

FUNDAMENTALS OF ANTHROPO-NATURAL INTERACTION IN THE CONTEXT OF THE LEADING IDEAS OF V. VERNADSKY'S THEORY OF THE NOOSPHERE AND PROCESSES IN EDUCATION

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Abstract: The article presents the theoretical and empirical research results of the basics of anthropo-natural interaction, which is implemented using the leading ideas of the theory of the noosphere V. Vernadsky and the study of processes in education. Among the leading ideas of Vernadsky's theory of the noosphere, the ideas of considering the noosphere as a result of the evolutionary development of the biosphere are singled out. As well as consideration of changes in the content of interaction in the system "man – nature" and the dynamics of the formation of the basis of anthropo-natural interaction. Education is considered as one of the effective ways to harmonize the relationship between man and nature, because the processes in education create external causes to ensure the movement of man from lower to higher levels of its ontogenetic development. Also, the processes in education are considered as influencing the formation and development of the noosphere. Empirical research results confirm the unity of man with a certain part of our planet, where she spent his childhood. The connection with the native land is firmly fixed in the "memory of childhood". This is a memory of plants and animals that are characteristic of the nature of this area. It is established that the "memory of childhood" affects the content of interaction in the system "man – nature".

Keywords: Anthropo-natural interaction, Biosphere, Childhood memory, Education, Man, Nature, Noosphere, Processes in education.

1 Introduction

During its development, human civilization has formed different approaches to human interaction with nature. Anthropo-natural interaction is reflected in religion, philosophy, morality, art, science. These forms of social consciousness (religion, philosophy, morality, art, science) differently reflect the anthropo-natural interaction.

Our attention was drawn to scientific developments, which promote the unity of modern man with nature and identify ways to harmonize the interaction in the system "man – nature". In the general scientific context, a number of problems related to anthropo-natural interaction can be identified.

This is the problem of overcoming complications in the relationship of modern man with nature. As well as the problem of conscious denial of the destructive influences on nature. The problem of conscious assertion of purposeful interaction with nature to achieve the harmonious functioning of the system "man – nature". The problem of conscious assertion of purposeful interaction with nature to achieve the harmonious functioning of the system "man – nature".

For a society characterized by a combination of significant economic achievements with the negative consequences caused by the same achievements, technogenic thinking is characteristic. The basis of this thinking is determined by the belief that man is able to conquer nature, with the help of technology to gain full control over the elements of nature and ensure the well-being of people [14].

Mankind is increasingly aware of the fallacy of such a relationship with nature. The development of so-called "clean" technologies does not harmonize the functioning of the system "man – nature", because the process of interaction in the system "man – nature" is formed at the level of human consciousness. In the minds of modern man must establish an understanding of the relationship between the development of society and the need for constant harmonization of interaction in the system "man - nature"; human dependence on nature; emotional and value attitude to nature; nature conservation in a globalized world.

Modern people must also realize the expediency of directing the intellectual potential of society to the sustainable development of mankind. (The theory of sustainable development emerged in the second half of the 20th century and became a response to the challenges posed by the consequences of the violation of harmonious interaction in the system "man - nature").

Aliyeva notes that each epoch in its own way creates and organizes the world in which it lives. Teaching a person to live in this world is the task of education, regardless of what priorities it adheres to and what paradigms it serves. On what grounds to teach a person to live depends on the content of education. Also, the grounds are determined by the achievements of science, its priorities and the image of the world, which is constructed by the current stage of development of science [1].

2 Materials and Methods

Research Design. The analysis of the basics of anthropo-natural interaction was carried out using the leading ideas of V. Vernadsky's theory of the noosphere [20-24]. Emphasis is also placed on the processes in education that cause the formation and development of the noosphere, as they create external causes to ensure human movement from lower levels of its ontogenetic development to higher ones.

Experimental research concerns the fixation in the "memory of childhood" of the objects of nature of the homeland, which influences the formation of the basis of anthropo-natural interaction. Conclusions are formulated that have theoretical and practical significance for understanding the basics of anthropo-natural interaction in the context of the leading ideas of Vernadsky's theory of the noosphere and processes in education.

Study Group. Publications in specialized editions, monographs in the considered fields, reports, and other secondary sources.

Data Collection Tools. The research uses the following general scientific methods: theoretical analysis, synthesis, comparison, systematization, generalization, classification.

Data Collection. The research uses the following methods: theoretical (analysis of scientific materials, systematization and structuring of selected information, generalization of the obtained results) and empirical (observations, questionnaire).

Data Analysis. Systematization and classification were used for data analysis.

3 Results

According to Martin, the basis of anthropo-natural interaction of the period 1950-1967 is reflected in the phrase "man conqueror and converter of nature." Anthropo-natural interaction of the period 1968-1989 corresponds to the phrase "man uses and protects nature." Anthropo-natural interaction of the period 1992-2012 is explained by the following statement: "man knows nature, understands its significance for his own life, treats nature with care, protects it" [8].

Consideration of the basis of anthropo-natural interaction in the context of human unity with a certain part of our planet, which forms the so-called "childhood memory".

"The noosphere is a nature transformed in the interests of man, the equilibrium state of which is supported by the purposeful activity of mankind [24]."

According to this key thesis of V. Vernadsky's theory of the noosphere (Vernadsky, 2004), the modern biosphere is the result of long-term historical development of the whole organic world in its interaction with inanimate nature.

Vernadsky's theory of the noosphere explains the role of mankind in the evolution of the biosphere and the laws of its transition to the noosphere. According to the teachings of Vernadsky, the noosphere is a nature transformed in the interests of man, the equilibrium state of which is maintained by the purposeful activity of mankind.

Humanized nature appeared together with man, when he did not yet consciously regulate the course of global processes. The noosphere is a state of the biosphere consciously created by man, in which man must control his activities. Understanding the noosphere as a unity of the biosphere and humanity, refutes the assertion that man is a self-sufficient living being living by its own laws. Man is a part of nature. Their unity is due primarily to the functional inseparability of the environment and man, the planetary nature of human activity.

According to Vernadsky's theory of the noosphere, the transformation of the biosphere into the noosphere takes place in the process of the "explosion" of scientific thought, i.e., its rapid growth, development of science and social work based on human scientific results. Social processes of the 20th century are characterized by Vernadsky as a unique phenomenon and called the "explosion" of scientific thought. The scientist has repeatedly stressed that having deep roots in the past structure of the biosphere, this phenomenon is prepared by all its previous development, and therefore is not a short-term and transient geological phenomenon. Without stopping and moving in the opposite direction, the process of transforming the biosphere into the noosphere has slowed down or accelerated in the event of an "explosion" of scientific thought.

According to Vernadsky, the noosphere is a "biosphere processed by scientific thought, which was prepared by hundreds of millions, and perhaps billions of years by the process created by Homo sapiens" [20]. According to Vernadsky's theory of the noosphere, the "explosion" of scientific thought of the twentieth century caused the process of transformation of the biosphere into the noosphere.

In the article "Chronic fatigue development of modern human in the context of Vernadsky's noosphere theory" [10] scientific events of the late 20th century and early 21st century contributed to the formation of the noosphere. This is manifested in the rapid transition of post-industrial society from the stage of the information society to the stage of the knowledge society and to the rapid development of the latter. Modern reality has manifested itself in objective and virtual reality. The global information space provides effective information interaction between people regardless of their spatial location, rapid access to global information resources, meeting the needs of information products and services, significantly increasing the role of information and knowledge in political, economic, social and cultural life.

In the article "ICT as a means of implementing thematic FIN-modeling in the organization of training in institutions of higher pedagogical and adult education" [11] modern society is characterized as an information society and a knowledge society.

The achieved level of social development has affected the education sector, causing its development as a system that covers a person from birth to the end of life, and establishing the priority of continuous personal development of future teachers

and personal and professional development of existing teachers. Under these conditions, the education industry shows great openness to innovative developments of scientists and educators-practitioners, concerning the use of ICT as an essential attribute of the information society and knowledge society, everyday life of modern man, the organization of modern educational process. In the information society, nature is lost through information technology, and the process of regulating relations with nature is replaced by slogans for nature conservation.

"The modern biosphere as a result of man-made human activity is radically transformed and becomes a noosphere – the "sphere of the mind" [24]."

In the context of this leading idea of Vernadsky's theory of the noosphere, the noosphere is the result of the evolutionary development of the biosphere, which is caused by various processes, including educational ones. H. Kostyuk noted that "the individual is part of the biological system that determines his physical development, and at the same time [4]. That is, the individual is a subsystem in relation to society and a system in relation to itself. The formation of the noosphere as a result of the evolutionary development of the biosphere is considered in the context of educational processes, which lead to the formation of the individual as a person.

The driving forces of human mental development are the internal contradictions that arise in his life, activities, relationships with the social and natural environment. This is a contradiction between new needs, human aspirations and the level of development of its capabilities, between the requirements set before it and the degree of mastery of the necessary skills and abilities. Also between new tasks and previously formed habits, ways of thinking and behaving; between the growing inner capabilities of a person, ahead of his way of life, and his objective position in the family and in the team. Derivative contradictions are also the driving forces of human mental development. They are due to human attitudes to the environment (natural and social), as well as successes and failures, imbalance in human interaction with society.

For contradictions to lead to development, they must become a source of human activity aimed at resolving internal contradictions by forming new ways of behaving. These contradictions are resolved in the activity and lead to the formation of personality traits and qualities.

The formation of the noosphere is directly related to the mental development of man throughout life. The mental development of man reflects the "internal logic of the ontogenetic formation of the individual as a conscious social being, its orientation, abilities and other properties." Under the "internal logic", Kostyuk understands the internally necessary movement of the individual, which is formed from lower to higher levels of its ontogenetic development. In this upward movement, "external causes always act through internal conditions" [3].

The internal conditions include individual features of higher nervous activity, its internal laws, revealed through physiological studies. The internal conditions also include human needs and attitudes, feelings and abilities, a system of skills, habits and knowledge, which reflect the individual experience of man, the experience of all mankind.

Processes in education cause the formation and development of the noosphere, as they create external causes to ensure human movement from lower to higher levels of its ontogenetic development. In the course of historical development of mankind and in the ontogenetic development of each individual, cultural forms of behavior and a peculiar form of human adaptation to nature arise and are formed, which radically distinguishes man from animals and is the basis of his whole life [26].

Processes in education, which are aimed at continuous improvement of human learning and increase the effectiveness of its actions in various activities. At the same time, among these

activities, an important place is given to leading activities. This activity causes main changes in mental processes, psychological characteristics of the child at a certain stage of its development. The main psychological neoformations (abilities) of a person in a certain period of his development depend on the nature of the leading activity.

During the leading activity, new types of activity appear and differentiate and separate mental processes arise, are formed and rebuilt. Human development is directly determined by its internal and external activities and depends on existing living conditions.

In the course of historical development of mankind there was a formation of forms and types of education. Next we quote the article "ICT as a means of implementing thematic FIN-modeling in the organization of training in institutions of higher pedagogical and adult education". "According to Article 8 "Types of Education", the Law of Ukraine "On Education", formal, non-formal, and informal education have become normatively legal [15].

Formal education is seen as a legislatively normalized translational model of social experience, the submodels of which are implemented at different levels of education. Formal education is enabled by formal training, which is a process of providing learners with a social experience that is structured and harmonized with relevant state standards and curricula, through direct and indirect engagement with learners, and is completed in the education with the results of training to achieve the appropriate level of education and the qualification recognized by the state, determined by the standards of education" [12].

The article "Usage of information and communication technologies in foreign and Ukrainian practices in continuing pedagogical education of the digital era" [13] states that in the course of the historical development of mankind, changes have been recorded in the understanding of the essence of man and in the definition of actions that affect the process of his existence. The authors of the article summarize the following data of scientific works:

- A change in the view of man, which is manifested in the transition from understanding man as a biosocial being to understanding him as a 'noosphere', 'cosmoplanetary', divine being [25];
- Change in the model of human existence is recorded as a transition from the model of adaptive actions to the model of non-adaptive actions. In turn, this transition led to the replacement of the actions of regulation of the external environment by actions of self-regulation, self-actualization, self-realization, self-realization, self-reflection, self-development, self-improvement, self-belief [5].

The foundations of anthropo-natural interaction in the context of processes in education have been revealed in scientific works. In the concept of the German didact G. Schulte, the educational material about nature is structured on the following topics:

- "Man is a living being" (grades 1-4);
- "Man and the environment" (grades 5-10);
- "Man and the environment" (grades 11-13);
- "Man and the formation of the environment" (institution of higher education).

The analysis of topics shows the focus on the harmonization of interaction in the system "man - nature".

In the works of the German scientist W. Kattman, the anthropocentric structure of biological education is organized on the basis of finding the answer to the question:

- What are the biological bases and conditions of human existence?
- What is the originality of man in the biosphere?
- What is the significance of human evolution? [9].

Analysis of the content of the questions indicates their compliance with the basics of anthropo-natural interaction.

According to the generalized data of Kuchaj, the national system of ecological education of Great Britain is aimed at overcoming the negative consequences of industrialization and scientific and technological progress [6]. This activity is based on universal values and folk traditions of environmental protection and is aimed at spreading environmental ideas in society. This is reflected in national documents: "A Children's Environment and Health Strategy for the United Kingdom"; "Freedom of Information and Environmental Information Regulations Freedom of Information", and others [17, 18].

The documents emphasize the need to pay more attention to environmental education and upbringing of various categories of the population and identify priority areas for its further development.

The noosphere is incompatible with anthropogenic environmental degradation. The condition for the creation of the noosphere should be the elimination of the danger of a global environmental crisis [24].

According to Vernadsky, human society is a certain stage in the development of nature. According to the theory of the noosphere, humanity acts as a natural factor, genetically related to the biosphere, acting within its functioning and development. Man, human society is rapidly changing the structure of the biosphere and forming the noosphere. Man, human society is rapidly changing the structure of the biosphere and forming the noosphere [21].

The formation of the noosphere is a complex process, but necessary, because the future of civilization depends on the ability of mankind to transform the biosphere into a sphere of reason and harmonize anthropo-natural interaction.

4 Discussion

Taking into account the scientific developments reflected in the article [8], we can talk about the positive dynamics of the formation of anthropo-natural interaction (Figure 1) and the change in the content of this interaction.

Man conquers and transforms nature – this is an anthropo-natural interaction in 1950-1967. Man uses and protects nature – this is the anthropo-natural interaction of 1968-1989. Man knows nature, understands its significance for his own life, treats nature with care, protects it – this is the anthropo-natural interaction of 1992-2012.

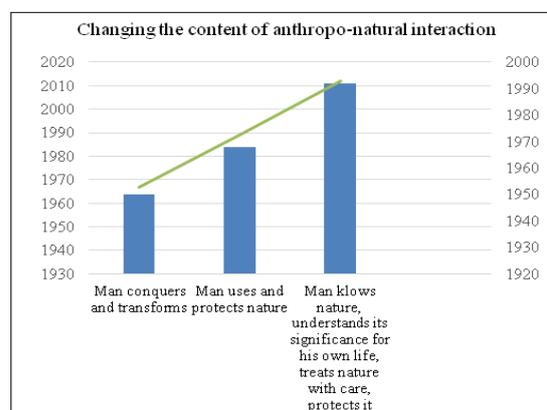


Figure 1 – Positive dynamics of change in the content of anthropo-natural interaction

At the same time, our attention was drawn to another leading idea of Vernadsky's theory of the noosphere: "man, like every living natural body, is connected with a certain geological shell of our planet – the biosphere" [23].

We have focused our efforts on the study of the unity of man with a certain part of our planet. In the course of the research it was established that the child's perception of the nature of the small homeland forms the so-called "childhood memory".

This memory strongly fixes the connection with the native land, first of all, as a memory of plants and animals that are typical for the nature of this area. The experience of past impressions remains forever in a person as the most important determinant of the experience of the present moment.

Psychologists have repeatedly emphasized that activity settings are always mediated by past experience – the situations in which the child was brought up [19], as well as her experiences, which were of exceptional importance [27].

Childhood impressions form a certain block in the memory, which concentrates on the experience of emotional and aesthetic reflections on natural objects and phenomena. Emotional memory reproduces perceived impressions. From the many traces left in the human psyche from his experience, formed one large, expanded and in-depth "memory" of events with homogeneous feelings [7].

Everyone carries a huge wealth of past impressions from encounters with nature, but does not know how to use these past impressions. The ability to awaken your own emotional memory and include it in adult life helps to survive stress.

"Childhood memory" comes to life and comes into close contact with the system of later acquired value orientations and restores the selfless purity of the view of life, events, the world. When mentioned, ordinary objects of nature acquire a perfect sound, and this provides a qualitatively different level of perception of the world – recognition.

This peculiar reaction to nature differs from its direct perception. Recognition is a very necessary process for deepening the emotional comprehension of nature because it has not a sensory but a reflex basis.

The analysis of the questionnaires of students of pedagogical universities (Volodymyr Vynnychenko Central Ukrainian State Pedagogical University, Kropyvnytskyi, Ukraine; Borys Grinchenko Kyiv University, Kyiv, Ukraine) and teachers who underwent advanced training at the institute (Municipal Institution "Kirovograd Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynsky", Kropyvnytskyi, Ukraine) revealed that in the memory of adults, there is a strong connection with the native land, which was formed in childhood (Figure 2).

This connection is recorded in human memory using a specific natural object. This process can be explained using the work of I. Pavlov. "The activity of the nervous system is aimed, on the one hand, at uniting, integrating the work of all parts of the body, and, on the other – at the connection of the organism with the environment and at balancing the body's systems with the environment" [16, p. 106].

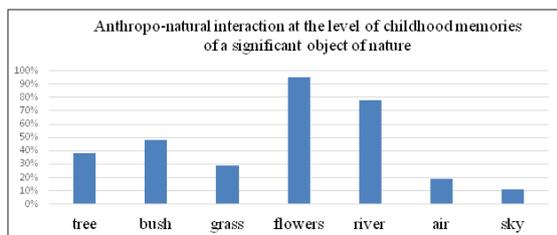


Figure 2 – Anthropo-natural interaction at the level of childhood memories of a significant object of nature

Anthropo-natural interaction at the level of childhood memories is etched in the memory due to the emotions experienced, as well as due to perceived odors and actions performed (Figure 3).

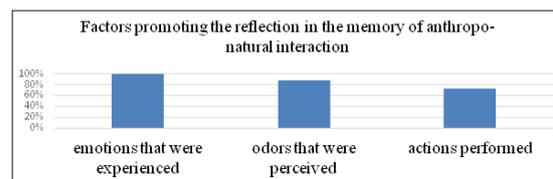


Figure 3 – Factors contributing to the reflection in the memory of anthropo-natural interaction at the level of childhood memories of a significant object of nature of a certain part of the biosphere

The participants of the experimental research indicated that the reproduction in memory of a significant object of nature is associated with the experience of various emotions. In particular, with the experience of positive emotions (emotions of joy, feelings of peace, security, prosperity) and negative (experiencing the early loss of a parent, etc.). Each memory records the connection between personal life and the life of nature or a significant and expensive natural object.

5 Conclusion

Anthropo-natural interaction fixes a certain way of functioning of the system "man-nature". In this way, the focus on solving a particular problem is demonstrated.

As an example we will give as follows:

- The problem of overcoming complications in the relationship of modern man with nature;
- The problem of conscious denial of the destructive influences on nature;
- The problem of conscious assertion of purposeful interaction with nature to achieve the harmonious functioning of the system "man - nature";
- The problem of conscious assertion of purposeful interaction with nature to achieve the harmonious functioning of the system "man - nature".

The process of interaction in the system "man - nature" is formed at the level of human consciousness. One of the effective ways to harmonize the interaction in the system "man - nature" is education. Educational processes should contribute to the assertion in the minds of modern man of the need to direct the intellectual potential of society to the sustainable development of mankind.

5.1 Suggestion

The main ideas of the evolutionary approach proposed here to the study of the prospects for world education is that transformations are expected in education, which are closely associated with evolutionary changes in the entire civilization process and the interaction of society and nature. Moreover, it will not be just one the "final" model of education of the 21st century (say, only a model of education for sustainable development, which is now being most intensively developed in comparison with other promising models), but an evolutionary series of models and strategies of educational processes and systems, contributing to the formation of a new civilization, ensuring the survival of mankind and the preservation of the biosphere. The future of global education includes at least two "leading" aspects. First, it is the outstripping development of education itself in comparison with other spheres of activity (economic, political, etc.).

Secondly, it is a leading mechanism in the very content of the educational process, its orientation towards a future sustainable society. The "outwardly leading" aspect is logically connected with the "internally leading" content of the educational process: after all, if, say, education remains a lagging conservative system focused mainly on retrospective or momentary conditions, it will never become, in the full sense, an innovative advanced education that realizes the goals and principles of the global

transition to SD. That is why it is important to focus attention, first of all, on the internal innovative and advanced mechanisms of the future educational system, turning it into a priority-dominating factor and an instrument of the global strategy of socio-natural development of the third millennium.

5.2 Limitation

The main limitation of the study is small sample and rather simplified research design. However, we put for ourselves the task to outline the issues of education processes in the noosphere, their perception by individuals, for further consideration in the value and motivational field concerning lifelong education.

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