

Davy's assistant at the Institution ; and afterwards his successor. The Institution which produced such researches as those of these two men, may well be considered as a great school of exact and philosophical chemistry. Mr. Faraday, from the beginning of his course of inquiry, appears to have had the consciousness that he was engaged on a great connected work. His *Experimental Researches*, which appeared in a series of Memoirs in the *Philosophical Transactions*, are divided into short paragraphs, numbered into a continued order from 1 up to 1160, at the time at which I write;<sup>10</sup> and destined, probably, to extend much further. These paragraphs are connected by a very rigorous method of investigation and reasoning which runs through the whole body of them. Yet this unity of purpose was not at first obvious. His first two Memoirs were upon subjects which we have already treated of (B. xiii. c. 5 and c. 8), Voltaic Induction, and the evolution of Electricity from Magnetism. His "Third Series" has also been already referred to. Its object was, as a preparatory step towards further investigation, to show the identity of voltaic and animal electricity with that of the electrical machine ; and as machine electricity differs from other kinds in being successively in a state of tension and explosion, instead of a continued current, Mr. Faraday succeeded in identifying it with them, by causing the electrical discharge to pass through a bad conductor into a discharging-train of vast extent ; nothing less, indeed, than the whole fabric of the metallic gas-pipes and water-pipes of London. In this Memoir<sup>11</sup> it is easy to see already traces of the general theoretical views at which he had arrived ; but these are not expressly stated till his "Fifth Series ;" his intermediate Fourth Series being occupied by another subsidiary labor on the conditions of conduction. At length, however, in the Fifth Series, which was read to the Royal Society in June, 1833, he approaches the theory of electro-chemical decomposition. Most preceding theorists, and Davy amongst the number, had referred this result to *attractive powers* residing in the *poles* of the apparatus ; and had even pretended to compare the intensity of this attraction at different distances from the poles. By a number of singularly beautiful and skilful experiments, Mr. Faraday shows that the phenomena can with no propriety be

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<sup>10</sup> December, 1835. (At present, when I am revising the second edition, September, 1846, Dr. Faraday has recently published the "Twenty-first Series" of his *Researches* ending with paragraph 2453.)

<sup>11</sup> *Phil. Trans.* 1833.