

was not completed till light had been thrown upon it from other quarters. The identity of galvanism with electricity, for instance, was at first, as we have intimated, rather conjectured than proved. It was denied by Dr. Fowler, in 1793; was supposed to be confirmed by Dr. Wells two years later; but was, still later, questioned by Davy. The nature of the operation of the pile was variously conceived. Volta himself had obtained a view of it which succeeding researches confirmed, when he asserted,^o in 1800, that it resembled an electric battery feebly charged and constantly renewing its charge. In pursuance of this view, the common electrical action was, at a later period (for instance by Ampère, in 1820), called *electrical tension*, while the voltaic action was called the *electrical current*, or *electromotive action*. The different effects produced, by increasing the size and the number of the plates in the voltaic trough, were also very remarkable. The power of producing heat was found to depend on the size of the plates; the power of producing chemical changes, on the other hand, was augmented by the number of plates of which the battery consisted. The former effect was referred to the increased *quantity*, the latter to the *intensity*, of the electric fluid. We mention these distinctions at present, rather for the purpose of explaining the language in which the results of the succeeding investigations are narrated, than with the intention of representing the hypotheses and measures which they imply, as clearly established, at the period of which we speak. For that purpose new discoveries were requisite, which we have soon to relate.

CHAPTER III.

DISCOVERY OF THE LAWS OF THE MUTUAL ATTRACTION AND REPULSION OF VOLTAIC CURRENTS.—AMPÈRE.

IN order to show the place of voltaic electricity among the mechanico-chemical sciences, we must speak of its mechanical laws as separate from the laws of electro-magnetic action; although, in fact, it was only in consequence of the forces which conducting voltaic wires exert upon magnets, that those forces were detected which they exert upon each

^o *Phil. Trans.* p. 408.