

have unequal properties in different directions; and the process of revealing it was termed polarisation. Huygens had discovered this property, which he found was given to rays of light if they passed through certain crystals, notably through Iceland spar, which has the capacity of dividing the rays so that objects seen through them appear double. He could not explain it on his hypothesis of undulations, though he had invented a geometrical construction of the double refraction which had led him to its discovery. Malus showed in 1808 that double refraction was not a necessary accompaniment of polarisation, but that ordinary reflexion was enough to give these sides to rays of light. Although the projectile theory gave no complete explanation of this property, still the supposition that this one- or many-sidedness was owing to certain geometrical shapes of the projected particles suggested that double refraction might be explained by the different attraction or repulsion which these particles suffered according to the aspect

determining the course of the ordinary and extraordinary rays in Iceland spar, described the phenomenon fully, admitting at the same time that he could not explain it. When Malus discovered that light might acquire this peculiar property by reflexion, Young wrote in a review ('Quarterly Review,' May 1810): "The discovery . . . appears to us to be by far the most important and interesting that has been made in France, concerning the properties of light, at least since the time of Huygens; and it is so much the more deserving of notice, as it greatly influences the general balance of evidence in the comparison of the undulatory and the projectile theories of the nature of

light" (Works, vol. i. p. 247). And Malus himself, in writing to Young as Foreign Secretary of the Royal Society, by whom he had been awarded the Rumford Medal, says: "Je ne regarde pas la connaissance de ces phénomènes comme plus favorable au système de l'émission qu'à celui des ondulations. Ils démontrent également l'insuffisance des deux hypothèses; en effet comment expliquer dans l'une ou dans l'autre pourquoi un rayon polarisé peut traverser sous une certaine inclinaison un corps diaphane, en se dérochant totalement à la réflexion partielle qui a lieu à la surface de ces corps dans les cas ordinaires?" (quoted by Peacock, 'Life of Young,' p. 248 note).