Electric energy may also be regarded as compounded of two factors—

(1) Electric quantity or charge.
(2) Electric potential.

Now, when a current passes through a wire, the quantity of electricity passing depends on the potential, or, as it is sometimes called, electric pressure, and on the diameter, length, and material of the wire. The total energy communicated in the form of an electric current has, as its factors, the quantity of electricity passing, and the potential with which the electricity is urged along its course.

It is probable that chemical energy may also be conceived to consist of two factors; the one is generally called atomic or formula weight, for chemical elements and groups enter into and separate out of combinations in quantities proportional to these numbers. At the same time it is probable that when two elements unite together they attract each other, and that this attraction depends for its amount on the nature of the elements which are presented to one another; the chemical attraction has been termed affinity. Now it has already been explained on p. 37 that when a current is passed through a solution of an electrolyte, it is conveyed by the ions present in solution; and these ions are composed of elements, or groups of elements, each of which carries one, two, or more electrons. It is here evident that the quantity of an element or group which conveys electricity is identical with the quantity which enters into combination; it may be termed the equivalent, and while the equivalent is that quantity which conveys a unit quantity of electricity, it is also that which serves as the unit of quantity in chemical compounds. It would appear, therefore, that one of the factors of chemical energy is numerically identical with one of the factors of electrical energy, and it follows from this that the other factor must also be proportional; that is, a measurement of electric potential is equivalent to a measurement of chemical potential