Socio-cultural factors of human surviving under the conditions of the Leningrad blockade

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Aim
The aim of the article is to show the significance of the axiological approach in explaining the place of socio-cultural factors, such as social status, ethical values and art, in survival of human population under the conditions of the Leningrad blockade, which reveal in a new methodological viewpoint the significance of the fundamental discoveries, made by Soviet scientists, still underestimated, in biology and medicine (high viability of a part of the population under extremely severe conditions, possibility of activating the hidden reserves of the organism on the verge of life and death, dysregulation pathology, high life potential of the human body, dependence of severity and outcomes of alimentary dystrophy on the psychoemotional status), which have an enduring value and are very topical in our days of significant growth rate of occurrence of extreme situations like environmental and anthropogenic disasters, local armed conflicts and criminal events.

Materials and methods
In this article the following theoretical tools are applied: a widely used in science neurobiological approach; a new approach to the nature of art as a means of human survival; a cosmological model of the «world of many worlds», a concept of space ethics and the corrected «hierarchy of needs» by A. Maslow. The axiological approach is chosen as the methodology and logic of the scientific research, which is, in its turn, a component of the modern scientific cognition that makes possible to show the significance of socio-cultural factors of human survival in extreme situations.

Results and discussion
For the first time in the philosophical literature, the role of socio-cultural factors as a methodological and logical explanation of scientific discoveries in biology and medicine during the Leningrad blockade is shown, which makes it possible to reveal the significance of these factors under the conditions of the growth of occurrence rate of contemporary extreme situations. For the first time a hypothesis has been put forward, according to which the diversity of the systems of ethical values of human society is rooted in the depths of the Multiverse.

Conclusion
It is suggested to use the results of discoveries in biology and medicine dated back to the Leningrad blockade together with the revealed mechanisms of such socio-cultural factors as social status, ethical and artistic values, which represent the concentrated aesthetics, for human survival under extreme situations of the modern world.

Keywords
Methodology, Logics, Extreme situation, Social status, Ethical values, Aesthetic values, Multiverse, Medicine, Biology, Discovery, Alimentary dystrophy, Pathology, Blockade

Imprint

Introduction
At present, the dynamic development of the world is characterized by such a significant increase in the number of extreme situations that they become a daily feature of modern life. Now, a sharp increase in the occurrence rate of natural and anthropogenic environmental disasters, local armed conflicts and terrorist acts, leading to mass casualties, is observed. This means that inevitability of extreme situations at the beginning of the 21st century must be taken as a quite certain reality, which makes it necessary to take measures to minimize their destructive consequences. The extreme nature of the vital activity of the modern complex non-linear information society with its latest scientific achievements and high technologies is caused by all the previous development of the society during nearly the whole of the last century. It is quite natural that in the scientific literature considered are the problems of genesis of extreme situations generated by nature itself and the dynamics of war in world
history, the mechanisms of the Second World War, the connection of military force with economic and cultural factors, the problems of genocide of entire nations, the problems of human existence under the conditions of concentration camps and the Leningrad blockade [1].

The paradox of the modern world lies in the fact that the growth of the extreme situations number is accompanied by modern achievements in the field of science, especially neurobiology, the latest technologies such as information and communication, nano-, bio-, cognitive and social sciences. A great importance in this regard, in opinion of Russian researchers V.B. Simonenko and S.V. Magayeva, have still not fully appreciated achievements in biology and medicine made under the conditions of the Leningrad blockade, which itself is a monstrous experiment that placed the human body «on the verge of the existence» [2]. Fundamental discoveries in biology and medicine, made under the conditions of the Leningrad blockade, prove to be very promising for researching the natural mechanisms of survival and recovery of the human body in pathologies emerging in extreme situations.

Materials and methods

Scientific research shows that the Leningrad blockade was the most difficult, massive and lasting extreme situation in the history of mankind. The specific aggravation of the situation consists in the action of three pathogenic factors, such as the psychological pressure of the 900-day siege of the city with bombing strikes and artillery shelling; almost full hunger and fierce cold of the first blockade winter. “Success in studying the blockade and postblockade pathology is still little known and unrealized. Meanwhile, an analysis of scientific works by clinicians, pathophysiological, pathoanatomists and histologists allows us to consider that during the severe time of the blockade, major discoveries were made in the field of biology and medicine, which until now have not been properly evaluated by experts” [2–5].

Soviet biologists and physicians under the extreme conditions of the Leningrad blockade managed to collect valuable material on the basics of survival and recovery of the organism subjected to the shock in its vital activity foundations, using the pathogenesis of alimentary dystrophy as the main cause of human death events. The studies of the clinicians of the blockade time revealed the hidden reserves of the organism and the importance of the psychosomatic factor for the emergency situations outcomes, what at the beginning of the 21st century determined their need for studying the regularities of the organism’s vital activity in everyday extreme situations. In their fundamental research «The Leningrad blockade: discoveries in biology and medicine» V.B. Simonenko and S.V. Magayeva showed that for the theory and practice of modern medicine and biology of great significance are the following discoveries of the Leningrad blockade: the appearance of a high life potential of the human body; activation of natural mechanisms of viability in a significant part of the human population in the long-term extreme situation; diseases of nervous regulation of functions and their significance for the outcomes of an extreme situation; dependence of severity and outcomes of alimentary dystrophy on the psycho-emotional status; dependence of severity and outcomes of the atrophic process on the preservation of apoptosis regulation at the organism level; possibility of natural reduction of atherosclerotic lesions in the vascular wall; a key role of nervous mechanisms in the pathogenesis of hypertensive disease [2].

The significance of the blockade discoveries in biology and medicine is that they determine the ways to develop the activation of natural sanogenetic mechanisms and increase the vitality of the organism in extreme situations. Besides, they contain empirical facts confirming the importance of such socio-cultural factors as social status, ethical and artistic values for human survival in extreme situations. First of all, the survival statistics shows that those who had the social status of workers of defensive and rehabilitation institutions, as well as representatives of public military authorities, who were engaged in securing the life of besieged Leningrad, survived [2] that received its scientific justification in modern research. Thus, D. Rock in his monograph «Brain. Instructions for use: how to use your capabilities to the maximum and without overloads” emphasizes the importance of the social status in human life:»Status is one of the main engines of social behavior, in addition to community and justice”. In order to maintain or improve their status, people are ready to go very far. The feelings obtained when the status increases may be more positive than money, and if it decreases, it is felt almost as a danger to life «[6]. The status represents one more primary reinforcement or threat. In case of determining the attitude of associates to the status of a person,
his brain uses the same schemes and mechanisms as when determining the attitude to other basic needs that provide survival. Moreover, the neurobiological studies show that the human brain is a unity of the left and right hemispheres, each of which performs its specific functions, including the left hemisphere focused on the rationalization of human behavior, which «apparently has a considerable value in terms of survival» [7].

This fact fits perfectly into the latest neurobiological studies, according to which the human brain has a neural social network responsible for the relationship of the individual with society; it is similar to neural networks that control vision, movement or hearing: «We are born with a social network» [6]. The famous hierarchy of needs by A. Maslow needs some correction considering the latest neurobiological research. «Many modern studies show that the brain, when interacting with social needs, uses the same neural networks as it is the case with survival. Hunger and ostracism activate the same reactions to threat and pain, involve the same neural networks «[6]. This neurobiological approach perfectly fits the research of the neurophysiological foundations of ethics, which have now become widespread. The dynamic development of science and the latest technologies (information, computer, gene, etc.) posed the problem of the neurophysiological foundations of ethics with a particular severity. Indeed, in science already at the end of the XX century there were first studies concerning the importance of ethics in solving the existential problems caused by the interference of genetic technology in the bodily nature of a human, as well as the importance of the biological foundations for ethics in scientific experiments, which receives scientific justification in modern research [8, 9]. Herein, we should take into account the fact that, on the neuro-physiological basis, the mental structures of a social individual are formed, without which the existence of ethical norms and values is impossible. An intensive development of the problem of neuro-physiological foundations of ethics in the context of neurobiology is also associated with the rapid development of neuromarketing and the enormous popularity of scientific research in the field of human brain [10].

At present, mankind is in a situation, when, thanks to the fundamental transformations of the world, the end of the «familiar era» (I. Wallerstein) is coming, which is closely connected with the increased truly strategic importance of nano-, bio-, info-, cogno-, and social technologies (NBICS-technologies) for the beginning of the new, fourth industrial revolution (Industry 4.0), literally turning the whole way of life both of the society and an individual therein. The ethics literature states that nowadays people express concern for the environment, as its destruction is able to put an end to our civilization. However, only a few try to comprehend the fundamental, strategic significance of the moral, or ethical, environment in the life activity of a human individual and the society [8]. The ethical environment is a kind of mirror, showing a person's reflection in the eyes of the world, although he often does not feel the impact of this environment. This ethical environment is generated and supported by human individuals, who, in this sense, are ethical animals raised in a certain socio-cultural environment that facilitates the implementation of a life-affirming or life-defying worldview.

In his monograph «Culture and Ethics», outstanding humanist thinker A. Schweitzer justifies the ethics of reverence for life, which is the interpenetration of the ethics of self-improvement and the ethics of self-denial. The core of this interpenetration is the elementary thinking that generates reverence for life, as it proceeds from the fundamental problems of man's relationship to the world, the meaning of life and the essence of good. Here we are speaking about the relationship of a man as a finite being to the infinite being of the surrounding world, which has an ethical character that was emphasized by A. Schweitzer [12]. He shows that a man bears a subjective responsibility that goes to infinity and represents a responsibility for the whole life that is in the sphere of his influence. Herein, a man becomes internally free from the outside world and at the same time strives to fulfill his responsibility, and that is the ethics [12]. In other words, the source of ethics is the man's deep awareness of the world-affirmation, which, together with the life-affirmation, is naturally inherent in his will to live and which he strives to realize.

The subjective responsibility of a human individual is the ethics that is of cosmic character, which is the connection of man's ultimate being with the infinite being of the surrounding world, a link constantly generated by culture that represents the unlikely potency of an infinite nature. It is clear that the subjectivity of a human individual lies not only in culture, but also in the biological evolutionary process appeared due to the mutual influence of the necessity and a chance. Recent
scientific achievements in the field of an understanding of the nature of life show that the understanding of biological evolution, developed by the science of the 20th century, is obsolete and incomplete [13]. This thesis is argued in the monograph by the foreign researcher E.V. Kunin «The logic of the case. On the nature and origin of biological evolution», which uses a new perspective on the probability of a spontaneous appearance of life, generated by modern cosmology. It should be borne in mind that «any time-stable replicator» is meant under the form of life therein [13]. It has been just any replicating system that is capable of evolution due to the joint action of drift and natural selection that allows us to approach the problem of the origin of life within the framework of modern cosmology. Unlike the old cosmological concepts, treating the finite Universe, the recently introduced model of the «world of many worlds» (WMW) is an infinite multiverse with an infinite number of island universes, which cardinaly changes the very definitions of the possible, probable and accidental. Basing on the WMW model, E.V. Kunin draws the following fundamental conclusion: «Thus, the spontaneous emergence of complex systems that could be considered practically impossible in the final universe becomes not only possible, but also inevitable in the WMW, although the a priori a probability of the vast majority of stories occurring in a given universe is vanishing small. This new force of a chance, reinforced by the anthropic reasoning, has profound consequences for our understanding of any phenomenon in the universe, including life on the Earth” [13]. Consequently, the hypothetical assumption that the human society, which appeared as a result of cosmo-bio-co-sociological evolution, evolved a variety of systems of ethical values, ultimately conditioned by the Multiverse, has the right to exist. Thus, everything is built in accordance with a chain as follows: life arises in an infinite multiverse (infinite being), then society appears with its culture and a human being (ultimate being), which is an ethical animal living in the ethical environment created by himself.

The scientific studies establish a fundamental empirical fact, according to which any system of ethical values is conditioned by a set of cosmophysical fluctuations of space-time, which also influence the ethical environment permeating the aggregate of social, political, economic, informational and other environments of society. These cosmophysical fluctuations of space-time are also manifested in fluctuations in the activity of the Sun, which lead to changes in the psyche of human individuals, to «hot» and «colored» revolutions, insurrections, rebellions, as shown by A.L. Chizhevsky [14]. It is clear that in such emergency situations a radical change in the ethical environment occurs, when the old system of ethical values is disintegrated, accompanied by negative, destructive social processes.

It should be noted that during the Leningrad blockade the ethical environment of the Soviet society was preserved with its high spirituality and patriotism, which strengthened the motivation to survive and facilitated the experience of the burden of blockade life [2]. As the blockade of Leningrad is 900 days of inhuman suffering, courage and heroism of its inhabitants. The «Blockade book» by A. Adamovich, based on original materials, documents, letters, memoirs of the survivor of the siege, tells about the defenders of the city, the heroic dramatic days of the defense of Leningrad during the Great Patriotic War [15]. No less remarkable is the book by S. Yarovoy “The blockade ethics», which describes the moral values of the Leningraders died in 1941-1942. The book's narrative is the description how people found their death in broken streets and frozen houses, in endless queues for bread, others managed to survive in inhuman conditions, but they all brought to us a story about their experience of torment, their perseverance, their pity and humanity, about how people gave their helping hands to each other in the blockade nightmare [16]. It is shown that works of art served as one of the powerful means of maintaining ethical standards, contributing to the survival of a human under the terrible conditions. «The thirst for art was simultaneously suppressed and consolidated under the blockade conditions» [16].

Art contributed to a strong motivation to survive on the brink of death, forced to exert strong-willed efforts to combat death, included creative brain activity in an extreme situation, as evidenced by the activities of legendary poet and publicist Olga Fedorovna Berggolts, scientist Mikhail Vasilievich Chernorutsky, who developed the foundations of the of alimentary dystrophy pathogenesis, the survivor of the siege and painter Elena Oskarovna Martilla and thousands of other famous and unknown devotees, martyrs and heroes. It is quite logical that in the speech dedicated to his 90th anniversary D.S. Likhachev cited his vexed during the Blockade thought that “a book saves from
death”. He believed that during frenzied hunger just the distraction from thoughts about food alienated the irreversible stage of alimentary dystrophy: “Books, namely stories and tales, and especially poetry, helped us a lot: they diverted our attention and created the conditions, under which a person continued to live, not “ate himself”” [2]. On the whole, art contributed to Leningraders’ survival, because it gave them a sense of high dignity, a sense of a person recognition that comes from the nature of art.

The Atlas of World Art proposes a new view on art as one of the oldest, most widespread and important types of human activity, and that is one of the reasons for the unchanged significance of art in human life to provide an elementary survival through an aesthetic form [17]. Therefore, it becomes clear why the work of art so strongly affects the emotional and intellectual world of a man, why many Leningraders under the extreme conditions of the blockade could survive through communication with works of art (it is not accident that not only Leningrad, but also all the front soldiers were thrilled by the Dmitry Shostakovich’s concert by the Leningrad Philharmonic in November 1942).

Results and discussions

In the present paper the axiological approach has been used for the first time as a methodological and logical basis for studying the materials and results obtained by Soviet scientists during the Leningrad blockade, and the most important discovery of them in human biology is the confirmation of the high vitality of a part of the population under the extreme conditions. The importance of the axiological approach in the field of biology and medicine to explain the mechanisms of the influence of such socio-cultural factors as social status, ethical and artistic values for human survival in life-threatening situations has been stated for the first time. A hypothesis that any system of ethical values has its roots in the depths of the Multiverse, which explains its significance for human survival in extreme situations is due to the fact that these values are rooted in the depths of the Multiverse. The importance of the aesthetic values (whose concentrated representation is art), which is based on intranuclear and cosmic processes, is shown. Prospects for further minimizing some consequences of extreme situations for humans are associated with the use of a number of scientific methodologies, such as axiology, neurobiology, artificial intelligence, robotics, nanotechnology, biomedical technology, and others.

Conclusion

For the first time identified is the importance of the axiological approach combined with neurobiology as a methodology and logic of scientific cognition, in which an important role is assigned to the perfect discoveries made by Soviet scientists under the conditions of the Leningrad blockade in the field of biology and medicine, which have an enduring significance for human survival in extreme situations that have become everyday’s phenomena in the modern world. Basing on the axiological and neurobiological methodology, the possibilities of using such socio-cultural factors as social status, ethical and aesthetic values, allowing minimizing the consequences of extreme situations for a human individual, are shown for the first time. A hypothesis has been put forward that the effectiveness of ethical values in human survival in extreme situations is due to the fact that these values are rooted in the depths of the Multiverse. The importance of the aesthetic values (whose concentrated representation is art), which is based on intranuclear and cosmic processes, is shown. Prospects for further minimizing some consequences of extreme situations for humans are associated with the use of a number of scientific methodologies, such as axiology, neurobiology, artificial intelligence, robotics, nanotechnology, biomedical technology, and others.

Statement on ethical issues

Research involving people and/or animals is in full compliance with current national and international ethical standards.

Conflict of interest

None declared.

Author contributions

The authors read the ICMJE criteria for authorship and approved the final manuscript.

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