

INTRODUCTION.

Of the Mechanico-Chemical Sciences.

UNDER the title of Mechanico-Chemical Sciences, I include the laws of Magnetism, Electricity, Galvanism, and the other classes of phenomena closely related to these, as Thermo-electricity. This group of subjects forms a curious and interesting portion of our physical knowledge; and not the least of the circumstances which give them their interest, is that double bearing upon mechanical and chemical principles, which their name is intended to imply. Indeed, at first sight they appear to be purely Mechanical Sciences; the attractions and repulsions, the pressure and motion, which occur in these cases, are referrible to mechanical conceptions and laws, as completely as the weight or fall of terrestrial bodies, or the motion of the moon and planets. And if the phenomena of magnetism and electricity had directed us only to such laws, the corresponding sciences must have been arranged as branches of mechanics. But we find that, on the other side, these phenomena have laws and bearings of a kind altogether different. Magnetism is associated with Electricity by its mechanical analogies; and, more recently, has been discovered to be still more closely connected with it by physical influence; electric is identified with galvanic agency; but in galvanism, decomposition, or some action of that kind, universally appears; and these appearances lead to very general laws. Now composition and decomposition are the subjects of Chemistry; and thus we find that we are insensibly but irresistibly led into the domain of that science. The highest generalizations to which we can look, in advancing from the elementary facts of electricity and galvanism, must involve chemical notions; we must therefore, in laying out the platform of these sciences, make provision for that convergence of mechanical and chemical theory, which they are to exhibit as we ascend.

We must begin, however, with stating the mechanical phenomena of these sciences, and the reduction of such phenomena to laws. In this point of view, the phenomena of which we have to speak are those in which bodies exhibit attractions and repulsions, peculiarly determined by their nature and circumstances; as the magnet, and a