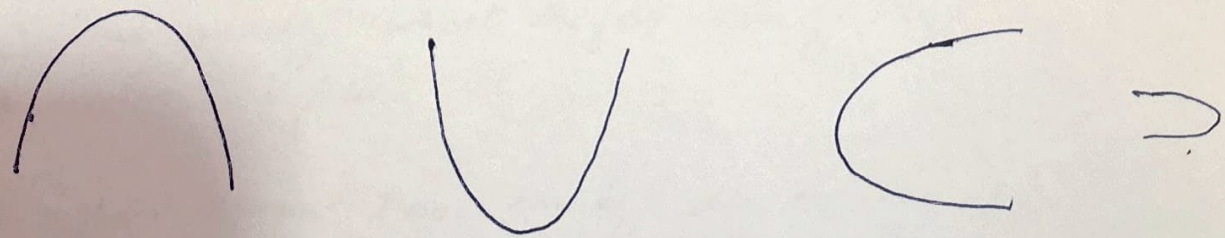
Classification of folds

Folds are classified based on following :-

→ Sense of curvature
→ Stratigraphic direction
→ Symmetry
→ orientation of Axial plane
→ plunge of Fold Axis.
→ curvature of Hinge-line / Fold Axis.
→ curvature of Axial planes
→ Interlimb angle
→ Shape of the Fold Hinge
→ Geometric relation with neighbouring structures.

→ Sense of curvature

* Antiform – A fold that closes upward
* Synform – A fold that closes downward
* Neutral – A fold that closes sideways.

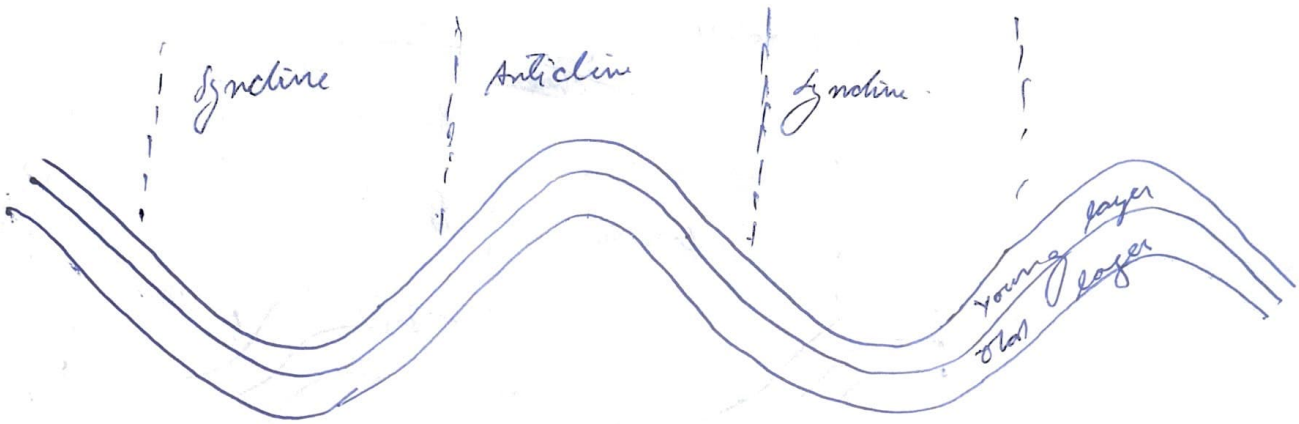


Antiform Synform Neutral

→ Stratigraphic younging direction to fold closure - I.

* Anticline ÷ A fold in which the direction of younging is away from the fold core (intrados)

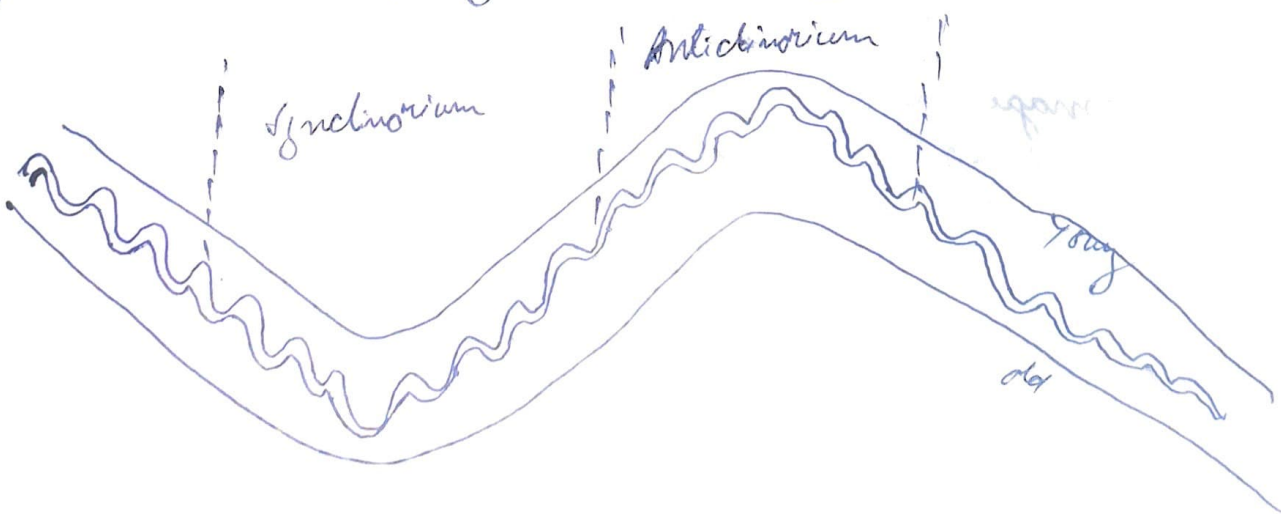
* Syncline ÷ A fold in which the direction of younging is towards the fold core (intrados)



→ Stratigraphic younging Direction to fold closure - II.

* Anticlinorium ÷ A large anticline with many smaller folds.

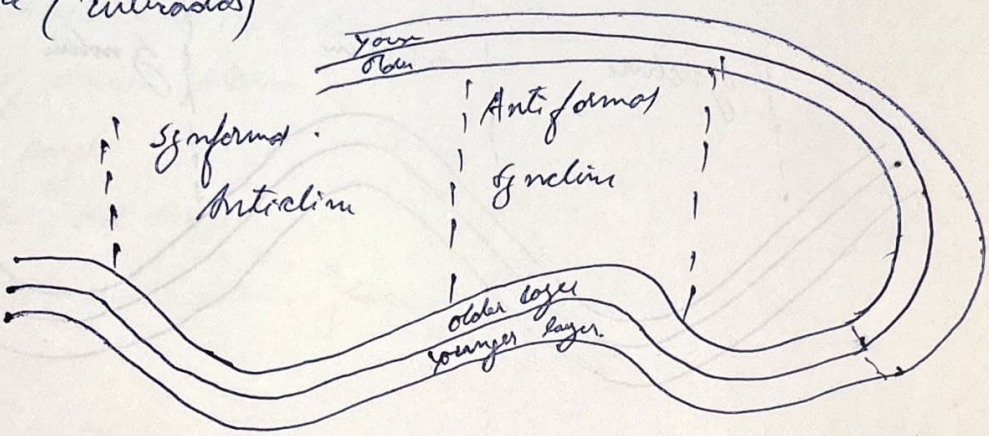
* Synclinorium ÷ A large syncline with many smaller folds.



→ Stratigraphic youngging Direction to fold closure - (11)

✲ Synformal Anticline - A fold that closes downward but with direction of youngging away from the fold core (intrados)

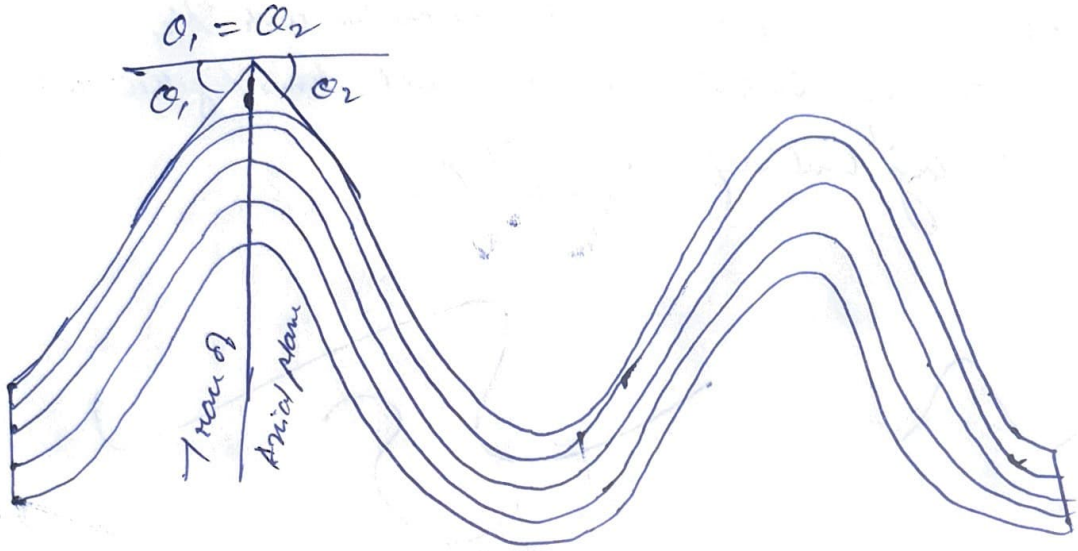
✲ Antiformal Synclime ÷ A fold that closes upward but in which the youngging is towards the fold core (extrados)

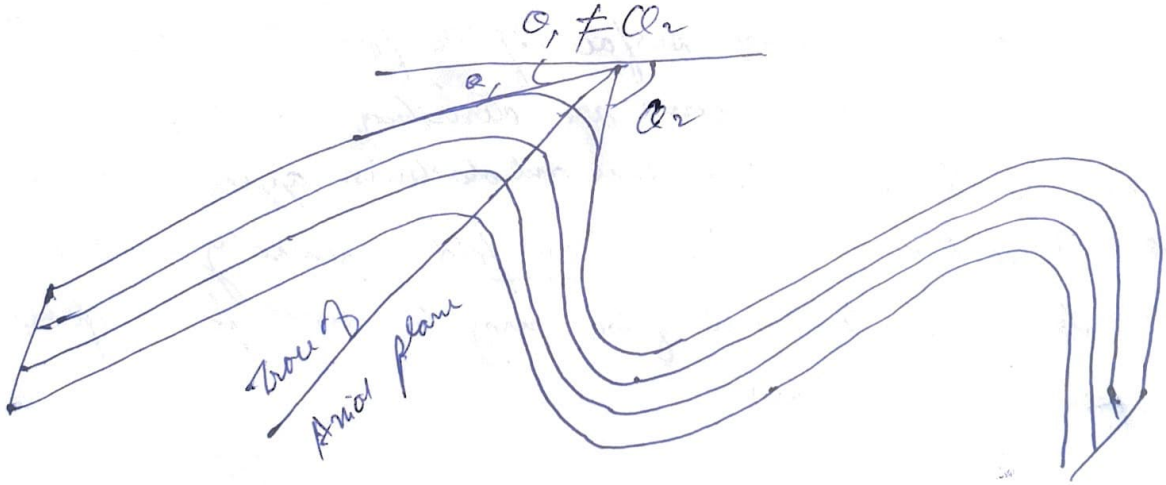


→ Symmetry of Fold ÷

✲ Symmetric Fold ÷ A fold is symmetric, if in profile the shape of one side of the hinge is a mirror image on other side and the ~~other~~ limbs are identical in length. The plane of symmetry is the axial plane and also the bisector of the median surface.

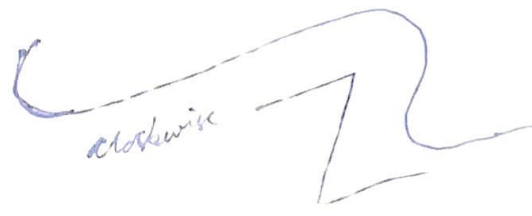
✲ Asymmetric Fold ÷ A Fold that does not have any mirror plane of symmetry and the limbs are of unequal lngth.



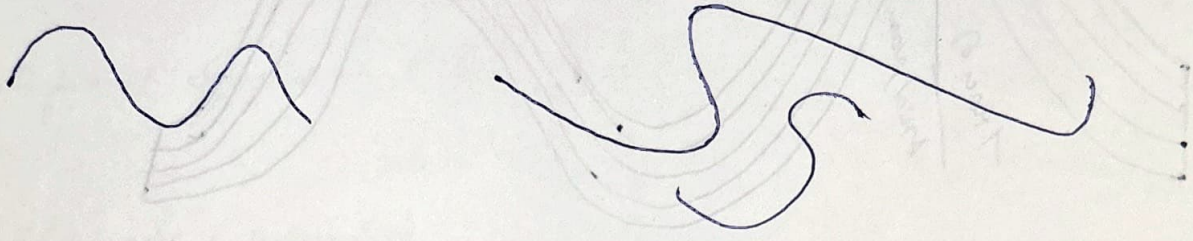


~~*~~ More of ~~Sys.~~ Asymmetric Folds.

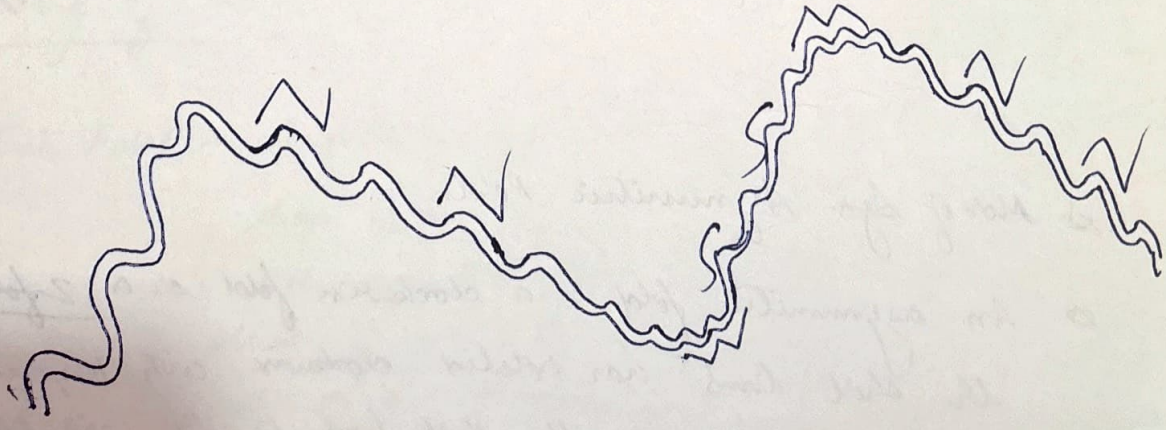
* An asymmetric fold is a clockwise fold or a <u>Z-fold</u> if the short limb has rotated clockwise with respect to the two long limbs also the short limb together with the adjacent long limbs define a Z-shape



- The asymmetric fold is a counter clockwise fold or an S-fold if the short limb has rotated counter-clockwise with the respect to the long limb; also the short limb together with the adjacent long limb define a S-shape

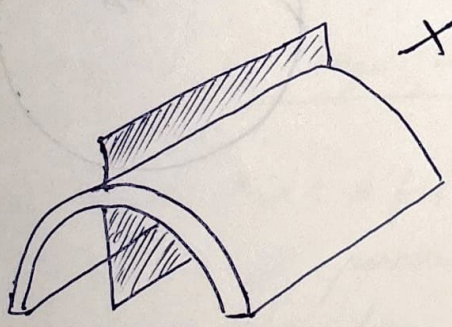


- with a folded structure, the Z and S-folds systematically appear across the axial surface. If the folds in a limb have a clockwise apparent vergence are described as Z-folds whereas those in the other limb have anticlockwise apparent vergence are S-folds. Symmetrical M-folds generally occur in the hinge zone (W-folds may be used for Synforms opposed to antiforms)

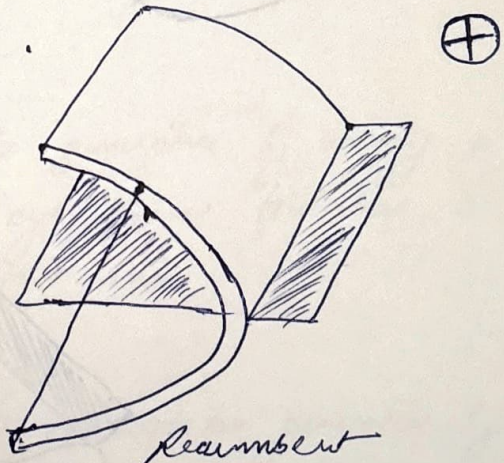


→ orientation of Axial plane

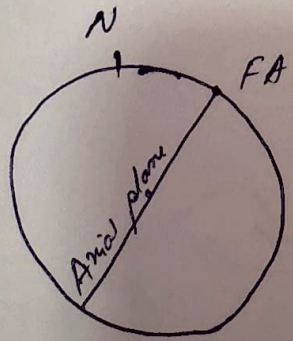
- Upright fold ÷ with vertical or nearly vertical axial plane.
- Recumbent fold ÷ with axial plane dipping at angle of 10° or less.
- Inclined Fold ÷ with inclined axial planes.
- Reclined Fold ÷ Inclined fold in which the plan of the fold axis or the axial plane is between 80°–100°.
- overturned fold ÷ Inclined fold in which both the limbs have the same sense of inclination.

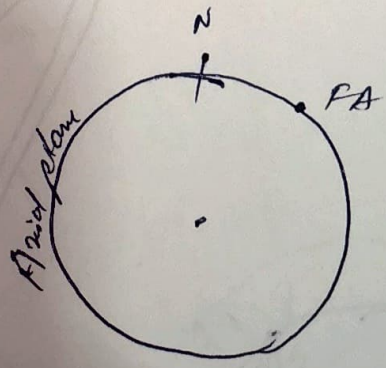


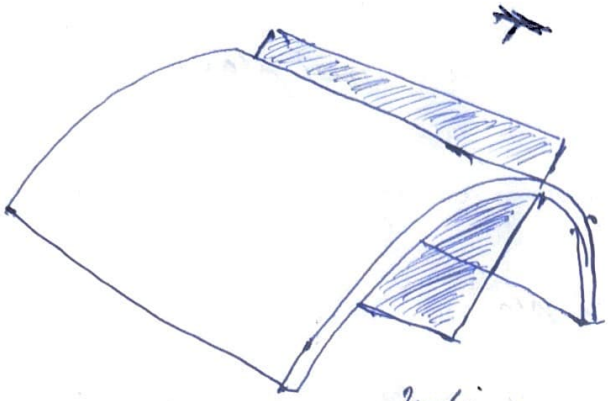
upright



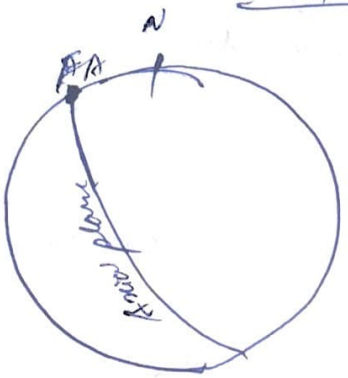
Recumbent

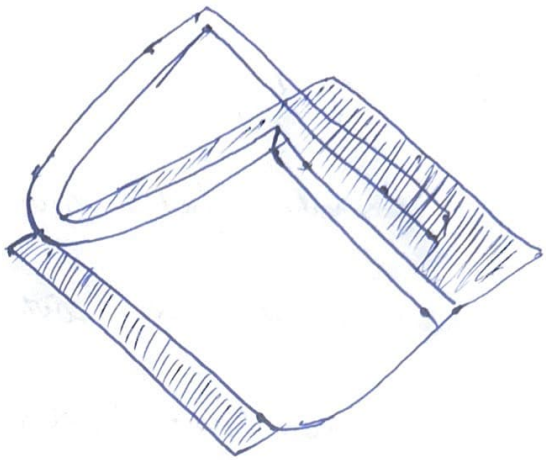




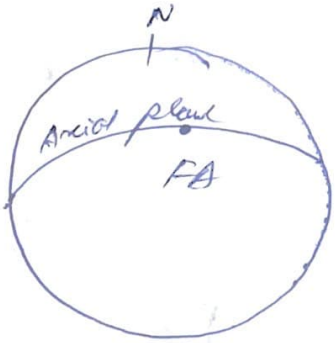


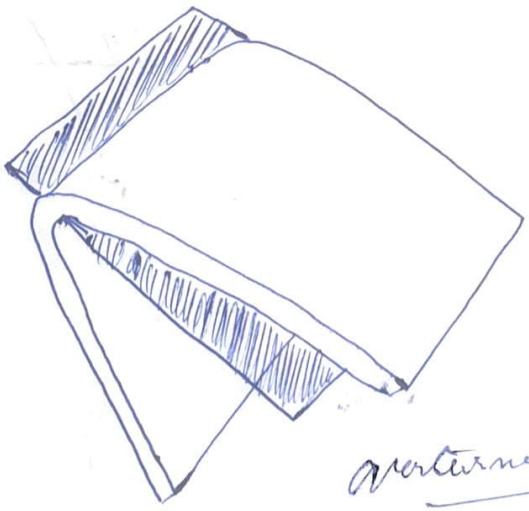
2 inclined



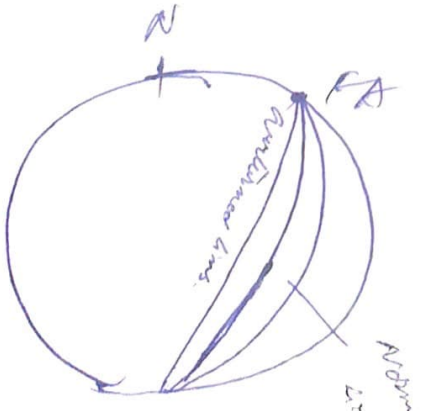


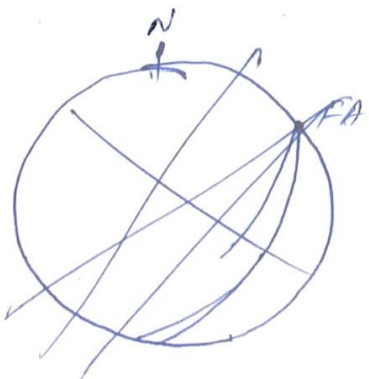
Reclined





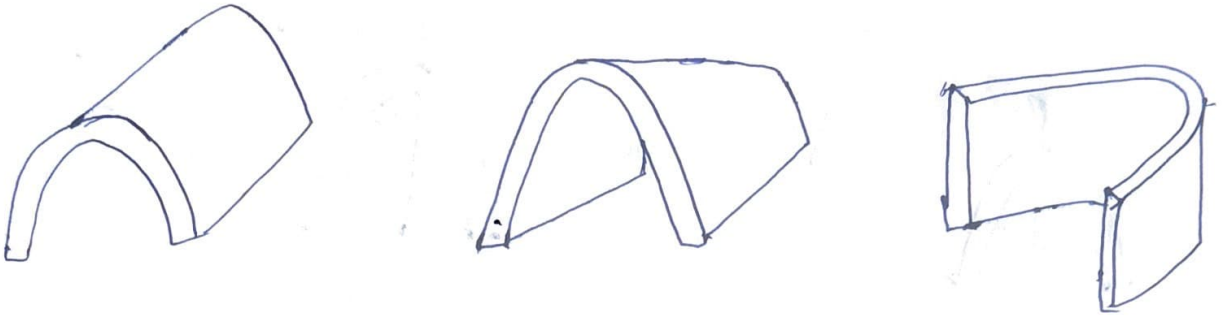
overturned





→ Plunge of the Fold Axis

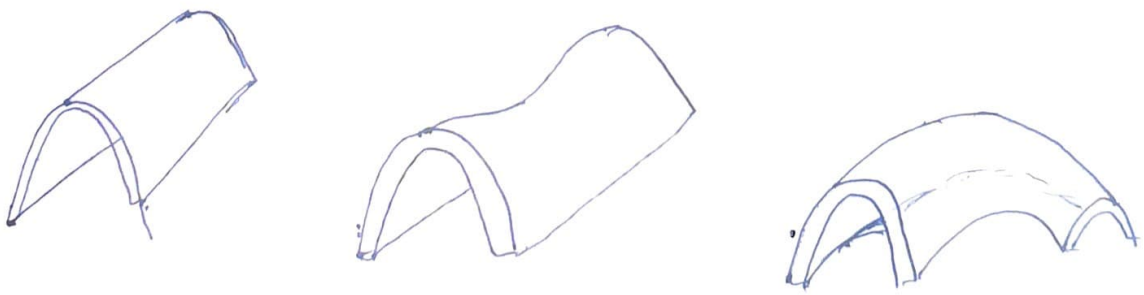
- Horizontal Fold :- A Fold whose Fold axis is horizontal
- Plunging Fold :- A Fold whose Fold axis is inclined.
- Vertical Fold :- A Fold with vertical Fold axis.



→ curvature of Hinge line / Fold Axis

- Cylindrical Fold :- A fold which can be generated by moving a line parallel to itself. A cylindrical fold has a rectilinear hinge line parallel to the fold axis.

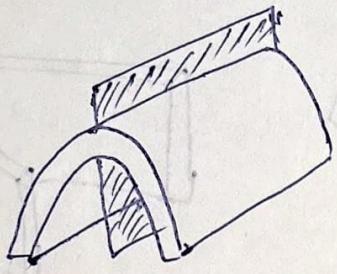
- Non-cylindrical Fold :- A Fold which cannot be generated by moving a line parallel to itself. The hinge line is either curved or the fold is conical.



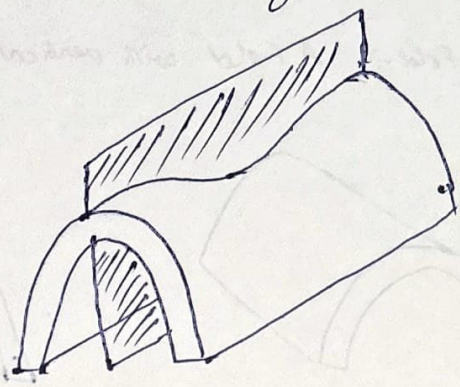
C. N.C N.C

→ curvature of Axial plane

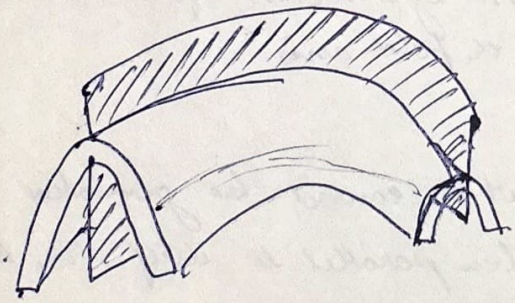
- ☆ plane fold :- A fold with planar axial surface.
- ☆ non-plane fold :- A fold with curved axial surface



Plane Fold



Plane-Fold

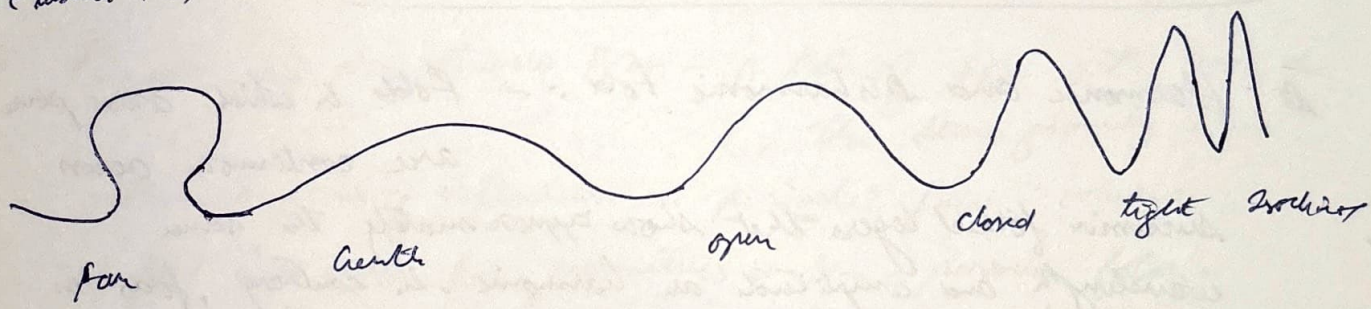


Non-plane Fold.

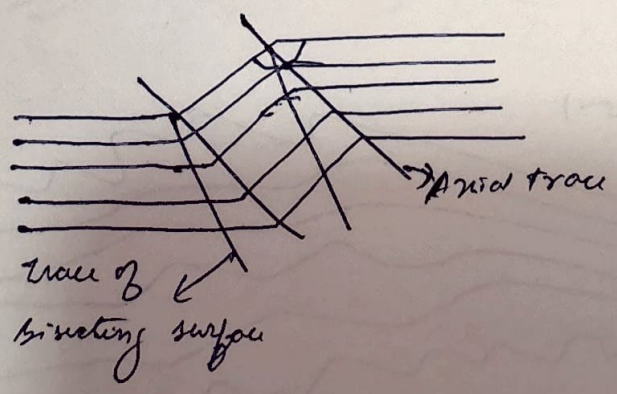
→ Interlimb Angle

- Gentle Fold – 180° < Interlimb angle < 120°
- open Fold – 120° < I.A < 70°
- closed Fold – 70° < I.A < 30°
- tight Fold – 30° < IA < 0°
- Isoclinal Fold – with sub-parallel limbs.
- Fan. Fold – with negative interlimb angle.

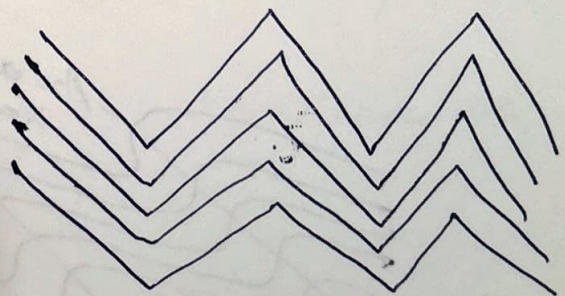
(Elastica Fold)



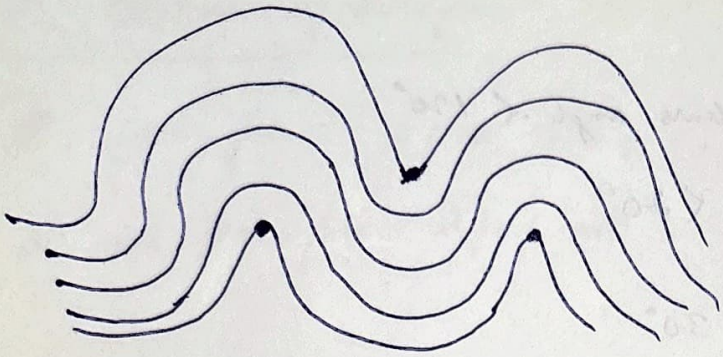
→ Shape of the Fold Hinge



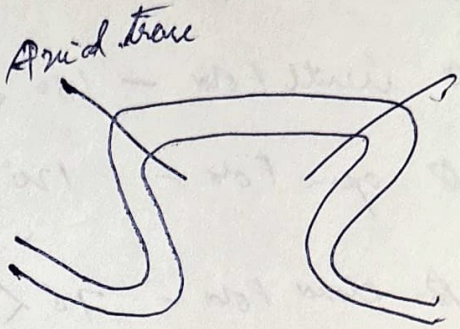
Kink Fold.



Chevron Fold.



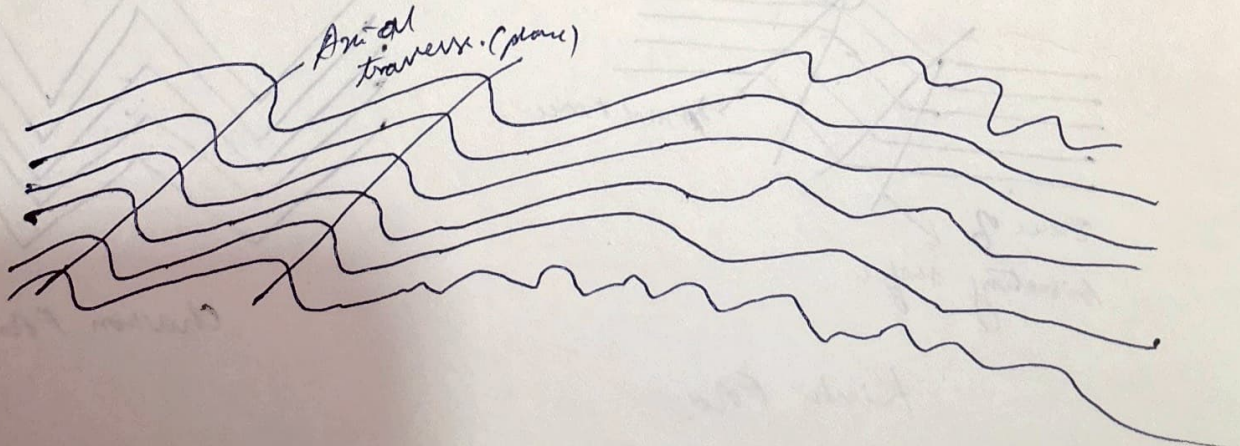
Concentric Folds



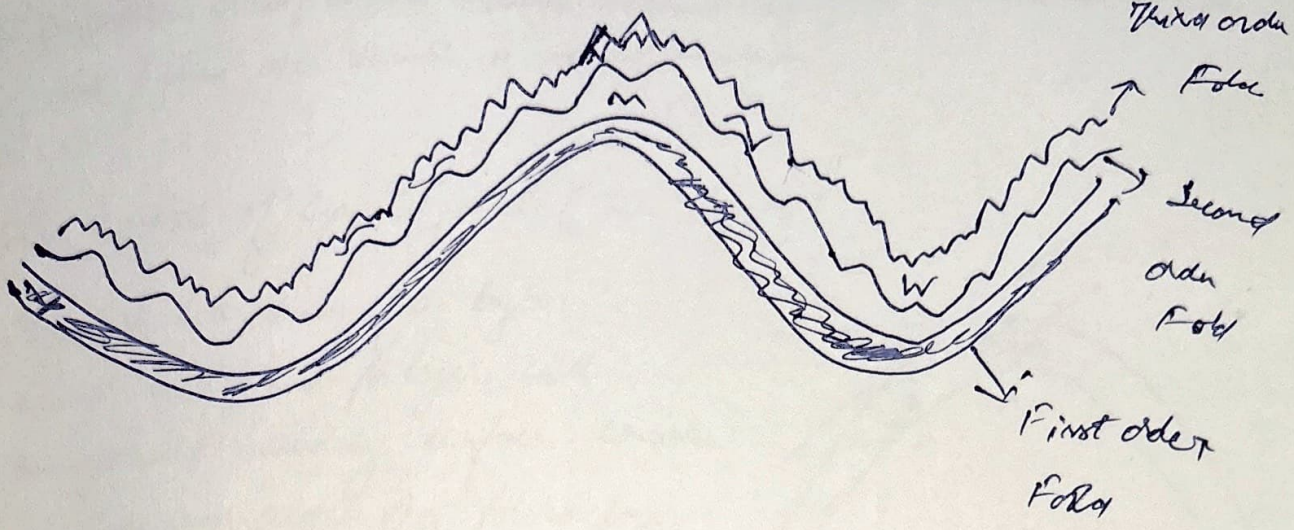
Box Fold.

→ Geometric relations with neighbouring structures

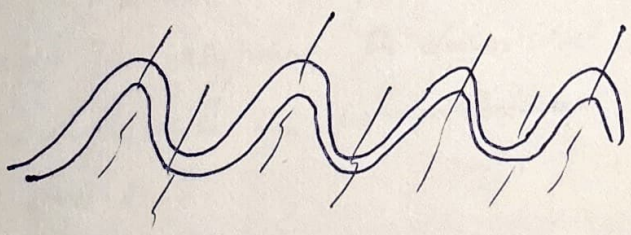
- Harmonic and Disharmonic Fold :- Folds in which axial plane are continuous across successive folded layers that show approximately the same wavelength and amplitude are harmonic. In contrary, folds in which the amplitude / wavelength and style change along discontinuous axial surfaces from one layer to another are disharmonic.



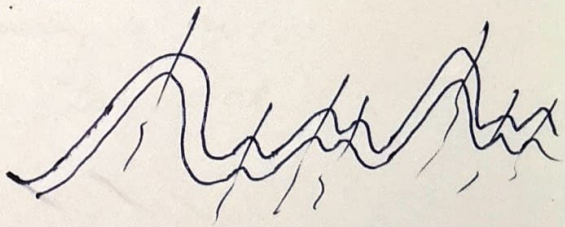
* Disharmonic Folds and Fold of order



* Periodic and Non-Periodic Folds :- A train of fold with more or less the same geometry b/w alternate points of inflection. in periodic fold. whereas a fold with dissimilar geometries is Non-periodic fold. but both have Axial plane constant a ~~harmonic~~ same harmonic.



Periodic Folds



Non-Periodic Folds

Polyclinal Folds :- Axial plane not constant