

## SCIENCE IN MEDIEVAL CIVILIZATIONS

### Topic 5

#### **Medieval Scientific Revolution: Myth or Reality?**

It is generally accepted that the Scientific Revolution occurred in the 17th Century, which was full of the important discoveries, and is thus consequently known as “the century of scientific discoveries”. The best examples among them are the establishment of the experimental scientific method by the Italian astronomer Galileo Galilei (1564-1642), the introduction of the inductive logical method by the English philosopher Francis Bacon (1561-1626), and the formulation of the Theory of Gravitation by the English physicist Isaac Newton (1642-1727). While for Kuhn and Koyré on the one hand their explanations represent exemplar scientific revolutions (Kuhn, 1996), for Duhem and Crombie on the other hand they are only scientific continuities (cf. Crombie, 1959).

The claimed, but not really proven, evidences for the Nicolaus Copernicus’s heliocentric theory which were given by Galileo Galilei in his book *Dialogo sopra i due massimi sistemi del mondo* (Dialogue Concerning the Two Chief World Systems) published in 1632 and which were presumably based on his thorough astronomical observations made by his telescope, were not enough to end the debate on the rotation of the Earth around the Sun, which was already discussed by the above mentioned 14th century French priest Jean Buridan in his work *Quaestiones de Caelo et Mundo* (Quaestiones of Sky and Earth) (Crombie, 1959). Moreover, the origins of the inductive logical method can be found in the work *Opus majus* written by the above mentioned 13th Century Oxford Franciscan Roger Bacon, which was four hundred years before it was completely explained by the 17th Century Cambridge philosopher Francis Bacon in his book *Novum organum* published in 1620 (although sharing the same family name the two mentioned philosophers were not related) (cf. Crombie, 1959). Finally, the laws of optics as described in the book *Opticks* published in 1704 and written by 17th Century Cambridge mathematician Isaac Newton, does not seem so revolutionary any more if one knows that the refraction of light by a spherical lens was already qualitatively and quantitatively explained by the above mentioned 13th Century English bishop Robert Grosseteste in the work *De Iride* (On Lens) (cf. Crombie, 1959).

While on the one hand it is true that there was no continuity in the development of the scientific concepts between the above mentioned 13th Century philosophers and the 17th Century scientists, on the other hand it is also the fact that the works of the earlier authors were more than accessible to the later authors, because they were all published after the invention of the

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printing machine around 1440 by the German printer and publisher Johannes Gutenberg (c. 1395-1468) (cf. Hannam, 2011). On this track it is easy to understand why Crombie claimed that if one wants to talk about the Scientific Revolution, it should be divided into two phases: the first one in the 13th and the second one in the 17th Century (cf. Crombie, 1959). In this respect the best illustration of the importance of the Medieval Latin Science for the later scientific development could be given by drawing a parallel between the development of sciences and the development of arts, because the Renaissance Art as well has not just occurred out of nowhere, but has had its predecessors in the medieval artists like Giotto di Bondone (1266-1337) for example.

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