

investigation of the question, Du Bois-Reymond<sup>1</sup> gave the impression, in his earliest deliverance, that the

<sup>1</sup> Du Bois-Reymond's position in the vitalistic controversy is interesting and instructive, inasmuch as he considerably modified his opinions in course of time. His first deliverance on the subject is to be found in the preface to his celebrated 'Untersuchungen über Thierische Elektrizität' (March 1848). This discussion of the subject followed soon after the deliverances of men like Berzelius (1839), Schwann (1839), Schleiden (1842), Lotze (1842), on the same subject, which are stated to have been "ineffectual." After the lapse of twenty-four years Du Bois-Reymond approached the subject again in his celebrated address at the German Association of Sciences at Leipzig, 1872, entitled "Ueber die Grenzen des Naturerkennens." This deliverance created a great sensation: the pamphlet appeared in many editions and translations, and only in this country failed to get adequately noticed. A further explanation of the views expounded in it was given by the author (1880) in an oration at the meeting held annually in honour of Leibniz in the Berlin Academy on the 5th of July. It bears the characteristic title "Die sieben Welträthsel." These documents together contain the author's "philosophical creed," which ends in "Pyrrhonism," out of which there seems no escape except through "Supernaturalism," which, however, begins where science ends. (See note 1 to the last-mentioned address.) All three documents are reprinted in the two volumes of 'Reden' (Leipsic, 1886-87), from which I quote. In the interval of a quarter of a century which lay between the first and

second deliverance great changes had come over scientific thought. The mechanical view, which had been put forward in an extreme form in 1848, when it was prophesied that "physiology, giving up its particularistic interest, would disappear in the great united estate of natural philosophy, would be entirely dissolved in organic physics and chemistry" (vol. ii. p. 23), had had time and opportunity to show its power and its limits. It had gained through greater facility of application (such as Ludwig's automatic curve-plotting), through the larger conception of "Stoffwechsel" as denoting "metabolism" of matter and energy. The author himself had introduced a new definition of life as a "dynamical equilibrium" in the place of older descriptions (vol. ii. p. 25); and, above all, Darwin had shown the possibility of a mechanical explanation of so-called "final causes" in nature. The author himself was one of that great school, emanating from Johannes Müller, but now represented by the still greater Helmholtz, which had pushed the mechanical or exact treatment to its furthest limits, to the analysis of the phenomena of the nervous system in its highest activity, those of sensation and perception. It is therefore highly significant that, instead of confirming the earlier dictum, that the exact treatment would halt only at the most advanced point—viz., the manifestation of "free will,"—the author is now forced to admit that not only is the "origin" of all motion quite obscure, but likewise the lowest forms of animation or consciousness are not to be explained mechanically,