

micrometers, in which instrument lines were drawn on glass at a distance of 1-500th of an inch. The interference of the undulations of the rays reflected from the two sides of these fine lines, produced periodical colors. In the same manner, he accounts for the colors of thin plates, by the interference of the light partially reflected from the two surfaces of the plates. We have already seen that Hooke had long before suggested the same explanation; and Young says at the end of his paper, "It was not till I had satisfied myself respecting all these phenomena, that I found in Hooke's *Micrographia* a passage which might have led me earlier to a similar opinion." He also quotes from Newton many passages which assume the existence of an ether; of which, as we have already seen, Newton suggests the necessity in these very phenomena, though he would apply it in combination with the emission of material light. In July, 1802, Young explained, on the same principle, some facts in indistinct vision, and other similar appearances. And in 1803,<sup>1</sup> he speaks more positively still. "In making," he says, "some experiments on the fringes of colors accompanying shadows, I have found so simple and so demonstrative a proof of the general law of interference of two portions of light, which I have already endeavored to establish, that I think it right to lay before the Royal Society a short statement of the facts which appear to me to be thus decisive." The two papers just mentioned certainly ought to have convinced all scientific men of the truth of the doctrine thus urged; for the number and exactness of the explanations is very remarkable. They include the colored fringes which are seen with the shadows of fibres; the colors produced by a dew between two pieces of glass, which, according to the theory, should appear when the thickness of the plate is *six* times that of thin plates, and which do so; the changes resulting from the employment of other fluids than water; the effect of inclining the plates; also the fringes and bands which accompany shadows, the phenomena observed by Grimaldi, Newton, Maraldi, and others, and hitherto never at all reduced to rule. Young observes, very justly, "whatever may be thought of the theory, we have got a simple and general law" of the phenomena. He moreover calculated the length of an undulation from the measurements of fringes of shadows, as he had done before from the colors of thin plates; and found a very close accordance of the results of the various cases with one another.

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<sup>1</sup> *Phil. Trans.* Memoir, read Nov. 24.