

Mr. Isaac Newton's Considerations on the former Reply [of Francis Linus]

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Mr. Isaac Newton's *Considerations on the former Reply; together with further Directions, how to make the Experiment controverted aright: Written to the Publisher from Cambridge, Novemb. 13. 1675*

SIR,

When you shew'd me Mr. *Line's* second Letter. I remember I told you, that I thought an answer in writing would be insignificant, because the dispute was not about any Ratiocination, but my veracity in relating an Experiment, which he denies will succeed as it is described in my printed Letters: For this is to be decided not by discourse, but new tryal of the Experiment. What it is that imposes upon Mr. *Line* I cannot imagin; but I suspect he has not tryed the Experiment since he acquainted himself with my Theory, but depends upon his old notions taken up before he had any hint given to observe the figure of the coloured Image. I shall desire him therefore, before he returns any answer, to try it once more for his satisfaction, and that according to this manner.

Let him take any Prisme, and hold it so that its Axis may be perpendicular to the Sun's rays, and in this posture let it be placed as close as may be to the hole through which the Sun shines into a dark room, which hole may be about the bigness of a Pease. Then let him turn the Prism slowly about its Axis, and he shall see the colours move upon the opposite wall first towards that place to which the Sun's direct light would pass, it the Prism were taken away, and then back again. When they are in the middle of these two contrary motions, that is, when they are nearest that place to which the Sun's direct ray tends, there let him stop; for then are the rays equally refracted on both sides the Prism. In this posture of the Prism let him observe the figure of the colours, and he shall find it not round as he contends, but oblong, and so much the more oblong as the Angle of the Prism, comprehended by the refracting plains, is bigger, and the wall, on which the colours are cast, more distant from the Prism; the colours red, yellow, green, blew, purple, succeeding in order not from one side of the figure to the other, as in Mr. *Line's* conjecture, but from one end to the other; and the length of the Figure being not parallel but transverse to the Axis of the Prism. After this manner I used to try the Experiment: For I have try'd it often; sometimes to observe the circumstances of it, sometimes in order to further Experiments, and sometimes to show it to others, and in all my tryals the success was the same. But whereas Mr. *Line* thinks, I tryed it in a cloudy day, and placed the Prism at a great distance from the hole of the window; the Experiment will not succeed well if the day be not clear, and the Prism placed close to the hole, or so near at least, that all the Sun's light that comes from the hole may pass through the Prism also, so as to appear in a round form if intercepted by a paper immediately after it has past the Prism.

When Mr. *Line* has tryed this, I could wish, he would proceed a little further to try that which I call'd the *Experimentum Crucis*, seeing (if I mis-remember not) he denies that as well as the other. For when he has

tryed them (which by his denying them, I know he has not done yet as they should be tryed) I presume he will rest satisfied.

Three or four days after you gave me a sight of Mr. *Line*'s second Letter, I remember I thereupon show'd the first of these two Experiments to that Gentleman whom you found with me, when you gave me that visit, and whilst I was shewing it to him, A. H. (a member of the *R. Society*) came in and I shewed it to him also. And you may remember, that R. H. two or three years agoe in a Letter read before the *R. Society*, and transmitted to me, gave testimony not only to the Experiments questioned by Mr. *Line*, but to all those set down in my first Letter about Colours, as having tryed them himself; and when you read Mr. *Line*'s Letter at a meeting of the said *Society*; and was pleased to do me the favour to propound the Experiment to be tryed in their presence, R. H. spake of it to them as a thing not to be questioned. But if it have not yet been tryed before them, and any of them, upon Mr. *Line*'s confidence, doubt of it, I promise when I shall have the happiness to be at any more of their Assemblies, upon the least hint, to shew 'em the tryal of it; and I hope, I shall not be troublesome, because it may be tryed (though not so perfectly) even without darkning a room, or the expence of any more time than half a quarter of an hour; although, if Mr. *Line* persist in his denyal of it, I could wish it might be tryed sooner there, than I shall have an opportunity to be among them.
