SHORT COMMUNICATIONS

Artificial Evolution in Transhumanism

Transhumanism is a modern philosophy that is based on the belief that human nature is evolving over time not only because of Darwin's natural evolution (Bowler, 2003, p. 16) but also because of social impacts and technical innovations. The philosophy is based on many historical forerunners, for example, Nietzsche's famous idea that a human is just a rope between an animal and posthuman or Fedorov's idea about the possibility of immortality (Semenova & Gacheva, 2006).

In this paper, the author shows that from a current technological perspective in the not-so-far future humans will be able to choose their own personal way to evolve, upgrade themselves with electronic or organic devices which will improve or simply add new feelings to their beings, including a list of historical preconditions.

The invention of language, the wheel, the printing press, and many other historical examples assure us that humans are unique species that can accelerate their own evolution. Some of the representatives of modern transhumanists see their mission in searching for ways to speed up the evolution. Among the adherents of this school is Ray Kurzweil, who literally said that "evolution […] represents the purpose of life" (Kurzweil, 2001).

Over billions of years, life on the planet developed according to the rules that were determined by natural evolution—the rules that allow organisms to survive and develop in the wild, natural world. But for the human species, much has changed in the last ten thousand years. The taming of fire, Neolithic, urban and industrial revolutions have greatly changed the lives of people, drawing them out of the wilderness. These cultural changes are unprecedented, and therefore give reason to believe that natural evolution cannot cope with the modern needs of man. The person has the right to choose how it evolves.

In the historical perspective, the idea of artificial evolution is not new—it is rooted in the earliest human cultures. A number of man-made human beasts appear already in the pantheon of Egyptian gods (Remler, 2010, p. 4). In modern times,

this idea is assigned a specific coloring. Thus, in 1748, Julien Ofer de La Mettrie wrote his work *Man a Machine*, in which he argues that "man is but an animal" and a "machine" (de La Mettrie, 1748). The analogy of man and machine allows speculating about the upgrades of human body that can be applied in the same way as an upgrade of a machine. In 1794, Marquis de Condorcet described a very important transhumanist postulate, arguing that the improvement of abilities is not subject to restrictions (Hamowy, 2008). It is a deeply philosophical thought which declares that human freedom depends on the development of its own body. In the 1960s, Rechenberg and his colleague Schwefel pioneered in artificial evolution in engineering studies. Through systematic mutations of suboptimal airplane and rocket designs, etc. they evolved better ones.

One of the most famous futurists of modern times, Ray Kurzweil characterizes artificial evolution as follows:

> technological evolution is a continuation of biological evolution, so the approximation of singularity is due to the action of several objective laws, one of which is the famous Moore law of doubling the density of transistors in microprocessors every 18 months. (Kurzweil, 2001)

Taking into account all of the above facts, we can conclude that the idea of artificial evolution was inherent in many human cultures throughout the years. For a more detailed discussion of artificial evolution, we must briefly describe the mechanisms of natural evolution.

Charles Darwin described a theory according to which there is a competition between different life forms in the universe. Because of such competition, genes are trying to evolve inside organisms in order to be in better position relative to competitors. Our natural desire as humanists who appreciate human life as a highest value is to regulate evolution to increase our chances to survive in the aggressive world. This concept of evolution that can be consciously directed is an artificial evolution itself. And there seems to be a real chance to organize it in the foreseeable future because of modern technological capabilities.

The process of evolution of homo sapiens is traditionally divided into the following stages:

1) The emergence and development of the genus Homo and its first representatives—Homo habilis. This period lasted for about two million years and during this time several kinds of humans appeared and disappeared. (Adhikari, 2019)

2) The emergence of the species Homo sapiens about 200,000 years ago.

3) The appearance of the Cro-Magnon about 150,000 years ago.

4) The termination of biological evolution 30,000–50,000 years ago.

An important question among the transhumanists is the following: Does intellect affect the evolution of a man? In other words, does a person influence his own evolution since he became a rational person? This question is ambiguous. For example, N. N. Moiseyev does not agree. In the environment of transhumanists, it is commonly believed that man influences his evolution, and this situation is so important that it is even called "the first axiom of transhumanism" (Pride, 2007). A proof of this is reportedly the difference in the frequency of violations of color vision between hunter-gatherers and humans with productive economy. Since humans owe their intellect to the Neolithic revolution, it is justified to say that a person is able to influence evolution through the power of his intellect.

How does intelligence affect the evolution of people? The most powerful factor is innovative activity, among which one can distinguish technologies of food production, political, economic, cultural and humanitarian technologies, health care, transportation. All these have influenced demography and, consequently, natural selection. This list of innovative activities contributed to an increase in the average life expectancy of 22 years in the antiquity to 75 years today. On the other hand, it is known that life appeared on planet Earth about 3.5 billion years ago, and Homo sapiens, the only existing species of the genus Homo appeared 200,000 years ago. From this, it turns out that a modern person exists only 0.00005 per cent of the time since the onset of life on earth.

If we compare the 200,000 years of human history with the modern scientific period, when a person began to actively collect and accumulate knowledge using a scientific method, it turns out that the 400 years of modern age constitutes only 0.002 per cent of the total time of human history, and only 0.0000001 per cent since the moment of appearance of life on the earth. There is also convincing evidence today that 80 per cent of all of today's knowledge about the structure of the world has been received over the past 20 years. Thus, we see a disproportionate cognitive dispersion and a significant acceleration in the growth of scientific knowledge. These and other observations allow transhumanists to assert that humankind continues to evolve, but not by virtue of natural laws, but owing to scientific knowledge. Human is declared the first being capable of independently influencing its evolution.

Those facts are in tune with the well-known futurist, Raymond Kurzweil. According to Kurzweil (2001), the accumulation of human knowledge increases exponentially. The reasons for such a cumulative effect lie in the scientific method and successes in individual sciences and technologies, for example, in the field of information technology. Today, computer technology makes much of the useful work much faster and better than a person, and limits to the growth of the efficiency of computers are not visible.

One of the most perspective directions of human growth from the transhumanist perspective is a merge between human and computer. This symbiosis can improve human quality of life, its longevity. Computing devices are simple and cheap. They can do deductive operations many times faster than human brain, the same is with inductive operations which give us probabilistic output with much better accuracy than a human. Machine learning systems are growing at an amazing pace. Moreover, there is already an ecosystem in place to translate information between different computing devices with near-light speed (computer networks). It seems reasonable to improve our bodies with such capabilities.

In a broad sense transhumanism provides a rich arsenal for the realization of artificial evolution which one should consider if one wants to control one's evolution:

- Genetic manipulation
- Nanotechnology
- Cybernetics
- Cyborgism
- Pharmacological enhancement

As an example of current technologies, let us remind that brain-controlled hand prosthetics are already available (Jones, 2017). There is research underway to develop sensation of touch with the prosthetics. Prototypes of artificial eyes have been created (Roman, 1994). These devices are intended to compensate for lost functions in people with disabilities, but transhumanists go further and argue that at some point these devices will become more functional than human organs, and then many will want to acquire them to modify their body. And, in the long run, at some point, devices will eliminate human dependence on their parts of body, allowing them to move their consciousness into an isolated environment, such as computer memory. Thus, a human will be placed in a digital network, and in fact, will exist as long as the network exists. This idea is called "digital immortality" (Rothblatt, 2014).

Today the movement of so-called body- or biohackers, people who are ready to experiment with their own bodies for the purpose of its technical improvement, is gaining in popularity. Lepht Anonym, a representative of the movement, for example, has inserted the following devices under his skin—neodymium metal disks that enable physical control of electromagnetic fields, internal compasses providing a physical understanding of the northern and southern magnetic poles, and a Bluetooth device that controls various home appliances.

Another famous bodyhacker is Neil Harbisson (2012), an artist from Barcelona who suffers from color blindness. Doctors implanted in his head a camera that allows him to recognize colors, decoding the color according to a musical note. That is, with this device, Harbisson received sensory input that did not exist in a human by nature. It is worth noting that Harbisson was refused the operation by the Committee on Medical Ethics in Europe and he had to find a doctor who agreed to perform the operation anonymously.

Harbisson noted many times that he was repeatedly exposed to social pressure after surgery. This indicates that the society is not ready to accept such innovations. In fact, cyborgism is a big social dilemma. If transhumanists are right and in the future anyone can improve themselves with various electronic devices, then the society in the present form will cease to exist. All people will be different, and this represents a new futuristic motif of the Tower of Babylon.

For now, to protect his own rights and the rights of other cyborgs, Neil Harbisson established the Cyborg Foundation (*n.d.*). He believes that in the future many will want to improve their senses or add new ones and it will be carried out on demand. Humans will be patched as a computational device in both ways, hardware and software.

More and more popular is the use of another class of devices, ultrasonic sonars (*Habr*, 2013), which are especially relevant to blind people. This type of device helps determine the distance between the device and the obstacle (for example, the closer the interference is, the more frequent is the sound signal), so this technology allows the blind to move safely, provided they have transmission.

There are also spinal implants to manage pain—the implants receive pain signals and block their further transmittance to the brain, thus making a person insensitive to pain. Spinal implants are particularly useful to those whose lives are disrupted by pain. Another example of the practical use of this device is its applications in military affairs.

The following type includes implants designed to stimulate the brain, which can significantly accelerate mental activity and increase concentration (*Krasnaia Vesna*, 2018). The DARPA organization is working on a brain-stimulating implant to alter neural activity. A detailed study was published in journal *Nature* in 2017 (Reardon, 2017). In 2015, several hundred office employees of Epicenter, the largest technological hub in Stockholm, were implanted with a chip the size of a grain of rice in their hands. The chip help them open the door to the office, gain access to corporate equipment and make calculations. Hannes Sjöblad, one of the company's representatives, explained his agreement to use this technology: "We already interact with technology all the time. Today it's a bit messy: we need pin codes and passwords. Wouldn't it be easy to just touch with your hand? That's really intuitive." (Paine, 2015)

We can conclude that there are a lot of people today who have already improved themselves. Some of them are transhumanists, some of them are not. But the fact that human nature is not a stable form is obvious and the transhumanist movement has been right in this position. Unfortunately, medical research which confirms the long-term safety of most of these devices is not yet available. But transhumanists believe that this is just a matter of time, and artificial modification of the body will be a predictable trend of the present.

As a conclusion, we can summarize that, in the long run, many of the above-mentioned technologies—artificial modification, biotechnologies, controlled technological and biological evolution—will allow humanity to independently plan and implement its own evolution. There may be no single species of Homo sapiens as each individual or group of individuals can have its own evolutionary path.

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