Willebrord Snel Biography

Willebrord Snel

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Biography

Snel is most famous for his research on the refraction of light, which yielded Snel's law. He also devoted a considerable amount of time to the calculation of geographic distances through trigonometric triangulation, and he is often credited with founding the modern science of mapmaking.

Snel was born in Leiden, Holland, in 1580, where his father taught mathematics. He was considered something of a prodigy, and at the age of twenty, though he had not yet completed his master's degree, he was allowed to lecture in mathematics at the University of Leiden. Snel spent the next few years traveling across Europe and meeting such influential scientists as Tycho Brahe and Johannes Kepler. He completed his graduate studies in 1608 and, in 1613, was appointed to his father's chair at the university teaching mathematics, physics, and optics.

Shortly after his appointment, Snel began his experiments with triangulation. Very little work in this field had been attempted, and so Snel had to develop most of its techniques along the way. Using a large quadrant, he began to equate distances with the angle by which they were visibly separated. After many repetitions Snel even suggested a figure for the radius of the Earth based on his trigonometric findings; this figure has been recently tested and found to be very precise.

Probably Snel's most important contribution to the annals of science was his law of refraction. He noted that a ray of light passing from one transparent medium into another (for example, moving from air into water or glass) would bend slightly at the boundary. This phenomenon had been observed long ago by Ptolemy, had never been properly explained. Snel showed that the sine of the two angles (the angle of incidence and the angle of refraction) were related, and that their ratio was a constant. That constant is known as the index of refraction and is determined by the type of material the light is passing through.

There is some controversy over the true authorship of Snel's law. Snel himself never published his findings, and it was not until 1637 that the law of refraction was introduced by René Descartes. Descartes' equation differed slightly from Snel's but was blatantly derivative. Some prominent scientists--most notably Christiaan Huygens -- accused Descartes of plagiarism, particularly after it was found that he had made a number of trips to Leiden after Snel's death.