ROCK STRUCTURES

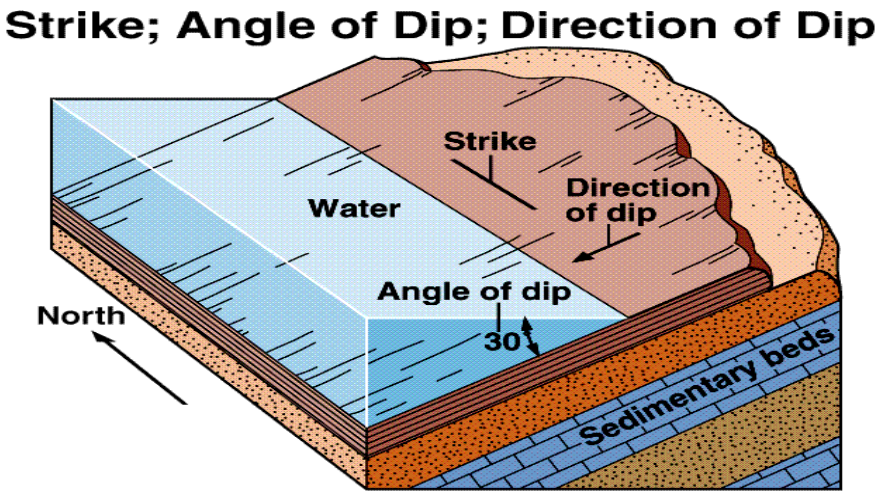
Plane: a flat surface; it has the property that a line joining any two points lies wholly on its surface. Two intersecting lines define a plane.

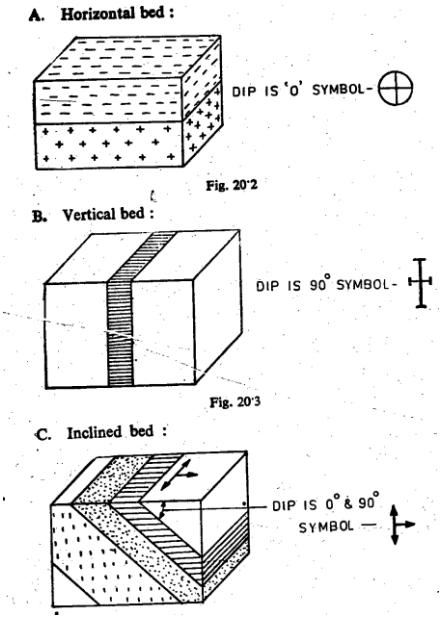
Attitude: the general term for the orientation of a plane or line in space, usually related to geographical coordinates and the horizontal. Both trend and inclination are components of attitude.
Trend: the direction of a horizontal line specified by its bearing or azimuth.
Bearing: the horizontal angle measured east or west from true north or south.
Azimuth: the horizontal angle measured clockwise from true north.
Strike: the trend of a horizontal line on an inclined plane. It is marked by the line of intersection with a horizontal plane.
Structural bearing: the horizontal angle measured from the strike direction to the line of interest.
Inclination: the vertical angle, usually measured downward, from the horizontal to a sloping plane or line.
Dip
Bedding and other geological layers and planes that are not horizontal are said to dip. The *dip* is the slope of a geological surface. There are two aspects to the dip of a plane

(a) the *direction of dip*, which is the compass direction towards which the plane slopes; and
(b) the *angle of dip*, which is the angle that the plane makes with a horizontal plane.
The angle of dip is an angle between 0° (for horizontal planes) and 90° (for vertical planes)

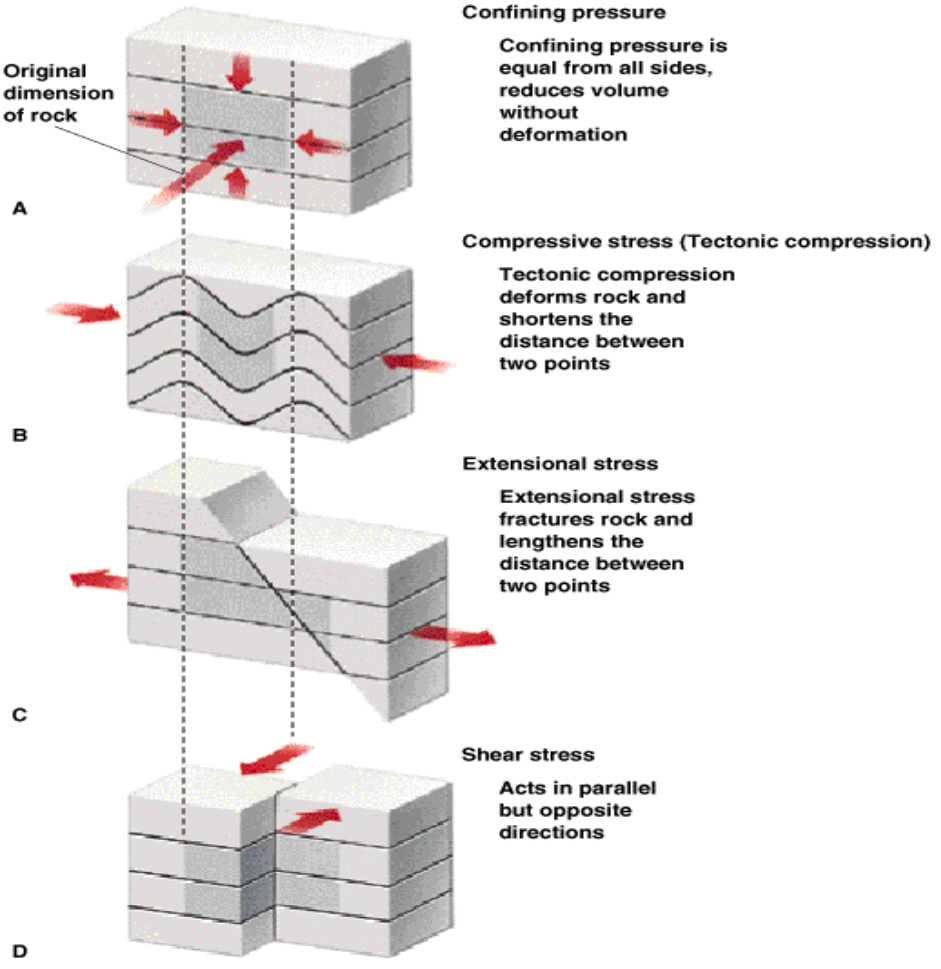
True dip: the inclination of the steepest line on a plane; it is measured perpendicular to the strike direction.

Apparent dip: the inclination of an oblique line on a plane; it is always less than true dip.





Thompson and Turk: Earth Science and the Environment, 2/e
Figure 8.1



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FOLDS

The bending or crumbling of rock-strata due to compressional forces acting tangentially or horizontally towards a common point or plane or rather shortening from opposite directions is known as folding.

Folding occurs when pre-existing elements are transformed into new curviplanar or curvilinear configurations, whatever their original state

Important parts and terminologies associated with folds

- *Limb*
- *Axis*
- *Axial Plane*
- *Hinge point and Hinge line*
- *Inter limb angle*
- *Median surface*
- *Wave length/Amplitude*
- *Crestal plane and trough plane*

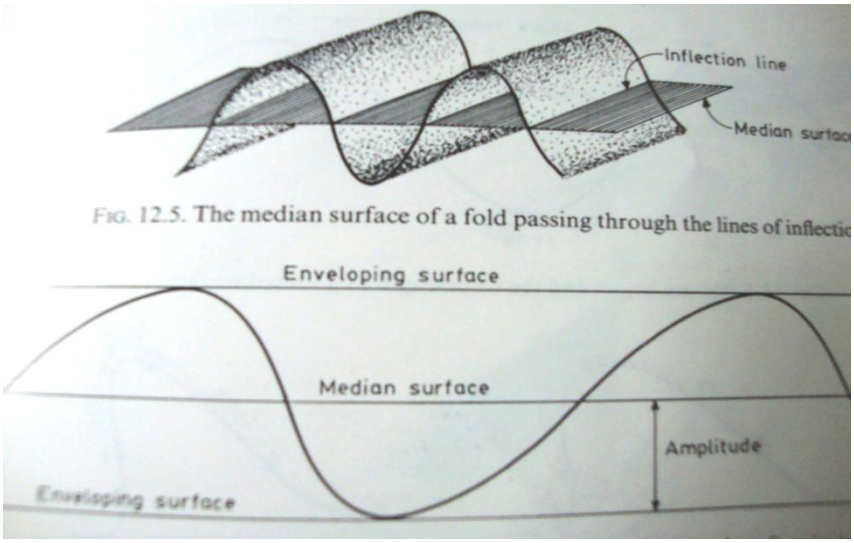


FIG. 12.5. The median surface of a fold passing through the lines of inflecti

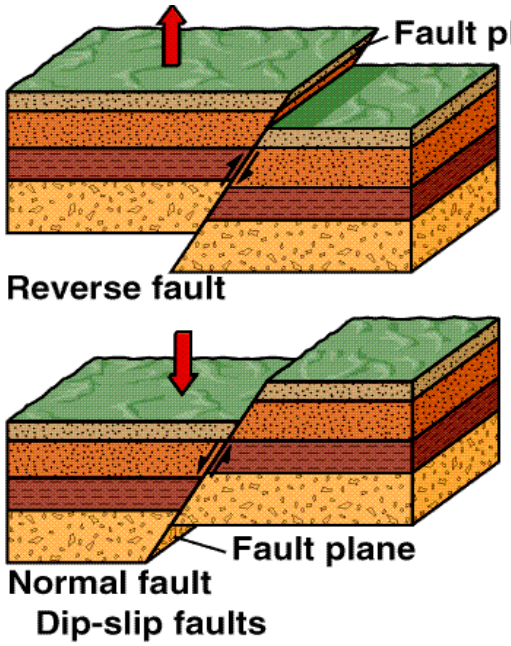
Geometric classification

Based on sense of curvature

- Antiform - fold that closes upward
- Synform - fold that closes downward
- Dome - Antiformal structure with no distinct trend of hinge line
- Basin - synformal structure with no distinct trend of hinge line

Fractures in rock

- Joints
  - Columnar jointing
  - Sheet jointing
  - Joint set
- **Faults**
  - **Dip-slip faults- normal and reverse**
    - **Footwall vs. hanging wall**
  - *Normal fault*
    - Graben; Rift
    - Horst ; fault-block mountain range



Dip-Slip Fault

Dip-slip faults **A**

Fractures in rock

- Faults
  - ***Reverse fault***
    - **Thrust fault- low angle reverse fault**
  - *Strike-Slip fault*
    - Left-lateral vs. right-lateral