

S.SEIFULLIN KAZAKH AGRO TECHNICAL UNIVERSITY

DEPARTMENT OF PHILOSOPHY  
(2708)

# **History and Philosophy of Science**

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# **Theme 5. Modern European Science - the classic stage of the development of science**

- **The purpose of the lecture:** analysis of the classical stage of scientific development and the identification of elements of classical science.

# Plan:

- 1. Empiricism***
- 2. Rationalism***
- 3. The Enlightenment***

# Basic concepts:

- The methodology of science
- Rationalism
- Empiricism
- The Enlightenment
- Classical science

# Empiricism

- Empiricism is direction in the philosophy of the New Age, recognized as the foundation of knowledge is experience.
- The founder of empiricism was ***Francis Bacon***. Bacon has developed a method of experimental induction, which became the core of a comprehensive program of scientific and technological power of humanity.

# Empiricism

- Bacon was a real "prophet", a herald of modern scientific and technological civilization.
- "Knowledge is force."

# Empiricism

- The purpose of science is bringing benefits to mankind
- The main task of philosophy is the construction of a new method of learning

# Rationalism

- Rationalism is trend in modern philosophy, whose representatives argued the possibility of knowing reality from the pure principles of thinking, independent of experience. The founder of classical rationalism was ***Rene Descartes.***



# Rationalism

- Central to the methodology of Descartes takes the principle of evidence or intellectual intuition - the focus of classical rationalism. The only criterion of truth is the mind; true only that which is conceived mind quite clearly and distinctly; what is conceived clearly and distinctly, it is the true being. «Cogito ergo sum» - «I think, therefore I am" - known formula of Descartes.

# ***The Enlightenment***

- **Francois Marie Arouet (Voltaire)** - the founder of the French Enlightenment.
- **Voltaire English quotes**
- I disapprove of what you say, but I will defend to the death your right to say it.
- Doubt is not a pleasant condition, but certainty is absurd.
- Work saves us from three great evils: boredom, vice and need.

# The Enlightenment

- **The French Encyclopedists** - There are authors of "Encyclopedia, or the Explanatory Dictionary of the Sciences, Arts and Crafts" (1751-1780), which was headed by D'Alembert and Diderot, and which includes the most outstanding thinkers, scientists, writers, engineers of the Enlightenment: Voltaire, Rousseau, Turgot, Buffon, de Condillac, Marmontel, Raynal, and etc.

# INVENTIONS AND DISCOVERIES

- Barometer and atmospheric pressure: 1643-1646
- The pendulum clock: 1656-1657
- The pocket watch: 1675
- Pressure cooker and piston: 1685-1690
- Piano and forte: 1698
- Steam pump: 1698-1702

# INVENTIONS AND DISCOVERIES

- Boiler, cylinder and piston: 1704-1712
- Mercury thermometer: 1714-1742
- Chronometer: 1714-1766
- Sextant: 1731-1757
- The Leyden jar: 1745-1746
- James Watt and the condenser: 1764-1769
- Machine tools, gun barrels and cylinders:  
1774-1800

# INVENTIONS AND DISCOVERIES

- Double-acting engine and governor:  
1782-1787
- Year of the balloon - hot air:1783
- Bifocals: 1784
- Cotton gin: 1793
- Lithography: 1798-1875
- Jenner and vaccination: 1796-1798