

Internal Structure of the Earth

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⇒ Why do we study Internal/Interior Structure of the Earth?

(विश्लेष)

→ "The Configuration of the surface of the Earth" is largely a product of the processes operating in the interior of the Earth. Exogenic as well as Endogenic processes are constantly shaping the Landscape. A proper understanding of the Physiographic character of a region remains incomplete if the effects of ENDOGENIC processes are ignored.

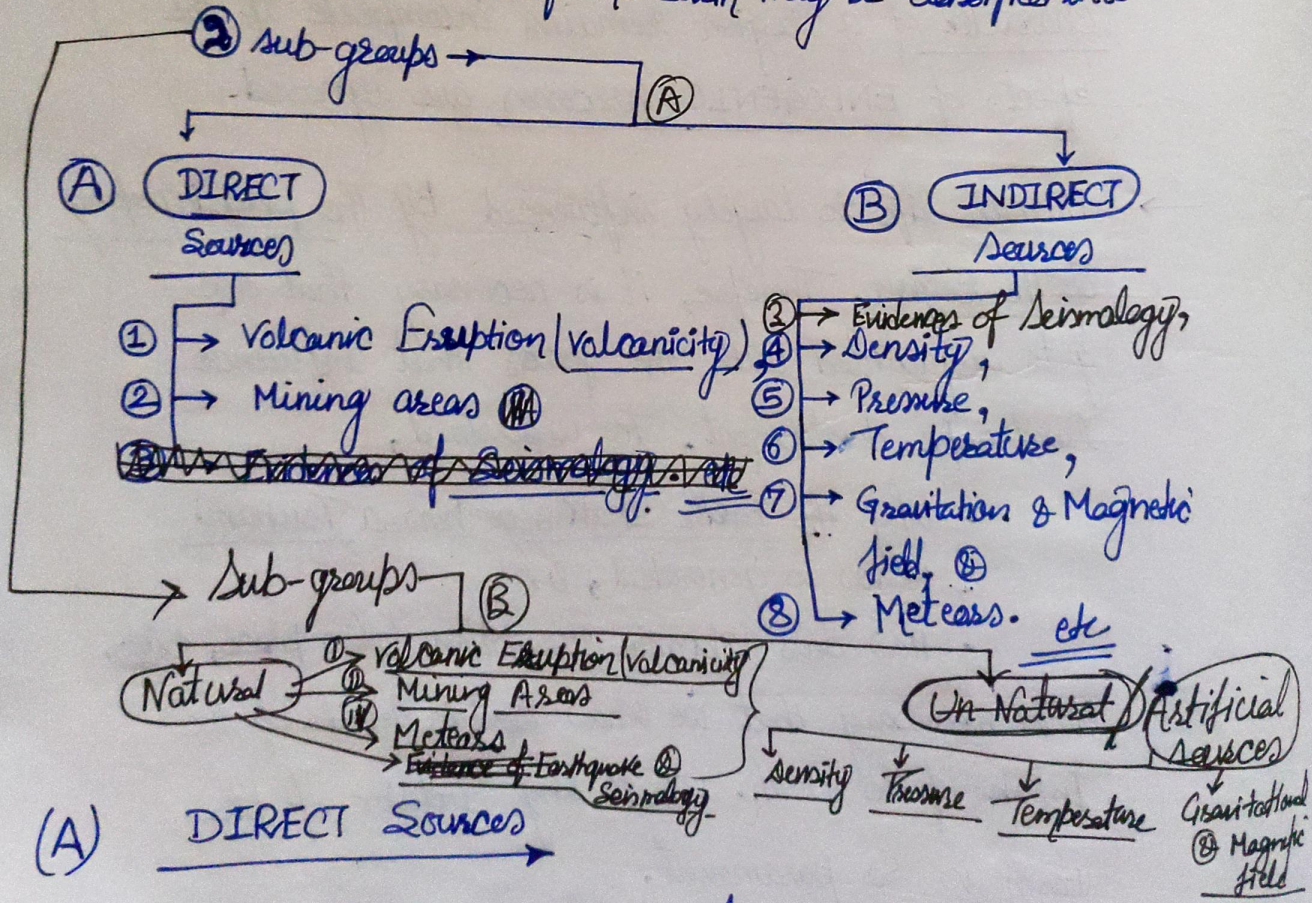
→ Human life is largely influenced by the physiography of the region. Therefore, it is necessary that one gets acquainted with the forces that influence landscape development. To understand,

- why the Earth shakes or how a Tsunami waves is generated, &
- How does Volcanic Eruption takes place, ~~etc~~

it is necessary that we know certain details of the Interior of the Earth. That's why Interior of the Earth is so paramount.

Sources of Information about the Interior of the Earth

The Earth's Radius is 6,370 Kms. No one can reach the centre of the earth & make observations or collect samples of the material. Under such conditions, most of our knowledge about the interior of the Earth is largely based on estimates & inferences which is obtained through "direct observations" and "analysis of materials". The sources which provide knowledge about the interior of the Earth may be classified into



① **volcanicity** → on the basis of upwelling & spread of Hot & Liquid LAVA on the Earth's surface

during volcanic Eruption, ~~that~~ Some scientists believe that there is atleast such a layer below the Earth's surface which is in liquid state. Such molten layer has been termed as 'Magma chamber' which supplies Magma and lava during volcanic eruptions.

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Mining Areas

→ The most easily available solid Earth material is surface rock or the rocks we get from mining areas. Gold mines in South Africa are as deep as 3-4 kms. Going beyond this depth is not possible as it is very hot at this depth. Besides mining, Scientists have taken up a number of projects to penetrate deeper depths to explore the conditions in the crustal positions, such as →

"Deep Ocean Drilling Project" and "Integrated Ocean Drilling Project". The deepest drill at KOLA in Arctic Ocean, has so far reached a depth of 12 km. These deep drilling projects have provided large volume of information through the analysis of material collected at different depths.

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Evidences of Seismology

→ The Study of Seismic waves provides a complete picture of the layered Interior. Seismic waves originates

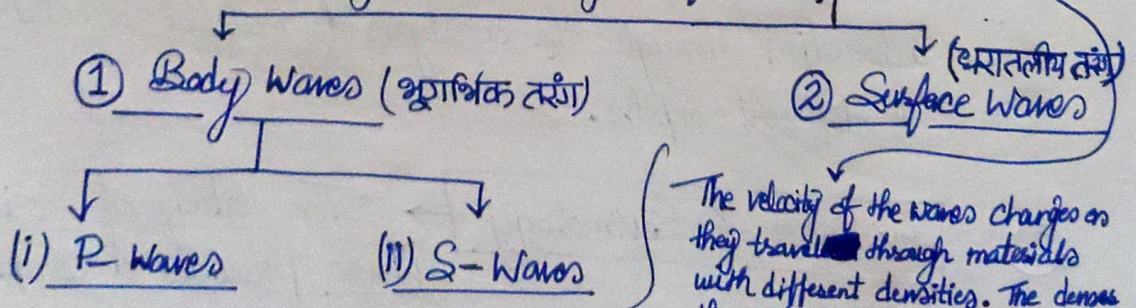
through an Earthquake (shaking of the Earth) which is a natural event and caused due to release of Energy who generates waves that travel in all directions. The release of energy occurs along a Fault. The point where the energy is released is called the FOCUS of an Earthquake, also known as "HYPOCENTRE". ^(उद्गम बिन्दु) The energy waves travelling in different ^(अभिन्न) directions reach the surface. The point on the surface, nearest to the focus, is called "EPICENTRE". It is the first one to experience the waves. ^(अनुभव) It is a point directly above the focus (90° right angle).

→ Earthquake Waves

All Natural Earthquakes takes place in the "Lithosphere". ~~Lithosphere~~

(The crust & uppermost part of the ^(स्फटिकमंडल) Mantle are called Lithosphere. Its thickness ranges from 10-200 km.)

An instrument called "SEISMOGRAPH" records the waves reaching the surface, which shows ~~three~~ ^{two} distinct sections each representing different types of waves.



The velocity of the waves changes as they travel through materials with different densities. The denser the material, the higher is the velocity. Their direction also changes as they Reflect @ Refract when coming across the materials with different densities.

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