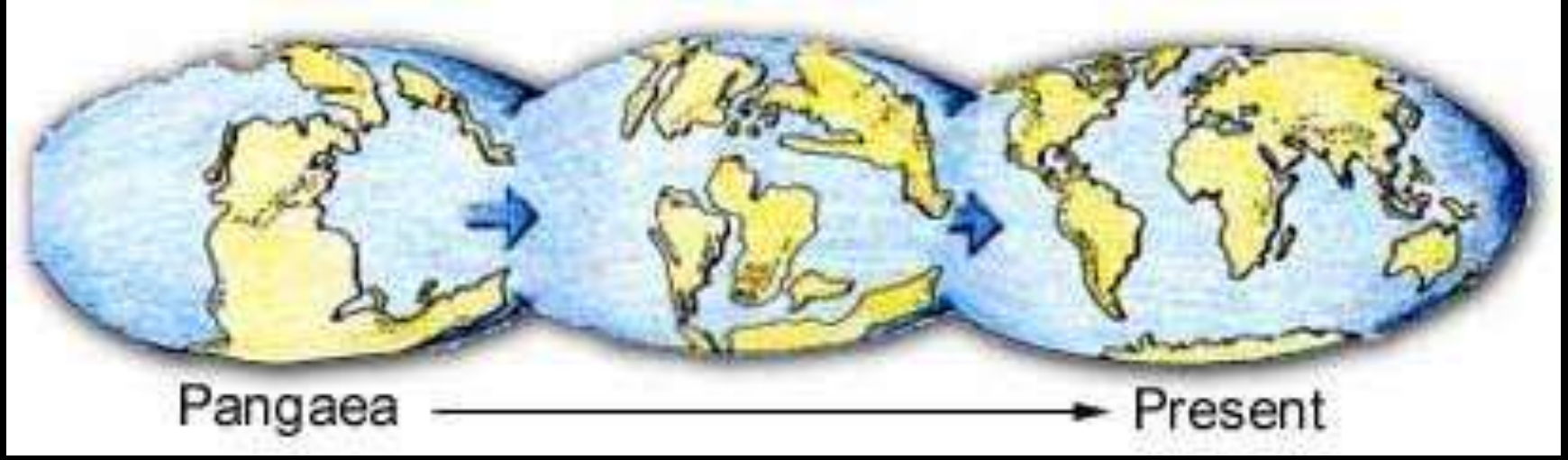
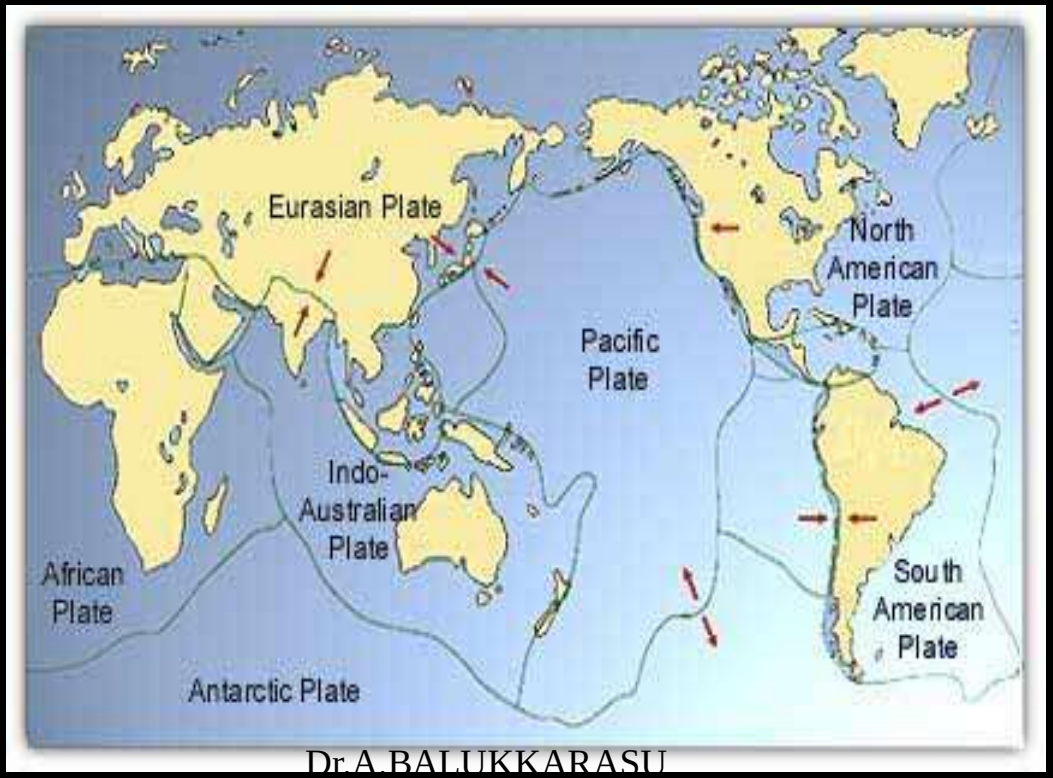
CONVECTION CURRENTS



What causes the plates to MOVE????



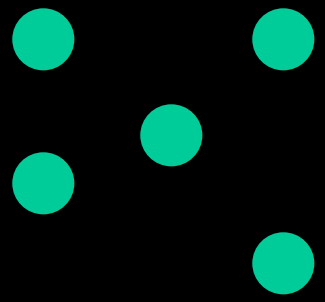
What exactly are ***Convection Currents***?

Density

- Density is the amount of anything in a certain space; the quantity of a matter in a given area.

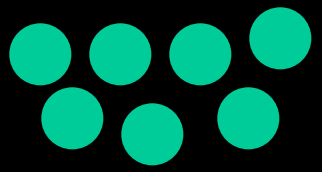
- Less dense WARM water contains-

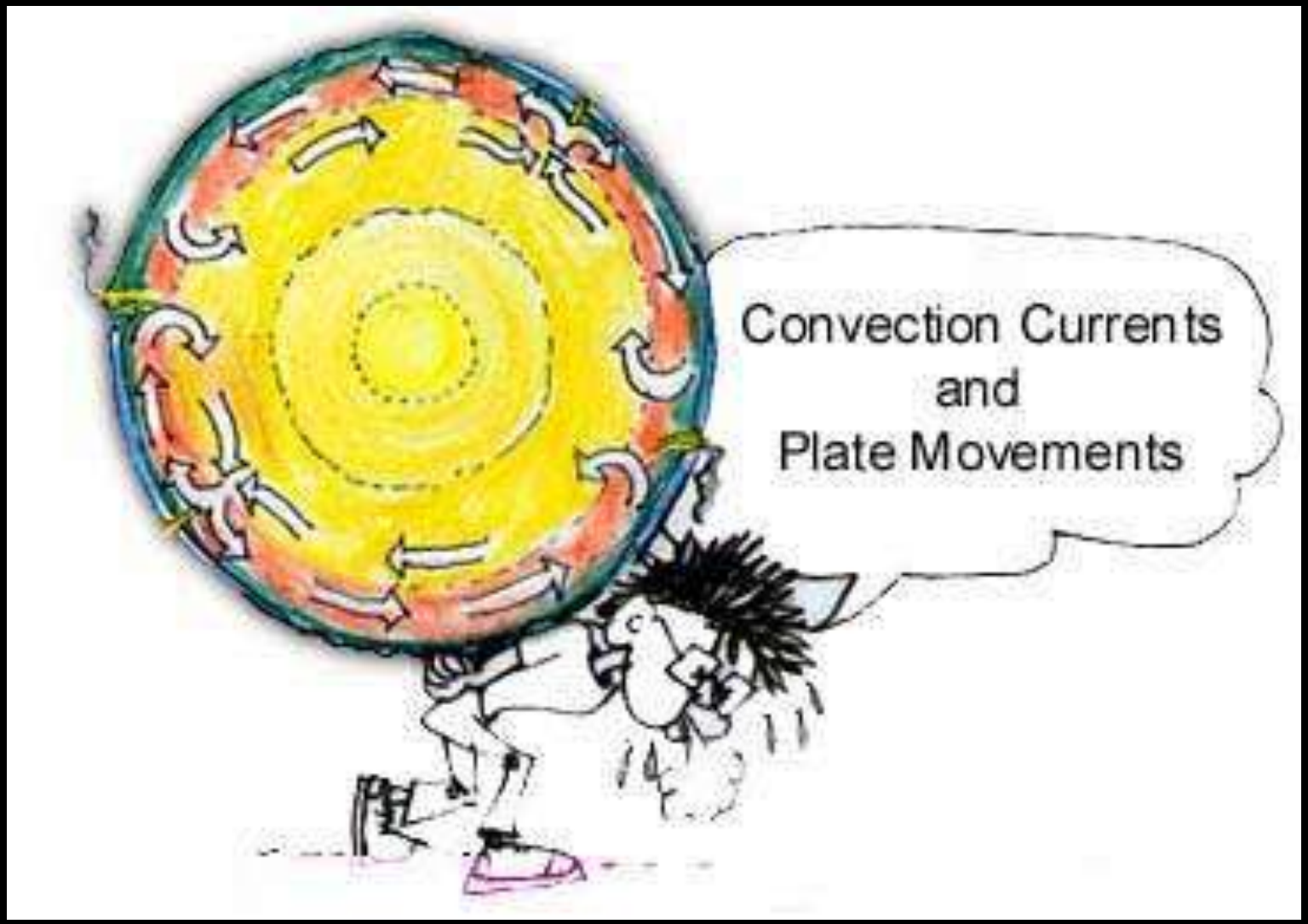
molecules that are not close to each other they are excited and move faster and are moving away from each other.

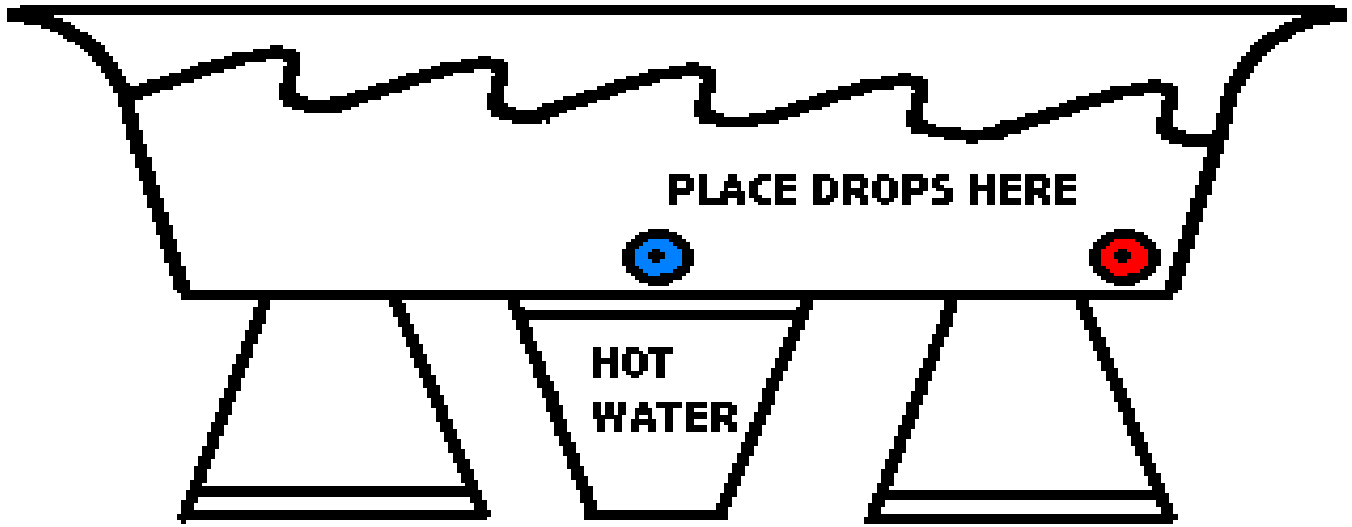


Denser Cold water contains-

- molecules that are close to each other, they are packed close and are Not able to move much.




Convection Currents
and
Plate Movements



Which way does the warmed water move ?

What happens when it reaches the surface?

Which way does the cooler water on the edges move?

Is warmer water denser or less dense than cooler water? Are the water molecules moving faster or slower in warmer water?

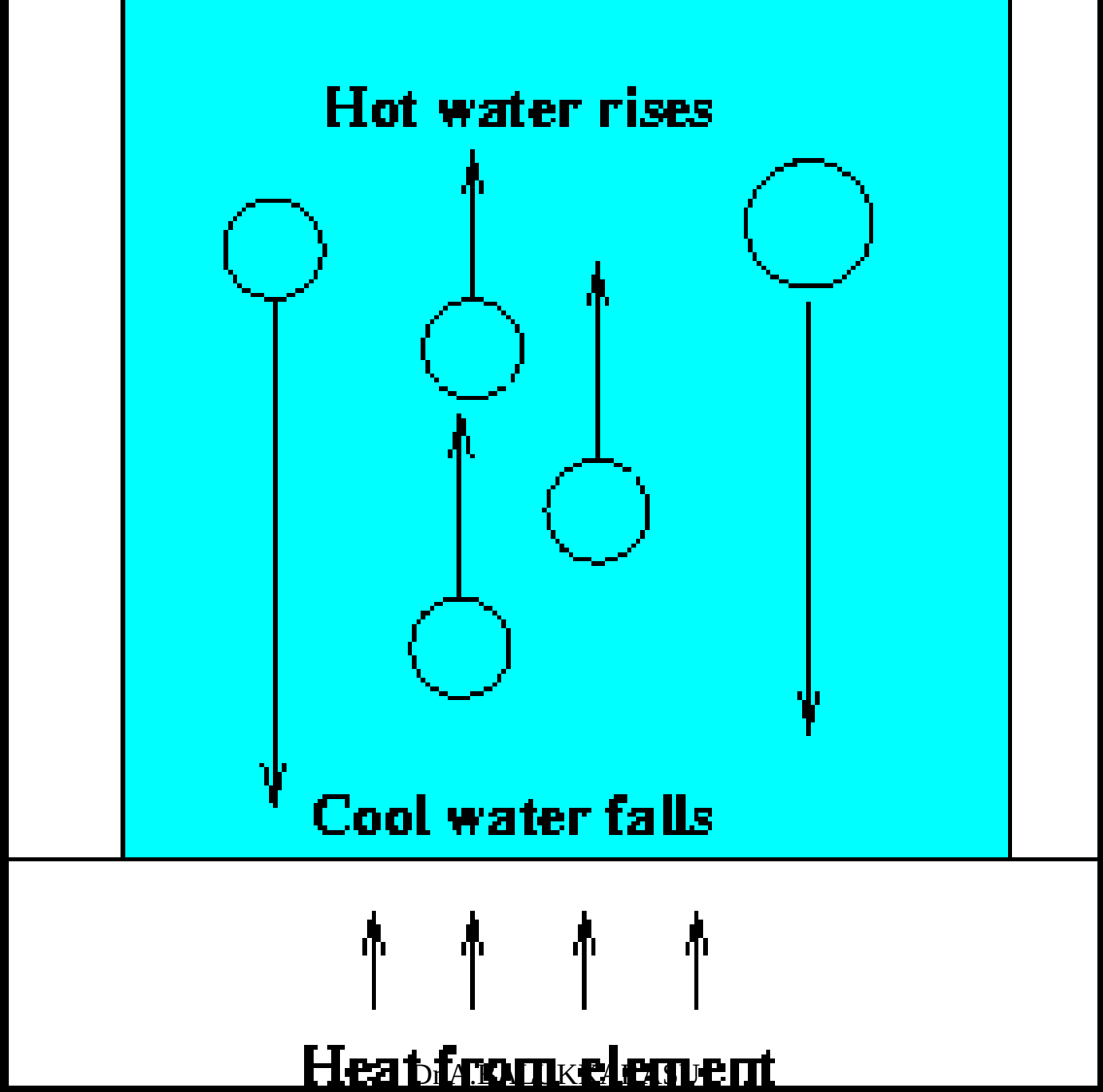
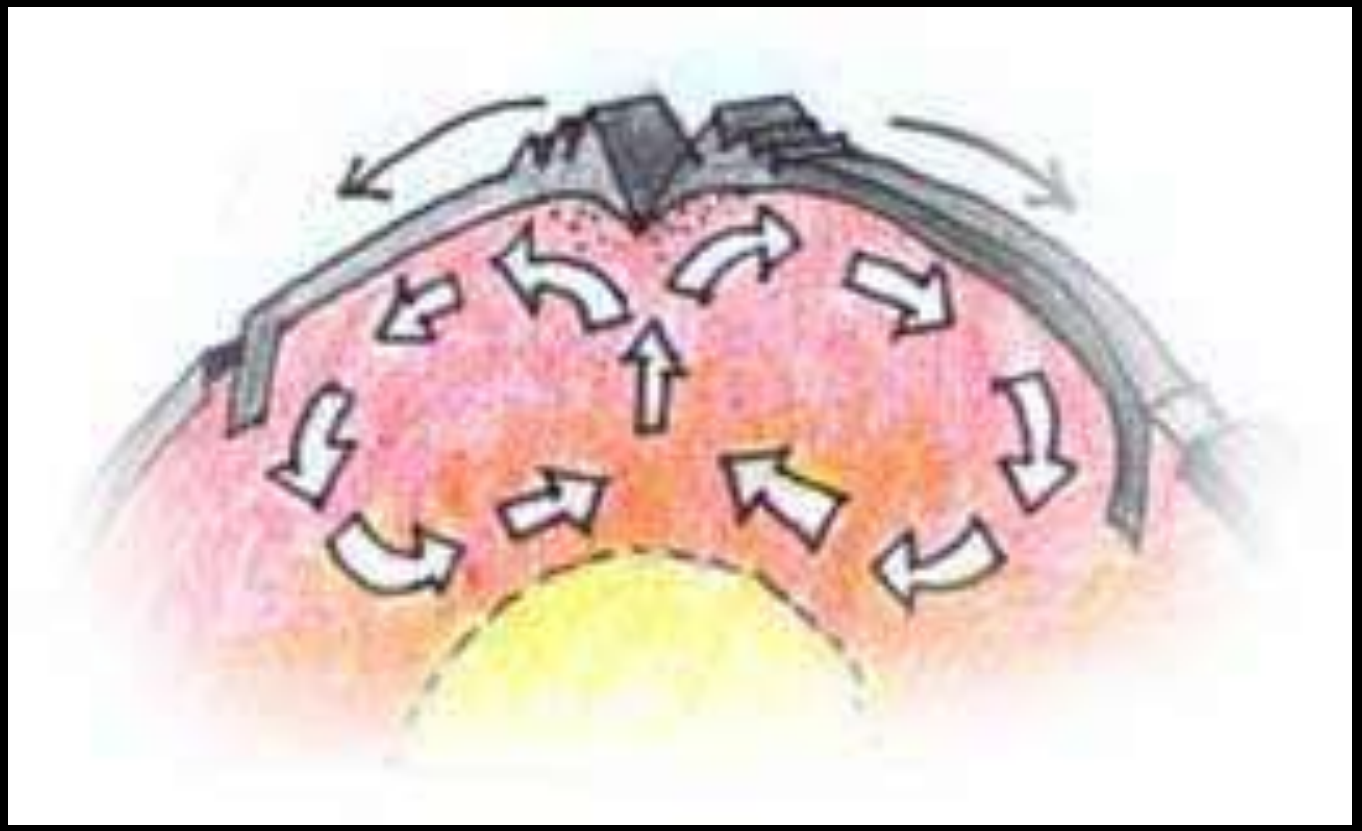
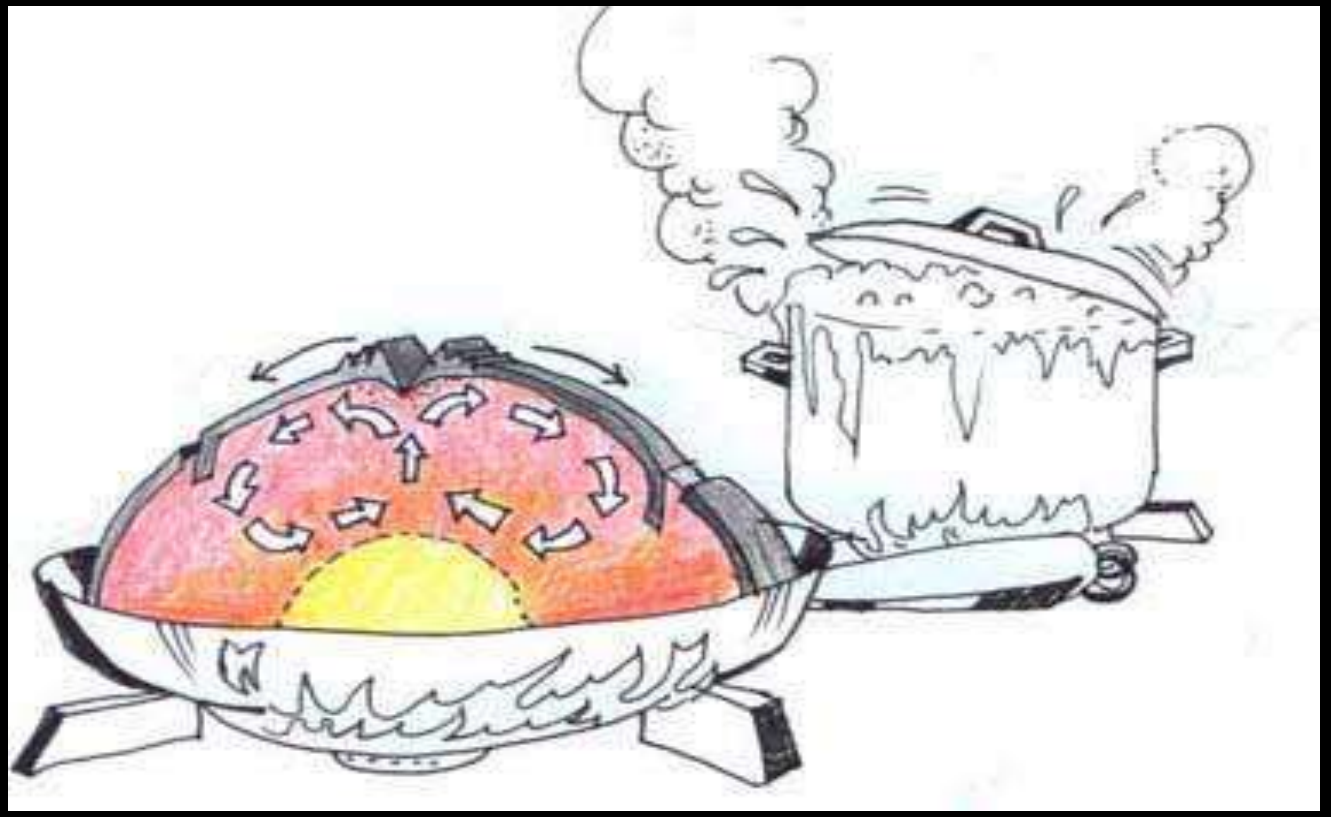

Hot water rises
Cool water falls
Heat from element

Diagram 2 of LAB What happens when we add hot water to the center of the tray o f water???



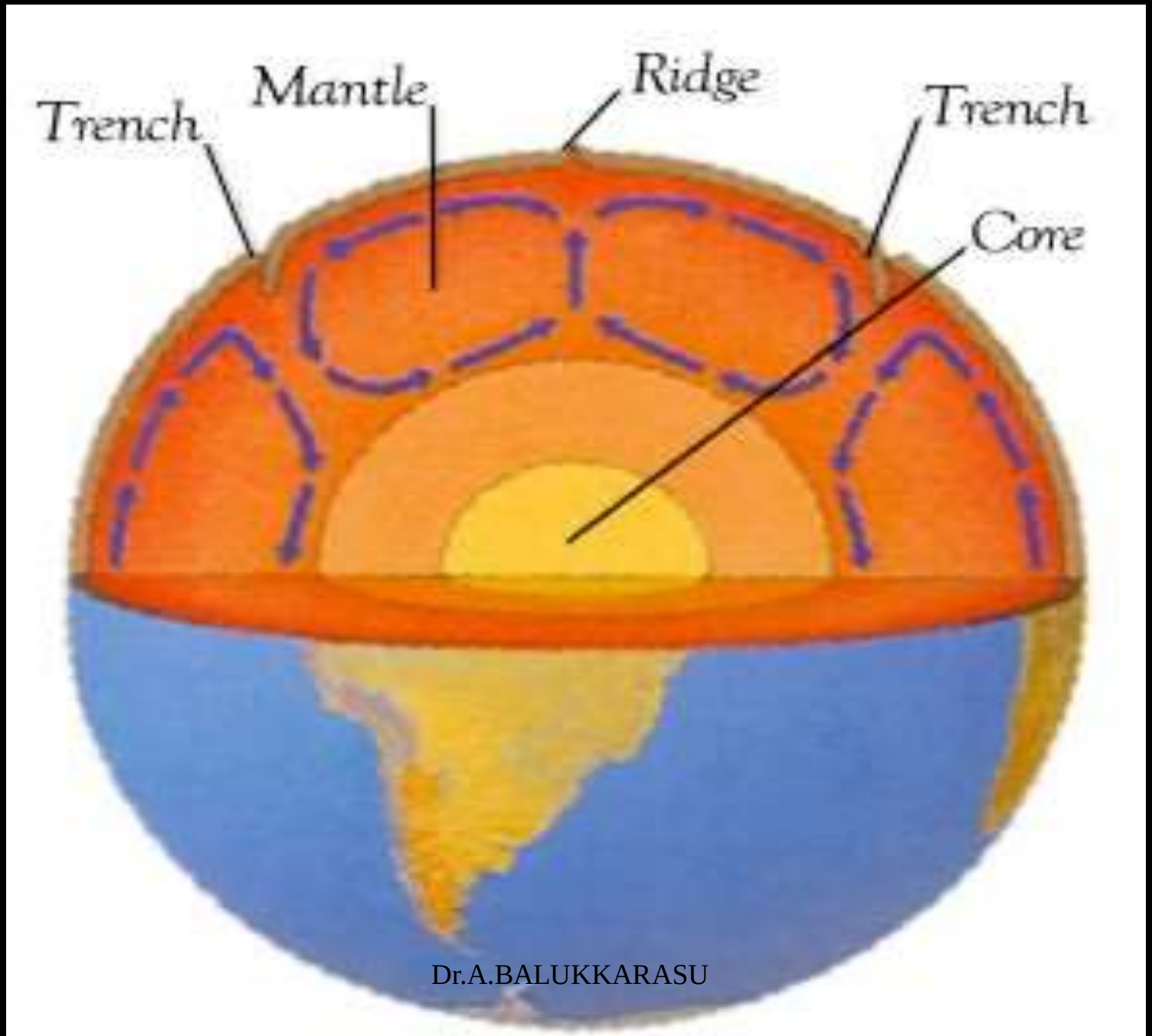
Magma heats up and rises.
Water that is heated expands and rises to the surface of the tray. Similarly, the magma nearer the core expands and rises to top of the mantle.

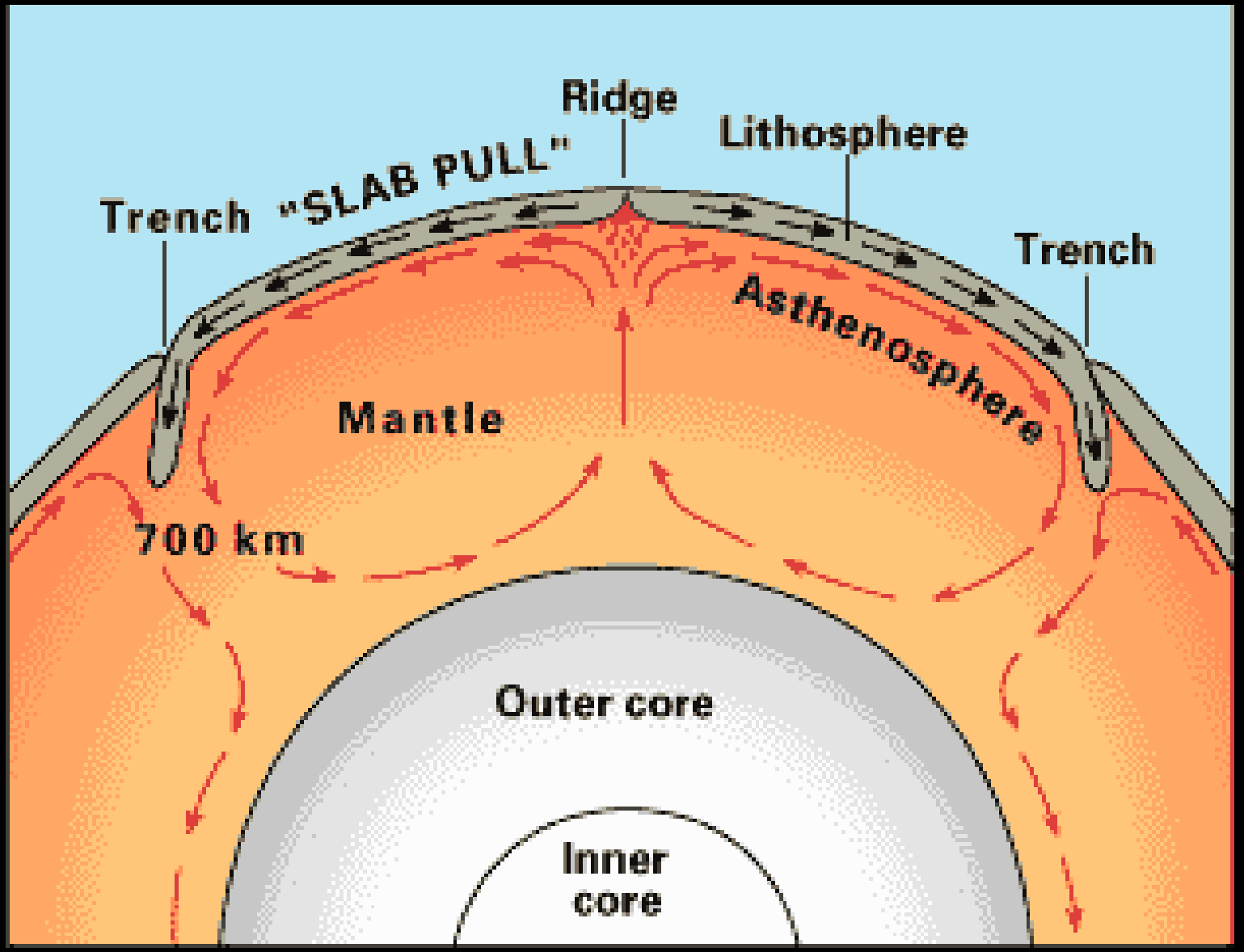
How does the experiment relate to Ocean Floor Spreading?

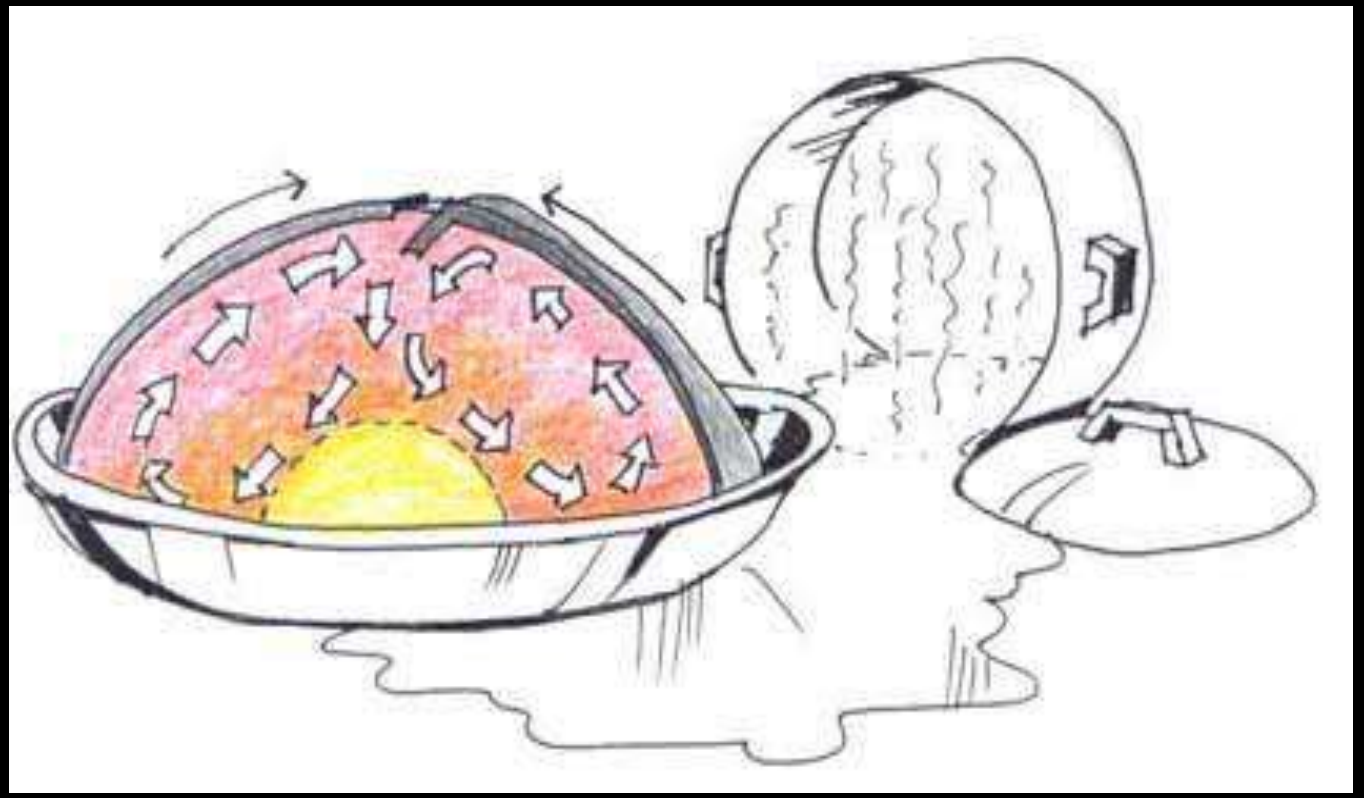


Magma spreads out, plates move apart.

Water that has risen spreads out across the surface, cools and sinks to the bottom. Similarly, the magma that has risen spreads out beneath the plates. As the magma spreads out, the plates are dragged along and they move away from each other. This is the process of **sea-floor spreading**.


Trench
Mantle
Ridge
Trench
Core


Ridge
Lithosphere
"SLAB PULL"
Trench
Trench
Asthenosphere
Mantle
700 km
Outer core
Inner
core



Magma sinks, plates dragged towards each other.

When the magma sinks, the plates are dragged towards each other. This is the process of **subduction**. The repeated heating and rising of the magma sets up continuous convection currents in the mantle, causing the plates to move.

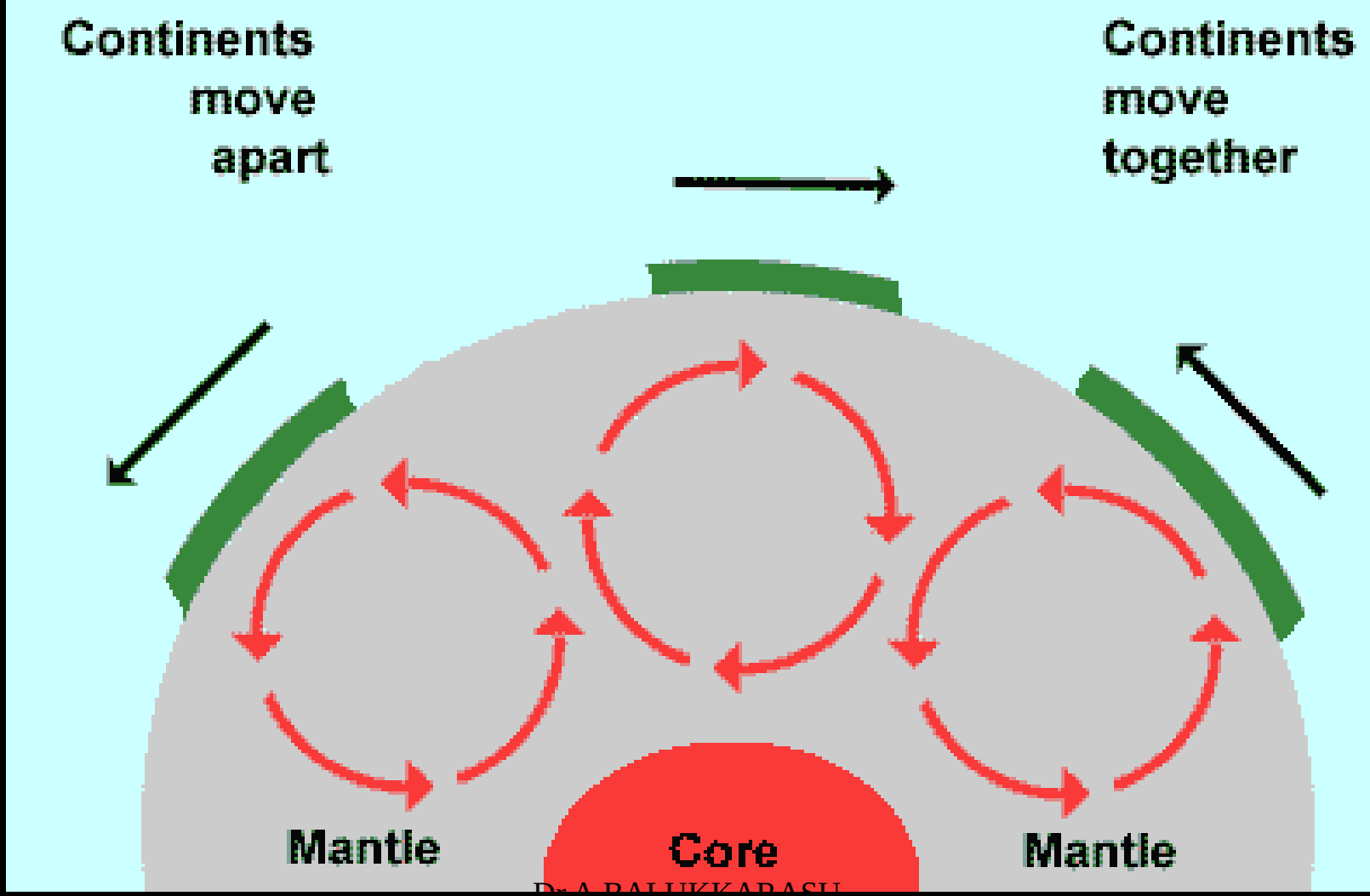
How does this experiment compare to a real convection current?

- Hot liquids are less dense than cold and will rise.
- In the Earth's deep mantle and outer core, the magma that is closer to the extremely hot inner core rises because it's less dense and then pushes the cooler magma that is further from the intense heat down.
- When the cooler magma is pushed down, it is heated more and rises. The somewhat less hot magma is more dense and so it sinks.
- This motion is what we call a convection current and is what causes the plates to move that are riding on the surface of all of this.

How does density and temperature effect plate movement?

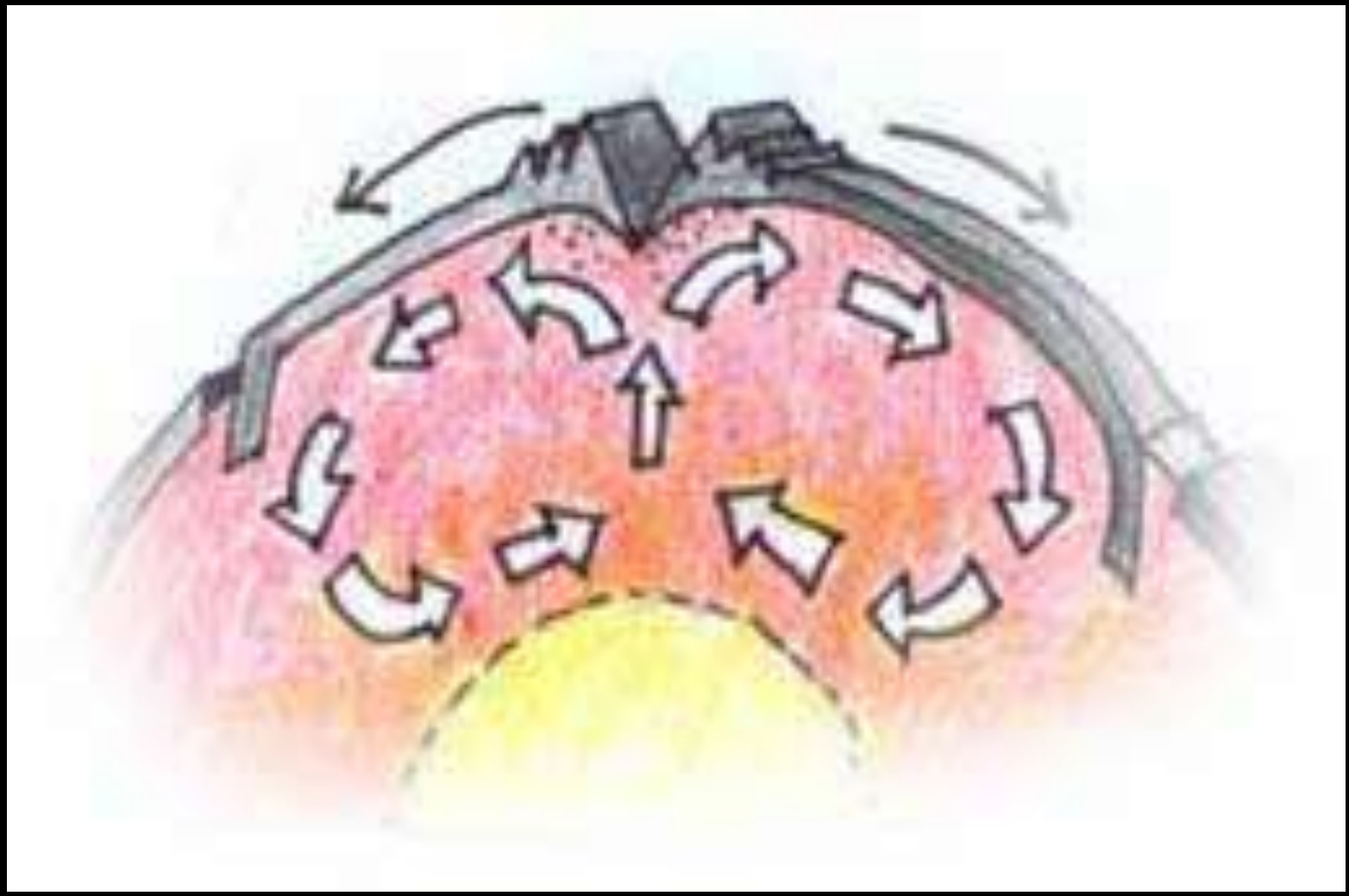
- Hotter material such as material in the earth's mantle is less dense and rises.
- Cooler more dense material in the earth's mantle is more dense and sinks.
- As cooler material becomes hot again it rises
- Rising and sinking occurs in a continuous cycle
- This circular motion carries plates of the lithosphere along with it the continents move.
- This process is called convection currents!

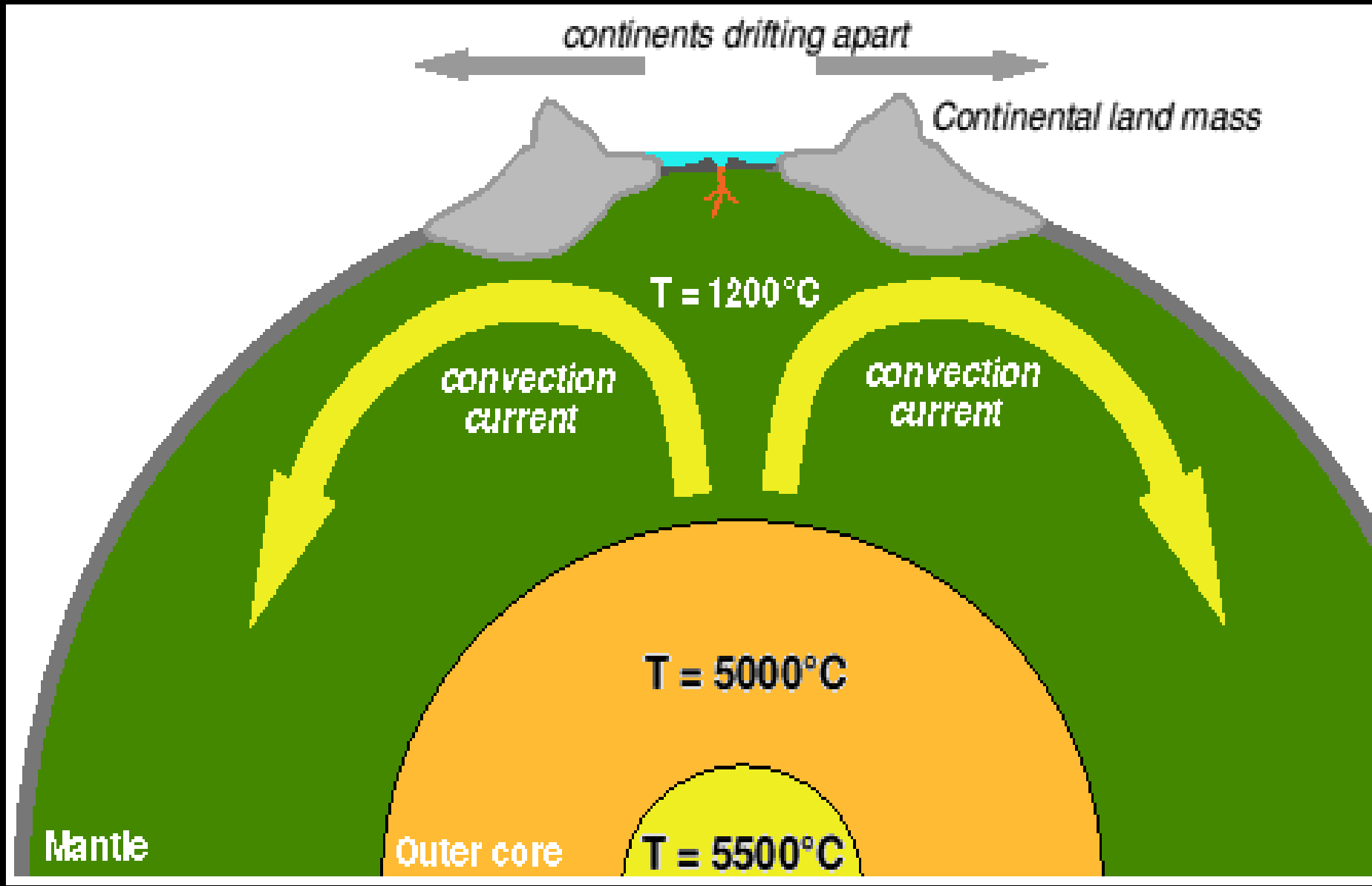
Convection Currents

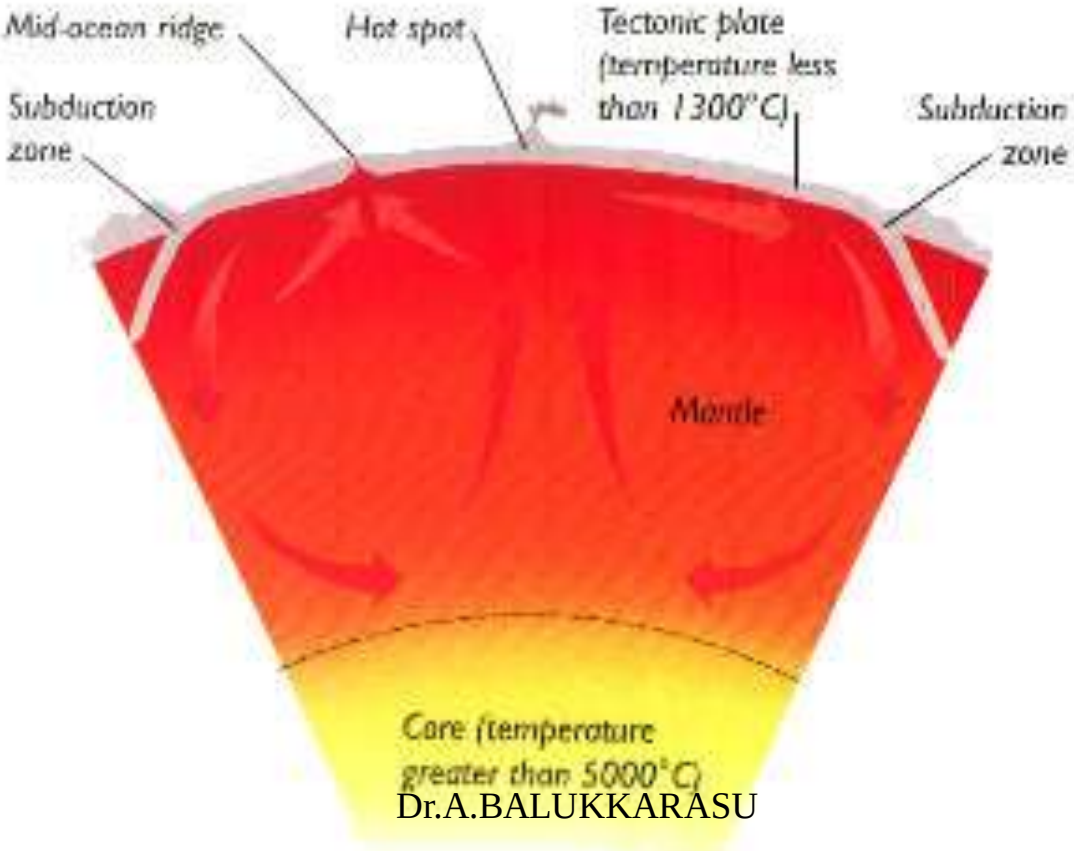


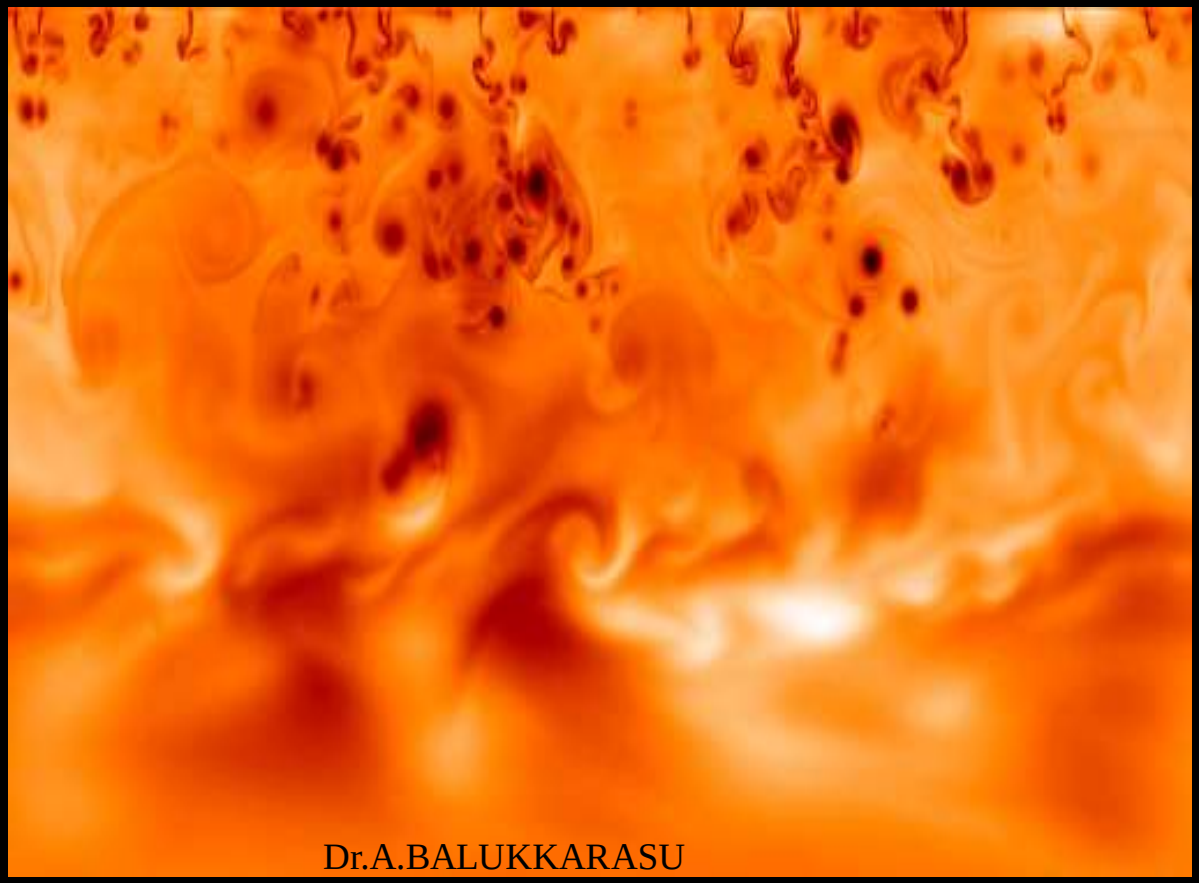
Density

- Density is the amount of anything in a certain space; the quantity of a matter in a given area.
- Hot liquids are less dense than cold liquids.
- Currents are a flow of water, air, or any liquid (or gas).
- Convection currents are circular currents or movement within a liquid (or gas) due to different densities of the hotter and cooler parts.




continents drifting apart
Continental land mass
T = 1200°C
convection current
convection current
T = 5000°C
T = 5500°C
Mantle
Outer core





Dr.A.BALUKKARASU

Tonight:

1) You will thoroughly complete your lab packet.

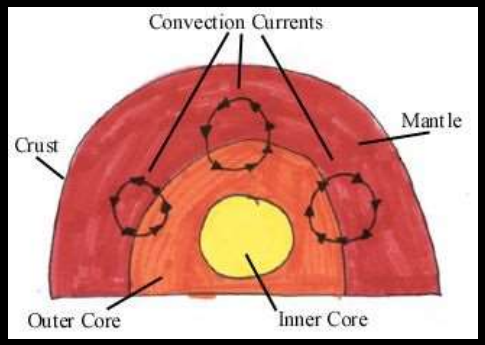
Reflect on loose-leaf….

1) How do convection currents relate to ocean floor spreading?

(This should be at least a paragraph!)

2) A simple diagram on a piece of white paper showing how a convection current works.

Ex:_



http://www.students.i.csbsju.edu/ijflenner/convection_currents.htm