

Principles of petrology
(232 G)

Main topics & Course teaching:

- 1- Introduction.**
- 2- The earth zones**
- 3- Composition of the earth**
- 4- Rock-forming minerals**
- 5- Classification of rocks**
- 6- Igneous petrology**
- 7- Sedimentary petrology**
- 8- Metamorphic petrology**

Introduction:

- **Petrology** (*from Greek: Petra, rock; and logos, knowledge*) is the branch of GEOLOGY that studies rocks, and the conditions in which rocks form.

- Where as **PETROGRAPHY** deals with the descriptive part of rocks and **PETROGENESIS** deals with the mode of formation of rocks. These two together makeup Petrology.

- Petrology comprises the

Origin,

Association

Occurrence

Mineral composition

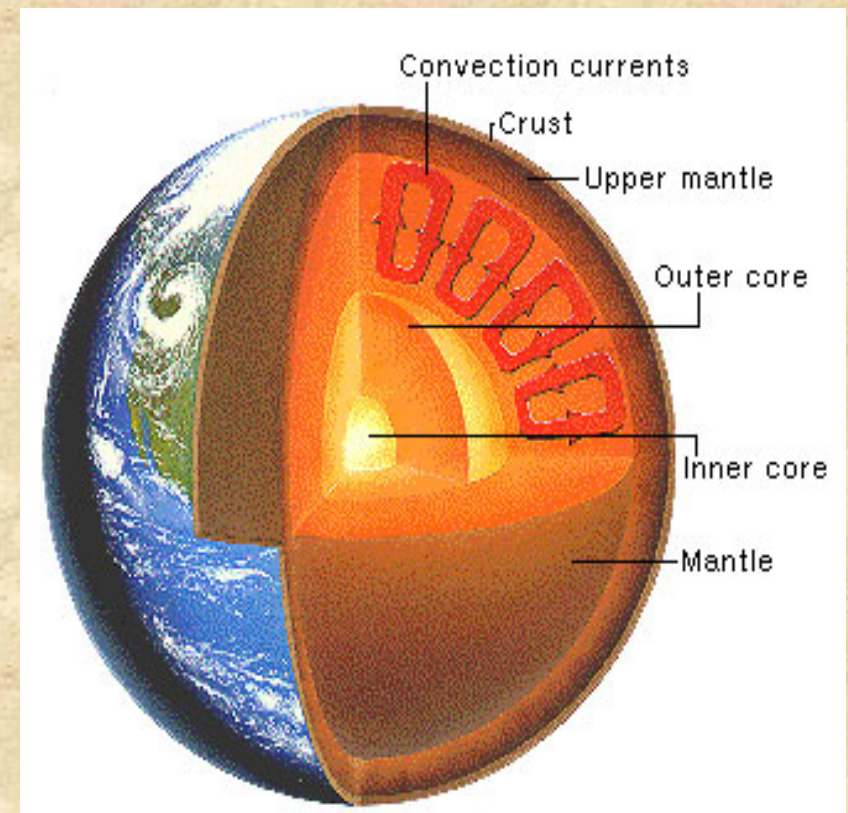
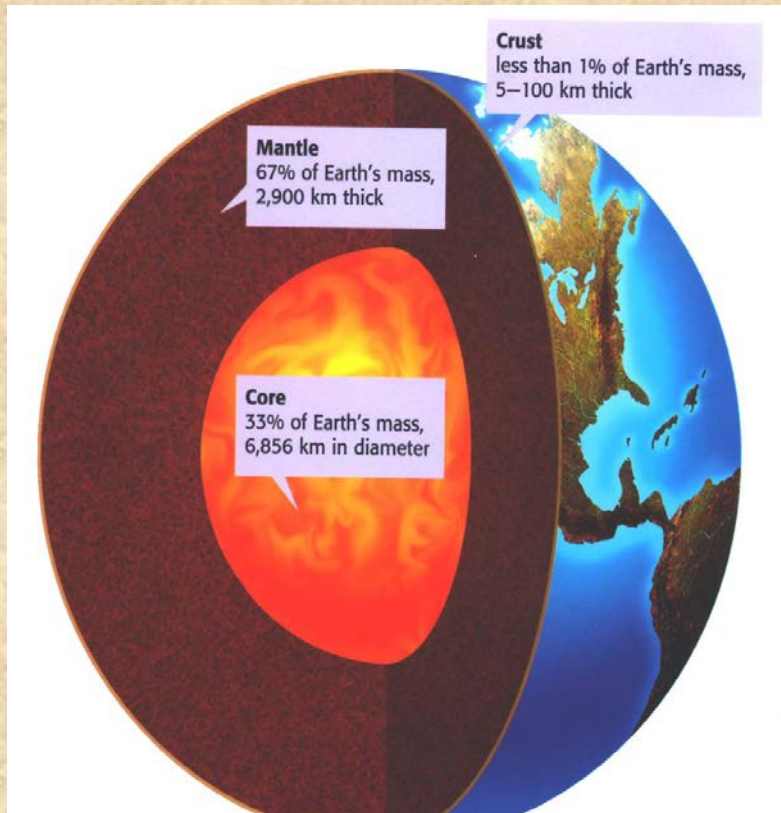
Texture

Structure

Physical properties of rocks

The earth zones

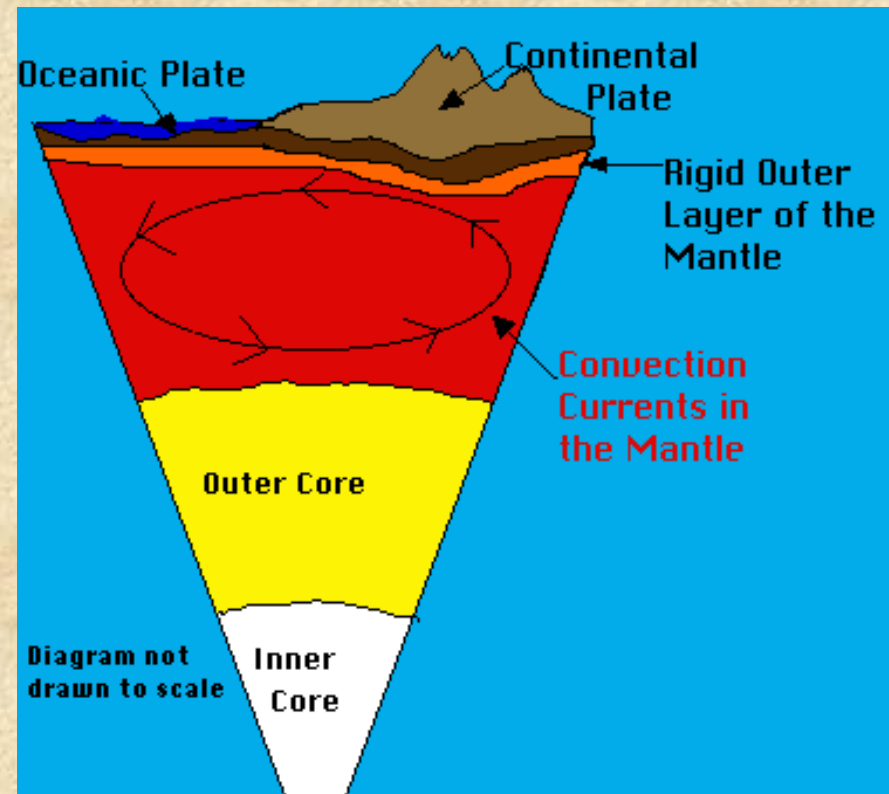
- Crust
- Mantle
- Core



The earth zones

Earth is a sphere of unknown material surrounded by a number of thin envelopes:

- (1) **Barysphere**
- (2) **Pyrosphere**
- (3) **Asthenosphere**
- (4) **Lithosphere**
- (5) **Tectonosphere**
- (6) **Hydrosphere**
- (7) **Atmosphere**
- (8) **Biosphere**



The earth zones

- The heavy interior is known as the *barysphere*. This is followed outwardly by the *lithosphere*, the thin, rocky crust of the earth; then by a more or less continuous skin of water, the *hydrosphere* " and finally by the outermost envelope of gas and vapour, the *atmosphere*.
- Other zones have been distinguished and named for special purposes:
- The zone of igneous activity and lava formation, situated between the lithosphere and the barysphere, is the *pyrosphere*,
- the living envelope which permeates the outermost zones, as the *biosphere*,
- A zone towards the base of the lithosphere which can sustain little or no stress has been called the *asthenosphere* (sphere of weakness);
- the zone in which crustal movements originate has been named the *tectonosphere*, by certain Continental geologists.

Composition of the earth shells

The earth has been called a projectile of nickel-steel covered with a slaggy crust.

Meteorites or shooting stars:

They are divided into three main groups which pass gradually one into the other:

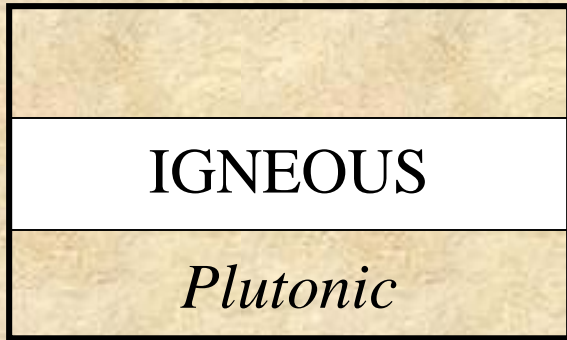
I. Siderites: - *The iron meteorites, consisting almost entirely of iron alloyed with nickel.*

II. Siderolites: - *Mixtures of nickel-iron and heavy basic silicates, such as olivine and pyroxene.*

III. Aerolites: - *The stony meteorites, consisting almost entirely of heavy basic silicates, olivine and pyroxenes, and resembling some of the rarer and most basic types of terrestrial igneous rocks*



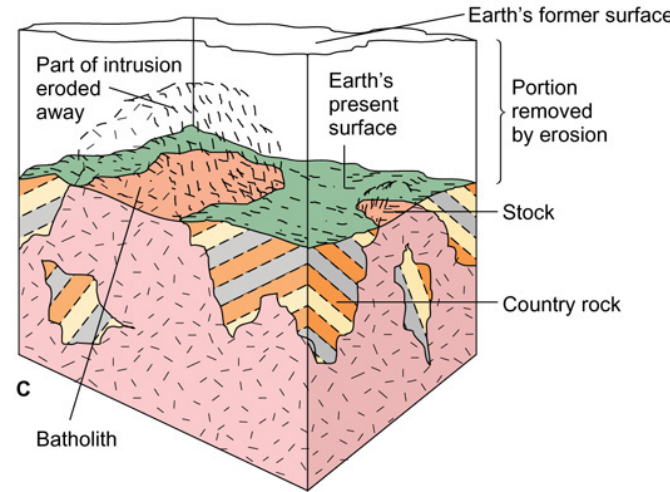
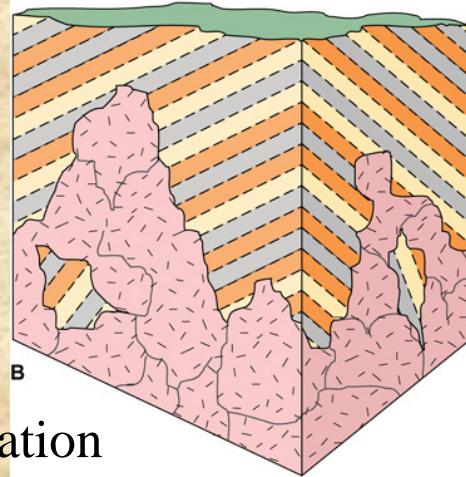
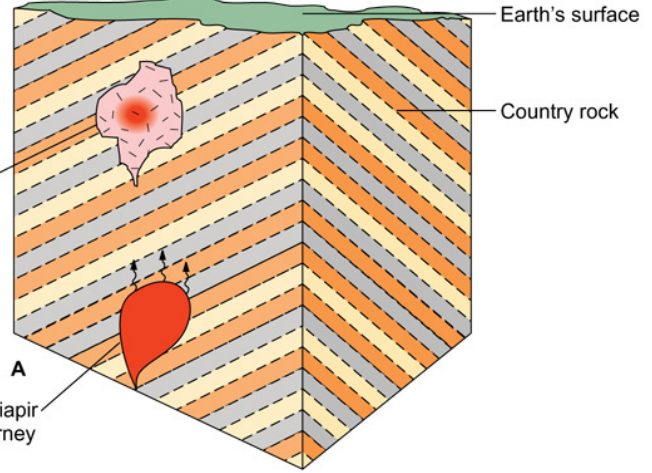
Classification of rocks

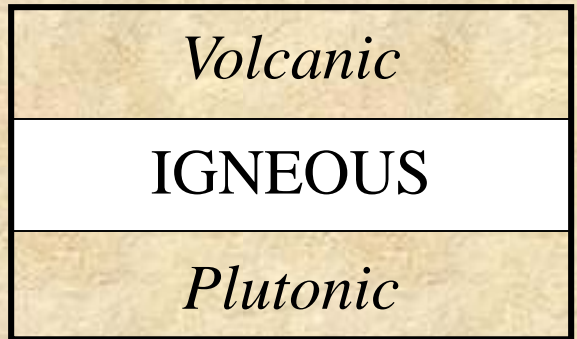
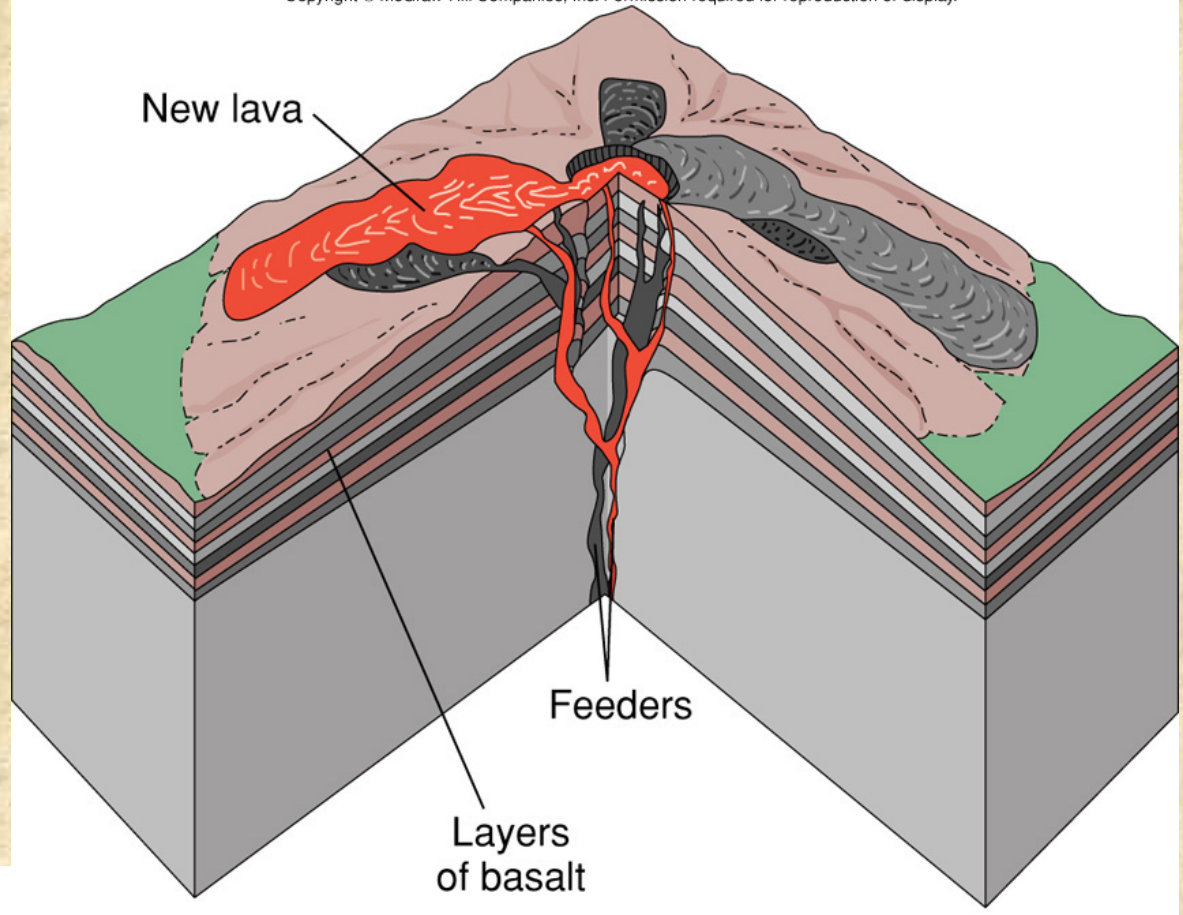


Crystallization



Pluton in place solidifying to granite

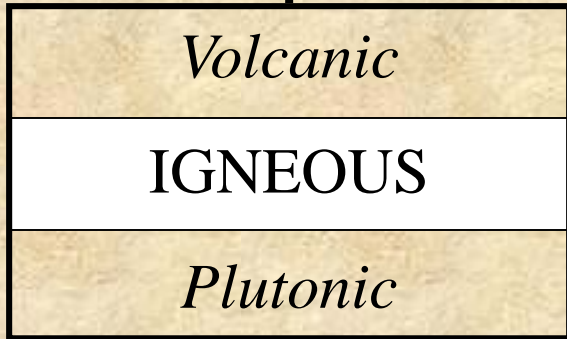
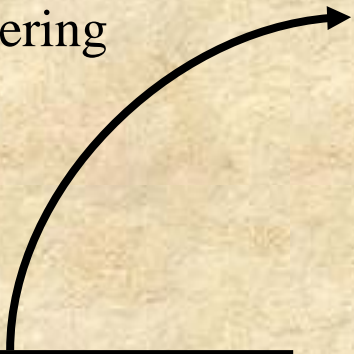




MAGMA

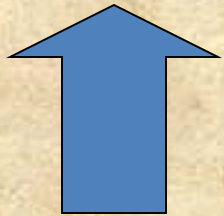


Weathering



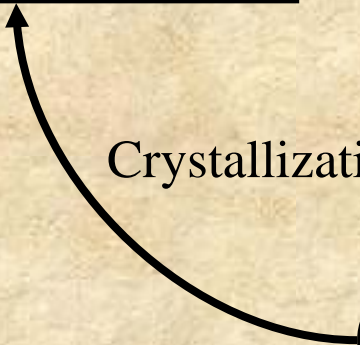
IGNEOUS

Plutonic



Uplift

Crystallization



MAGMA



