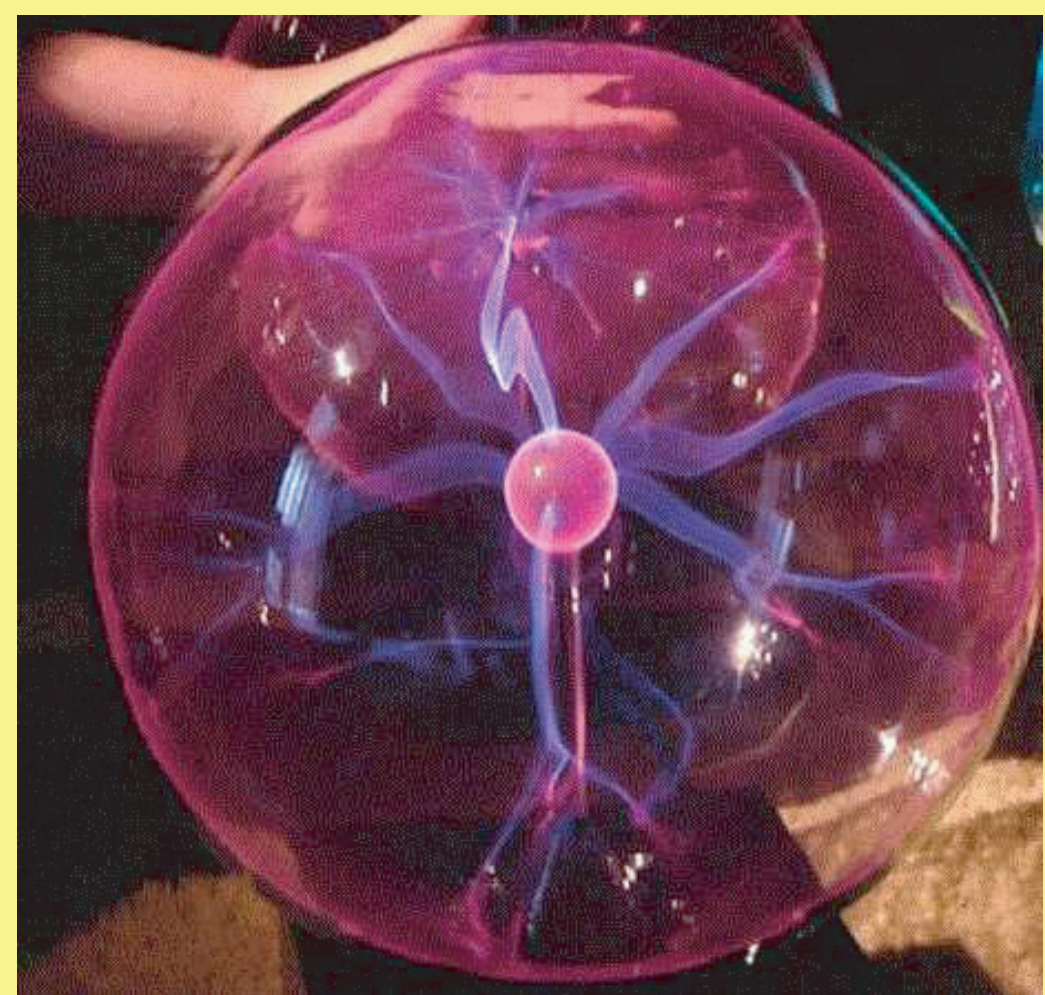


PLASMA BALL

The empty glass ball or globe was carefully cleaned , evacuated, and refilled with a very low-pressure mixture of gases (mostly helium).(Figure 1) The electrode near the globe's center is connected to a high voltage source, producing an intense electric field which ejects large numbers of electrons from the electrode. These electrons repel each other and accelerate toward the globe's inner surface, colliding with the surrounding gas and soon gaining enough energy to ionize some of the gas atoms . This electric discharge, consisting of ions and electrons in approximately equal numbers, is called a "plasma". The paths taken by the electrons are illuminated by their glowing trails of ionized gases which meander as the streaming particles collide with other atoms along the way . As charge builds up at spots on the globe's inner surface, the arriving electrons begin to be repelled and the stream wanders to a new location while the accumulated electric charge eventually escapes into the surrounding air. Thus the electron trajectories are normally random.



When you place your hand on the globe (Figure 2), you provide a faster (lower resistance) escape route for the electric charges causing the discharge to concentrate at the points of contact. If you were to simultaneously touch the earth with your other hand you would feel a slight shock from the (very low) electric current passing through you.

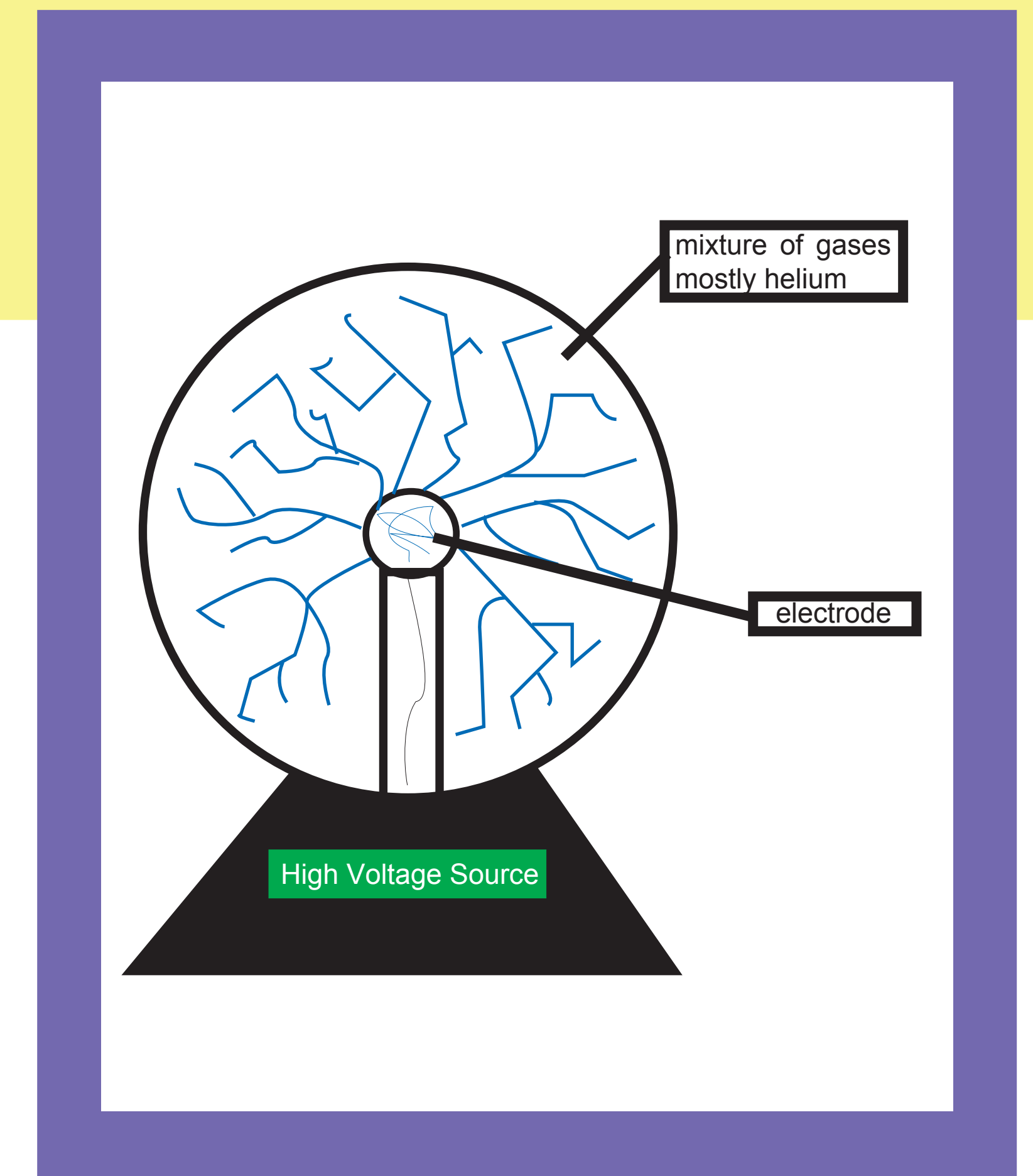


Fig. 1

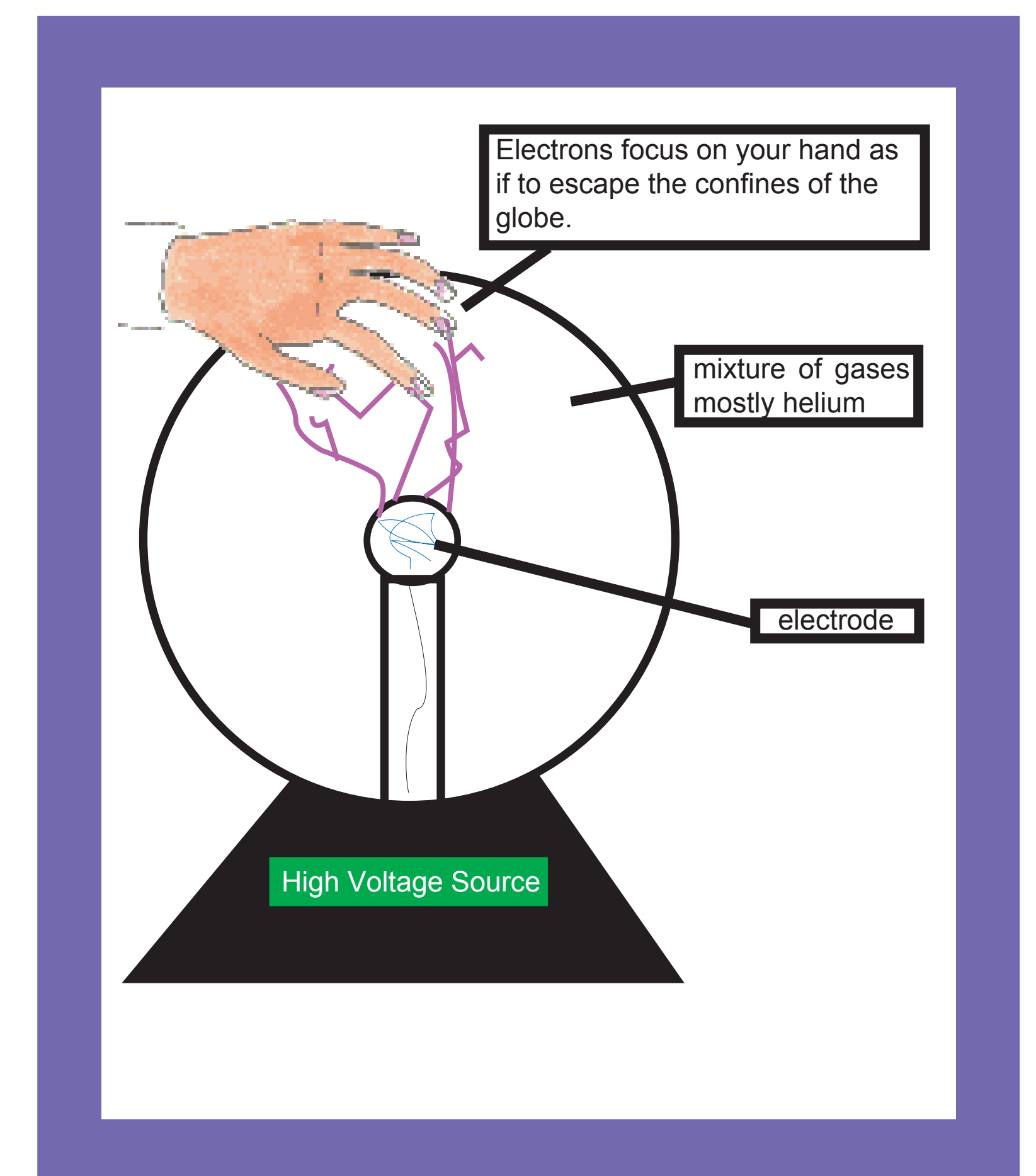


Fig. 2