

## SCIENCE IN MEDIEVAL CIVILIZATIONS

### Topic 1

Sumerian Mythology / Astronomy

Egyptian Medicine

Indian Mathematics

Ancient Greek Arkhe Quest

Pythagoras

Euclides

Aristotle Physics / Metaphysics

Alchemy

Galileo

Newton

Einstein

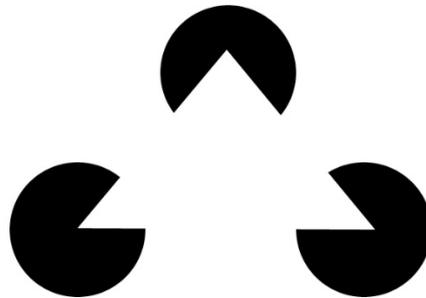
Hawking

Higgs

What is common to all these historical examples in the name of scientificity? What is the difference that will consider the approaches that are accepted as unscientific and which will be excluded from the history of scientific thought?

Where do we look for the History of Scientific Thought? What are we looking for? How do we know that what we find is what we are looking for?

WHAT IS FIXED IN THE THEORY AND APPLICATION (PRACTICE) OF SCIENCE IN CONTINUOUS CHANGE?  
  
WHAT MAKES THIS A CONTINUOUS INTERVENTION WITH THE VISIBLE RADICAL CHANGES IN THE FOCUS POINT IN THE DETAILS?



Is there a triangle in the figure above? How do we see it, if any? There are no three lines drawn! When the simulation is established, when we look at the history, where and how do we see the 'scientificity' quality?

What is common to 'scientificity' in all these historical examples? What is the difference that will consider the approaches that are accepted as unscientific and which will be excluded from the history of scientific thought?

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Middle Ages are generally perceived as a period of darkness and stagnation between the heights of the Antiquity and the Renaissance. This notion is especially held to be true in the case of the medieval science. It has originated from the views of Denis Diderot, Jean le Rond D'Alembert, Montesquieu, Jean Jacques Rousseau, Francois Marie Aouret de Voltaire and the other philosophers of the 18th Century French Enlightenment, who have perceived the Middle Ages as a dark period of the human history, between the lights of the Antiquity and the Renaissance, dominated by the power of the Roman Catholic Church and without any scientific development (cf. Kalin, 1997).

After the fall of the Western Roman Empire in 476 a.C., its territory was divided between the different barbarian tribes that gradually have formed their own feudal states (cf. Boing, 1971). The Eastern Roman Empire known as the Byzantium managed to survive until 1453, while the southern part of the Mediterranean was in the 7th Century conquered by the Muslim Arabs. The works of the Greek and the Roman natural philosophers were mainly destroyed in the West and have survived only in the traces such as the Latin transcripts stored in the Catholic monasteries which have spread across Europe (cf. Riché, 1976).

Although the majority of the mentioned works has survived in the Byzantium, there they had merely a minor impact on the development of the science, because of the close relationship between the Orthodox Church and the authoritarian state, the continuous struggle for a survival, and the belief in a perpetual truth revealed in the works of the ancient authorities. Thus, the main role of the Byzantine science was the transmission of the classical knowledge to the Islamic Caliphate and the Latin West, but also in the transmission of the original achievements of the former to the later. Its main highlights were the building of the Hagia Sophia church by the architects and mathematicians Isidore of Miletus and Anthemius of Tralles, which for a thousand years remained the biggest church in the world, and the discovery of the Greek Fire mixture used in the naval battles due to its possibility of burning on water, which has enabled the survival of the Byzantine Empire for a thousand years. Both achievements occurred already in the 6th Century at the height of the Byzantine science, thus clearly becoming its symbols, due to the fact that afterwards it went into a slow continuous decay. Consequently, the Byzantine science always remained classical science, which reached its peaks only through the returning to the ancient authorities during the Macedonian (11th), the Komnenoi (12th), and the Palaeologean (14th) Renaissance (cf. Tatakis and Moutafakis, 2003). A notable example of a medieval female Byzantine scientist is the princess Anna Komnene (1083-1153) daughter of Emperor Alexios I Komnenos of Byzantium and Irene Doukaina. In her chronicle work *Alexiad*

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she gave an account of her court education, based on the ancient Greek language, literature, rhetoric, and sciences, but which also included medicine, astronomy, mathematics, geography, history, and military affairs. According to her contemporaries she taught medicine, was at the head of the main Constantinople hospital and orphanage which held beds for 10,000 patients and orphans, and was considered to be an expert on gout disease (cf. Connor, 2004).

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<http://inters.org/middle-ages-science>