

## Aristotle's Wheel and Galileo's Mistake

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There are two peculiar mathematical-metaphysical thought-experiments that are crucial to Galileo's consideration of the notion of continuum. The first one opposes an Aristotelian claim that was generally accepted at that time that an actual infinite division of a continuum is impossible: by banding the straight line into the circle, one can obtain infinitely many parts, or sides, because, as Galileo believed, circle is a polygon with infinitely many sides. The second one applies the same conception of the circle as a key idea to the solution to an ancient paradox known as The Aristotle's Wheel. Galileo uses an analogy between circles and polygons with finitely many sides for his very original, unusual and interesting solution, and that solution is our main topic in this paper. After offering a solution to the paradox based on contemporary theories of continuum, we will present Galileo's putative solution, and point to its significance to Galileo's theory of continuum. We will then give two arguments aimed to show a contradiction in Galileo's solution. Our intention is to suggest an inner critique, without appealing to any particular modern or old theory of continuum, and without using any claim that could not be ascribed to Galileo. Although our first argument might fall short of our target, since it applies a Euclidean definition which Galileo might reject, we believe that our second argument does not presuppose anything external to Galileo's theory.