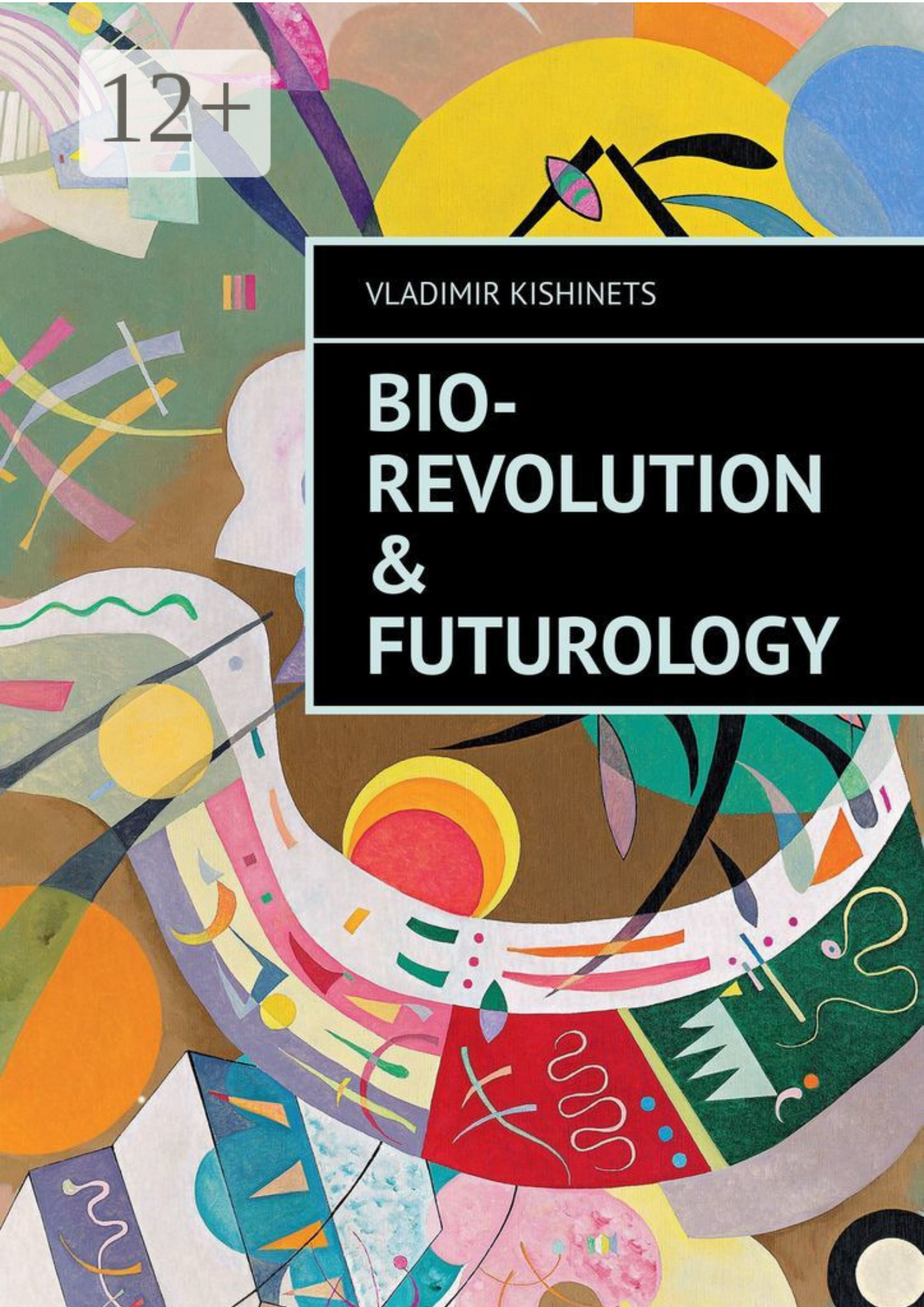


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VLADIMIR KISHINETS

**BIO-
REVOLUTION
&
FUTUROLOGY**



Vladimir Kishinets

Bio-revolution & Futurology

«Издательские решения»

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The book contains a popular description of the results of the analysis of some humanitarian (socio-psychological, economic, political, etc.) consequences of the development of emerging technologies for managing human biology.

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Bio-revolution & Futurology

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This small collection begins with a translation of the article “Catch the biorevolution train...», published in November 2019 in “Invest Foresight” magazine, which can be considered an introduction, an annotation to the second, more detailed work, “Bio-revolution is coming” (2018).

V. Kishinets

Catch the biorevolution train, or why futurology is needed

Very briefly about where the progress of biology leads and the importance of studying the future in three parts.

1. Biotechnologies and life GMO people? Yes

At the end of 2018, a chinese professor announced the birth of two twin girls in whose embryo he “disabled” the CCR5 gene. He explained this as a desire to make children immune to their father’s HIV infection.

Although we are talking about the world’s first genetically modified people, the main reaction to the event was the indignation of experts: the Chinese applied a new, breakthrough method of editing genes CRISPR/Cas9 (“Crisper”), which is actively used for editing DNA, but creates side effects and such experiments on people are considered, so far, not ethical and are prohibited in many countries. The Professor has been subjected to state censure and does not get in touch. To date, the fate of the children is unknown...

However, not all experts support a complete ban on such experiments. The characteristic news was announced by the BBC in a note: “a Russian biologist wants to create genetically modified children. What hinders him and what does Vladimir Putin have to do with it?” (www.bbc.com/russian/features-49883302). Dilemma between the danger of such experiments and their enormous potential benefits is a difficult, demanding, scientific and ethical problem.

However, despite the complexity of the situation, there is no doubt that **the widespread use of genetic technologies in humans is only a matter of time. The world is on the verge of managing human biology.**

Why should manage biology?

The need for this is quite clear: human bio-physiology, formed by evolution, is very imperfect. One of the consequences of this is, for example, thousands of fatal diseases and minor ailments that torment people.

Although modern medicine of tablets and scalpels has achieved great success in the fight against them and continues to develop actively, its fundamental limitations are obvious: it will never be able to cure all diseases, it will not be able to give what a person really needs – absolute health. There is only one way out of this impasse, which seems paradoxical at first glance – we need to change and improve... biology of people themselves.

Health medicine

The General meaning here can be explained as follows: it is known that living beings suffer only from diseases that their biology allows. So people are genetically protected from swine fever viruses, and animals do not suffer from many of our diseases. This means that purposefully changing (modifying) the genome can make a person immune to infections. It is even more obvious that biological modification (biomodification) is the only remedy for hereditary and genetic diseases, somatic and mental.

The theoretical possibility, the visible progress in the development of genetic biomodification technologies and their understandable huge benefits leave no doubt that such a genetic and biological biomedicine will be created in the foreseeable future.

It will become the embodiment of the idea of “health medicine” that eliminates the root causes of pathologies, while the modern, struggling with their consequences, “medicine of diseases”, will develop as a means of emergency assistance in case of accidents, injuries, etc.

More than medicine

But biomodification is not just about fighting diseases. This is the path to victory over the most inexorable biological “curses” of intelligent man-aging and physiological limitations of life time.

This possibility is determined by the fact that living structures that have the ability to self-renew at the cellular level are potentially immortal, and the aging that kills them is not some kind of wear

and tear of the body, as it looks outwardly. Aging that ends in death is part of the generational change mechanism, a biological program for freeing the living space from the parent individuals who have fulfilled their evolutionary functions.

Like all life-cycle programs, it is written in DNA and, therefore, by modifying the genome, it can be stopped, disabled, reversed, providing a person with permanent youth and a physiologically unlimited life span. At the current level of development of fundamental biology, solving the mechanisms of aging and creating technologies to counteract them is inevitable. Of course, such (physiological) immortality will not save you from death in disasters, but the average life expectancy can increase not by 10—20 years, as is dreamed of today, but by many hundreds of times.

But that's not all. With the development of technologies, biomedicine will allow you to literally control the human body, change the appearance, face, volume of fat deposits, muscles, length of limbs (bioplasty), as well as change the psycho-cognitive properties (psychoplasty). Thanks to this, people will no longer be the result, figuratively speaking, of a lottery of a combination of parental genes, but will become the real masters of their body and spirit. Against the background of the victory over diseases and aging, these opportunities may seem insignificant, but, as the analysis shows, they will be extremely in demand and will allow solving the problem of innate bio-physiological inequality of people that is insurmountable today.

It is not difficult to understand what serious consequences in interpersonal, economic, socio-political relations will result from the implementation of such real, and not normative, human equality.

Thus, the scientific revolution in biology that is beginning today can give a person truly the greatest, incomparable, benefits of life: absolute health, eternal youth, the ability to change and live thousands of lives.

On the progress of biotechnology

Although such prospects may seem fantastic, there is hardly a serious specialist who denies the fundamental possibility of such technologies. Moreover, their analogues have existed in nature for billions of years and all living things, including humans, are actually the result of a chain of genetic changes implemented with the help of a huge number of biological technologies created by nature.

In fact, the phenomenon of life is the sum of natural biotechnologies.

Some elements of this natural toolkit have been used in biology for a long time, but the creation of the mentioned CRISPR/Cas9 opens up new horizons.

It is based on a natural molecular complex for destroying viruses in bacteria, isolated and ingeniously adapted by biologists for previously inaccessible manipulations with DNA in multicellular organisms. This was not only an important practical, but also a scientific and ideological breakthrough. This use of natural biotech will significantly accelerate the creation of biomedicine.

Of course, there are still many problems to solve. Today, only the very first steps have been taken towards the creation of publicly available biotechnologies, towards the solution of the main, grandiose and extremely complex task of ensuring the inalienable right of access to them for the entire population of the earth. At the same time, the dynamics are obvious – the predictions made in 2005 about gene-cell technologies are being implemented even ahead of schedule, and important discoveries can happen here at any moment.

2. Revolution of revolutions

Thus, we can state that man is approaching the most important event in his history – the creation of technologies for improving and managing his biological basis. It is easy to understand that no conceivable scientific discoveries and inventions that are certainly waiting for humanity ahead, can not be compared with this in its significance. Therefore, the success in creating biomedicine can rightly be called the greatest scientific revolution.

However, it will not only be a scientific and technological revolution. Its social, humanitarian, and civilizational consequences will be no less grandiose. They are inevitable, because everything in our world – interpersonal relations, economics, morality, politics, law, religion, art, absolutely everything – is ultimately determined by the biological properties of a person and their change is a change in the Foundation of the world order.

It is difficult, for example, even to list the changes in people's lives as a result of overcoming aging: from the return to work of the mass of rejuvenated pensioners and the acceleration of population growth, to changes in the attitude of future super-long-livers to work, to marriage and family relations, to life and death, to violence, wars, to physical risk, art, entertainment, etc.

No less revolutionary will be the consequences of other areas of biomedicine application.

Problems of the revolution

The final results of this biosocial revolution will be unequivocally positive. It will make people's lives much more comfortable, safe, and reasonable. However, it will not be without serious problems. It is expected that the processes will be complicated when the inevitable contradiction of new forms of human existence with the previous economic, political, legal principles and mechanisms will require their fundamental, global changes.

The obvious consequence of such a radical restructuring will be a transition period with widespread destabilization of management systems, disruption of economic and production-technological ties. As the analysis shows, it is very likely that this will lead to a special global crisis that cannot be resolved by today's methods, to a widespread drop in production, a decline in living standards, etc. Only way to mitigate it is to prepare technical, political, and social measures to counteract it in advance.

This will require huge efforts and a lot of time, and much will depend on how timely responsible politicians, scientists, entrepreneurs, and everyone who is able to influence the course of future events will be able to understand their logic and meaning.

It is obvious, however, that the upcoming changes are so non-trivial and go beyond ordinary ideas about the future that it is impossible to understand and predict them without serious scientific analysis...

Revolution today

But biorevolution is not only a problem, even if not so distant, but of the future. Even today, it sets quite specific goals.

The most obvious one is the full activation of biological research. Its main, humanistic meaning is obvious: every day that brings the creation of gene-cell medicine closer is a real saving of millions of human lives.

It also has a political aspect. As information about the priceless benefits of genetic medical technologies spreads, people's desire to get access to them will gradually expand and strengthen, take the form of a kind of universal ideology, and efforts to create a national biomedicine will become, having pushed aside many other problems, the main criterion for the effectiveness of politicians and States. This will create new factors in domestic and international politics.

They will also affect the economy and business: along with certain problems, new opportunities will open up to meet the changing needs of people and participate in high-tech developments, not

only in the field of biotechnology, but also in improving their highly knowledge – intensive tools-physical, technical, information, mathematical, chemical-that require the development of a wide range of natural science and engineering areas.

(By the way, businesses are already reacting quite actively to these opportunities. Abroad, companies have begun to appear EN masse, proclaiming their goal to radically extend human life, and in Moscow, Forbes magazine is preparing a business conference “Investing in immortality”).

3. Time of futurology

Choose the right train

In General, this is quite consistent with Russian directives on scientific and technical mobilization: “Time is being compressed, the scale of tasks and challenges is very large, it is huge. If we continue to spray money, move slowly forward, we will simply be late. ...Even in the last car of the ‘technological revolution’ we will not have time to jump” (V. Putin).

Not to waste money means, among other things, to determine priorities, to choose from a variety of “technology trains” correct, reliable routes. This means, first of all, that the chosen technological directions should be realizable, and not just fantasies.

But not only that. It is also important to understand their humanitarian significance, to assess the socio-psychological, political (and not just defense and industrial) consequences of their implementation. It is necessary, figuratively speaking, to decide what will be especially important for people in the future – the technique of moving to Mars, wind energy or life without aging.

(Underestimating this “humanitarian” criterion can be fatal – the Soviet Country, without actually losing the arms race, suffered a catastrophic defeat because of its disregard for the human factor and the need to respond to the changing needs of people, including the emergence of new technologies).

However, this “humanitarian” analysis is in many ways more complex than scientific and technical analysis. It is often required from the authors of discoveries and inventions themselves, although it is quite strange to expect from specialists in electronics or molecular biology a deep understanding of the impact of their work on the future of social relations. Not surprisingly, the result is usually limited to the statement – “this technology will change the world”. On the other hand, there is no more benefit from the philosophy of social scientists who are not immersed in scientific and technical problems.

Only futurological research, i.e. synthesis of analysis of technology development with analysis of their interaction with a person, can give a real idea of future trends. Only this combination of natural science, engineering and human studies knowledge allows you to get a real idea of the future, to understand the laws of its formation.

Unfortunately, in the West today there are no, at least in the public domain, any serious futurological works of this kind. We do not pay attention to this either.

Time of futurology

At the same time, the role of futurological Analytics goes far beyond the choice of technological priorities. Thus, it is quite obvious that an adequate view of the global future is a prerequisite for success in making any strategic decisions in foreign and domestic policy, in the economy, defense, training, etc.

It is less obvious that futurological forecasts are an ideological, worldview factor, a tool for forming ideas about development goals in the public consciousness, opening up new horizons.

This is especially important for young people who feel the need for new, beyond the ordinary, incentives for activity. It is not surprising, therefore, that, for example, the more than dubious idea of the American entrepreneur I. Musk about the future colonization of Mars, aroused the enthusiasm of a considerable number of young people both abroad and here...

This example illustrates another obvious fact:

a society that is not able to formulate its own vision of the future is forced, one way or another, to focus on goals defined by others.

...Today, in a situation of “compressed time”, when the premonition of technological breakthroughs and their global consequences is literally in the air, the development of domestic futurology is of particular importance. No new colliders or spacecraft are needed to analyze future

changes, but its importance cannot be overstated. The future must be studied. At least in order not to be late for the train biorevolution.

Bio-revolution is coming

Preface

This book is a brief description of some of the results of many years of study of future social, psychological, biological consequences of the development of new important technologies, especially biotechnology¹.

In this small work, I tried, without much detail and justification, to give a general idea of the emerging biomedicine and the enormous human and civilizational changes that its inevitable introduction would cause.

* * *

In the history of humankind, we can highlight some special (meta-historical) events that drastically change the direction of its development. These events represent the introduction of technologies that are especially important for the existence of people.

Such an event was, for example, the long process of mastering fire by primitive humanity and, above all, using it for the heat treatment of food. The cardinal expansion as a result of this base of food of the ancient people changed their position in the biocenosis, became an impetus to appearance of Homo sapiens. Closer to us, the development of steam and electricity has immeasurably increased human power, led to the industrial revolution, to enormous socio-economic and political changes, to the beginning of the era of scientific and technological development.

As a result, over the past 150—200 years, people have gained

immeasurably more knowledge about the world and created significantly more technology than in many previous millennia. It is quite logical that this new knowledge today leads to the creation of technologies that will once again change the paradigm of the existence of mankind. Today we are on the threshold of a landmark event – the biotechnology revolution.

This coming revolution of revolutions will be the inevitable consequence of the great success of science, which has now reached an understanding of almost all the basic mechanisms of the phenomenon of life.

It is quite natural that this understanding will inevitably be followed by the creation of a new biomedicine, which will be able to save a people from many natural imperfections.

Already the first steps in this direction open fantastic prospects – not only the complete deliverance of people from thousands of diseases, but also the victory over the curses of aging and inevitable mortality.

The pursuit of this goal will soon become a new universal ideology, and its achievement – the greatest act of humanism in history. However, many difficulties and challenges remain to be overcome along the way...

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¹ My first work on the topic: “Nano Sapiens, или Молчание небес”, 2005.

1. ACTUAL IMMORTALITY

*Listen, I tell you a mystery:
We will not all sleep, but we will all be changed...
The First Epistle of St. Paul to the Corinthians*

Predictions

It is impossible to describe in such a small work all the scientific and technological prerequisites for the creation of a new biomedicine that have appeared in recent years². The evidentiary presentation of their details would take too much space.

Therefore, we will simply confirm our statements with a few facts and quotes from authoritative sources:

April 2010. Pope Benedict XVI: “Man’s resistance to death becomes evident”, modern science seeks to find means that save not only from all diseases, “but for our ultimate destiny – for death itself. Surely the medicine of immortality must exist.”³

In 2013, at the opening of the established Google company “Life” (Calico), it was announced that its goal – to extend human life for at least 500 years. Today all activities of the company are classified.

October 2017. President Vladimir Putin: “... in the near future [humanity will enter] in a very difficult and very critical period,” science is capable of “getting into the genetic code” and approaching possibility of creating people “with given characteristics.”⁴

² More information about them can be found in my work “Актуальное бессмертие. 1. Надежды и перспективы”, 2017, (Actual Immortality. 1. Hope and Prospects).

³ http://www.vatican.va/holy_father/benedict_xvi/homilies/2010/documents/hf_ben-xvi_hom_20100403_veglia-pasquale_en.html

⁴ <http://www.kremlin.ru/events/president/news/55890>

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