

1.4 GEOLOGICAL WORK ASSOCIATED WITH WIND

- The earth is surrounded by an envelope of gases called the atmosphere.
- Atmosphere is composed chiefly of gases collectively known as air.
- Air in motion is called wind.
- The movement of the atmosphere in a direction parallel to the earth surface is wind .i.e. the air in motion is called wind whereas the vertical movements of the atmosphere are termed as air currents.
- Wind is one of the major geological agents of change on the surface.

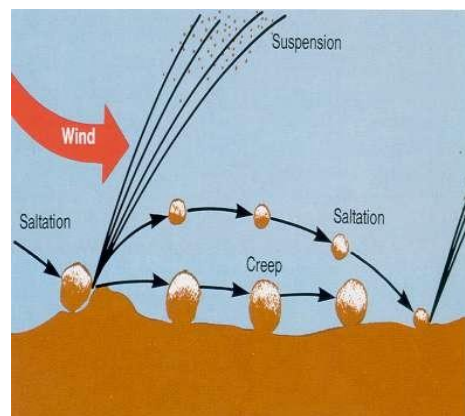


The Entire geological work performed by wind can be studied

- 1) Erosion
- 2) Transportation
- 3) Deposition

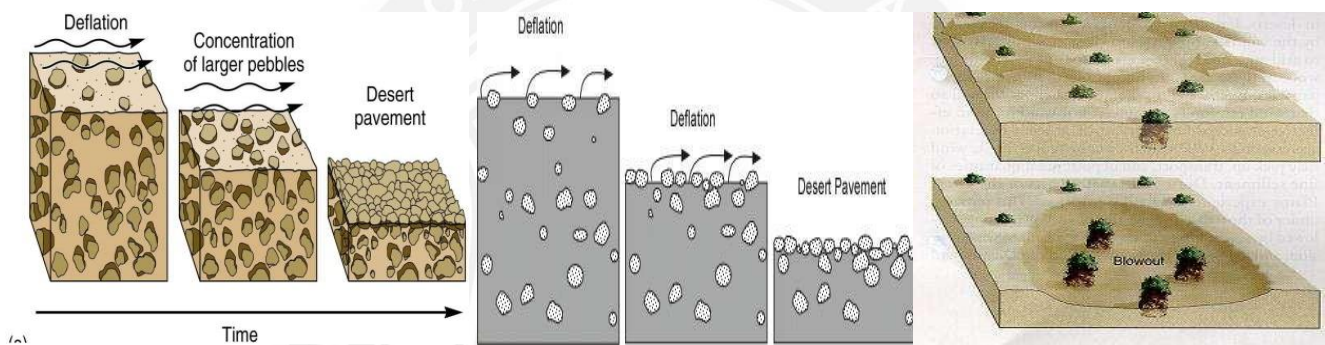
Wind Erosion:-

- Deflation
- Abrasion
- Attrition



a. Deflation [To blow away]

- Wind possesses not much erosive power over rocks [or] over the ground covered with vegetation.
- Wind moving with sufficient velocity over dry and loose sands (or) bare ground covered dust, it remove huge quantity of material from the surface known as deflation.
- In some desert deflation may remove the sand from a particular location to such an extent depression touching the water is known as blow outs.



Deflation - oasis

- Water filled depression known as Oasis is a place where vegetation is grows in desert.
- Stack is another term used for depression created by deflation.
- E.g. Auattarea in Western Egypt.



Deflation – Hammada

- It is a bare rock surface from which thin cover of sand has been blown away by strong winds. E.g. found in deserts



b. Wind abrasion

Wind is a powerful agent for wear of the rock surfaces when equipped with sand and dust particles.

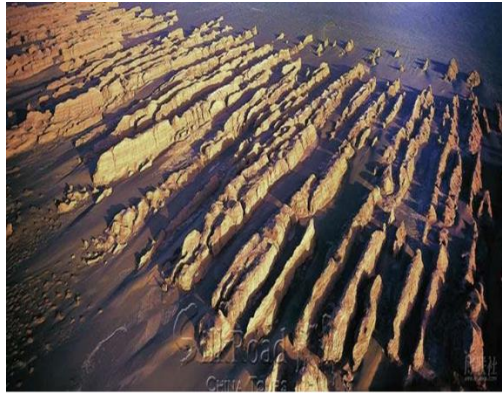
The load is acquired by the strong winds quite early blowing over sand heaps and loose dry soil.

This type of erosion involves polishing and altering of rock surface by a natural agent like wind, is known as wind abrasion.



Yardangs

- It is an elongated low lying ridges forming overhangs above depression.
- Yardangs are formed in area where rocks of alternate hard and soft rock lying one over other with gentle slopes.



Pedestal rocks

It is known as mushroom rocks. They flat topped rock masses with slender supporting rock stems. The top is commonly referred as overhang and the support on pedestal.

The overhang and the stem are of the same rock that has been eroded by the winds quite unevenly resulting in the mushroom like appearance of the rock mass. They are generally few meters in height.



Ventifacts

- ✓ These are small sized rock fragments having one, two, three or more polished faces.
- ✓ These wind polished fragments are called ventifacts.

c. Attrition of wind

- The sand grains and other particles that are lifted by the winds and carried away and do not travel in a straight path.

- Their path is determined by their density and velocity of wind.
- It moves in zig – zag paths.

Factors affecting the Wind Erosion:-

1. Nature of region.

- ▶ Areas covered by thick vegetation are least affected by winds.
- ▶ Marshy lands and saturated soil are not affected by wind erosion.
- ▶ Land surface such as dust, silt and sand are easily eroded by wind.

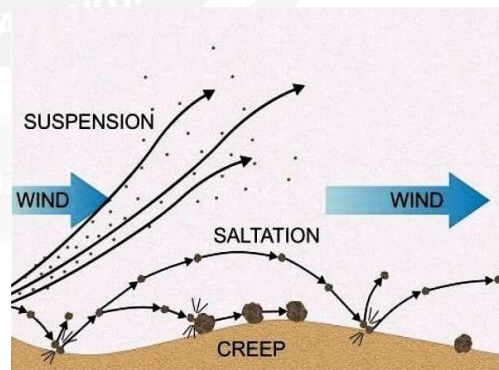
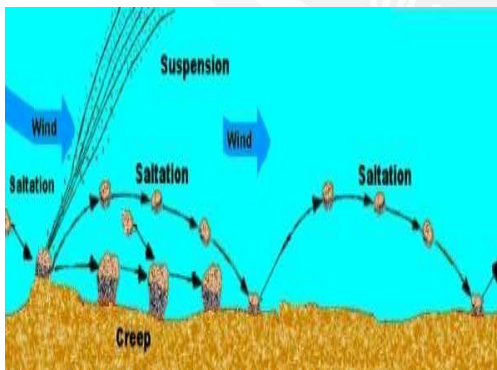
Wind Transportation

- Wind performs work of Transportation in two ways:

- 1) Suspension
- 2) Saltation

1. Suspension

- The light density clay particles may be lifted by the wind from ground and move along with winds is called suspension.



2. Saltation

- The heavier and coarse sediments are lifted up with high velocity and short distance above ground up to 2 m. They are picked up and drop again during the transportation process of bouncing and jumping is called saltation.

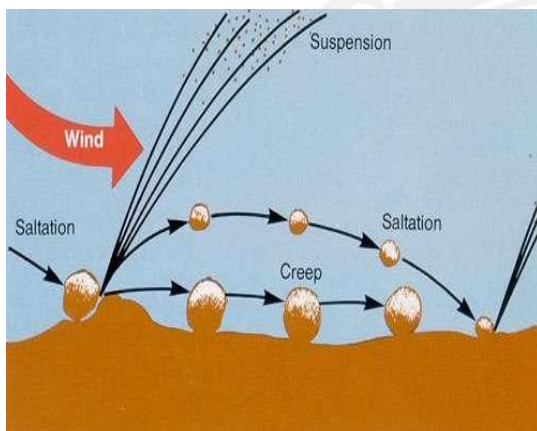
Deposition by Wind:-

1. Aeolian deposits

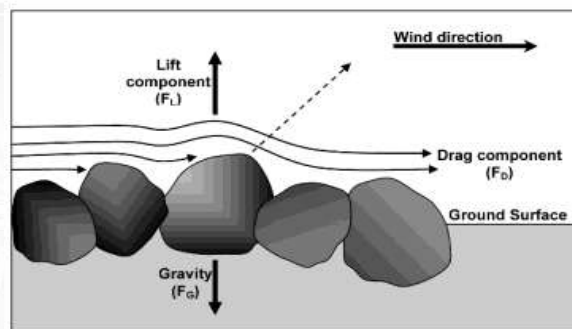
Land forms and deposits made by wind-blown sediments are referred as Aeolian deposits.

Two types of Aeolian deposits

- ▶ Sand Dunes
- ▶ Loess



Coastal dunes: aeolian transport



Types of Aeolian deposits

Sand Dunes

A sand dune is defined as a broadly conical heap of sand with two slopes on either side of ridge or crest.

Its types

- Crescentic dunes Type:- Barchans-Half moon shaped
- Sigmoidal dunes
- Transverse dunes



Types of Sand Dunes

i. Crescentic dunes

The windward slope is convex but leeward concave in outline. This is called crescentic dunes.

Type:-

1. Barchans

This is a type of crescentic dunes developed by wind in the same direction for considerable length of time.

ii. Sigmoidal Dune:-

- It is the shape of horns and a curved outline.
- Longitudinal dunes are called as saifs.

iii. Transverse Dune:-

There are generally crescent dunes in nature and formed across the wind.

Loess:

The finest particles of dust travelling in suspension with the wind are transported to a considerable distance. When dropped down under favourable conditions these have been found to accumulate in the different constituents the form of paper-thin laminae, which have aggregated together to form a massive deposit known as Loess.

