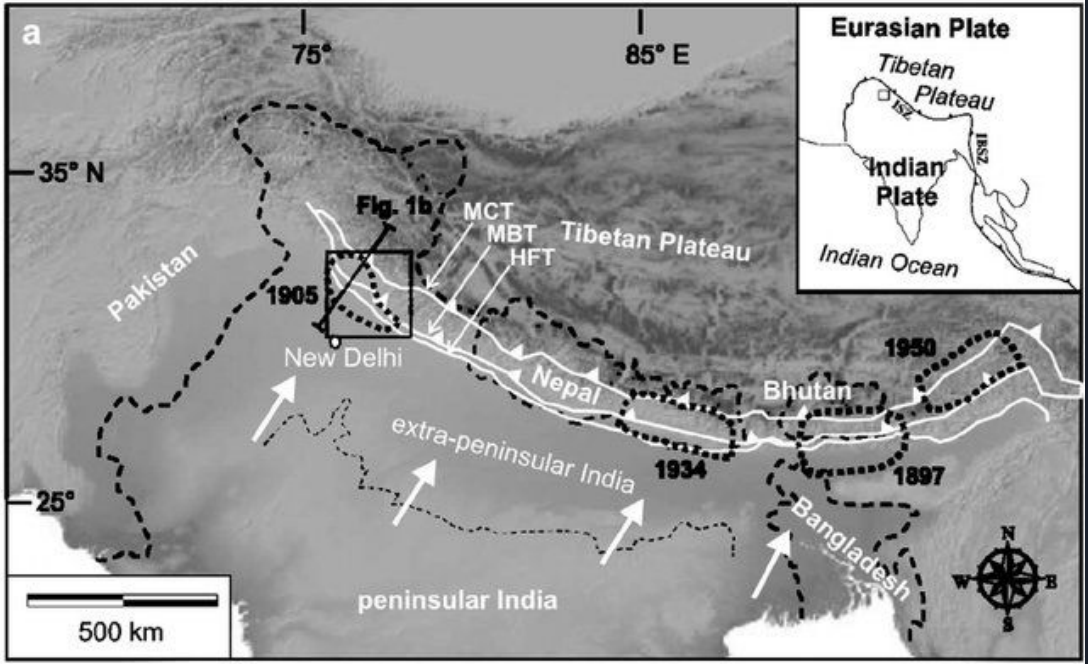
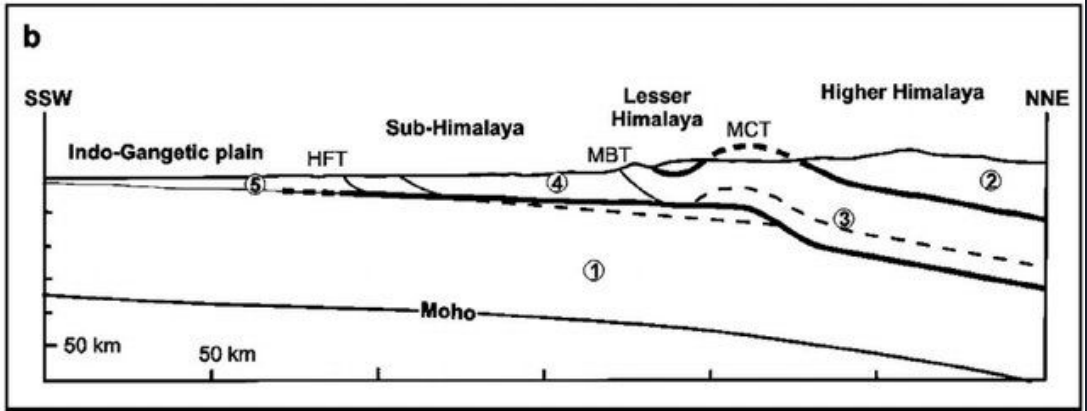
Origin in the light of Plates

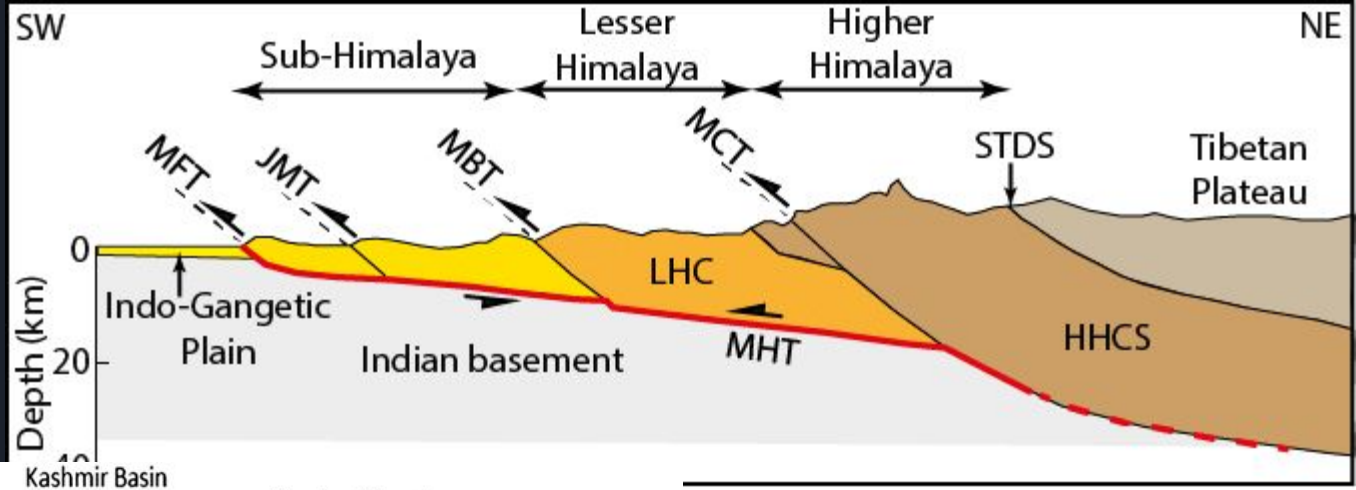


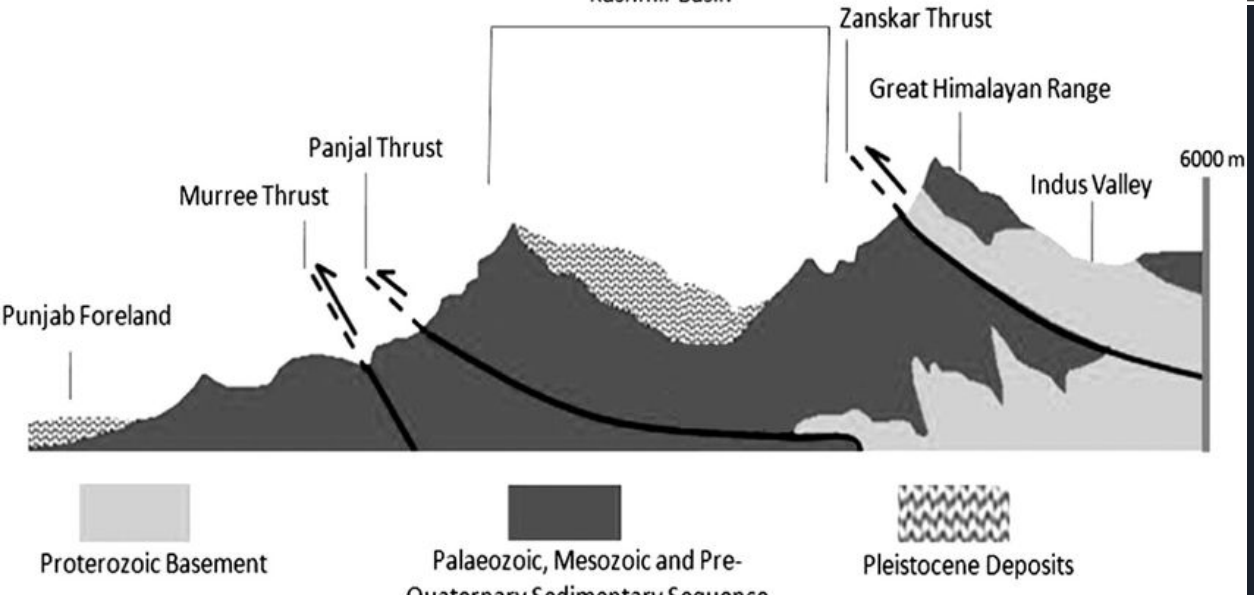
Himalayan Tectonics





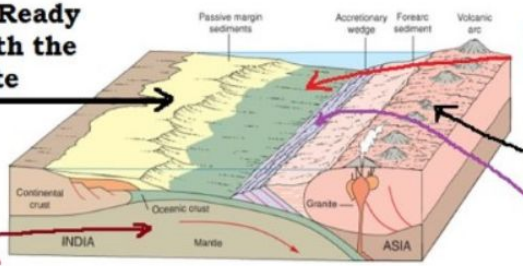
Himalaya


SW
NE
Sub-Himalaya
Lesser Himalaya
Higher Himalaya
MFT
JMT
MBT
MCT
STDS
Tibetan Plateau
0
Depth (km)
20
Indo-Gangetic Plain
LHC
Indian basement
MHT
HHCS
Kashmir Basin


Zanskar Thrust
Great Himalayan Range
Panjal Thrust
Murree Thrust
6000 m
Indus Valley
Punjab Foreland
Proterozoic Basement
Palaeozoic, Mesozoic and Pre-
Pleistocene Deposits

Indian Plate Ready to Collide with the Eurasian Plate

Oceanic Plate is subducting below the Eurasian Plate



Tethys Geosyncline with sediments

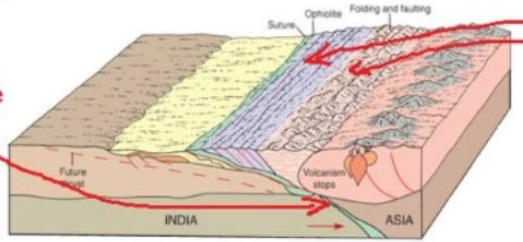
Continental Arc formed due to volcanism.

Sediments Accumulating to form Accretionary Wedge

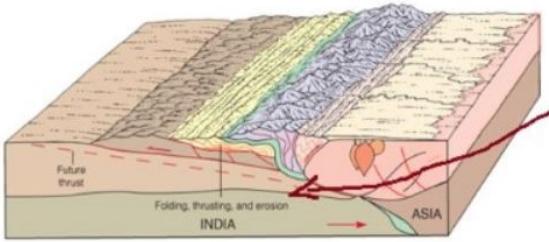
Folding of the existing landform

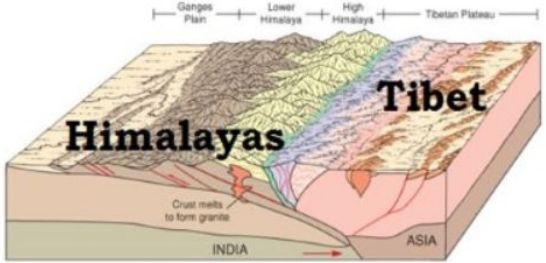
Oceanic Plate Disappers

Continent - Continent Colision

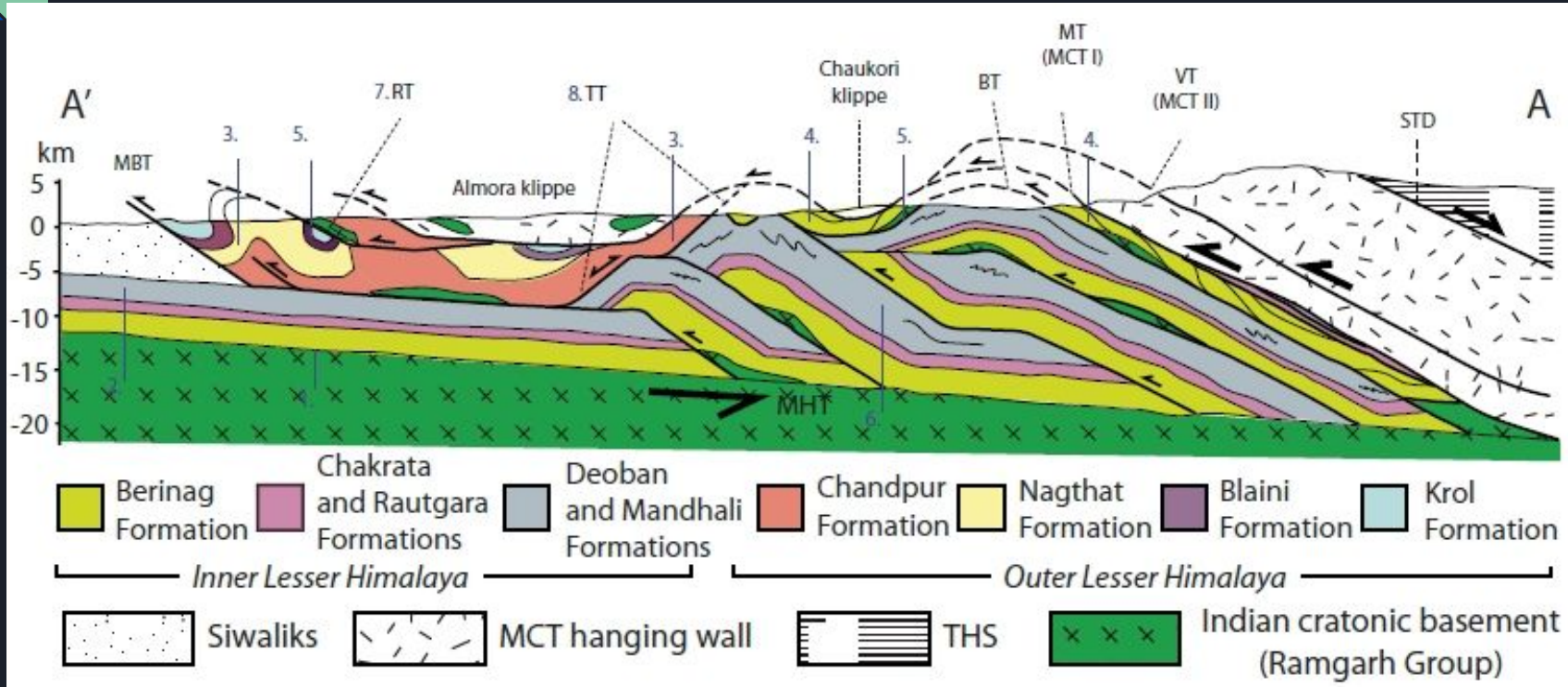


Continental Plate cannot subduct below 40 - 50 km





During high-grade metamorphism in the roots of the mountain range, the continental crust itself may partially melt to form granite with distinctive compositions; these are found in no other tectonic setting.



MBT—Main Boundary Thrust, RT—Ramgarh Thrust, TT—Tons Thrust, BT—Berinag Thrust, MCT—Main Central Thrust, MT—Munsiari Thrust, VT—Vaikrita Thrust, STD—South Tibetan Detachment, MHT—Main Himalayan Thrust, THS—Tethyan Himalayan Sequence.

The Greater Himalayan Range

Trans-Himalayan range (Tibetan Himalaya)

- These are the mountain ranges to the immediate north of the Himadri in Jammu and Kashmir.
- Main ranges: the Zaskar, the Ladakh, the Kailas and the Karakoram.
- The northernmost range: **Karakoram**. It is home of the greatest glaciers of world outside polar regions. It forms India's frontier with Afghanistan and China and acts as a watershed between India and Turkmenistan. It is also called the backbone of high Asia.
- Nanga Parbat is the culmination of the Zaskar range in the northwest.
- Average elevation: 3000m; about 40km wide

Great Himalayas (Himadri)

- The northern most and the highest range of the Himalayas
- The most continuous mountain range of the world.
- Terminates abruptly at the syntaxial bends: Nanga Parbat in northwest and Namcha Barwa in the northeast.
- The core of this part is composed of granite.
- Average height of peaks: 6,000 meters
- Average width: 25 km
- Because of the lofty heights, the peaks of this range are perennially covered with snow.
- All the prominent Himalayan peaks are in this range e.g. Mt. Everest (Nepal), Kanchenjunga, Nanga Parbat, Nacha Bharwa etc.
- Famous glaciers like the Yamunotri and the Gangotri lie here.

Main Central

Himalayas

The Lesser Himalayas (or Himachal; or the Middle Himalayas)

- This range lies between the Shiwaliks in the south and the Greater Himalayas in the north.
- Average height: 3,700 to 4,500 meter
- Average width: 60-80 km
- This range is highly dissected and uneven.
- It mainly consists of metamorphosed rocks.
- The gentle slopes of the eastern part of this range are covered with dense forests.
- The south facing slopes of other parts of this range are very steep and generally devoid of any vegetation. The north facing gentle slopes of this range are covered by dense vegetation.
- Local names: **Pir Panjal** in Jammu and Kashmir and **Dhauladhar** in Himachal Pradesh
- Most of the hill towns or resort towns are located in this Himachal range e.g. Shimla, Nainital, Mussouri, Darjeeling
- All great valleys like Kashmir Valley, Kangra Valley, Kullu Valley are present here.

The Shiwaliks (Outer Himalayas)

- The southernmost range of Himalayas; Located between the Great Plains and Lesser Himalayas
- Also known as Manak Parbat in ancient times.
- Altitude: 900 - 1100 metres.
- Width: Varies from 50 km in Himachal Pradesh to less than 15 km in Arunachal Pradesh.
- Composed of unconsolidated sediments brought down by rivers from the northern Himalayan ranges.
- They are almost unbroken chain of low hills except for a gap of 80-90 km which is occupied by the valley of the Tista River and Raidak River.
- As the Shivaliks were formed, they obstructed courses of rivers draining from the Himalayas and formed lakes. The debris brought by these rivers were deposited in these lakes. After the rivers had cut their courses through the Shivalik range, the lakes were drained away leaving behind plains called **Duns** in the west and **Duars** in the East. These are shallow synclinal valleys in the northern end of the Shivalik hills. These are confined to small sections of the Strike Valleys e.g. Dehradun, Udhampur.
- **Chhos**: The Eastern part of Shivalik range upto Nepal is covered with thick forests but the forest cover becomes thin in the West. The southern slopes of this range are almost devoid of forest cover in Punjab and Himachal Pradesh and are highly dissected by seasonal streams. Such areas are locally referred to as Chhos, typical manifestation seen in Hoshiarpur district of Punjab.

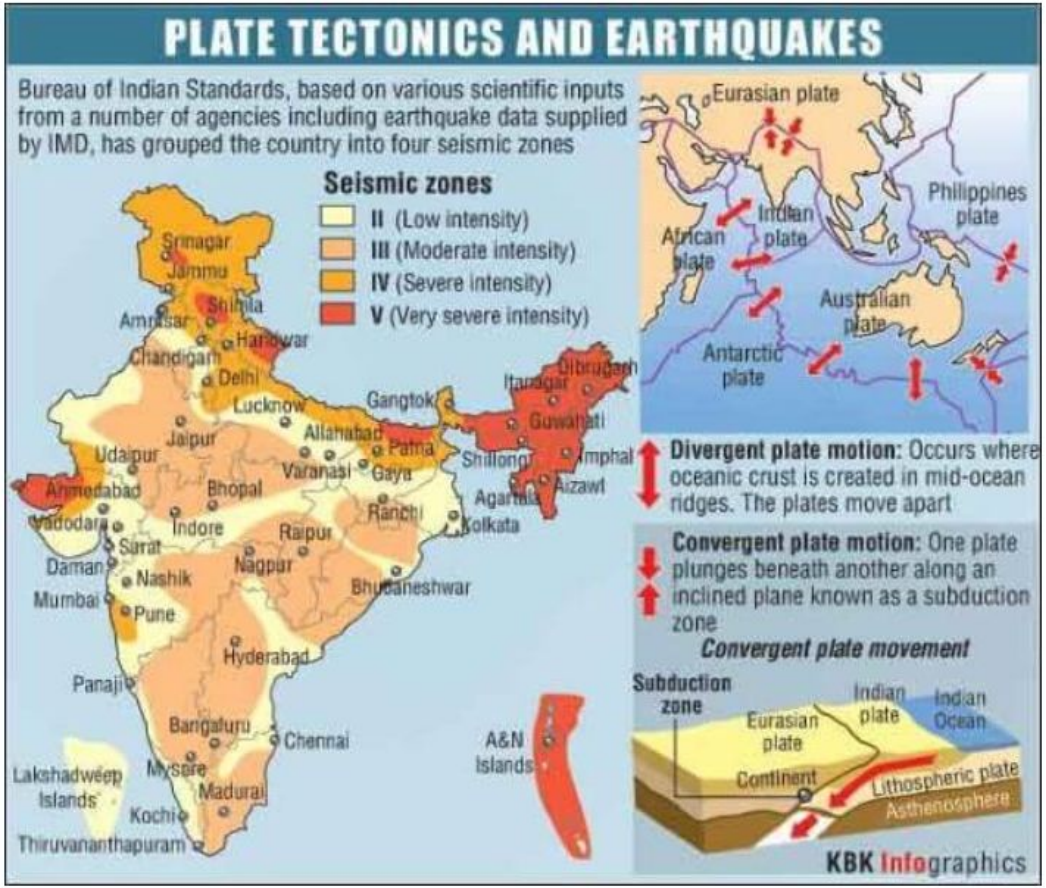
Thrust Zone

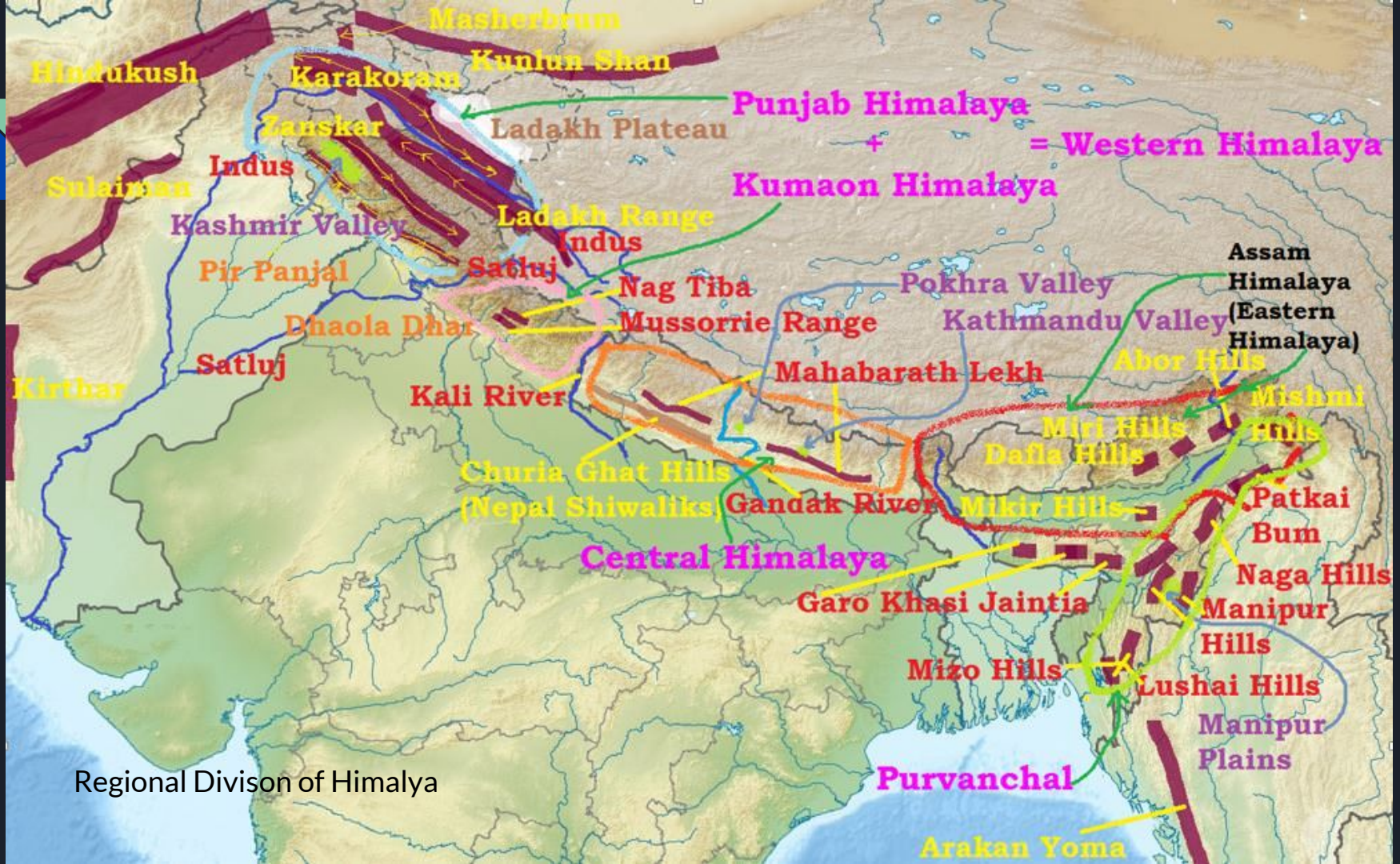
Main Boundary

Thrust

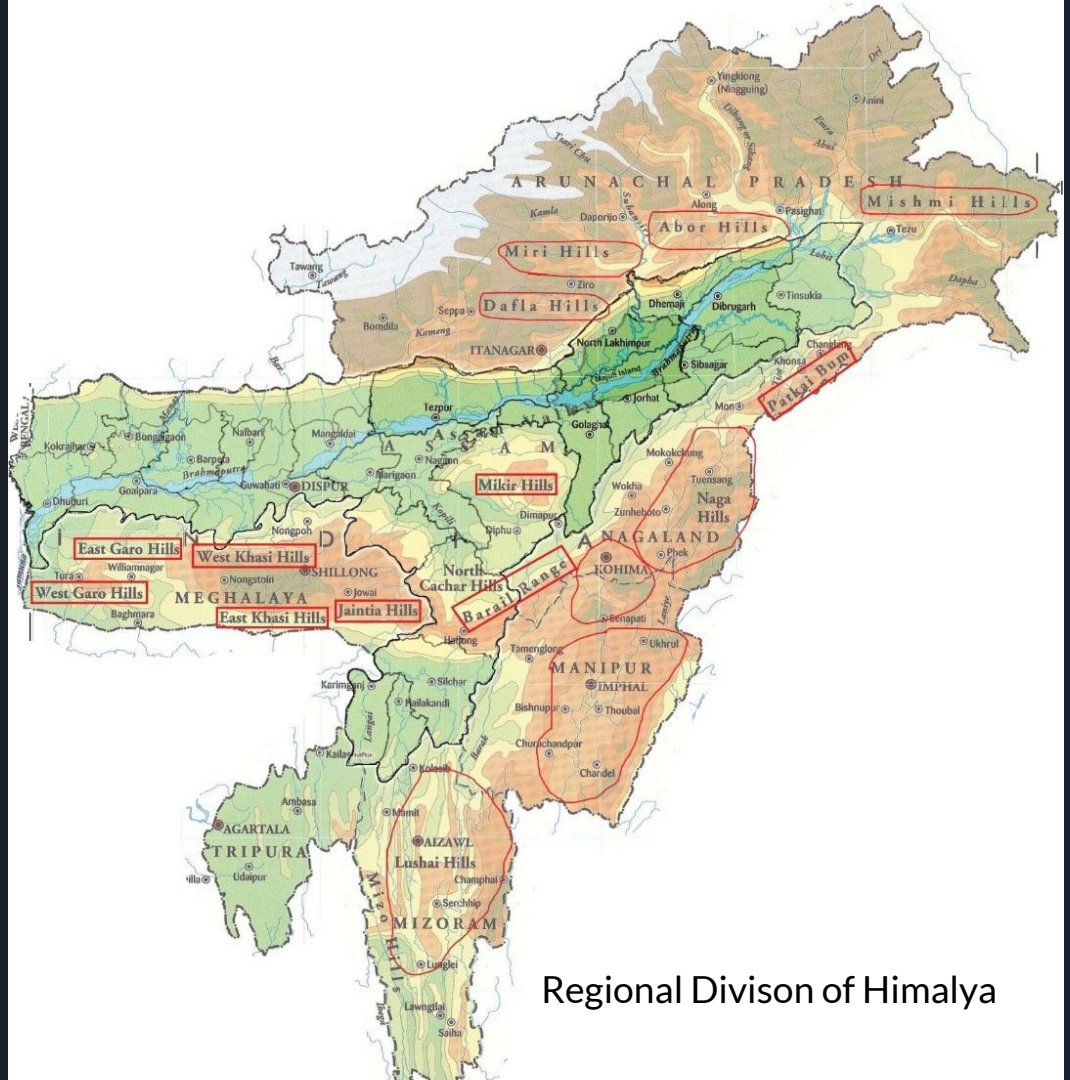
Himalayan Frontal

Earthquake And Himalaya



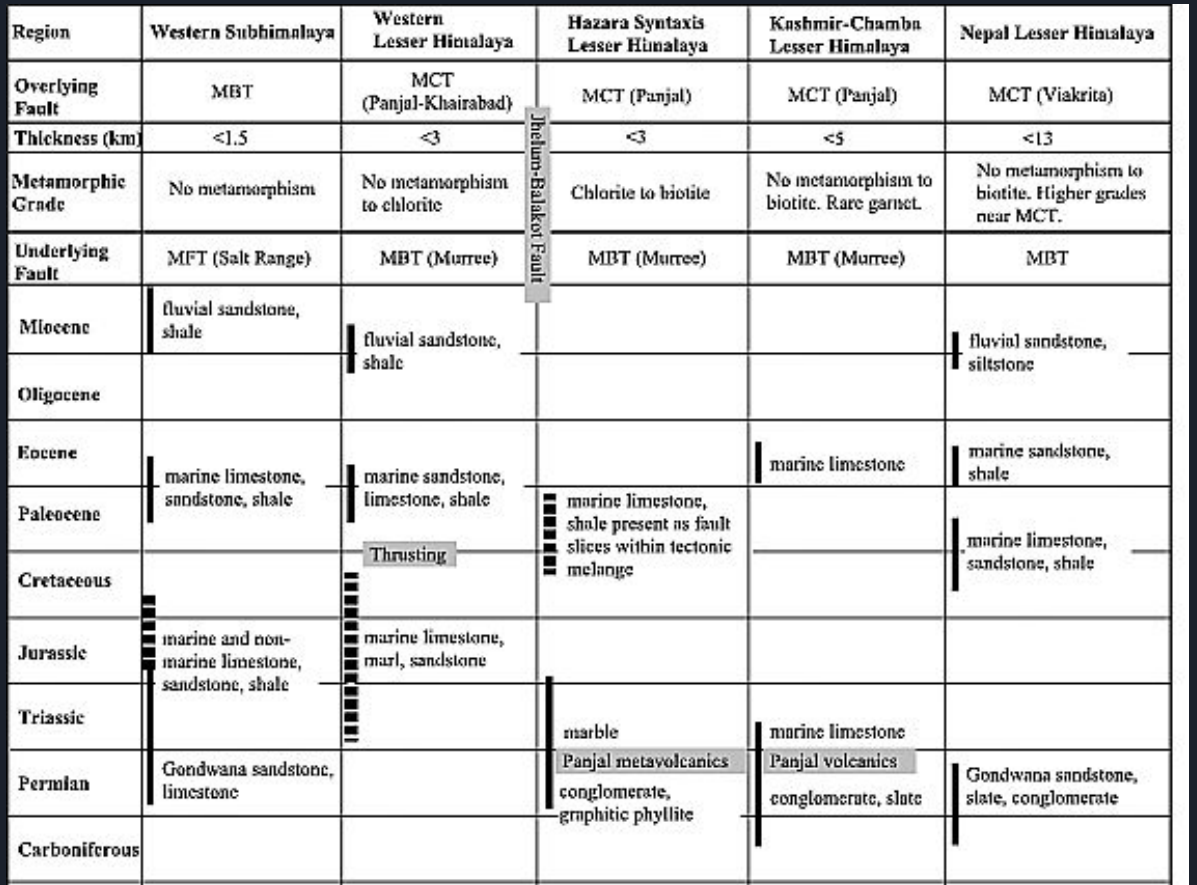


Regional Divison of Himalya



Regional Divison of Himalya

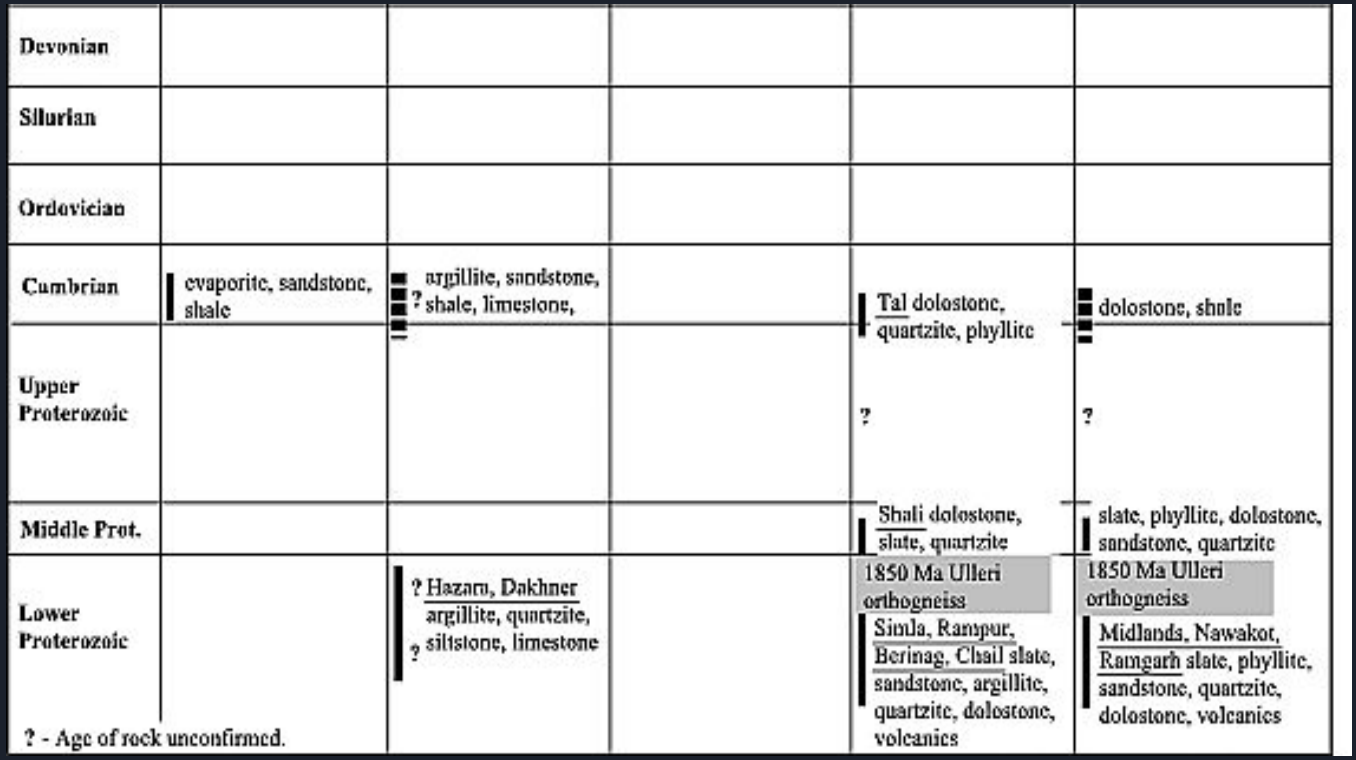
Stratigraphy



Region	Western Subhimalaya	Western Lesser Himalaya	Hazara Syntaxis Lesser Himalaya	Kashmir-Chamba Lesser Himalaya	Nepal Lesser Himalaya
Overlying Fault	MBT	MCT (Panjal-Khairabad)	MCT (Panjal)	MCT (Panjal)	MCT (Viakrita)
Thickness (km)	<1.5	<3	<3	<5	<13
Metamorphic Grade	No metamorphism	No metamorphism to chlorite	Chlorite to biotite	No metamorphism to biotite. Rare garnet.	No metamorphism to biotite. Higher grades near MCT.
Underlying Fault	MFT (Salt Range)	MBT (Murree)	MBT (Murree)	MBT (Murree)	MBT
Miocene	fluvial sandstone, shale	fluvial sandstone, shale			fluvial sandstone, siltstone
Oligocene					
Eocene	marine limestone, sandstone, shale	marine sandstone, limestone, shale		marine limestone	marine sandstone, shale
Paleocene			marine limestone, shale present as fault slices within tectonic melange		marine limestone, sandstone, shale
Cretaceous		Thrusting			
Jurassic	marine and non-marine limestone, sandstone, shale	marine limestone, marl, sandstone			
Triassic			marble	marine limestone	
Permian	Gondwana sandstone, limestone		Panjal metavolcanics conglomerate, graphitic phyllite	Panjal volcanics conglomerate, slate	Gondwana sandstone, slate, conglomerate
Carboniferous					

Jhelum-Balakot Fault

Stratigraphy



Thank you
Have questions? Ask Here

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