out, which in the course of the eighteenth century combined to establish what I termed the astronomical view of nature. The undulatory theory of light, established by Young and Fresnel during the first quarter of the nineteenth century, was a breaking away from what then seemed to many Continental philosophers a promising line of thought, a unifying principle in natural philosophy. As long as light was thought to consist of particles, however minute, which were projected from luminous centres, the mechanical laws of impact, of attraction and repulsion, could be applied; and they went a considerable way in apparently explaining the ordinary phenomena of light, such as motion in straight lines, reflexion, and refraction. They failed indeed in the case of diffraction or inflection, and still more in those phenomena which were misleadingly grouped under the term polarisation. The new theory seemed specially adapted to these more recently discovered phenomena, but it had to be admitted that the explanation of reflexion and refraction of light at the surface of polished, transparent, or opaque bodies met with considerable difficulties.

26. Problems as to the nature of the ether.

The new theory had introduced the conception of an all-pervading, apparently imponderable substance, the ether. The reintroduction of this conception into physical science was repugnant to many thinkers of the then prevailing school,[1] and it became more so when it had—

[1] One of the crucial tests for deciding between the corpuscular and the wave theory of light was the relative speed with which light travels in air and in water, *i.e.*, in a refracting substance. Foucault, in 1850, by a very ingenious method, improved since by Mitchelson, measured the speed of light in various media. He proved that light moves faster in air than in water, whereas on the corpuscular theory the speed of light in water must be to its speed in air as 4 to 3 approximately. "This finally disposed of the corpuscular theory"