

thirty years later. Dr. Wollaston was a person whose character led him to look long at the laws of phenomena, before he attempted to determine their causes; and it does not appear that he had decided the claims of the rival theories in his own mind. Herschel (I now speak of the son) had at first the general mathematical prejudice in favor of the emission doctrine. Even when he had himself studied and extended the laws of dipolarized phenomena, he translated them into the language of the theory of moveable polarization. In 1819, he refers to, and corrects, this theory; and says, it is now "relieved from every difficulty, and entitled to rank with the fits of easy transmission and reflection as a general and simple physical law;" a just judgment, but one which now conveys less of praise than he then intended. At a later period, he remarked that we cannot be certain that if the theory of emission had been as much cultivated as that of undulation, it might not have been as successful; an opinion which was certainly untenable after the fair trial of the two theories in the case of diffraction, and extravagant after Fresnel's beautiful explanation of double refraction and polarization. Even in 1827, in a *Treatise on Light*, published in the *Encyclopædia Metropolitana*, he gives a section to the calculations of the Newtonian theory; and appears to consider the rivalry of the theories as still subsisting. But yet he there speaks with a proper appreciation of the advantages of the new doctrine. After tracing the prelude to it, he says, "But the unpursued speculations of Newton, and the opinions of Hooke, however distinct, must not be put in competition, and, indeed, ought scarcely to be mentioned, with the elegant, simple, and comprehensive theory of Young,—a theory which, if not founded in nature, is certainly one of the happiest fictions that the genius of man ever invented to grasp together natural phenomena, which, at their first discovery, seemed in irreconcilable opposition to it. It is, in fact, in all its applications and details, one succession of *felicities*; insomuch, that we may almost be induced to say, if it be not true, it deserves to be so."

In France, Young's theory was little noticed or known, except perhaps by M. Arago, till it was revived by Fresnel. And though Fresnel's assertion of the undulatory theory was not so rudely received as Young's had been, it met with no small opposition from the older mathematicians, and made its way slowly to the notice and comprehension of men of science. M. Arago would perhaps have at once adopted the conception of transverse vibrations, when it was suggested by his fellow-laborer, Fresnel, if it had not been that he was a member of the Insti-