

instant, "a capital experiment." This discovery was soon followed by that of the decomposition of soda; and shortly after, of other bodies of the same kind; and the interest and activity of the whole chemical world were turned to the subject in an intense degree.

At this period, there might be noticed three great branches of speculation on this subject; *the theory of the pile, the theory of electrical decomposition, and the theory of the identity of chemical and electrical forces*; which last doctrine, however, was found to include the other two, as might have been anticipated from the time of its first suggestion.

It will not be necessary to say much on the theories of the voltaic pile, as separate from other parts of the subject. The *contact-theory*, which ascribed the action to the contact of different metals, was maintained by Volta himself; but gradually disappeared, as it was proved (by Wollaston⁶ especially,) that the effect of the pile was inseparably connected with oxidation or other chemical changes. The theories of electro-chemical decomposition were numerous, and especially after the promulgation of Davy's *Memoir* in 1806; and, whatever might be the defects under which these speculations for a long time labored, the subject was powerfully urged on in the direction in which truth lay, by Davy's discoveries and views. That there remained something still to be done, in order to give full evidence and consistency to the theory, appears from this;—that some of the most important parts of Davy's results struck his followers as extraordinary paradoxes;—for instance, the fact that the decomposed elements are transferred from one part of the circuit to another, in a form which escapes the cognizance of our senses, through intervening substances for which they have a strong affinity. It was found afterwards that the circumstance which appeared to make the process so wonderful, was, in fact, the condition of its going on at all. Davy's expressions often seem to indicate the most exact notions: for instance, he says, "It is very natural to suppose that the repellent and attractive energies are communicated from one particle to another of the same kind, so as to establish a conducting *chain* in the fluid; and that the locomotion takes place in consequence;"⁷ and yet at other times he speaks of the element as *attracted* and *repelled* by the metallic surfaces which form the *poles*;—a different, and, as it appeared afterwards, an untenable view. Mr. Faraday, who supplied what was wanting, justly notices this vagueness.

⁶ *Phil. Trans.* 1801, p. 427.

⁷ Paris, i. 154.