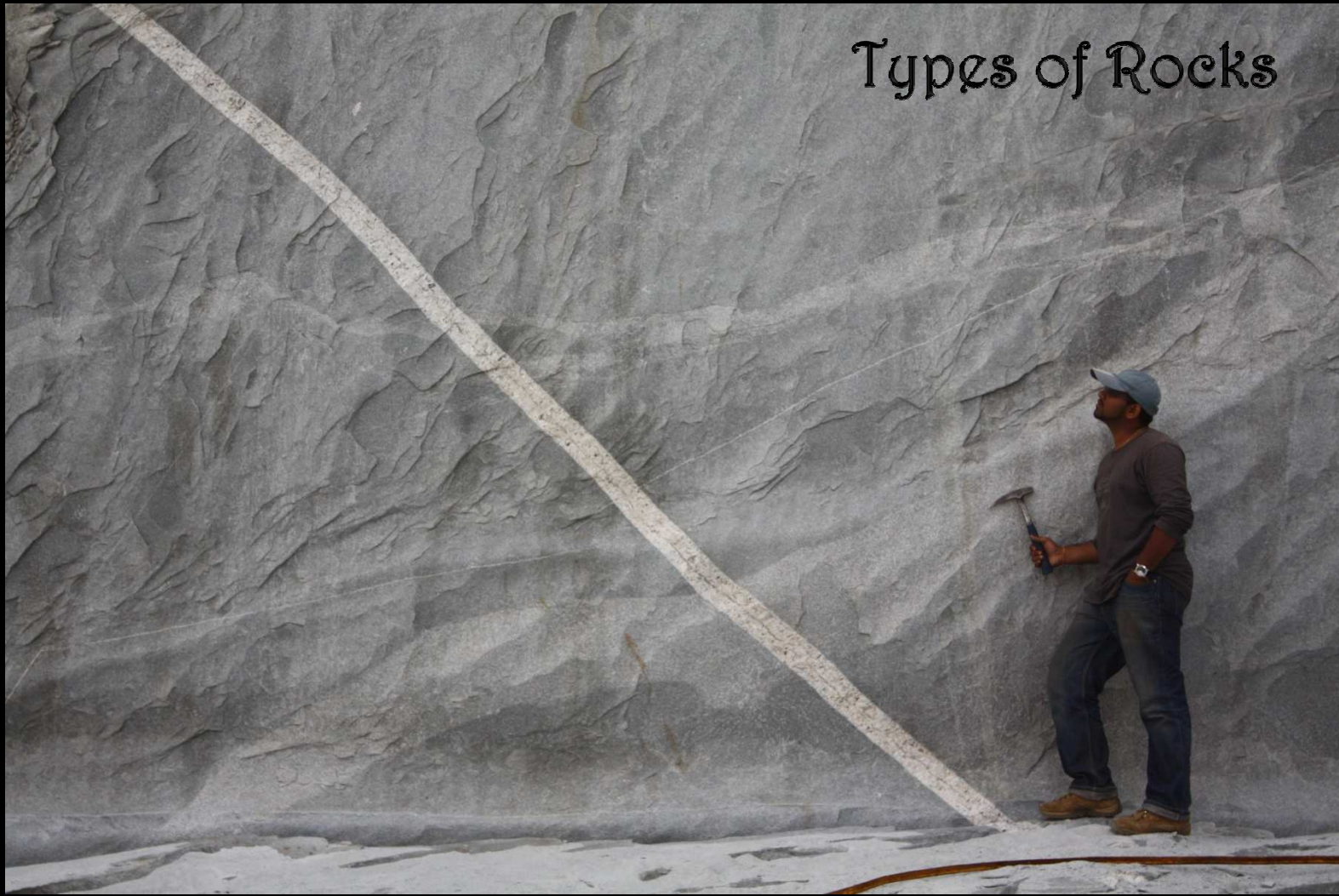


Types of Rocks



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Plot 4, Lenyadri society, Sus road, Pashan, Pune-411021. ☎020-25871539

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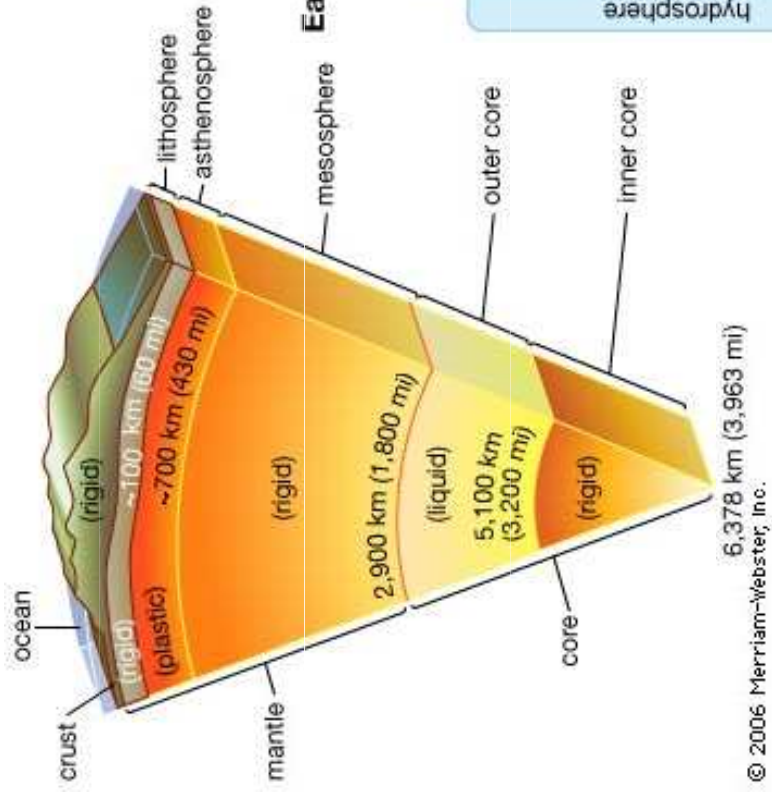


Rocks

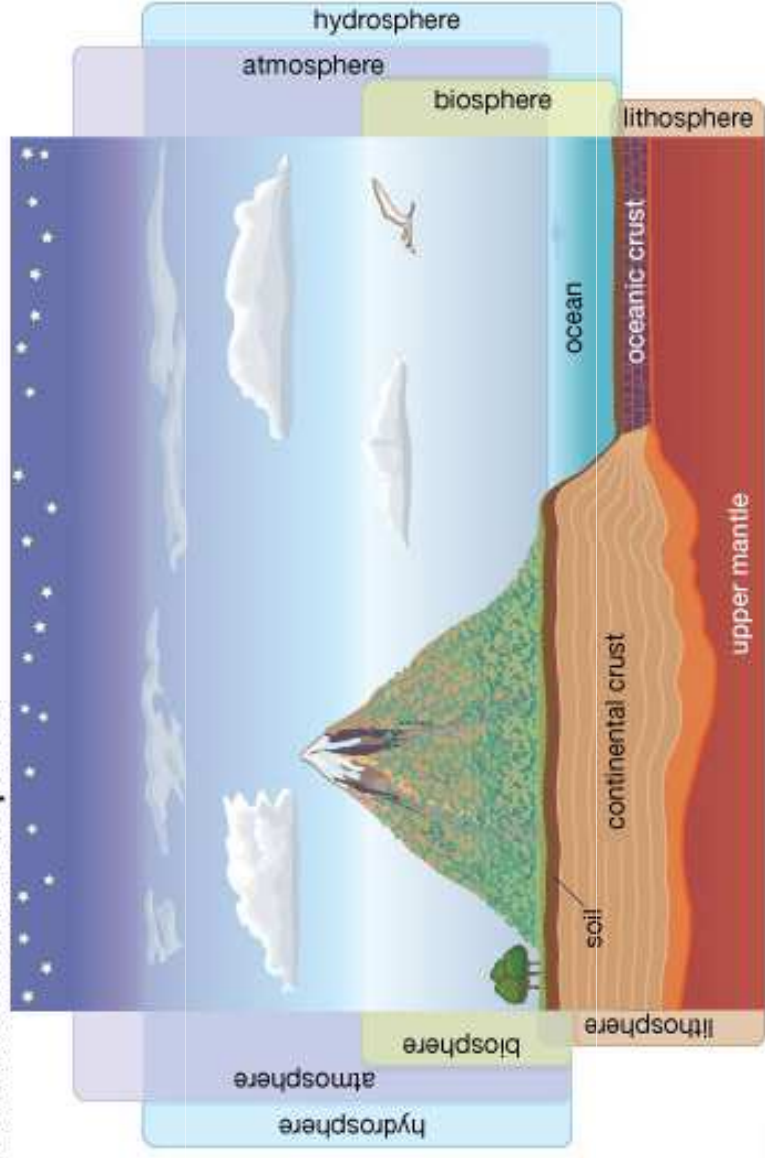
A **Rock** or **Stone** is a naturally occurring solid aggregate of **minerals** and/or **Mineraloids**.



The Lithosphere



Earth's environmental spheres



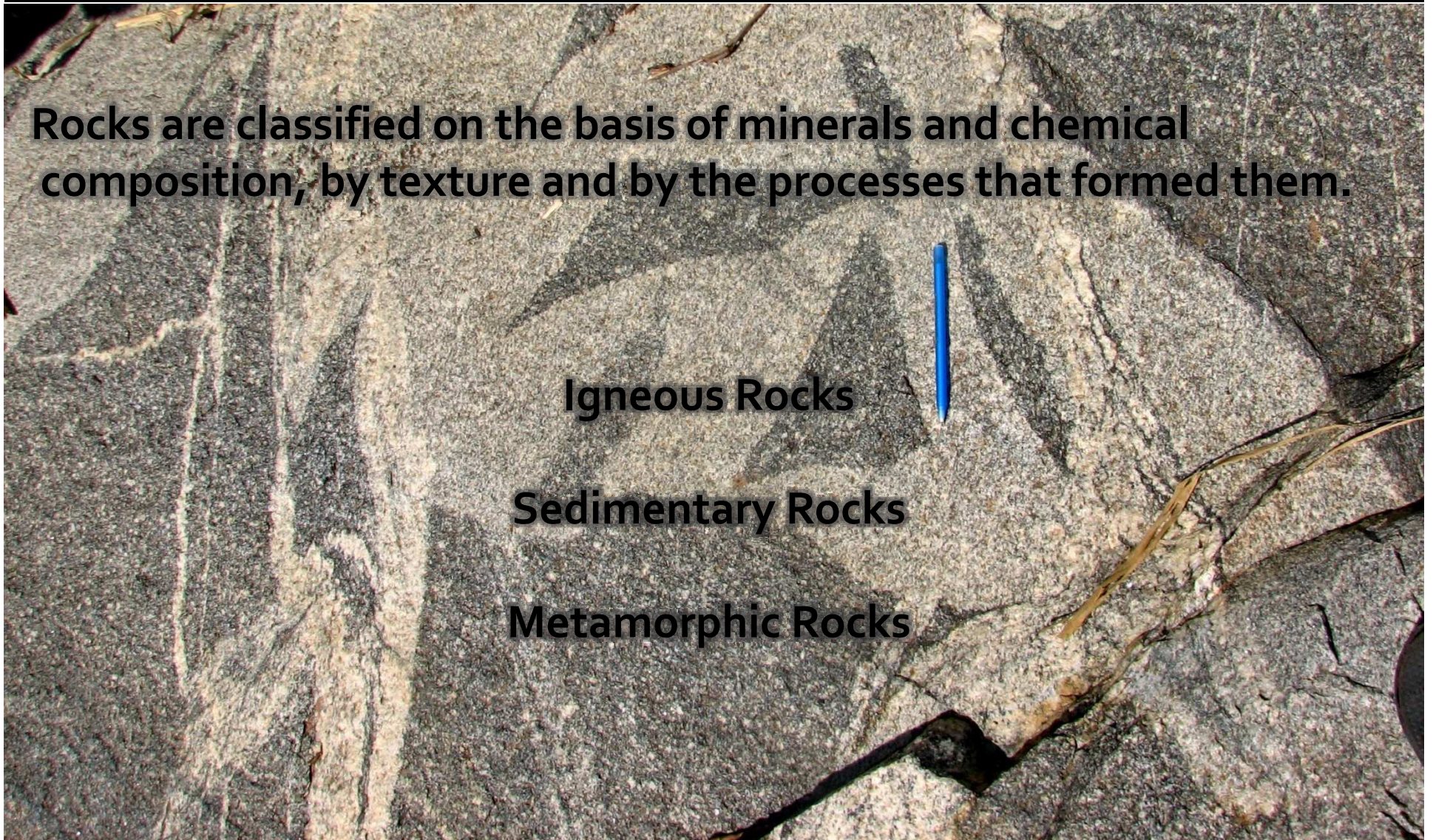
Types of Rocks

Rocks are classified on the basis of minerals and chemical composition, by texture and by the processes that formed them.

Igneous Rocks

Sedimentary Rocks

Metamorphic Rocks



Igneous Rocks

Igneous Rocks are formed from the consolidation of “magma” or molten rock material.

They are formed either below the surface as intrusive(plutonic) rocks or on the surface as extrusive(volcanic) rocks.



Melting of rocks – Increase in Temperature, Decrease in Pressure, Change in Composition

Igneous Rocks.....contd.

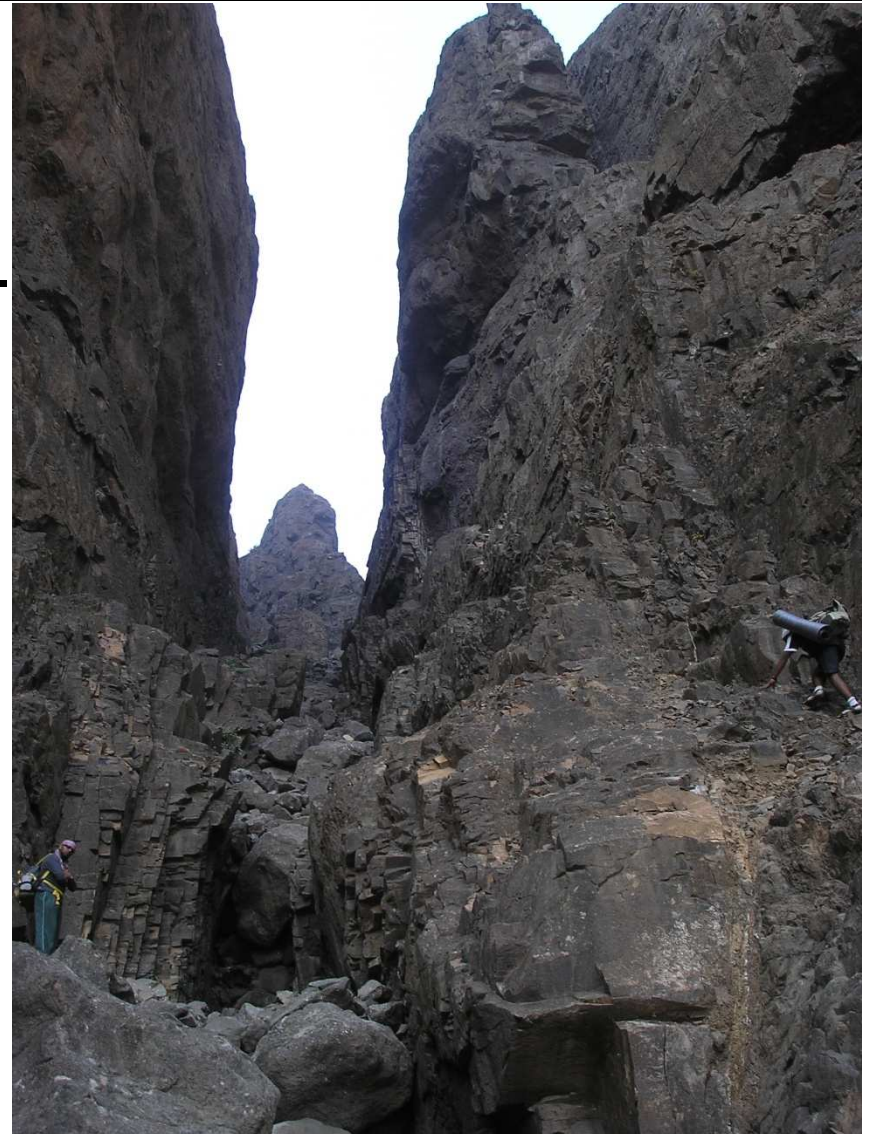
Intrusive Igneous Rocks

Magma cools and solidifies within the crust.

Slow cooling.

Larger grain/crystal size

Eg. Dykes, Granite Batholiths etc.



A granite Batholith



Igneous Rocks.....contd.

Extrusive Igneous Rocks

Magma comes out on the surface and then solidifies. This cooling is generally fast so the grain size is very fine.



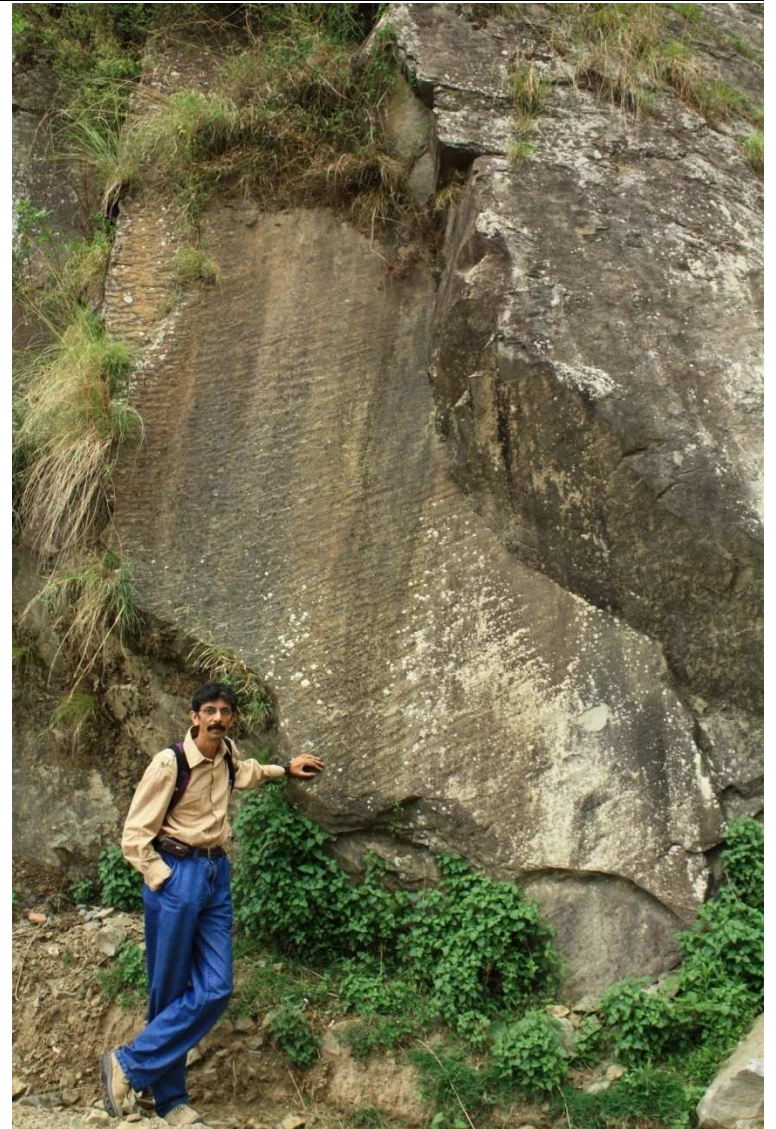
Eg. Basalts

Sedimentary Rocks

Sedimentary rocks are formed by sedimentation of material at the Earth's surface and within bodies of water.

Sedimentation – Deposition or Precipitation,
compaction

(Weathering and Erosion)



Metamorphic Rocks

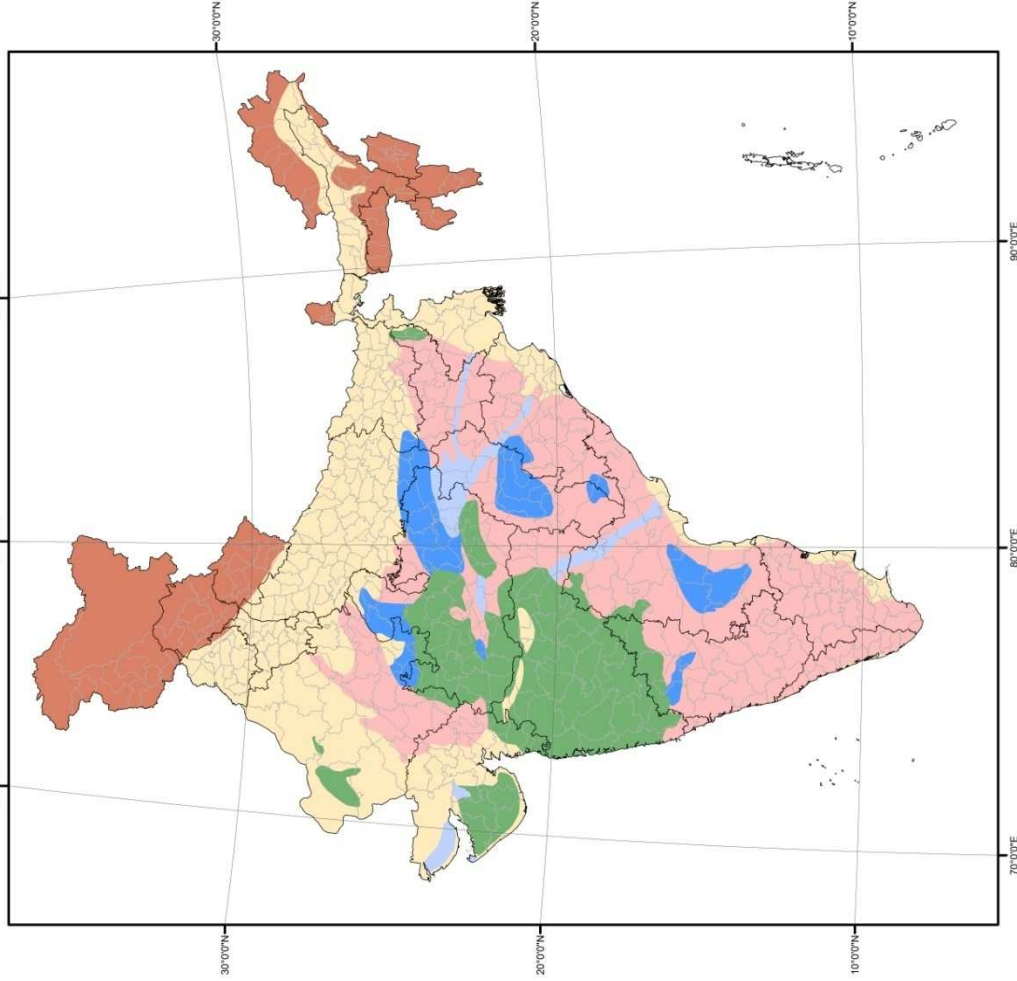
Metamorphic rocks are formed from pre-existing rocks after they undergo some changes in Temperature and Pressure.

Parent rock- Igneous/Sedimentary or Metamorphic



Heating through magma/intrusions, Fracturing, Burial

Overlay of generalised hydrogeological settings on administrative boundaries (Districts and States)



Legend

Formations

- Mountain Systems
- Alluvial (Unconsolidated) Systems
- Sedimentary (Soft Rock) Systems
- Sedimentary (Hard Rock) Systems
- Volcanic Systems
- Crystalline (Basement) Systems



Openings in rocks....

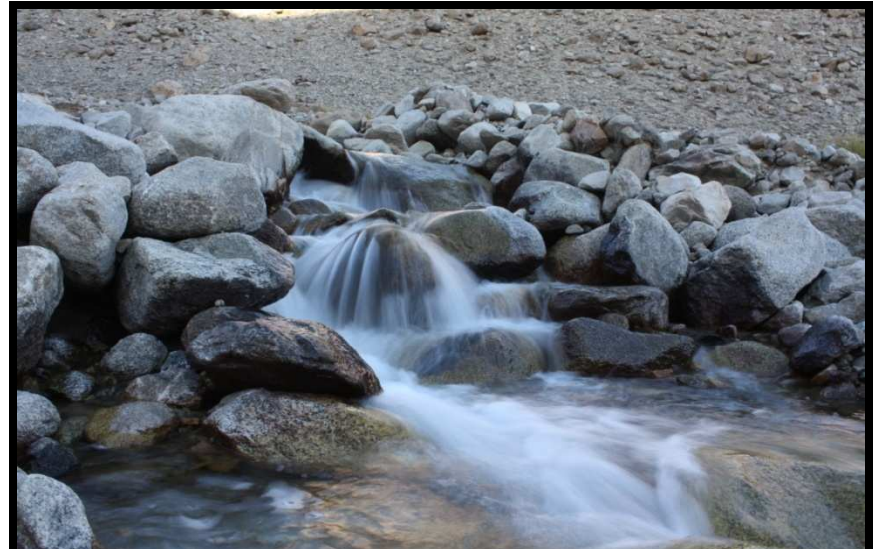


Action of water on the ground

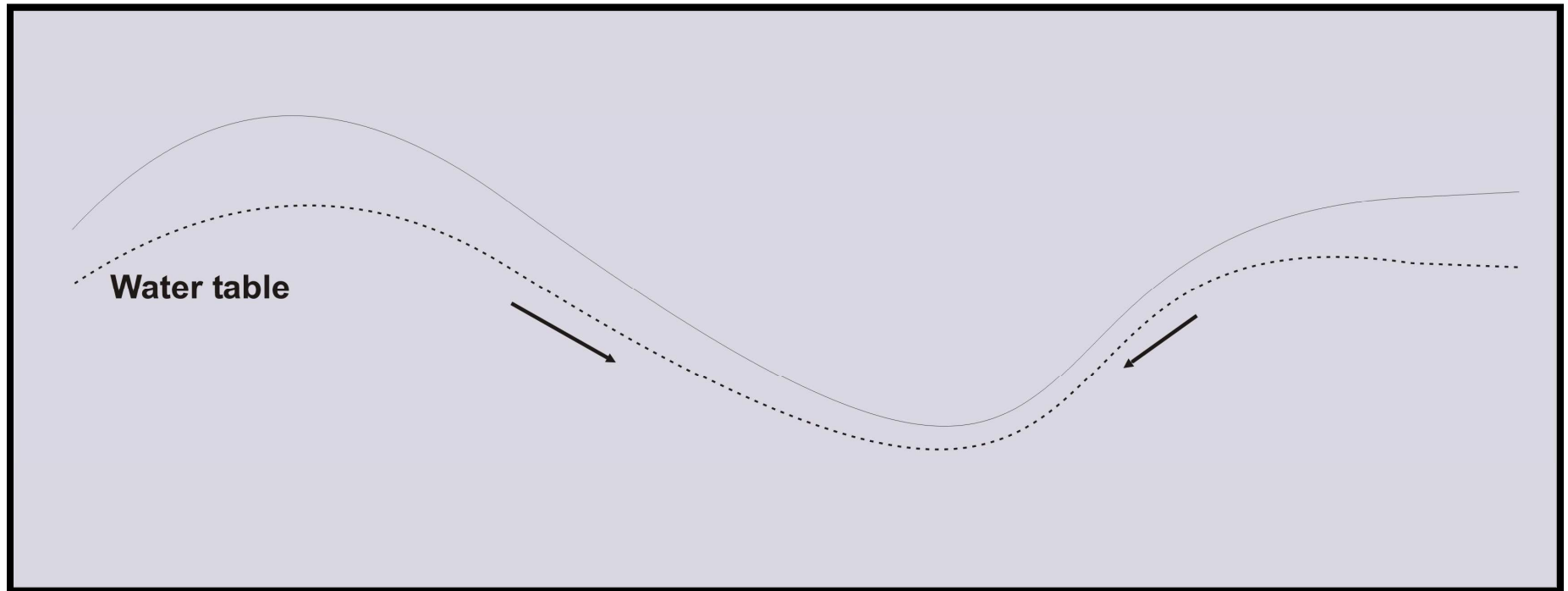
-Weathering



-Erosion



The shape of the ground determines how water will flow above and below it

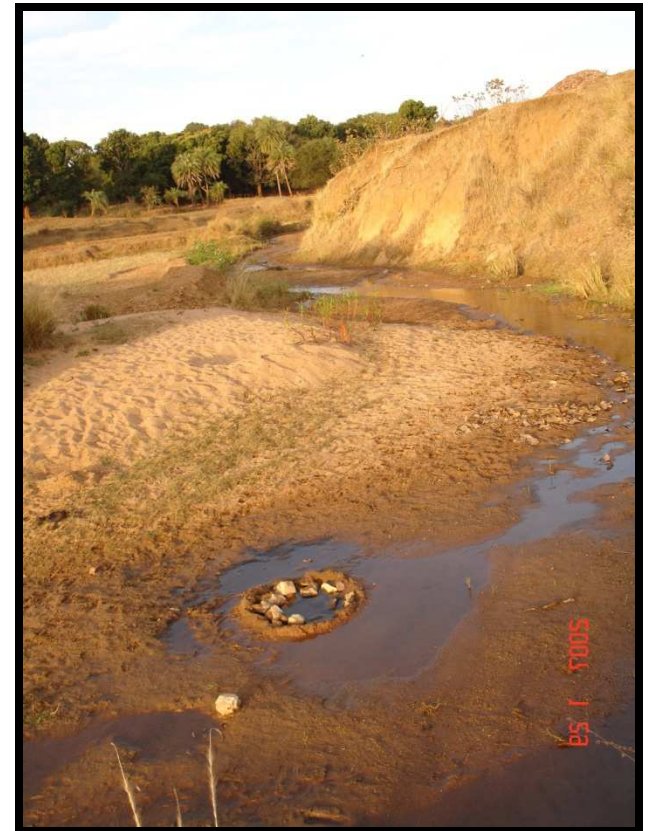


On the other hand, water is an important agent in shaping ground surface...

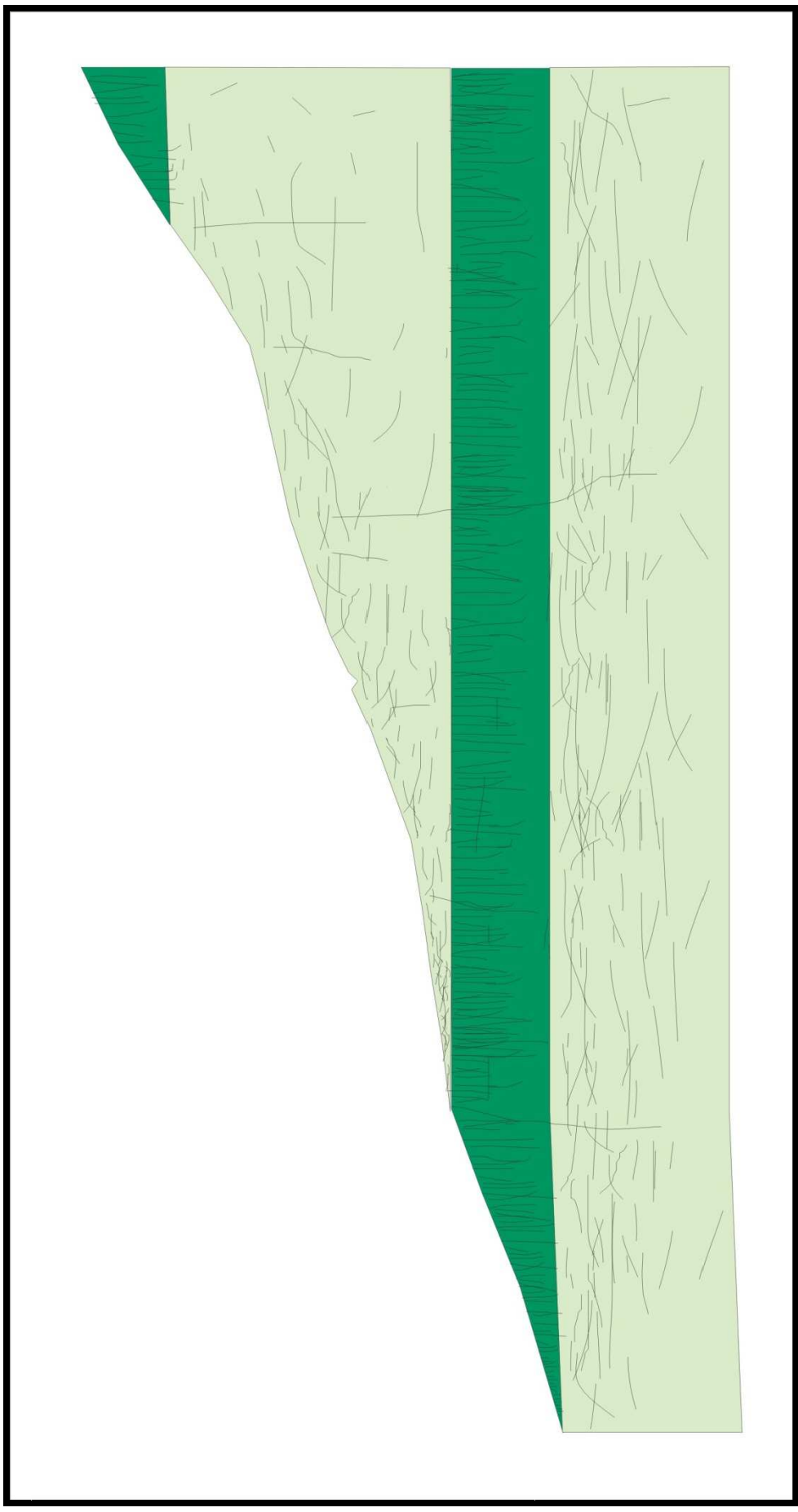
Water accumulates in and flows through...

-Pores

-Fractures



The nature of openings – vertical / horizontal / inclined / horizontal / inclined – decide how groundwater flows through the rock





Horizontal Openings



Vertical Openings



Inclined Openings

The surface of the earth may be underlain
by different types of rocks...



BASALT



A dark coloured, fine-grained, 'extrusive' **igneous rock** composed of plagioclase feldspar, pyroxene, and magnetite, with or without olivine, and containing not more than 53 wt.% of SiO_2 .

GRANITE

A light coloured, coarse-grained, **igneous rock** consisting essentially of quartz (at least 20%), alkali feldspar, mica with or more commonly without amphibole and accessory apatite, magnetite and sphene.



SANDSTONE



It is a **sedimentary** rock formed from lithified sand, comprising of grains between $63\mu\text{m}$ and $1000\mu\text{m}$ in size, bound together with a mud matrix and a mineral cement formed during burial diagenesis.

LIMESTONE

It is a **sedimentary type** of rock composed mainly of calcite and/or dolomite, which is often of organic, chemical or detrital origin.



GNEISS

General petrological term applied to coarse-grained, banded rocks that are formed during high-grade, regional metamorphism.



SCHISTS



A regional **metamorphic rock** of pelitic compositions which displays a schistosity. They are coarse grained, having a grain size greater than 1mm.

LATERITE



Weathering product of rock, composed mainly of hydrated iron, aluminium oxides, hydroxides, clay minerals, and also containing some silica.

CONGLOMERATE

Coarse grained (rudaceous) rock with rounded clasts that are greater than 2mm in size.



SHALE



Fine grained fissile, **sedimentary rock**, composed of clay sized and silt sized particles of unspecified mineral composition.



PEGMATITE

Very coarse grained,
igneous rock,
usually of granitic
composition, in
which the individual
crystals are at least
2.5 cm in length.



Thank you for your patience.....

