S.SEIFULLIN KAZAKH AGRO TECHNICAL UNIVERSITY

DEPARTMENT OF PHILOSOPHY
(2708)

History and Philosophy of Science

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Theme 4. The emergence and establishment of science

- **The purpose of the lecture:** historical and logical analysis of the stages of formation and development of science.

Plan:

Background of the experimental method

1. Leonardo da Vinci (1452-1519).
2. Nicolaus Copernicus (1473-1543).
3. Galileo Galilei (1564-1642).

Leonardo da Vinci

- Italian painter, scientist, and engineer. His paintings are notable for their use of the technique of sfumato and include The Virgin of the Rocks (1483–85), The Last Supper (1498), and the Mona Lisa (1504–05). He devoted himself to a wide range of other subjects, from anatomy and biology to mechanics and hydraulics: his 19 notebooks include studies of the human circulatory system and plans for a type of aircraft and a submarine.

Leonardo da Vinci Quotes

- Learning never exhausts the mind.
- Tears come from the heart and not from the brain.
- Simplicity is the ultimate sophistication.
- All our knowledge has its origins in our perceptions.
- He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast.
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Inventions by Leonardo da Vinci

- Parachute
- Wheel lock
- Bike
- Tank
- Portable bridges
- Spotlight
- Catapult
- Robot

Nicolaus Copernicus

- Polish astronomer who proposed that the planets have the Sun as the fixed point to which their motions are to be referred; that the Earth is a planet which, besides orbiting the Sun annually, also turns once daily on its own axis; and that very slow, long-term changes in the direction of this axis account for the precession of the equinoxes. This representation of the heavens is usually called the heliocentric.

Nicolaus Copernicus

- Copernicus's theory had important consequences for later thinkers of the scientific revolution, including such major figures as Galileo, Kepler, Descartes, and Newton. Copernicus probably hit upon his main idea sometime between 1508 and 1514, and during those years he wrote a manuscript usually called the Commentariolus ("Little Commentary").

Nicolaus Copernicus

- However, the book that contains the final version of his theory, De revolutionibus orbium coelestium libri VI (“Six Books Concerning the Revolutions of the Heavenly Orbs”), did not appear in print until 1543, the year of his death.

Galileo Galilei

- Italian natural philosopher, astronomer, and mathematician who made fundamental contributions to the sciences of motion, astronomy, and strength of materials and to the development of the scientific method. His formulation of (circular) inertia, the law of falling bodies, and parabolic trajectories marked the beginning of a fundamental change in the study of motion.

Galileo Galilei

- His insistence that the book of nature was written in the language of mathematics changed natural philosophy from a verbal, qualitative account to a mathematical one in which experimentation became a recognized method for discovering the facts of nature.

Galileo Galilei

- Finally, his discoveries with the telescope revolutionized astronomy and paved the way for the acceptance of the Copernican heliocentric system, but his advocacy of that system eventually resulted in an Inquisition process against him.