

The first step in this career of discovery was that made by Galvani, Professor of Anatomy at Bologna. In 1790, electricity, as an experimental science, was nearly stationary. The impulse given to its progress by the splendid phenomena of the Leyden phial had almost died away; Coulomb was employed in systematizing the theory of the electric fluid, as shown by its statical effects; but in all the other parts of the subject, no great principle or new result had for some time been detected. The first announcement of Galvani's discovery in 1791 excited great notice, for it was given forth as a manifestation of electricity under a new and remarkable character; namely, as residing in the muscles of animals.¹ The limbs of a dissected frog were observed to move, when touched with pieces of two different metals; the agent which produced these motions was conceived to be identified with electricity, and was termed *animal electricity*; and Galvani's experiments were repeated, with various modifications, in all parts of Europe, exciting much curiosity, and giving rise to many speculations.

It is our business to determine the character of each great discovery which appears in the progress of science. Men are fond of repeating that such discoveries are most commonly the result of accident; and we have seen reason to reject this opinion, since that preparation of thought by which the accident produces discovery is the most important of the conditions on which the successful event depends. Such accidents are like a spark which discharges a gun already loaded and pointed. In the case of Galvani, indeed, the discovery may, with more propriety than usual, be said to have been casual; but in the form in which it was first noted, it exhibited no important novelty. His frog was lying on a table near the conductor of an electrical machine, and the convulsions appeared only when a spark was taken from the machine. If Galvani had been as good a physicist as he was an anatomist, he would probably have seen that the movements so occasioned proved only that the muscles or nerves, or the two together, formed a very sensitive indicator of electrical action. It was when he produced such motions by contact of metals alone, that he obtained an important and fundamental fact in science.

The analysis of this fact into its real and essential conditions was the work of Alexander Volta, another Italian professor. Volta, indeed, possessed that knowledge of the subject of electricity which made a hint like that of Galvani the basis of a new science. Galvani appears

¹ *De Viribus Electricis in Motu Musculari.* Comm. Bonon. t. vii. 1792.