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**GLOBAL HUMAN TRANSFORMATION UNDER CONDITIONS  
OF WORLD TECHNOGENIC DEVELOPMENT**

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**Abstract**

In modern era, under the influence of systemic universalization, the human being as a biosocial creature experiences interrelated socio-cultural, socio-technological and socio-natural transformations. Socio-cultural transformations of man due to modern globalization are caused by the fact that under the influence of the global culture, a hierarchy of man's market-oriented qualities and values, combined with the increasingly lost traditional qualities, developed over the millennia of agricultural society existence, is built. Socio-technological transformations are caused by the fact that the vital activity of universal society is connected with the development of new environment – technosphere, technogenic lifestyle, using technologies to solve numerous problems, and even improvement of Homo sapiens. Under the influence of modern globalization, the social and natural aspect of transformations consists in the degradation of man as a natural and biological being, and degradation of his ancient natural characteristics. This is connected with reduced physical activity, and increasing mental, emotional and psychological burden, accompanied by losses in man's physical and mental health, his genetic transformations. Technosphere elements and processes have a negative influence on the human body, which is typical for cities and other towns. Technosphere, using the achievements of technoscience, initiates global changes of Homo sapiens in conjunction with artificial processes. This will eventually contribute to the formation of technogenic creatures. Interrelated social, technospheric and natural biological changes occur with different intensity in the bio-social nature of people who universalize technological societies. Contemporary globalization serves as a mechanism for changing the direction of human evolution and subordinating it to technosphere.

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## 1. Introduction

Global human transformation means radical qualitative changes that occur in people on a global level. Currently we can trace changes of the biospheric and technospheric man only, give some forecast on the formation of post human (biotechno- social and techno-social) creatures. Until a certain time, man created by the whole development of the biosphere developed mainly as a biosphere being and his natural inclinations prevailed over social abilities. Despite all the difficulties of survival in the biospheric environment, where his natural selection occurred, man corresponded to it. This man is rightfully called abiospheric man, because both his origin and vital activity were entirely determined by the biosphere status and evolution. The boundary of the transition to a post biospheric man is a technogenic change of the world. Thus, at the end of the XIX century, when Russia was an agricultural country and almost nineteenthths of its population lived in rural areas, biospheric dependence of life and activity was considerable: 43% of children died before the age of 5, four of seven children, born by an average Russian woman lived up to the age of 15-17. With the transition to an industrial society and with the creation of technogenic conditions, less than 2% of children die before the age of 5.

Biospheric man, or homo sapiens, has passed a long history, originating 5-7 million years ago from subhuman primates. According to the latest data, 300-350 thousand years ago, Neanderthal men formed and evolved, and predominated in Europe. About 200 thousand years ago, Cro-Magnon men came from Africa, who eventually annihilated Neanderthal men and probably assimilated with them. The major global change in the life of Cro-Magnon men occurred 40-60 thousand years ago, when on the basis of collective labor activities and communal life there were formed foundations of mythological culture and consciousness, norms of morality, developed languages for communication, primary self-consciousness, and more or less strong social consciousness. Some scientists call modern Cro-Magnon men i.e. the current men, ashomo sapiens, in fact, historical persons, showing their cultural heritage in the cumulative history of mankind.

## 2. Methods and Results

The study of problems of socio-technogenic development of the world, which is actively studied by a group of scientists in Bryansk state technical University under the guidance of the authors, has allowed to make a new analysis of the man (socio-natural approach) and content of many modern transitional processes on Earth planet (Trifankov, & Dergachev, 2016). This article discusses the evolutionary anthropo-technogenic change of human life. The latter lead to degradation and even destruction of the biosphere and biospheric life in the next three centuries, and to global and controversial transformation of the human.

A significant stage in the development of a biospheric man was the Neolithic period and the following ten thousand years of arable farming development. In 1800, 95% of the population lived in rural areas and about 90% were engaged in agriculture. Within 10 thousand years, there were formed agricultural civilizations, so-called traditional societies. A farmer, successor of the tribal person became a typical man on the Earth. Significant changes of natural and social kind began to happen to the man since the Neolithic period and agricultural development of the planet. It was during this period when social

life began to develop, and consequently, man's social qualities, and the pressure of natural selection started to reduce. "The man himself in his social history, –Kaznacheev (2014), states, for example, - is increasingly driven by goal factors, mediated by culture elements, social needs, slipped from the realms of natural selection and entered the area of the cultural bio-social evolutionary process. Soviet biologist Koltsov (1924), showed in the 20-ies of the last century that within about the last 8-10 thousand years, the pressure of natural selection dropped a thousand times. Nowadays, the pressure of natural selection on man probably decreased twice more". And further he says that "the issue of humanity autotrophy formulated by Vernadsky (2001), is obviously not used enough in modern researches"(Kaznacheev, 2014).

Global transformations of abiospheric man concern such issues as the formation of races, four blood groups, changes in the division of labour, education and family development, lifestyle, social consciousness and self - consciousness, social qualities of people, etc. On the boundary of transition from an agricultural to an industrial society, a high level of harmony of natural and social human qualities is also noted. As Berdyaev (1989) writes in his paper "Man and machine", technical civilization separates man from his foremother – earth, makes him a supernatural creature and strikes humanism, humanistic world outlook, leads to man's dehumanization.

The current global transformation of a biospheric man is connected with the technological development of the world as a result of the industrial revolution, industrialization, urbanization and technological revolution that, in fact, defines a modern global transition of life, and man as well. This transformation was particularly evident in the twentieth century, and at increasing speed, it is taking place in the current – twenty-first century. Growing destruction of biosphere with the development of the industrial society and dynamic formation of techno-noosphere, especially in the second half of the twentieth century, is characterized not only by reducing the pressure of natural selection and physical load, but also by serious transformation and degradation processes in man (Demidenko, 1993).

It is known that in the early twentieth century (2006) half of the world's population already lived in cities (3.3 billion people), experiencing the most powerful factors of socio-technospheric development. And although the average duration of human life in industrial society reached 70-80 years, or grew twice compared to the average life duration in a developed agricultural society, however, degradation of natural qualities of the population increased dramatically, and the increase in life duration is explained by the establishment of social and health care infrastructure, better nutrition, lifestyle and high level of education.

### **3. Results & discussion**

A biospheric man under the conditions of rapid technological development is gradually turning into a technospheric man who can fully support his livelihood in technospheric environment characterized by high life comfort. If within two centuries, the urban population increased from 0,045 up to 3 billion people, then by the end of the XXI century we can expect up to 9 billion city dwellers of 11 billion humans. Degradation processes of mankind manifest in technogenic society as a "civilized - urban" – cardiovascular, oncological, allergic, mental, genetic, endocrine, etc. All of them, as many researchers in medicine and biology point out, are organically linked to the destruction of immune, cardiovascular, endocrine, reproductive and other functional systems of a human and are caused primarily by changed

conditions of life and vital activity, among which difficult environment and increasing technogenic impact are leading ones. Pathological phenomena are extremely evident in the body and life of man in the environment of a big city (very technospheric one), especially saturated with synthesized chemicals. Thus, during four decades (the thirties and the seventies of the twentieth century) air pollution in Los Angeles increased about 40 times, and almost in the same proportion — many pulmonary diseases, including lung cancer. In the twentieth century, cancer among the male population of the US A increased from 4-5% to 36-37%, and allergic diseases — ten times, and reached the level of 14-15%.

Because of the transition of mankind to technospheric environment former natural, especially genital (childbearing) functions and characteristics of man are lost. So, in the most developed countries of the world (i.e. technospheric, urban) 60-80% of mothers are unable to breastfeed babies with human milk and use artificial milk formulas. This most often occurs due to the fact that city girls are separated from the natural world and do not get the necessary nutrients, that leads to weak development of their mammary glands. If in the XIX century only 4-5 % of women needed medical care for childbirth, now the majority do. In highly industrialized countries, there are many maternity hospitals where most women give birth by caesarean section. Every fourth woman gives birth using this way in the U.S. In Canada, approximately one third of women up to age of 60 hysterectomize even if its disease is not very critical to avoid cancer and other dangerous consequences. Men also have serious problems, especially in big cities; it is the growth of impotence (40% in the USA), a sharp decline in sperm quality and production. According to some studies, in the twentieth century, the sperm production decreased by 50-60% and over the last 50 years of the twentieth century — almost by 40%. There are fewer active spermatozoa. Domestic and even wild animals exposed to chemicals show similar processes.

All above-mentioned stresses not only the problem of population reproduction, but also the issue of life extinction on the planet, "eco-technological apocalypse" of a biospheric man. Since there is a significant decrease in immune protection of a man, there are built special clinics for saving children; where they live in a sterile clean environment, and come outside in protective suits. This trend may lead to the need to create special technospheric conditions for a significant number of people in the technospheric world (Demidenko, 2003).

Technospheric man replacing a biospheric one is still a man, although he has modified natural and especially social and technogenic qualities. The integration of social, technical and biological in man under the influence of industrialization, urbanization, informatization and other contemporary social processes till remains unnoticed. A modern man is already characterized by a significant presence of "techno" in his body. But such processes and negative trends are increasing: a substantial loss of natural health, destruction of human bodies leads to the fact that medicine increasingly intrudes into biological tissue of a human, healing and changing it. We can assume that in the XXI-XXII centuries, hominids will not be able to maintain their life and activity without sophisticated equipment. And if human life was supported and regulated by biospheric processes before, now it is more and more determined by social infrastructure, medical and recreation equipment. Moreover, there is an increase in replacement of natural organs with artificial ones. If in 90-e years of the XX century such a change increased by 3 times, in the first decade of the XXI century it is about 5-6 times. Now, there are about 1 million of human-cyborgs who have artificial bodies controlled by human brain, or automatic devices. Artificial organs, electronic computers, target and home computers, replacing man's mental operations, functioning in an increasingly

complicated technosphere and many others mean that in the biological tissue of the CRO-magnon, there is a new creature developing – biotechno-sociological, in fact “post-human”, the way from which to a "biological cyborg" is a short time.

Bolonkin and Moravek (1993), computing philosophers, are sure that at least within 150-200 years there will be a more perfect creature (than man) made of artificial materials, which will perceive human culture and will go to explore the outer space. Alexander Bolonkin, Doctor of Engineering from Russia, worked for NASA and was engaged in developing such a post-human being. If a technospheric man is still a transformed type of a CRO-magnon, then a bio-techno-sociological creature is beyond its limits. Uncontrolled development of the technological world brings us to the "end of the world" not only of biosphere, but of a biospheric man as well. One of our current goals is to preserve the biosphere and the man, created by it.

At this point, it is necessary to stress the formation of a new life on the planet under the conditions of increasing technogenic development – almost entirely artificial world (cities, settlements, large buildings, roads), covering more than 4 % of the earth's land (with 16-17 % if not more at the end of the current century) and at the same time, more than half of the population living there (i.e. citizens), as well as semi-artificial covering more than half of the land affected by already anthropogenic (i.e. not fully biospheric) soils. Only these two facts clearly indicate new trends in the development of the modern society and the whole world, transforming the man. Now the most dangerous parts of the technosphere are artificial xenobiotics synthesized by man and destroying vital processes of living creatures. Their inflow into the existing environment is growing like an avalanche, making the heavy-duty effect of a thermonuclear bomb exploding slowly over several hundreds, if not tens, of years and leading to the destruction of the biosphere and biospheric people (Antropo-technogenic degradation of the biosphere, 2014).

"The effects of synthetic materials on humans are not studied enough so far, as researches of toxic properties of only one substance require up to five years and nearly 600 thousand dollars, - E. V. Ponomareva says, in her book "Xenobiotics". If you want to know how a substance affects the human genome or what is the probability of cancer from its exposure, than 1.3 million dollars will be required in addition. Therefore, using synthetic substances, man often does not know about the consequences they can cause. For example, the United States produces 3350 kinds of pesticides, but only for 121 of them have complete information on toxicity. There are more than 3400 widely used makeup preparations, but data on toxicity are only available for 13 % of them. In developed countries, there are 1338 synthetic compounds produced on a large scale, but only 147 have data about their safety. And among 65 thousand chemical substances in the world of business only less than 1 % have been studied for their toxicity. We can say that mankind puts itself to a chemical experiment" (Ponomareva, 2007).

The scope of growth of artificial xenobiotics negative impact in mass commerce can also be proved by the facts of cancer growth of "cigarette chemicals" throughout the world and particularly in Russia in the last decade. One can say that smoking has always been harmful. It is difficult to argue this. But smoking in the past, before anthropogenic rapid social development, did not have big negative effects, especially cancer. According to one German doctor, who in the early twenty-first century gathered data on lung cancer in the world, he counted more than 500 cases of lung cancer in all developed countries, including smokers, and in 1990 in the United States and the Soviet Union, there were already one million of these patients. The matter is that until the twentieth century for the production of cigarettes they used tobacco

grown on natural, biospheric soils containing "biospheric chemicals" in its composition, that is, only those chemical elements and in a certain proportion, from which animals, and then human body were formed for many millions of years. This is quite clearly proved by the facts of good compatibility and high efficiency of medicines made of biological tissues of living organisms, as well as allergies and many other illnesses which occur quite often because of synthetic drugs.

As it is shown in the studies carried out in 28 of the most developed countries in the period of their active industrial development (60-80 years of XX century), cancer among female smokers has increased by more than 200 times in just 20 years, whereas among non-smokers who are under relatively little chemical-technogenic pressure this figure is only 10 times. And further "chemical promotion" of cancer from cigarettes just gradually increases, though the industrial and anthropogenic pressure in the so-called post-industrial countries, where the vast majority of the population is employed in the service sector (about 80 %), significantly decreased; growing technogenesis here is already not due to the manufacturing process, but due to the increasingly artificial and not environmentally safe products. The danger of modern smoking process is determined by the cultivation of tobacco with the use of mineral fertilizers and chemicals, various additives, the integration of nicotine with pollution in the atmosphere, a serious decline in the activity of the human immune system in the technogenic conditions of his life, etc. At the beginning of XXI century, 1200 people die on average a day in the United States because of smoking or about half a million a year; that's more than US losses in world war II and the Vietnam war combined. Statistics show that smokers at the age of 40-49 die 3 times more often than non-smokers. Smokers suffer from chronic diseases such as bronchitis, asthma, pulmonary tuberculosis, lung cancer, cancer of the mouth, lips, their gastritis, peptic ulcer and many other diseases become worse. It is not the full list of consequences because of smoking.

Now, we introduce heavy metals, radioactive elements, automotive exhaust gases, synthetic chemicals, etc. in the biosphere biotic cycle that is not only beyond the scope of harmony with the biosphere by the human body, but also causes the strongest transformational changes of his natural qualities, and changes in other animals, existing in the expanding technospheric conditions. Therefore, aurochs in Belovezhskaya Pushcha (Romanchuk, 2013), as reported in the press, lose their ability to reproduce the herd, they are placed in ecologically clean regions of Russia. The problems of increasing technogenesis concern fundamentally man regardless of his living in the city or outside of it, because technogenesis covers more and more of the world together with filling geobiochemical processes with artificial chemicals. The latter cover almost all life on the planet and its environment, penetrating into the life with synthesized chemicals, artificial xenobiotics. Now researchers find about two thousand artificial inclusions in the human body, ranging from medical drugs, artificial organs and various chemical contaminants. In towns and cities the milk of women, breastfeeding children, there are up to 300 or more different substances, and many of them do not contribute to the normal development of the child's health. Xenobiotics, which are still little-known, do not cause widespread protests against their production yet, although they radically and at the same time adversely alter life processes. For example, in 70-e years of the XX century, according to medical scientists, men of Russia had approximately 70% active sperm, and at the beginning of the XXI century their number reaches only 50%, indicating the swiftness of transformation processes in the organism of a modern man. Reduction of child birth is due not only to the deteriorating socio-economic conditions, but also to technogenic conditions of human existence.

On the basis of the above mentioned, we can draw a conclusion that excessive technological development of the world community and the rapid technogenic penetration into the earthly nature, in particular, into living substance and world's population, is one of the most dangerous global problems of modern development not only of humanity but of the entire planet comparable only to a thermonuclear world war. Hence there is one of the major problems: a need to carry out a fundamental research of the current stage of technogenic socio-natural development of the earthly world, and especially a research of the dangers of artificial life on our planet. This task can only be solved by international and at the same time deep interdisciplinary research, since it is very costly and cannot be stretched for a long term. It is organically connected with the need to take emergency measures according to the research results in order to change the vector of mankind development and earthly bionature. We can confidently say that natural evolution of life self-development on the planet is over, and now there is a strong necessity, as Vernadsky (2001), wrote, for the collective humanity on the basis of collective mind (science) to build a reasonable, i.e. humane noospheric world on the planet.

As a result of socio-technological development there is formed a biotechnogenic man (according to Burovskij 2008; Gnatic 2010; Kutyrev, 2012), who is the result of technogenicsocio-natural evolution. His technogenesis will increase due to the use of the latest technologies. Those problems are discussed in the works of Bryansk Scientific School (Trifankov, & Dergachev, 2016).

#### **4. Conclusions**

Thus, in the modern era, under the influence of systemic universalization, the human being as a biosocial creature experiences interrelated socio-cultural, socio-technological and socio-natural transformations (Dergacheva, 2016).

Socio-cultural transformations of man due to modern globalization are caused by the fact that under the influence of the global culture there is built a hierarchy of man's market-oriented qualities and values, combined with the increasingly lost traditional qualities, developed over the millennia of agricultural society existence. Collectivity and unity, traditional humane living standards are replaced by individualism, selfishness, the desire to use human and natural resources for own benefit, which is determined by the degree of involvement of the individual (and the country) into the global market economy of technological societies.

Socio-technological transformations are caused by the fact that the vital activity of universal society is connected with the development of new environment – technosphere, technogenic lifestyle, using technologies to solve numerous problems, and even improvement of Homo sapiens.

Under the influence of modern globalization, a social and natural aspect of transformations consists in the degradation of man as a natural and biological being, and degradation of his ancient natural characteristics. This is connected with reduced physical activity, and increasing mental, emotional and psychological burden, accompanied by losses in man's physical and mental health, his genetic transformations. Medical care of weakened people leads to disruption of natural selection mechanisms and genetic pathologies. All this combined with bad lifestyle habits and distribution of technogenic food in the globalizing community contributes to the increase of diseases of civilization. Technosphere elements and processes (especially its chemical and electromagnetic components) have a negative influence on the human body, which is typical for cities and other towns. Technosphere, using the achievements of

technoscience, initiates global changes of Homo sapiens in conjunction with artificial processes. This will eventually contribute to the formation of technogenic creatures.

Interrelated social, technospheric and natural biological changes occur with different intensity in the bio-social nature of people who universalize technological societies. Therefore, contemporary globalization serves as a mechanism for changing the direction of human evolution and subordinating it to technosphere.

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