

WHERE IS NECESSARY TO SEARCH TRACES OF LIFE ON MARS? A. P. Vidmachenko¹, ¹Main Astronomical Observatory of National Academy of Sciences of Ukraine, Str. Ak. Zabolotnogo, 27, Kyiv, 03680, vida@mao.kiev.ua.

The presence of clays on Mars is an important indication of the liquid water presence on the planet's surface. But the wet period of history was too short for the development of terrestrial-type life. In addition, the latest data have shown that any water on the Martian surface may have been too salty and acidic for support regular Life [6]. It was at early stages of Mars history about four billion years ago. Mars looked like an ancient Earth: had a thick atmosphere of carbon dioxide, water vapor and ammonia, with the liquid ocean on the surface; and there were a much warmer than it is now. That is, the planet was once a much more appropriate than it is today, for the existence of the Life. In those years Life originated on Earth. It is possible that the same thing has happened on Mars too. Impact craters, that formed on Mars surface in a result of falling of numerous meteorites and cometary nuclei [1, 2], in due time could lead to formation and, later, to conservation of some signs of life [5]. However, a catastrophic collision with a large asteroid resulted to the formation of a huge astrobleme Hellas. Ejection for thousands of kilometers around a million tonnes of soil, covered a considerable part of the planet's surface together with Life, which was formed on it before that time. The dust which has risen into the atmosphere, has blocked access to the surface of the sunlight, and together with other factors has transformed the planet into a cold and lifeless desert. It is clear that desertification of Mars happened a long time ago. At that time neither on Mars nor on Earth yet did not exist advanced forms of Life. Now Mars is geologically almost completely dead [7, 8]. On Mars, practically there is no magnetosphere, and there is a very thin atmosphere. And this is clearly insufficient to protect the life against bombardment of solar wind and hard ultraviolet. But there is a possibility that if Life nevertheless appeared on Mars, it does not disappear without a trace. But Life has moved from the planet's surface to subsoil and preserved there. The traces of that life and should be search there. Thus, on Mars were identified a small amounts of methane and formaldehyde. They can talk about possible evidence of life on Mars [3, 4]. It was also found that, for example, lichens of Earth are able to survive even in modern conditions of Mars.

Suffice quick rotation period (>24 hours) suggests the possibility of existence of the intrinsic magnetic field of Mars. From observations with "Mars Global Surveyor" it was found that the magnetic field near the surface of the planet is now small ~40 nT. But there

were found "spots" of magnetic field ~400 nT at the surface. Are registered about a dozen areas with a length of several hundred kilometers, which are independent and variously directed magnetic fields with different magnetic intensity. These vast areas of the Martian crust solidified millions or even billions of years ago in the presence of a strong magnetic field of the planet, which many years ago was generated in liquid (at least then) core of Mars. This can be explained by the fact that the various fragments of the observed crust of Mars were formed at different polarity had once existing of magnetic field.

And then in the presence of a strong magnetic field of Mars, were much more likely to save the Life from the effects of the primary hard radiation of the active Sun. In this context, it is necessary to search for traces of Life, not only in those places where once there was a lot of water, but also in those layers of sedimentary rocks, which relate to the first geological era (Phyllo-cian), which lasted for the first ~500-700 million years. That's when Mars was very wet planet, that had a strong magnetic field, which could then protect nascent Life. The soil contains clay minerals, phyllosilicates. For their formation is necessary in a considerable quantity water, temperature greater than 273 K and the lowered acidity. It has now found thousands of scattered areas of the planet with such rocks, which are commonly found in young volcanic rock, and that there are many places on the surface in the presence of a strong magnetic field. But in order to identify possible relict Life on Mars, needs to carefully examine the areas on the surface of the planet, which are located in the areas of the soil emission in Hellas valley at latitudes near – (40-50)°, where there are strong evidence of modern water outputs from under the planet's surface [9].

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