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UNDERGROUND HABITATS - A BRAVE NEW WORLD

Abstract

Traditionally designed, Mars habitats tended to be built above ground using in-situ and ex-situ materials, which are to be brought from Earth.

The purpose of this Paper is to examine whether underground Mars habitats can be easier and more economically built and designed. First, it will require significant less amounts of materials to be transported from Earth, thus allowing more space for humans, food and other relevant supplies on board. This would allow for faster and more economical transport of humans and more efficient colonisation. Second, if the habitats are placed underground, they provide natural shielding from radiation and environmental influence which is not suitable for human life. Further on, it is more certain that the indoor temperature shall be easier maintained given the steady underground environmental conditions. Finally, shelter based habitat will provide for more protection against possible meteor shower or other threats. Thirdly, given that the excavated amount of materials can be used for building, thus providing a complete use of in-situ materials, accompanying buildings such as entrance chambers can be built using such materials, yet allowing quicker and easier construction.

In conclusion, mentioned method would require only for specialised tools to be brought along the missions, allowing the initial settlers to establish a permanent habitat on Mars. Or, even more convenient, the crew can bring along a 3D printer allowing for various types of tools to be created on site.

Such modus of construction will prove to be more economic and reliable than the one which includes transporting materials from Earth.