GEOLOGY

Notes by-

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INDIAN GEOLOGY

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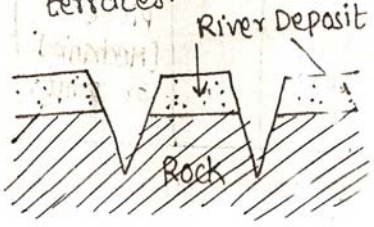
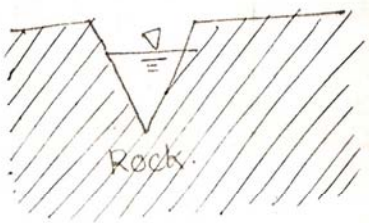
Indian regions are divided in to -

1] Triangular portion to the south ⇒ Peninsula
2] Montainous region bordering India on north west, north & NE ⇒ Extra peninsula
3] Indo-Gangetic plain - seperating above two.

Point	Peninsula	Extra-Peninsula
① Geological History	* This has never been under submergence since Cambrian times. * Hence post Cambrian marine deposits are not found.	* This was under submergence for longer period from Cambrian onwards. * Built up of marine deposit.
② Geological structure.	* Beds are horizontal or gently dipping (except oldest rock) * Do not show folding, overthrust etc.	* It is weak portion of earth crust. * Dip of bedding plane is high. * folding, faults, overthrust occurs.
③ physiography.	* Mountains are of circum denudation or of relict type. eg: Sahyadri, Vindhya, Satpuras etc. * Rivers are in old stage. or rejuvenated river. Indication of incised meanders, gorges river terraces. 	* Mountains originates due to orogenic earth movement. * Rivers are in Youth stage * steep gradients * Downward cutting * Narrow river. 

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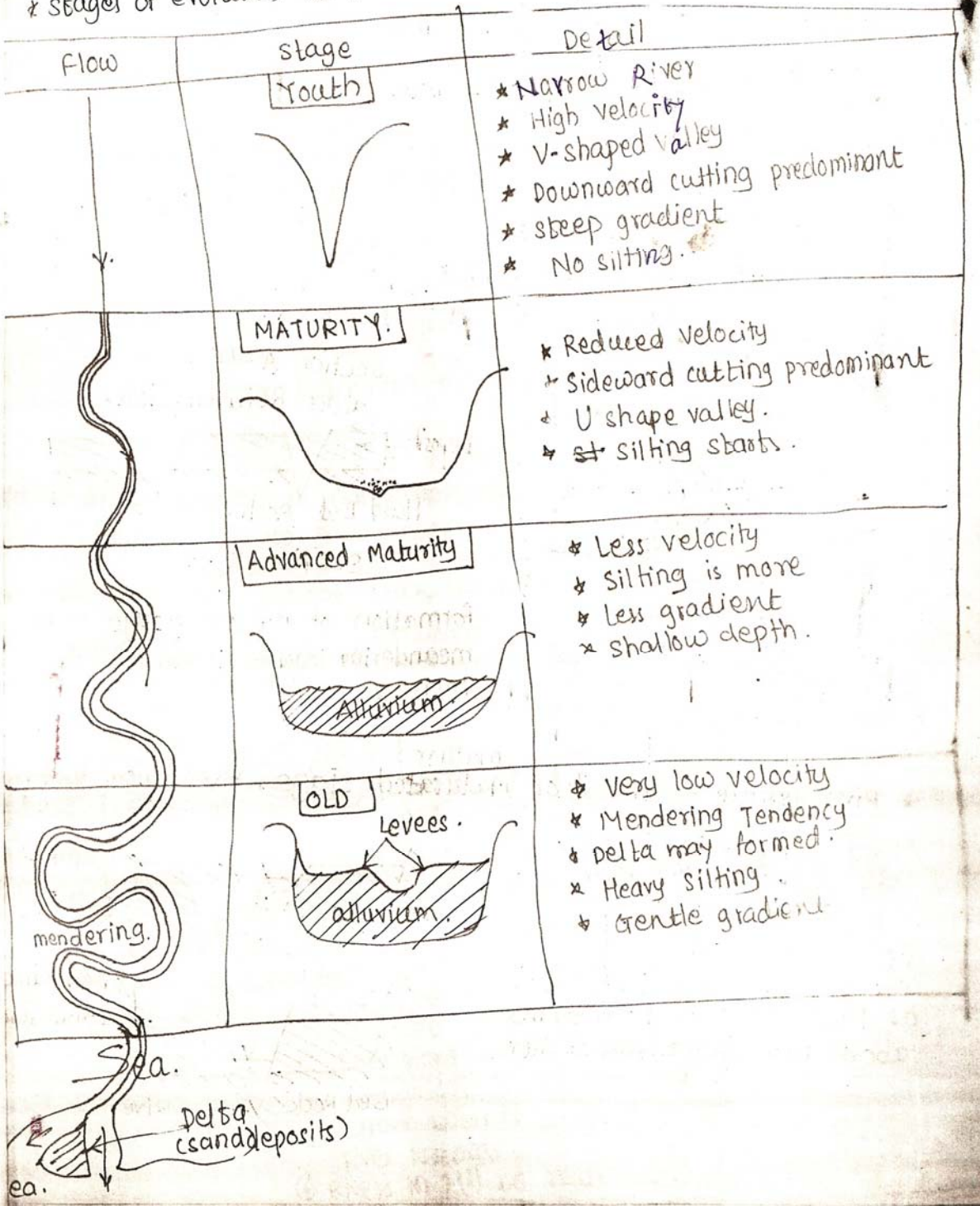
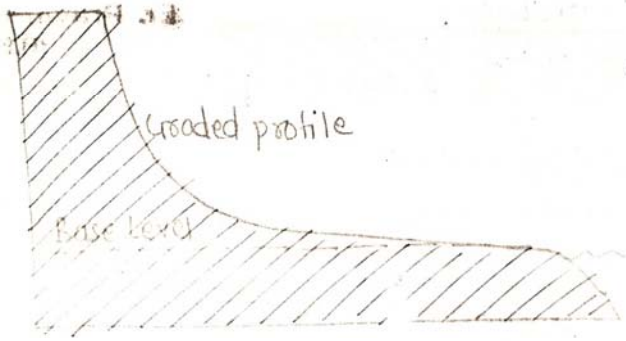
* Weathering agents: a] External :- ① Water - River.
② Glaciers
③ Wind
④ Sea.

b] Internal - ① Earth movement
② Vocalism.
③ Earth Quake.

* stages of evolution of River valley :-

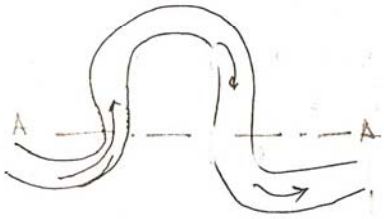
Flow	stage	Detail
	Youth	* Narrow River * High velocity * V-shaped valley * Downward cutting predominant * steep gradient * No silting.
	MATURITY.	* Reduced velocity * Sideward cutting predominant * U shape valley. * Silting starts.
	Advanced Maturity	* Less velocity * Silting is more * Less gradient * Shallow depth.
	OLD	* Very low velocity * Mendering Tendency * Delta may formed. * Heavy Silting. * Gentle gradient

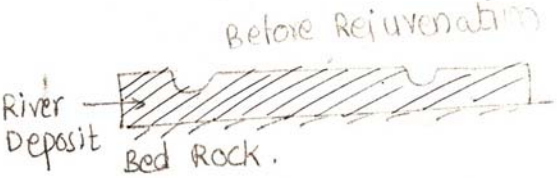


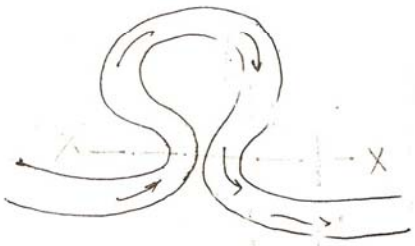


Graded profile of a mature River.

* Incised Meander / Meandering of River / Oxbow lakes (see 'IE' Not



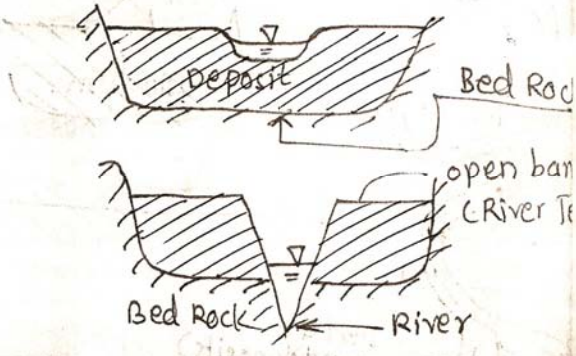




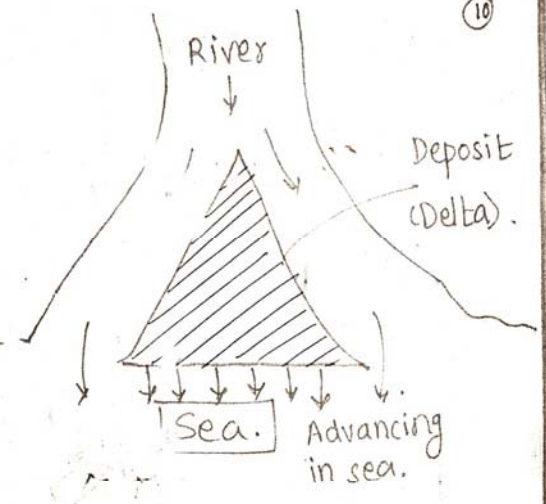
Section X-X

formation of narrow gorge with meandering course is called incised meander.

* River Terrace:- In old or matured stage, river shows heavy deposits of alluvium. After rejuvenation, river cut its own deposit & flow through bedrock. Old alluvium deposits left as flat terraces on both banks above new water level of river



Delta:- When river enters the sea, its velocity is decreases & deposit gets silted in the basin. If there is no strong current or waves or tides to sweep away the matl., it accumulate at the mouth of river. In course of time a "Delta" is formed which grows into the sea as a fanlike deposit having the form of a rough triangle resembling the greek letter Delta. (Δ).



Many large rives such as Nile, Ganga, Mississippi etc have such deltas advancing in to the sea at varying rate.

* **Rejuvenation:-** (कायाकल्प) Dischionary meaning: "To become Young again"

A normal cycle of river erosion may be interupted by movement of earth. The area may be uplifted or depressed it. If it is depressed its surface is brought nearer to the base level the work to be done by erosion is reduced, & the remaining stages of the cycle then in progress are passed through more quickly.

If on the other hand, the area is uplifted, the rivers are further raised above base level, the work to be done by erosion is increased & rivers are obliged to begin afresh the task of grading their courses. If rivers are in old stage their vel. is very less, hence no power to cut the basin. But as the surface is raised, water head is increased & they have power of downcutting, which is characteristic of youth & therefore said to be rejuvenated.

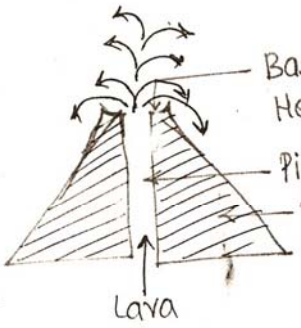
∴ Rejuvenation:- Change from old stage to youth stage dure to raising of basin due to earth movement.

* Characteristics:-
① Narrow River
② V shape
③ Downward cutting & deeping of bed predominant
④ Behaviour is like youth stage.
⑤ Indication of Incised meanders, gorges, river terraces.
⑥ Rivers in MH are rejuvenated rivers.

MH = महाराष्ट्र

Volcanism/Volcanicity:-

When magma formed at depth finds a through passage to the surface of earth through cracks & fissures in crustal rocks it is outpoured on the surface through volcanoes as lava. This extrusion of lava is one of the phases of igneous activity is known as Volcanism or volcanicity.



Products of volcanicity:-

① Gases:- steam, CO_2, NO_2, SO_2
② Solid Product:- ash cinders, lapili, bombs or scoria.- pyroclastic matls.
③ Magma:- Molten rock.

Types of mountains:-

1] Mountains due to earth movements or tectonic mountains:
   a] Due to Folding: Orogenic
   b] Due to Faulting: Epeirogenic
2] Mountains of circumdenudation or Relict type:-
3] Mountains of Accumulation:-
   a] Volcanic Accumulation
   b] Igneous Accumulation.

① Organic or fold mountains:-
Format^n:- ① Actual uplift
② Great heights
③ Rocks formerly occurring at low levels.
④ mountains eg Himalayas, Alps, Rockies etc. are this type.

② Epeirogenic or Fault or block mountain:-
Format^n:- when two ~~or~~ faults running roughly parallel to each other, the middle block called as "Horst" stands out

as a block mountain either due to its actual upward movement or subsidence of side blocks.

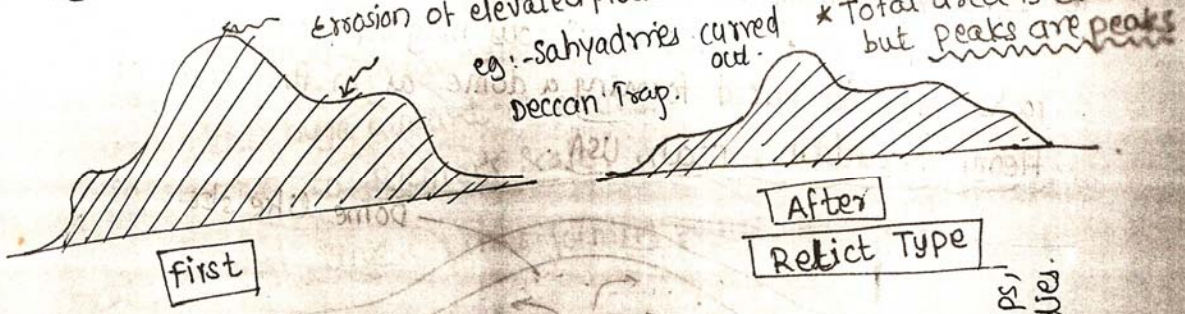
"Kharas Mountain" of SW Africa are an eg.

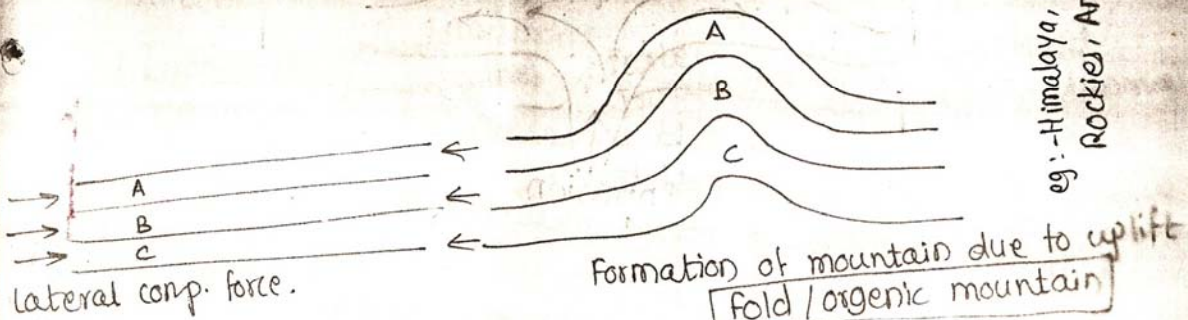
③ Mountains of circumdenudation or Relict Type:- → Deeply cut in narrow segment

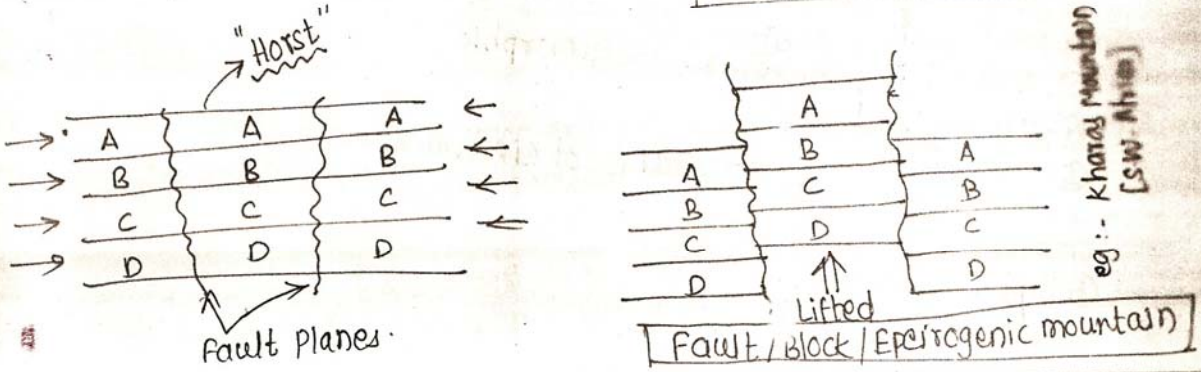
When an elevated plateau is dissected by long continued erosion some blocks stands out as peaks above the surrounding areas which have been reduced to low level by erosion. Such remnants of high plateaus which are at a higher level than the surrounding because the area around them has been eroded to a lower level called relict mountains.

The Sahyadris carved out of the volcanic plateau built up of Deccan Trap lavas are a good eg.

Dictionary meaning:
Plateau:- An extensive area of relatively flat high land, usually bounded by steep sides.
Remnants:- Small qty. of things left from a larger quantity



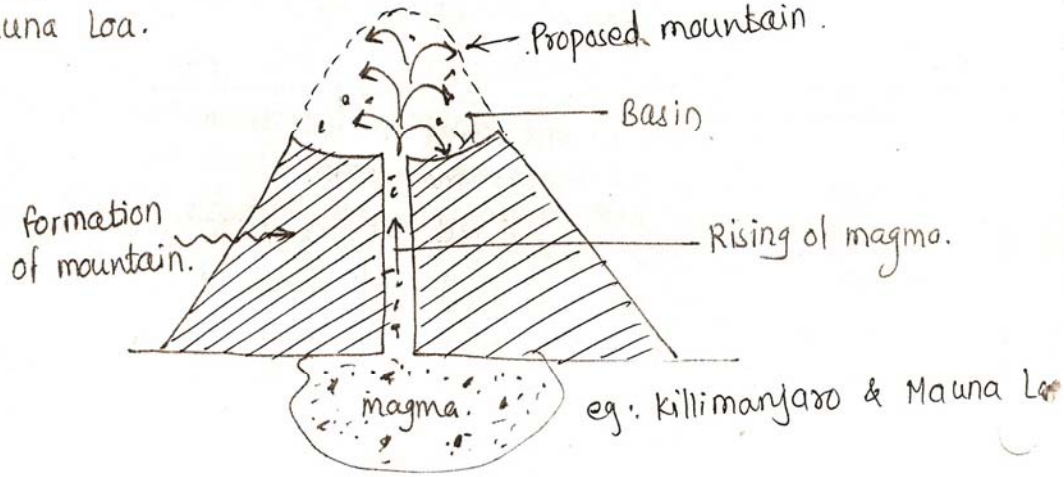




④ Volcanic accumulation :-

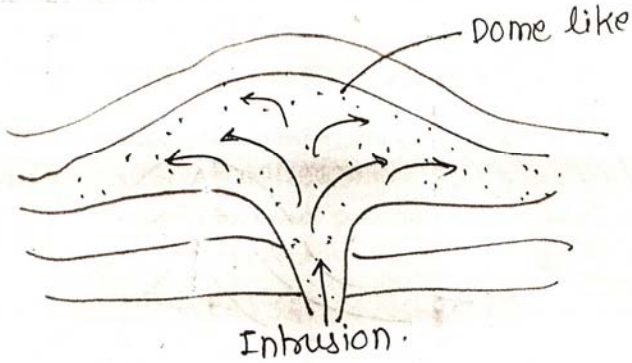
Pyroclastic matl. & lava coming out of the central vent of a volcano accumulate around the vent & build a cone. Such accumulations may grow to considerable heights giving rise to volcanic mountains such as Killimanjaro & Mauna Loa.

[all combinat° of magma – from dust to big size boulders.]



⑤ Igneous Intrusion :-

Due to intrusion of viscous magma from below ~~bulged~~ stratified rocks may be raised forming a dome as in the case of Henry Mountain, Utah, USA.



* Indian mountain :-

① Himalaya ⇒ Fold mountain
② Peninsular ⇒ Relicts
③ Aravallis ⇒ Folded metamorphic
④ Vindhyas
⑤ satpuras
⑥ Eastern Ghats
⑦ Western Ghat
⑧ Rajmahal Hills

} Mountains of circumdenudation.