

perty, which seemed to require for its very conception a crystalline structure in the body, belonged nevertheless to several fluids, and in different directions for different fluids. Oil of turpentine, and an essential oil of laurel, gave the plane of polarization a rotation to the left hand; oil of citron, syrup of sugar, and a solution of camphor, gave a rotation to the right hand. Soon after, the like discovery was made independently by Dr. Seebeck, of Berlin.

It will easily be supposed that all these brilliant phenomena could not be observed, and the laws of many of the phenomena discovered, without attempts on the part of philosophers to combine them all under the dominion of some wide and profound theory. Endeavors to ascend from such knowledge as we have spoken of, to the general theory of light, were, in fact, made at every stage of the subject, and with a success which at last won almost all suffrages. We are now arrived at the point at which we are called upon to trace the history of this theory; to pass from the laws of phenomena to their causes;—from Formal to Physical Optics. The undulatory theory of light, the only discovery which can stand by the side of the theory of universal gravitation, as a doctrine belonging to the same order, for its generality, its fertility, and its certainty, may properly be treated of with that ceremony which we have hitherto bestowed only on the great advances of astronomy; and I shall therefore now proceed to speak of the Prelude to this epoch, the Epoch itself, and its Sequel, according to the form of the preceding Book which treats of astronomy.

[2nd Ed.] [I ought to have stated, in the beginning of this chapter, that Malus discovered the depolarization of *white light* in 1811. He found that a pencil of light which, being polarized, refused to be reflected by a surface properly placed, recovered its power of being reflected after being transmitted through certain crystals and other transparent bodies. Malus intended to pursue this subject, when his researches were terminated by his death, Feb. 7, 1812. M. Arago, about the same time, announced his important discovery of the depolarization of *colors* by crystals.

I may add, to what is above said of M. Biot's discoveries respecting the circular polarizing power of fluids, that he pursued his researches so as to bring into view some most curious relations among the elements of bodies. It appeared that certain substances, as sugar of canes, had a right-handed effect, and certain other substances, as gum, a left-handed effect; and that the molecular value of this effect was not altered by dilution. It appeared also that a certain element of the