TENDER HEART HIGH SCHOOL

Sector 33 B, Chandigarh

NAME: VARUN SALHOTRA CLASS: IX

SUBJECT: GEOGRAPHY DATE: 22/7/24

CHAPTER 6: ROCKS

(1) Introduction

→ Rocks are the naturally occurring material that forms the crust of the Earth. Moreover, it is the collection of different minerals and it is found in different Colour, Size and Texture.

→ Mostly Rocks are categorised according to mineral and chemical composition present in it and the way in which they are formed.

→ Rocks forms the Earth's solid layer, which is also referred as **Rocksphere**.

→ The Scientific study of Character and Origin of Rocks is known as **Petrology**; which is an essential part of Geology.

(2) Difference between Rocks and Minerals

ROCKS	MINERALS
→ Rocks are considered as aggregates of mineral elements.	→ Minerals are naturally occurring solid inorganic substances.
→ Rocks are heterogeneous in form.	→ Minerals are Homogeneous in form.
→ Rocks has no definite chemical composition	→ Minerals have a definite chemical composition.
→ Major rocks are Igneous Rocks, Sedimentary Rocks and Metamorphic Rocks	→ Major mineral groups are Silicates, Carbonates, Sulphides and metallic minerals.

(3) Importance of Rocks

→ When Rocks are disintegrated into fine particles, it results in the formation of Soil upon which all the agricultural activities depend.

→ Rocks helps us in acquiring knowledge about past animals, environment and plants that are now extinct, because all the fossils are found in rocks.

→ Rocks contains variety of minerals that are useful for Industries such as Iron, Copper, Marble, Granite etc.
→ Rocks provide basic material for construction of Roads, Dams, Buildings etc.
→ Rocks also have reserves of Coal, Petroleum and Natural Gas.
→ Gold a precious mineral found in rocks helps to know the value of a nations currency.
→ Rocks also acts as shelter for many organisms, as sometimes it is seen that many organisms make their shelter in the cracks of the rocks.
→ Rock salt extracted from sedimentary rocks is used in cooking.
→ The Study of Rocks helps to know about the formation of Earth, past Climate and movement of Tectonic Plates.

(3) Types of Rocks and their Classification

(A) IGNEOUS ROCK:

→ These are those rocks that are formed due to cooling, solidification and crystallisation of Hot Lava.
→ Igneous Rocks are the first rocks that were formed on the Earth's Crust, so they are also known as Primary Rocks.
→ Since all the other rocks are formed directly or indirectly from Igneous Rocks, so these rocks are also known as Parent Rocks. eg: Granite, Syenite, Obsidian, Pumice etc.

* Features of Igneous Rock

→ These Rocks are Granular and crystalline in Nature.
→ These Rocks are hard rocks and water does not percolates through these rocks.
→ These rocks are not found in layers due to solidification of Magma.
→ These rocks dont contain any fossil.
→ These rocks are found in Volcanic Zones.
→ These rocks are generally weathered by Mechanical Weathering.

Classification on Types of Igneous Rocks
(on the basis of mode of Origin)

- Intrusive
  - Plutonic
  - Hypabyssal
- Extrusive
  - Explosive
  - Quiet

(ii) Intrusive Igneous Rocks:

When the rising magma is not able to reach the Earth's surface during a volcanic activity, than the magma cools and solidifies below the Earth's surface. This cooling and solidification of lava forms Intrusive Igneous Rocks. eg: Granite, Tonalite, Manzonite etc.

Intrusive Igneous Rocks are divided into two types:

(a) Plutonic Igneous Rocks:

→ These rocks are formed due to cooling of Magma deep inside the earth.

→ These rocks are very coarse grained rocks.

→ In deep inside the earth, the rate of cooling of magma is very slow due to high temperature, so there is sufficient time for the full development of large grains in these Rocks. eg: Granite, Tonalite etc.

(b) Hypabyssal Igneous Rocks:

These are those rocks that are formed due to cooling and solidification of rising magma during an Volcanic Activity in the cracks, pores, hollows etc below the earth's surface. eg: Dolerite.

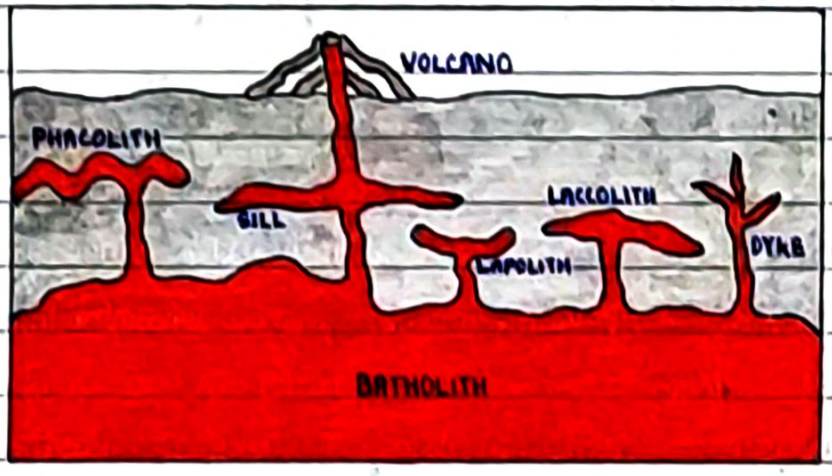


Fig: Hypabyssal Igneous Rocks

⊙ Batholith:

→ These are irregular and undulating form of solidified intruded magma.

→ They usually have dome shape.

→ The upper portion of these rocks are seen when the overlying coven is removed due to continuous denudation. But its lower part cannot be seen because these rocks are buried deep inside the earth.

→ eg: Ranchi Batholith, Sierra Nevada Batholith etc.

⊙ Laccolith:

→ The rocks are formed due to injection of magma along the bedding plane of horizontally bedded sedimentary Rocks.

→ These rocks has mushroom shape and they are convex in form.

→ eg: Pine Valley Mountain (USA), Henry Mountain (U.S.A) etc.

⊙ Phacolith:

→ These rocks are formed due to injection of magma along the Anticlines and synclines.

→ They are formed in the region of Folded Mountains but parallel to bedding plane.

→ eg: Franklin (New Jersey), Omey Pluton (Ireland)

⊙ Lapolith:

→ When magma solidifies in a concave shallow Basin whose central part is sat downwards, it is referred as lapolith.

→ These rocks are coarse grained due to slow process of cooling of magma.

→ It is Lenticular in shape.

→ eg: Sudbury (ontario), Humboldt (Nevada) etc.

⊙ Sills:

→ These rocks are formed due to injection and solidification of Magma between the bedding planes of Sedimentary Rocks.

→ The thick beds of magma is known as Sills and thin beds of magma is known as Slate.

→ When Sills are exposed to external denudational process, they form landforms suchas Cuesta, Ridges, Hogbacks etc.

→ eg: Great Whin Sill (Durham), Bushveld Sill (Southern Africa) etc.

⊙ Dykes:

→ They are wall like formation of solidified magma.

→ These rocks are mostly perpendicular to the beds of sedimentary Rocks.

→ They form different landforms suchas Dyke Lake, Upstanding Ridges etc.

→ eg: Dhuandhar Dyke (India), Black Canyon (USA), Isle of Arran (Scotland)

(ii) Extrusive Igneous Rocks

→ These rocks are formed due to cooling and solidification of hot and molten lava on the Earth's surface.

→ These rocks are formed during fissure type of volcanic eruption. Moreover, they are also known as Volcanic Rocks.

→ These rocks are fine grained because the lava is cooled and solidified very quickly as soon as it reaches the surface of the Earth.

→ eg: Basalt, Gabbro, Obsidian etc.

Extrusive Igneous Rocks are divided into two types:

(a) Explosive Type:

→ The rocks formed due to the mixture of volcanic materials that is elected during Explosive type of Violent volcanic eruption is referred as Explosive Type of Extrusive Igneous Rocks.

→ These rocks forms materials such as:-

⊙ Bombs:

These are big fragments of rocks that forms when a volcano elects viscous lava during an eruption.

⊙ Lapilli:

These are tear-drop shaped droplets of molten or semi-molten lava that is elected during an volcanic Eruption.

⊙ Tuffs:

These are the fine volcanic materials that are deposited in aquatic conditions are referred as Tuffs.

⊙ Volcanic Ash:

It is a mixture of Rock, minerals and Glass particles that is elected from a volcano during an eruption.

⊙ Volcanic Dust:

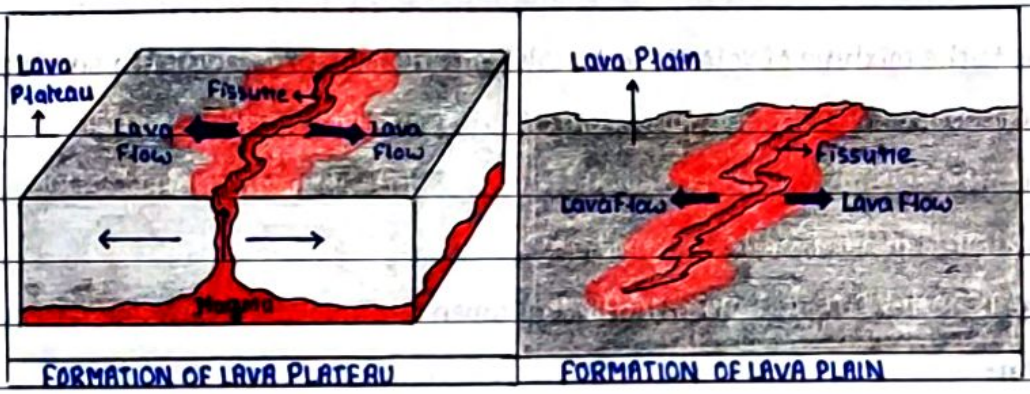
It resembles fine particles of Rock powder that are blown out from a volcano and may remain suspended in Atmosphere for long duration. It produces Red Sunset and also does Climatic Modifications.

(b) Quiet Type :

→ When Lava comes out through fissures on the Earth's surface, it is referred as Lava Flow. These Lavas cools and solidifies on the Earth's surface to form Basalt. The nature of eruption of these lava is very Quiet.

→ When several episodes of Lava Flow occur during fissure eruption, it results in the formation of Lava Plateaus and Lava Plains.

→ eg: Plateau - Columbian Plateau (U.S.A), Mahabaleshwar Plateau (India) etc.
Plains - Borring Lava Plain (USA), Bannen Waste Lava Plain (Iceland) etc.



FORMATION OF LAVA PLATEAU FORMATION OF LAVA PLAIN

Uses of Igneous Rocks

→ These rocks are used to build Statues.

→ Granite is used to make counter Tops.

→ Pumice is used in Toothpaste and cosmetic products.

→ Pegmatite is the source of commercial minerals

→ Gabbro is mixed with concrete to construct bridges

→ obsidian is used to make Jewellery.