CHAPTER I.

Discovery of Voltaic Electricity.

WE have given the name of *mechanico-chemical* to the class of sciences now under our consideration; for these sciences are concerned with cases in which mechanical effects, that is, attractions and repulsions, are produced; while the conditions under which these effects occur, depend, as we shall hereafter see, on chemical relations. In that branch of these sciences which we have just treated of, Magnetism, the mechanical phenomena were obvious, but their connexion with chemical causes was by no means apparent, and, indeed, has not yet come under our notice.

The subject to which we now proceed, Galvanism, belongs to the same group, but, at first sight, exhibits only the other, the chemical, portion of the features of the class; for the connexion of galvanic phenomena with chemical action was soon made out, but the mechanical effects which accompany them were not examined till the examination was required by a new train of discovery. It is to be observed, that I do not include in the class of mechanical effects the convulsive motions in the limbs of animals which are occasioned by galvanic action; for these movements are produced, not by attraction and repulsion, but by muscular irritability; and though they indicate the existence of a peculiar agency, cannot be used to measure its intensity and law.

The various examples of the class of agents which we here consider, —magnetism, electricity, galvanism, electro-magnetism, thermo-electricity,—differ from each other principally in the circumstances by which they are called into action; and these differences are in reality of a chemical nature, and will have to be considered when we come to treat of the inductive steps by which the general principles of chemical theory are established. In the present part of our task, therefore, we must take for granted the chemical conditions on which the excitation of these various kinds of action depends, and trace the history of the discovery of their mechanical laws only. This rule will much abridge the account we have here to give of the progress of discovery in the provinces to which I have just referred.