

the progress of science, the generalizations of one generation are absorbed in the wider generalizations of the next.

But in order to reach securely this wider generalization, Faraday combined the two branches of the subject which we have already noticed;—the *theory of electrical decomposition* with the *theory of the pile*. For his researches on the origin of activity of the voltaic circuit (his Eighth Series), led him to see more clearly than any one before him, what, as we have said, the most sagacious of preceding philosophers had maintained, that the current in the pile was due to the mutual chemical action of its elements. He was led to consider the processes which go on in the *exciting-cell* and in the decomposing place as of the same kind, but opposite in direction. The chemical composition of the fluid with the zinc, in the common apparatus, produces, when the circuit is completed, a current of electric influence in the wire; and this current, if it pass through an electrolyte, manifests itself by *decomposition*, overcoming the chemical affinity which there resists it. An electrolyte cannot conduct without being decomposed. The forces at the point of composition and the point of decomposition are of the same kind, and are opposed to each other by means of the conducting-wire; the wire may properly be spoken of²⁶ as *conducting chemical affinity*: it allows two forces of the same kind to oppose one another;²⁶ electricity is only another mode of the exertion of chemical forces;²⁷ and we might express all the circumstances of the voltaic pile without using any other term than chemical affinity, though that of electricity may be very convenient.²⁸ Bodies are held together by a definite power, which, when it ceases to discharge that office, may be thrown into the condition of an electric current.²⁹

Thus the great principle of the identity of electrical and chemical action was completely established. It was, as Faraday with great candor says,³⁰ a confirmation of the general views put forth by Davy, in 1806, and might be expressed in his terms, that “chemical and electrical attractions are produced by the same cause;” but it is easy to see that neither was the full import of these expressions understood nor were the quantities to which they refer conceived as measurable quantities, nor was the assertion anything but a sagacious conjecture, till Faraday gave the interpretation, measure, and proof, of which we have spoken. The evidence of the incompleteness of the views of his predecessor we have already adduced, in speaking of his vague and incon-

²⁶ Researches Art. 918.

²⁷ 915.

²⁸ 917.

²⁹ 855.

³⁰ 965.