http://www.geology.19thcenturyscience.org/books/1858-Whewell-HistSci/README.htm

There is one difficulty, and one inaccuracy, in Young's views at this period, which it may be proper to note. The difficulty was, that he found it necessary to suppose that light, when reflected at a rarer medium, is retarded by half an undulation. This assumption, though often urged at a later period as an argument against the theory, was fully justified as the mechanical principles of the subject were unfolded; and the necessity of it was clear to Young from the first. On the strength of this, says he, "I ventured to predict, that if the reflections were of the same kind, made at the surfaces of a thin plate, of a density intermediate between the densities of the mediums surrounding it, the central spot would be white; and I have now the pleasure of stating, that I have fully verified this prediction by interposing a drop of oil of sassafras between a prism of flint-glass and a lens of crown-glass."

The inaccuracy of his calculations consisted in his considering the external fringe of shadows to be produced by the interference of a ray *reflected* from the *edge* of the object, with a ray which passes clear of it; instead of supposing *all the parts* of the wave of light to corroborate or interfere with one another. The mathematical treatment of the question on the latter hypothesis was by no means easy. Young was a mathematician of considerable power in the solution of the problems which came before him: though his methods possessed none of the analytical elegance which, in his time, had become general in France. But it does not appear that he ever solved the problem of undulations as applied to fringes, with its true conditions. He did, however, rectify his conceptions of the nature of the interference; and we may add, that the numerical error of the consequences of the defective hypothesis is not such as to prevent their confirming the undulatory theory.[2]

But though this theory was thus so powerfully recommended by experiment and calculation, it met with little favor in the scientific world. Perhaps this will be in some measure accounted for, when we come, in the next chapter, to speak of the mode of its reception by

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[2] I may mention, in addition to the applications which Young made of the principle of interferences, his *Eriometer*, an instrument invented for the purpose of measuring the thickness of the fibres of wood; and the explanation of the supernumerary bands of the rainbow. These explanations involve calculations founded on the length of an undulation of light, and were confirmed by experiment, as far as experiment went.