Human and Nature in the Conditions of Modern Technological Systems: Environmental and Ethical Aspects

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Abstract—NBIC (nano-, bio, informational technologies and cognitive sciences) convergence, being the basis of sixth techno-economic paradigm, could contribute to the improvement of certain organs and functions of the human body only in some moments and could be useful in environmental renovation. There is a serious danger for the humans to lose their own nature and existence due to the absolute priority given to the artificial component together with underestimation of the spiritual, personal component. Also the above lost is possible due to the appearance of qualitatively new factors of destruction of the natural and cultural environment. The research is required of the risks essence, of threats and dangers that loom up all living things and first of all — the mankind. The social and humanitarian components of NBICS technologies, which are the basis of the seventh techno-economic paradigm, should to be supplemented with communicative technologies and non-technological components: methodology, dialogue, heuristics, which are developed in science and philosophy. Also they should be filled in with poetics and living human accompaniment. Ethics control by the individual and the collective subject must be congruent with not only the ethics of technology, but also with bioethics and ecology of culture. To prevent environmental catastrophe, the particular importance takes biopolitics, as well as moral eco- and bio-responsibility — as a response to the right of others to live. Our responsibilities are determined in accordance with the rights of the Other Living and connatural Diverse.

Keywords—convergent technologies; sixth and seventh techno-economic paradigm; human and natural ecology; eco- and bioethics; methodology; dialogue; heuristics; poetry; transhumanism; post-humanism; post-human

I. INTRODUCTION

Comprehensive scale and pervasive nature of the technologies as the way of relationship between the human and the world in XXI century is expressed, in particular, that at the very beginning of century, at first in USA, and then and in many other countries of the world, including Russia, there was a movement, the goal of developing and implementing so-called converged NBIC technologies.

Convergence combines, in mutual transfusion, four components: nano-, bio, informational technologies and cognitive sciences. They form the basis of the sixth techno-economic paradigm, which involves even technological improvement of the human himself.

Other convergences are known: "complex MBNRIC technologies (medicine, bio- and nanotechnology, robotics, information and cognitive technologies), as well as GRAIN technologies (Genomics, Robotics, Artificial Intelligence, Nano-technologies) [1]. All these technologies, as well as the program "Human Robot Collaboration" (the integration of human and robot), have the main object of the human application: constructive improvement of his nature, the symbiosis of human and machine, transformation of people into a component of a technogeneous hybrid. In support of these goals, the ideas of transhumanism and post-humanism has been developed and widely disseminated, including the concept of post-human, which is critically and of seriously concerned by many scientists and philosophers, because the very human nature itself is under threat.

II. THE SOCIAL-CULTURAL ANALYSIS OF CONVERGENT TECHNOLOGIES

Having entered the current stage of development, being the result of the last technological revolution and the processes of globalization, humanity could survive only if the native, natural-historical and sociocultural basis of human existence in a technical environment will be preserved. Therefore, there is the necessity of sociocultural context of the consideration of technology and science, which it is the background of the technology. This context assumes, first of all, the analysis of the historical and socio-cultural features of the nature of the above technology and science, inter alia current situation.

From the point of view human nature preserving in the situation of striving for its improvement, it is important to take into account the relationship between the natural and the artificial. L.N. Gumilev indicates the criteria distinguish between natural phenomena and things created by people:

"The elements of nature are transforming into each other ... Nature lives forever ... And vice versa, objects created by human could either be preserved or destroyed ... But they are not eternal ..." [2].

The division into natural and artificial systems correlates with the distinction between rigid and discrete systems in Gumilev's theory: "When studying history ... we encounter any gradations of systems of described types, with the exception of the extreme ones, i.e. only hard or only discrete, since both of them are not viable ... Therefore, in practice we encounter systems with varying degrees of rigidity, moreover, the higher is the level of rigidity, the more it is brought into it by the human's labour, and the lower the level is — then the creation of the system is initiated by the processes of nature, constantly transforming its constituent elements "[3].

For a long time, conformist and technogeneous civilizations coexisted in the world. They were characterized by a fundamentally different ratio of artificial and natural, and in to a great extent — by opposite value reference points. But technogeneous civilizations, overtaking traditionalist societies in their development, "exerted increasing pressure on them. As a result, many conformist societies have implemented a number of catch-up upgrades that put them on the path of technogeneous development" [4].

Thus, the Sino-Confucian civilizational matrix of the adaptation of man and society to nature is transformed into an adaptation to a technogeneous society. The Indo-Buddhist survival code, which includes spiritual practices, including the psychotechnics of meditation, does not stand up to the pressures of material and informational technologies, so India and a number of other eastern countries are forced to choose technogeneous development path. Russia and a number of other countries, which are characterized by the dialogue with the East and the West, also strive to keep up with technical modernization.

However, in case of the domination of uniformity in the pursuit of a technogeneous model is it possible to hope for the realization of M. Heidegger's forecast that someday in China or Russia there may be a free attitude to technology? Wouldn't this condition be disastrous to human nature, society and the environment? The problems of convergence of modern technologies are fundamentally insoluble, because in a technogeneous society the social system and the human himself reach the maximum of the artificiality. The extreme degree of artificiality of the system makes it unviable.

Socio-cultural analysis of convergence also includes a historical, socio-temporal aspect. From this point of view, two opposite trends are found out. On the one hand, there is a wide margin of technologically leading countries, and, on the other hand, "catching up postmodernization" of emerging countries that are capable of perceiving both technologies that simplify life and activities of people and society, and those that represent the algorithmic characteristic of traditionalist cultures of communication and spiritual contemplation. Therefore, the new way of life could be mastered in countries with different levels of technological

development and at the same time — take on various forms in Eastern, Western, Eastern European and other civilizations.

III. THE SYSTEMIC-PHILOSOPHICAL OUTLOOK ON THE IDEA OF THE SEVENTH TECHNO-ECONOMIC PARADIGM

The concernment with the fate of Russia and the entire world and the orientation towards the socio-cultural paradigm inherent in our civilization were prerequisites that gave rise to attempts to work out compromise or alternative ways of development for the sixth technological paradigm. "... It is rather in Russia," writes psychologist and philosopher V.E. Lepsky, — there are potential opportunities for the working out and usage of social humanitarian technologies of innovative development. ... The development of ... socio-humanitarian technologies is done for benefit of of the formation of the seventh socio-humanitarian technological paradigm" [5].

The idea of the seventh technological paradigm is based on the NBICS-convergence, which also includes the ethical component: "It is necessary to single out ... a threat common to all technological structures: the detachment of technology, and especially technology, from ethical reflection. ... If today we don't set out and start seriously to solve the problems of social humanitarian support for innovative development, then irreversible asocial processes may arise" [6].

However, so-called constructive synergy communication cannot be carried out in the "tetrahedron" concept of the relationship between convergent technologies, which comes from M. Roco and W. Bainbridge, because there are no subjects in it. In NBIC convergence there is, in the ideal case, synergistic integration, which is far from identical to synergic — spiritual, distinct unity, possible only between personalities, subjects. "Nano-objects become the focus of synergistic integration," V.I. Arshinov said. "However, evolutionary and anthropological discourse does not form from this a-subject logic of the substitution of nano-objects" [7].

The considered concept of convergent technologies (NBICS) is no longer "tetrahedral", but "pyramidal", including as the top of "S" — socio-humanitarian technologies, including sociocultural and educational ones. Albeit the fact that the main difference of the new paradigm is not the development of new technologies, but the " production" of humans, who are able to create technologies, organize new living conditions and forms of consciousness, generate new realities (technological, cultural, social). Therefore, of top importance are: the development and implementation of communicative technologies based on dialogics, and, what is most important, non-technological, heuristic ways of preparing creative minds of new formation and non-algorithmic methods of developing new technologies.

The system model of the proposed version of NBICS-technology looks like already octahedral. Within the model the non-technological components stand out into an independent pole, and the subject is transcendent towards the system and, at the same time, immanent to its context —

internal — spiritual-personal environment and to the temporary, cultural and historical aspect [8].

IV. NON-TECHNOLOGICAL COMPONENTS OF NBICS TECHNOLOGIES

The effectiveness of educational, socio-cultural and, in general, of any other technologies in the social and humanitarian sphere depends on their harmonious combination with methodological, heuristic, and spiritual factors of organizing activities and communication. Also they depend on the formation of a human and his living environment, on the compliance with measures in the ratio of artificial and natural in the new technological structure [9]. Technology, as a system of operations, that transform or preserve the object of activity should be considered and implemented in inseparable and distinct unity with methodology as an organization activity of the subject and should be considered and implemented with axiology, which is aimed at finding the criteria for selection and assessment of values.

Furthermore, the activity as a subject-object form of activity is in close connection with interpersonal communication, organized by the methods of dialogics, self-actualization of the subject in its formation and in the development of new technologies and spiritual contemplation of the process and results of creativity. If in the field of education and socio-cultural activities, in the field of the preparation of people, who are capable for creating new technologies, the artificial prevails over the natural, technologies over methodology and heuristics; the result turns out to be an imitation or even a simulation of education and creativity [10].

In the practice of using these technologies and methodologies, the approaches from the positions of philosophy, axiology, cultural studies, sociology and other social sciences and humanities prove to be in demand and effectively implemented. In turn, these sciences acquire the ability to harmonize with the latest technologies. But above technologies and sciences there should be free will and responsibility of the person and society. A condition to prevent the global catastrophe is the preservation by people of their status as subjects of technologies, especially of those in which a person is an object for technological influence.

It seems to be insufficient to reduce moral control over the development and application of convergent technologies to the ethics of technology. Since we are talking about the technological improvement of human and about attempts to replace objects of nature with artificial organs and tissues, it is very important to effect research in the field of biomedical and environmental ethics. These approaches should be used actively in practice. Due to the fact that the socio-cultural technologies which are used today in education, organization of corporate leisure and other areas are far from perfection and even they often damage the internal and external cultural environment, it is necessary to develop the ecology of culture to be applied to NBICS technologies.

The positive answer to this question depends on whether convergent technologies, including the socio-humanitarian

component, will become the new foundation for humanity to "construct a new building with new moral aspirations". It was mentioned by N.N. Moiseev in 2000 annum, when he asked: "Humanity, to be or not be?"

V. ENVIRONMENTAL RISKS OF THE SIXTH TECHNOLOGICAL PARADIGM: ETHICAL ASPECT

The accidents at the Japanese atomic powerplants "Fukushima-1" and "Fukushima-2", which tragically coincided with the 25th anniversary of the Chernobyl accident, the construction of a new atomic powerplant in Belarus once again recalls the fragility and vulnerability of human life and human dependence on technogeneous (anthropogenic) disasters. A retrospective view creates an image of the past century as the atomic and space age, the century of urbanization and the population explosion, age of electronics and microelectronics, information technology and genetic engineering. The achievements of the fourth and fifth technological paradigm make it possible to predict the transition to the sixth technological paradigm. Nanoenergy, nano- and biotechnologies, molecular, cellular and nuclear technologies, nano-biotechnologies, nanobionics, and other nanoscale productions become its main industries. As a result, new types of communications are already being formed, a new medicine — nanomedicine, actively using stem cells, engineering of living tissues and organs, restorative surgery, a significant increase in life expectancy. An optimistic view of the future guarantees the dominance of digital technology, the creation of artificial intelligence and other "IT" benefits. At the same time, a technically and economically powerful human is neither happier nor spiritually richer. He is confused and looks into the future with fear, says Ulrich Beck — one of the leading European sociologists.

This is due to the formation of a new type of sociality — a risk society. In it, the traditional" place of community of need is occupied by a community of fear," which" becomes a political force" [11]. In different parts of the world, at the level of governments and international organizations, among politicians, businessmen and ordinary people, there is a ripening fear of the fact that the Earth's biosphere as the ecological niche of humanity and the whole Life system is under spelling destruction today.

Risks, threats and dangers cannot be completely excluded from the process of development of ecosystems, from human existence, from society and nature. Their source could be any of the subsystems of a socio-natural ecosystem — inanimate nature (earthquake or tsunami); wildlife (extinction of a particular species). "Second nature" — is a culture created by people (technogeneous accidents, disasters). In this regard, the question arises of the nature of the risks and dangers that threaten the whole creation, and first of all — the humanity [12].

Risk — it is the possible danger of an adverse outcome of an event; a combination of the likelihood and consequences of its occurrence. This is a characteristic of a situation that has an uncertain probabilistic nature of the outcome, most often — the probability of an unfavourable result (loss).

There are different types of risks: individual — it is characterized by the danger for an individual; collective (group, social) — the appearance of danger for the collective, for a certain social group of people; professional — it is associated with the professional activities of a human. Several risks are noted: the risk as a criterion of the expected failure in the activity; motivated risk — which involves situational advantages in the activity; unmotivated risk — risk with no rational basis; justified and unjustified risks. The acceptable (permissible) risk stands out in particular — it is the minimum amount of risk that could be achieved with technical, economic and technological capabilities as a compromise between the level of safety and the possibilities of achieving this level [13].

In any case, risk is always a situation of choice: between a less attractive, but more reliable strategy, and a more attractive, but less reliable one. For example, there is a situation when it is necessary to resolve the issue of creating nuclear power plants: more economical, but also more dangerous (by the way, the risk theory was developed during the development of radiation and environmental risk assessments).

Another fundamental problem is the situation of creating a risk (for example, road traffic accidents, as one of the leading causes of death, are often "created" by driver insobriety; the risk of a nuclear catastrophe — with the construction of a nuclear power plant itself). Thus, the risk creation represents risk by itself. One of the effective ways to solve the problem of "creating a risk" is to assess the situation so that the "scenario" includes unpopular and incredibly high "threats" and / or" vision events". This causes fear, forcing people to act without creating a risk.

The concepts of "risk" and "threat" are related, but they differ from each other. A threat is a very low probability of a serious event that is difficult to assess because it never occurred, therefore effective preventive measures are not available, which could be taken to reduce the likelihood or impact of a possible negative event. Here are the examples of threats: naturally-occurring catastrophic events (earthquake, flood, tsunami, volcanic eruption, forest fires); human-made catastrophic events (nuclear threat), environmental catastrophe (global climate change).

At the same time, the concepts of "risk" and "threat" are closely related to the concept of "danger". Danger — this is the possibility of circumstances that can thus affect a complex environmental or social system, which will lead to a deterioration or impossibility of its functioning and development. Danger, like a threat, is an objective circumstance: the occurrence or likelihood of undesirable events. The risk is associated with the subjective human activity (for example, when creating risks).

In previous eras, risk was examined as the result of insufficient development of technologies and scientific knowledge. Therefore, the main way to reduce civilizational risks was seen in scientific knowledge and the creation of new technologies [14]. Today, the situation has radically changed: in the era of the fourth, fifth, sixth paradigm, risks are not formed by insufficiency, but by redundancy of

technological and scientific progress. The risks which came from the fission of atomic nucleus, genetic engineering, cloning or building a new nuclear power plant, become synonymous with the global threat to all mankind, the threat of self-destruction of life on Earth. The globalization of risks unites the humanity and makes us look for a common morally significant answer. Once academician P.L. Kapitsa remarked: "We must be able to overcome difficulties, but we must be able and not to create them".

The required level increase of biosafety could only be achieved by changing of all forms of social activity based on environmental awareness. In ensuring the minimum level of environmental risk and biosafety of humanity should be based on the legal terms and the principles of eco- and bioethics. The general principles of eco-ethics, designed to ensure the biosafety of mankind in a risk society, include: the principle of respect for all forms of life, the principle of biodiversity, the principle of sustainability of the biosphere (it is the basis of the concept of sustainable development), the principle of environmental justice, the principle of common property of natural resources, the principle of precaution and principle of danger presumption arising from the principle of respect for life and the principle of precaution.

The RIO-92 Declaration says: "There was never in history that it depends so much upon what do you do, or do not do, for yourself, for others, for your children, for your grandchildren, for life in all its diversity of forms". Taking into account these conditions, our bioresponsibility takes on special significance — the recognition that, frankly speaking, our responsibility is the answer to the right of others to live. And our responsibilities are defined in accordance with the rights of the Other Living and, more broadly, the connatural Diverse.

VI. CONCLUSION

The threat of a possible loss by a human of his own nature and of his being is due to the absolutizing of the artificial component and the underestimation of the spiritual, personal factor in the application of convergent technologies. To prevent a human from losing himself, it is necessary to complement the socio-humanitarian components of NBICS technologies with non-technological components.

- The creation of technologies for assembling a collective subject should be added with communication technologies based on dialogics and the modern development of spiritual practices [15].

- The technologies that are aimed at the objects of activity and reflection should be put under control of the methodology which is addressed to the subject, and under control of the axiology, which is focused on super-value criteria.

- In organizing the "production" of people capable of creating technologies, a bet should be placed on poetics, heuristics and the setting the stage for the freedom of creativity.

- In conjunction of the social and humanitarian superstructure with NBIC convergences, it is necessary to use the subjectivity transferred by a human to his fields of activity — nature, culture and technology, the combination of their synergistic effects with the synergistic unity of people among themselves [16].

- Moral control on the part of the individual and collective subject must be affected not only in the aspects of the ethics of technology, but also in bioethics and the ecology of culture.

A variety of additions and charging of the socio-cultural components of convergent technologies, including in different countries, is possible. It seems impossible either for Russia or for other countries to move on to the seventh technological paradigm, bypassing the sixth. It is necessary to make the transition to the sixth paradigm in the new version of convergent technologies, implying the supremacy of human and spiritual, non-technological components.

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