

RESISTANCE AND POTENTIAL.—The pupil should study the simple cell, as described in Gregory and Simmons, *Lessons in Science*, pages 129, 130. Then the teacher should show that other metals may be used for the plates; also that other liquids may be used, such as brine, or hydrochloric acid, or potassium hydroxide solution. Next show that some liquids, such as alcohol or coal-oil, will not serve, and that some solids, as wood or glass, will not do for the plates. Show also that the plates must be connected by metal wire, and that wood, string, or glass will give no deflection. In this way the pupils can be taught the requisite arrangement to get a current, and they can be given proper ideas of resistance, conductivity, difference of potential, and current strength. Have each pupil take plates of iron (an iron nail), zinc, copper, lead, and carbon, immerse them in pairs in weak sulphuric acid (1 of acid to 10 of water), and, by connecting with the mercury cups of the current indicator and noting in each case the direction in which the needle is deflected, arrange them in an electro-motive series.

THE HEATING EFFECT.—This can be shown by connecting the dry cells in series and joining the terminals by a short piece of one of the strands that go to make up picture wire. If not hot enough to glow, try whether it is hot enough to light a match applied to it.

THE ELECTRO MAGNET.—This can be illustrated by winding insulated copper wire, No. 20, around a stick of carbon or a large lead-pencil, connecting the terminals of this wire with a dry-cell battery, laying the coil on paper, and plotting its magnetic field as was done for the magnet. Show an increase of strength by slipping a piece of soft