MAGNETIC INDUCTION.

around conductors as so many discs threaded on it, and the illustrations given in explanation, are necessarily very imperfect. They have been found very helpful to so many who were trying to get the fundamental idea of electro-magnetic induction that they are given here in the hope they will prove equally helpful, and if the student has thoroughly grasped the idea this far, he will have little or no difficulty in following the subject to any extent he is likely to require, even though it may turn out occasionally that our elementary illustrations do not quite fit in with the observed phenomena.

These facts regarding magnetic induction can be demonstrated very easily if one has access to the simple apparatus found in any electrical laboratory. If we take a simple loop of wire and join its two ends to a sensitive galvanometer by long flexible leads, so that the latter is not disturbed, we will find the needle of the instrument deflected by simply waving the wire loop before the poles of a strong magnet, and, if we observe carefully, the deflection as we approach the magnet will be opposite to that as the wire leaves it. What induces currents in a closed conductor is any sudden change in the strength of the magnetic field surrounding it, whether getting stronger or weaker does not matter; the important factor is suddenness of change and the more sudden the more intense is the induced current. The direction of flow in an induced current from the magnetic field getting stronger is opposite to that when it is getting weaker.

If instead of a simple loop we use a coil of wire having ten turns, the electro-motive force of the induced current will be ten times greater. Also, instead of moving the coil before the magnet, the latter may be moved to and from the coil and the effect will be the same; or we may place a second coil inside or outside the first one and send an intermittent current through one of them—secondary alternating currents will be induced in the other coil. Lastly, if these two coils are wound on to a core of iron the effects are greatly intensified, especially if the iron

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