

It will be noted that one end immediately turns towards the North and the other towards the South.

That end towards the North is called the North pole of the needle, or more properly speaking, the North Seeking Pole, for I will show you that the kind of magnetism that is at the North seeking end of the needle is different from the magnetism which attracts it towards the magnetic North pole of the earth.

I have here another needle, similar to the one suspended before you ; this one has also the properties exhibited by the suspended one, that is, it is magnetized.

Now, upon bringing the North seeking pole of this needle towards the North seeking pole of that one which can turn freely, it is seen that the one I hold in my hand *repels* the other, and that the South end of one also repels the South end of the other ; but the North end of *either* attracts the South end of the other. Therefore the magnetism of the so-called North end of the needle is not the same as the magnetism of the North pole of the earth.

An ordinary magnetic needle costs about two dollars, but there are circumstances under which it may, and often has suddenly risen from this trifling value to the enormous sum of three or four millions of dollars.

For instance, in the case of one of our costly modern ships of war. Imagine one of these giants of the ocean cruising in a storm on a dangerous coast, the sun, moon and stars obscured by clouds and rain ; her commander unable to find anchorage must depend entirely upon that bar of steel for guidance, to save his ship and the lives of all on board.

Insignificant though the needle seems to be, there is no known substitute for it, under conditions such as I have named.

Though the value of the Magnetic Needle cannot be over-estimated, it is subject to changes, or influences, which are not perfectly understood and which at times cannot be successfully guarded against.

It is therefore necessary to use it, or to follow it, very cautiously, otherwise serious consequences might result.

The magnetic poles of the earth are not identical with its geographic