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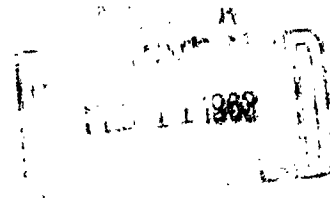
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COSMOS - EARTH

By

V. V. Parin



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COSMOS - EARTH
By
V. V. Parin

Prophetic Words.

I write these pages, when the radio station of the entire world are translating a meeting of workers at Red Square. The nation is greeting its hero, conqueror of the cosmos Yuriy Gagarin. And I was the fortunate one because I, whose articles appear in the journal Vestnik Vozdukhoplavaniya, which I have edited and presented the first reports by Konstantin Eduardovich Tsiolkov, I was the fortunate one to see with my own eyes the first cosmonaut. I was fortunate to live and see this great day.

Only one day ago I began writing a report for the magazine OGONEK that the K.E. Tsiolkovskiy fund at the Academy of Sciences USSR has gained several new reports and letters in answer to our appeal to soviet citizens, inserted in No.39 of the OGONEK (for the past year). The first mail, which we have received, was from a Muscovite B.B. Kazhinskiy, containing two originals of scientific transactions by K.E.Tsiolkovskiy and ten of his writings. I was just getting ready to write on valuable the collection of these materials is for the development of scientific legacy of our great scientist.

By my writing has been interrupted - radio began transmitting a Tass announcement about the long awaited achievement: the first cosmonaut in the world Yuriy Alekseyevich Gagarin was shot up on board the ship Vostek and penetrated into cosmic space and what is more he safely returned and landed on Soviet soil. I then took out from hiding a sheet of paper that became yellow from age, which I collect as a relic- the first writing by Konstantin Eduardovich to me, written almost 50 years ago. Here are the

prophetic lines (see photo copy).

The prediction has finally come to realization. Not timidly, but with full unabated confidence our man - the soviet man - took the journey in his cosmic ship. The old learned person was right, when he wrote on September 13 1935 to the Central Committee of the All Union Communist Party :

" All my efforts on aviation, rocketry and interplanetary communication I do place to the disposal of the Bolshevik Party and Soviet Government, true leaders of progress of human culture. I am confident, that they will successfully complete these undertakings ".

Life has fully confirmed his prediction.

signed by B.Vorobyev
scientific secretary of the Commission
for preparing and publishing the scientific
legacy of K.E.Tsiolkovskiy at the Academy
of Sciences USSR.

Article by V.V.Parin

Right now there is no place on this globe where they would not be delighted with the achievement of Yuriy Gagarin, the great achievements of soviet scientists, who made possible this legendary achievement of April 12, 1961. And many are already figuring, how terrestrial sciences can be enriched by man's penetration into the cosmos.

One of such sciences, which readied man's flight into the cosmos and which in turn is being extremely enriched by cosmic journeys, is cosmic biology.

Our correspondent inquired about it from a member of the Academy of Medical Sciences prof.V.V.Parin.

A bit of history

For a whole generation, which started its life together with our century, humanity has fully mastered the air space of the Earth. I remember, when I was a child, and over empty spaces the first flight of large structures, wooden funnels etc. have been demonstrated, these flying monsters have then acquired the ^{name of/} " Flying Shelves " . What sensations these flights have created. This is difficult to imagine now , when a cosmic

ship with a man on board has already realized its first journey.

But man - a wonderful being. He never rests on his achievements. Life creates new problems, and to solve same, new sciences come ^{into/} being. One of these is cosmic biology.

When has it come into being?

Without strong theoretical and practical bases rocket construction could not be developed and consequently cosmic biology could not have developed.

These bases were laid by the great Russian scientist Konstantin Eduardovich Tsiolkovskiy.

The first page in cosmic biology was turned in 1949, when soviet scientists - Dr of medical sciences V.I.Yakovlev and prof.V.N.Chernov - began conducting experiments with sending up animals to greater altitudes.

The second page was also turned by soviet scientists. This was on November 3, 1957. On board the second soviet man-made Earth satellite was placed the dog Layka.

Soviet scientists have carefully and persistently worked out the conditions for man's flight into the cosmos.

Biologists, engineers, constructors, doctors worked together to make this flight to make this flight safe for his health and life. Only after all the systems have been thoroughly checked has Yuriy Gagarin received a "visa" for the flight...

Three Problems

Cosmic biology is confronted by three basic problems: to learn how terrestrial in habitants and plants will fare during cosmic flights, penetrate into the life secrets of other planets and, finally, to explain these wide horizons, which open before medicine and biology by the origination of the new science.

Cosmic biology investigates how various forms of life behave in cosmos. As an example of this is the crew of "Neah's Arc" of — the second soviet cosmic ship.

The simplest representatives of living organisms on this ship was a bacteriophag, invisible even under an ordinary microscope. How is it affected by the cosmic jour-

ney ? How do its characteristics change under the effect of cosmic radiations ?

One of the "bricks" included in the composition of living organisms appears to be DNA - Deoxyribonucleic acid . Scientists have shown that it is of great importance for the transmission of hereditary symptoms. That is why this chemical compound was also sent into cosmos. The question concerning the effect of cosmic radiation on heredity should have been answered by a small prolific fly. It is therefore no by accident that scientists for many years use it for studying the laws of transmission of hereditary symptoms: they multiply very rapidly, and its hereditary symptoms have been well scrutinized.

Belka and Strelka were the most highly developed animals in the cabin of the cosmic ship.

Why were dogs used, than closest to man's evolutionary development monkeys ? The fact is than man-like monkeys are very capricious, even more than man himself. They react extremely painful to outer irritants.

In dogs reactions of blood circulation and respiration to changes in outer conditions are approximately the same , as in humans. For this reason the dog was man's forerunner in the cosmos.

About Astrobotany and Cosmobiology

"The representation of the Mars on Earth " - the so-called institute at Alma-Ata, where member correspondent of the Academy of Sciences USSR G.A. Tikhov worked, developed a poetical and fantastic science - strobotany. It studies plants on other planets. As soon as this science came into being and it has immediately created lively discussions. There were scientists, which negated the very foundation of the new science. "You cannot study plants from one planet, when you are on another planet " they said. "There is no life nor plants on the Mars nor on the Venus, therefore there is simply nothing to investigate there " they were seconded by others. The third group was in agreement with the basic principles of astrobotany, but objected to certain individual sections of G.A. Tikhov's proposals.

Right now I will now go in any deeper into the arguments of the scientists. The scientific expedition, which will collect herbariums of Marsian plants, will add some light into this problem. I will say only that much, that now astrobotany has penetrated into a more extensive science - cosmic biology. Man, going on a cosmic trip, should know, to what he will be exposed on other planets, what the physical conditions on these planets are from the viewpoint of preserving his life at the time of journeying to one of them.

Right now are being developed new scientific methods, with the aid of which it is possible to more thoroughly examine the physico-chemical conditions of the atmosphere of Mars and Venus, methods are being improved, enabling to study the surface of other planets of our solar system.

An example for this - the photographing of the reverse side of the Moon and launching of the soviet — interplanetary station toward the Venus. An example for this, is the first in history of humanity mans round the Earth journey by Yuriy Gagarin.

Cosmos - Earth

Can cosmic biology be useful to us here on Earth?

Of course it can. Science is already now possessing interesting data in this respect. First of all cosmic biology may exert a greater effect on the development of medicine.

On board the second soviet cosmic ship were carried various species of intestinal bacilli, mans constant satellite. Scientists are studying whether the activities of these microorganisms have changed under conditions of cosmic flight and after it.

Cells on cancerous tumors have also made the flight on the cosmic ship. Do you know that in studying cancer medicine is widely employing cultured cancer cells on special nutritious media outside of the organism. They handle cancer cells in various ways and they explain, what does retard their growth, which ones cause destruction and which, on the other hand stimulate their vital activities.

It is absolutely probable, that various dosages of cosmic radiation may differently affect the vital activities of cancer cells. And so cosmic biology, maybe, will introduce new ways of combatting this disease.

Sending into cosmic species of fungi-producers of antibiotics, it is possible to consider the possibility of changing their properties and consequently obtain new, still unknown on Earth varieties of antibiotics. And to say what value human-useful antibiotics have for the development of medicine, is absolutely impossible.

I would like to say about still another interesting experiment, made by soviet scientists. As you know, the second cosmic ship also carried seeds of certain plants. It appeared that dry onion seeds, sown after the cosmic trip, grew much faster than the ones which have never flown anywhere. And in wheat, pea and corn sprouts the processes of cellular parting and growth were several times faster. The growth of certain actinomyces was also 6 times faster.

This means, that cosmic biology is assisting in the development of medicine and other natural sciences and possibly also an increase in the fruitfulness of many plants. Perspectives of cosmic biology are also inexhaustive, as the inexhaustive spaces (distances) of the boundless cosmos.

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