

nary refraction of this crystal, to see if each phenomenon which is deduced from theory, would agree with what is really observed. And this being so, it is no slight proof of the truth of our suppositions and principles; but what I am going to add here confirms them still more wonderfully; that is, the different modes of cutting this crystal, in which the surfaces produced give rise to refractions exactly such as they ought to be, and as I had foreseen them, according to the preceding theory."

Statements of this kind, coming from a philosopher like Huyghens, were entitled to great confidence; Newton, however, appears not to have noticed, or to have disregarded them. In his *Opticks*, he gives a rule for the extraordinary refraction of Iceland spar which is altogether erroneous, without assigning any reason for rejecting the law published by Huyghens; and, so far as appears, without having made any experiments of his own. The Huyghenian doctrine of double refraction fell, along with his theory of undulations, into temporary neglect, of which we shall have hereafter to speak. But in 1788, Haüy showed that Huyghens's rule agreed much better than Newton's with the phenomena: and in 1802, Wollaston, applying a method of his own for measuring refraction, came to the same result. "He made," says Young,⁴ "a number of accurate experiments with an apparatus singularly well calculated to examine the phenomena, but could find no general principle to connect them, until the work of Huyghens was pointed out to him." In 1808, the subject of double refraction was proposed as a prize-question by the French Institute; and Malus, whose Memoir obtained the prize, says, "I began by observing and measuring a long series of phenomena on natural and artificial faces of Iceland spar. Then, testing by means of these observations the different laws proposed up to the present time by physical writers, I was struck with the admirable agreement of the law of Huyghens with the phenomena, and I was soon convinced that it is really the law of nature." Pursuing the consequences of the law, he found that it satisfied phenomena which Huyghens himself had not observed. From this time, then, the truth of the Huyghenian law was universally allowed, and soon afterwards, the theory by which it had been suggested was generally received.

The property of double refraction had been first studied only in Iceland spar, in which it is very obvious. The same property belongs,

⁴ *Quart. Rev.* 1809, Nov. p. 338.