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Human Habitation Beyond Low Earth Orbit (3)

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THE ROAD LESS TRAVELLED: GREENHOUSES AND ITS HUMANIZING SYNERGIES

Abstract

In a recent design-in-use study of astronauts experiences in space habitats discussed in Architecture for Astronauts it was found that besides the basic advantages mentioned for life support there are clearly additional 'side effects' for habitability and physical wellbeing. Other researchers have also documented that astronauts experiences away from Earth extend beyond the scientific to include a strong spiritual, poetic and existential component (1), though this has not been widely publicized by space programs and considered only minimally in programmatic requirements for space architecture.

The authors have composed several key theses regarding the need to promote plant-human relationships in space, including areas where synergy and symbiosis occur. The justification is taken from a plurality of information, including A.) surveys conducted by the DLR on people living in remote research stations, B.) scientific research and astronauts experiences as detailed in Architecture for Astronauts, and C.), Paterson's investigation into the philosophical bases of horticulture, and the thousands-of-years old traditions of penjing and bonsai. Physical and technical requirements for greenhouse architecture in space will be detailed in the paper. As well, philosophical considerations will be introduced and discussed in the context of future missions as being "part and parcel" of the necessity for including plants, greenhouses and environmental design to humanize the experience of space travel, prevent psychological crises, improve efficiency of life-support systems, promote health and well-being of astronauts, and create supportive environments for communities in space.

(1) As per Dr. Kendrick Oliver, lecture October 2011 at University of Bristol, UK, from his forthcoming book To Touch the Face of God? Religion and the U.S. Space Program 1957-75, Johns Hopkins University Press.