

TRACE FOSSILS OF ENDOLITHIC MICROORGANISMS IN ANTARCTICA:
A MODEL FOR MARS

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Cryptoendolithic microorganisms survive in the hostile dry and cold climate of the Antarctic desert by taking refuge in the interstices of porous sandstone rocks. Their continued existence depends on a precarious equilibrium of geological and physical factors: Once this equilibrium shifts, conditions for life are no longer present and silica deposition may take place, filling the pore spaces in the rocks. Such events took place during periods of glaciation and under certain circumstances can also occur in recent times. The endolithic microbial activity causes chemical changes in the rock substrate which result in characteristic color patterns: When silica deposition sets in, these microbial color patterns are preserved as trace fossils.

If life arose on early Mars, then, during the loss of atmosphere and water, organisms may have withdrawn into porous rocks as the last habitable niche in a deteriorating environment, forming endolithic communities similar to those now living in the Antarctic desert. They also may have left behind recognizable trace fossils. It is suggested that a search for such trace fossils should be considered for future missions to Mars.