History and philosophy of science

- Rakhimova ZH.
- Kodirova D.

What is a science?

Science (from the Latin word *scientia*, meaning "knowledge")[1] is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe.

- The earliest roots of science can be traced to Ancient Egypt and Mesopotamia in around 3500 to 3000 BCE.
- Their contributions to mathematics, astronomy, and medicine entered and shaped Greek natural philosophy of classical antiquity, whereby formal attempts were made to provide explanations of events in the physical world based on natural causes.

- Modern science is typically divided into three major branches that consist of the natural sciences (e.g., biology, chemistry, and physics), which study nature in the broadest sense; the social sciences (e.g., economics, psychology, and sociology), which study individuals and societies; and the formal sciences (e.g., logic, mathematics, and theoretical computer science), which study abstract concepts.

- The structure of science as an activity can be represented as a set of three basic elements: the goal – obtaining new scientific knowledge; the subject – the available empirical and theoretical information to help solve scientific problems; the resources – methods of analysis and communication available to the researcher that help achieve acceptable to the scientific community solution to a problem.

Philosophy as the Mother of Science

- Philosophy was the original inquiry into the nature of the world. (Socrates, Plato, Aristotle, etc.) It combined what we'd now call 'science' with other aspects of reality, and asked all those questions. (So philosophers asked about the origin of the universe, what it was made of, what it was all for, what was ethical, etc., all in one package.)

  As that knowledge grew and people started specializing, and as philosophers started to realize better the role of controlled observation in gaining certain types of knowledge, and as they learned more about the world to start to impose stable categories on phenomena, the sciences split off from philosophy. So, for example, Aristotle is called the father of biology: he catalogued a great many species, speculated (in a very sexist manner) on biology and reproduction. He also philosophized about what made humans different from other animals. But, it was only some time after him that biology turned into a science with a shared set of standards, research problems, etc. - one could say that before Darwin, biology wasn't distinct from a whole host of other inquiries into life-related subjects.

  The word "scientists" is a recent invention, formally distinguishing experimental investigators of nature from other modes of inquiry. (Newton called himself a "natural philosopher" because 'scientist' wasn't created yet. And, he probably would have objected even so: he did an awful lot of philosophy (epistemology, especially) in his Principia Mathematica.)

- The modern philosophy of science as a study of the general laws of scientific knowledge in its historical development and the changing social and cultural context

- According to the domestic researcher T. Leshkevich, in creating the image of the philosophy of science one should distinguish between the two meanings of this term: 1) as a direction of the Western and the Russian philosophy presented by a variety of concepts that offer one or another model of the development of the science which originated in the second half of the XIX-th century; 2) as a discipline that emerged during the second half of the XX-th century in response to the need to understand the socio-cultural function of science in the scientific and technological revolution (STR). Its subjects are the general patterns and trends of the scientific cognition as a special activity for the production of the scientific knowledge taken in its historical development and considered in the changing social and cultural context

- The formation and development of the philosophy of science as a discipline was influenced by: 1) the general socio-cultural background of a particular historical epoch; 2) gnosiological, epistemological, and methodological studies; 3) theoretical approaches, models and concepts developed in the framework of the philosophy of science as a branch of the modern philosophy.
  The range of the main problems of the philosophy of science is quite wide: the scientific criteria and the differences between the scientific knowledge and the unscientific one; logic of the scientific research; structure of the scientific knowledge; mechanisms for generating new knowledge; scientific rationality; patterns of the history of science; interaction of science and culture; science base; value of science; ethos of science, etc. All of them are derived from the central problem of the philosophy of science – the problem of growth (development) of the scientific knowledge.