МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА
И ПРОДОВОЛЬСТВИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

ГЛАВНОЕ УПРАВЛЕНИЕ ОБРАЗОВАНИЯ,
НАУКИ И КАДРОВОЙ ПОЛИТИКИ

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СЕЛЬСКОХОЗЯЙСТВЕННАЯ АКАДЕМИЯ»

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PHILOSOPHY AND METHODOLOGY OF SCIENCE

ФИЛОСОФИЯ И МЕТОДОЛОГИЯ НАУКИ

Пособие
для студентов всех специальностей
углубленного высшего образования

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Пособие «Philosophy and methodology of science» написано на английском языке для студентов, получающих углубленное высшее образование. Пособие предполагает формирование общего представления об истории, принципах и закономерностях становления и развития философского и общенаучного знания. Содержит краткое изложение вопросов тем, ключевые понятия, вопросы для самопроверки, список рекомендованных литературных источников.

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INTRODUCTION

Philosophy is a specific type of a rational-critical worldview, as well as a special form of consciousness, which represents the integral theoretical and generalized system of knowledge about man and the world in their interrelation.

Philosophy occupies one of the central positions in contemporary social and humanitarian education. It makes a valuable contribution into shaping one's worldview and an active civil and patriotic position; it enables our objective evaluation of the development of modern culture and civilization.

The main purpose of philosophical studies is to master the heritage of world and domestic philosophical ideas, to stimulate students' creative attitude to this heritage, and to develop the skills of independent philosophical thinking. In this connection, the specific objective of the Philosophy and methodology of science course is to study the dynamics of philosophical knowledge in a broad historical and cultural context in close association with the development of the spiritual culture of humanity, as well as the philosophical comprehension of contemporary social reality.

To understand the subject of philosophy means to broaden the horizon of students' philosophical perception of the world in general, and of modern science and technology in particular, as well as to comprehend one's position in life.

In the conditions of rapid accumulation of massive ecological, economic, political, interethnic and other problems of the XXI century, it is becoming significant for any social activity to be evaluate from human perspectives. The need for an unquestionably humanistic orientation brings about a whole range of issues related to worldview.

Nowadays, in the conditions of building a global innovative society, it is not enough to be just a literate person. We feel that a certain "amount of knowledge" is insufficient. According to the new educational paradigm, the quality of the modern educational process presupposes practical implementation of a continuous education model, with a wide usage of modern technical and, predominantly, computer technologies.

The principles of the continuity of education and of a competency-based approach to teaching are the leading ones in the modern philosophy of education. The development of a personality in this context is a continuous and integrated process, linking social and personal development with the formation and development of professional competencies.

The capacity to think critically about one's scientific discipline, the ability to identify and analyze the general assumptions underpinning it, and the capacity to recognize the methodological purposes of a method are skills that are prized not only by those wishing to thoroughly understand the discipline they study, but also by those interested in the (general) possibilities and frontiers of knowledge provided by science. Those who study social science and the humanities (among others) typically have to learn, understand and develop the ability to critically appraise the system of knowledge the discipline engages with, whilst also learning about the principles and methods that generated it. Although disciplines vary in terms of what is studied (the object of investigation), the goals pursued, and their research methods, this variety does not preclude us from studying the methodological features they share.

This educational and methodological manual arose out of a desire to contribute to explanations of the methodological features that are sufficiently general as to apply to (almost) all the empirical sciences – and, therefore, to the natural and social sciences, just as much as the humanities. The topics we will cover relate to the general philosophy (or methodology) of science. Although the material is suitable for use as a textbook for introductory courses in the methodology or philosophy of science, the selection and treatment of some of the topics are reflective of the author's views. I would encourage readers to approach the chapters critically, patiently, and with an open mind.

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1. RELATIONSHIP OF PHILOSOPHY AND SCIENCE IN THE HISTORICAL DYNAMICS OF CULTURE

1.1. Philosophy: subject, purposes, problems

The birth of philosophy did not coincide with the beginning of human history. Philosophy is a product of spiritual development of humanity and a specific form of public consciousness. Philosophy as a specific field of knowledge appeared during the epoch of decomposition of the primitive society and transition from barbarity to civilization. In those distant times, public division of labor took place, the monogamous family was established, antagonistic classes and the state appeared. In other words, social interactions became more varied, knowledge accumulated, and arts were developing. Progress in the manufacture of goods, advance in social relations and culture led to serious changes in people's views about the world around them, which triggered the birth of philosophy.

Philosophy originated in the first millennium BC, in the countries of the ancient world: Ancient India, Ancient China and Ancient Greece. It was in

Ancient Greece and Rome, between the 7th century BC and the 5th century AD that philosophy shaped in its classical form.

The word "**philosophy**" is formed of two ancient Greek words: phileo – love, and sophia – wisdom. In a literal translation, "philosophy" means "love of wisdom". According to the legend, Pythagoras was the first to use the words "philosophy" and "philosopher". He declared himself not a "sophist" (wise man), but a philosopher, i.e., a person who loves wisdom and feels attraction towards it, or rather, towards truth. He said that only God can possess "wisdom", and man can only aspire for wisdom and love it. Diogenes Laertius mentioned the Great Game as the metaphor of life, "where some went to compete for the prize and others went with wares to sell, but the best as spectators; for similarly, in life, some grow up with servile natures, greedy for fame and gain, but the philosopher seeks for truth". Thus, the Greeks were convinced that wisdom is the ideal of knowledge and human behavior.

One of the main tasks of the Philosophy and methodology of science course is to awaken in the reader at least a friendly or respectful attitude to

wisdom, as well as to philosophy. It is not easy to answer the question: "What does wisdom mean?" Though wisdom not reduced to knowledge, without it, it cannot exist. Studying philosophy will help you to become wiser, to cope with difficulties in life; it will contribute to your professional and personal development.

Human attitude to the world changed significantly. The adaptation type of relationship replaced by the tendency towards transformation. The appearance of philosophy meant the resolution of inconsistencies between the mythological consciousness and the emerging scientific thinking. The task of philosophy was to generalize all existing knowledge about the world and channel it into one system. A human being was included into this holistic view of the environment due to his/her ability to influence the world inan active and conscious way. Gradually, philosophy has become a system of generalized knowledge about nature, man and society.

Thus, philosophy is a historically changing, generalized system of knowledge about the world, man and man's place in this world.

Philosophical knowledge is a worldview-related type of knowledge. Atthe same time, not any type of worldview-related knowledge is philosophical knowledge. The "**worldview**" concept is broader than the concept of"philosophy" and "is much older" than the latter. A worldview is a way of spiritual orientation of a person in the surrounding reality, a mode of its spiritual and practical comprehension. It includes not only a person's ideas about the external world, but also an evaluation of the person's places in thisworld, as well as the beliefs and ideals expressed through people's behavior.Knowledge is the basic component, and it constitutes the basis of worldview in the form of a generalized model of the world and the place ofthe person in it. Worldview presupposes the existence of those universals ofculture, by which a holistic picture of reality created (space, God, destiny, law, truth, good, etc.).

Values are express through the norms and ideals and perform the regulatory function. They serve as a spiritual reference point of human activity, and attach positive importance and a sense of purpose to it. Beliefs can be establish based on knowledge and values. Moral, aesthetic, religious, political and scientific beliefs and programs of action formed based on knowledge and values.

Sensual and emotional components of worldview make it subjectively important; fill it with personal meaning and significance. They express man's personal perception of the world, its comprehension and assessment of his place in it.

Mythology is the oldest type of worldview, a collection of people's mythical views and beliefs about the world, its origin, and man's place in this world. The mythological worldview exists in different forms. Mythology has the following varieties: animism, which represents personification of inanimate nature; totemism, according to which animals have supernatural qualities; fetishism, in which supernatural properties attributed to some things or elements, etc.

In the course of thousands of years, myth ruled people's consciousness. Man's sense of being, his emotional perception and the understanding of nature available to humans expressed in ancient legends about fantastic Mythology creatures, courageous and almighty gods, and feats of heroes – in a metaphorical and artistic form. It was an attempt to answer the questions about the destiny of a kin, the origin and order of the world and humanrelationships.

With the further progress of human society, the mythological mode of thinking loses the former role; though some of its elements can reproduced in mass consciousness today. Civilization has created new types of worldviews – religion and philosophy. Their multifaceted interaction traced throughout all the stages of history.

The predominantly emotional and illogical character of mythology partly overcome in religion. **Religion** as a type of worldview based on thebelief in the supernatural; it compensates for human helplessness in the face of the confronting forces of nature and society, and facilitates the processes of their consolidation.

Besides, religion has always claimed to be an exhaustive and true explanation of the "meaning-of-life" problems. At the same time, the picture ofthe macrocosm – as well as the answers to the questions about human deathand immortality, conscience and duty, good and evil – presented to people based on their faith in the existence of almighty supernatural forces. Thereligious cult connected with the system of dogmas. They accepted by believers, and accompanied by an emotional perception of their validity. In mythology, both gods and people were part of nature; they lived "together" in the natural, "terrestrial" world. The religious worldview based on the belief in the existence of supernatural forces governing human life and the universe.

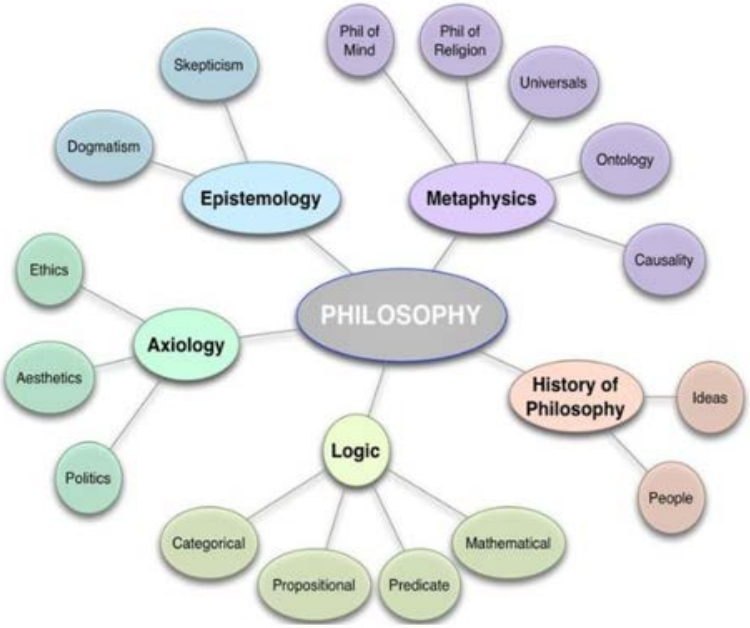
The **philosophical worldview** is qualitatively new in comparison with the mythological and religious types of worldviews; it counters dogma with doubt, belief – with logic, emotions – with the intellect. Philosophy focused on the rational explanation of the world. Knowledge and the rational-

theoretical understanding of the world and man replace imagery and symbolism. Fiction and revelation replaced by logical comprehension. While answering the same questions related to worldview as posed by mythology and religion, philosophy relies not on belief, but on rational-theoretical knowledge. It represents a logically regulated system of knowledge providing a unified idea about the world. Its emergence in the7th – 5th centuries BC in Ancient Greece, Ancient India and Ancient China was a revolutionary process of overcoming the mythological-religious worldview.

It was there and then that a special type of worldview-related knowledge was form as an expression not of the divine, but rather human love of wisdom.

The philosophy studies universal laws of functioning and development natural and social systems taking into account active presence at them the person. It has the disciplinary structure presented ontology, anthropology, gnoseology, epistemology, science philosophy, methodology of a science, social philosophy, history philosophy.

Figure 1



Ontology systematizes scientific knowledge of the universe with the account of researches in the mathematician, the physicist, astronomy, biology, geology, ecology based on dialectics and synergetic achievements. The scientific picture of life supplemented with a scientific picture of the nature in which frameworks the key role-played by concepts of biosphere and a noosphere.

The **anthropology** generalizes knowledge biological, humanitarian, social sciences about the person. Key categories of a life, death, meaning of the life, existence, consciousness, life of the person, anthroposociogenesis analyzed.

Gnoseology and epistemology accented on knowledge and their role in various fields of activity of modern humankind.

The **science philosophy studies** a phenomenon of a science from the point of view of history, the status in a modern society, functions, structure, interaction with economy, engineering activity, a policy, art, religion.

The **science methodology studies** the tool aspects of research activity connected with scientific researches, workings out, methods, forms of representation of scientific results, levels of researches, stages.

The **social philosophy** systematize knowledge of humanitarian and economic sciences of a society from the point of view of a role in it of is material-industrial, legal, moral, spiritual, aesthetic basis. The history philosophy studies a society in dynamics, in development, from the point of view of historical time, historical consciousness, historical memory, the future. The futurology closely connected with it.

The philosophy correlates all time, its developed concepts with a concrete historical reality, chronologically fixing it and designating. Beginning XXI century contacts an epoch of modernization of a modern society. For a designation of this epoch, the term “postmodern” is used. For the first time it was used by R. Panvits in 1917. Considering the changes occurring during a postmodern epoch, R. Bart, Z. Derrida, M. Fuko, Z. Bodrijar, F. Gvattari, U. Eko, J. Habermas, S. Hantington have started to solve a problem of updating of philosophy with reference to present conditions. Thephilosophy status is defined by its interdisciplinary feature, that it forms scientific outlook, bases of scientific researches, private world of the person systematizes, gives answers to questions interesting the modern person.

The mission of philosophy in a society life concluded in a substantiation of effective ways of development of economy, the state, the person. In Belarus, philosophy problems are concentrated on methodology of innovative activity, problems of national safety.

1.2. Problem of method in philosophy

The effectiveness of human activity depends on a great number of factors, first, on the **method** – a set of rules, techniques and operations used for mastering practical and theoretical objects. The nature of methods corresponds to the subject of investigation, the tasks, available experience and other factors.

By the area of usage, the following main groups of methods are distinguished:

- Special scientific;
- General scientific;
- Universal (philosophical).

Philosophical methods, like other scientific methods, originate in people's practical activities; they reflect the logic and the laws of the development of the world.

The subject of philosophy also identifies the features of philosophical methods. First, there is a higher level of generalization inherent in philosophical methods, and second, philosophical methods can be understood with the help of categories, which are extremely general concepts. Since the object of philosophy is not available to the methods of science (supervision, experiment, etc.) or for ordinary cognition (common sense), it can be explored with rational-theoretical modes by revealing of categorical ties and essential characteristics of the object.

Depending on the answer to the question "Is the world developing or it is constant and invariable?" we can find two opposite philosophical worldviews and methodological systems. They are dialectics and metaphysics. The second fundamental question is the question about motion and development (and also – "what is primary?"; "Is it possible to know the world?").

Dialectics (Greek dialectike – an art of conducting dispute, conversation) – is a method of philosophical cognition of reality and its transformation, and whose major principle is consideration of the reality phenomena in their interrelation, change and development. According to the dialectic doctrine, the unity of opposites forms the basis of all phenomena and processes of objective and subjective reality (form and content, essence and phenomenon, cause and effect, necessity and contingency, etc.), the struggle between which makes up the source of their origin and development.

Metaphysics (Greek meta ta physika – after physics) is a method of cognition and transformation of reality, opposed to dialectics and connected

with the exaggeration and absolutization of one of the sides of an instance, a certain characteristic of the comprehensive whole (variability or invariability, discontinuous or continuous, necessity or contingency, the external or the internal, etc.). In general, metaphysics is a simplified, primitive doctrine about motion and development. As a philosophical method of thinking, it is the most widely spread method in the metaphysical materialism and natural sciences of the 17th–18th centuries.

Philosophy as a special phenomenon and a form of public consciousness is a complex interaction with its other forms – science, art, morality, religion, etc. By developing a complete system of ideological knowledge and values, it forms the most common theoretical foundation of people's spiritual activity. On the other hand, aesthetic ideals, moral standards, scientific truth and political ideas transformed through philosophical synthesis in to genera logical principles of understanding man's relationship to reality.

The philosophy considers a natural and social reality in development. It is a question of changes of the directed character, different intensity, a configuration. One philosopher in life development takes away value to straight-line characteristics of systems, continuity, others – to mechanisms of self-organizing of systems in nonlinear conditions.

Linear representation of life issued in the dialectic concept of development of natural and social systems. Plato, Aristotle, G. Hegel, K. Marx consistently carried out this work, F. Engels transformed dialectics to methodology scientific and practical activities.

The dialectics describes mechanisms of development by means of categories, principles, and laws. In it, find relation answers to three basic questions on a source of any development, the mechanism of development, an orientation and continuity of development. The source of any development sees dialectics available in a natural and social reality of the contradictions which structure formed by the contrasts possessing properties of identity and distinction.

Therefore, a variety of the physical world created by four basic interactions – gravitational, electromagnetic, weak nuclear, strong nuclear. A variety ofthe biological world creates geophysical, chemical, geological, genetic, coevolution interactions.

The unity and conflict of opposites law specifies in interrelation of conditions of identity and distinction of contrasts. If in interaction of contrasts distinctions, the contradiction passes in a stage of the constructive struggle connected with detection coevolution of a resource of development, raising stability of system to external influences start to dominate. Mechanisms of

development of life concluded in the quantitative and qualitative changes, which are in an interconnection of a measure and the maintenances of certain processes.

The measure characterizes indicators of the optimum functional environment of development of systems, their extreme limit on which border the system transformed to new quality, according to the changed conditionsof development of life. The optimum functional environment is formed un- der the influence of physical, chemical characteristics of interactions. Within the Earth, the complex of physical, chemical, geological, organic interactions has generated the optimum environment in the form of biosphere. It approaches both to live organisms, and humankind for realization of social programs.

People in addition to optimum characteristics of the geographical environment enter optimum indicators of resources put into circulation to industrial activity. These indicators designated as a quota. Entering quantitative restrictions on consumed resources in economic sphere the mankind pursues the aim of maintenance of profitability is mountain – also oil- extracting branches, an effective utilization of resources on the basis of a competition of manufacturers at the expense of quality.

Manufacturers have developed quality management system for maintenance of necessary level of competitive capacity. It is synthesized in the international system in which frameworks the quality standards operate, corresponding certificates stand out, laboratories of diagnostics of quality operate, the standard base, outlook functions. Originally, the quality management has been concentrated to activity results. However, this control it has appeared insufficiently because activity errors pawned at a design stage of artefacts, technological processes.

Therefore, the quality management has extended the control to all stages of activity up to production realization, and its service.

In Belarus to questions of introduction of a quality management the considerable attention as the national economy focused on export problems is paid.

The development orientation formed by processes of increase in functional, adaptive possibilities of natural and social systems to constantly changing conditions of their existence. The similar tendency in a society designated as progressive.

In economy of market type, the lifting periods replaced by recession, stagnation, depression, revival of a social life. They manage to be overcome, as development in economic sphere has cyclic character. It means,

that the progressive vector becomes every time dominating after time recession. Philosophers describe these processes through the mechanism of negation of negation. This mechanism formulated in the form of the law.

The development orientation is in many respects determined by cumulative mechanisms of natural and social dynamics. These mechanisms operate at level of the information, energy and culture. They create continuity of development of life and, accordingly, a basis of steady existence of a reality. It is the important feature it is use in the adaptable purposes by live organisms, also people in the course of social activity.

The orientation and continuity of social development have generated mechanisms of transformation, modernization, scientific and technical revolution.

Categories in dialectics, except functions connected with interpretation principles and laws, carry out function of reflex-ion of laws of development of various spheres of life, human activity, and knowledge of social sphere. These categories on advantage have pair character. Among them, it is possible to allocate individual; essence and the phenomenon; the maintenance and the form; possibility and the validity; necessity and accident; necessity and freedom; cause and effect.

The dialectics is applicable in ontology, anthropology, gnoseology, social philosophy. It can be considering as universal methodology. One more concept of development began to apply for the similar status in the XXth century – **synergetic**. In its life treated as the certain integrity characterized by dynamics of chaos and self-organizing of systems.

Conceptual registration of synergetic occurred in 60–70th years of the XXth century. The system approach considerably supplements a picture of development of life as in addition to the linear equations enters the nonlinear equations and necessity dialectically combines with accident within the limits of concept of dynamic chaos. This chaos possesses constructive properties of the architect. It forms conditions for matter self-organizing in dissipative structures of open type. They store the information on base principles of the organization and a variety of life. Dissipative structures are in a mode of constant information interchange and energy with environment. Elements forming them possess a considerable autonomy, which allows them to separate from system at any moment and to return to a condition of dynamic chaos. Here they have an opportunity for the next self-organizing taking into account-changed dynamics of external and internal factors.

Synergistic occurrence along with dialectics testifies that real developments of life are much more various, than one-two concepts of development

of the same life. Probably, the philosophy will come at any stage to synthesis of conceptual constructions.

1.3. Philosophy and myth. Formation of philosophy

As has already been mentioned, philosophy as a special type of worldview and specific form of public consciousness is a product of a rather recent development of humankind.

There was no philosophy in the primitive society, though it is possible to speak about some elements of philosophizing in the thinking of ancient people. Generally, philosophizing is a characteristic feature of each of us, not only of specialists. During the archaic times, the need for a worldview induced a person to reconsider, due to increasing knowledge, the superstitions and myths, in order to find correlations with real life. These elements of philosophizing were an integral part the holistic (syncretic) consciousness of the primitive people, along with the morals, art and religion. Gradually, in the mythological worldview, two tendencies became visible: the firstone transformed traditional belief into more accurate religious views, the second one formed the so-called pre-philosophy in social consciousness. Further, philosophy and specialized knowledge (science) were single out from pre-philosophy. This was the result of the development of abstract thinking, the increasing complexity of socio-historical practices, the need for a deeper understanding of reality, and the growing differentiation of knowledge.

In general, in the research works on the genesis (Greek: genesis – origin) of philosophy, two concepts have been generated: the mythological and the gnoseological (Greek: gnosis – knowledge). The first one traces the origin of philosophy to mythology, the other – to science.

Philosophy as a new type of worldview, which replaced the mythological world perception, emerged in the 6th century BC, in three relatively isolated regions of the ancient world simultaneously: in the East – in Ancient China and Ancient India, and in the West – in Ancient Greece. The general cultural and civilization background that had been form there by that time and prompted the **birth of philosophy**, related to a number of reasons:

– transition of ancient societies from bronze to iron, and a considerable growth of labor forces on that basis;

– sharp social and property-related stratification, as well as class differentiation of society;

– aggravation of social contradictions and sociopolitical struggle;

– formation of slaveholding states in the West, and Oriental states in the East;

– decomposition of a traditional way of life;

– development of workmanship and the cities, trade and monetary relations and, as a consequence, deep crisis of the traditional religious- mythological system which did not satisfy the emerging requirements of individuals and society for a sober rational perception, comprehension and interpretation of reality, free from mythological symbolism.

The new level of the development of humankind in the ancient times led inevitably to the appearance of a new form of the world comprehension – its philosophy. During that epoch the basic categories, which appear in our thinking, as well as the basics of world religions, which remain very influential even today, were work out. At that, particular time a person beganto realize their being as part of one whole, and the self as not isolated, but universal.

1.4. Philosophy and science

The philosophy of the Modern Era is a historical type of classical philosophy of the 16–17th centuries. The 17th century was the time of great achievements in European philosophy, which left the universities (which remained at the disposal of Neo-Scholasticism) and became a subject of intense intellectual inquiry for philosophers, politicians, scientists, the military, diplomats and ordinary people. It was the period in European history when capitalist relations in industry became stronger and progressed, and colonial wars stimulated the growth of productive forces. In political life, it was the time of the first bourgeois revolutions (in England, Holland, etc.). In culture, educational and scientific tendencies opposed the lifeless atmosphere of religious scholasticism. The leading European powers came to the foreground of bourgeois development. The new bourgeoisie, unlike the old feudal nobility, actively participated in agricultural modernization, trade expansion and the development of manufacture. Social and economic transformations needed legislative reforms favoring the development of trade and industry, and stimulated sociopolitical thought.

The rapid development of natural sciences confirming their social usefulness by various technical inventions actualized gnoseological problematic. Scientific knowledge of nature, substantiating well-grounded and useful information, more often opposed the medieval ideal of knowledge based on contemplation. The basis for the development of scientific knowledge established, primarily, due to the **discoveries in physics** (I. Newton's classical mechanics) and **mathematics** (R. Descartes). Science supported by experi-

ments and developed the knowledge, which was further master by industrial production and technologies.

Among the outstanding scientists who formulated the main principles of classical mechanics, studying movement and interaction of material bodies, were **G. Galilee** (1564–1642) and **I. Newton** (1642–1727). Thanks to their efforts and the progress in mathematics (analytical geometry, differential and integral calculus, algebra, etc.), a new physical picture of the world created, and the picture, which had a huge philosophical value.

Philosophy resembled science with its impressive continuous achievements, and it followed science in the way the latter perceived the world, using scientific terms and concepts. Because the 17th and the 18th centuries are the period of great achievements in mechanics in the new European science, in philosophy, accordingly, in its ontological part, mechanistic metaphysical materialism was form, which helped to understand the natural world. Besides, liberalism came into being and received a philosophical substantiation as a sociopolitical ideology of young European bourgeoisie that was fill with social optimism and oriented towards the future. With the new sociopolitical realities of the bourgeois society, which was developing very quickly, the definition of philosophical essence and origin was formulated, as well as the place of an individual, his/her value orientations, the principles of his/her communication and interaction with other individuals and with society as a whole.

Parallel to the formation of the new European philosophical rationalism, the problem of the method of scientific inquiry was becoming more and more conspicuous, and it defined the basic gnoseological positions of philosophy in the Modern Era.

1.5. Nonclassical and postclassical philosophy

The Belarus philosophy integrated into the European and Russian intellectual spaces, which characterized under the influence of globalization by the general problematic of schools. Among them, we can allocate existentialism, phenomenology, positivism, personalism, structuralism, and hermeneutics.

The **existentialism** is a philosophical school close to problems of the person and modern culture. It studies private world of the person from the point of view of boundary situations. These situations create extremeness for the individual in the form of a choice between a life and death, harm and good, belief and meanness. Dane S. Kierkegaard and Russian

F.A. Dostoevsky were ancestors of existentialism. Most of all representatives of existentialism are in Russia, France and Germany. In Belarus, the existentialism presented in the form of a literary genre in products of the writers devoted to the Great Patriotic War. In these products hard years of struggle against fascism, difficult situations of a choice between a life, death and rescue of lives of other people reveal. Courage is present at products with meanness, treachery, uncertainty. Patriotism dominates at heroes of our time – cadets, students, workers of the organizations and the enterprises. Traitors appear inminority. Their victories carry a temporality.

The **phenomenology** is a philosophical school, which does by a studying subject the sensual reality, which is in daily forms of activity. At such approach to activity the power is not so important for knowing, that occurs from the point of view of physical, chemical processes in an industrial copper, it is enough to it to have the information on an input and a system exit. The basic ideas connected with phenomenology; E. Husserl has formulated. Methodological use of these ideas traced in phenomenological thermodynamics, cultural science, social philosophy, information technologies. Special interest in technical experts caused by visualization of images, work with object of modelling in a mode of a virtual reality. Precisely also technical experts in the course of the visual supervision connected with their professional work, distinguish maintained system from the parties not were in sight of the designer. Philosophers of Germany, France, were engaged in phenomenology. In Belarus, the phenomenology used in methodological function in the course of teaching of technical and humanitarian disciplines.

Personalism is the philosophical school close to theology. In its problems of a life and death of the person, meaning of the life, considered proceeding from belief in the God. Value of the person defined by that it is creation. In this fact the sense of freedom, creativity is covered. The ancestor of personalism is N. Berdyaev who has formulated the basic ideas of school. Under the influence of its sights, the French national school personalism was generate. Ideas personalism claimed in Latin America and in the USA. In a modern kind, positivism and pragmatism represent the English-speaking analytical philosophy popular at the American and British universities.

Under the influence of **positivism,** there was such science as sociology. Positivism promoted development of philosophy of a science, which became popular in Europe, to the North America. Based on synthesis of positivistic and Marxist ideas the science philosophy roughly developed in the USSR.

The **structuralism** is the philosophical school connected with linguistics, ethnography, sociology. It has arisen in the XXth century in Franceand in the USA. The French philosophers have interest to culture. They actively study structures colloquial and a written language, are engaged in ethnographic researches. Popularity researches Z. Lévi-Strauss in pool of Amazon, which allowed formulate a problem of protection of steady structures of ability to live of humankind and have received preservations of a biological variety of a planet, the radical people.

Z. Derrida's works steel in structuralism transition in one of updating of philosophy of the **postmodernism** accented on problems of modern culture. In the USA, the structuralism, thanks to T. Parsons's works, became methodology of working out of social technologies of a stable society in which the basic stabilization functions assigned to civil structures. It has allowed the country, in the conditions of constant inflow of the population from the outside, to create a basis of social balance at level of the multicultural structures presented by city communities.

In Belarus, the structuralism is actual in the sociological version of the decision of problems as it is necessary for country to involve constructive potential of a civil society in business sphere.

The postmodernism is the newest philosophy of culture, which, taking into account technologies of visualization, interactive dialogue, social networks, tries to present the culture world as earlier not exist space of dialogue, life. Transformations analyzed in a wide spectrum of linguistic, psychological, economic problems. The basic thesis of a postmodernism formulated as a deconstruction of classical outlook. The postmodernism has played a huge constructive role in development of the Belarus culture, thanks to an aesthetics developed by representatives of Vitebsk art school. Among known artists of this school K. Malevich, M. Sahgal. Thanking their activity, Vitebsk became capital of modern culture of Belarus.

1.6. Materialism and idealism in classical and nonclassical philosophical systems

The philosophy traditionally deals with a life problem. Thus, it is not limited only to its present existence. It connects the present existence with the historical past and future.

Materialism is a philosophical worldview, according to which matter, as an objective reality, is ontologically the primary principle (cause, condition, limitation) in the sphere of being, and the ideal (concepts, will, con-

sciousness, etc.) is secondary (result, consequence). Materialism asserts the existence in the sphere of existence of the only "absolute" substance of existence – matter, all entities are formed by matter, and ideal phenomena (including consciousness) are processes of interaction of material entities. The laws of the material world apply to the entire world, including society and humans.

Religious-spiritual positions are accented on a recognition as an initial fundamental principle of life of the non-material essence designated as the God, spirit, soul, absolute idea. These positions designated as idealism.

Idealism is a term to denote a wide range of philosophical concepts and worldviews, which based on the assertion of the primacy of ideas in relation to matter in the sphere of being.

Many historical and philosophical works carry out a dichotomy that considers the opposition of idealism to materialism as the essence of philosophy. The categories of materialism and idealism are historical categories in all eras.

Within the limits of a materialistic direction, historically allocate dialectic, mechanistic updating. Dialectic updating was developed Heraclitus, K. Marx. It considers material life in development. Mechanistic updating developed by B. Spinoza, I. Newton. It describes material life based on laws of classical mechanics.

Within the limits of an idealistic direction allocate objective and pan egoism. Objective (Pythagoras, Plato, Aristotle, G. Hegel) deduces the absolute idea existing out of consciousness of the person as an initial substance of life. The God can be such absolute idea. The pan egoism (Berkeley, Fichte) accented on consciousness of the person as initial essence of life.

The modern epoch does not give basic value to materialism and idealism opposition as they localized in different segments of activity of public consciousness (scientific and religious). Material life appears in engineering, administrative, economic practice as a proteogenic reality with physical, chemical, geological, biological properties on the Earth (biosphere) and a techno sphere (the technogenic reality created by mankind on the basis ofa biological and geological reality). The world outlook aspect of life in this case concluded that the reality exists both on the Earth, and in the Universe. Thus, material life is presented the natural reality in the form of the Universe, the Earth and the person.

Human consciousness and it is material practical embodiment in the form of a techno genic reality. Interest to an ontologic problematic has considerably increased in XXth century philosophy. In statement "a question

on life", the approach to treatment of the concept that was most full reflectin M. Heidegger's works varies. According to M. Heidegger, life is a unique theme of philosophy. In work "Dasein and time" he marks Life and time, what exactly the question on life is the basic philosophical question. Life according to Heidegger does not possess any person substantial and it is not close in itself, but leaves itself, showing itself real. Life which ourselves are, presence; literally, "here-life" is treated by it as realized by the person time and final through a prism of own existence. Thereby, M. Heidegger has found considerably new reference point for philosophy, trying to confirm it on the real base of the most human existence to which abstract ideas and principles are deeply alien.

Terminology became area of the ontological analysis in postmodernist philosophy. Instead of metaphysical presence, the deconstruction designates the organization of textual senses. Plurality postmodernist philosophy leans against representations about presence of set of the possible semantic worlds.

The synergetic supplements a modern scientific picture of life with nature interpretation as realities in which dynamics of processes defined by nonlinear tendencies of self-organizing.

1.7. Substantive and relational concepts of space and time

Space and time as categories of modern culture, activity, are included into the competence of various specialties.

The **space** is the important economic category from the point of view of logistics, transit functions of territory, and its transitivity.

Time contains huge potential of historical memory, which allows consolidating the nation within the limits of the decision of problems of a sustainable development.

Space this is material life with certain physical, chemical, biological, social properties. In scales of the Universe, it acts as the basic place of formation of objective, system structures with certain dynamics and power.

In philosophy, the space defined as the objective reality given to us in sensations, existing irrespective of consciousness of the person. The images of space reflected by consciousness are designated as perceptual (mentality level) and conceptual (thinking level). The space energetically also is information is sated. It generates particles, which form a building material for macro- and mega bodies. The Basis of generating ability of space as dynamic environment is formed by four interactions – gravitational, electromagnetic, weak nuclear, strong nuclear.

The material spatial environment is an objective reality, a subject of display and studying from the point of view of topological and metric properties. Perceptual the form of display of space functionally shown in consciousness of the person at level of psycho-emotional relaxation. The conceptual form realized by consciousness of the person at level of logic-conceptual thinking and has result in the form of scientific concepts of space and time. The spatial environment characterized by dynamics certain by a saturation of events and the information. The processes occurring in space have duration, which designated as time. In the tideway of dynamics time directionally. Duration of spatial processes in a combination to their dimensions designated as existential contained.

In scales of the Universe as a starting point, the point in which there was a **big explosion** is accepted singular and dynamics has got the natural basis fixed by astrophysics, physics and chemistry subject. Methodological and topological properties of space are described geometry. In classical philosophy long time are substantive and relativistic approaches to space.

The **substantive approach** enters representation about space as independent essence, a condition of existence of material objects. To this position adhered I. Newton.

The **relational approach** of property of space and time puts in direct dependence on the material objects determining the metrics of space also on speed of their movement. These representations developed A. Einstein.

The **social space** is fixed by subject features of activity of humankind and the industrial zone, city line, region, an agrarian zone, a rest zone, a sanatorium zone etc.

Social time – chronological parameters designated as geopolitical, economic, architecturally building, architecturally-landscape. Features of social space play a key role in country development. Therefore, in case of Belarusit is a question of favorable geopolitical position, which creates economic resources of transit, logistics and customs activity. For architects and builders, the social and natural space is an object of designing, creativity, industrial activity, an esthetics, design. There are rich traditions of development of cultural space, its aesthetic interpretation in the form of certain styles. In social space actual philosophical relaxations of architects about ecology, ergonomics, system methodology, history, a spiritual life of a society visualized.

The big not urbanized spaces are zones of woods, bogs, agricultural activity. In Belarus, much becomes for uniform distribution of anthropogenesis pressure to biosphere. Efforts for an intensification of an agricultural

production, agrotourism to raise an effective utilization of territorial complexes are simultaneously undertaken. Social time displayed by the categories setting the importance of the present, the past and the future. Chronological traditions set integrity and continuity of cultural dynamics.

Key words: philosophy, worldview, mythology, religion, ontology, anthropology, gnoseology, social philosophy, method, dialectics, metaphysics, synergetic, existentialism, phenomenology, personalism, positivism, structuralism, postmodernism, materialism, idealism, space, time.

Checklist for self-examination

1. What is philosophy?
2. What are the aim and mission of philosophy?
3. What is the subject of philosophy?
4. What problems does philosophy address?
5. How do philosophy and worldview correspond?
6. What is included into the structure of worldview?
7. What are the main features of modern philosophy?
8. How are modern European philosophy and science connected?

2. MAJOR PROBLEMS OF CONTEMPORARYPHILOSOPHY

2.1. Philosophy of being

Ontology is a fundamental part of philosophical knowledge, the core of any philosophy. Though the word “ontology” came into use in the 17th century, ontological issues arose much earlier. The “Fathers” of ontology are Heraclitus, Plato, and Aristotle. Observing the diversity and variability of things, the first philosophers searched for some kind of “true existence” in them, which is common for all things, or true being, which doesn’t arise and disappear, but is their universal and stable basis.

The category of being characterizes what is inherent in the whole world (existence in general). The main sign of being as such (the whole world) is that this being (the world in general) exists.

Ontology is a doctrine about being, about existing things. It is a branch of philosophy which studies being, existence in general, regardless at the properties, characteristics and varieties of existence. Ontology begins with the questions: What is being? Is there nonbeing?

The fundamental category of ontology is the category of being.

Being is a unity of forms and ways of existence. The philosophical understanding of being is that of existence as such, or existence in general. All things and phenomena in the world, man and his consciousness, nature, society, culture, the world in general, knowledge about the world and its structure – do exist, so they can be combined by the notion of being.

Being is the central category of ontology. Reflections about being and nonbeing run through the whole history of philosophy.

In all the teachings of ancient philosophers, the category of being, though it occupied the central position, was still fill with different meanings. Parmenides, for example, adhered to an abstract understanding of being. He argued that thinking and the things thought reflects, are the same, because without being in which the thought is represented, it cannot be discovered. The philosopher's main thesis was being exists, and nonbeing does not exist.

For Democritus, both being (atoms) and nonbeing (emptiness) really exist. The soul, according to Democritus, consists of atoms, which are just like fire, but smaller, more agile and round.

Plato opposed true being (the world of spiritual essences) to the sensual existence, where, in his opinion, being and nonbeing merge in the form of pale imprints of ideas within passive matter. One of the main motifs in his philosophy is the idea that being is the source of every positive reality. Along with the concept of being and mind as identical, he substantiated another thesis, according to which being is life, movement, soul, and thanks to truth, beauty and proportionality, it brings good to the world. Thus, because of their connection with being, things become more concrete, individual and freer, getting further away from abstract monotony.

Aristotle defined the essence of being as such, and what it is like in itself. For him, being as a whole is being as possibility. As for being in reality, it if always a being of something and not merely being. Thus, in ancient philosophy, existence regarded as a set of concrete forms of being. Nonbeing could consider only as relative.

In the Middle Ages, when religious doctrines were dominating, being was most often identified with **God**, who, they believed, was the source and origin of the being of individual things. The existence of things was connected with the forms of manifestation of being, and the main thesis was the judgment: "God is existence".

In the Modern Era, the concept of being played an essential role in all philosophical systems. During the Age of Enlightenment, philosophers

worked out the conception of existence, albeit in different ways, which allowed justifying scientific knowledge.

Classical German philosophy supplemented the category of existence with **dialectical meanings**. For example, Hegel saw being and nonbeing as united potentially from the outset, in germ. He considered their inter-transitions as becoming, fully agreeing in this case with the ancient Greek philosopher Heraclitus. G. Hegel's great merit was dialectical understanding of the categories of being and nonbeing as identical and different, as interrelated and inter-transitory.

In postclassical philosophy, the problem of being was a prominent feature in the **irrationality teachings.** In his philosophy, A. Schopenhauer sets the task to find the ultimate solution to the mystery of being. Proceeding from the indisputable recognition of the objectivity of the world, he claims, that because the world itself knows nothing about its existence, it becomes such only for the subject who cognizes it, and therefore it is the world of the person, i.e., the world corresponding to one's own perception.

In the history of philosophy, the concept of matter arose in connection with the attempts of ancient thinkers to explain the unity of the world. In Antiquity, the diversity and harmony of the surrounding world provoked the aspiration to find a sustainable and steady fundamental basis for diverse things and phenomena, which would remain as such despite changes – in other words, substance. Identifying it with matter, the materialists of the past searched for a substratum, or for the primordial matter, from the elements of which all things formed.

A new synthesizing attempt to find the beginning of all things was the atomistic doctrine of Leucippus, Democritus, Epicurus, and Lucretius. The doctrine about atoms was one of the most fruitful achievements of human thought. Having arisen in the 5th century BC, the atomistic idea has existed for more than 20 centuries. It enabled the explanation of many natural processes. Suffice it to recollect such scientific discoveries as Newton's laws, the molecular-kinetic theory of thermal processes, Mendeleyev's periodic system, etc. Today it is difficult to imagine the development of different branches of natural sciences without the theory of the ancient **atomists**.

Within the frames of the doctrine of matter as substance, philosophers of the Modern Era focused their attention on its attributive properties. They saw the essence of matter not so much in corporality as its defining sign, but in such properties as extension, hardness, imperviousness, inertness, density, etc.

In modern philosophical conception of matter, general features of an infinite set of sensually perceived things should be reflected. Matter does not

exist outside things, their properties and relations, but only in them and through them.

It is important therefore to locate such properties of matter, which would essentially distinguish it, within the limits of the main question of philosophy, from consciousness, as it is opposite. Such definition of matter offered by V.I. Lenin. Matter is a philosophical category used to designate objective reality, which presented to the person through senses; which copied, photographed, reflected by our perceptions, while existing independently from them.

2.2. Dynamic organization of being

One of the achievements of more than a 2500-year development of philosophy is the thesis about inseparability of matter and motion. The idea about the variability of being was generate in high Antiquity. Aristotle believed that the ignorance of motion involves the ignorance of nature. He believed that "any kind of **motion** is change. The idea of eternal absolute motion as an integral property of matter as its way of existent expressed by the philosophers of the 18th century.

The word "motion" is familiar to each person. More often, it is understood in daily communication as moving one body in respect to others. Such change of the position of bodies named **mechanical motion** in physics. However, there are other changes in the world. They can be internal and external, structural and functional, essential and inessential, qualitative or quantitative, related to the bodies of various levels, etc. Motion appears in the process of interaction of different material formations.

Being without motion is as senseless as being without matter. All forms of being represent a concrete form of moving matter. Motion in application to matter is change in general.

Motion as a way of existence of matter is inconsistent. It is the unity of change, transformation and preservation. The fundamental law of nature – the law of preservation and transformation of energy – integrates and represents both sides.

Motion as change in general should distinguished from the term "development". Here we shall note that by means of the category of development, more profound features of motion, as a way of the existence of matter become know. With reference to matter, development should understand as its self-regeneration, self-organization and conception of qualitatively different forms of life.

The absolute nature of motion finds its expression in concrete kinds and

forms. In the history of philosophy, there were attempts to classify the variety of forms of motion. F. Engels offered a holistic classification of the forms of motion of matter for the first time.

Building on the contemporary level of scientific knowledge, he singled out five forms of motion of matter, hierarchically interconnected: mechanical, physical, chemical, biological and social.

Each of them characterized by a special agent of motion, type of interaction between objects and by specific laws.

In modern science and philosophy, all forms of reality considered as existing in time and space. Historically, two approaches have developed to the interpretation of space and time: the substantial, the relational.

The first approach formed in the classical science and it connected with the understanding of space and time as objective independent phenomena along with matter. Space reduced to the infinite void containing all bodies, and time – to "pure" duration. This idea formulated in general by Democritus, got its logical conclusion in Newton's conception of absolute space and time. According to this conception, there is empty space, a vacuum, and its nature is homogeneous. It is due to this void in space that the motion of discrete material bodies can take place The Substantial concept of space and time as a physical model of the world, formulated by Newton, occupied the dominant place in the science a philosophy of the 17th – 18th centuries. The idea of absolute space and time was well suited for the ordinary understanding of things and events: the existence of mechanical motion seemed to be infallible proof of the presence of the stationary and absolute space.

The second (Relational) approach, which was hinted at by Aristotle, was developed by R. Descartes, G. Leibniz, J. Toland. The main point of this concept is that space and time considered not as certain substances, but as the forms of existence of things. Leibniz, for example, underlining the relative nature of space and time, called space "the order of existence", and time – "the order of sequences".

Space and time are the universal objective forms of coordination of the material systems and their states. These are not independent essences, but universal structures of the relations between things and processes. Space is a form of being, characterizing the way of coexistence of material formations their structurality and extension. Time is a form of the existence of matter, characterizing the interaction of objects and changes of their states, the sequence of processes and their duration.

It is necessary to distinguish real, perceptual and conceptual space; as well as real, perceptual and conceptual time. Real space and time are the

objective forms of being of moving matter and the universal structures of co-existence and modification of things in the physical world. Perceptual space and time related to the coexistence and consequent changes of our feelings, i.e., they are a human reflection of real space and time.

Conceptual space and time are a way to describe real space and time, their different theoretical models. The examples of conceptual spaces are Euclid's three-dimensional space, the four-dimensional system of coordinates of Einstein's relativity theory, n-dimensional mathematical spaces and others.

Key words: ontology, being, God, dialectical meanings, irrationality teachings, atomist, motion.

Checklist for self-examination

1. What is metaphysics?
2. What is ontology?
3. What are the basic categories of ontology?
4. How matter understood in the history of philosophy?
5. What is the modern understanding of matter?
6. What is the spatial and temporal organization of being?
7. What is the difference between the real, perceptual and conceptual space and time?

3. PHILOSOPHY OF NATURE. PHILOSOPHY OFSCIENCE

3.1. Concept of nature

In the narrow sense, by **nature** we understand a habitat, and we subdivide it into the natural and the artificial ones. Already in Antiquity, philosophers distinguished **natural processes**, which are independent from man (cosmic forces and laws), and **artificial** ("techne" – art, craft), which are connected with human abilities (Aristotle).

Due to the development of natural and social sciences, there appeared a distinction between the first, not divine, but physical nature (geographical environment), and the second, artificial, social, public nature (anthropogenic, social, techno sphere). Nature as the natural environment is a relatively independent form of being, located in the same range as the being of man, society and spiritual culture.

Nature is one of the forms of being. The concept of nature is versatile. Being one of the major universals of culture, it is reflecting the evolution in the human understanding of nature, as well as the development of the natural sciences and the philosophical knowledge about them. Currently the concept of "nature" used in three basic meanings:

1) everything that exists (existence, being);

2) the natural habitat of human beings;

3) the essence of things.

The most detailed intellectual comprehension of nature in its initial – meaning elaborated in classical philosophy.

In ancient Greek philosophy, the concept of "nature" meant the world in general (existence as such, **cosmos**), as well as the essence of things (the fundamental grounds). These meanings complemented each other. Man, entire environment, for ancient philosophers, is the macrocosm, and human nature – the microcosm. Herewith the unified variety of all existing things was associated with the single internal essence of things (elements, origins and substance).

If the mythological worldview based on the superiority of natural forces over man and was oriented towards the submission of man to nature, the worldview of Antiquity was in harmony with the surrounding world and was in aesthetic balance with the macrocosm and the microcosm.

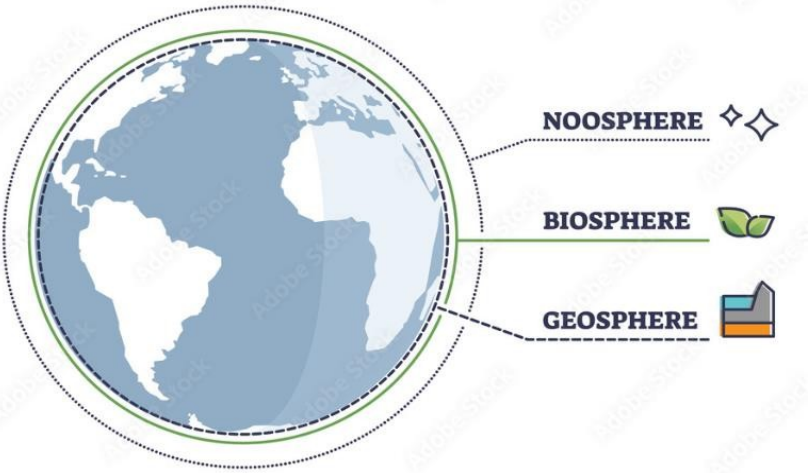
In medieval philosophy, because of the general tendency of converting philosophy into the "maid" of **theology**, nature divided into two kinds: the creating nature (i.e., the nature of God) and the created nature. A medieval man united both physical nature and God's nature. According to the eschatological logic of medieval thinking, a person should care only about the soul and its salvation. What concerns the created nature, during that epoch it lost its value and passed to the lower form of being, unworthy of attention? Man, hailed by God above nature, no longer felt himself in a harmony with nature. Following the divine project and the religious plan of being, he was longer interested in cognition of nature and its technical and experimental mastering, and fully devoted himself to the service and study of the nature of God.

Starting from the Renaissance, man began to master nature in an intensive manner. Reviving the ancient ideals, including that of the harmony with the cosmos, the Renaissance man understood this harmony in his own way, in connection with his needs.

In the philosophy and science of the Modern Age, different parts of the world appear as both an object and subject of special, concrete-scientific

and experimental studies. In this regard, nature was acquiring a new understanding – as a **universum**, a multitude of the probable and endless worlds, and the cosmos – as the Universe.

Figure 2



The **biosphere** is one of the levels of material being. The structure of the biosphere connected with the evolution of forms of living matter and consists of the following levels: molecular level; cellular level; tissular level; organismal level; population level; level of biogeocoenosis.

The last function indicates the philosophical sense of the concept of the biosphere. This is also associated with the name of V. I. Vernadsky and the concept of the noosphere.

The concept of the noosphere was develop in the writings of the French philosopher Teilhard de Chardin and the Russian scientist V.I. Vernadsky.

The **noosphere** (Greek: noos – sphere of mind) is a new stage in the development of the biosphere, which is influenced by human intellectual activities; with its boundaries constantly expanding, people should develop a responsibility for the processes of the evolution of the planet.

In the relations between society and nature, a fundamental role should belong to **ecological imperatives** and the principle of **co-evolution** – the joint development of human beings and the biosphere. This concept of **universal evolutionism** is an interdisciplinary project to develop a common

picture of the whole process of development of nature and society. Universal evolutionism is a synthesis of the idea of evolution and a systemic approach.

Universal evolutionism is the basis of modern **scientific picture of the world** and relies on the basic theories of the 20th century:

• the theory of the non-stationary Universe (which established the idea of evolution in non-organic nature);

• synergetics as a doctrine of self-organization in living and nonliving systems;

• the theory of biological evolution and development, including the concept of the biosphere and noosphere.

The general scientific picture of the world is one of the important elements of general scientific knowledge. Its other elements are paradigmatic scientific theories, as well as general scientific methods and norms of scientific research ("ideals and norms of scientific knowledge"). General scientific knowledge goes beyond the ontology and methodology of not only individual sciences, but also individual areas of scientific knowledge. It acts as a prerequisite or "a priori" even in relation to fundamental ("paradigmatic") scientific theories. The general scientific picture of the world is the ac- cumulated content of scientific knowledge of a certain era and therefore always has a historical character.

The idea of co-evolution, or the harmonized development of man and the biosphere, had a major influence on modern natural sciences and the humanitarian thought; it was included into the practice of public administration – in the working out of the concept of **sustainable development**.

The philosophy of nature nowadays seems to regain its status as fundamental ontology, especially in relation to the comprehension of today's global problems, particularly the problems related to the crises in various aspects at the interaction between modern society and the environment.

3.2. Science as a social institute

Science as a social institution is a special, relatively independent sphere of human activity, acting as a historical product of the long development of civilization and spiritual culture, which has developed its own types of communication, human interaction, forms of division of research labor and norms of consciousness of scientists.

Science is a central social institution in all modern societies. Increasing-

ly, the very existence of modern society depends on advanced scientific knowledge. Not only the material conditions of society's existence, but also the very idea of the world depend on the development of science.

The institutionalization of science is a relatively recent phenomenon.

Until the beginning of the 20th century, science existed mainly way in the form of non-professional activities of representatives of the intellectual elite. Its rapid development in the 20th century led to differentiation and specialization of scientific knowledge. The need to master special disciplines of a relatively narrow, specialized profile predetermined the emergence of institutes for long-term training of relevant specialists. The technological consequences of scientific discoveries have made it necessary to involve significant capital investments, both private and public, in the process of their development and successful industrial application.

Paradoxically, until the first decades of the twentieth century science never became a social problem, and therefore did not become a stable subject of comprehensive study.

The specificity of the scientific profession manifested primarily in the fact that its cultural component – the body of special knowledge – in its numerous manifestations contains its main content. The product of science, which in the eyes of society appears as "scientific knowledge," is not the data of any individual study, but the result of the work of an entire factory for processing primary research information, its examination, theoretical and methodological analysis, systemic processing, etc. Constant replenishment of the body of certified scientific knowledge as the goal of science is a multi-stage processing of the information flow continuously coming from the forefront of research. Almost all members of the disciplinary community take part in the work of "certifying" (examination) of this or that result as a fragment claiming to be a contribution to knowledge. Therefore, the results themselves always presented to the community in a clearly standardized form of scientific publication (oral or written), in which both the content of the result and the names of its authors are fixed.

Research and development include:

– Basic researches (theoretical and search);

– Applied researches;

– Developmental works;

– Skilled, experimental works (can carried out on any of the previous stages).

Preparation of scientific shots carried out through postgraduate study

and doctoral studies, the organization of scientific activity of students.

In Belarus functions about 300 scientific organizations. In scientific researches and workings out is engaged 30 thousand persons. Researches and workings out in the field of engineering science traditionally prevail. The cores personnel and financial resources are concentrated in National academy of sciences of Belarus, the Ministries of Education, public health services, and the industry.

The national academy of sciences of Belarus is the higher state scientific organization of republic to which problems on development and coordination of a domestic science and formation state scientifically – the technical policy assigned. State scientifically – the technical policy is directed on priority support of the most perspective scientific researches, scientifically-technical workings out and the innovative projects focused on the decision of problems of social and economic development of the country.

The control system of scientific researches and workings out based on use program-targeted methods. These are government programs of basic researches in the field of natural, technical and social studies.

The **scientific school** – the organizational-creative structure of activity obliged by the existence to the visible scientist-organizer, capable on the basis of the received results to create the whole direction of researches and personnel potential in the form of the prepared candidates and doctors of sciences, and also capable to provide continuity of generations, an urgency of spent researches and workings out.

In the XXth century the science transformed in systematic activity in which frameworks of a steel to prevail accents of working out of actual research programs on a joint of set of disciplines. For reflexional of the new approach to vision of a natural and technogenic reality began to use possibilities of the metatheoretical analysis.

The transfer of innovations from scientific sphere in industrial sphere, and then its business occurs by means of formation of the special organizational structures, which have received the name of subjects of an **innovative infrastructure**.

The innovative infrastructure assumes presence of techno parks, techno poles, innovative-technological centers, and small innovative and venture enterprises, free economic zones.

According to methodological problems bases of a scientific picture of the nature in shape quantum mechanics, synergetic, microphysical, thermodynamic, environment, and noosphere representations were developed.

New role in a science the mathematics thanks to the equations for practi-

cally any problems, especially modelling, experiment has started to play, measurements, designing.

Physics as the leader of natural sciences has generated interdisciplinary communications with geography, chemistry, biology, astronomy, geology.

Each of natural-science disciplines has entered into close contact with scientific and technical disciplines that has given the basis to speak about the complex of scientific and technical disciplines forming the list corresponding professional competencies.

The **interdisciplinary** status of a science specifies in its aspiration to the decision of complex problems, including an exit in practical activities. Practical specialization has generated industrial, ecological, social directions of activity of a science.

The scientific direction is a science or a complex of sciences in which area researches conducted. The complex scientific problem is a set ofthe problems united by the uniform purpose. Specific scientific and technical problems are characteristic for certain manufactures, problem industries. The theme of scientific research gives answers to the concrete scientific questions covering a part of a problem.

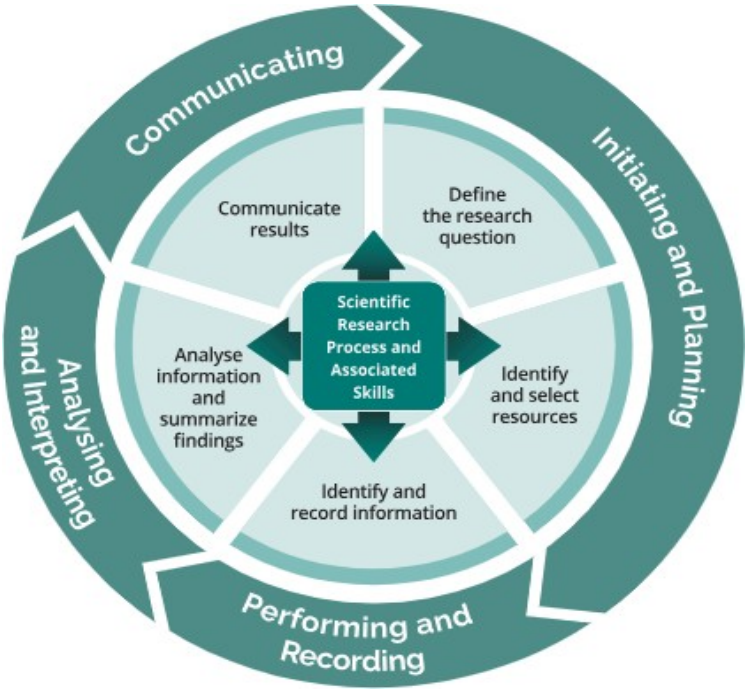
The scientific question is the scientific problem concerning a concrete theme of scientific research. The direction of scientific research defined by the scientific program, the state theme. The theme of scientific research should be actual (important, demanding the prompt permission), to have scientific novelty, to bring contribution to society development, to be economically effective for a national economy.

The profitability requirement sometimes replaced with the requirement importance, defining prestige of a national science, the state. The theme choice essentially becomes simpler in the presence of tradition of scientific school.

Productivity of scientific research is a question of the organization of planning, work performance. Plans and sequence of actions of scientists depend on a kind of object, the purposes of scientific research. Therefore, if it spenton technical themes the basic preplanned document – the feasibility report in the beginning is developed, and then carried out theoretical and experimental researches, the scientific and technical report and results of work made take root into manufacture.

Stages of scientific research: The preparatory; Carrying out of researches; Works on the text; Introductions of results of scientific research.

Figure 3



The preparatory stage assumes a theme choice; a substantiation of necessity of carrying out of researches; definition of a hypothesis, the purposes and research problems; working out of the plan or the program of scientific research; preparation of means of research (toolkit). The theme of scientific research formulated, the reasons of it working out proved. By familiarity with the literature and materials before the spent researches, it is found out, in what measure theme questions are studied also what results are received. The attention concentrates on questions on which answers are not present or they are insufficient.

The research stage includes regular studying of the literature on a theme, statistical data, archival materials; carrying out of theoretical and empirical researches; processing, generalization and the analysis of the received data; explanations of the new scientific facts, arguing and a formulation position, conclusions and practical recommendations and offers.

Work on the text assumes composition definition (constructions, internal structure) works; specification of the title, names of heads and paragraphs; preparation of the draught manuscript and its editing; text registration, including the list of the used literature and appendices.

Plan of scientific research the basic idea that connects structural elements of a technique, defines an order of carrying out of research, its stages. In a research plan, contain the purpose, problems, a hypothesis, criteria, and indicators sequence of application of methods, order of management of an experiment course, a procedure for registration, accumulation and generalizations of an experimental material.

The **research plan** assumes:

– Problem and theme choice;
– Definition of object and subject, the purposes and problems;
– Working out of a hypothesis of research;
– Choice of methods and working out of a technique of research;
– Structural components of research process.
– General acquaintance with a research problem;
– Formulation of research objectives;
– Working out of a hypothesis of research;
– Statement of research problems;
– The organization and experiment carrying out;
– Generalization and synthesis of experimental data.

The organization and experiment carrying out: the technique of scientific research is a set of methods, ways of research, an order of their application, interpretation of the received results. Results depend on character of object of studying, methodology, a research objective, the developed methods, the general skill level of the researcher.

Object of scientific research – system, process or the phenomenon, generating the problem situation demanding studying.

Subject of scientific research – a part, the party, property, the relation of the object investigated with definite purpose in given conditions, an element of object of research.

Hypothesis – the scientific assumption the representing probable decision of a problem. Should be formulated clearly, precisely, consistently, have communication with the theory.

As **problems** – scientific research called questions, reception of answers on which is necessary for research objective achievement.

3.3. Science as a system of fundamental and applied researches

Theoretical scientific research based on application of mathematical and logic methods of knowledge of object. Result of theoretical research is the establishment of dependences, the description of properties and laws. Results of theoretical research demand verification. Theoretical and experimental scientific researches provide experimental activity on natural samples or models.

Empirical scientific researches carried out in laboratory conditions in which properties are studied, dependences and laws, also spent for acknowledgement of the put forward theoretical positions.

Basic researches directed on opening and studying of the phenomena and laws of the nature, creation of principles of research. The purpose of opening of laws is detection of communications between the phenomena, creations of new theories. Basic researches connected with a great risk and uncertainty from the point of view of reception of the concrete positive result which probability does not exceed 10%. Such researches are conducted on border known and unknown. Despite it, basic researches make a basis of development both the science, and a social production.

Applied researches is creation of new or perfection of existing means of production, consumer goods etc. Object of research of engineering science are cars, technologies, organizational structure. Practical orientation and a concrete special-purpose designation of applied researches doe's probability of reception of results expected from them rather considerable, not less than 80–90%.

Because of applied researches based on scientific concepts, the technical created. Complex scientific researches study diverse properties of object, each of which can provide application of various methods and research means. As an example of complex research, the estimation of reliability of the new car serves. Reliability of the car is integrated property and maintainability, a keeping and durability of details caused by its separate properties, as non-failure operation.

Differentiated scientific research is a study in which one of the properties or a group of homogeneous properties is studied. Each investigated property of reliability of the car differentiated.

In 18–19 centuries, the science has been involved in methodological discussion about possibilities of knowledge of the world. Among philosophers and scientists there was a majority of those who did not see restrictions of informative character. However, there were those who doubted cognoscibil-

ity of the world. The special line was represented by sceptics. Successes of a science in the XXth century in knowledge were so obvious, that practically allscientists have forgotten about these discussions.

In the end of century there was a problem not cognoscibility borders, and moral borders of research activity of scientists in connection with application of the weapon of mass defeat and rapid development of gene engineering. The gnoseology and methodology engaged in studying of this question of the logician.

The **logic studies** specificity of the scientific formalized thinking, which is not giving in often to rules of verification, dealing with virtual objects. However, conclusions and recommendations of this thinking often leave in area of acceptance of administrative decisions, designing of control systems.

The logic opens requirements to process of scientific researchers from the point of view of its sequence and to representation of results of scientific researches. The logic of scientific researches regulates process of realization of an object in view in the form of specific targets. The hypothesis in which expected results of researches and workings out are stated originally formulated. Then the condition of a question in the form of already reached by other experts is studied. This condition fixed by an abstract statement of a problem. Against the reached results, problems of scientific research specified. They pass in a stage of constructive search of missing decisions by carrying out of laboratory measurements, mathematical modelling, computer data processing, designing, manufacturing of a pre-production model, its research to conformity to the set parameters.

Representation of results of scientific researches carried out in the form of scientific publications, certificates of introductions, patents, the text of the dissertation, scientific reports on themes. The dissertation is the key form of representation of results of scientific researchers at level of the personal contribution to development of a science, concrete scientific area, and engineering activity. All these documents regulated regarding registration by concrete instructions and requirements. The dissertation demands support in the form of certain stages of its representation on faculty meeting, Council about protection of dissertations.

All these stages, as well as a stage of scientific researches, the postgraduate student, and the competitor pass at active participation of the supervisor of studies. In this process it is important to young scientist to seize skills of verbal and nonverbal communications, ethos scientific activity, scientific communications and the argument.

The gnoseology studies the status of the scientist in research process and analyzes not only a problem of reliability of results of scientific activity, but also moral responsibility for scientific and technical workings out.

The methodology is concentrated on the theory of a method and the description and classification of methods applied in scientific researches.

In modern engineering the modelling method is most claimed. It is connected by that in this method began possible to connect practical and theoretical problems of activity on the basis of use of computer technologies.

The industrial direction of activity of a science is connected with realization of projects in area nanotechnology, quantum optics, microbiology, bionics, power, quantum chemistry.

The **ecological direction** of activity of a science is accented on studying of consequences of anthropogenesis pressure from mankind on biosphere. Technologies of decrease in this pressure at the expense of more uniform distribution of anthropogenesis loadings to the biological environment, clearing and restoration of an environment, preservation of a biological variety as basic condition of stability of biosphere are developed.

3.4. Ethics of science

Methodological principles of ethical activity in a science were formed throughout several thousand years. Rapid development of engineering science in the XXth century has induced physicists to statement of a question on ethical aspects of scientific and technical researches, especially against active application of the weapon of mass defeat. Development of computer technologies and corresponding communications has induced philosophers to working out of problems of program ethics and virtual dialogue.

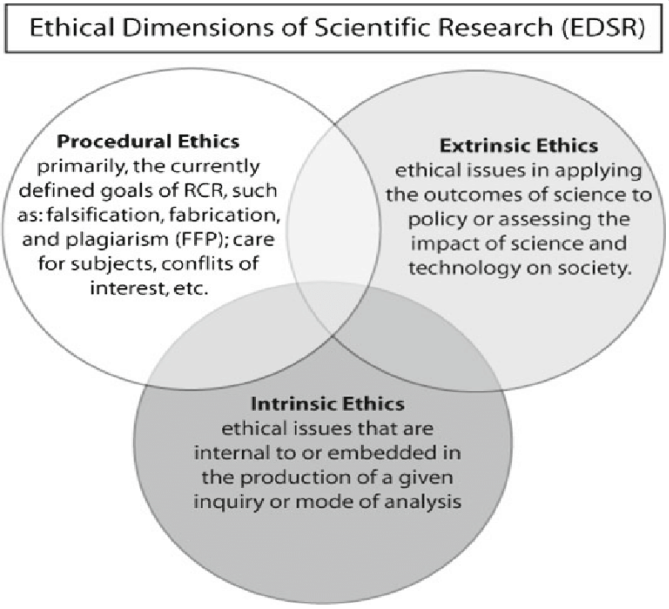
The gene engineering transformed a modern science to bionics and has deduced an ethical problematic on level of universal discussions in which the importance of valuable subjects and necessity of interactive monitoring of public opinion was defined, including carrying out of national referenda. Ethics were actively squeezed out from a science under various pretexts. One of them consists that the philosophers, dealing with **ethical problems** and concepts, and could not give an accurate substantiation to those offers which they use arguing about morals, morals, responsibility. In this sense ethics mismatch strict formal canons of logic and mathematics. It has given the basis to scientists not to think about possible moral consequences of their activity. If these scientists made crimes against humanity their actions became a subject of the analysis of legal structures. But after the Second World War scientists practically did not become a subject of heightened interest for legal structures as scientific workings out directly did not contact character of their application by other people. In this connection heightened interest for justice was represented by military criminals and terrorists.

The **Internet** has even more divided functions of moral, legal responsibility. It became an offshore zone where known degree of freedom was re-

ceived by pedophiles, hackers, the criminal groups actively using social networks for the organization of shadow business, aggressive actions. Only legal sanctions cannot return a global network in atmosphere of action of public norms. Philosophy rehabilitation in questions of social communications is necessary. Each person should understand accurately, that social networks just as also social relations not mediated by technical devices are a part of uniform social space where morals and the right nobody cancelled. It is important to understand scientist who give to the mass consumer technical devices through system of their batch production, sales. The Internet resources create illusion of that candidate and theses for a doctor's degree are written by compilation texts of different authors. Sometimes such "experts" at all do not understand a difference between scientific and amateur sources of the information.

Abstract style cannot be mixed with plagiarism. This style means a statement of achievements of other scientists and engineers own author's style corresponding to retelling of understanding generated in a brain of the given problem. But the understanding of working out of other scientist cannot move as opening. It is a question of an estimation of the results received by other scientific schools.

Figure 4



So, the problem of mutual relation of a science and morals has got a special urgency in second half of XXth century as the main object in system the object-subject becomes intersubjective the world. For which strengthening of accent of the subject in scientific researches more and more essential necessity for working out of ethical principles and standards. Realizations of this problem the big role becomes characteristic belongs applied to ethics – bioethics, biomedical ethics, computer ethics, ecological ethics which have arisen in the seventies XX centuries as reciprocal spiritually-moral reaction to innovative technologies. They develop moral principles and focus scientists on observance of social responsibility before the person and mankind. The purpose of these fields of knowledge is ethical examination of scientific researches introduced in practice taking into account universal and individual values.

Inclusion of **humanistic reference points** and norms creates possibility to carry out not only the new approach to strategy of scientific and technical development on the basis of innovative technologies, but also to prevent, or to soften not predicted, uncontrollable and undesirable consequences from their realization.

Principle "do not do much harm", having arisen in bowels of the most ancient civilizations, is a principal synonym "sanctity of a life". It includes recognition of the universal rights and personal freedoms, collective nature, confidentiality, the impartial analysis of medical, technical and technological errors. So today in the conditions of intensive development of a science there is a question on expediency of workings out in those or its other areas, about ethics uses of those or other methods, their realizations For example, the perspective area nanotechnology will allow to work in the future at level genome, to correct genetic infringements and by that, apparently, will open prospects of treatment of hereditary diseases But, on the other hand, researches in the field of manipulations with genome, and also the cloning is connected with risk of ethical aspects such as safety in research for the person, risk of use of techniques with a view of selection of certain genotypes.

The technological working out, which use is supposed for improvement of health of the person, should pass careful check before introduction in practice, the constant control during its use also is necessary. As a regulator of ethical examination, a principle "do not do much harm" assumes not only personal safety, but also collective safety. Not casually in the concept of the Sustainable development accepted at Conference on environment and development (Rio 1992) one of conditions its observance is application of ecologically safe high technologies which are starting with interests both present, and the future generations. Following a principle "do not do much harm" the scientist, the engineer, the doctor, the ecologist fulfill the public

duty, realizing responsibility for results of the activity.

The principle of the informed consent is based on human rights realization on reception full and trustworthy information about an environment condition, about a condition of its health, about appointment and functions of technical devices etc. He assumes informing on the purposes, consequences of innovative technologies, forming thus in a society social condition of adaptation of its subjects to achievements of a science of technics and innovative technologies.

The principle of autonomy of the person proves in an independent, free choice of ideas, methods and means of their realization, the voluntary consent or disagreement with opinions and arguments of other subjects. At definition of strategy and professional work tactics it is necessary to be guided by the principle of tolerance expressed in acceptance of the universal rights and freedom, respect of self-expression and display of individuality of each of the members of the community included in given process. Their joint cooperation assumes goodwill and the equality based on principles "do not do much harm", the informed consent and an autonomy of the person.

There are methods of activization of creative thinking, methods of regular search, methods of the directed search. Expediency of application of the method, belonging to this or that group depends on complexity of a solved problem. Methods of activization of creative thinking are directed on elimination of psychological inertia of the thinking interfering a finding inventive of decisions. They allow increasing number of put forward ideas, raising productivity of process.

The most known **methods of psychological activization** concern: brain storm, shadow brainstorming, a method of focal objects, a method "reception of analogies", conference of ideas, a "coaching" method and others.

Methods of the **systematized search** concern: the is functional-cost analysis, morphological the analysis, a functional method, lists of control questions, a method of garlands of associations and metaphors, a method repeated consecutive, a method of synthesis of optimum forms, a method of the system economic analysis of constructive decisions. Among these methods some were development or synthesis of others.

Functional cost analysis – a method of technical and economic research of the technical systems, directed on parity optimization between their consumer properties and expenses for display of these properties. Mainprinciples are: the functional approach which assumes abstraction from object as is material-material structure, a formulation of its main useful function by strict rules, taking into account that performance of useful functions in analyzed object always is accompanied by harmful both neutral functions, and object representation as complex of functions carried out by it.

Functions are classified and ranged on the importance, rather, and also quality of performance of functions is estimated.

3.5. Science and innovative development of a modern society

Tool function of a science consists in use of its experimentally- measuring, modelling possibilities. In the conditions of XXI centuries the science became technoscience as has concentrated in laboratories unique complexes, the bench equipment, materials, an infrastructure and communications. The similar base allows a science to use various methods and the newest means of processing and representation of knowledge.

World outlook function of a science consists that it develops principles on which basis the scientific picture of a natural and technogenic reality is formed. This picture carries out interdisciplinary synthesis of results of scientific researches in integral representation.

Heuristic function of a science consists in opening before unknown phenomena, their description, and adaptation to already existing categorical structures. If there is a necessity of revision of the fundamental interpretations, caused by opening then scientists go on a way of change of the world outlook bases of separate disciplines, or sciences as a whole.

Innovative value of a science consists in transformation of a modern science into system engineering activity in which frameworks of research are combined with the invention, designing and designing not only artefacts, but also activity systems.

In Belarus innovative value of a science is defined by special value as the country can count only on the human capital in the international division of labor. From this position Belarus finds partners for cooperation. It is a question that there are states which possess superfluous financial resources. They are interested in their strategic use on the terms of cooperation with the techno-logical states. The innovative resource of Belarus opens possibilities not only for the international cooperation, but also more an effective utilization of own natural resources available for the country, export potential escalating.

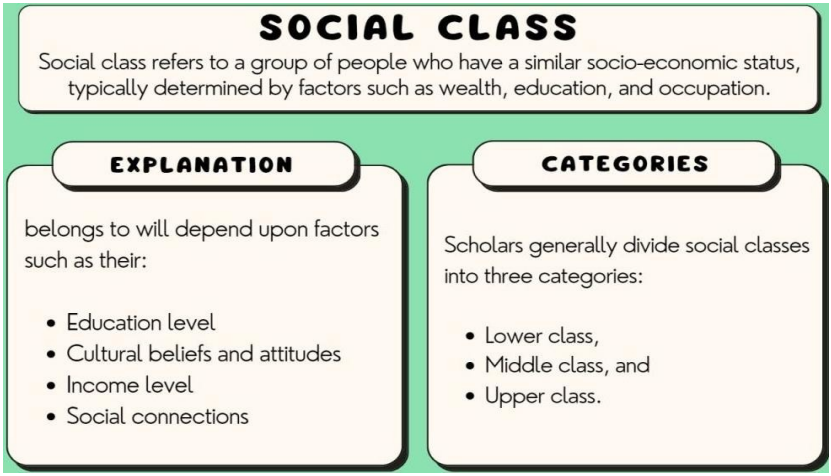
Innovative function of a science reveals by means of functioning of a special infrastructure in which aspects of financing of scientific researches are considered, introductions of innovative workings out. Financing of innovative activity is conducted through the state and venture funds. Introduction of innovative products of researches is carried out by means of activity of **techno parks**. The state places emphasis on practical return of scientific researches. Workings out are key criterion of award of candidate and doctor's degrees.

Business assumes presence of the businessmen, favorable conditions of activity, financial re-sources. Business is connected with bank sector, the industry, agriculture, building, and information technologies. In Belarus much becomes for development of the business, favorable conditions of investment. Large business is represented by owners and heads of transnational corporations. Average and the small-scale business demand constant support from the state as it forms stability of structures of a civil society.

The increasing role in development of economy of Belarus is played by business philosophy, philosophy of risks and economic safety. The business philosophy develops the principles of ethics of business relations adapted for the Eurasian region, responsibility. The business philosophy is accented on problems of creation of middle class at level of small and average industrial structures, spheres of services, service.

The **middle class** refers to a class of people in the middle of a social hierarchy, often defined by occupation, income, education, or social status. The term has historically been associated with modernity, capitalism and political debate. Common definitions for the middle class range from the middle fifth of individuals on a nation's income ladder, to everyone but the poorest and wealthiest 20%. Theories like “Paradox of Interest” use decile groups and wealth distribution data to determine the size and wealth share of the middle class.

Figure 5



The word “middle” may be misleading in that it suggests that those in the middle class have earnings within the middle of the population's income distribution, which may not be the case. Middle class families tend to own their own home (although with a mortgage), own a car (although with a loan or lease), send their kids to college (although with student loans or scholarships), are saving for retirement, and have enough disposable savings to afford certain luxuries like dining out and vacations.

The philosophy of risks develops methodology of activity of domestic economic structures in the conditions of the unstable markets, quickly varying conjuncture of activity. The philosophy of economic safety at level of the concept of national safety defines segments of activity the most vulnerable in the competitive environment and develops actions for their strengthening to self-sufficiency level.

In the politician, in the conditions of the XXth century, there was a change connected with growth of influence of legal, sociological sciences. Considerable in this process processes of democratization of a public life have played. Management and science have actively adjoined in the end of XIX centuries when there were the questions connected with necessity of adjustment systems engineering of manufacture, introductions of the effective organization of work, marketing and logistics. Great depression of the thirtieth years of the XXth century only has strengthened requirement of cooperation of administrative commercial structures and scientific schools.

Scientific and technical revolutions create a basis for modernization of systems of activity existing in a society. Activity has complex and versatile character. First of all, it mentions economy as in its limit’s material assets and artefacts subject realizations in the world market in the conditions of sharp competitive struggle are created. Modernization allows by use of the newest equipment, the technologies, new principles of the organization of work, automation to reduce power consumption, activity, power dependence, to improve indicators of activity of the enterprises in the field of quality, volumes of manufacture.

The economy export potential as a result, there is a possibility for considerable currency receipts in the country. Modernization is spent according to government programs, business plans. The important programs are connected with maintenance of national safety. The societies having sufficient financial and intellectual resources are most intensively modernized. Belarus is in number of most quickly modernized states of the world thanks to the considerable scientific potential, growing investment appeal.

3.6. Scientific revolutions and modernization

Scientific Revolution, drastic change in scientific thought that took place during the 16th and 17th centuries. A new view of nature emerged during the Scientific Revolution, replacing the Greek view that had dominated science for almost 2,000 years. Science became an autonomous discipline, distinct from both philosophy and technology, and it came to be regarded as having utilitarian goals. By the end of this period, it may not be too much to say that science had replaced Christianity as the focal point of European civilization.

Out of the ferment of the Renaissance and Reformation there arose a new view of science, bringing about the following transformations: the reeducation of common sense in favor of abstract reasoning; the substitution of a quantitative for a qualitative view of nature; the view of nature as a machine rather than as an organism; the development of an experimental, scientific method that sought definite answers to certain limited questions couched in the framework of specific theories; and the acceptance of new criteria for explanation. It was no longer sufficient to publish scientific results in an expensive book that few could buy; information had to be spread widely and rapidly. Natural philosophers had to be sure of their data, and to that end they required independent and critical confirmation of their discoveries. New means were created to accomplish these ends. Scientific societies sprang up, beginning in Italy in the early years of the 17th century and culminating in the two great national scientific societies that mark the zenith of the Scientific Revolution.

The old practice of hiding new discoveries in private jargon, obscure language, or even anagrams gradually gave way to the ideal of universal comprehensibility. New canons of reporting were devised so that experiments and discoveries could be reproduced by others. This required new precision in language and a willingness to share experimental or observational methods. The failure of others to reproduce results cast serious doubts upon the original reports. Thus, were created the tools for a massive assault on nature's secrets.

Thomas S. Kuhn (1922–1996) was an American historian of science noted for **The Structure of Scientific Revolutions** (1962), one of the most influential works of history and philosophy written in the 20th century.

In his first book, The Copernican Revolution (1957), Kuhn studied the development of the heliocentric theory of the solar system during the Renaissance. In his landmark second book, The Structure of Scientific Revolu-

tions, he argued that scientific research and thought are defined by "paradigms," or conceptual world-views, that consist of formal theories, classic experiments, and trusted methods. Scientists typically accept a prevailing paradigm and try to extend its scope by refining theories, explaining puzzling data, and establishing more precise measures of standards and phenomena. Eventually, however, their efforts may generate insoluble theoretical problems or experimental anomalies that expose a paradigm's inadequacies or contradict it altogether. This accumulation of difficulties triggers a crisis that can only be resolved by an intellectual revolution that replaces an old paradigm with a new one. The overthrow of Ptolemaic cosmology by Copernican heliocentrism, and the displacement of Newtonian mechanics by quantum physics and general relativity, are both examples of major paradigm shifts.

Kuhn questioned the traditional conception of scientific progress as a gradual, cumulative acquisition of knowledge based on rationally chosen experimental frameworks. Instead, he argued that the paradigm determines the kinds of experiments scientists perform, the types of questions they ask rather than the "why" that had characterized the Aristotelian search for final causes.

A shift in the paradigm alters the fundamental concepts underlying research and inspires new standards of evidence, new research techniques, and new pathways of theory and experiment that are radically incommensurate with the old ones.

Kuhn's book revolutionized the history and philosophy of science, and his concept of paradigm shifts was extended to such disciplines as political science, economics, sociology, and even to business management. Kuhn's later works were a collection of essays, The Essential Tension (1977), and the technical study Black-Body Theory and the Quantum Discontinuity (1978).

Modernization study is a new interdisciplinary science, but modernization science includes not only the modernization study, but also the modernization theory and knowledge. It deals with modernization phenomenon, and explains both the frontier change of modern civilization, the principles of national advancement, and the international competition and differentiation etc.

The word "modernization" appeared approximately in the 18th century (1748–1770). It was widely used as a general word between the 18th and 19th century, and gradually became an academic term in the 20th century. The modernization science emerges in the 21st century. There is no standard

definition of modernization so far, but there are a variety of operational definitions which can be raised according to the theoretical meanings of modernization and the needs of modernization research. Here is the three points. Firstly, modernization has been a profound change of human civilizations since about 18th century. It includes not only the great change and transformation from traditional to modern politics, economy, society and culture, but also all human development and the rational protection of natural environment at present. Modernization has been a worldwide trend, which takes place both in the pioneering-countries and subsequently on a global scale, but some community and peoples have not taken part in it.

Secondly, modernization has been also an international competition from a policy perspective. It includes both the international competition to catch-up, reach and maintain the advanced level of national development in the world, the international cooperation and differentiation, and the great change of the international system, meanwhile cultural diversity exists across space and time. Countries which have reached and maintained the world's advanced level are developed nations, and others are developing nations; there is a certain probability of transferring status between the two types of countries.

Thirdly, modernization has its duality. From the perspective of civilization change, every country is making progress and may succeed in the modernization. But the pace of progressing and the level of development differ from country to country, so not all the countries succeed simultaneously. From the perspective of international competition, only a few countries are able to reach and maintain the world's advanced level. In the past 300 years, advanced countries have accounted for less than 20% of the world total number of countries while the proportion of developing countries exceeded 80%. In a span of about 50 years, about 5% of the developing countries are probably upgraded to advanced ones, and the probability that an advanced country downgraded to a developing one is about 10%.

The necessary components of modernization are many phenomena and processes.

Innovations are created (mastered) new or advanced technologies, kinds of a commodity out-put or services, and also the organizational-technical decisions of industrial, administrative, commercial or other character promoting advancement of technologies, a commodity output and services on the market.

Innovative infrastructure is set of the organizational structures, capable to provide innovative process. Techno parks, technopoles, venture structures, innovative funds concern that.

Innovative process is the activity providing creation and realization of innovations in the form of a transfer of technologies.

Transfer of technology is transformation process a resource in useful technological, consumer commercial function.

Investments are a financial investment in innovative projects for the purpose of reception of profit on their realization.

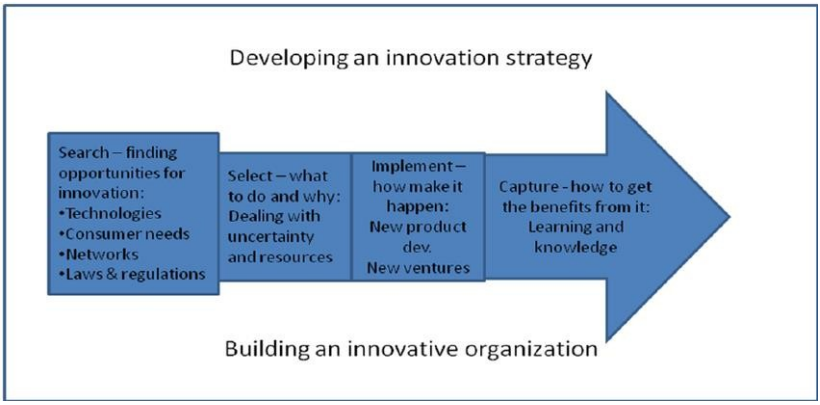
Investment climate is atmosphere of investment created by the state corresponding guarantees of the property right to the financial capital and received profit from the point of view of observance by both parties of the obligations taken on.

Investment risks is absence of guaran-tees of full conformity of result from the point of view of expectations on an input of innovative process and an exit from it, that is fraught with loss of investments.

Venture financing is financing of the innovative enterprises of the small-scale business occupied with working out and manufacture of high technology production, connected with attraction of the private capital.

Consulting is the commercial market connected with rendering of services in the field of the information, knowledge, innovative products (an electronic database).

Figure 6



The **intellectual property** is reflecting the copyright fixed legally to products of intellectual activity in scientific, industrial, marketing areas. The form of protection of objects of the industrial property is legally designated as the patent. This document certifies authorship, a priority or the possession right the given product and the exclusive right to its use.

Scientific researches are the search prospecting activity connected with gathering of the missing information, knowledge of the nature, the person, technical devices and processes, the natural and social environment, the person-machine the systems, used for working out of theories, formation of laws, optimizations of design decisions.

Leasing activity is the optimized activity based on cession of rights of use of inventions, industrial samples, trademarks, "know-how". In a broad sense – transfer to other organizations of experts, the industrial, building technics, with a view of innovative problems and an effective utilization of available resources. Granting of the rights is made out in the form of licenses. The basic advantage of leasing consists in concentration of research and development at level of the specialized companies that will allow manufacturers to co-operate with these companies and to save own resources as license cost it is considerable below expenses for research and development.

Franchising is the way of the innovative development based on the license contract on the right of use of technology checked up by the market of a how and a trade mark (brand).

Many Belarus enterprises thus get access to innovative products and technologies. In turn the European partners have an opportunity increases in volumes of manufacture and their realization in the new markets. Precisely as well the manufacturers using known brands and leave for themselves on the new European market.

Engineering is the activity connected with working out of innovative projects, the organization of productions at the enterprise within the limits of an introduced innovation.

3.7. Forms of scientific communication

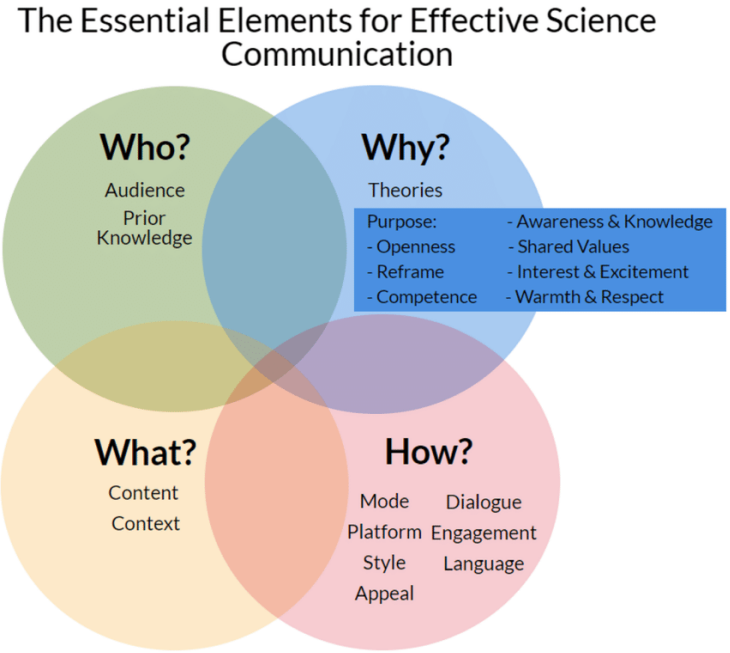
Delving into the world of science can often be a complex journey which hinges on understanding the critical role of communication in science. This informative guide aims to shed light on the ins and outs of scientific communication, from the basic understanding to intricate aspects, along with practical examples and types, thereby elucidating why it is indispensable. Additionally, this guide offers an in-depth exploration of the principles and practice of mastering such communication, coupled with case studies.

Communication in science refers to the process through which scientific information is conveyed, shared, and interpreted. It includes the verbal or written transfer of scientific concepts, ideas, findings, and theories among scientists and non-scientists alike. It occurs in various stages – from initial discovery to peer-reviewed publication, and it takes diverse forms.

The **argumentation** included the thesis and demonstration and proof. Discussion – the major means of intellectual dialogue, a way of optimizations of creative search. Productive discussion promotes revealing, statement and the decision of concrete scientific problems, occurrence of new interdisciplinary directions, search and introduction of non-standard approaches to the decision of contradictions constantly arising in a science.

The argument is the speech procedure serving of justification of this or that point of view, for the purpose of its acceptance by the recipient (to which it is addressed). In argument allocate the thesis, arguments and demonstration.

Figure 7



The **thesis** is the initial judgment which validity reveals in the course of the proof. As a rule, the thesis comprises new idea, original thought which it is necessary to give reason.

Arguments are statements, from which value (true or false) the validity of the thesis is deduced. Demonstration is a logic interrelation of the thesis

and arguments. The thesis should be formulated clearly, accurately, in an explicit form, not to suppose ambiguities and a variety in its interpretation. As arguments can be used statements about the established facts established by means of direct supervision or during research experiments.

The **axiomatic method** is widely used in the geometry, some sections of physics, chemistry, others natural and the exact sciences. Within the limits of the argument following demands are made to axioms: The basic types of the argument: On character of a substantiation: the proof, a refutation, acknowledgement, objection, an explanation, interpretation; On a demonstration orientation: the deductive argument and not deductive; Within the limits of professional work of the expert of technical qualification such types of the argument, as the proof and a refutation more often are used.

The **proof** – the logic operation proving the validity of the initial thesis; the refutation – opens it falsity. In a science the proof is often based on carrying out of supervision and experiments, use of private consequences from the basic standard concepts. Proofs happen direct and indirect. In direct – the validity of the thesis is deduced from the validity of arguments, in indirect – from them falsity. Similarly, in a direct refutation falsity the thesis follows from falsity arguments, in indirect – from their validity. As a direct refutation data to absurdity» are often used: the validity of the thesis is supposed, logic consequences are deduced from it, falsity which becomes obvious and serves as argument in advantage falsity the initial thesis.

Within the limits of the scientific argument except a thesis refutation the refutation of arguments (their inconsistency though it yet does not mean falsity the thesis reveals), and a demonstration refutation is often applied (absence of logic communication of the thesis with the resulted arguments though it too does not mean falsity the thesis reveals; it is necessary to search for new arguments which will be logically connected with it through this or that form of conclusion). By means of proofs the science acquires new knowledge, the refutation allows to get rid it of fallacies, errors and errors. Except these strict logic operations, the scientific argument widely uses acknowledgement (for example, in favor of the scientific hypotheses which validity is not established yet with all evidence), and the objections directed on easing of the thesis, though and not possessing absolute logic reliability (for example, the reference to the person of the opponent, to feelings of listeners, etc.).

The explanation opens the reason of the observable facts, explains features of action of fundamental laws of the nature generalized in scientific theories.

3.8. Methodology of scientific research

The **research methodology** aims to make the researcher systematic in his thinking, proposals and research, free of intellectual stagnation and oriented towards creativity, renewal, criticism and systematic and organized analysis, and avoiding making any arbitrary judgments by the researcher or falling into scientific naivety, based on the extent of his armament with scientific methodology and research methods and techniques. The approach is meant the way or the path (in the field of language), and it is defined as: the path that leads to revealing the truth in the sciences by means of a set of general rules that dominate the functioning of the mind and determine its operations until it reaches a known result.

Methodology is a branch of epistemology concerned with the study of curricula or methods that allow access to scientific knowledge of things and phenomena. We can also consider that the curriculum is a stand before the subject, and we are talking in this case, for example, on the experimental approach and the medical curriculum, and the word curriculum also means resorting to analytical patterns specific to distinct scientific branches, as for the methodology, there are those who make the concept of curriculum synonymous with the concept of methodology.

Is the method the methodology? The method is that path or method that the researcher chooses from among several scientific methods and methods (curricula) in proportion to the subject of his research, in order to address his problem according to specific research steps, in order to reach solutions to it or to some results regarding it, and therefore it can be said that the methodology is more comprehensive. From the science of curricula, which is an essential part of it, it mainly appears in how to treat the subject at the level of the body and the research plan, which are two parts of the research. As for the methodology, it is concerned with all parts and sections of scientific research, by stating its elements, conditions, and rules governing them, as well as issues related to form such as: how to document in the margin, how to document a list of references, stop signs. The meaning of the methodology of scientific research as a process or intellectual activity (induction and interpretation of reality), differs from the issue of logical methods, and the content of the methodology as a method of organizing and comprehensive depiction of the parts of scientific research, and the commitment to implement them stage after stage, and the methodology in its broad sense isthe philosophy of scientific research and the thought followed in scientific research.

The purpose of introducing the student to the methodology is as a general method aimed at avoiding the mistakes that the novice researcher usually makes. The researcher must have a clear vision of what he is looking for (defining the topic of the research, setting a methodological plan of action), and the latter is not represented in the techniques that can be followed, but rather a mental mechanism for memorizing and extrapolating the reality or the topic as a comprehensive perception of the dimensions of the research, and for this reason the researcher when he faces great difficulties that are almost To abort his research project, the reason is not due to the ineffectiveness of the techniques used, but rather to his inability to identify and follow a methodology that includes all parts of the research.

The scientific method is a way of achievement of a research objective. Methods of scientific knowledge share on the general and special. The general methods concern: theoretical, empirical, mathematical methods.

Organizational and methodical maintenance of working out and performance of programs of scientific researches is carried out by National academy of sciences of Belarus with participation of other state customers, and also Council about coordination fundamental and applied researches; programs of applied scientific researches and the programs of complex character containing an applied part – NAS Belarus together with the State committee on a science and technologies with participation of other state customers of programs. Programs of scientific researchers are developed in priority directions of fundamental and applied scientific researches of Belarus, confirmed Ministerial council of Belarus on representation of National academy of sciences of Belarus, taking into account priority directions of scientific and technical activity in Belarus.

The innovative system as set of the interconnected managing subjects who are carrying out working out, creation and manufacture of innovations, and also intellectual products for achievement of the purpose – the organizations of effective manufacture at optimum use of resources – has an infrastructure. One of its elements is the innovative networks formed on a voluntary basis. They directly do not participate in creation of innovations, but play the important role in maintenance of all innovative process.

Government programs of scientific researchers are subdivided into government programs of the fundamental, focused fundamental and applied scientific researches. The government program of basic researches is acomplex interconnected theoretical and (or) the experimental search re- search works directed on reception of new knowledge of the basic laws of development of the nature, the person, a society, is artificial created objects and

ways of their application. An ultimate goal of a government program of fundamental scientific researches is reception of the new scientific knowledge expressed in the form of laws, theories, hypotheses, principles, directions of researches and in other forms.

The government program of the focused basic researches is a complex of thematically coordinated tasks directed on the decision of a separate large scientific problem and on finding-out of directions of further use of new knowledge received thus for reception of practically important results. Ultimate goals state the program of the focused fundamental scientific researchers are reception of new knowledge within the limits of a separate large scientific problem, and also reception of the scientific results focused on practical application.

The government program of applied scientific researches is a complex of the tasks directed on research of ways of practical application opened before phenomena and processes, the decision of the concrete scientific problems having the direct appendix in a national economy. Ultimate goals of a government program of applied scientific researchers are reception of practically important scientific results expressed in creation of laboratory samples or breadboard models of products, technologies, substances, grades andhybrids of plants, samples of breeds of animals, techniques and methodical recommendations, and also carrying out of organizational-methodical actions for performance of workings out within the limits of the state targetand state scientific and technical programs.

Programs of scientific researchers can be complex and include fundamental and applied researches. In such cases the orientation of tasks and ultimate goals of sections of programs should meet the requirements, shown to corresponding programs.

Theoretical methods of scientific researches: **Modeling** allows an experimental method to objects and direct action with which is inconvenient or it is impossible, assumes cogitative actions with model.

Abstraction consists in mental derivation from insignificant and fixation of one or several interesting researchers of the parties of a subject.

The **analysis** is a method of research by subject decomposition on components.

Synthesis – connection of the parts received at the analysis in whole. Mathematical methods include: Statistical methods; Methods and models of the theory of counts and network modeling; Methods and models of dynamic programming.

Empirical methods of scientific researches. Scientific supervision is the

deliberate and purposeful perception caused by a problem of activity. The object is studied in natural conditions of its existence, without influence onit and environment.

Scientific measurement is a definition of the relation of the measured size to other size accepted for unit. As set of actions it is directed on a finding of numerical value (length, volume, duration etc.). The international systems of units of measure and their standards operate. Creation of universal systems of units of measure has given to scientific supervision accuracy and generality. For example, with the advent of mechanical hours in XIII–XIV centuries in Europe affirm time units: second, minute, hour. The metrology is engaged in working out of measuring techniques, studies methods and reception principles by practical consideration information on the sizes characterizing properties and conditions of different objects, creates measuring devices.

Research experiment – the method of the knowledge based on fixing and the control of conditions set by the researcher. Check of hypotheses and theories – experiment function.

3.9. Co-evolutional imperative and ecological values of modern civilization

In the relations between society and nature, a fundamental role should belong to ecological imperatives and the principle of co-evolution – the joint development of human beings and the biosphere. The author of the concept of co-evolution of nature and society is a prominent Russian scientist of the 20th century N. Timofeev-Ressovsky. The notion of co-evolution defines the strategy of the interaction of nature and society in line with the concept of global (universal) evolutionism.

This concept of universal evolutionism is an interdisciplinary project to develop a common picture of the whole process of development of nature and society. Universal evolutionism is a synthesis of the idea of evolution and a systemic approach. That is why the interrelation and development of non-living, living and social matter is seen as a self-organizing process, and evolution as such is presented as a transition from one type of self- organizing system to another.

Universal evolutionism is the basis of modern scientific picture of the world and relies on the basic theories of the 20th century:

• the theory of the non-stationary Universe (which established the idea of evolution in non-organic nature);

• synergetic as a doctrine of self-organization in living and nonliving systems;

• the theory of biological evolution and development, including the concept of the biosphere and noosphere.

The idea of co-evolution, or the harmonized development of man and the biosphere, had a major influence on modern natural sciences and the so co-humanitarian thought; it was included into the practice of public administration – in the working out of the concept of sustainable development. The concept of "**sustainable development**" has become widely used in scientific and political discourse after the publication of the International Commission of the UN Conference on Environment and Development (Brundtland Commission) report "Our Common Future" (1987). It was defined there as the development which ensures the needs of present generates without compromising the welfare of future generations.

The main objective of the new strategy was to ensure the survival of humanity by addressing the intra-social tension and conflicts and balanced socio-natural interaction. The main objective of sustainable development the achievement of balance between the socio-economic development and conservation of the environmental and natural resources for the satisfaction of the vital needs of present and future generations, taking into account the population growth. Proceeding from this, sustainable development involves such socio-economic model in the 21st century, which can satisfy the needs of the living generations and lay down favorable prospects for future generations.

The document, which was adopted by the world community – "Agenda for the 21st century" – outlines the program of action for the achievement of sustainable development goals. The basic points of the new strategy are reduced to the following provisions:

• in the focus of economic and social politics, there should be people

• hose right to a healthy, productive life in harmony with nature is a priority;

• the problems of preserving the environment and those of economic development must be resolved inseparably;

• all nations have the right for development, while maintaining the quality of the environment both in the present and future;

• states must take responsibility for their actions that harm the environment of other countries;

• states must replace the production and consumption models which it not conducive to sustainable development.

Held in August–September 2002, the Johannesburg World Summit on the highest level drew the world's attention once again to the concept of development proposed by another UN Conference on Environment sustainable and Development in Rio de Janeiro (1992) as a new model of the dynamics of civilization.

The philosophy of nature nowadays seems to regain its status as fundamental ontology, especially in relation to the comprehension of today's global problems, particularly the problems related to the crises in various aspects at the interaction between modern society and the environment.

Key words: nature, cosmos, theology, universum, biosphere, noosphere, ecological imperatives, co-evolution, universal evolutionism, scientific picture of the world, sustainable development, science, scientific school, innovative infrastructure, interdisciplinary, stages of scientific research, research plan, object, subject, hypothesis, theoretical scientific research, empirical scientific researches, basic researches, applied researches, differentiated scientific research, logic studies, representation of results, ecological direction, ethical problems, Internet, methods of psychological activization, systematized search, functional cost analysis, techno parks, middle class, modernization study, innovations, argumentation, proof.

Checklist for self-examination

1. What is the subject of the philosophy of nature?
2. What are the definitions of nature in sciences and philosophy?
3. How are the concepts of the biosphere and noosphere connected?
4. What is co-evolution and what role does it play in the contemporary philosophy of nature?
5. What role in the understanding of the processes in the noosphere belongs the principle of global evolutionism?

4. PHILOSOPHICAL ANTHROPOLOGY

4.1. Problem of man in philosophy and science

The term "**anthropology**" means a doctrine about man; and philosophical anthropology, correspondingly, is a philosophical doctrine about man, or the philosophy of man (anthropology).

The difference between the philosophical doctrine of man and concrete

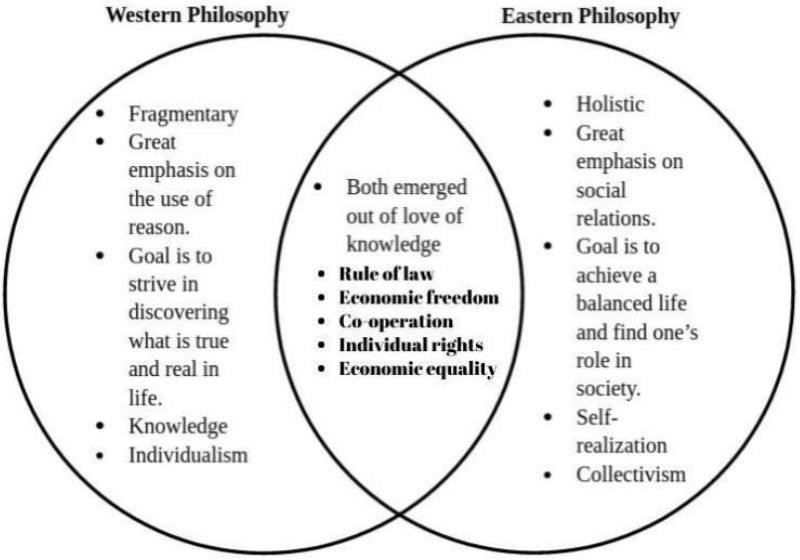
applied sciences is that philosophy examines the most common problems of human existence in the world, the aspects of human existence as a species md a being that stands on top of the evolutionary ladder. As man precedes the philosophy of man, philosophical anthropology be a common conceptual platform for scientific knowledge. It seeks to develop such a category of man that would include the fundamental principles of person; it's most important and essential characteristics. The philosophical point of view on man as a personality includes investigation of the problems **anthroposociogenesis** (the origin of man), sense of life, freedom and necessity in the activity of the individual.

Man is the highest stage of development of living organisms in nature known/studied by people; man is an intelligent being with abstract inking and a capacity for speech, self-consciousness and ability to set goals; man is the subject of history and culture, a biosocial being, genetically and functionally ordained by the development of nature, society and culture; a multifaceted being that represents an ambivalent unity of body, soul and spirit.

Man is in the focus of cognition of various forms of culture – philosophy, science, art and religion. Questions about the nature/essence of man, his origin, place in the universe, and his mission have been discussed in phi losophy for more than 2,500 years. In old oriental (Chinese, Indian) and ancient philosophy, man is treated as an organic part of the universe – cosmic, spiritual or social. During that period of history, the first scientific medical knowledge about man was gained by experience. Man was considered a partof nature, and his essence was understood as caused by the global mind or cosmic soul (logos, Atman, Tao), and his way of life – as ordained by the laws of destiny. However, the first historical attempts to comprehend man reveal differences between the Eastern and European/ancient approaches to interpretation of the inner and outer man.

The differences between Eastern and European (ancient) approaches to the interpretation of the internal and external "outline" of man, as historically first experience of human comprehension, are already evident. In the **Eastern tradition**, man is organically merged with the world, the universe, the soul and body are equal and reunited with the cosmic origin (Tao, Atman). This tradition implies improvement (exercise, introspection) of soul and body. **Ancient/Western philosophy** has a tradition (Plato) of opposing body and soul. The body belongs to the imperfect, changeable world of things, while the soul endeavors to return to the authentic and unchanging world of ideas.

Figure 8



Striving to understand the nature and specificity of man, the thinkers of Antiquity also linked it with society, pointing at intelligence, sociality, and humaneness as salient features of people. It is worth reminding that in Ancient China, Confucius, in his concept of man, also points at humaneness as the most typical manifestation of the social nature of man. Summarizing scientific achievements of Antiquity, Aristotle, the ancient Greek philosopher, defines the essence of man in comparison with animals through social, socio-political activity in the state as the activity o: the soul ruled by reason. The thesis coined by Protagoras – "man is the measure of all things" – most clearly represents the humanistic position of ancient philosophy in its understanding of man. Since then, the humanism has accompanied humanityin its public, social and cultural development.

Absolutizing the role of spirit and mind in his interpretation of maa ("man is reason"), Aristotle, however, does not regard man outside of nature, society or the state. Man, according to Aristotle, is a social and political being, and outside of the state, he is like a beast or a god. Ancient Greek thinkers did not just exalt man as a political being, as an integral part of a polis – a Greek state – they projected the idea of law and order onto the

world of nature and cosmos through the prism of human moral and political qualities.

The understanding of human nature changed with adoption of **Christianity** in Europe. The emphasis was placed on the inner, spiritual life of man.

The **Renaissance** (14–16th centuries), with its profound interest in dm cultural heritage of Antiquity, was the epoch of the "discovery of man". Theessence of humanism as a sociocultural phenomenon is that, contrary to the views on sin and guilt that had dominated in the Middle Ages, it proclaimedthe creative person as the highest value. Man is free, he has dignity and capacity for creative development; his knowledge is a social power, the powerand triumph of reason – such are the principles of the new vision of muMan as such is likened to God.

Philosophers of the Renaissance saw the essence of man in that he is a "great work of nature" (Dante), "the greatest instrument of nature" (Leonardo da Vinci), "the greatest miracle" (Pomponazzi).

Francysk Skaryna, the prominent Belarusian educator and publishing pioneer (ca. 1490 – before January 29, 1552), elaborating on the idea of Pietro Pomponazzi and recognizing the latter s personal and direct ideological in fluence on himself, realistically reinvented the concept of a human being as the highest intrinsic value. Skaryna placed special emphasis on such moral aspects of human activity as humaneness and justice.

Modern philosophy strives to discover the essence of man not only (trough rationality, morality, sociality and even God-likeness, as before. Now, it takes into account the natural biological basis of man. Thomas Hobbes built his definition of man on acknowledgement of the sum of natural faculties – both of body and mind – that, though, can only come true for man under the so-called social contract in a society/state as the foundation of the existence of man.

Representatives of the 18th century French materialism provided further substantiation to the materialistic approach to man.

The great representatives of classical German philosophy denied the fundamental innate nature of evil and depravity of man. They optimistically stated that people should have a hope for improving themselves with their own capacity; therefore, everyone can become a good person.

Man, according to German philosophers, is the creator of himself through a variety of his practical activities. However, they understood these activities only in **abstracto**, as the activities of thought, will and spirit.

German philosophers scientifically justified their denial of the need to

ink man's mission and destination with God and with the supernatural in general. They pointed out that all purposes and the sense of human existence in in man as such.

In their propositions about qualitative aspects of social laws, the role of labor in the shaping of man, about the dialectics of freedom in the evolution the human spirit, German philosophers to a large extent paved the way for development of Feuerbach's anthropologism and the Marxist theory of society and man.

In the 19th century, new approaches to the understanding of man were outlined. One of them was established by the Romantics and the "philosophers of life". They regarded man as a complex being, a "living contradiction", aid emphasized the role of irrational impulses (feelings, will, and intuition) in his behavior and creativity. In the 20th century, these ideas were elaborated in the philosophy of existentialism, personalism, and other concepts of man. Another approach is associated with Karl Marx. Within the Marxist paradigm, the essence of man is viewed as his social qualities determined by socio-cultural terms of his socialization. Emphasis on the role of external circumstances, entities and determinations lies in the foundation of various versions of sociologism.

Modern philosophical anthropology is closely related to other sciences that study human beings, in particular, anthropology that studies natural and historical origins of man; psychology that studies psychic foundation of behavior; sociology, which considers a person in the context of social life, logics, linguistics, etc.

The person is a subject of studying of anthropology. This science investigates historical, cultural, psychological aspects activity, behavior and private world of people. The term "anthropology" means a doctrine about man; and philosophical anthropology, correspondingly, is a philosophical doctrine about man, or the philosophy of man (anthropology).

The historical anthropology is connected with archeology. The cultural anthropology studies communities of people in a close connection with ethnography, sociology and a demography science. The anthropology is accented on behavior of people from the point of view of the right. It has powerful research base in the form of special laboratories, law-enforcement structures. The main task of these structures consists in preventive maintenance of offences, and also in operative actions of investigation of the facts of crimes, formation of an objective picture of actions of concrete people.

The psychology studies private world of the person, its mentality and consciousness. It promotes the best understanding of features of emotional,

sensual, rational, spiritual human life. The social psychology opens features of dynamics of public consciousness at level of the small social groups operating according to the certain cultural program, or formed spontaneously in the form of crowd. Safety of the population in the urbanized space, in the conditions of carrying out of holidays, festivals, sports actions, taking into account tragical consequences of display of the mechanism of crowd, is one of key problems of law enforcement bodies. Danger to associates can be formulated by separate people and be planned as destructive action with heavy consequences for a life. The motivation results from features **deviant behavior**, the aggressive relation to the social environment. Therefore, struggle against terrorism is the important condition of maintenance of public safety. There is a complex of the sciences studying the person as a biological being. First of all, it is a question of anatomy, medicine, ergonomics, bionics, physiology of the higher nervous activity. Population health is the major resource of the state, the nation. In Belarus to this question the considerable attention as the nation requires the decision of questions of demographic safety is paid.

The philosophical anthropology studies the person in a complex of concepts inherent in it, namely, as a biological and social being. It considers achievements in studying of the person of concrete sciences, and also problems and the senses which are a subject of theological judgements, relaxions of people about meaning of the life, death, the God, belief. Subject of philosophical relaxions are questions of an origin, life, essence of the person. In a question of an origin of the person the philosophy starts with the given modern sciences.

For medical sciences, genetics the law connected with an evolutionary origin of species. It allows to be engaged in diagnostics, to treat hereditary diseases, to solve the important problem of gene engineering connected with manufacture of donor bodies. Technologies of cloning cause the ambiguous relation as they are based on use stem cages, assume intervention in spheres which mention the major aspects of morals and religious belief. At sources of the theory of evolution stood C. Darvin, G. Mendel. Christians get acquainted with this true in the Bible. Abortions, suicide, deprivation of a life of other person, marriage and family destruction, and also the sinful affairs connected with drunkenness, a narcotism, arrogance, cruelty, violence, gluttony are subject to condemnation.

Archeologists in the course of excavation, anthropological historical reconstruction practically have completely tracked the basic stages of evolution of mankind.

Genetics this evolution have tracked at level genome the person and have revealed set of the similar person in biological systems and animals that are allowed to raise efficiency of struggle against carriers of infections.

Thus, scientists do not aspire to world outlook generalizations in a question of mutual relations of a science and religion as in questions of rescue of a life. Except genetic, surgical problems doctors face the complicated questions arising on border of a life and death. One of these questions is designated as a problem **euthanasia**. It is a question of the right of the patient if it is capable to make of the decision in a situation of heavy disease, on the basis of the verdict of doctors given to it about hopelessness of its condition, to make decision on the termination of a life to avoid the hardest physical tortures. The similar mechanism of decision-making is regulated by legal relations, a responsibility of the parties, public control and the country legislation.

One more aspect of profession of a physician is connected with concept of death at level of mentality, consciousness. It is a situation when the human body is functional only at level of biochemical exchange processes. Usually, such condition is provided with devices feeding an organism. It can last ten years. In this case about the patient doctors divide weight of responsibility with its near relations. Time conditions of clinical death have generated the whole direction of relaxions of people about the world after death, about transition from a life to death and from death by a life. Basically, it is a question of the mechanisms of consciousness accompanying these transitions by the certain maintenance of impressions, images.

In mutual relation of a life and death the functional and various sense for the person bears value of a life as possibilities of a choice are connected with it, love, creation of a family, creative realization. On the basis of these motivations the maintenance of life of the person is formed. In this maintenance activity, dialogue, spirituality is presented. Activity forms the social importance of the individual as persons, as human capital. Dialogue reflects variety of social relations of the person. Spirituality reveals humanism, humanity.

The lion's share of that represents the person, is formed in public and individual consciousness. It is private world of the person which combines public norms of morals, the rights with own vision of a reality. By means of consciousness the individual reflects the information, processes it, forms knowledge and skills of activity, dialogue, behavior. The brain directly influences dynamics mental, thought processes of the individual. In a more comprehensive sense influences of an organism on consciousness it is nec-

essary to consider sexual features of people – men and women, and also age – children and parents.

The **gender problematics** became one of key in a modern society as in it the complex of the questions is fixed, men concerning the social status and women. It is a question as of material incomes, and the political, civil rights. The **feminism** philosophy has made much for social justice restoration in mutual relations of men and women. In Belarus there is no sharpness in the given question as business qualities of people dominate over the sexual. The state in details enough regulated social aspects of a life of the woman as mothers. The person is so many-sided, that philosophers cannot capture its feature the uniform approach.

4.2. Man as a personality

The most important aspect of the problem of man is his formation as an active personality, which is spiritually rich and harmoniously developed.

Personality is a concept used to describe social and spiritual qualities of an individual as a bearer of human dignity, freedom, will and commitment as manifested in interactions with other people. The status of man as a personality requires, on the one hand, a certain degree of autonomy from society; though, on the other hand, it has certain prerequisites (economic, political, moral, and legal) for safeguarding man's rights and freedoms in society. The problem of personality is interdisciplinary; it is extensively explored by philosophy, psychology, sociology, pedagogics and other sciences. Philosophical discourse is primarily focused on the phylogenetic analysis of the aspects of the personality phenomenon. It is considered in the context of social envelopment, maturing and formation of the preconditions for growth of a human personality within society. The origins of this process date back to Antiquity (democracy, private property, concept of man as the measure of all things). In the Middle Ages, the personal beginning in man articulated by Christianity, which directed him to the inner world and instilled the need to care for the salvation of the soul. The Renaissance asserted the pathos of creative self-affirmation of man. In the Modern Era, science established itself as an independent cognitive power of man; various ideological projects of a law-governed state and civil society, which gained political and legal institutionalization in the 19th century, were developed. The formation of industrial civilization encourages the envelopment of individualism and entrepreneurship. Thus, a person as a social phenomenon is a historical product.

The questions of human personality, the prospects of its formation and education in the modern world are at the heart of philosophical anthropology. Russian religious philosophy was governed by a conviction that the essence of a personality may be revealed only through its relations with God. There are two most prominent and opposing concepts (except for the religious one) in the interpretation of personality by postclassical philosophy: biologic and structural. Adherents of the first one refute social determination of personality explaining it by heredity and neurophysiological structures of the organism. Adherents of structuralism, in their turn, acknowledge the social determination of personality and essentially reduce the notion of society to some impersonal and permanent social and spiritual structures.

The concept of personality is substantiated in the corresponding notions of the "individual" and "individuality". The concept of the "**individual**" is used to refer to a person as a specific representative of the human race, or to identify him/her as a representative of a particular social group.

As there is a difference in personality from manners, behavior, character, there is an essential difference between personality and individuality.

Personality is the ability to transfer the essence of capacity of character to an utterly new situation, as the politician who assumes power for the first time.

Individuality is the personality that refuses to conform to the collective. In the formation of Individuality, man enters the zone of psychological growth that permits the emergence of perfect form, and the formation of the unique type.

When the notion of the individual reflects the integrity of a specific human being from the moment of birth, then the identity of the newborn lies only in the opportunities associated with future efforts of its educators: parents, teachers, communities and society in general. Therefore, it is true that a personality is not born, but developed. Personality is fully a product of the social, historical and ontogenetic development of man. It is directly materialized in the individual's social status and roles, socially significant actions and motives, etc. Not only the personality is a product and object of society; it is certainly its subject, which influences the environment by his/her active efforts. The higher the influence, the more noticeable is the expression of personality. Therefore, we must not reduce personality to the reason, thoughts and motives of man. As an active being, a personality leaves its imprints on everything surrounding it. The concept of "personality" is mostly focused on social and spiritual qualities of a person as a bearer

of human dignity, freedom, will and determination.

Personality is manifested through its attributive properties, such as the ability for and commitment to socially useful work, possession of the reason and intellect, freedom and responsibility, direction and originality (uniqueness), character and temperament, etc.

Personality socialization is a process, when an individual gains social and cultural experience (knowledge, values, social norms, roles, forms of communication, behavior programs, ways of activity) that enable their integration in social networks and full membership in society. Communication is a basis of human life, a meaningful and conceptual aspect of social interaction. Socialization is impossible without communication.

Socialization is the process by which we acquire our social identities and internalize the values, norms, statuses, and roles of the social world. Socialization is the process whereby people learn the attitudes, values, and actions appropriate to individuals as members of a particular culture.

Types of Socialization:

Primary – during the early years of life. The teaching of language and other cognitive skills.

Anticipatory – learning which is directed toward one's future roles. College, Trade School, Law School, Medical School.

Developmental Socialization – new learning is added to and blended with old in a relatively smooth and continuous process of development.

Reverse Socialization – the younger generation transfers knowledge to the older generation. This occurs mostly in industrial societies where the pace of technological change is very rapid, a good example is children teaching their parents how to use computers.

Primary **agents of socialization** include people with whom we have a close intimate relationship, such as parents, and usually occur when people are very young.

The family is usually considered the primary agent of socialization, and schools, peer groups, and the mass media are considered secondary socialization agencies.

Secondary agents of socialization are groups or institutions that influence an individual’s socialization process after or alongside primary agents like family.

They include secondary relationships (not close, personal, or intimate) and function to liberate the individual from a dependence upon the primary attachments and relationships formed within the family group.

The level of culture and the nature of social activity of any society de-

pend in many aspects on the status of education within it. In most general terms, education means the institutions, ways and forms through which people gain knowledge and understanding of the world and themselves, learn professional skills and ways of living in a society. The essence of education is revealed in its functions. The major ones are:

1) transfer of socio-cultural experience from one generation to another;

2) development of man as a personality, a social entity, a citizen;

3) training of an individual to perform a particular community service.

These functions are not executed separately. They complement each other.

Thus, any kind of education includes both training and upbringing. It links people with the world of culture and the ideals of humanism. In this way people get more freedom and become more creative.

4.3. Freedom and responsibility. Sense of life

Freedom is an essential characteristic of man. However, the understanding of its nature, sources and forms of expression is far from univocal. The history of philosophical and political thought provides a range of views on the phenomenon of freedom – from its complete negation to recognition asa heavenly gift. Here are several judgements.

Thomas Hobbes viewed freedom as the absence of all the impediments to action. The French enlightener Voltaire understood freedom as free will: "...I am free When I can do what I please". The German philosopher Kant saw in freedom the highest manifestation of the human spirit – man's ability to follow the dictates (imperatives) of moral consciousness. The Dutch philosopher Baruch Spinoza understood freedom as the learnt and comprehended necessity. Friedrich Engels further specified the notion of freedom: it is action based on the conscious necessity. Furthermore, the American psychologist Erich Fromm concretizes this point of view: freedom is an action based on knowledge of alternatives and their consequences. The Russian philosopher Nikolai Berdyaev believed that freedom cannot be derived from anything, it can only reside in it from the beginning, since freedom is not being, it is spirit. In the philosophy of existentialism, freedom is associated with man's responsibility for his life.

The phenomenon of freedom is extremely versatile. In addition to external dimensions – social (economic, political, legal) and technical (related to the use of tools created by people for their purposes) – it has internal human

dimensions (psychological, mental, volitional) that are, in particular, expressed in people's aspirations either for authority or submission. Dependences between them are complex and dialectical. For example, one can say that Americans or Europeans feel themselves free people due to their social, economic and technological environment. However, the reverse would be true as well: economy and technology in America and Europe are in the state they are now, because they were built and developed by free people.

Man has always been curious about such particular problems as life and death and a closely related question about the sense of life.

Life is a way for man to exist as a biological and social entity. At the same time, man, as an animate being, is mortal. Moreover, he is aware of his mortality, unlike other animate beings ("he knows about death"). The question about the sense of life can be expressed in Hamlets modified question "to be or to have?"

Since the beginning of human history, people have been asking the age-old question: What is the **meaning of life**? This question has been asked by philosophers, theologians, and ordinary people alike, and it continues to be a topic of debate and contemplation today.

There are many different theories and ideas about the meaning of life, and it is likely that there is no one "correct" answer. Some people believe that the meaning of life is to find happiness and fulfillment, while others believe that the meaning of life is to serve a higher purpose or to make the world a better place. Still others believe that the meaning of life is simply to exist and to experience the world around us.

One popular theory about the meaning of life is the idea of hedonism, which suggests that the purpose of life is to seek pleasure and avoid pain. This theory is based on the belief that human beings are naturally driven to seek pleasure and avoid suffering, and that this is the ultimate goal of life.

Another theory about the meaning of life is the idea of eudaimonia, which is a Greek term that translates to "happiness" or "flourishing". This theory suggests that the purpose of life is to achieve a state of happiness or well-being, which is often equated with living a virtuous and fulfilling life.

A third theory about the meaning of life is the idea of existentialism, which suggests that the meaning of life is something that each individual must create for themselves. This theory is based on the belief that life has no inherent meaning, and that it is up to each individual to give their own life meaning through their actions and choices.

Ultimately, the meaning of life is a deeply personal question, and the an-

swer will be different for each individual. Some people may find meaning in relationships, others may find meaning in their work or their hobbies, and still others may find meaning in their spirituality or their contributions to the world.

Regardless of what one believes about the meaning of life, it is clear that this is a question that has fascinated people throughout history and will continue to do so for generations to come. So, the meaning of life is something that is subjective and personal to each individual, and it is up to each of us to determine what gives our own lives meaning and purpose.

4.4. Human consciousness

Consciousness is a fundamental category of philosophy, psychology, sociology and cognitive science, as it determines the major component of the human psyche. Consciousness is also referred to as a human ability of abstract conceptual and verbal thinking; the ability to receive generalized knowledge about the relations and laws of objective reality; ability to idealize as a way of goal setting, which precedes man's concrete/practical activity; consciousness also means a specifically human way of adaptation to the surroundings.

In ontological terms, consciousness is a subjective reality, an ideal world of knowledge, feelings, images and ideas forming man's inner world, which is not perceived by sensory organs.

In epistemological terms, consciousness is the unity of theoretical knowledge that varies in degree; scientific pictures of the world; and paradigms of scientific knowledge.

In axiological terms, consciousness comprises valuable components: norms, ideals and beliefs.

In praxeological terms, consciousness performs the function of goal setting and organization of creative transformation of natural and social conditions for its existence.

The first animistic concepts (anyma – spirit) were related to the human belief in spirits as the driving energy. Later, these concepts were uniquely interpreted through religious doctrines. According to them, consciousness is a display of a specific immaterial substance – the "soul", with its autonomous existence independent of matter and the human brain, in particular.

Rationalized beliefs in the primacy and eternity of spirit were taken up by idealism, which is very close to religious doctrines. Idealism endows

consciousness (reason, idea, spirit) with an autonomous existence allegedly creating and giving birth to the surrounding world, controlling its motion and development.

Culture in general is instrumental in the development of consciousness; at the same time, the unconscious determines conscious actions on the level its sensations, inclinations and passions. The unconscious information builds up and determines tastes, habits, etc.; it is retained in human memory, inter alia, as the social experience of humankind (archetypes, traditions) that affects consciousness one way or another. On the other hand, the accumulated knowledge, experience and sociocultural traditions are decisive for the formation of consciousness in the process of personality development, as they define man primarily as a conscious being.

Consciousness exists as a subjective image of the objective world, as a method of social regulation of human activity. It is ideal in the sense that an image is not a thing, but its picture in the human brain.

Consciousness develops from the common property of matter – **reflection**, which means the ability of some material systems to leave "footprints" in other systems in the process of their interaction. Due to the interaction between the systems, their relations bear the character of inter-reflection. Reflection in its most ordinary form is a specific function of interacting material systems, each being in the state of dynamic equilibrium.

In other words, reflection is the ability of material entities to reproduce properties and aspects of other systems. The simplest examples are the following: a footprint in sand, footprints of animals that died long ago, bouncing of a body after collision with another body, etc.

Thinking is a qualitatively special higher form of reflection typical of man only. Reflection as such has special manifestations on various levels of matter organization: inanimate nature, organic life, and on the social level.

Irritability, or a selective response to external effects, is the elementary and initial form of reflection inherent in all animate organisms. Irritability manifests the ability of animate organisms to respond to a short-time effect of the environment in a purposeful manner.

A new form of reflection – **sensitivity**, i.e., the ability to reflect individual properties of things as subjective sensations, is developed along with the complication of the forms of interaction between organisms and the environment. Sensitivity formation is based on the ability to respond to both vital and indirectly related environmental factors.

Psychic reflection that expresses the ability of animate organisms to an-

alyze complex sets of simultaneous irritants and reflect them as a uniform image of a situation is even more complicated in organic nature. Psychic reflection is a special form of adaptation of animate beings to the changing outer environment in the process of the long-term evolutionary development.

Consciousness formed and evolved in close connection with the development of the brain. Our consciousness is a product of the material organ – the brain. Consciousness is not a substance of the brain or any other matter, it is the ability of the subject to reflect the outside world as a live image of the material realm. The reflection of matter in human consciousness is man's internal, spiritual world.

The relation of psychic phenomena of consciousness with the activity of the brain is doubtless, though this statement cannot explain the secrets of consciousness in full. To get a more profound understanding of it, we would need to reveal the inner mechanisms of brain activity and the regularities underlying the psyche and consciousness.

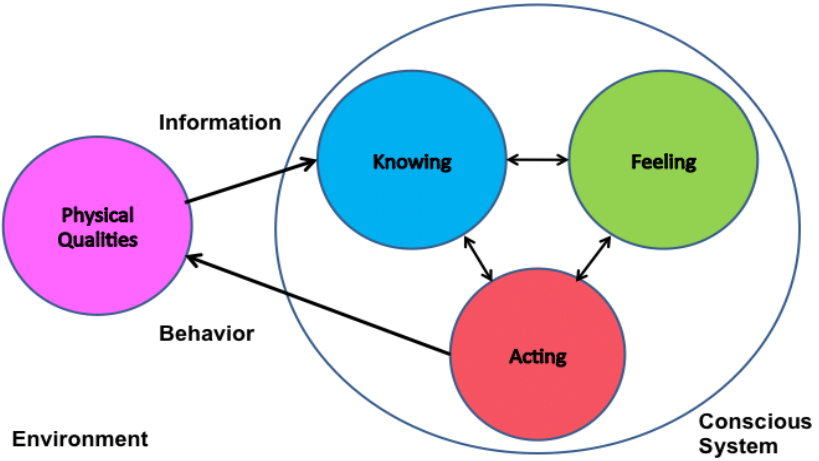
The notion of the psyche is broader than that of consciousness. The human **psyche** means a complex of phenomena of man's inner subjective realm, as different from the outer realm of things, including the human body. The main components of the psyche are sensations, perceptions, beliefs ("outer feelings"); the reason, abstract thinking in the form of notions, judgements, speculation; emotions – grief, joy, agitation, fear ("inner feelings"); and will.

The qualitative difference between the human psyche and the animal psyche is that man is capable of foreseeing individual effects of his activity, the nature and direction of natural and social developments.

Modern sociobiologists often tend to confuse the social life of animals and human society. Attempts at humanizing dolphins are especially frequent. Some authors believe that an exclusive organization of the dolphins' brain opens the door to their reasonable activity. However, in fact, according to the latest research data, neither the behavior, nor the structural/functional organization of their cerebral cortex confirm that dolphins possess the properties of the human psyche.

The human psyche properties are attributed to beasts without consideration of the major difference between human consciousness and the animal psyche. Human thinking is typically expressed in notions, judgements and speculations; human consciousness is self-consciousness – the realization of the Ego as opposite to the surrounding world.

Figure 9



The creative, active nature of consciousness is manifested in the selectiveness of the latter. It selects and focuses on one or several objects out of a number of things.

The creative role of consciousness should be understood as a transformation of the surrounding by man through practical activity rather than as creation of world consciousness (as proposed by idealism). Such human conscious activity as a material process is based on objective laws and implements human goals and plans that have been produced by consciousness. Idea- or goal-based human actions, rather than consciousness, can change and create new objective reality.

Language is a sign information system intended for the reception, processing, storage and transfer of information.

The emergence of language is based on people's collective activity, as well as on thinking. Human communication facilitated the improvement of tools, while skills of using the latter became the property of the entire collective.

Consciousness was formed on the basis of people's social life and their continuous interaction through communication. The means of communication is word, which has a generalized nature.

Thus, language does not exist without thinking, in the same way – ideas do not exist without language. Language and thinking evolve along with the evolution of society.

New aspects of consciousness have been realized in the recent years due to extensive progress of informatics and computer technology. Complex dynamic systems explored by cybernetics are characterized by the ability to receive, store and process information and exercise control that basis.

The development of cybernetics opened doors to the creation of electronic computers capable of performing “intellectual” operations.

What are the similarities and differences between the brain and cybernetic devices? The materiality, regular nature of information processes are common for the brain and its simulators. However, machines are limited to logical data processing in the form of physical and chemical operations. Data processing by human thinking is based both on similar operations in the brain neurons and on specific neurophysiological phenomena.

An important role on the level of thinking belongs to the emotional aspect that can expedite and slow down data processing.

A machine processes information through a special program, while human thinking has no explicit coding and programming. A computer is a tool rather than a subject of cognition and social action.

Key words: anthropology, anthroposociogenesis, Eastern and Western philosophy, deviant behavior, gender problematics, personality, individual, individuality, socialization, agents of socialization, freedom, meaning of life, reflection, irritability, sensitivity, psyche, consciousness, language.

Checklist for self-examination

1. What does philosophical anthropology study?
2. How is man defined in classical and postclassical philosophy?
3. What basic approaches to the study of human nature are used in philosophy?
4. What is personality and what is its structure?
5. What are the personality formation and development mechanisms?
6. What is the essence of the question of the sense of life?
7. How do freedom and responsibility correlate?
8. What is consciousness?
9. How are the concepts of the “psyche” and “consciousness” related?
10. What distinguishes the human psyche from the animal psyche?
11. What is self-consciousness?
12. How are thinking and language related?
13. What is the problem of artificial intelligence?

5. SOCIAL PHILOSOPHY

5.1. Specificity of a social reality and society structure

The concept of **society** is related to the word “socium”, which has Latin roots. The word “socium” (Latin: socium – general) etymologically comes from the Latin verb “socio", which means to join, to merge, to begin common work.

Philosophers have been interested in the nature of society for a lone time. The older generation of the Sophists (Protagoras, Gorgias), and later – G. B. Vico, K. Marx, substantiated the idea that society by its nature is subjective and “hand-made”, qualitatively different from nature (Vico), and its essence can be understood by the mind (Marx). The backbone of society is public relations, which, in K. Marx’s deep conviction, is impossible to see even with the help of a microscope. The understanding of the essence of society is charged with human consciousness and with different meaning.

Society is the product of targeted and reasonably organized joint activity of large and small groups of people, united by different connections and relationships, needs and interest.

After defining the essential characteristic of the concept of society as an object of study of facial philosophy, it is possible to define the subject of this philosophical discipline.

Social philosophy is a special philosophical science, which studies the fundamental grounds of society as a holistic phenomenon. Consequently, social philosophy proceeds not only from the fact that society is a set of people, and that man is an element of society as a system – a biological, social and spiritual being. Thus, science takes into account that individual people are born, live, and die. During their lifetime and after their death, there are multiple links and relations between people. This means that society is not just a certain group of people, but include different connections and relationships between people, such kind of links, which provide a continuous nature of existence and development of sustainable non-natural reality.

Regardless of the fact whether social philosophy approaches its subject from the point of view of society as a special kind of being, or from the perspective of the individuals taken in their relations and ties with other people, it is always focused on the cognition of the most common and universal principles.

The social reality is a product of historical activity of mankind. It includes is material-industrial sphere, spheres of economic, social, political,

spiritual relations. Specificity of a **social reality** consists that it is space of ability to live of people. This space includes components lifeless and wild life in the form of biosphere, and also culture. The person is a basic element of social space as it actively forms it according to requirements, values, traditions, ideals.

The concept of the person of space of a social reality is concretized through society structure. At a social reality actively, there is a population possessing demographic, sexual, age, ethnic, social, racial, religious signs. The basic role in a modern society is played by cultural, national signs which form a variety of social groups. One of them have a territorial sign of the nation, others territorially are not caused. They are a product of valuable orientations, a material standard of living.

With XVI centuries the social reality develops in the form of the **technogenic civilization** based on priorities of scientific and technical development. New updating of a social reality became a subject of studying of philosophy. Results of philosophical researches are presented formation, civilization, techno-determinism, passionary, communicative concepts. Formation the concept is developed by K. Marks, F. Engels and V.I. Lenin. It considers scientific and technical progress in a close connection with criteria of social justice. For these purposes initial representation about a formation as unity of basis and fine tuning is entered. The basis fixes specificity of economic relations between social groups. It is primary on influence on a superstructure connected with sociopolitical, spiritual relations be- tween social groups (classes). In basis contradiction of technogenic development connected with discrepancy of relations of production to character and a level of development of productive forces of mankind is covered. Discrepancy pours out in the social conflict and leads to change of socioeconomic structures. This change can be carried out through a social revolution.

The **M. Weber concept** represents scientific and technical progress in a context of religious-cultural traditions of an economic pragmatism. It has proved influence of traditions on efficiency of economic activities and the organization of a society on an example of Protestant ethics of work. Technogenic dynamics associates with live system with signs of a birth inherent in its elements, ripening, destruction, a competition.

The aspect of a competition dominates in works of end XX – beginnings XXI of centuries. Technogenic civilizations are characterized industrial, postindustrial, information by levels of development.

In social philosophy, three main approaches have developed historically to answer the question of how people connect with each other by means of society.

The first approach is based on the idea of man as the ensemble (set) of social relations. K. Marx, for example, who advocated this approach, believed that man becomes man only in society and thanks to society, i.e., he becomes a social being through his connections and relations with other people.

The second approach is based on the understanding of man as an autonomous subject, who has the mind and will, who is capable of reasonable actions and conscious choices. Such approach was developed by M. Weber who proceeded from the fact that society is a product of interaction of autonomous individuals.

The third approach is based on the interpretation of society as a system of communication, the parties of which are social relations and human activities (J. Habermas), as well as communication by means of activities aimed at the environment (N. Luhmann). According to N. Luhmann, the fundamental principle of society is communication.

Thus, modern social philosophy characterized by **pluralism of concepts** in the study of nature and fundamental principles of society.

This pluralism, however, is not chaotic and can be conventionally presented as the coexistence and interaction of the three worldview-related paradigms of social studies – naturalism, idealistic understanding of society,and materialistic understanding of society.

The **materialistic understanding** of society is represented primarily in classical and contemporary Marxism. The **idealistic understanding** of society is represented in the psychological direction of the interpretation of society.

Naturalism (Latin: natura – nature) in its understanding of society captures the importance of natural, biological factors in social life, and at the same time expresses the attempt to present these factors as defining, i.e., systemically important, lying at the basis of others, derived from them. The naturalistic program in social philosophy is represented by three main variants:

• reductionism (example – “geographical determinism” of Ch.-L. Montesquieu, claiming that climate determines the laws of social life);

• ethnocentrism (the concept of passionarity of L. N. Gumilyov);

• organicism (the concept of H. Spencer, who regarded society by analogy with a living organism).

In philosophical science (social philosophy and philosophy of history), society is characterized as a dynamic self-developing system, i.e., a system

which can, while seriously changing, at the same time save its essence and qualitative definiteness.

Society is a self-organizing and self-developing open social system, whose way of life is the activity of people and their communication with the environment.

In different social-philosophical models of society, there are its different systemic elements.

In Marxist philosophy, for example, the subsystems of society are commonly believed to be the following areas of its life, which are identified depending on the type of public relations:

• the economic sphere, the elements of which are material production and the relations of production (among which the main ones are the property relations) that arise between people in the process of production of material goods, their exchange, distribution and consumption;

• the social sphere, consisting of such structural units as classes, social communities, social institutions, etc. taken in their relationship and interaction with each other. The social sphere is the sphere of reproduction of man as a social being;

• the political sphere, which includes various actors of political relations: state, political parties, political leaders, etc.

• the spiritual sphere, covering various forms of public consciousness: law, religion, philosophy, morality and art.

Each of these spheres, being in itself an element of the system called "society", appears in its turn as a system, in respect to the elements that constitute it. All the four spheres of public life are not only interrelated, but also mutually determine each other. The division of society into the spheres mentioned above is, of course, somewhat arbitrary, but it helps to single out and examine certain areas of the whole society, a diverse and complex social life.

Considering the typology of social activity in society as a system to be the basis, several other spheres or areas of people's activity can be distinguished, for example:

• the material sphere – the sphere of production of material values;

• the spiritual sphere – the sphere of production of spiritual values;

• the managerial sphere – the sphere of regulation of material and spiritual values;

• the services sphere – the sphere of maintenance of production and regulation of material and spiritual values.

The social structure of society is a body of various communities of peo-

ple, taken in their interaction. The forms of community of people are usually divided into natural-historical, ethno-historical, socio-historical.

Natural-historical forms of community of people are race, generation, gender, etc.

Ethno-historical communities of people are kin, tribe, ethnic group, nation.

Socio-historical forms of community of people are classes, estates, social strata, castes, etc.

The most important sociological and social-philosophical concepts of the study of the social structure of society are the concept of social-class and the stratification concept.

For Marxism, the division of society into big groups of people, or classes, is typical; such division is crucial for the social structure of society.

V. I. Lenin defined classes as "large groups of people differing from each other by the place they occupy in a historically determined system of social production, by their relation (in most cases fixed and formulated in law) to the means of production, by their role in the social organization of labor, and, consequently, by the dimensions of the share of social wealth of which they dispose and the mode of acquiring it".

Nowadays the idea of class division of society, with all its theoretical value, occupies a noticeably inferior place in contemporary sociology and philosophy in comparison with the popularity of the stratification concept.

A **stratum** is a layer. From the standpoint of the **stratification** theory (the founders of which are considered to be P. A. Sorokin and M. Weber), society is seen as a system of social layers and groups allocated according to various substantive grounds. Social difference, inequality, and in accordance with it, the position of people in the social structure is defined on the basis of various criteria, which can often be reduced to four primary ones: the size of income, level of education, access to power, prestige of profession. The representatives of one stratum (layer) usually have similar life standards and a way of life, which distinguishes them from the representatives of other strata.

An important notion in the concept of social stratification is **social mobility**, which implies the movement of individuals or social groups in the "horizontal" or "vertical" social plane, which leads to a change of their place and role in society. An example of horizontal mobility can be a student who moves from one school to another, or a worker moving from one plant to another. Vertical mobility means a person or a social group moving to another social stratum.

Social mobility is the movement of individuals, families, households or

other categories of people within or between social strata in a society. It is a change in social status relative to one's current social location within a given society. This movement occurs between layers or tiers in an open system of social stratification. Open stratification systems are those in which at least some value is given to achieved status characteristics in a society. The movement can be in a downward or upward direction. Markers for social mobility such as education and class, are used to predict, discuss and learn more about an individual or a group's mobility in society.

Social mobility is highly dependent on the overall structure of social statuses and occupations in a given society. The extent of differing social positions and the manner in which they fit together or overlap provides the overall social structure of such positions. Add to this the differing dimensions of status, such as Max Weber's delineation of economic stature, prestige, and power and we see the potential for complexity in a given social stratification system. Such dimensions within a given society can be seen as independent variables that can explain differences in social mobility at different times and places in different stratification systems. In addition, the same variables that contribute as intervening variables to the valuation of income or wealth and that also affect social status, social class, and social inequality do affect social mobility. These include sex or gender, race or ethnicity, and age.

Education provides one of the most promising chances of upward social mobility and attaining a higher social status, regardless of current social standing. However, the stratification of social classes and high wealth inequality directly affects the educational opportunities and outcomes. In other words, social class and a family's socioeconomic status directly affect a child's chances for obtaining a quality education and succeeding in life.

5.2. Phenomenon of globalization

Globalization reflects accelerated processes of an intensification of dialogue of mankind, cooperation of technogenic structures, features of a social life in conditions the Internet spaces. At level of economic representations, it is a question of formation of system of transnational manufacture and trade. On a level of development of information-computer technologies it is a question of occurrence on a planet of uniform communicative space. On a science level of development, it is a question of formation of practice of functioning of the international research centers of innovative activity, techno parks, cluster structures. On an educational level it is a question of crea-

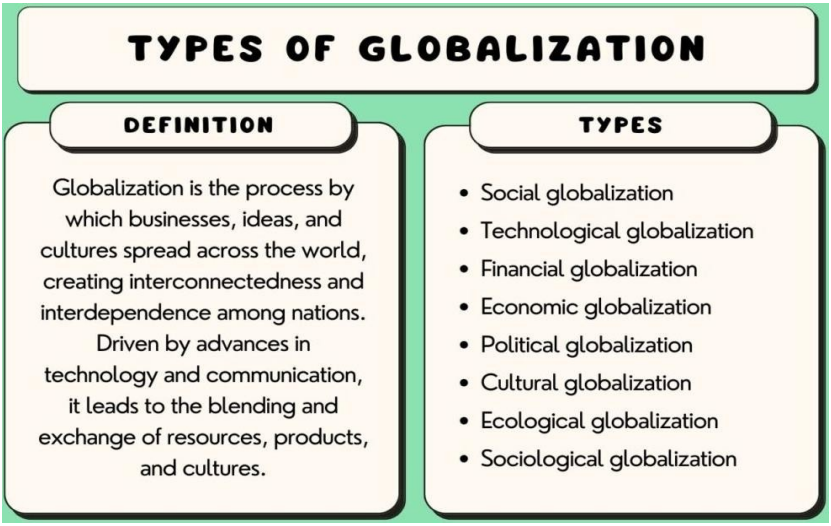
tion of the educational services corresponding to uniform international standards. At level of preservation of the environment (ecology) it is a question of strategy coevolution and a sustainable development which beginning was necessary within the limits of the United Nations in 1992 in Rio de Janeiro.

Globalization is complex process. It is a subject of studying of philosophy, sociology, political science, economic, technical, pedagogical, biological sciences. Globalization is capable to generate the consolidated basis of mankind for the decision of global problems. Huge megacities are served by difficult municipal infrastructural networks. Mass media create "global village". Thanks to expansion of network structures in economic the new transnational space, formed by such leading international political, economic and financial organizations as the WTO, IMF and the European bank of development etc. In similar space occurs virtualization economy in which continuously there is a shift from manufacture of the goods to manufacture of services, "immaterial" branches of economy.

Occurrence of the term "globalization" connect with a name of the Anglo-American sociologist of R. Robertson which in 1983 used concept globality in one of articles, and in 1992 has stated bases of the concept in a system kind. The Socially-philosophical judgement of the term of globalization is closely connected with works of such authors as D. Bell, E. Giddens, A. Toffler. The theory of a postindustrial society offered by D. Bell, describes its features as creation of a new class of intellectual elite, occurrence of new technologies, easing of contrast of leisure and work, estrangement of the person. D. Bell also has developed the concept of a relativity of deficiency according to which a place of the deficiencies eliminated by technical progress will occupy new, such as information deficiency, deficiency of time and consumption. In work "Flight from freedom" E. Fromm develops the thesis that the modern person has an aspiration to refuse the individuality and feebleness in favor of freedom. G. Marcuse and E. Fromm's ideas help to establish connection between processes of alienation of the person, atomization of societies and globalization processes. In Belarus these questions are in the center of attention of the state. The country participates in regional cooperation of the Eurasian states concerning military safety.

Globalization of a social reality has got steady character and the basis. Its economic advantages are obvious and to Belarus as transit state. Manufacturers aspire to overcome as much as possible the factor of national borders and by that to get access to the huge consumer and information market.

Figure 10



The economic ability to live of mankind it is inapplicable to spheres of a political, cultural, spiritual life where a variety of interests dominates, values, traditions.

In the conditions of globalization, it is a variety of a political, cultural, spiritual life has incorporated in an identity phenomenon. Political bases of identity are presented by values of independence of the country, a life in the national state, ideological traditions of religious belief within the given state, a historical role of certain ethnic groups in creation of the given state and culture. All it demands the balanced policy in questions of migration, the rights of migrants, assimilation, integration of migrants into values of societies new to them.

In Belarus questions of national identity are in the attention center as historically many ethnic groups which have created own national states boundary with our state participated in formation of the Belarus nation.

The international law which reflects not ethnic, but humanitarian aspects of a life of people admits uniform only. Cultural bases of identity of the nation are formed by the art creativity of the people expressed in folklore. Material forms of creativity are presented by crafts, the technologies of traditional activity connected with agriculture, hunting, fishery, collecting, ethnic cuisine. Art forms of creativity are presented tool, vocal, musical,

choreographic, celebratory culture, customs, ceremonies, the fine arts, national architecture, the design. Spiritual forms of creativity reflect private world of the people, feature of its mentality. Such generality arises under the influence of the general interests of the decision of problems of safety, human contacts, an intensification of internal resources on the basis of cooperation of efforts of managing subjects.

The problem civilization identity consists that test its stability not only external factors in the form of the same globalization. In any civilization thereof ethnic separatism which can use technologies of terrorism takes place. If in a regional civilization the processes of disintegration connected with loss of periphery the civilization kernel also can undergo to destruction begin. But it while only one of assumptions as globalization chronologically occupies the small historical period and it obviously insufficiently for end defined civilization cycles. While in the scientific literature fears concerning the consolidation of civilizations caused by globalization and the epoch of collision of civilizations (S. Huntington) connected with it are expressed only.

The culture philosophy studies a wide spectrum of problems, beginning from structure of material, art, spiritual forms of activity of people, finishing dynamics of structural formations at level of civilizations.

The Structurally functional approach to culture allocates it as the social reality connected with material, art, spiritual forms of activity of people.

The ethnographic approach fixes structures of a life, a family, folklore, marriage, a myth.

The sociological approach reveals features of national, mass, elite cultures.

The psychological approach explains mechanisms of behavior of people in the conditions of a mass culture when problems of public safety get key value.

Ethics supplement psychology with the analysis of behavior of people in the conditions of a mass culture from the point of view of categories of morals, morals.

The aesthetics shows culture as the certain image of the world formed by people on the basis of style, taste, religious traditions.

The religious studies show features of spiritual culture of mankind. Culture philosophy questions of communication of scientific and technical progress with values of creativity interest. This interest is caused by that the techniques regulates the rigid technologies of activity which are leading up a role of the person before mechanical functions. In the huge social car val-

ue of individuality is lost. The importance of the person thereby decreases. To it the relation as to any other artifact is formed. Especially obvious such situations become in extreme conditions of modern wars where purely tactical problems of drawing of blow on the opponent prevail, liquidations of an infrastructure, communications.

The destiny of the peace population thus is not taken into consideration. It perishes as a result of mass blows of aircraft, rocket bombardments. It becomes the basic way of demonstration of force, ideology propagation. The more the killed peace inhabitants, the there is more than attention to initiators of aggressive actions.

All these features of functioning of a modern information society have created vicious practice in which basis the pursuit of effective event lays. This pursuit provokes immoral technologies not only aggressive actions, but also earning money. All it means that the mass culture philosophy practically has completely lost sight of key categories of ethics, the right, creative freedom. In narrower sense speech should go about philosophy of pop culture not carrying out the critical function of the analysis of popular virtual images of serials, computer games.

Mass media in the name of a yellow press bring huge demoralizing effect in mass consciousness. Noted tendencies of development of a mass culture became visible in the XXth century beginning. They have generated moods of decline of culture, destruction of technogenic civilizations. About it wrote N. Berdyaev, O. Spengler, K. Jaspers. Graphic means futurists, expressionists have shown this problem. Gradually the fine arts resource was transformed to commercial service, propagation of consumer culture, pop art.

5.3. Coevolution and sustainable development

The term "**coevolution**" is entered into a scientific turn by ecologists in the sixties the XXth centuries. In social ecology coevolution contacts a problem of adjustment of mutually advantageous coexistence on the Earth biosphere and technogenic activity of mankind. For the decision of this question, it is necessary to know certain analogues of optimum coexistence of diverse structures.

The analogue can be developed proceeding from the biosphere organization as global system. From the point of view of industrial culture, the biosphere concerns systems of type without waste. It accumulates considerable resources in a kind hydrocarbon and other kinds of raw materials. Efficiency of biosphere is defined by gradual consumption of renewed kinds of energy,

first of all solar, and also its repeated use in cyclic exchange processes.

In an ideal technogenic civilizations should aspire to similar efficiency of consumption. But the mankind in the conditions of beginning XXI century is only in an initial stage of technogenic development from the point of view of efficiency of biosphere. Therefore, coevolution between a technogenic reality and biospheric is, but it is in an initial stage of development. Transition strategy on coevolution is formulated in 1992 in Rio de Janeiro within the limits of the United Nations and designated as strategy of a sustainable development of mankind in which limits the basic manufacturers of the emissions, harmful substances should find a consensus under key programs of ecological stabilization of a planet. In concept "coevolution" processes of interdependence, interference is reflected in level lifeless, wildlife and a society. If the importance of modernization and a quality management is not called in question the relation to investment in preservationof the environment is ambiguous, as has confirmed the international forum which was passing in 2010 in Copenhagen.

Anybody any more does not deny presence of a powerful social base at supporters of balanced development. This feature affects and the maintenance of modernization and quality management standards. Therefore, there is a necessity for more steadfast analysis of processes of interaction of mankind and the nature, the live and lifeless nature for a context of evolution and modern lines in the world market.

Coevolution it is allocated as a subject of special studying originally was up to standard of interaction of live organisms and environment and became a subject of studying of biologists and ecologists. Such approach has opened a way to working out of the interdisciplinary concept coevolution. Following the results of scientific researches became obvious, that coevolution creates between systems steady processes of an exchange by substance, energy, the information.

Coevolution became a subject of active studying at level of internal processes of biosphere. They are studied in the form of mutual relations the owner – a parasite, a predator – extraction, an insect – a plant. Formation of interrelations between populations in the course of evolution went in the geographical environment. Biologists have revealed three basic mechanisms of interaction of the populations based on narrow specialization, generalization and symbiosis.

The mechanism of reproductive possibilities of the animal and vegetative worlds was originally used. This type of culture basically depended on presence of a biological variety of a food orientation, successful hunting,

fishing and collecting. Such type social coevolution did not guarantee stability of a life of communities of primitive hunters. Therefore, the mankind has made a step to development of bio-technologies of domestication of wild animals, selections of plants, uses of natural materials. Coevolution mankind with the biological variety of a planet modified by it became a new stage in which frameworks society resources have repeatedly increased that has made possible formation of agrarian civilizations, occurrence of city culture.

In the conditions of intensive growth of the population, its requirements caused by formation of secular culture, the considered historical type coevolution became insufficient from the point of view of requirements of the West European population. The massive migration of Europeans on other continents could not solve the arisen problem even.

The technics in the form of cars and scientifically organized work has allowed a society to increase repeatedly productivity of activity and provide surplus value manufacture. There was a basis for existence of liberal economy. In its basis regulation mechanisms through a supply and demand, a public division of labor between a city (the basic consumer of biological production) and village (the consumer of tools of work and the goods of industrial group) lay.

The additional resource base was necessary. The manufacture of cars and systems of communications in the form of coal, iron ore that has caused rapid development of the mining industry and the infringement of stability of landscape complexes caused by this development (aeration of superficial breeds, pollution of underground waters, erosion of fertile soils). Industrial developers began to compete to traditional users of the earth (agricultural, wood manufacture). Development of transport communications has led to additional withdrawal from an agricultural turn of the earths. By the end of XIX century the industrial society has strengthened techno genic pressure upon the nature through active development of power, motor industry and the chemical and petrochemical industry.

Actually, activity of mankind has fallen outside the limit's reproductive possibilities of biosphere. Limitation of resources has pushed the largest manufacturers and consumers to formation of outlook of the geopolitical control over territories potentially rich minerals. The world energy crisis of the eightieth years of the XXth century has shown to mankind that the new historical form coevolution in which basis principles of a sustainable development of a society and the external nature from positions of potential of hi-tech modernization should lay is necessary. Interests of the nature and eco-

nomic profitability have incorporated in point of innovative strategy of formation of the high technology manufactures based on technologies of deep and effective processing of raw materials, secondary use of resources, processes without waste. This reorganization occurred within the limits of culture formation system designing of the territorial structures, the urbanized spaces.

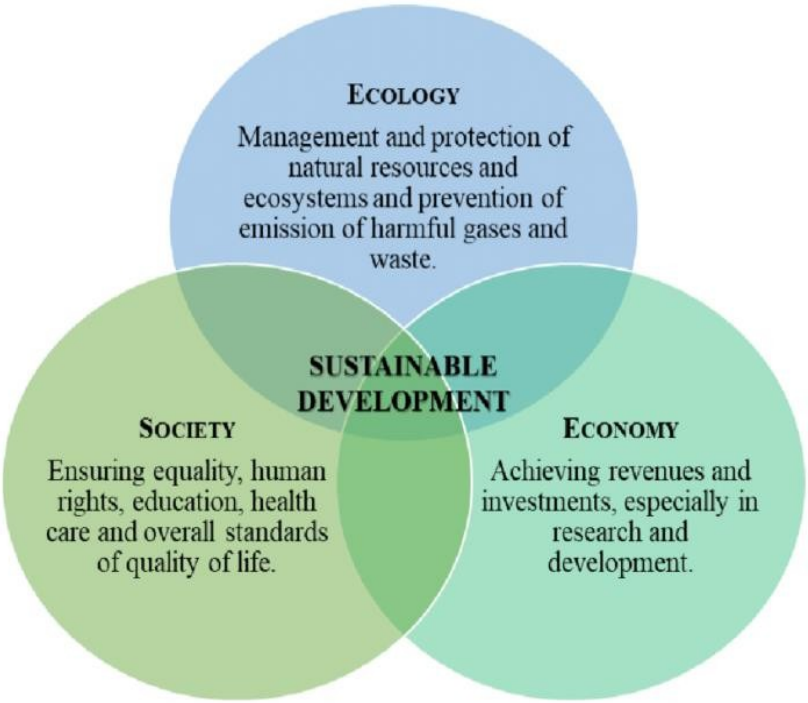
Within the limits of the considered approach problems of maintenance of hygienic conditions of ability to live of the population by rational wildlife management, preservation of the environment, modernization of an infrastructure and communications, optimization of air, transport, water streams (sewer structures) began to be solved. Macro designing as territorial units has selected region, agglomeration. Micro designing accented on average and small cities.

Stability bio is defined substantially by self-regulation and reproduction of atmospheric air, water resources, soils, wood and park zones also geochemical and physical activity of landscapes, balance of a biomass. The loadings are projected also on the second participant 1) maximum permissible concentration of chemical elements in atmosphere, water, soil; 2) criteria of zoning; 3) restrictions; 4) rationing of sanitary ruptures, clearings of industrial emissions and sewage, recycling, dust disinfecting. The big plans of mankind in the tideway of the decision of these problems contact modernization and innovative activity. Innovative activity solves problems 1) perfection of technologies of sewage treatment; 2) reductions of emissions in atmosphere of harmful substances, 3) processing of a firm industrial and municipal waste; 4) introductions technologies; 5) creations of ecologically pure types of transport, safe power, systems of effective water supply and water removal, operative communication; 6) introductions of new methods of engineering preparation of territories; 7) uses of silent types of transport; 8) progressive methods of water preparation; 9) modern methods of protection against influence of electromagnetic fluctuations, radiation, thermal pollution; 10) technologies of a lining of engineering communications; 11) optimum placing of technical systems in territory.

Sustainable development and **environmental justice** locked in a co-evolutionary relationship, coupled by their mutual focus on social equity. However, they are not entirely compatible in that focus. Sustainable development includes equity as a co-equal partner in the policy triad of environment, economy, and equity, concerning itself with optimizing the balance of those three goals over time across large and small geographic scales. Environmental justice uses equity as the theme for a narrow, single-minded fo-

cus on eliminating disproportionate impacts of environmental degradation on racial minorities at site-specific levels. While there is room for cooperation between those two systems of environmental policy, there is also the likelihood of competition and conflict.

Figure 11



If the history of mainstream environmentalism and Deep Ecology is any indication, and it may not be, over time sustainable development and environmental justice will find less in common. But they will always couplein a co-evolutionary dance. The bottom line for sustainable development is that, while it will become the dominant force in national and international environmental policy, it will always have to deal with the narrow, locally-entrenched form of environmental justice. The bottom line for environmental justice is that so long as it contends that racially disproportionate local impact is never acceptable regardless of economic and environmental sus-

tainability indicators, it will play an opposition role in the environmental policy of the future. If environmental justice advocates want more than that, they are likely to be as disappointed and marginalized as today's Deep Ecology devotees; however, if they are content with having a seat at the table of sustainable development, though with no power of veto, they will continue to have a meaningful role in the coevolutionary play of environmental policy.

This prediction of the co-evolution of sustainable development and environmental justice is not meant to discourage or discredit the environmental justice policy movement. Environmental justice undoubtedly will shape sustainable development. It already has. But the writing is on the wall: as a complex adaptive system driven by the goal of multi-trait optimization, sustainable development will relate to environmental justice through strategies of cooperation, competition, and conflict. The unknown for now is what the mix of those strategies will be.

Key words: society, social philosophy, social reality, technogenic civilization, materialistic understanding, idealistic understanding, naturalism, stratification, social mobility, coevolution, sustainable development, environmental justice.

Checklist for self-examination

1. What is the subject of the philosophy of history?
2. What are the sources and factors of sociodynamics?
3. What are the characteristics of the geo-climatic, demographic, technical,technological, spiritual and globalization factors of sociodynamics?
4. What is a socio-economic formation and what are its types?
5. What is civilization?
6. What are the objective and subjective properties of the process of globalization?

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