

CONTENTS OF THE SECOND VOLUME.

CHAPTER VI.

ON THE KINETIC OR MECHANICAL VIEW OF NATURE.

The idea of motion in ancient philosophy, 3 ; Descartes' development of the kinetic view, 6 ; Huygens and Newton, 7 ; Revival of the kinetic view in the nineteenth century, 7 ; Young and Fresnel, 8 ; Undulatory and emission theories, 11 ; Both theories kinetic, 11 ; Undulatory theory prepared by acoustics, 12 ; Newton's authority on the side of the emission theory, 14 ; But also suggests the other theory, 15 ; Biot, Brewster, and Laplace against the undulatory theory, 16 ; Euler, the successor of Huygens, 16 ; Young, 16 ; His "general law of the interference of light," 18 ; Theory of the luminiferous ether, 18 ; Brougham's attack on Young, 19 ; Augustin Fresnel, 21 ; Difficulties presented by the polarisation of light, 22 ; Fresnel's Memoir on Diffraction, 25 ; Young and Fresnel introduce the conception of transverse vibrations, 28 ; Mechanical difference between light and sound, 30 ; The properties of the ether, 31 ; Other kinetic theories, 34 ; Kinetic theory of gases, 34 ; Vortex motion, 35 ; Faraday's researches, 35 ; Problems as to the nature of the ether, 36 ; The theory of elasticity, 40 ; The problem of the ether may be treated mathematically, 44 ; or experimentally, 44 ; Necessity of combining the two methods, 44 ; Spectrum analysis, 45 ; The clue furnished by the phenomena on which it depends, 47 ; Sir G. Stokes, 47 ; Gustav Kirchhoff, 48 ; Explanation of fluorescence, 52 ; View of the ether as an "elastic solid," 54 ; Lord Kelvin's researches, 55 ; Tyndall's 'Heat,' 57 ; Lord Kelvin's vortex theory of matter, 57 ; Helmholtz's investigations, 58 ; Earlier researches on vortex motion, 61 ; Influence of Helmholtz's investigations in England, 62 ; Difficulties of the vortex ring theory, 64 ; Modern view of electrical phenomena : Faraday, 66 ;