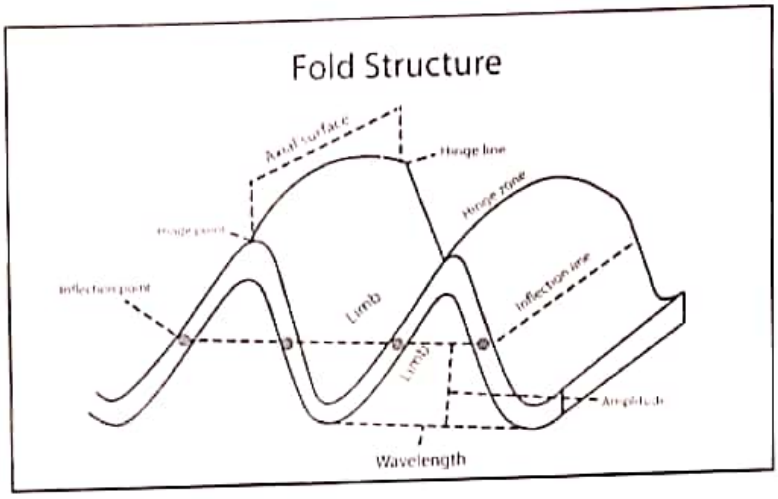
1st Sem.

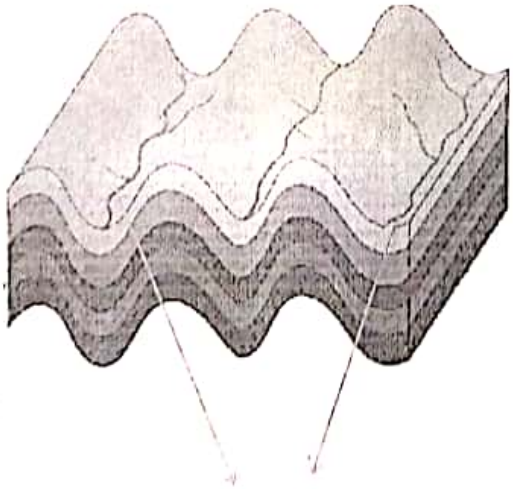
Development of river network and landforms on folded structure.

A fold is a stack of originally planar surfaces, such as sedimentary strata, that are bent or curved during permanent deformation.Sedimentary rock beds are squeezed and buckled and folded into anticlines and synclines due to lateral compressive forces.



Step– 1:

This stage in the formation of inverted topography is shown here. The anticlinal folds form ridges and the streams flow down the synclinal valleys.



consequent streams (Strike streams)

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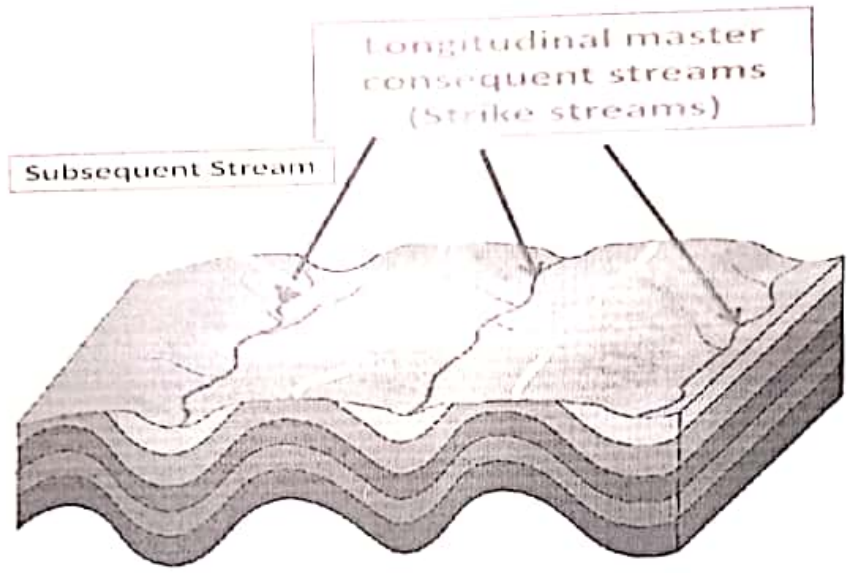
Step – 2:

This stage in the formation of inverted topography is shown here. In this stage, erosion has cut through the more resistant layer (lightest brown), removed the top of the anticlines, and reached the softer layers below.



Step – 3: Inversion of relief

- Inversion of relief occurs in the folded structure having symmetrical folds having alternate sequence of anticlines and synclines and simple formation.
- In this stage down cutting erosion of the anticlines has formed valleys which the streams now occupy. The remainder of the harder layer is preserved in the synclinal ridges.
    - As anticline turn into syncline, syncline turn into anticline.
    - Stratigraphically the younger bed is found in lower portion and the older one is in upper portion.
    - Structurally, valley geology is found at the base of anticline and anticline based structure is found at the root of syncline.

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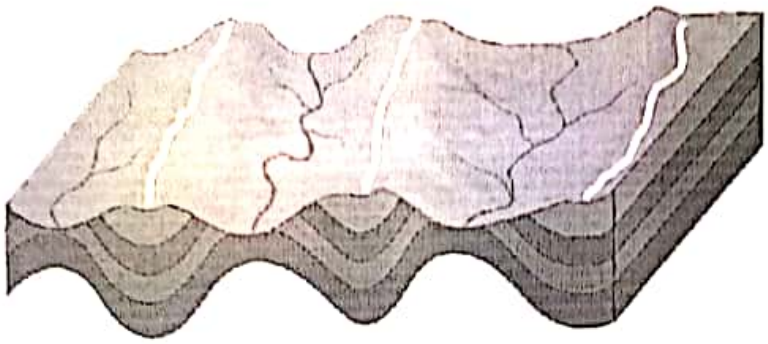

Inversion of relief

Another feature of the Valley and Ridge is the presence in some areas of inverted topography. Inverted topography occurs when a topographically low area forms on a geological feature that is structurally high (a topographic valley on a structural anticline) or vice versa (a topographic ridge on a structural syncline).

Causes of Inversion of Relief

- Development of transvers Consequent River alongside anticlinal ridge or horst as well as formation of some sub-consequent rivers and strong head ward erosion mainly responsible for valley bed deposition.

- The mountain top, particularly in folded zone, is more erosive because the upward bent is severely tensile. So, large number of micro cracks alongside fold axis are present. That is why it is more fragile. On the other hand due to compressional force the lower bent become very much crystallize and resist erosion.

- The factor of safety is very less at the mountain top whereas it is very high at the valley bottommost. At the valley top tangential force of gravity (gt) is more active than actual perpendicular gravity (gp) or basal gravity. At the valley gp less than or equal to g means less erosion. At the mountain gt > gp or g = more erosion.

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Landforms

- Anticlinal Ridges: Structures in character and represent unfolded rock beds.
- Synclinal Ridges: It is a erosional origin and ar4e formed due to more erosion of anticlinal ridges.
- Homoclinal ridges: It is formed on the anticlinal beds e.g. uniformally inclined of resistant rocks having uniform slopes on both sides.
- Synclinal valleys: It is a structural origin and represent structural valleys formed due to down folding of rock beds. The erosional synclinal valleys also called as sequent valleys are formed due to erosion of synclinal ridges at the end of cycle of erosion or during late mature stage.
- Anticlinal valleys: It is a erosional origin and develop between homoclinal ridges and resistant beds of anticlines.

22.9.22.

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