twice as strong, and twice as much water will escape in the same time, because the resistance to its flow has been reduced to one-half of what it was before. So also can we adjust our resistance to the flow from the electric main to a strength of current we call one *ampère*, or, if we make it half the amount of resistance, the strength will be two ampères, and so on.

It will now be obvious that the strength of current depends not only on the voltage, but also on the resistance offered to its passage; we now need some standard or unit of resistance if we are to be in a position to arrange our circuits according to any given set of requirements. The unit of resistance is called the Ohm, in honour of the scientist who formulated the law which is known by his name. The resistance of a copper wire one-twentieth of an inch in diameter and 100 yards long is almost exactly one ohm. It has been mentioned that a Daniell's cell has a voltage—usually written e.m.f., meaning electro motive force—of one volt. If we join the two terminals of this cell by the two ends of a copper wire as specified, the strength of current through the wire will be one ampère.

The resistance of a conductor varies—

(*a*) Directly as the length.

(*b*) Inversely as the area of the cross section.

(*c*) With the nature of the material of which the conductor is made.

(*d*) To a certain extent with the temperature.

The first two are sufficiently obvious, and the different conducting properties of substances has been briefly referred to. The influence of temperature is not very great under ordinary circumstances and may be ignored for the present.

**Ohm's Law.**—We are now in a position to understand Ohm's law, the importance of which may be gathered when it is stated that it underlies every intelligent application of electrical science. It is as follows:—The strength of the current in any circuit varies directly as