

1786, followed, fifteen years after, by Volta's greater invention. The late eminent Prof. Du Bois-Reymond, in various passages¹ of his scientific and literary writings, has told us of the recurrent fascination which the *fata morgana* of Electricity has exercised over those interested in the explanation of the phenomena of innervation; how this seductive clue has been, in the

9.
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¹ See vol. ii. pp. 212, 386, 528 of Du Bois-Reymond's 'Reden,' also his 'Untersuchungen über thierische Electricität' (1848), vol. i. pp. 30-128. One of the first to take up in the interests of nervous physiology the clue which Galvani's discovery afforded was A. von Humboldt, who published in 1797, three years before Volta's discovery, his valuable "Versuche über die gereizte Muskel- und Nervenfasern, nebst Vermuthungen über den chemischen Process des Lebens in der Thier- und Pflanzenwelt." A lucid account of Humboldt's work is given by Prof. Wundt in the third volume of the German edition of Bruhns' 'Life of Humboldt,' p. 301 *sqq.* "It is difficult," he says, "to picture to oneself nowadays the excitement which the observations of Galvani produced in the scientific world. . . . Such experiments had almost become a general subject of entertainment in cultured circles. . . . It almost appeared as if what at that time was looked upon as the most general property of living matter, irritability, were by the experiment of Galvani to be for the first time unveiled in its real essence. . . . At the time when Humboldt made his experiments the contest was still going on between the followers of Galvani and Volta." This referred to a physiological or purely physical explanation of the phenomenon.

"Barely three years after the publication of Humboldt's work the discovery of Volta's pile put an abrupt end to all theories which were based upon the physiological origin of galvanic phenomena. The brilliant development of physical galvanism from that moment pushed the physiological aspect of electricity for a long time into the background. . . . Humboldt's work was forgotten" (p. 310). In the meantime Humboldt had travelled in South America, where he had—*inter alia*—observed the "natural electromotors which stand in such extraordinary connection with the nervous system" of the electrical eel (*Gymnotus electricus*), giving a thrilling description of a battle between the horses and the eels which he witnessed in the waters of Calabozo. (See Humboldt's 'Personal Narrative,' vol. iv. p. 345 *sqq.*; also 'Ansichten der Natur,' vol. i. p. 33.) Interest in the subject of animal electricity was again revived by Italian physiologists about the year 1835. Nobili, Marianini, Santi-Linari, Matteucci repeated and enlarged the experiments of Galvani, and through the influence of Humboldt and Johannes Müller, the study of the whole subject was comprehensively taken up at Berlin by Du Bois-Reymond about 1840, and exhaustively treated in his great work on the subject (vol. i. 1848, vol. ii. 1860).