

Morley's Trisector Theorem (AD 1899)

Glass

In 1899, Anglo-American mathematician and accomplished chess player Frank Morley proposed Morley's theorem that states that in *any* triangle, the three points of intersection of adjacent angle trisectors *always* form an equilateral triangle. *Trisectors* refers to the straight lines that divide the interior angles into three equal parts, and these lines intersect in six points, of which three are vertices of an equilateral triangle. Various proofs exist, and some of the earliest proofs were quite complicated.

Morley's colleagues found the result so beautiful and surprising that it came to be known as "Morley's miracle". Richard Francis writes, "Apparently overlooked by ancient geometers or hastily abandoned because of trisection and constructability uncertainties, the problem came to light only a century ago. Though conjectured around 1900 by Frank Morley, resolution or rigorous proof was to await even more recent advances. This beautiful and elegant Euclidean theorem, mysteriously unnoticed across the ages, thus belongs to the twentieth century."

It lasted until 1909 before the Indian mathematician *Mandyam Tondanur Naraniengar* proved Morley's theorem. Morley's theorem continues to fascinate mathematicians. In 1998, Alain Connes, a French Fields Medalist, presented a new proof of Morley's theorem.