

30819

OTS: 60-11,448

JPRS: 2449

5 April 1960

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- USSR -

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205 EAST 42nd STREET, SUITE 300  
NEW YORK 17, N. Y.

JPRS: 2449

CSO : 3622-N

## ARTIFICIAL SATELLITES OF MARS?

[The following is a translation of an article written by V. I. Cherednychenko, Candidate of Physico-Mathematical Sciences, in Nauka i Zhyttya (Science and Life), No 11, Kiev, Nov 1959, page 8.]

The discovery of the satellites of Mars is fairly recent -- 1877. They were named in honor of the ancient Roman god of war, Mars: the first satellite was named Phobos and the second Deimos. These names, translated into Ukrainian, mean Fear and Horror. The satellites are so small that they appear as mere bright dots even in the most powerful telescopes. Phobos, the satellite closest to Mars, is only 9,400 kilometers away from the center of the planet, which means that it is 41 times closer to that planet than the moon is to the earth. Its diameter is 15 kilometers. The second satellite, Deimos, eight kilometers in diameter, is located at a distance of 23,600 kilometers from Mars, which is 17 times less than the distance between the moon and the earth. Due to this proximity, the satellites complete relatively rapid revolutions around Mars. Phobos makes one revolution around Mars in just 7 hours and 39 minutes, and Deimos in 30 hours and 18 minutes.

The small size and close location of the satellites of Mars have been attracting the attention of scientists for a long time. It was particularly interesting that the period of revolution of Phobos around Mars is shorter than the period of diurnal revolution of the planet itself (24 hours and 37 minutes). Such a phenomenon is unknown for any natural satellite of the other planets in the solar system. The artificial satellites of the earth, however, have much shorter periods of revolution around the earth than the latter's diurnal revolution. This circumstance, together with a number of physical data about the planet Mars, which indicate the presence of life on it, suggested the idea that at least Phobos, the satellite closest to the planet, was an artificial product.

This viewpoint was proposed fairly recently in a work by a Soviet scientist, Professor I. S. Shklovskii of Moscow University. He made the following basic assumptions:

It was known from the investigations of the American scientist Sharples that, several decades after its discovery, Phobos travelled along its orbit ahead of its calculated position by an enormous magnitude -- two and one half degrees. This fact could only be explained as follows: Phobos accelerated its motion when it got closer to the surface of Mars. An analogous phenomenon is observed in the artificial satellites of the earth when they get close to the surface of the earth and decelerate in the terrestrial atmosphere.

The calculations of I. S. Shklovskii indicate that, at this great acceleration, Phobos should fall on Mars within 15 million years. This is a very short time in comparison with the age of the planet Mars, which is several billion years old.

What are the causes of this great acceleration of Phobos? A satellite can draw closer to a planet and simultaneously accelerate as a result of braking in the interplanetary medium. However, the absence of such braking of the more distant satellite, Deimos, excluded this explanation. The extended atmosphere of Mars could also brake the motion of Phobos. But the calculations of the American scientist Whipple, made on the assumption that Phobos was a solid heavenly body, did not confirm this conjecture.

The acceleration of Phobos could have been caused by the tidal effect of the accumulation of liquid substances on the planet's surface or by tides in the solid film of the planet. Numerous observations, however, indicated a lack of any large water reservoirs on Mars, and the calculations of the English astronomer Jeffries proved that tides in the solid film of Mars could explain only a very small part of the observed acceleration of the satellite of Mars.

There was, therefore, only one assumption to be made, i.e., that the satellites of Mars are hollow inside, with a solid hard cover. Such satellites, however, would be of a low compactness and experience considerable braking even in the very rarefied atmosphere of Mars. Natural hollow satellites, however, are an impossibility. The assumption therefore follows that the satellites of Mars are artificial.

According to I. S. Shklovskii, Phobos and Deimos are the relics of a former civilization of highly organized beings on Mars, who, between two and three million years ago (and this is the age of the satellites of Mars) launched the artificial satellites of the planet. At that time the atmosphere of Mars contained abundant oxygen and there were large water reserves. Within several million years, however, the oxygen and most of the water on Mars disappeared, and at the same time the existence of the highly organized intelligent beings of the planet also ceased.

Future flights of terrestrial cosmic rockets in the direction of Mars will show the accuracy of these assumptions. In the opinion of the Kiev astronomers, I. S. Shklovskii did not take into account the possibility that the braking motion of Phobos resulted from contact with clouds of particles of ashes, which could be discharged to great heights during volcanic explosions on Mars. Nevertheless, the assumptions of the Moscow astrophysicist are very interesting.

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