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BIOSFEROS VIRSMAS Į NOOSFERĄ: NUO SINKRETINĖS *HOMO* SĄMONĖS IKI ŽMOGAUS IR GAMTOS KOEVOLIUCIJOS

Transformation Stages of Biosphere
into Noosphere: from Syncretic Consciousness
of *Homo* to Co-Evolution of Man and Nature

SUMMARY

The article examines the process of transformation of the biosphere into the noosphere. This transformation is characterized by three evolutionary stages: anthropogenetic, anthropocentric (industrial and post-industrial) and anthropocosmic. The first stage reflects the biogenic stage of the subordination of nature. These transformations were associated with achievements of *Homo sapiens* predecessors and with the invention of the first tools of labour. The second stage is a technogenic one. It is quite distant in relation to the first stage. It goes back to the history of the creation of more advanced tools for all types of human activity and enters an active phase during the period of industrial civilisation. The anthropocentric stage occurs when the rapid growth of industrial production in the biosphere become irreversible. The third stage is a post-industrial one. Large-scale global changes in the biosphere happen under the influence of the intelligent activity of world civilisation. The leading role of this period belongs exclusively to the human mind. It is concluded that nowadays all the prerequisites for entry into noosphere are outlined. The main driving force should be the world idea of reasonable sufficiency, justice, and ascending humanism.

SANTRAUKA

Straipsnyje nagrinėjamas biosferos virsmas noosfera, kuriam būdingi trys evoliucijos tarpniai: antropogenetinis, antropocentrinis (pramoninis ir postindustrinis) ir antropokosminis. Pirmasis tarpnis reiškia bioge-

RAKTAŽODŽIAI: antropocentrizmas, antropokosmizmas, noosfera, biosfera, koevoliucija, žmogaus protas.

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nių gamtos pavaldumą, kurio transformacijos susijusios su *Homo sapiens* pirmtakų laimėjimais ir pirmųjų darbo įrankių išradimu. Antrasis tarpsnis yra technogeninis. Pirmieji du tarpsniai yra toli vienas nuo kito. Antrasis tarpsnis susijęs su pažangesnių įrankių visų rūšių žmogaus veiklai kūrimo istorija. Tai aktyvioji pramoninės civilizacijos laikotarpio fazė, kai vyksta spartus pramoninės gamybos augimas ir transformacijos procesai biosferoje tampa negrįžtami. Trečiajam – postindustriniam – tarpsniui būdingi gausūs plataus masto pasaulio biosferos pokyčiai, kuriuos veikia protinga pasaulio civilizacijos veikla. Šiuo laikotarpiu pagrindinis vaidmuo tenka žmogaus protui. Apibendrinant daroma išvada, kad šiandien egzistuoja visos prielaidos žmonijai įžengti į naują evoliucijos tarpsnį – noosferą, o pagrindinė varomoji jėga turėtų būti pasaulinė protingo pakankumo, teisingumo ir kylančio humanizmo idėja.

INTRODUCTION

Nowadays V. I. Vernadsky's doctrine (1988) about biosphere and the transition into noosphere as a new quality has more supporters than sceptics. It is relevant for studying the prospects of human society and planetary life evolution in general (Moiseev 1990; Molchanov 1998; Habermas 2002; Bischof 2007; Pitt, Samson 2012; Levit 2000; Hödl 2012; Vasko 2021, etc.).

The scholar considered noosphere: "firstly, as a special state of the Planet, in which humanity is the main transforming geological force; secondly, the area of manifestation of scientific knowledge; thirdly, the main factor in further evolution of biosphere" (Vernadsky 1988: 76). At the same time, considering the development / formation stages of noosphere B. Artemenko writes that:

"in some cases Vladimir Ivanovich reasoned about noosphere in the future tense (it has not yet come), in other cases – in the present tense (we are entering it), but sometimes he linked the formation of noosphere with *Homo sapiens*' emergence or industrial production's emergence" (Artemenko 2013: 136).

We agree with B. Artemenko that: "such contradictions somewhat compli-

cate the perception of this scientific concept, but this does not affect interest in it" (Ibid.). The above-mentioned observations testify to the controversial nature of this issue. It is represented in the works of many scholars, some of them have been included in this article.

The internal form of noosphere as a term (from Greek noos – "mind") reveals the meaning associated with the phenomena that consider intelligent human activity as planetary progress dominant. According to this assumption, it is obvious that the origins of human activity go back to the development of such a kind of *Homo* as *Homo sapiens*. Discussions about cognitive abilities development of this type of *Homo* in general and linguistic (articulatory-acoustic) skills do not stop in the 21st century. The actualisation of these studies is explained by new discoveries in anthropology, evolutionary biogenetics, paleontology, in the theory of glotogenesis and its two polar concepts: monogenesis (it is represented in Nostratic hypothesis) and polygenesis (Korolyova et al. 2020). The problem of the human mind, which has become the subject of discussion in the concepts of noospheric thinking is the key issue of all discussions.

The purpose of the article is to briefly review the transformation stages of biosphere into the noosphere: from the products of the *Homo sapiens* precursors

activity to the new anthropocosmic stage, which is based on harmonising the results principle of human mind and nature.

ACADEMICIAN V. I. VERNADSKY'S IDEAS ABOUT NOOSPHERE

I am not going to be very original if I cite a long-known fact about noosphere as a "thinking" shell of planetary life. Its formation began with the emergence and development of human consciousness (Teilhard de Chardin 1987, 1994).

Academician V. I. Vernadsky approached the study of noosphere more thoroughly. Perceiving the laws of nature and improving technology (first , tools of activity) he argued that mankind becomes a potential planetary force and begins to influence transformations in biosphere (Vernadsky 1988). Of course, V. I. Vernadsky the academician has the fundamental ideas of noosphere's doctrine. But the scholar did not have time to develop a theoretical and methodological basis for a fundamentally new for that time field of scientific knowledge (cit.: Artemenko 2013).

Interest to V. I. Vernadsky's teachings became relevant only at the end of the 20th century, when modern civilisation faced global environmental, demographic, and, above all, spiritual, moral, and ethical problems (Ecology 2002).

Scholar's concept, which is based on the scientific knowledge of the surround-

ing world and the rational use of the resources of the Planet, focuses on the need for the harmonious development of human civilisation with its enormous needs and biosphere (Moiseev 1990). V. I. Vernadsky considered biosphere as a vital natural environment in which mankind as the anthropocenter, using the latest achievements of reason, controls the state and manages biosphere without destroying its integrity and stability (Vernadsky 1994; Berestovka 2006).

Noospheric concept is both a universal theory and, in many respects, it is original, therefore the theoretical provisions and conclusions of various philosophers differ both from each other and from the original source (Ecology 2002). However, the general views of representatives of noospheric scientific movement are represented in the systematisation of main stages of noospheric formation.

I am going to comment on development stages of noospheric process already synthesized by scholars (Ecology 2002): from its origins, where, in my opinion, glotogenesis plays a leading role (Vasko 2021).

BIOGENIC STAGE IN BIOSPHERE TRANSFORMATION BY MAN

The first stage of nature subordination, its transformations begin with the ancient achievements of *Homo sapiens'*

predecessors, one of which is the human language. Ecologists call this stage biogenic / agrarian (*collecting, appropriating*

(Ecology 2002), *adaptive* or *resilient* (the concept of resilience is represented in a broad sense here (Kapranov et al. 2021)).

I. I. Molchanov and V. I. Vernadsky note that the mind's emergence and its further progress is connected:

“with the purposeful evolution of living nature in the direction of its ever increasing complexity. By correlating consciousness with living matter, the scholar naturally concludes that the mind is not only an earthly, but it is also a cosmic phenomenon. It is no coincidence that traditional interpretation of the term noosphere as the sphere of Mind proceeds from the explanation of biosphere, which is under the influence of man, and it is transformed by him” (Molchanov 1982: 26).

Such an interpretation allows to speak about noosphere of the Paleolithic, Mesolithic, Neolithic, Eneolithic times. The transformation of biosphere into noosphere means the gradual assimilation of biosphere by man.

Based on the geological time calculation, this period began already with the *Homo ergaster's* (“working man”) emergence about two million years ago. The *Homo ergaster's* evolution took place during a period of total drought, which dried up tropical forests and created huge deserts on the African continent (Kapranov 2018; Korolyova 2018). That is why this anthropoid was already adapted both to the heat (he / she did not have a hairline, unlike its predecessors) and to such climatic conditions. The “working man” was the first species to migrate outside of Africa; its relicts have been found in various regions of Asia, from Turkey to China. It was in Asia that he reached a new stage in his development, it was

called *Homo erectus* (“erectus man”). Although it was also a small anthropopopulation of hunter-gatherers.

Later in the history of *Homo erectus* who inhabited this region, there was an event that became a turning point in anthropogenesis and in planetary life in general. The Toba volcano eruption led to a decrease in the average temperature of the atmosphere by several degrees. As a result, climate change and *Homo sapiens'* emergence as a more progressive new human species are forcing *Homo erectus* to leave the region.

Due to the fact that *Homo sapiens* possessed language and articulate speech, it is obvious that it allowed him / her not only to plan his actions, but to transmit ideas from one individual to another. It was communication that led the early man to the manufacture of tools of labour that were more perfect by that time (Kapranov 2021).

In this stage of evolution, a spontaneously emerging harmony became an important feature in the relationship between emerging mankind and natural environment. However, with the still insufficient development of forms of labour, the primitiveness of labour instruments, the small number of people, biosphere remained the determining factor in socio-natural sphere. Ancient man not only lived by appropriating the products of biosphere, but he also exerted a reverse effect with his natural organs and forces. Biotic laws determined the socio-natural sphere. Therefore, this stage in the noosphere development is called not only collecting and appropriating, but also adaptive (Ecology 2002).

The stone and bone processing techniques development and complication, but most importantly – new knowledge, i. e. the discovery and use of fire in the Neolithic era required a completely new level of collective memory. A system of various taboos gradually developed which imposed prohibitions on many aspects of life. At the same time, more effective hunting techniques already mastered have become the reason for the rapid destruction of large ungulates. A global ecological crisis has arisen, which has engulfed all continents in different periods. Mankind was on the brink of disaster (Petrov 2011).

Human ecological lacuna began to be eliminated due to the development of agriculture and cattle breeding. These changes completed the stage of human animal life with a dominant lifestyle – hunting. From this moment, a person begins to actively intervene in biogeochemical cycles: the creation of agrocenoses, the use of renewable and non-renewable energy sources (Ecology 2002).

Based on the above-mentioned empirical observations it can be assumed that biogenic stage of the noospheric process is characterised by local changes in biosphere, even though in some geographic regions, already at the stage of the existence of ancient civilisations and cultures, natural landscapes were changed. For the existence and development any civilisation needs natural resources, the main of which were fertile soils, convenient for agriculture, forest, water, vital plants, and animals, as well as building material. And most importantly, for processing of natural resources

the progress of reason was needed for the manufacture of more advanced labour tools and processing products technologies (Moiseev 1990).

However, even at this stage, due to the low level of development of production forces and poorly populated territories, natural resources, nevertheless they were actively used by man, could not lead to definitively irreversible changes in natural landscapes. As it was noted above, such changes occurred because of environmental or other catastrophic events. This state of noosphere was facilitated by the isolation of the first civilisations and their different economic development (Ecology 2002).

Thanks to the fact that man invented agriculture and animal husbandry, the anthroposphere was able to survive the crisis at the end of the Neolithic (Neolithic revolution).

Summarising the above-mentioned theses about the initial stage of the noospheric thinking formation, it should be noted that under the conditions of its biogenetic state, the mode of production was of an appropriating nature. This means that it was not so many men who regulated the use of natural resources, because nature regulated the mankind subordination to natural laws. Nature automatically and harshly responded to man's violation of its integrity and harmony. This is evidenced by the death of the civilisations of Central Asia, the Near and Middle East, the disappearance of some ancient peoples in general.

In the course of its development the mankind needs increased, but it did not upset the balance of the SOCIETY – NA-

TURE dichotomy. Man's productive activity took place in the natural environment itself and according to the laws of nature. Nature regulated not only the

production process, but also the geographical division of labour. Various natural conditions led to the development of agriculture and cattle breeding.

TECHNOGENIC STAGE IN NATURAL LANDSCAPES TRANSFORMATIONS BY HUMAN

The second stage, quite distant in relation to the first stage in historical time, is called a technogenic one, considering the natural landscapes transformations. The origins of this stage go back to the Eneolithic era, i. e. the copper-stone age, during which technological revolution takes place. Metalworking as a new branch of activity arises. That is why for the first time mankind begins to use labour tools made of metal. A real technological revolution is taking place that has changed the history of human society development.

Without delving into further periodization of the achievements of the Iron Age (Brileva 2008), it should be noted that mankind continued to actively and uncontrollably use natural landscapes, taking into account all the positive facts of progress. The chosen strategy of civilizational development led to the creation of prerequisites already in modern times for the industrial revolution. The progress of industrial civilization began counting the irreversibility of transformations in biosphere.

By the end of the 17th century, world history was characterised by industrial revolution, by the rapid growth of the machine industry. For its continuous development raw materials and enormous natural resources were needed. This increased the pressure of civilization on

the Earth's ecosystems. During this period the achievements of human mind were significant compared to the previous biogenic period.

The creation of a large machine industry in the leading branches of production prepared the material prerequisites for the further rapid development of the productive forces. The growth of factory production greatly contributed to the exacerbation of the contradictions between mental and physical labour (Moiseev 1990).

The use of machines and factories led to mass production. In turn, it caused numerous environmental risks: negative impact on the environment, depletion of natural resources, during the extraction of which nature has undergone colossal changes. Deforestation is one example, because wood was massively used in production. When the trees disappear, the wilderness in the forest zones also becomes unviable. The lack of trees is exacerbated by carbon emissions problem in the process of manufacturing. While the forest produces oxygen and affects the atmosphere, factories emit toxic substances and absorb oxygen. The pollution caused by the activities of metallurgical and chemical plants contains not only harmful emissions into the air, but it also pollutes the earth and the world ocean (Ecology 2002).

Global warming has become the main problem caused by pollution and carbon emissions. As temperatures rise, glaciers melt, and the oceans are rapidly replenishing water levels. Certain animal species are threatened with extinction and even extinction because of global warming.

Summarizing a brief overview of human mind influence on biosphere in the technogenic period (from the technological revolution including the industrial revolution achievements), it can be assumed that, as industrialization became a factor of positive changes in the life of mankind, it caused significant environmental damage biosphere, which can be compared to a disaster.

If earlier, in the process of using natural resources, a person depended only on natural factors, then in the industrial noosphere, a man became dependent on social production, which, to ensure it, uncontrollably transformed biosphere.

Industrial and agricultural technologies destroying nature were used, accompanied by "unfamiliar to nature" waste formation. This contributed to the fact

that man could no longer regulate his relationships with nature. If we return to V. I. Vernadsky's ideas (Molchanov 1982), we should agree with A. A. Korotovskikh's assessments, the valuable thoughts of the academician that: "living matter, acting as a geologically powerful chemical conductor, not only adapts to the external environment, but transforms this environment, adapting it to its needs, creating favourable conditions for the maximum manifestation of geochemical capabilities" (Korotovskikh 2009: 92).

To achieve this effect, it is necessary that the relationships between intelligent organisms and nature be established not only through mutual competition and struggle, but through cooperation and mutual assistance (Korolyova, Korolyov 2020).

V. I. Vernadsky emphasized that mankind should realize its place and role in natural cycles of matter and energy and does not disturb this cycle with its production activities (Vernadsky 1988). The global processes caused by people must correspond to the processes taking place in biosphere.

POSTINDUSTRIAL STAGE OF GLOBAL CHANGES IN BIOSPHERE

The third stage is post-industrial one. It aggravated global changes in biosphere under the influence of intelligent activity of world civilization, as well as it gave rise to post-industrial society formation. During this period the direct role belongs exclusively to human mind.

The rapid development of aviation and astronautics in the 60s and 70s of the 20th century expanded the scope of human mind far beyond biosphere up

to the solar system borders. During this period the human mind ceases to be only a product of the Earth.

The scientific and technological revolution radically changed the relationships between man and nature. It created all the conditions for removing any technical restrictions in the use of natural resources. As a result, the contradictions between the unlimited possibilities for the development of production and

the limited possibilities of natural resources has intensified (Ecology 2002).

As a result, the main component of noosphere (the mind itself, its awareness of negative consequences and destructive results of its own activities) was actively talked in the 70s and 80s of the last century. It happened when mankind was faced with global environmental problems, the basis of which was laid by unreasonable economic activities. Moreover, the world began to take concrete practical steps to reduce the negative consequences of the results of its activities.

This is how the prerequisites for resource-saving technologies creation and a new stage in the relationship between man and nature arise through a comprehensive restructuring of science, technology and production. The new character of the relationships to nature is an objective necessity of social development. It became necessary to fulfil the requirements of optimal correspondence law between the nature of society devel-

opment and natural environment conditions. Strict adherence to environmental principles is becoming an objective necessity.

Based on these principles, the logic of noosphere formation and development assumes only two ways of human development and predetermines its choice: either to ensure noosphere harmonious development, ensuring the peaceful coexistence of human society and biosphere, or to continue moving along the path of its destruction. The doctrine of noosphere is very important in planning and organising any major projects involving changes in natural landscapes (Frolov 2009).

V. I. Vernadsky, by interpreting noosphere concept, strove to explain the consequences of man's invasion of planetary biogeochemical cycles. He was convinced that the noosphere transition is taking place under the influence of scientific advances. He is very much hoped that mankind should realise this.

CONCLUSIONS

Today there is a clear trend concerning the transition from philosophical principle of anthropocentrism to anthropocosmism.

Human responsibility in history is considered from transcendental principle point of view. As a result, a new subject of research is formed, i. e. a set of natural and social phenomena and objects that are significant for human existence and resilient behavioural models formation (Kapranov et al. 2021)). Philosophical thought stimulates the formation of public opinion focused on overcoming envi-

ronmental problems generated by the cultural attitudes of past eras. Representatives of this trend ascribe to mankind an unconditional need for a cardinal transformation (Habermas 2002).

The traditional philosophical worldview, which set a certain scale of values in the SOCIETY – NATURE system for many centuries, could not protect mankind from global ecological crisis threat. This means that a man's worldview must change.

V. I. Vernadsky's ideas about noosphere find their support in real life, especially now, when the ecological crisis

on Earth has become a harsh reality. The transition to the active stage of the noosphere requires a restructuring of all being, a change in standards and ideals in order for a person to learn to be a harmonious part in a close triad: BIOSPHERE – ANTHROPOSPHERE – NOOSPHERE. To do this, he needs to start with knowing himself, educating the ability to live in noosphere. But noosphere cannot come before the representative of a reasonably organised society is ready for it.

Noosphere seems to be such an era in the development of the world community, in which the long-standing dreams of mankind about a reasonable, sustainable structure of life on the Planet are realized. In the harsh conditions of the ecological crisis, mankind is forced to begin the ways of realizing the dream of the

noosphere, when not an economy that provides abundance, but an appropriate level of consciousness can lead to success.

N. N. Moiseev interprets “sustainable development” as “a strategy for the transition to such a state of nature and society, which can be characterised by the term “coevolution” or the era of a new phase of noosphere. According to the scholar, this strategy is based on the implementation of the conditions of co-evolution, i.e. joint evolution of nature and society (Moiseev 1990). The new noospheric strategy should become the fundamental concept for all spheres of human activity – scientific and technological development, culture, education, the formation of a new morality. It will change the entire system of social, international, ethnic relations, the scale of values, etc.

PROSPECTS FOR FURTHER STUDY OF PROBLEM

The sense of life should consist of purposeful activity concerning stabilise biosphere. Without this, it is impossible to ensure the stability of culture and civilisation, reproduction, and genetic stability of man as a species.

Many scholars believe that the centre of culture gravity should shift to the humanitarian sphere, to the development of human personality and focus on the

formation of new morality, philosophy, new artifacts of art and, above all, on new concepts of education.

Herein there are prospects for further discussion of the scientific problem proposed in the article, associated with the need to develop a new co-evolutionary anthropocosmic scientific paradigm. It should be based on the idea of reasonable sufficiency, justice and humanity.

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