

Syngeosis: Application of the Principles of Symbiosis to Geological Processes

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The ultimate aim of geology is to understand the role of natural processes in shaping a terrestrial planet. A process is that which animates and transforms matter, driven by available energy. Rock deformation, tectonics, mantle convection, partial melting, differentiation, orogeny, weathering, erosion, geodynamo, and even life are all processes that operate on a living planet, which involve many of the same materials and energy sources. Symbiosis, the intricate interplay of the collective processes carried out by a community of organisms, is widely established in ecological science. Less well-understood, however, is the extension of these emergent communal behaviors to include non-biological processes operating across the planet scale through deep time, something I term "syngeosis." In this presentation I will examine the interplay of abiotic processes from the viewpoint of ecological dynamics, and attempt to establish the difference between "life on a planet" and a "living planet."

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