

It was recognised by Young, and still more clearly by Fresnel, that the medium which they supposed to be the carrier of light could not have the ordinary properties of either a solid, a liquid, or a gas. It offered apparently no resistance to the motion of the heavenly bodies, its waves were not like those which in air produced sound; it propagated its waves at a speed much greater than any other velocity known at that time; at the same time the wave-motion was not that of a body possessing the properties of a gas—*i.e.*, an elastic, compressible fluid: it was that of a body offering resistance to change of form rather than to change of bulk. It was evident that the different properties, which we see roughly assembled to constitute the three forms of ponderable matter with which we are practically acquainted, the solid, the liquid, and the gaseous, cannot be assembled in any similar manner in this imponderable substance, the ether. It was bound to have inertia—*i.e.*, mass—otherwise the laws of motion could not be employed in dealing with it, and mathematical thinking about it would be impossible. A more perfect description of the elementary movements which constituted light evidently required a minute experimental study, and a closer mathematical definition of the different properties of matter, known popularly but not very clearly under the terms compressibility, rigidity, mobility, elasticity, viscosity, &c., and of the inter-dependence of these clearly defined properties one on the other. Just about the time when the vibratory theory of light began to be seriously entertained by natural philosophers, a beginning had also been made in this study: the theory of elasticity had been founded in