

has been remarked, "the glory of surmounting them would be unique."¹

44.
Modern
view of
electrical
phenomena:
Faraday.

The vortex-atom theory is the most advanced chapter in the kinetic theory of matter, the most exalted glimpse into the mechanical view of nature. Though suggested by Helmholtz, it has, as already stated, been limited almost exclusively to this country. If science still shows international differences and patriotic predilections, this affords one of the few remaining examples. Another step first taken in this country, the last and most important contribution to the science of physical motion, the greatest support of the kinetic or mechanical view of nature, has, in union with the undulatory theory of light, been now all but universally accepted in the scientific world: I refer to the modern view of electric phenomena, which for a long time was supported by the solitary labours and genius of Faraday.

His great discoveries of magneto-electricity, of induction, of the electrification of light, to which I have had repeated occasion to refer, made his name familiar to the whole scientific world; but the processes of reasoning by which he arrived at them, or to which in his mind they gave rise, were ignored or not understood.² Whilst

¹ Tait, in 'Recent Advances of Physical Science,' p. 302, and Clerk Maxwell, in article "Atom" ('Ency. Brit.,' 9th ed., or 'Collected Scientific Papers,' vol. ii. p. 472).

² See Helmholtz's 'Faraday Lecture,' delivered before the Chemical Society on April 5, 1881, reprinted in his 'Vorträge und Reden,' vol. ii. p. 275, &c. "Since the mathematical interpretation of Faraday's theorems by Clerk Maxwell has

been given, we see indeed how sharply defined the conceptions are and how consistent the reasoning which lay concealed in Faraday's words, which to his contemporaries appeared so indefinite and obscure; and it is in the highest degree remarkable to see how a large number of comprehensive theorems, the proof of which taxes the highest powers of mathematical analysis, were found by him without the use of a single mathematical formula,