

the theory of vibrations had already achieved so much. He was thus more interested in the physical nature than in the geometrical properties of rays of light. He was impressed by the analogies which exist between many phenomena of sound and light, and acquainted with the writings of the Continental mathematicians, among whom Euler was conspicuous as favouring the undulatory or ether theory of Huygens. He noticed that in Newton's writings were to be found the germs of both theories, also that the arguments by which Newton convinced himself that a theory of undulations could not explain the rectilinear propagation of light, were untenable.¹ On reflecting in May 1801 on Newton's beautiful experiments,

Voice. . . . When I began the outline of an essay on the human voice, I found myself at a loss for a perfect conception of what sound was, and during the three years that I passed at Emmanuel College, Cambridge, I collected all the information relating to it that I could procure from books, and I made a variety of original experiments on sounds of all kinds, and on the motions of fluids in general. In the course of these inquiries I learned to my surprise how much further our neighbours on the Continent were advanced in the investigation of the motions of sounding bodies and of elastic fluids than any of our countrymen; and in making some experiments on the production of sounds, I was so forcibly impressed with the resemblance of the phenomena that I saw to those of the colours of thin plates, with which I was already acquainted, that I began to suspect the existence of a closer analogy between them than I could before have easily believed" (p. 199). This led

to his 'Outlines of Experiments and Inquiries respecting Sound and Light' (ibid., p. 64).

¹ Works, vol. i. p. 200. "Newton's arguments from experiment appear to me to have been sufficiently obviated by what Lambert has advanced in the 'Memoirs of Berlin.' . . . The demonstration is attempted in the 'Principia': to me it appears to be defective. . . . The celebrated Laplace, in comparing the opinions respecting light, is contented to call the Newtonian doctrine a hypothesis, which, on account of the facility of its application to the phenomena, is extremely probable. If he had considered the undulatory system as demonstrably absurd, he would not have expressed himself in so undecided a manner. . . . Much as I venerate the name of Newton, I am not therefore obliged to believe that he was infallible. I see . . . with regret that he was liable to err, and that his authority has, perhaps, sometimes even retarded the progress of science," &c., &c.