Section Two

INTELLIGENT MATTER

The Techno-Humanitarian Balance and Modernity

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The authors studied the problem of techno-humanitarian balance. A difference was found in approaches to the study of technological progress and its impact on the development of society. The ideas of transhumanism, existential risk, etc. suggested by Nick Bostrom, David Pearce, etc. provided a utilitarian attitude towards new technologies. The representatives of transhumanism proceeded from the idea that any technology is part of human nature and expanded its presence in life. Nazaretyan’s ideas were based on the opposite premise. Namely, man and technology have a different nature of origin. Hence, the need arises to adapt to a non-native environment and create certain restraining mechanisms. The societies that failed to adapt to the exponential spread of information and communication technologies in time undermined the natural and/or geopolitical foundations of their existence. In turn, the societies that have adapted to new technologies have achieved sustainable development and prosperity. The authors used the comparative method of research, as well as methods of modelling, analysis, and synthesis. The study resulted in the testing of two models of the relationship

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between society and technology, built on the Nazaretyan hypothesis and the Bostrom concept. The test results proved the effectiveness of the model, built on the concept of Bostrom. The model presents the general dynamic nature of man and technology.

Keywords: techno-humanitarian balance, Akop Nazaretyan, philosophy of transhumanism, techno-engineering, existential risk, Nick Bostrom, process philosophy

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Introduction

The hypothesis (sometimes the law) of the techno-humanitarian balance was proposed by Akop Nazaretyan in 2001 (Nazaretyan, 2001). Subsequently, the author refined its interpretation several times (Nazaretyan, 2003; 2005). The most common one is the following definition of Nazaretyan’s hypothesis: the more powerful the technology is, the better quality detergents are needed to maintain the social system (Nazaretyan, 2001).

Nazaretyan was one of the few Soviet philosophers who promoted his ideas in leading English-language scientific publications after the collapse of the USSR. In 2003, he published an article in the Journal for the Theory of Social Behavior, in which he revealed a causal relationship between the three variables: technological potential, cultural regulation quality, and social sustainability. He formulated the hypothesis “that the higher production and war technologies’ power, the more refined the behaviour regulation means (consolidated values and norms, etc.) that are required for self-preservation of the society” (Nazaretyan, 2003).

In 2005, Nazaretyan published an article in the Journal for General Philosophy of Science, in which he pointed out the fundamental difference between the approaches to Big History in Western and “Soviet” culture. Nazaretyan wrote, “The non-equilibrium approach in the context of modern control and self-organization theories, alters the portrayal of the past, and still more dramatically, estimation of the civilization’s potential perspectives” (Nazaretyan, 2005). The hypothesis of techno-humanitarian balance was presented in the article as an opportunity to assess human evolution in relation to scientific and technological progress.

The Nazaretyan hypothesis was formalized as a general relationship between the ability of society to avoid man-made disasters, i.e., Internal Sustainability (Si), the quality of self-regulatory mechanisms (Regulation functions — \( f_1 (R) \)) and technological potential (Technologies functions — \( f_2 (T) \)).

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Si = \frac{f_1 (R)}{f_2 (T)} \quad (1)
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An analysis of scientific publications suggests that the Nazaretyan hypothesis did not affect Western discourse. However, it caused a great resonance and discussion in the post-Soviet space. For example, Evstifeeva et al. used the hypothesis as the basis for creating a practice-oriented approach to study the personal potential of modern engineers, development of their personal qualities by means of socio-humanitarian technologies, and reflexive approach used in the educational process (Evstifeeva et al., 2012).

Cheshko et al., on the basis of Nazaretyan’s hypothesis, created the co-evolutionary concept of the tri-modal stable evolutionary strategy (SESH) of Homo sapiens. The concept based on the principle of evolutionary complementarity of anthropogenesis: value of evolutionary risk
and evolutionary path of human evolution is defined by descriptive (evolutionary efficiency) and creative-teleological (evolutionary correctness) parameters simultaneously, that cannot be instrumental reduced to other ones (Cheshko et al., 2014; Cheshko et al., 2015).

Zhelnin used the Nazaretyan hypothesis to explain the phenomenon of sociobiological crisis. He proved that as a result of “information inflation,” the human psychic appears the object of systematic stress, which may lead not only to an increase of mental disorders but also somatic ones (Zhelnin, 2014).

Sokolov used the hypothesis of techno-humanitarian balance to reason humanistic model of the noosphere man, “as it can provide techno-humanitarian balance in post-industrial civilization” (Sokolov, 2019). Sokolov considered the possibilities of the cultivation of noosphere person and the role of libraries in this pedagogical process.

Krichevsky studied the theoretical and practical aspects of the problem of creating a new “cosmic” human in the paradigm of space exploration and the creation of cosmic humanity. In his opinion, the hypothesis of techno-humanitarian balance plays an important role in solving the problem of the future human and humanity (Krichevsky, 2020).

In the article, the authors examine techno-humanitarian balance as a problem. The importance of this problem is explained by the consideration of the role of information and communication technologies in the sustainable development of society. The determination of human nature and technology with subsequent modelling of the relationship between them comes first.

The philosophy of transhumanism

Nazaretyan created the hypothesis of techno-humanitarian balance in an already existing discourse, which was caused by an international cultural movement called transhumanism. The primary source of the idea of transhumanism originated in Ancient Greece. It was formed by the difference of meanings implied by the terms “sophia” and “techne.” Namely, between the qualities those Gods endowed man with at birth and the technical skills that man learned throughout life (Bazaluk, 2019).

Since then, the original Greek meanings have been substantially changed. However, the source of the problem has remained unchanged. In modern language, its meaning can be conveyed as a fundamental transformation that “fundamentally transforms the human condition through radical technological enhancement” (Ross, 2020). The source of the ideas of transhumanism is in the contradiction between the nature of man, i.e., what forms the essence of human being, on the one hand, and techne, i.e., products that man has created to take care of himself and his way of life, on the other hand. For several millennia, the essence of man and the essence of things created by man were considered different. However, starting from the second half of the 20th century, after the studies of Julian Huxley, Fereidoun M. Esfandiary, etc., a different vision of this problem appeared. There was an understanding that the essence of things created by man is a continuation of the essence of human beings. Arguments appeared that allowed an essential unity between the being of humans and the being of things created by them (Bostrom, 2003).

In 1998, Nick Bostrom and David Pearce founded the World Transhumanist Association (WTA). Transhumanism began to be positioned as a legitimate subject of scientific inquiry and public policy (Bostrom, 2003). David Pearce stated, “biotechnology will abolish suffering throughout the living world. Our descendants will be animated by gradients of genetically preprogrammed well-being that are orders of magnitude richer than today’s peak experiences” (Pearce, 2007). In 2008, the World Transhumanist Association rebranded and became known as Humanity +. In the new organization, political goals receded into the...
background, and “the ethical use of technology, such as artificial intelligence, to expand human capacities” came to the fore. In other words, we want people to be better than well. This is the goal of transhumanism” (Humanity +, 2020).

The philosophy of transhumanism is of primary interest to our study. It offers a special discourse on the meaning of being human in anticipation of radical technology. Its reflection is based on the assertion that a person is not just open to the outside world, of which technology is an important part. Man is part of the outside world. He is essentially present in it. Therefore, the essence of techno-engineering is a certain part of the essence of humans. This is their nature. Hence, greater-than-human machine intelligence, mind-computer interfaces, gene-editing, and nanotechnology are the natural necessity and indisputable utility of upgraded humans.

The consequence of this reflection was the discovery of a new space of human self-actualization. This is an additional and virtual world created by technical means. Human being in these worlds has become a reality.

The Philosophy of Transhumanism uses the philosophy of neuroscience and neurophilosophy (Bickle et al., 2019; Lin & Bazaluk, 2020) as the basis for research. Both disciplines reveal the complex relationships that have developed between neurosciences and psychology, as well as the role of digital technologies in these relationships. Modern models of the human brain functioning are no longer limited to the field of neuroscience. New models have been created and are being studied that examine the involvement of the brain in cosmic consciousness and cosmic evolution (Kastrup, 2018), planetary evolution (Smirnov & Odintsova, 2019; Sokolov, 2019), and global geopolitical processes (Bazaluk & Balinchenko, 2020; Lifková, 2019), etc. It was found that self-sufficiency of the brain or neurobiology of resilience is primarily provided by neurobiological processes (Cathomas et al., 2019). Their quality guarantees not only the functioning of the body, but also modern technology. The latter creates the unity of neurobiology of resilience and sustainable development of society. These may be the technologies that control human health and mental state (Lifková, 2019); educational technology (Lin & Bazaluk, 2020); artificial intelligence and space technologies (Soroka & Kurkova, 2019); etc.

Modern neurobiological models exclude the essential difference between the neural structures that determine the functions of consciousness and digital technologies that expand the functions of consciousness. They prove their essential unity. Consciousness and digital technology determine the quality of each other’s presence. Cybernetic organisms are a good example in this case. Namely, “integration of out-of-body and inside-the-body nanoscale devices with a human, that is, creation of augmented human” (Koucheryavy et al., 2017).

The philosophy of neuroscience and neurophilosophy provide an essential empirical basis for the research on the philosophy of transhumanism. The philosophy of transhumanism focuses on the ethical use of technologies such as artificial intelligence, nanotechnology, nanomedicine, biotechnology, stem cells, and gene therapy (Humanity +, 2020). The philosophy of the World Transhumanist Association and its successor Humanity + is the philosophy of pragmatism that sets specific goals and determines the ways to achieve them. The priority is the search for answers to questions of the expansion of neurobiological and biological processes due to new technologies, as well as the argumentation of the ethics of this action.

An existential risk

The end of the 20th century has brought with it the rethinking of the essence of human nature and technology. The generally recognised division has lost its evidence. Information and communication technologies as a product of human activity turned out to be a continuation
of human nature in reality. The nature of man and technology began to be studied as one in its essence.

Studies of this kind have encountered ethical limitations. The value norms and rules that determined human behaviour and their attitude to the products of their labour did not allow their essential unity. They predicted technological disasters, the threat of the destruction of civilization, personal and social crisis, etc.

Around this time, Nazaretyan proposed the hypothesis of techno-humanitarian balance. Nazaretyan’s hypothesis was based on the traditional point of view, which affirmed the different essence of human beings and the existence of information and communication technologies. This difference gave rise to antagonism: the being of technology opposed the being of man. To emerge victorious in the current confrontation, a person had to continuously improve the means of constraining technology (Nazaretyan, 2001, 2003, 2005).

However, in the Western discourse, the traditional point of view on the essence of man and technology became less and less popular. Technogenic disasters and cataclysms did occur. However, they did not have the regularity and the consequences for humanity that were predicted, inter alia, by the Nazaretyan hypothesis. At the same time, new technologies have increasingly become part of everyday life. The complementary and virtual world has become a reality in which more and more people have found a space of self-actualization (Pinto et al., 2013).

The promotion of views on the unity of the essence of man and technology is associated with the concept of existential risk. In 2005, Nick Bostrom founded The Future of Humanity Institute as part of the Faculty of Philosophy and the Oxford Martin School. In early 2010, he developed the concept of existential risk, in which he proposed a new way of thinking about the ideal of sustainability (Bostrom, 2013). Bostrom claimed the following (Bostrom, 2013):

1. An existential risk is a concept that can focus on long-term global efforts and sustainability concerns.
2. The biggest existential risks are anthropogenic and related to potential future technologies.
3. A moral case can be made that existential risk reduction is strictly more important than any other global public good.
4. Sustainability should be reconceptualised in dynamic terms, as aiming for a sustainable trajectory rather than a sustainable state.
5. Some small existential risks can be mitigated today directly (e.g., asteroids) or indirectly (by building resilience and reserves to increase survivability in a range of extreme scenarios). Still, it is more important to build capacity to improve humanity’s ability to deal with the larger existential risks that will arise later in this century. This will require collective wisdom, technology foresight, and the ability when necessary to mobilize a strong global coordinated response to anticipated existential risks.
6. Perhaps the most cost-effective way to reduce existential risks today is to fund analysis of a wide range of existential risks and potential mitigation strategies, with a long-term perspective.

The concept of existential risk is the exact opposite of the hypothesis of techno-humanitarian balance. Bostrom acknowledged the risk associated with potential future technologies and the fact that the cause of the risk was man himself. However, Bostrom did not associate the sustainable development of society with technology containment in
order to preserve the social system, as Nazaretyan suggested. Bostrom argued that society and technology have a single entity, so they should be reconceptualised in dynamic terms. Bostrom proposed that human beings and technologies not be regarded as sustainable states that complement or oppose each other. He suggested exploring them as a process having a common nature. In essence, Bostrom’s argumentation of the unity of the essence of man and technology was based on the research of process philosophy. Techno-humanitarian balance began to be viewed through the prism of process philosophy.

**Techno-humanitarian balance in process philosophy**

Process philosophy is based on the premise that being is dynamic and that the dynamic nature of being should be the primary focus of any comprehensive philosophical account of reality and our place within it (Seibt, 2020). The dynamic nature of being, which is studied by process philosophy, offers the opportunity to test two models of techno-humanitarian balance:

1. A model that provides for a different essence of man and technology. The balance between them is provided by the Nazaretyan hypothesis.
2. A model that provides a single entity of man and technology. It is based on the Bostrom concept.

Consider the first model. The stability of the model based on various entities is provided by a system of complex restraining balances. They are determined by the Nazaretyan hypothesis. From formula 1, it follows that the technological potential \( f_2(T) \) should always be lower than the quality of self-regulatory mechanisms \( f_1(R) \) if society wants to avoid anthropogenic disasters. Sustainable development of society is provided by its ability to anticipate and protect itself from future technologies. However, in fact, the technological potential is ahead of the mechanisms of self-regulation created by man. This is evidenced by the studies of migration processes caused by technogenic or other factors (Bazaluk & Balinchenko, 2020). Bazaluk and Balinchenko proved that the mechanisms of social regulation are formed after the beginning of the migration process. The created mechanisms regulate the ongoing process or eliminate the consequences of an already completed event. In a study by Churin et al., it was proved that operation of the system to redistribute mineral extraction revenue occurs upon completion of the technological revolution and is its consequence, but not vice versa (Churin et al., 2019). Yakushik draws attention to the necessity of dialogue and mutual understanding between different civilizational layers in national States and in inter-State relations (Yakushik, 2019). However, the need to create mechanisms of self-regulation is a consequence, not a cause. The reason for regulation is an anthropogenic factor. Soroka and Kurkova have shown that the exponential growth of artificial intelligence and space technologies is a reason for rethinking legal and ethical norms, and not their consequence (Soroka & Kurkova, 2019).

The above studies prove that in the vast majority of events, the value of technological potential \( f_2(T) \) is always higher than the quality value of self-regulatory mechanisms \( f_1(R) \). This means that if we follow the Nazaretyan hypothesis, then humanity should have perished in anthropogenic disasters.

Studies by Balinchenko, Churin, Soroka, Yakushik et al. prove that:

a) the high value of the technological potential \( f_2(T) \) does not cause the growth of anthropogenic disasters;

b) self-regulatory mechanisms \( f_1(R) \) are created post factum. They are the result, and not the cause of the growth of technological potential;
c) sustainable development of society cannot be determined by the ratio of the quality of self-regulation mechanisms (Regulation functions — \( f_1(R) \)) and technological potential (Technologies functions — \( f_2(T) \)), since in most cases the technological potential causes the creation of self-regulation mechanisms and determines their value.

Consider the second model based on the Bostrom concept. Its main feature is that the dynamic nature of being of man and technology is considered as essentially united being. Bostrom does not formalize his concept. He defines it as “a concept that can focus long-term global efforts and sustainability concerns” (Bostrom, 2013). Existential risk is any risk that can lead humanity to complete destruction. Existential risks can be natural (supervolcanoes, asteroid impacts, any other destructive influence of space processes), and anthropogenic (nuclear war, climate change, artificial intelligence, etc.). Bostrom does not oppose man and technology. On the contrary, he considers technology as an important part of the confrontation between man and cosmic processes. Even when it comes to the existential risk of anthropogenic nature, Bostrom speaks of the transformation of man, and not of man’s self-preservation from technology. According to Bostrom, it is man who is the cause of existential risk, not technology. Therefore, for the sustainable development of society, it is necessary to educate a person. Plato considered the cause of all people’s troubles to be their ignorance (Bazaluk, 2019). Therefore, Bostrom sees the prevention of the existential risks of anthropogenic origin in the fight against human ignorance, and not in the creation of restraining mechanisms of self-regulation. The Bostrom concept envisions the use of technology in the prevention of existential risk.

The second model allows considering “psychology of social expectations of a personality as the unity of the mental process, mental state and properties of expectations” (Khmil & Popovych, 2019). The Bostrom model reveals the unity of human life and the role of information and communication technologies “in spatial planning, urban modelling and simulation, acquisition of information using different sensors and model spatial processes, the use of data to create more capable visualization tools, and the use of virtual models to simulate real environments and plan and manage other aspects of the built environment such as energy” (Pinto et al., 2013).

The Bostrom concept forces us to rethink a traditional political perspective on the nature of power, which has always been linked to force, domination, and sovereignty issues. Lifková proved that “As the new devices come to light, a new frontier of power emerges in the digital sphere — a power that is exercised with subtlety and disguised as a voluntary” (Lifková, 2019). The study by Lifková proves that technology does not oppose human nature, but improves it.

**Conclusions**

Thus, techno-humanitarian balance was investigated as a modern issue. As a result, two opposing approaches were discovered in the study of the essence of human beings and technology, which determine the role of technological progress in human life. The first approach is the hypothesis of the techno-humanitarian balance proposed by Nazaretyan. The hypothesis formalizes the traditional point of view on the different natures of man and technology. It follows from the hypothesis that the sustainable development of society depends on the importance of self-regulation mechanisms (Regulation functions — \( f_1(R) \)) that hold back the technological potential (Technologies functions — \( f_2(T) \)). This allows the social system to adapt to the technological process and not be destroyed by it.
The second approach is due to transhumanism and a new understanding of the essence of man and technology. This new understanding is fully apparent in the concept of existential risk proposed by Nick Bostrom. In the Bostrom concept, human nature and technology are united. Existential risk is due primarily to human ignorance, which must be overcome, inter alia, using new technologies. There are no contradictions between the social system and technological progress. They cause each other’s development. These are the two parts of a whole that allow speaking of a social system as a cosmic civilization (Krichevsky, 2020).

The considered models and their consequences allow concluding that the second approach corresponds to the present time. The studies of Bostrom, Khmil, Pinto, Lifková, etc. prove its truth. The first approach contradicts modern research on the sustainable development of society. Perhaps that is why Nazaretyan not only refined his hypothesis several times, but also used it with great reservations in his studies of the last years of his life (Nazaretyan, 2020).

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