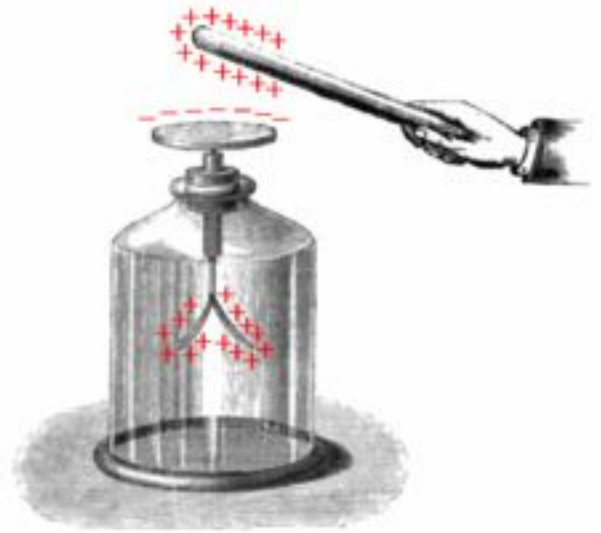


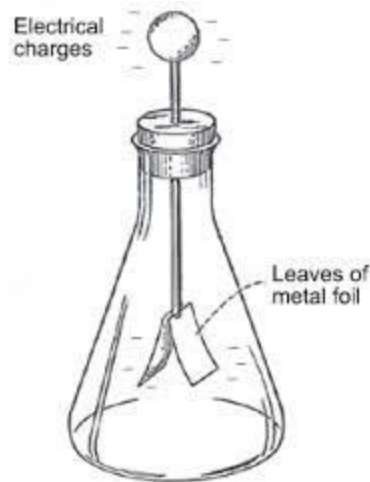
ELECTROSCOPE

An **electroscope** is an early scientific measurement that is used to detect the presence and magnitude of electric charge on a body. It was the first electrical measuring instrument.



MAKING:

We take a glass jar with a cork. A conducting wire is passed through this cork and thin strips of aluminium foils are connected to it.

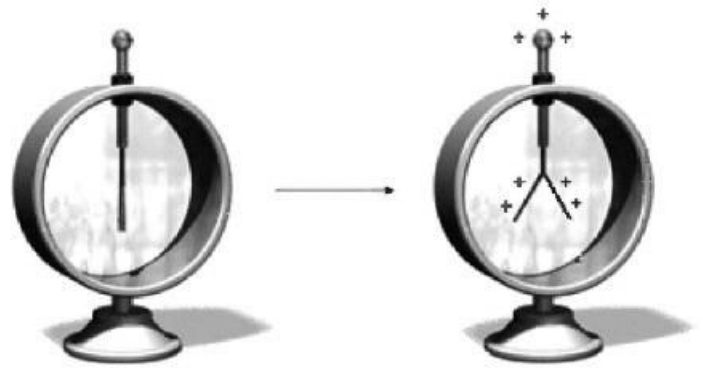


The pith ball electroscope and the **gold-leaf electroscope** are two classical types of electroscope that are still used in physics education to demonstrate the principles of electrostatics. Electroscopes were used by the Austrian scientist Victor Hess in the discovery of cosmic rays.

PRINCIPLE:

It is based on the following principles:

- Whenever two charges of similar nature come closer they experience a repulsion where charge opposite polarity attract each other.



b. It also works on the principle of induced charge.

WORKING:

A metal conductor is connected to the aluminium leaves which goes straight up to the neck of the bottle. As a charged body (say positively charged) is brought near to the metal conductor the negative charge gets collected at the nearest end of the conductor. The other end (leaves) occupy a temporarily positive charge. The leaves repel each other because they carry similar charge. As the charge is removed from the top end it occupies its original state and the leaves come closer. The charging can be done via two methods:

i. **Charge by conduction**: By simply touching the metal conductor with a charged body.

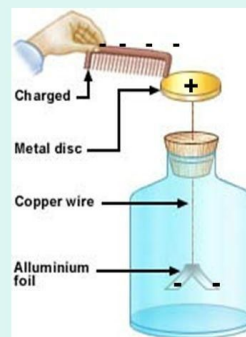
Charge by conduction- (direct contact)

Comb is negatively charged

Comb repels extra electrons on top leaving it positive.

Leaves collect electrons making them negatively charged

Leaves separate



ii. **Charge by Induction**: By bringing a charged body near to it and not touching it. This

attracts the opposite charge which in turn gets accumulated at the end.

Charging By Induction



Step 2:

When you **ground** the neutral electroscope, you provide its electrons with a **path** away from the **repulsive** influence. Some electrons **leave** the electroscope.

APPLICATION:

1. It is used to detect high voltage. (Generally used for comparison of the two charged sources)
2. It can be used to detect polarity of the high voltage supply. We begin with charging it with any polarity (say positive) and later bring the high voltage supply near to it. If they get attracted, it implies that the charges are of opposite nature.

Side view of leaf electroscope

