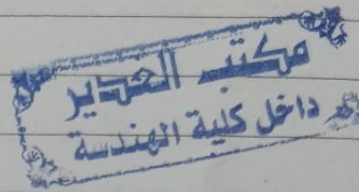


Chapter 4

Surface Processes :-

Introduction :-

All landmasses are continually worn away or denuded by weathering and erosion, the agents of erosion being the sea, rivers, wind and ice. In this manner, the surface features of the earth are gradually, but constantly, changing.



Erosion :-

The detrital products resulting from denudation are transported by water, wind, ice or the action of gravity, and are ultimately deposited.

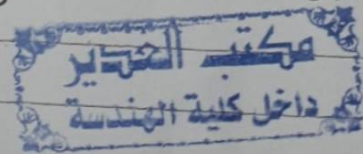
Weathering :-

The process of weathering represents an adjustment of the minerals of which a rock is composed to the conditions prevailing on the surface of the earth. As such, weathering of rocks is brought about by physical disintegration, chemical decomposition and biological activity.

Working Principle of Weathering Process.

2

It weakens the rock fabric and exaggerates any structural weaknesses, all of which further aid the breakdown processes. A rock may become more friable as a result of the development of fractures both between and within mineral grains. The agents of weathering, unlike those of erosion, do not themselves provide for the transportation of debris from the surface of a rock mass. Therefore, unless the rock waste is otherwise removed, it eventually acts as a protective cover, preventing further weathering. If weathering is to be continuous, fresh rock exposures must be constantly revealed, which means that the weathered debris must be removed by the action of gravity, running water, wind or moving ice.

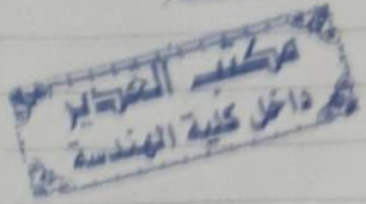


Factors Affecting the Weathering Process :

The response of a rock mass to weathering is directly related to :

Size of rock mass (coarse-grained rocks generally weather more rapidly than fine-grained ones)

The water content (the amount of water that a rock contains influences mechanical breakdown, especially in terms of frost action).



- Durability of the rock mass

- mineralogical composition.

- texture.

- porosity.

(The closeness of the interlocking of grains governs the porosity of the rock, this in turn, determines the amount of water it can hold, and hence, the more porous the rock, the more susceptible it is to chemical attack).

Strength

(the degree of interlocking between component minerals since the more strongly a rock is bonded together, the greater is its resistance to weathering).

Climatic regime

The type and rate of weathering varies from one climatic regime to another. In humid regions, chemical and chemico-biological processes are generally much more significant than those of mechanical disintegration. It is depends on :-

Temperature

(an increase in temperature causes an increase in weathering).

Humidity

(an increase in humidity causes an increase in weathering).