

of the electrified condition of the clouds in stormy weather was shown to have a basis. It was then easy to surmise that electricity was no insignificant element, and that in time much might be achieved by means of it. This, and some little knowledge picked up about pith-balls and electric sparks, included all that the eighteenth century knew about electricity. Not until the following century was any really important advance recorded.

Galvani, an Italian scientist, led the way towards the production of a continuous current by showing that bodies might be electrified by means of chemicals. His experiments suggested to Volta, in 1850, the electric cell, the same as is used to-day, with but few alterations. At the same period another important step was made in the discovery of the relation between electricity and magnetism. Previous to this scientists had been quite well acquainted with the use of the magnet and its property of attracting bits of iron and steel. But it was never thought that this property might become a titanic force, capable of setting in motion the machinery of great cities. To the genius of Oersted is due this discovery. He found, on passing an electric current through a wire conductor, that the latter was surrounded by a magnetic field, such as encompasses the ordinary magnet. Thereupon he reasoned that magnetism was a property of the electric current. About ten years later Joseph Henry and Michael Faraday found a second relation between the two, which made it possible to produce electricity by magnetism. This was magnetic induction, as it is called, and is the method now used in the manufacture of electricity for commercial purposes. The two discoveries soon lead to the invention of the dynamo and motor, which, at the present day, assist in the centralization and distribution of electric power. In 1834 the electric telegraph, evolving from the principle that electricity causes magnetism, was invented, and ten years later the telephone, employing the principle discovered by Henry and Faraday, was constructed. The importance of these discoveries may appear from the fact that they rendered possible all the electrical contrivances and machines that are indispensable for the commercial world of to-day.

When Tyndall came over to America, about the middle of the nineteenth century, to deliver a course of scientific lectures, he used to light the hall, in which he spoke, a current of electricity supplied by a battery of ordinary cells. The preparation of them required nearly the whole afternoon before each lecture, not to speak of the