

Science Suppressed: Aristarchus and the Effect of Authority

In the landmark work “The Structure of Scientific Revolutions,” Thomas Kuhn proposed that scientific knowledge does not follow a linear progression, but instead is marked by revolutionary change that radically alters the basic assumptions within a field (Kuhn, 1962). This appears to be an objective process that relies on the evidence of a new theory or hypotheses that usurps the old. Although somewhat intuitive, this view of paradigms seems to ignore some of the other factors that affect the adoption of scientific theories that lead to revolutions. A particular case is the first heliocentric theory proposed by Aristarchus of Samos, a third-century BCE Greek scientist.

In applying Kuhn’s model, it is clear that Aristarchus was challenging the existing geocentric theory that was widely accepted by scholars within the ancient world. Yet, his theory failed to gain traction or acceptance in the scientific community. To fully understand why Aristarchus’s theory was never adopted, it is necessary to observe the other surrounding factors, subjective factors often not associated with the scientific process. Aristarchus will serve as a case study, demonstrating how various authority figures surrounding him contributed to the failure of heliocentrism in third-century BCE Greece. This model can also be extrapolated to other historical examples and comment on the objectivity of the scientific process.

Due to the drastic differences between modern science and ancient Greek science, it is essential to build a context surrounding defining what ancient science was and how it operated. G.E.R. Lloyd provides an important explanation of how ancient science lived on a spectrum, without any singular field defined as “science” (Lloyd, 1970). To contextualize the period, there is a focus on how knowledge was transmitted and shared, such as the poetry of Cleanthes and the peer review between Eratosthenes and Archimedes. This paper also explores weight of authority

in early Greek culture, drawing upon the influence of the Seven Sages. It is clear through the authority figures that surrounded Aristarchus, such as Aristotle, Cleanthes, and Claudius Ptolemy, that authorities subscribing to the dogma of geocentrism were a large contributing factor to the negative reception of Aristarchus's theory.

In order to understand how authority operated within ancient Greece, this paper will address both real and constructed authority; "real" refers to those who held positions of power or respect that granted an individual authority, and "constructed" refers to how authors asserted themselves as authorities through their writing (Weber, 1958; Wietzke, 2017). Both authority and surrounding Greek culture will be analyzed through scientific texts that were written both before and after Aristarchus in various fields (mathematics, astronomy, medicine, etc.), in order to more holistically represent the changing dynamics of the Hellenistic period in which Aristarchus is situated.

This paper ultimately seeks to revise how the scientific process is viewed by demonstrating that in premodern science, acceptance of theories was not purely objective and was at times driven by dogma. This can be viewed through the case study of Aristarchus as his theory failed to overcome the dogmatic following dedicated to a geocentric view. Extrapolating the use of subjective factors in viewing scientific change will provide more comprehensive views of the scientific process as it affects those that engage with the scientific community.

Bibliography

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