**WHERE AND WHAT EXACTLY CAN BE THE "TRACES" OF LIFE ON MARS?** A. F. Steklov[1] and A. P. Vidmachenko[1,2], [1]Main Astronomical Observatory of National Academy of Sciences of Ukraine, Str. Ak. Zabolotnogo, 27, Kyiv, 03143, [2]National University of Life and Environmental Sciences of Ukraine, Str. Heroyiv Oborony, 12, Kyiv, 03041, stec36@i.ua, vida@mao.kiev.ua.

Now on Mars there is a very low-power magnetosphere [12], a very thin atmosphere and the average temperature rarely rises above 200 K. Under these conditions, there are few chances to protect possible life on the surface from the solar wind and hard ultraviolet. Let's define life as a self-sustaining physical and chemical system that is capable of reproducing similar to samself offspring, which inheriting the main features of parents. Moreover, the descendants should manifested inheritances of possible genetic changes. After all, they will be responsible for changes in populations, showing in action a system of survival and natural selection in the changed external conditions. In recent years, a number of microorganisms have been discovered on our planet, which are in conditions very similar to some regions of Mars. Also, in the Martian soil, the equipment installed on the rovers made it possible to detect complex organic molecules with the so-called left-sided chirality. It is this characteristic of molecules that indicates a possible metabolism, which is a strong indication of their biological nature, and not just a certain biological marker. The direct search for life on Mars was begun in 1976 from the "Viking" missions. Not having received an unequivocal confirmation, and based on the fact that the only amino-nucleic acid form of life known to us cannot exist without water [10, 11], all subsequent searches for life forms on this planet began with the search for water. For example, the detection in the clay-rich Martian medium of boron and manganese [1, 3, 5, 6] clearly indicates its possible presence in the water below the surface. After all, boron is a vital chemical element for the prebiotic processes occurring on Earth. It is quite possible to assume that this can also be related to Mars, indicating a certain potential for the emergence and development of independent life on Mars [3, 8]. Also, terrestrial cyanobacteria have the ability to form carbon compounds [2, 4, 5]. They can survive both in arid deserts and in an oxygen-free atmosphere. Therefore, we have the right to assume that some carbon deposits recently found in Martian soil may be a manifestation of metabolism for a possible Martian life [7, 9]. That is, to have a biological origin, and to promote the survival of aerobic life forms, as well as to form minerals and accumulate nitrogen. In addition, there remains the likelihood that if life on Mars once did appear, it did not disappear without a trace [13-15]. For example, it can be assumed that it could move from the surface - into the bowels of the planet, and can be conserved there in relic fossils. The possibility of saving life in very simple forms is also not excluded. Therefore, traces of such life forms should be sought under the surface at a certain depth in those places where water was in the first hundreds of millions of years. Now on the surface of Mars recorded numerous traces of water-erosion activity. The impact of fluid flows is carried by many details of the relief of the planet [16, 17]. Surface images obtained from orbiters show that sources of traces of groundwater outflow are on the facing to the Sun of steep slopes of valleys and craters, at a depth of 100 to 500 m below the level of the main surface. This suggests that it is at these depths that the ground ice melts, and the water goes out to the slopes. Its freezing point may well reduce by the presence of dissolved salts in groundwater. And this fact can affect the length of the registered flows. Also, most likely, any life form on Mars today is probably microbial. And since the surface of the planet is irradiated all day by hard ultraviolet radiation and solar radiation, it seems that one of the possible ways to avoid their harmful effects - is to live below the surface.

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