

Lecture 27: Science and the Self: Macrocosms and Microcosms

De-centering Europe – Shifting Perspectives

I. Advent of the Scientific Method

- A. Secularism
- B. New Modes of Explanation
 - Logical Method
 - Experimentation
 - Mathematics – a language of abstraction

II. De-centering the Earth– New perspective on the universe

- A. Copernicus’s Heliocentric Model, 1543
- B. Resistance of Tradition
- C. Galileo’s Challenge to the Heavens

III. De-centering the Soul – ordering the self on a mechanical model

- A. Man as Mechanism – Circulation and the Human Body
- B. Making Scientists of Men – seeing the world through glass

Advent of the Scientific Method

Changes in perspective grew out of changing context in the west:

- 1) Opening up of new horizons through colonization and expansion
- 2) Frustrations with religious conflict and the growing role of doubt, skepticism
- 3) Emphasis on new modes of acute observation: inquisitors manuals, confession, ethnography, and the natural world.

As a consequence a new world view began to emerge:

Secularism – characterized by a search for non-religious explanations for political authority and natural phenomena.

New Modes of Explanation and Analysis = A Scientific Revolution (*scientia* = knowledge, ways of knowing)

-- **Logical Method** = moving from known principles to unknown conclusions = deductive reasoning

-- **Experimentation** = based on observation, perspective and measurement

-- **Mathematics** = a grammar and language of abstraction to explain the natural world and to encode natural rules and laws of behavior.

De-centering the Earth– New perspective on the Universe

Nicholas Copernicus's (1473-1543), *On the Revolutions of Heavenly Spheres*, published in 1543, proposed a Heliocentric Model = Sun centered model of the cosmos = radically new idea emerged from logical, mathematics, and simplicity of explanation.

Tycho Brahe (1546-1601), used detailed observation to confirm Copernicus's findings.

Johannes Kepler (1571-1630), also agreed with Copernican system and added idea of elliptical orbits of the planets.

Resistance of Tradition = God put the earth at the center of the universe Ptolemaic model vs. Copernicus

Galileo's Challenge to the Heavens

Galileo Galilei (1564-1642) – took Copernicus's ideas further. 1608/9 used his crafted telescope to reconfirm and advance heliocentric model.

In 1610 he published *The Starry Messenger* describing the stars and the Milky Way. The telescope put these issues onto the world stage = natural eye confirmed the mathematics.

In 1615, he responded to the debate about the authority of the Bible vs. science = published "Concerning the use of biblical quotations in Matters of Science." = argued that science supersedes theology, but God was the author of both the Bible and the natural world, or laws of nature.

1616 = Copernicus and heliocentric model condemned by Inquisition. Texts put on Index of Forbidden Books.

1632 = Galileo brought before Roman Inquisition, ultimately found guilty of "vehement suspicion of heresy," Died under house arrest.

De-centering the soul – Ordering Man on a mechanical model

Man as Mechanism

Emergence of dissection as new theater of observation

Andreas Vesalius, (1514-1564), published *On the Fabric of the Human Body*, in 1543 = detailed descriptions with visual representations of the workings of the body and functions of the organs.

William Harvey, (1578-1657) = determines through observation the circulation of the blood in the body, published his findings in 1628.