SOME NATURAL PHENOMENON

I. LIGHTNING:

You might have seen sparks on an electric pole when wires become loose. This phenomenon is quite common when a wind is blowing and shaking the wires. You might also have seen sparks when a plug is loose in its socket. Lightning is also an electric spark, but on a huge scale.

In ancient time people did not understand the cause of these sparks. They were, therefore, afraid of lightning and thought that the wrath of gods was visiting them. Now, of course, we understand that lightning is caused by the accumulation of charges in the clouds. We need not be afraid of lightning, but we have to take precautions to protect ourselves from the deadly sparks.

II. CHARGING BY RUBBING:

Take a used ball pen refill and rub it vigorously with a piece of polythene. Bring it close to small pieces of paper. Take care not to touch the rubbed end of the refill with your hand or with a metallic object. Repeat the activity with small pieces of dry leaf, husk and mustard seeds. Record your observations.

When a plastic refill is rubbed with polythene, it acquires a small electric charge. Similarly, when a plastic comb is rubbed with dry hair, it acquires a small charge. These objects are called **charged objects.** In the process of charging the refill and the plastic comb polythene and hair also get charged.

III. TYPES OF CHARGES AND THEIR INTERACTION:

Rub a refill and place it gently in a glass tumbler as before. Bring an inflated charged balloon near the refill and observe. Let's summarize the observations:A charged balloon repelled a charged balloon. A charged refill repelled a charged refill. But a charged balloon attracted a charged refill.

Does it indicate that the charge on the balloon is of a different kind from the charge on the refill? Can we say then, that there are two kinds of charges? Can we also say that the charges of the same kind repel each other, while charges of different kind attract each other?**It is a convention to call the charge acquired by a glass rod when it is rubbed with silk as positive.** The other kind of charge is said to be negative.It is observed that when a charged glass rod is brought near a charged plastic straw rubbed with polythene there is attraction between the two. The plastic straw would carry a negative charge is correct. The electrical charges generated by rubbing are static. They do not move by themselves. When charges move, they constitute an electric current. The current in a circuit which makes a bulb glow, or the current that makes a wire hot, is nothing but a motion of charges.

IV. TRANSFER OF CHARGE

Take an empty jam bottle. Take a piece of cardboard slightly bigger in size than the mouth of the bottle. Pierce a hole in it so that a metal paper clip could be inserted. Open out paper clip as shown in figure. Cut two strips of aluminium foil about 4cm×1cmeach. Hang them on the paper clip in the cardboard lid so that it is perpendicular to it. Charge a refill and touch it with the end of the paper clip. Observe what happens. Is there any effect on the foil strips? Do they repel each other or attract each other? Touch now, other charged bodies with the end of the paper clip. Do foil

strips behave in the same way in all cases? Can this apparatus be used to detect whether a body is charged or not? Can you explain why the foil strips repel each other?

V. LIGHTNING

During the developments of a thunderstorm, the air currents move upward while the water droplets move downward. These vigorous movements cause separation of charges. By a process, not yet completely understood, the positive charges collect near the upper edges of the clouds and the negative charges accumulate near the lower edges. There is accumulation of positive charges near the ground also. When the magnitude of the accumulated charges becomes very large, the air which is normally a poor conductor of electricity is no longer able to resist their flow. Negative and positive charges meet, producing streaks of bright light and sound. We see streaks as lightning (Fig. 15.5). The process is called an electric discharge.

VII. EARTHQUAKES

An earthquake can cause damage to human life and property on a huge scale. A major earthquake occurred in India on 8th October 2005 in Uri and Tangdhar towns of North Kashmir. Before that a major earthquake occurred on 26th January 2001 in Bhuj District of Gujarat.

What is an Earthquake?

An earthquake is a sudden shaking or trembling of the earth lasting for a very short time. It is caused by a disturbance deep inside the earth's crust.

Earthquakes occur all the time, all over the earth. They are not even noticed. Major earthquakes are much less frequent. They can cause immense damage to buildings, bridges, dams and people. There can be a great loss to life and property. The earthquakes can cause floods, landslides and tsunamis. A major tsunami occurred in the Indian Ocean on 26th December 2004. All the coastal areas around the ocean suffered huge losses.

What Causes an Earthquake?

In ancient times, people did not know the true cause of earthquakes. Their ideas were, therefore, expressed in mythical stories such as the one told by Boojho's grandmother. Similar myths were prevalent in other parts of the world. Now we know that the tremors are caused by the disturbance deep down inside the uppermost layer of the earth called the crust.