

Changing the evolution of life and the main ways of saving the natural biological substance

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The authors carry out the analysis associated with the growth of the technological development of society, the death of the biosphere and the change of the evolution of life. Since the society is a subsystem of a more global system of life - the biosphere, in which it develops over the millennia and interacts with it, we propose to use the methodology of the socio-natural approach, whose origins may be found in the works of V.I. Vernadsky. The concept of such an approach is connected with the natural phenomenon of the centuries-old technogenic ascent of society on the basis of the developing mind as well as scientific and technological progress. Its transforming influence on nature begins with the formation of a productive agricultural economy, its technosphere — labor tools, production means, buildings, etc. On Earth as a result of the technocratic worldview and the world social and technological development, there is a change in the evolution of Life with the destruction of the biosphere, biospheric biological resources, the transition of Life from the biospheric nature to the artificial, technospheric environment - cities. This leads to the need for more in-depth studies of changing the evolution of life and the development of new approaches to the rational use of biospheric biological resources, not limited to environmental solutions for the development of the “green economy”.

Key words: biosphere, society, technosphere, noosphere, globalization, megatrends, social and technological development, evolution of life.

Introduction

With the advent of the man on Earth, the *anthropogenic era of the biosphere development* is emerging, “geological power” increasing. The Russian scientists A.P. Pavlov and V.I. Vernadsky [1, p. 173] wrote about it in the early twentieth century. Many scientists write about the powerful “geological-geological force” but without giving statistics. If we turn to 1800, when the agricultural society reached its heights, then the productive forces were based on practical knowledge of the homo - sapiens, the biological forces of the man and animals. During this period, the human muscular strength accounted for a third of labor operations, domesticated animals constituted more than two-thirds, and equipment accounted for 2%. Now the share of technology accounts for almost 99% of the energy [2, C.29-31]. Relying on the aggregate forces of machines, people begin to transform and destroy biosphere resources

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in pursuit of wealth. Let us turn only to the scale of biospheric losses over the period of a producing economy covering 10 thousand years. During this period, 2/3 of all biosphere forests were destroyed on Earth for the sake of agricultural needs, construction of cities and industrial centers, new industries - pulp and paper, chemical and other human needs. The forest is a rich area of natural-biospheric life, saturated with its wealth [3, 509]. According to our estimations, humanity used more than 2/3 of the soil cover and soil for its needs (2 billion hectares were taken out of circulation, 1.5 billion hectares were half-destroyed, enough for 100 years) [4, p.339]. Mass destruction of populations of living organisms started. For 4 decades (1970-2010), half of them went out of life, including $\frac{3}{4}$ in rivers and lakes, which reduced Earth's biological resources by one third [5, p.45]. These facts indicate the need for a deeper study of the world social and technological development as well as the search for effective methods for saving biosphere resources.

On the issue of changing the evolution of life on Earth

At the UN Conferences on Environment and Development in 1992 and 2012, one of the main issues was the acute problem of achieving the co-evolution of society and its surrounding nature with the sustainability of their development in the foreseeable future, with the preservation of biospheric resources for future generations. In recent years, the green economy has come to the fore, although its holistic concept has not yet been developed. The determining systems of life are the *biosphere*, which developed on Earth for about 4.0 billion years, and *humanity* (Cro-Magnons), which developed for about 200 thousand years, evolving into social systems in the biosphere. The authors single out the concepts of *Life* and *Bio-Sphere Life*, since the *analysis also includes proof of the beginning of the death of Biosphere Life, accompanied by a change in the evolution of Life itself on the planet, as evidenced by the rapidly growing death of many components of the modern Biosphere.*

Working on the problems of the biosphere, V.I. Vernadsky concludes that in the entire history of the development of life *the biota* has not only developed itself, but transformed the entire surface of the planet as well. Humanity is transforming and cultivating the biosphere even more, relying on science and receiving powerful productive forces comparable to the geological. E. Leroy spoke about a new stage in the development of the biosphere — the noosphere — being impressed by the lectures of V.I. Vernadsky [6, P.73]. V. I. Vernadsky, relying on the age-old experience of farmers in the cultivation of plants and animals, expresses the belief that the associated humanity will be engaged in the process of the noosphere formation [1, p. 175]. *His discovery makes us look at the modern world and its prospects in a different way. Researchers need to adopt his methodological approach to the study of the process of changing the world and life, which we call socio-natural.*

One of the central problems is the *problem of the Biosphere and Biosphere Life on Earth*. As it is known, K. Linnae, J. Lamark, C. Darwin, G. Mendel and E. Süss (1875) made a significant

contribution to the biosphere understanding. The latter considered the biosphere as the region of the habitat of living organisms of the planet. But the holistic theory of the biosphere was created by the Russian encyclopaedist V.I. Vernadsky (1926), who substantiated the geological, planetary-transformative role of living organisms (living matter). *At the same time, the Biosphere is interpreted with the partial coverage of the non-biospheric nature - the products of past biospheres.* It allegedly includes the lower part of the atmosphere (the troposphere), the entire hydrosphere (fresh and marine waters) and the upper part of the Earth's lithosphere. Its upper boundary is located at an altitude of 6 km above the sea level, the lower one is at a depth of 15 km deep in the earth's crust and 11 km in the ocean ("EdwART. Dictionary of environmental terms and definitions. 2010" URL: dic.academic.ru).

The biosphere is a self-regulating ecosystem maintaining ecological balance due to the flow of solar energy and the cycles of chemical elements-nutrients. The authors do not adhere to the point of view that the biosphere is a grandiose system, which includes both the world ocean and the depths of the lithosphere. We are talking about living matter and its environment, which are direct metabolic processes. *The biosphere is the core of life, the film of life, the biostrom,* which degrades and collapses under the influence of mankind. On land, more than a half of the soils are groundless, in fact, lifeless, anthropo-technogenic, *in which there is no film of life.* And now let us take the world ocean, which occupies 71% of the Earth's surface, but its biomass constitutes only 0.13% of the total mass of living organisms, although the ultra-thin film of life, which lies along the ocean's slopes, is not yet taken into account. The mass of living matter is concentrated on land. Moreover, 79% of animal species from the total number of wildlife objects account for only 1% of the total biomass of the Earth [7, c.402]. What kind of biosphere life can we talk about in areas on land deprived of soil cover and soils, which already number more than half [8, p. 43-44]? As it has become known over the past 40 years (1970-2010) the world's bio-resources have decreased by weight by about a third, the "living planet index" has been halved: the number of *counted populations* in the world decreased by 52%, in rivers and lakes by 76 % [9]. With such a destruction in 80 years, biological resources may disappear by the twenty-second century. The *technosphere develops in the natural environment, stretching its "hands" and other organs into an ecologically clean or already modified and dangerous non-living environment for it. After all, the soil biostrom gives 99.8% of the total biomass of the Earth, 98.5% of all food products, incl. 87% of protein* [10, p.10].

The subsystems of the biosphere are: 1) living matter (microorganisms, plants, animals, humanity); 2) soil cover (bio-substance), which accumulated on the planet's land for 0.5 billion years, being held by a sod layer with plant roots, reaching 2-3 meters deep in the lithosphere; 3) oceanic, marine, lake and river sediments with concentrations of living and dead organisms, reaching up to several hundred meters in the depths of the waters; 4) the biospheric (biotic, biogenic) circulation of substances

(biogeochemical phenomena that Vernadsky took as one of its foundations [1, p. 175]), 5) certain parts of the lithosphere, hydrosphere and atmosphere, filled with biogenes, minerals with substances beneficial for life; 6) complicating electromagnetic radiation in a living substance, which led to the emergence of consciousness and spiritual life in the society and became a part of the new Life being formed. The biostrom, that is, the Biosphere, is a thin layer of life, creeping along the surface of the lithosphere. Numerous processes of this layer are released into the environment containing the concentration of nutrients.

On the basis of the teachings of V.V. Dokuchaev, V.I. Vernadsky singled out a *bioinert substance* in the lithosphere - soils, which play an important role *in the reproduction of life on land and even in the hydrosphere (sediments, solutions)*. *Soil cover is one of the fundamentals of the terrestrial biosphere*, the natural environment in which the processes of accumulation of nutrient soil matter in combination with existing minerals take place. *Soils feed the hydrospheric biota, because a huge mass of organic matter is dumped from the land into the waters*. A complex preparation for the reproduction of Biosphere Life takes place in the *soil house*, due to which 92% of species of living organisms on the planet get food [10, p.9]. This is especially understood by soil-biologists (V. A. Kovda, G. V. Dobrovolsky, G. T. Vorobiev, G. S. Kust, A. S. Yakovlev), calculating the finiteness of biospheric life due to the exhaustion of the soil cover and historical soil sediments of nutrients.

Along with the biosphere degradation, the second most important megatrend of the development is also manifested, moreover, of a very rapid, global *technosphere*. One of the authors (E.S. Demydenko) defended the thesis and doctoral dissertation on urbanization, considering it as one of the stages of the technoferization of the planet [11], the second (E.A. Dergacheva) investigated the processes of modern globalization taking into account the transition of humanity from biospheric living conditions to technospheric [12]. With the development of society on Earth, they create an artificial world, starting with tools, dwellings and clothing. The formation of 7–8 thousand years of cities, the development of crafts in them meant a steady increase in the technosphere on Earth, although they grew slowly. As early as 1800, there were 45 million people out of 910 million earthlings or 5.1%. Since the beginning of the nineteenth century in the course of industrialization the process of urbanization - the rapid growth of cities with the transition of the rural population in them begins. If in the nineteenth century the population of people living in cities increased by 75 million people, for 150 years (1800–1950) - by 0.7 billion, for the next 60 years (until 2010) of the scientific and technical revolution by another 2.8 billion, making up more than half of the townspeople in 2015. Over 215 years (1800–2015), the growth of people living in cities was 80 times more than in the entire seven thousandth history of urban development. Now the world *has formed such a volume and mass of the technosphere, which has become comparable with the remnants of biospheric living matter*.

Over 10 thousand years of its formation, it captured 5% of the land and, according to our forecasts, with the current social and technogenic vector of the evolution of earthly life by the end of the XXI century a fifth of the sustainable land will be covered with technospheric objects. By this period, soilless, anthropo-technogenic soils will constitute about 70–75%, if not more. *The rapid development of capitalism in the XIX-XXI centuries leads to the grand destruction of the biosphere and the formation of the post-biospheric urban world, living through repeated bio-technological processing of biological matter.* Not only the patriarch of the theory of industrial society, J. Galbraith [13], but also the modern arbiter of humanity, the host of the Davos economic forum, K. Schwab, write about the problematic market economy - the “economy of an innocent deception” and the need to change the concept of shaping its profits. 14].

To the problem of preserving the natural biological substance

It is the *socio-natural approach that allows philosophy and science not only to reveal the real trends of the socio-technological development of the world*, but also to put forward practical ideas for solving this problem. We propose to begin with the formation of a project of the most probable, safe and promising escape from danger mortal to humans and the biosphere, reforming the UN to solve the problems of preserving peace and reviving biosphere life, and other tasks [15, 222]. Of the many issues we dwell on the central one - the preservation of significant biospheric biological resources, without which it is impossible to save biospheric life on Earth. Otherwise, Postbiospheric Life will have to be formed in the urban technosphere with enormous difficulties related to life, obtaining food for people and animals, production of the atmosphere, which is supported by biospheric biological matter, creating the green cover of the planet and the oxygen component of the atmosphere.

The greatest damage to biospheric organisms is caused by mass technocratic thinking, which hypnotically forms the global urban technosphere and man-made habitat of humans and living organisms for the sake of profit and super-profits, regardless of the biospheric nature and future life of humanity. As for the technogenic habitat, it is primarily associated with the scientific discoveries of new chemical substances, their production and distribution in all natural environments. The world's largest register of chemicals contains more than 91 million names, with about 15 thousand new names added every day [16]. At the same time, at least 150 thousand technogenic substances enter the biosphere annually. The overwhelming majority of these xenobiotic chemical substances are not analyzed for toxicity, mutagenicity, carcinogenicity, and teratogenicity [17]. The extent of technogenic human habitat is indicated by the following data: 2282 xenobiotics from the environment were found in the urine of 22 healthy adults [18] and in the blood tests of 10 newborns for the presence of 471 industrial pollutants there were found perceptible concentrations of 287 allogenic chemical substances [19].

Such technogenic pollution leads to disease and increased mortality of people and the death of many populations of organisms. "The New York Times" cites a tropic environmentalist who returned to the jungle of Puerto Rico 40 years later. The mass of living creatures had decreased there by 10-60 times. Publishing other similar materials, the "The World of News" newspaper (12/24/2018) gives them the title "The Death of the Earth Began". Ethnological scientists paint an apocalyptic picture of a dying world. One of the authors (E.S. Demydenko) sent more than once the generalized data, which indicate that the death of the earth is already ending to this newspaper, and we calmly react to this.

The current loss of soil cover is, sometimes called desertification of our planet. The history of the term "desertification" is about 70 years old, has several dozen definitions, reflecting the multidimensionality of this phenomenon [20, C.70-78]. Perhaps, it could most of all come under the concept of "death", since the loss of soil leads to the fact that there is less nutrient elements on such worn soils than on the surface of Mars or the Moon. This can be explained by the fact that over hundreds of millions of years, living matter on Earth pulled nutrients, which were used by people in the process of agricultural development and dumped into the seas and oceans as waste. Desert from nutrients. This is also characteristic of US soils, where 5% of biospheric forests and soils remain, only in the 20th century the amount of nutrients in soils decreased by 3 times, for some elements (iodine and iron) - 10 or more times [21, P.43]. Only in these areas, where we see huge losses of biological resources, a significant recovery work in other words salt-mine should be done if the elite, and then humanity really realizes the necessary scope of work in order to avoid Earth-deadness. Already in the XXII century, death will drive the earthlings into the cities where they will survive on bio-technological processes of nutrition and recovery.

The study of the loss of soil cover, its humus in the world was conducted by a prominent soil scientist of our country, V.A. Kovda. He obtained the following data. If in the 20s of the twentieth century 3 billion tons of humus was discharged annually into the seas and oceans, then in the 70s already 8 times more - an average of 24 billion tons [22, p. 149, 156], now, apparently, more than 30 billion tons. How much does the entire population eat annually? The following data is given - 1.3-1.5 billion tons [10, p.10]. Almost half of what mankind ate, passes through the urban toilet system, washed out into the river, and then into the seas and oceans, but it makes no more than 3%, and how is the rest 97% of humus washed away? This is the result of the mismanagement of all mankind. Are people such enemies of their own being? They simply do not know how to handle the soil and use it rationally.

Conclusion

The Russian Academy of Sciences (RAS) reviewed our scientific report "From the global degradation of the biosphere to a change in the evolution of life. - M.: RAS, 2017.- 28 p." [23],

agreed with its evidence and conclusions regarding the change in the evolution of life, having printed a brochure so that authors can send it out and work in this direction with interested organizations and individuals. The authors propose *a scenario of avoiding the deadly danger* of losing the biosphere and its natural biological substance. *The first task* is to urgently hold a large international congress of state and public figures with leading scientists of the world not only to discuss the current situation, but also to switch as much as possible a number of institutes to the leading scientists. *The human development strategy* should be based on preserving the self-developing biospheric nature and its compatibility with the artificial world built rationally on the biospheric, but not on the technospheric basis.

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