

coigne's letter, suggested that the Dutch experimenters might have taken one of the images reflected from the surfaces of the prism, of which there are several, instead of the proper refracted one. By the aid of this hint, Lucas of Liege repeated Newton's experiments, and obtained Newton's result, except that he never could obtain a spectrum whose length was more than three and a half times its breadth. Newton, on his side, persisted in asserting that the image would be five times as long as it was broad, if the experiment were properly made. It is curious that he should have been so confident of this, as to conceive himself certain that such would be the result in all cases. We now know that the dispersion, and consequently the length, of the spectrum, is very different for different kinds of glass, and it is very probable that the Dutch prism was really less dispersive than the English one.<sup>13</sup> The erroneous assumption which Newton made in this instance, he held by to the last; and was thus prevented from making the discovery of which we have next to speak.

Newton was attacked by persons of more importance than those we have yet mentioned; namely, Hooke and Huyghens. These philosophers, however, did not object so much to the laws of refraction of different colors, as to some expressions used by Newton, which, they conceived, conveyed false notions respecting the composition and nature of light. Newton had asserted that all the different colors are of distinct kinds, and that, by their composition, they form white light. This is true of colors as far as their analysis and composition by refraction are concerned; but Hooke maintained that all natural colors are produced by various combinations of two primary ones, red and violet;<sup>14</sup> and Huyghens held a similar doctrine, taking, however, yellow and blue for his basis. Newton answers, that such compositions as they speak of, are not compositions of simple colors in his sense of the expressions. These writers also had both of them adopted an opinion that light consisted in vibrations; and objected to Newton that his language was erroneous, as involving the hypothesis that light was a body. Newton appears to have had a horror of the word *hypothesis*, and protests against its being supposed that his "theory" rests on such a foundation.

The doctrine of the unequal refrangibility of different rays is clearly exemplified in the effects of lenses, which produce images more or

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<sup>13</sup> Brewster's *Newton*, p. 50.

<sup>14</sup> Brewster's *Newton*, p. 54. *Phil. Trans.* viii. 5084, 6086.