

endeavored to prove the opposite proposition. But supposing we leave these properties, the rectilinear course, the reflection, and the refraction of light, as problems in which neither theory has a decided advantage, what is the next material point? The colors of thin plates. Now, how does Newton's theory explain these? By a new and special supposition;—that of *fits of easy transmission and reflection*: a supposition which, though it truly expresses these facts, is not borne out by any other phenomena. But, passing over this, when we come to the peculiar laws of polarization in Iceland spar, how does Newton's meet this? Again by a special and new supposition;—that the rays of light have *sides*. Thus we find no fresh evidence in favor of the emission hypothesis springing out of the fresh demands made upon it. It may be urged, in reply, that the same is true of the undulatory theory; and it must be allowed that, at the time of which we now speak, its superiority in this respect was not manifested; though Hooke, as we have seen, had caught a glimpse of the explanation, which this theory supplies, of the colors of thin plates.

At a later period, Newton certainly seems to have been strongly disinclined to believe light to consist in undulations merely. "Are not," he says, in Question twenty-eight of the *Opticks*, "all hypotheses erroneous, in which light is supposed to consist in pression or motion propagated through a fluid medium?" The arguments which most weighed with him to produce this conviction, appear to have been the one already mentioned,—that, on the undulatory hypothesis, undulations passing through an aperture would be diffused; and again,—his conviction, that the properties of light, developed in various optical phenomena, "depend not upon new modifications, but upon the original and unchangeable properties of the rays." (Question twenty-seven.)

But yet, even in this state of his views, he was very far from abandoning the machinery of vibrations altogether. He is disposed to use such machinery to produce his "fits of easy transmission." In his seventeenth Query, he says,¹¹ "when a ray of light falls upon the surface of any pellucid body, and is there refracted or reflected; may not waves of vibrations or tremors be thereby excited in the refracting or reflecting medium at the point of incidence? . . . and do not these vibrations overtake the rays of light, and by overtaking them successively, do they not put them into the fits of easy reflection and easy

¹¹ *Opticks*, p. 322.