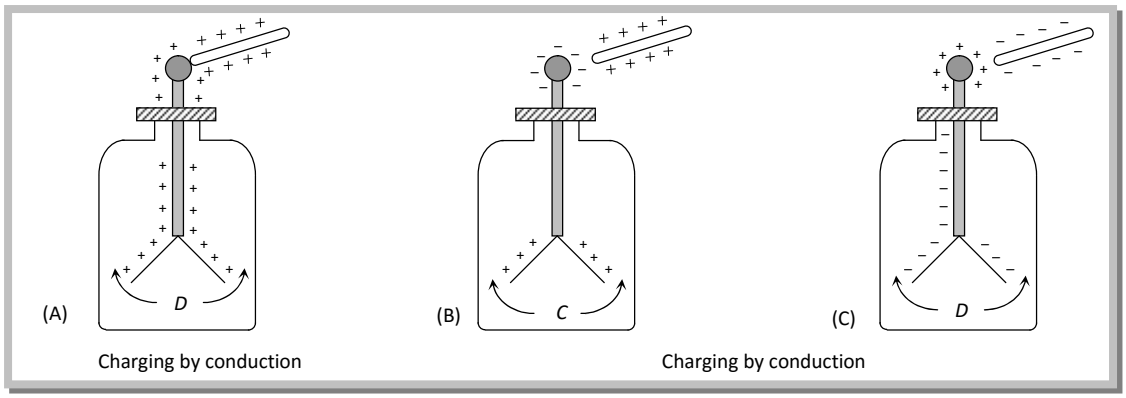
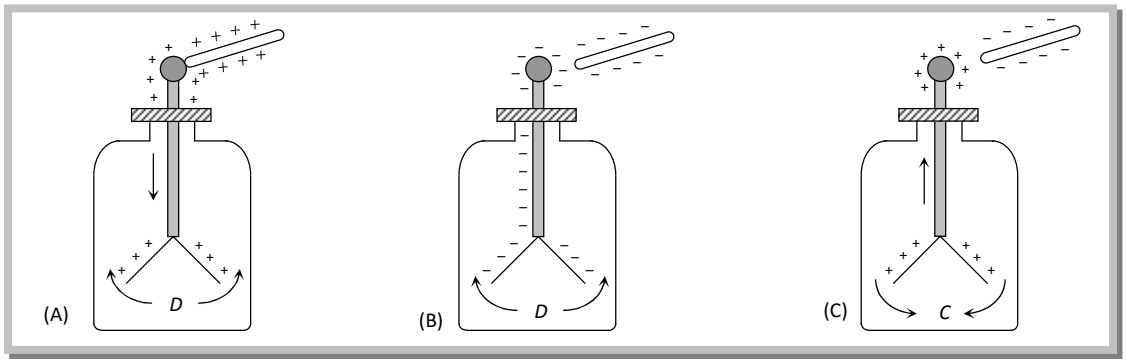
Electroscope.

It is a simple apparatus with which the presence of electric charge on a body is detected (see figure). When metal knob is touched with a charged body, some charge is transferred to the gold leaves, which then diverges due to repulsion. The separation gives a rough idea of the amount of charge on the body. If a charged body brought near a charged electroscope the leaves will further diverge. If the charge on body is similar to that on electroscope and will usually converge if opposite. If the induction effect is strong enough leaves after converging may again diverge.

(1) **Uncharged electroscope**

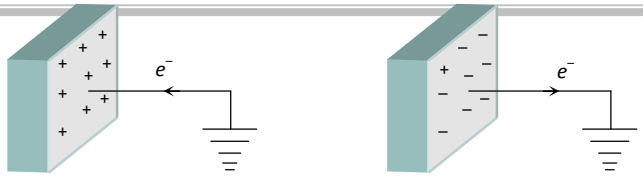


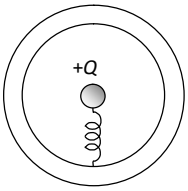
(2) **Charged electroscope**



Concepts

☞ After earthing a positively charged conductor electrons flow from earth to conductor and if a negatively charged conductor is earthed then electrons flows from conductor to earth.





☞ When a charged spherical conductor placed inside a hollow insulated conductor and connected if through a fine conducting wire the charge will be completely transferred from the inner conductor to the outer conductor.

☞ Lightening-rods arrestors are made up of conductors with one of their ends earthed while the other sharp, and protects a building from lightening either by neutralizing or conducting the charge of the cloud to the ground.

☞ With rise in temperature dielectric constant of liquid decreases.

☞ Induction takes place only in bodies (either conducting or non-conducting) and not in particles.

☞ If X-rays are incident on a charged electroscope, due to ionisation of air by X-rays the electroscope will get discharged and hence its leaves will collapse. However, if the electroscope is evacuated. X-rays will cause photoelectric effect with gold and so the leaves will further diverge if it is positively charged (or uncharged) and will converge if it is negatively charged.

☞ If only one charge is available than by repeating the induction process, it can be used to obtain a charge many times greater than its equilibrium. (High voltage generator)