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

Huyghens' assertion, that Snell did not *attend to* the proportion of the sines, is very captious; and becomes absurdly so, when it is made to mean that Snell did not *know* the law of the sines. It is not denied that Snell knew the true law, or that the true law is the law of the sines. Snell does not use the trigonometrical term *sine*, but he expresses the law in a geometrical form more simply. Even if he *had* attended to the law of the sines, he might reasonably have preferred his own way of stating it.

James Gregory also independently discovered the true law of refraction; and, in publishing it, states that he had learnt that it had already been published by Descartes].

But though Descartes does not, in this instance, produce any good claims to the character of an inductive philosopher, he showed considerable skill in tracing the consequences of the principle when once adopted. In particular we must consider him as the genuine author of the explanation of the rainbow. It is true that Fleischer[4] and Kepler had previously ascribed this phenomenon to the rays of sunlight which, falling on drops of rain, are refracted into each drop, reflected at its inner surface, and refracted out again: Antonio de Dominis had found that a glass globe of water, when placed in a particular position with respect to the eye, exhibited bright colors; and had hence explained the circular form of the bow, which, indeed, Aristotle had done before.[5] But none of these writers had shown why there was a narrow bright circle of a definite diameter; for the drops which send rays to the eye after two refractions and a reflection, occupy a much wider space in the heavens. Descartes assigned the reason for this in the most satisfactory manner,[6] by showing that the rays which, after two refractions and a reflection, come to the eye at an angle of about forty-one degrees with their original direction, are far more dense than those in any other position. He showed, in the same manner, that the existence and position of the *secondary bow* resulted from the same laws. This is the complete and adequate account of the state of things, so far as the brightness of the bows only is concerned; the explanation of the colors belongs to the next article of our survey.

The explanation of the rainbow and of its magnitude, afforded by Snell's law of sines, was perhaps one of the leading points in the verification of the law. The principle, being once established, was applied, by the aid of mathematical reasoning, to atmospheric refractions, opti-

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[4] Mont. i. 701. [5] *Meteorol.* iii. 3. [6] *Meteorum*, cap. viii. p. 196.