

S.SEIFULLIN KAZAKH AGRO TECHNICAL UNIVERSITY

DEPARTMENT OF PHILOSOPHY
(2708)

History and Philosophy of Science

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Theme 9. The scientific picture of the world

- **The purpose of the lecture:** the definition of the basic characteristics of the modern scientific picture of the world.

Plan:

1. Scientific picture of the world.
2. Historical forms of the scientific world.
3. The global evolution as a modern scientific picture of the world.

Basic concepts:

- Scientific picture of the world
- The global evolutionism
- The anthropic principle in cosmology

Scientific picture of the world

- a system of ideas about the properties and laws of reality, built in the compilation and synthesis of scientific concepts and principles.

Scientific picture of the world

- The scientific picture of the world is not a dogma and absolute truth. At the same time, scientific understanding closer to the truth, because they are based on the totality of the facts proven and established causal relationships. As a result, scientific knowledge can draw correct conclusions and predictions about the properties of our world and contribute to the development of human civilization.

Scientific picture of the world

- The scientific picture of the world may be different from the religious views of the world, based on the authority of the prophets, religious traditions, sacred texts, etc. Therefore, religious views are more conservative in contrast to the scientific, evolving as a result of discovery of new facts. In turn, the religious concept of the universe is subject to change, to move closer to the scientific views of his time.

Historical forms of the scientific world

- 1) Classical
- 2) Non-classical
- 3) Postnonclassical

Classical picture of the world

- Period: XVII - XIX centuries
- The basic idea: the transition from the geocentric to the heliocentric model of the world.
- The scientific revolution of Newton (Newton formulated the basic principles of the new scientific picture of the world)

Classical picture of the world

- There is a sharp contrast between the subject and object of research.
- The subject - "does not matter".
- The main - the language of mathematics.
- Methods of experimental studies.
- The basic principle: mechanical determinism
- The emergence of the mechanistic scientific world on the basis of experimental mathematical science.

Non-classical picture of the world

- Einstein's revolution.
- XIX-XX centuries.
- Discovery of the complex structure of the atom
- The phenomenon of radioactivity
- The discrete nature of electromagnetic radiation, etc.

Non-classical picture of the world

- The result has been undermined, the most important prerequisite for a mechanistic view of the world - the belief that simple forces acting between the same objects can explain all natural phenomena. Later, under the new picture of the world revolution took place in private sciences: cosmology (the concept of the universe is not stationary), biology (development of genetics), etc. Thus, during the XX century, science has changed dramatically its appearance in all its directions.

Postnonclassical picture of the world

- Buckminster Fuller (1895-1983) coined the term and attempted to define its scope in his two volume work Synergetics. His oeuvre inspired many researchers to tackle branches of synergetics. Three examples: Haken explored self-organizing structures of open systems far from thermodynamic equilibrium, Amy Edmondson explored tetrahedral and icosahedral geometry, and Stafford Beer tackled geodesics in the context of social dynamics.

Postnonclassical picture of the world

- Many other researchers toil today on aspects of Synergetics, though many deliberately distance themselves from Fuller's broad all-encompassing definition, given its problematic attempt to differentiate and relate all aspects of reality including the ideal and the physically realized, the container and the contained, the one and the many, the observer and the observed, the human microcosm and the universal macrocosm.