

## **EARTH QUAKES - THEORIES - CRUSTAL THERMO COUPLE**

### **Earth Quakes:**

The scientists world over accepted the plate tectonic theory is the best to explain the causes of earth quakes. Tectonic earthquakes occur anywhere in the earth where there is sufficient stored elastic strain energy to drive fracture propagation along a fault plane. The sides of a fault move past each other smoothly and seismically only if there are no irregularities or asperities along the fault surface that increase the frictional resistance.

### **Controversy and Shortcomings:**

But Tectonic theory fails to explain how and why sufficient elastic strain energy is stored in a particular spot and time and then is released at a particular spot and time to drive fracture propagation along a fault plane. The sides of a fault move past each other smoothly and seismically only if there are no irregularities or asperities along the fault surface that increase the frictional resistance.

At the time of Tsunami in Japan while reading news paper, I retorted it is due to THERMO COUPLE. I then started collecting data and observations for the same and came to conclusion:

The scientists do not differ to consider any other theory beside Plate Tectonic. Whereas Plate Tectonic is blunt because it does not tell us about the driving force of the earthquake and about exactly when, where and how they will occur. But on the other hand The Thermo couple Theory tell us about the driving force and other related factors once we study the implications of Thermo Couple Theory in relation to earthquakes.

### **What is a Thermo couple?**

- A thermocouple is comprised of at least two metals joined together to form two junctions. One is connected to the body whose temperature is to be measured; this is the hot or measuring junction. The other junction is connected to a body of known temperature; this is the cold or reference junction. Therefore the thermocouple measures unknown temperature of the body with reference to the known temperature of the other body.
- Working Principle.

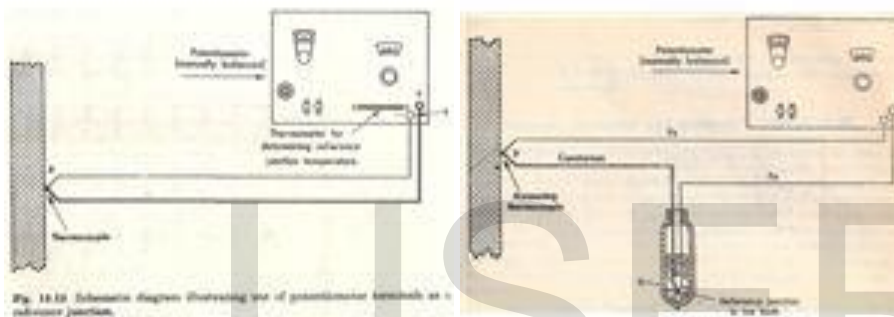
**The working principle of thermocouple is based on three effects, discovered by Seebeck, Peltier and Thomson. They are as follows:**

1. Seebeck effect: The Seebeck effect states that when two different or unlike metals are joined together at two junctions, an electromotive force (emf) is generated at the two junctions. The amount of emf generated is different for different combinations of the metals.

2. Peltier effect: As per the Peltier effect, when two dissimilar metals are joined together to form two junctions, emf is generated within the circuit due to the different temperatures of the two junctions of the circuit.
3. Thomson effect: As per the Thomson effect, when two unlike metals are joined together forming two junctions, the potential exists within them due to temperature gradient along the entire length of the conductors within the circuit.

In circuit most of the cases the emf suggested by the Thomson effect is very small and it can be neglected by making proper selection of the metals. The Peltier effect plays a prominent role in the working principle of the thermocouple.

➤ Diagrams



➤ How it Works

The general circuit for the working of thermocouple is shown in the figure 1 above. It comprises of two dissimilar metals, A and B. These are joined together to form two junctions, p and q, which are maintained at the temperatures  $T_1$  and  $T_2$  respectively. Remember that the thermocouple cannot be formed if there are not two junctions. Since the two junctions are maintained at different temperatures the Peltier emf is generated within the circuit and it is the function of the temperatures of two junctions.

If the temperature of both the junctions is same, equal and opposite emf will be generated at both junctions and the net current flowing through the junction is zero. If the junctions are maintained at different temperatures, the emf's will not become zero and there will be a net current flowing through the circuit. The total emf flowing through this circuit depends on the metals used within the circuit as well as the temperature of the two junctions. The total emf or the current flowing through the circuit can be measured easily by the suitable device. (Down Loaded)

### NATURE OF CRUST AND MANTLE:

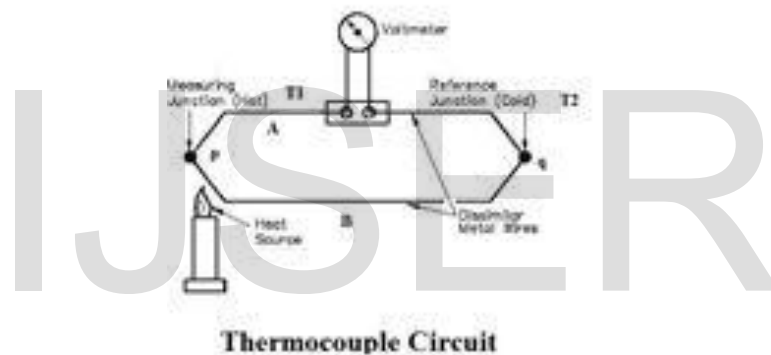
The crust and Mantle are porous by nature to accommodate and hold rain water to maintain the level of ground water above the water level of sea, river or nearby water body.

It has some pockets wherein water is always trapped from flowing to other places.

The temperature of ground water is always maintained colder than the sea/ocean water because of Constant / continuous evaporation from the earth surface and transpiration by plants.

The crust has variety of metals and there may be many dissimilar metals joined to form dormant arrays of Thermo Couples one end of which gets heated up to 2300° C due to heat from sun or from core of the earth.

**The voltage developed across Thermo Couple array is given by:**



$$V \propto (T2 - T1)$$

(difference of temp. across both ends)

$$V = A ( T2 - T1 )$$

$$V = A (2300 - 30) \text{ volts}$$

This voltage goes on accumulating very high potential across the two ends of

The thermo couple separated by material of high dielectric constant and no sooner this dielectric constant is broken, there is a huge FLASH/SPARK (This point is called the Epicenter) and the heavy current (Seebeck and Peltier Effect) flows through a closed circuit which creates havoc.

### EARTH QUAKES:

**General description;** It is generally seen that in cases of earth quakes, the earth shakes and tremors are felt on ground by shaking things with certain velocity which is measured on Richter scale.

The underground water is stored in above the rocky mantle at various places in pockets.

There may be many metals forming Thermo Couples/Arrays of Thermo couple. In summer season, one end p of The Thermo couple array when gets heated up/ activated, and gets charge accumulated on both points p and q. Both ends when highly charged /breaking down of dielectric constant, there would be a flash / spark of high intensity and this point is called "epicenter". This flash / Spark creates termers in the mantle of earth because it needs water to quench its thirst/ to equalize the temperature of both its ends. But water is not available in / around the vicinity but far away about 100 km. in pockets. So on breaking of dielectric constant of the medium/ getting activated (from epicenter), it sends termers to get the water released from such water pockets. The termers will go on till the time the thirst of the thermo couple is not quenched or the temperature of both ends gets equalized.

Recently there was an earth quake in Haryana having Epicenter at Hissar and termers were felt up to NCR towards East but no termers were reported from West. This proves that Thermo Couple got its requirement of water fulfilled from NTR.

All the drawbacks of plate tectonic are cleared in the case of Thermo Couple theory.

- (a) How the energy was accumulated and released at particular time and place. The points have been explained as above.

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