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SPACE AND HUMANITY

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Abstract

The exploitation of space has led to the emergence of many medical innovations for earthly use, and the pace of development of science and technology has increased, especially, and it is not for nothing that our time is called the time of scientific and technological progress.

Today we know our own planet better than ever. This means that space exploration really improves human life, increases humanity's collective knowledge, and helps build a modern society.

Introduction

At the time of the moon landing in 1969, many sincerely believed that at the beginning of the 21st century, space travel would become commonplace, and the inhabitants of Earth would begin to safely fly to other planets. Unfortunately, that future has not yet arrived, and people have begun to question whether we even need this space travel. Maybe the moon is enough? However, space exploration continues to fail to provide invaluable information in the fields of medicine, mining, and security. And of course, progress in the study of space has an inspiring effect on humanity. If we don't want to end up like the dinosaurs, we need to protect ourselves from the threat of large asteroid collisions. As a rule, approximately once every 10 thousand years, some celestial body the size of a football field threatens to attack the Earth, which can lead to irreversible consequences for the planet. Indeed, we must beware of such a "guest" with a diameter of at least 100 meters. The collision will destroy forests and fields, and will doom those who survived to starvation. Special space programs are aimed at identifying such a dangerous object and ejecting it from the trajectory long before it approaches the Earth.

A significant number of different devices, materials, and technologies were successfully developed for space programs, but later found their application on Earth. We all know about freeze-dried products and have been using them for a long time. In the 1960s, researchers developed a special plastic with reflective

metal injection. When used in the production of ordinary blankets, it retains up to 80% of the heat of the human body. Another valuable innovation is nitinol, a flexible but elastic alloy designed for satellite manufacturing. Dental braces are now made from this material.

The exploration of space has led to the emergence of numerous medical innovations for earthly use: for example, a method of introducing anti-cancer drugs directly into the tumor; equipment, with the help of which the nurse can do research and instantly transmit the data to the doctor; a mechanical manipulator arm performing complex actions. Pharmaceutical developments in the field of protecting astronauts from loss of bone and muscle mass in microgravity conditions have led to the creation of preparations for the prevention and treatment of osteoporosis. However, these preparations were easier to test in space, since astronauts lose about 1.5 % bone mass per month, and an elderly Earth woman loses 1.5 % per year.

If we want to create a world where our children aspire to become scientists and engineers, not just reality TV hosts, movie stars, or financial tycoons, then space exploration is a very inspiring process. It's time to ask the younger generation the question: "Who wants to be an aerospace engineer and design an airplane that can enter the thin atmosphere of Mars?"

Gold, silver, platinum, and other precious metals are found in outer space. Some international companies are already thinking about asteroid mining, so it is possible that the profession of space miner will appear in the near future. The Moon, for example, is a possible "supplier" of helium-3 (considered a possible fuel for nuclear power plants). On Earth, this substance costs up to 5 thousand dollars per liter. The Moon is also thought to be a potential source of rare earth elements such as europium and tantalum, which are in high demand for use in electronics, solar cell manufacturing, and other modern devices.

We all believe that life exists somewhere in space. In addition, many believe that aliens have already visited our planet. However, we have not yet received any signals from distant civilizations. That's why scientists looking for extraterrestrial civilizations are ready to deploy orbiting observatories and satellites to search for biological life in the atmospheres of distant planets outside our solar system. And that's just the beginning.

Our primitive ancestors, originating from East Africa, settled all over the planet, and since then, mankind has never stopped the process of its movement. We always want to explore and master something new and unknown, be it a short walk to the moon as tourists or a long interstellar journey spanning several generations. Years ago, a NASA executive drew the distinction between "understandable reasons" and "real reasons" for space exploration. Understandable reasons are matters of gaining economic and technological advantage, while real reasons include things like curiosity and the desire to leave a mark.

Humanity has learned how to send satellites into space, which helps us

monitor and combat pressing problems on Earth, including wildfires, oil spills, and depleting aquifers. Significant population growth, banal greed, and unwarranted frivolity about environmental consequences have already caused serious damage to our planet. Scientists estimate that the Earth has a "tolerable load" of 8 to 16 billion, and we are already more than 7 billion. Perhaps it is time for humanity to prepare for the resettlement of other planets for life.

With the development of space flights, the sphere of application of human activity is also expanding. Space travel is humanity's greatest achievement, the victory of reason over the forces of nature. If earlier all applications of scientific knowledge and technical achievements were limited to the earthly framework, then with the beginning of the exploration of Space, man began to gradually include it in the sphere of his practice.

Space flights not only open the possibility of ever deeper knowledge of the world around us. Today, there are already a number of purely practical problems of great national economic importance that can be most successfully solved with the help of space technologies.

One of these tasks is space television, which, with the help of artificial satellites-retransmitters, makes it possible to transmit television programs and telephone calls over great distances. Space-based communication options are more cost-effective than ground-based radio relay links, which consist of a chain of transceivers. So, to create a radio relay line, it is often necessary to build many transceivers. These stations must be serviced, heated, and supplied with electricity. Currently, television broadcasts are carried out through space with the help of only two ground stations – transmitting and receiving stations, and one space relay. In addition, the repeater satellite receives energy from the Sun.

Weather satellites are of no less important national economic importance. Some of them move in orbit around the Earth and thus inspect the entire surface of our planet. Special equipment installed on board satellites makes it possible to record various parameters characterizing the state of the Earth's atmosphere and to obtain operational information on the development of meteorological phenomena. In particular, systematic photography of cloud systems is carried out by meteorological satellites, which allows timely detection of the origin of cyclones and anticyclones, as well as the appearance of hurricanes and typhoons. Thanks to the use of weather satellites, operational weather forecasts have become much more accurate and reliable in recent years.

The study of atmospheric phenomena from space will allow scientists to understand more deeply the pattern of complex processes taking place in the Atmosphere. The prospects for realizing a kind of space production on board specialized orbital stations in the future are also very tempting. The fact is that in conditions of zero gravity and space vacuum it becomes possible to carry out unusual technological processes that are not achievable under terrestrial conditions, in particular to produce very pure substances, the synthesis of some chemical

compounds, including valuable drugs, to unusual alloys are obtained, particularly precise parts are developed. For example, perfectly shaped balls for ball bearings. It is possible that over time, power plants emitting heat, carbon dioxide, and harmful impurities during operation will also be taken out into space and thus not pollute the Earth's environment.

Entering the Solar System and into open interstellar space, exploring the boundless cosmic resources using a new form of physical movement - gravity control, will bring humanity to a qualitatively new level of the cosmic form of existence. This, in turn, will open the way to satisfy the need for continuous technological progress and all other branches of world production, the development of which is already beginning to be limited by the mass of environmental problems of a global, planetary nature. The vast arena of mutually beneficial international cooperation will open to countries and peoples the opportunity to ensure universal peace, guaranteed survival, and environmental safety for all.

Our time is not for nothing, called the time of scientific and technical progress. The pace of development of science and technology has increased, especially these days. However, a number of discoveries and inventions had not only ardent supporters, but also zealous opponents. Apparently, it couldn't be otherwise. The progress of mankind has always happened and is happening in the struggle of opposites. Some have wittily noted the three stages of confirmation of anything new. First, of the new, it is said: "This cannot be!" After a while, you can hear: "There is something here..." And, finally, there comes a moment when even the ardent skeptic is sincerely surprised: "How could it be otherwise?!"

Something similar happened with space exploration. Many greeted Earth's first artificial satellite with undisguised skepticism and disbelief. They said that the fact that several kilograms of metal were thrown into space orbit, what is the use of this experiment, and what will it bring to the world and humanity? And less than four years later, the world was surprised and shocked by an unheard-of event: Yuri Alekseevich Gagarin made an unprecedented flight around the Earth in the Vostok spacecraft. This day and the name of the person who first broke the chains of gravity have forever entered the memory of mankind.

However, human activities in space are quite controversial. We have witnessed both huge scientific breakthroughs and true heroism, but we cannot deny that at least Earth's orbit is a clash between different political and military ambitions. Science has explored many objects in the Solar System and is now seriously preparing to colonize the most accessible of them. All this leads us to ask the question: Do we have the moral right to carry expansion outside our atmosphere?

Ethics is a system of moral principles that determines some of the decisions we make in our lives. In fact, it is an attempt to maintain a balance between the interests of the individual and society as a whole. Thus, we must consider the dangers that space activities pose to astronauts and to the objects we

intend to explore and inhabit. Then it is necessary to evaluate the benefits that they will give to humanity.

The first question is – does the space industry help us all? There can be no doubt about that. Since 1976, NASA has published a yearbook called "Spinoff" that lists all the new technologies that have become available thanks to space exploration - 50 items on average for each. Here at a different time, laser eye surgery, GPS, artificial limbs, 3D printing, "smart foam", and water treatment plants are mentioned to me. Thanks to "sublime industry", advanced surgical procedures were developed, and the capabilities of the human body became clear.

Today we know our own planet better than ever. This means that space exploration really improves human life, increases humanity's collective knowledge, and helps build a modern society. At the same time, space flights are always very dangerous. The lives of cosmonauts directly depend on technology, which, despite all the efforts of engineers, occasionally fails.

Space outside the Earth's atmosphere is completely unsuitable for the existence of representatives of our species of living beings. Weightlessness causes muscle atrophy and bone degeneration, impairs vision, and weakens the immune system. There are also concerns about the mental impact that prolonged confinement and social isolation can have. Let's not forget about radiation, which affects the central nervous system and increases the risk of developing cancer. Despite the fact that modern spacecraft are much better protected from radiation, some scientists continue to oppose long-term stays in space due to this threat.

Conclusion

It is obvious that the danger to humans in space is real. Cosmonauts died both during the flights and during the preparation for them. On the other hand, astronauts are believed to have better health than other people. They have a higher average life expectancy and are less likely to die from the same cardiovascular diseases. This is most likely due to the intense physical training they go through during their careers. That is, from the point of view of the above-mentioned balance in this regard, everything is very harmonious and there should be no claims to the ethics of space agencies.

All this, however, is only one side of the matter. Because in addition to those moral doubts that send humans into space, we have the solar system, and beyond that, the entire universe. We live in an age when plans are being made to colonize other celestial bodies. Do we have this right - that is the question. This is reflected, among other things, at the legislative level. Since the late fifties, efforts to prevent space pollution have been directed primarily by the International Committee for Space Exploration. As early as 1967, they were supported by the signing of the Outer Space Treaty. Today, there is an awareness that we should not leave biological traces of our stay. This view is actively contested.

It is approaching the point where this pollution will be no less of a concern. Science cannot say unequivocally what effect the presence of a person will have on this or that space object, for the simple reason that, apart from the Moon, we have not had time to be anywhere. For many, however, it is quite obvious that being on our own Earth is the best answer to the question: "Why is it better for humanity to stay where it was created"? Climate warming, radioactive pollution, massive deforestation - we, one might say, have spoiled the Earth. A little more and it will become impossible to live here.

In conclusion, is it ethical to do what we like with the landscape? Do we have the right to spread clouds on Venus and cool our neighbor to a comfortable temperature for us? What about the distant future? With the psyche of modern man, it is easy to imagine a situation where he settles on a planet, completely exhausts its resources, and then jumps to the next one.

This is what worries so many thinkers and scientists. Among them, the opinion has long been formed that our species can be classified as "parasitic". And this once again emphasizes the importance of discussing and forming a full-fledged "space ethics". We are only taking the first steps in space exploration, and now is the time to lay down some rules.

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КОСМОСЪТ И ЧОВЕЧЕСТВОТО

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Резюме

Усвояването на Космоса доведе до появата на множество медицински иновации за земно използване, темповете на развитие на науката и технологиите са се увеличили особено и не напразно нашето време е наречено време на научно-техническия прогрес.

Днес ние познаваме нашата собствена планета по-добре от всякога. Това означава, че изследването на Космоса наистина подобрява човешкия живот, увеличава колективните знания на човечеството и помага за изграждането на модерно общество.