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Russian Cosmism as the Origin of "Space Anthropology"

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Abstract: The study analyzes the problems of formation of Russian cosmism anthropological ideal. The representatives of Russian cosmism consider the anthropological evolution of humanity as an ascension towards the moral, spiritual, intellectual and physical perfection. For example, the views of K. E. Tsiolkovsky analyzed the views of some scientists about the atom of an ether, as a philosophical and ideological Foundation, to achieve and being committed to the existence of personality in the universe. In the framework of Russian cosmism is grounded a new scientific philosophical-anthropological direction "space anthropology", studies the possible ways of evolution of mind in the universe.

Key words: Cosmism, space philosophy, anthropology of space, Tsiolkovsky, the atom of ether

INTRODUCTION

In recent decades, was constantly and steadily growing the interest into cosmism, it philosophical and cultural heritage. The problem of social development and perfection of man were always in the spotlight of Russian philosophy, philosophy of cosmism, as part thereof but only fragmentarily developed in his research. We are talking primarily about the study of the creative heritage of the most vivid representatives of Russian science and philosophy which are referred to as "Russian cosmism": K.E. Tsiolkovsky, N.F. Fedorov, Vladimir Vernadsky and some other. All this largely explains the sustained interest in the history, theory and methodological problems of Russian cosmism, which since the 70-ies of 22 century is always in the focus of attention of philosophers, sociologists and anthropologists not only in Russia but also in other countries (Hagemeister *et al*., 1989; Dyson, 1660; Finney, 1992; Siddiqi, 2010; Young, 2012; Sagan *et al*., 2000). Scientific and public interest to Russian cosmism is associated with the development of practical cosmonautics which demonstrated the inevitability and regularity of the beginning of the era of exploration and development of space, space travels. Space exploration has become not only a natural part of human existence at the beginning of the 21 century but the form of his life, rooted in the structures of his thinking.

Significance of Russian cosmism is in the person of his classics (N. F. Fedorov, V. I. Vernadsky, K. E. Tsiolkovsky, A. L. Chizhevsky and others) is to develop original ideas about the ways and means to achieve social and personal perfection. Based on the understanding of the evolution of the universe as a whole Russian cosmism put the issue of social order as a condition for creating a harmonious order of the planetary whole conscious coordination development of nature and society. Abroad, at different times in line with such beliefs, worked P. Teilhard de Chardin and E. Le Roy, H. Oberth and R. Goddard, R. Essnau-Pelterie, G. O'Neil, F. Dyson, A. Clark and many others. (Lytkin,2000) Determination of possible ways of development of human civilization and the prospects of its sustainable existence has an important place in Russian cosmism and intellectual life of Western Europe (Lytkin, 2003).

Philosophical heritage of K.E. Tsiolkovsky in the context of Russian cosmism, as its classic representative, diverse in content and depth of elaboration of the general issues and individual issues. He had a deep insight, often ahead of their time, for example, in creating the philosophical and ideological bases for the development of the theoretical foundations of Astronautics and its practical development. In the early twentieth century, K.E. Tsiolkovsky and other Russian cosmists, saw the great importance that may have in the future for humanity global threat: ecological disaster, the issue of population, space disasters, depletion of raw material resources, etc. K.E. Tsiolkovsky came up to address these and other issues from an anthropological point of view. He was deeply interested in problems of spiritual development of man and mankind.

MATERIALS AND METHODS

Interest for the works of K.E. Tsiolkovsky maintained at a high level in recent decades. This is largely due to the fact that Tsiolkovsky has developed the ideas of cosmism in the classical form (Lytkin *et al*., 1995). At the same time, philosophical and scientific ideas put forward and justified in the context of Russian cosmism and Tsiolkovsky K.E. (preserved mostly in manuscript heritage) are in need of reconstruction, organizing, clarifying their philosophical-anthropological and socio humanitarian sense, the theoretical values and practical values.

The question about our space future in the heritage of K.E. Tsiolkovsky, place it in the "Cosmic philosophy" of the scientist and his worldview seems to be one of the most significant, pioneering and important both from the point of view of the K. E. Tsiolkovsky and from the point of view of the development of space anthropology (Lytkin *et al*., 1995). Actually, this part of his "Cosmic philosophy" provides an opportunity to talk about the anthropological position of the scholar, to determine K.E. Tsiolkovsky as the Creator, the founder of a fundamentally new directions in anthropology. The space anthropology (Lytkin, 2000). The major contribution to the understanding and evaluation of the anthropological views of K. E. Tsiolkovsky contributed their works of academician A.D. Ursul who rightly believed that the contradictory philosophical views of K.E. Tsiolkovsky was carrying a huge charge of the heuristic, essentially new ideas, in particular, in the problem of cosmic future of humanity (Ursul, 1977).

Of course, significant were the studies of E.T. Fadeev who considered the ideas of K. E. Tsiolkovsky on space the evolution of the mind is certainly important from the point of view of attempts to explain the problem of self-development of matter.

In 80ies of 20 century defined rethinking the anthropological views of K. E. Tsiolkovsky. On the one hand, this was due to the development of manned space flight, increased flight duration astronauts. Space biology and medicine began to receive new data allowed to talk about changing our ideas about the possibility of further biological evolution of man in Cosmos. In this regard began to change the perspectives on anthropological ideas of K.E. Tsiolkovsky. Changed assessment and the General philosophical views of K. E. Tsiolkovsky on the problem of space future of humanity. It has been considered in two main aspects: philosophical and anthropo-evolutionary. It should be noted here bright works of L.V. Leskov, where highlights the evolutionary optimism of K. E. Tsiolkovsky, antifinalist assessment of the prospects of civilization development, the increasing active role of man and reason in the universe. Must be commended the directions of researchers of V.M. Mapelman, constantly and adequately analyzing the ethical views of K.E. Tsiolkovsky and believe that in the anthropological component of the philosophy of K.E. Tsiolkovsky visible attempt of the scientist to determine the place of man in an objective and inevitable process of mastering outer space.

The particular importance for understanding the philosophy of K.E. Tsiolkovsky, currently have the works V.V. Kazutinsky. Repeatedly analyzing anthropological views of the scientist, he came to several fundamental conclusions. Over time, he increasingly appreciates the place of K.E. Tsiolkovsky among Russian cosmists, noting at the same time that K.E. Tsiolkovsky is typical consider a modern human as the middle option of development from the primitive to the perfect man (future) having a different biology (Kazutinsky, 1999). Principled position of V. Kazutinsky, later it becomes the recognition that the philosophy of K.E. Tsiolkovsky were not anthropocentric in nature because it was directed not on the person, but on the "atom-spirit", so, anthropocosmism of K.E. Tsiolkovsky has no anthropocentric values (Razutinsky, 2001). As we have said, from our point of view, in the center of ethics and philosophy of K.E. Tsiolkovsky was the man and the happiness of man. The social and anthropological ideals of K.E. Tsiolkovsky is a perfection, perfect man and perfect society. For happy is the atom-the spirit does not need by itself, it makes no sense, axiological value. But it appears and everything falls into place when we become at anthropocentric position in relation to the views of K.E. Tsiolkovsky. To a modern person the interest of the person (rational selfishness) will always come first. For example, the same ecological approaches have the same meaning-the preservation of the environment. For whom for the aliens Of course not, for ourselves, our descendants. Perhaps the term "anthropocentrism" is not quite correct in relation to the anthropocosmism. If we assume that humanity will meet with a different mind, then that position will immediately become flawed. Maybe the position of K.E. Tsiolkovsky would be more sensible to call "intellectualism" (intellectualcentrism), implying that the scientist was watching the earth's civilization from probable other civilizations of the cosmos. He believes that in the future they will come together, forming a "cosmic mind" which will become the "will of the universe", which determines the cosmic order of power, which all and will dispose of the (already owns, given the difference in time of formation of civilizations in the universe, according to the views of K.E. Tsiolkovsky). We

believe such a position is rational and takes into account the views of K.E. Tsiolkovsky and the majority of the representatives of Russian cosmism.

Why in his studies K.E. Tsiolkovsky begins to analyze the future possibilities of human evolution, linking it with evolution space? First of all, the idea of space exploration, penetration, and then dispersed all over the universe were part of the whole "Cosmic philosophy, part of the plan of K.E. Tsiolkovsky in the field of social progress and against the individual as part of society. On the other hand, Tsiolkovsky as we have already established, a negative attitude to modern humanity, both from the point of view of its social organization and from the point of view of the level of development of civilization and hence the level of development of people as individuals. In General, he came to the conclusion that modern humanity is very, very far from ideal, both on the intellectual and moral qualities, including their physical appearance. People are living in deplorable conditions, forced to work hard for obtaining food, they exist in unsanitary conditions, with minimum time and money of their own intellectual, spiritual, moral progress (Tsiolkovsky, 2001a, b). The low level of development of civilization and people leads to the fact that people persist in the basest, primal instincts and superstitions, their ignorance leads to the fact that they do not pay attention to the outstanding people do not understand them and often pursue: "History teaches us that many geniuses were not appreciated and ruined in the conception-life and limited surrounding medium, absolutely innocent people" (Tsiolkovsky, 2001a, b). But, humanity is still in its early civilizational path. The earth, according to the scientist, still a very young world. The evolution of humanity both social and anthropological, even an individual only starting.

Tsiolkovsky writes that people, as a result of evolution, only recently separated from the animal Kingdom: "Even the higher animals (man) is very imperfect. For example: a small life, small and poorly constructed brain, etc. are All, in essence, is only the result of adaptation to the conditions of life on Earth, mainly to life at the equator and a sign of incomplete phylogenetic development (evolution)" (Tsiolkovsky, 2001a, b).

Approaching the problem of anthropogenesis, K.E. Tsiolkovsky comes to conclusion that above all, humanity had completed its evolution, moreover the present state of human condition starting from the point of view of its evolution. On the other hand, considering man as a product of evolution, product of anthropogenesis, he notes that during its evolutionary development, people improved significantly. There has been a big anthropological change and most importantly, increased volume and "quality" of the human brain, the quality and level of human intellect. Increased lifespan of people. All this allows the scientist to conclude that the evolution has not ended, it is in a process, development, in the future mankind will change and will change for the better. And this will be particularly true in the case that will change the environment of life: "On other planets, under other conditions and structure of animal will be different. Land time also gives the best."(Tsiolkovsky, 2001a, b). Tsiolkovsky correctly assesses the main conditions of human evolution is the external conditions, the natural environment, in which the people. It affects primarily on our culture, society and gradually and on our body. The changing external environment, habitats, includes a powerful adaptation processes. First of all, it affects human culture. Begins ice age, cold snap and people begin to live in shelters (huts, caves), to make primitive clothes made of animal skins, use a different type of food (the colder the climate, the more fatty foods used in the diet). Finally, begin to develop technologies associated with intensive use of fire, tools, etc. All this entails gradual change of society from primitive herds of humanity goes to well-developed social structure. Finally, last but not least, the changing external environment affects the external, physical appearance of people. Genetically selected and secured with the properties of the body which contribute most to human adaptation in these climatic conditions.

K.E. Tsiolkovsky makes the only possible correct and logical conclusion that in a changing external environment evolution will continue and on those planets which is potentially alife, it will adapt to changing conditions there. (Finney *et al*., 2000; Lytkin *et al*., 1995). If we assume that all the planets of the Solar system could have its own inhabitants, their bodies, their organs, according to the views of K. E. Tsiolkovsky, would consist of the substance which prevails on the surface of these planets. The scientist concludes that: "on cold and on hot planets and possible creatures composed of those seas, atmospheres and soils that exist on the planets". (Tsiolkovsky, 2001a, b). On planets closer to the Sun is dominated by heavy elements. Therefore, there is in the composition of the body of native animals will include heavy elements. Planet remote from the Sun, especially the giant planets (Jupiter, Saturn) consist mainly of light elements which, basically, would be the bodies of local animals. The same applies to the temperature distribution of life. On Earth, animals and people actively exist in the Arctic at subzero temperatures year-round (including the peoples of the Far North). Aboriginal Australian population survives at temperatures reaching up to

+50°C. Not to mention the simplest organisms that can survive at temperatures far exceeding the boiling point of water and below zero temperature of liquid helium. Adaptability of life is extremely high. And this, in turn, leads to a startling diversity of animals. Thus, Tsiolkovsky begins to analyze the problem of cosmic evolution in several ways: first of all, it conditions the evolution of the (total) on the planets (including Earth, of course); further, that the possible types of living beings is able to inhabit other planets and finally, possible directions for the evolution of humanity, linked their fate with life in outer space.

As we have seen, Tsiolkovsky believed that the chief factor in the General evolution of living organisms are the conditions of their existence, namely, environment: temperature, climate, atmosphere and its composition. The composition of matter of the planet and, finally, one of the main parameters is the force of gravity. The scientist believed, overall, that the mind, evolving in space according to common laws in accordance with the principle of monism, should have similar views, but it is to be anthropomorphic. But the main factor that can really affect the differences, say, in the growth of living beings or the way they move (biomechanics), it is the gravity of the planet. Do we need gravity for the body and what the role, positive or negative it plays, set K.E. Tsiolkovsky the question. He comes to the conclusion that the gravity plays a likely role of a limiter, obstacles to the free evolution of the improvement of the body: "do a person the weight exactly the same as on Earth? When the outer semblance or similarity of the organisms (different sizes or height), weight inhibits the growth all the more the stronger she is. So this reduces the volume of the brain and therefore mental strength. Turns out that it is harmful"(Tsiolkovsky, 2001a, b).

Naturally, the weaker the force of gravity, according to the scientist, the greater in size and mass may be a living organism (for example, the largest animals on Earth live in the ocean, where the relative force of gravity is reduced). Therefore, the greatest scope for the free development can get creatures, potentially under microgravity conditions, or in conditions of zero gravity (weightlessness). That is why, starting from the laws of mechanics, Tsiolkovsky wrote, that: "If people lived on the planet with greater severity, for example on Jupiter, growth and brain would inevitably decreased. ...On the contrary, if we lived, say, on the moon, where gravity is 6 times less then the growth could be, under full freedom of movement, in 6 times more." (Tsiolkovsky, 2001). Thus, Tsiolkovsky first, from the point of view of anthropology, considering the likely forms of life in other (not earthly) conditions of existence. He comes to the conclusion that, in any case, it is possible to foresee possible ways of the development of life and of living organisms based on shared data of the natural Sciences. But, knowing the General options, primarily physical habitat, we can hypothetically imagine the image of an animal that inhabit the hypothetical world. He very rationally observes, that, in principle, not important for us was the appearance of the creatures from the aesthetic point of view, because the concept of beauty is relative, conditional and change with the development of society and individuals, "each person has their own ideal of beauty"(Tsiolkovsky, 2001a, b). What imagined Tsiolkovsky probability of these hypothetical animals, potentially able to populate other planets. What is their General view-growth, mechanics of movements and other probabilistic parameters. In General, the scientist notes that: "we are talking about creatures, like people, only better. Between them may be of various breed, adapted to life on any planets." (Tsiolkovsky, 2001). On Earth we see that water is the largest part of living organisms, since life originated in water and organisms by natural evolutionary use water as part of the original habitat, containing it within yourself (as animals sushi) or continuing to live in the water. But on other planets, for example, remote from the Sun, where low temperatures, water is a mineral, as are other liquid substances, e.g., various gases, hydrocarbons. So life might evolve on other liquid basis. That's why, Tsiolkovsky wrote that: "On cold planets predominate hydrogen on close-water vapor or other liquids, converted to liquid through heat. This will make a new conclusion: and on cold, on hot planets and possible creatures composed of those seas, atmospheres and soils that exist on the planets" (Tsiolkovsky, 2001a, b). Depending on temperature regimes of existence of animals of different planets can differ in their relative teplokrovnosti. The main condition here, the need for a degree of temperature stability because temperature fluctuation is absolutely disastrous for living organisms as, for example, on the moon, where the temperature difference in the shade and in the sun is hundreds of degrees (Tsiolkovsky, 2001a, b). Does not consider K. E. Tsiolkovsky necessary and the presence of direct solar radiation for the existence of living organisms."

Theoretically any energy to support life; for example: the energy of motion and rotation of the planet, gravity, heat, nuclear energy and other of its species" (Tsiolkovsky, 2001a, b). Depending on the gravity of the planets, as we noted above, animals planets would change in growth and the lower the gravity, the higher and greater they might be and Vice versa. However, in our view, there must be other, more complex principles of correlation between the size of the organism and the

magnitude of the force of gravity of a celestial body and, hence, its size. Need and the availability of powerful enough of the biosphere that could feed these creatures. However, as we will see later, Tsiolkovsky offers a very original version of the life of the creature, even in space, in interplanetary space, outside an artificial environment. K. E. Tsiolkovsky analyzes in detail the options of living creatures on the planets, or in the environment with reduced gravity: " The smaller the radius of the planet or its severity, the greater the growth of the organism. If not, the organs of movement (legs etc) become very weak or thin. If not, increase jumping animals or their movement speed. May be a combination of all the three cases... can be various combinations of the three of tem edge cases" (Tsiolkovsky, 2001a, b).

Thus, the scientist considers the possibility of existence of different species of living beings on other planets, depending on their habitat. Meanwhile, recognizing their tremendous variability, he comes to the conclusion that the functions of their organs, their structure will be directly dependent on external conditions to which these animals will adapt in the process of its evolution.

Finally, K.E. Tsiolkovsky, in his works, comes to the conclusion that human evolution has not ended.
Moreover, in the very near (relatively) future our evolution will continue its rapid development. This will be evolution and anthropological and social. This will be associated with early era of space exploration. K. E. Tsiolkovsky was convinced that exploration of space is an inevitable stage of development of any civilization in space, including earth's civilization. While scientists believe that some of mankind will live on Earth. But most will move to the artificial space of the home, will live in an environment without gravity, freely developing and improving, achieving excellence in terms of individual and social: "the Mankind at the same time and improved in all respects and were settled in the solar system.... Thus, the flux of life toward the Sun and stood around him in artificial dwellings, arranged and placed between the orbits of Mars and Earth, as well as closer and further from the Sun.". Here begins very active and fast anthropo evolution. Since, settlements in space radically changed the lives of people. This changes the main and basic parameters-changing the force of gravity. People begin to live and to live permanently in microgravity conditions, or under conditions of significantly reduced gravity (compared to Earth). Man begins to evolve intellectually, morally, biologically and socially radically. First of all, changes the magnitude of his brain. According to K.E. Tsiolkovsky, brain is crucial for the future intellectual development of man. With more it increases memory, "mental strength". According to him, in accordance with the laws of mechanics, the brain can easily increase 2-3 times, "When people will live in artificial dwellings, in the air,...and there, in the ether between the planets is no obstacle for volumetric development of the brain, if not to consider complexity of the brain and supply of organs which, of course, will limit the development of brain mass" (Tsiolkovsky, 2001a, b). Weightless, generally, according to the scientist, becomes a very comfortable condition of a new environment, it is possible for life. After all, living creatures in the water, where there is a reduced relative gravity, the person in conditions of normal gravity (standing upside down) may have, to make any movement and so on (Tsiolkovsky, 2001a, b). What dramatic impact of gravity is on the move "Weakened the force of gravity to reduce the mass of organs of movement" (Tsiolkovsky, 2001a, b). Moreover, microgravity will have a decisive influence on all other bodies and systems of the human body! This scientific foreknowledge dramatically confirmed in the present time.

The practice of long-term space flights shows that in the human body (the astronaut) in zero gravity there is a marked change. That's why experts in the field of aerospace medicine and biology note that: "At the present time are studied physiological mechanisms underlying changes in the condition of man during weightlessness" (Kosmolinsky and Kusnets, 1990). Monitoring of astronauts during long space flights revealed the following picture: after 10-14 day of stay in weightlessness begins muscle atrophy, particularly, decreased muscle mass lower legs and then thighs and legs (in the absence of a special set of exercises) after 1 month-starts active conclusion potassium and calcium from the body, reduces the bone mass, it becomes more fragile; after 6-8 month changes in the structure of blood, particularly red blood cells take a spherical shape. (Nauka, 1987).

RESULTS AND DISCUSSION

So, it is experimentally confirmed that getting into a different environment the human body immediately involves potential physiological adaptation mechanisms. In zero gravity, in remembrance of the astronauts (on the basis of personal contacts with them), is very comfortable, convenient. Requires a minimum of muscular effort. Major muscle groups were practically excluded from the work (except for the hands and three fingers, with which the astronauts move around inside the space station). Abrupt changes in the structure of the bone tissue are related to the fact that the skeleton is not already experiencing stress from the muscles. As a result begin to change. Change the amount and strength of the heart muscle

contractions, blood flow, relatively, slower. Changes in the structure of blood. Extrapolating the situation, it is safe to say that if not for special events during space flight (long daily, 2-3 hour, physical exercise, exercise your cardiovascular system with the help of special equipment, the type of system "Chibis", receiving special medical potassium and calcium containing preparations, etc.), it would be problematic, the return of astronauts to Earth after long flights. As an example, can result in the flight of spacecraft "Soyuz-9" crew of Sevostyanov and Nikolaev on June 19, 1970. In the course of this first long flight for 17 day, practically were not carried out any physical exercise, so the astronauts were faced with huge medical concerns after returning to Earth.

Now imagine the situation, writes K. E. Tsiolkovsky, when thousands of people settle in outer settlements and live there permanently. Of course, biological evolution will take place very rapidly as a result of constant, long-term adaptation to new conditions of existence. Eventually, inevitably, there will be a new type of people. Tsiolkovsky writes about the species diversity of the new man: "there Were many diverse and perfect in its kind species that are adapted to different gravity, different atmospheres, to life in the void, to life without food, etc. Indeed, there was even produced a breed which could live only by sunlight.

It was quite a radiant energy light. Meanwhile they thought and lived as the wise men were happy. Their knowledge of outer space was so high that we can't describe" (Tsiolkovsky). Based on the logical postulate about the inevitability of biological evolucii of the body, in the event of resettlement in a different physical environment, in an environment with microgravity, Tsiolkovsky develops his thought further and further, relentlessly following his method to explore all possible to of the absolute, he comes to the conclusion that the evolution will give rise to a new kind of humanity. We can call it conditionally Homo Cosmicus. In the limiting form, it is an absolute (physical, intellectual and spiritual epistemological, ethical parameters) creature immortal lives in eternal, blissful and happy life. It exists in outer space, traveling from one star system to another. It has a spherical shape, because it is ideally, from the point of view of Konstantin Tsiolkovsky, who describes it as follows: "Imagine a completely isolated special animal. It does not penetrate any gases, fluids or other substances. From it also they can't be removed. Animal penetrated only by the rays of light. Meeting here chlorophyll, dissolved blood carbon dioxide and other products of disintegration of tissues of the animal. They decompose them, connect and deliver: oxygen, starch, sugar, nitrogenous and various other nutritious materials... This cycle is done forever as long as the animal will not be destroyed" (Tsiolkovsky, 2001a, b). Homo Cosmicus of K.E. Tsiolkovsky is perfect, metaphysically, the absolute being of the future, the utopian ideal, the anthropological imperative. He referred Tsiolkovsky in the abyss of space and time, because the scientist himself considered this variant of the ideal as likely and, therefore, hypothetical.

CONCLUSION

Thus, Tsiolkovsky, speaking about the ideals of the cosmic man, comes to the conclusion that the future evolution of humanity will inevitably be linked with his output into space and his permanent settlement there.

This will lead to drastic biological, personal and social evolution of mankind. Will arise a new kind of people whom we may call Homo Cosmicus. This kind of man is cosmic and the anthropological ideal of man which Tsiolkovsky places in the actual infinity of time and space, as a limit and therefore an unattainable stage of development, as a moral and physical ideal of a man who in many respects is in the nature of anthropological utopia.

ABBREVIATIONS

- Archive of the USSR Academy of Sciences-Archives of the Academy of Sciences of the USSR
- Archive of the Russian Academy of Sciences Archive of the Russian Academy of Sciences
- Archive of GMIC of K. E. Tsiolkovsky-Archive of the State Museum of cosmonautics history of K.E. Tsiolkovsky
- IIEiT the USSR Academy of Sciences-Institute of history of science and technology of the USSR Academy of Sciences
- IIEiT RAS - Institute for the history of science and technology of the Russian Academy of Sciences
- KSPU of K.E. Tsiolkovsky-Kaluga state pedagogical University of K.E. Tsiolkovsky
- KSU of K.E. Tsiolkovsky-Kaluga state University of K.E. Tsiolkovsky

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