What Change May Take Place after We Entered Space Era

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Abstract
Along with the successful flights of Virgin Galactic, Blue Origin, and SpaceX, space tourism seems to arrive into its implementation phase in 2021. As it is expected, within 10 years, this market will become a real and huge domain with hundreds of billions of dollars a year. Together with it, there will be tens of thousands of people come into and back from outer space every year. Alike what happened after the great discovery era of the human beings after it conquered the ocean, the mentality of the human beings will change. In this article, what change may take place after we entered the space era will be discussed in depth.

Keywords
human beings, mentality, space era, space tourism
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With the maiden flights of space tourism missions of Virgin Galactic, Blue Origin, and SpaceX, it is generally believed that the year 2021 marks the beginning of the Era of Space Tourism. In the coming years, humans may soon become a species that travels back and forth between the Earth and the vast space. In view of the large number of potential space tourists, it is estimated that there may be thousands of people traveling between the Earth and space each year beyond 2030. Though not tantamount to space immigration, these space tourism activities will bring about transformational changes to mankind comparable to those triggered by the discovery of the New World by Columbus. With an increasing number of civilians gaining access to space, these changes, thanks to the advancement of modern technology, are expected to alter human beings’ perceptions of ourselves and the world in a short period of time, which differs space tourism from the great geographic discoveries of the 15th–17th centuries when the changes took place in an incremental way.

In fact, human’s perception of the world has been altered to some degree since the first manned spaceflight by Cosmonaut Gagarin in 1961. Gagarin’s flight lasted for only one orbital period, i.e., 90 minutes, during which he was engaged in performing various scheduled operations and recordings, leaving little time to enjoy the view of the beautiful Earth and the deep universe outside the cabin window. Even that, he exclaimed to the reporters after his return from space, “I could see almost everything up there! It is so beautiful there!”

The following astronauts after Gagarin expressed similar feelings in diversified expressions. The Earth’s surface is extremely beautiful with blue oceans, yellow continents and deserts, green grasslands and forests, the poles covered by ice and snow, and white clouds floating above them. Since the spaceship orbits the Earth in about 90 minutes, the astronauts will experience 16 sunrises and sunsets in a single day. They can also see large areas of illuminating city lights on the night side of the Earth, as well as rolling thunders and lightning above the continents and the oceans. At that altitude, the curvature of the Earth is quite visible. There is a very thin layer of atmosphere between the blue Earth and the deep black universe dotted with vast number of stars. From an altitude of 90 km, the atmosphere looks as fragile as a thin veil, especially after sunset and before sunrise, when the sunshine is refracted by the metallic sodium in the atmosphere forming a visible thin yellow layer of sodium. Without the blockage of the atmosphere, the astronauts in orbit can see an unfathomable universe, where the stars do not twinkle and appear brighter and their numbers are so humongous that you cannot ignore their glares. The sun is so dazzling that even with the helmet on, the astronauts cannot afford to look at it directly.

When recalling the experience in space, Chinese Taikonaut Jing Haipeng said, “I slowly edged to the window to have a look at the Earth. Language fails to reveal the beauty of the brownish yellow land, the majestic mountains and the ribbon-like rivers. At that moment, I couldn’t help thinking about the boundlessness of the universe, the insignificance of individuals, and the greatness of our nation, and I was so proud of being a Chinese.” “It’s so beautiful out here!” is the instant spontaneous exclamation of Taikonaut Liu Boming, who performed the first extravehicular space walk from the Tianhe core module of the China Space Station (CSS), when he exited the module. These examples illustrate the impact brought about by seeing the Earth and space.

In December 2018, Anne McClain, a female American astronaut performed a spacewalk, and her feelings after this
are more representative. She recalled, “I feel like I was very connected to Earth, like it was mine and there was some ownership there, not only my hometown or my city or what I was familiar with, but the entire Earth. I felt an ownership and a kindred spirit with every part of it. You do feel this closeness to every human on Earth. You have this really distinct recognition that every single person you will ever meet, you have more in common with than you do different, no matter what.”

Space comes as the most remarkable revelations to the Apollo astronauts. The famous photo known as Earthrise (Figure 1) represents one of these revelations. About 380,000 kilometers away from the planet Earth, the Apollo 8 astronauts were flying around the moon for the first time and were thrilled to see the beautiful blue Earth “rising” slowly from the lunar surface. The famous color photograph of Earthrise was taken amid tremendous excitement. The world has to wait for a few days to see the returned photo, because the cameras at that time were film cameras. In commemoration of the 40th anniversary of the first manned landing on the moon, Apollo 11 astronaut Michael Collins’s speech as follows represents the revelations of all 27 humans who have seen the Earth with their own eyes from that distance: “I really believe that if the political leaders of the world could see their planet from a distance of 100,000 miles their outlook could be fundamentally changed. That all-important border would be invisible, that noisy argument silenced. The tiny globe would continue to turn, serenely ignoring its subdivisions, presenting a unified façade that would cry out for unified understanding, for homogeneous treatment. The earth must become as it appears: blue and white, not capitalist or communist; blue and white, not rich or poor; blue and white, not envious or envied.”

Above mentioned revelations and insights have, in fact, triggered the thinking of mankind. Related thinking on the Planet Earth’s resources and environment is manifested in a number of works, such as Silent Spring by American scholar Rachel Carson in the early 1960s, Operating Manual for Spaceship Earth by Richard Buckminster Fuller in the late 1960s, and Limits to Growth by the Club of Rome Project in the early 1970s. All of these ideas originated, in part, from the revelations acquired by humans when they stepped into space and thereafter treated the Earth as a planet. It can be said that the worldview of human beings started to change after humans ventured from the surface of the Earth to space and looked back at our home planet, especially from our moon, seeing the full picture of the magnificent blue planet.

However, we have to admit that these straightforward feelings as personal experiences are from the privileged few, some 600 astronauts who have flown in Low Earth Orbit, such as visiting space stations, and 27 astronauts who have been in lunar orbit (12 of them are Apollo astronauts landing on the moon). The overwhelming majority of the name list is pilots and engineers, while there are just a few scientists and six billionaires. It is obvious that their professions were relatively limited. More professions representing broader social standing should have adequate opportunities to get access to space, including, in particular, philosophers, artists, thinkers, and literary authors. It is not hard to imagine that they will use more thought-provoking language, even in artistic way to express and describe the revelations that space brings to humanity. And, of course, politicians can also have access to space, providing that they have reliable reasons to do so.

There is no doubt that the best way for humans to embrace the revelation of space is space tourism. In the future, space tourists will include people from the professions capable of critical thinking, such as artists and literary scholars. When they see the Planet Earth from that altitude, they will definitely have more sensitive and delicate revelations and feelings that are different from those of engineers and scientists. In the United States, the idea of sending people of different professions into space appeared during the Apollo program.

The history of mankind is a story of migration to cover the whole Planet Earth, e.g., venturing from the oceans to the lands, climbing down from the trees and migrating all over the continents, setting sail to the blue oceans from the lands, and conquering the poles. With the incessant advancement of science and technology, humans began to fly into the sky, and then to space and the moon. With the increasing mastery of science and technology and the expansion of the living environment, human civilization has been pushed was pushed forward. After descending from the trees, the use of fire by humans facilitated the birth of language and communication. Agricultural technology led to the emergence of human settlements and writing. Astronomical navigation, meteorological studies and shipbuilding technology promoted ocean navigation, trade globalization and market economy. Aerospace technology and the exploration of the universe...
triggered human thinking about ecology and sustainable development. But this was only the beginning of the space age, indicating the great leap of civilization in the coming decades. As Apollo 11 astronaut Collins said, “The earth must become as it appears: blue and white, not capitalist or Communist; blue and white, not rich or poor; blue and white, not envious or envied.”

For the time being, we are far away from the envisioned ideal civilization. A major reason underlying this lagging behind is that the mentality of a large number of thinkers and politicians is still in the marine age when the corresponding civilization is still characterized by colonial mentality, resource plundering, and market economy, and we are even in the era governed by so-called “dark forest” law which regards all strangers as enemies. The starting point for these people is confined to their own cities, regions, or nations at the best, instead of the Planet Earth and the whole human race, making their thoughts substantially different from the revelations brought by space to us. The revelations that space brings to mankind through the eyes and voices of 600+ astronauts, the 27 Apollo astronauts in particular, fails to reach the thinkers and politicians. Perhaps, it is necessary for them to go into space and experience it by themselves. Alternatively, the people around who can influence them can also go into space and bring back the profound revelations to them. If that realized, the next phase of human civilization is expected to be more compatible with the development of aerospace technology and the ever-changing space landscape.

The Chinese is a nation with long history and profound culture. In the blood of the Chinese nation, there is no inherent restlessness and recklessness to invade others and claim hegemony. The history has proven to some degree that China fell into the victim of the marine age. Ever since the aerospace age, China has never demonstrated any intention to plunder space resources and dominate space. On the contrary, China only seeks self-defense and the peaceful use of space. In ancient times, the idea of harmony between man and nature is pervasive in China, which transcends far beyond plundering and subjugating other countries. It is reasonable to say that the Chinese nation is perhaps the first nation in human history to gain the revelation of space. In the 5,000 years of history of Chinese civilization, the Chinese people are the first to realize the necessity to build a community with a shared future. It is necessary for China to continuously send Chinese people into space, being active participants of space tourism and even leading the era of space tourism. The people venturing into space should not be limited to a handful of Taikonauts performing national space missions.

Space tourists should include literary authors and scholars, artists, philosophers, entrepreneurs, teachers, workers, farmers, and other professions including, of course, the politicians, especially those involved in environment policy making and the policy enforcement. It is our hope that in the next 10 years or beyond, we will constantly come across an increasing number of flourishing travelogues, musical works, literary and cinematic works revealing multitudes of experiences of being in space and its corresponding revelations. The advancement of aerospace technology brings about the deepening of understanding of mankind itself and the world, which drives the process of human civilization and leads to the scientific theory of evolution, making the advancement an inevitable trend in human history.

(Translated by XU Yongjian, National Space Science Center, CAS)

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