

OPINION  
GUEST ESSAY

# The Soul of Soil



**By Ferris Jabr**

Mr. Jabr is the author of “[Becoming Earth: How Our Planet Came to Life](#).”

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When my partner and I bought our home in Portland, Ore. four years ago, we immediately began designing our dream garden, intending to replace a derelict grass lawn with ample beds of lush, long-blooming perennials. We soon discovered, however, that our soil was unyielding, clay-heavy and strewn with rubble. In previous, much tinier gardens, I’d circumvented such difficulties with a few bags of high-quality soil from the nursery. Replacing this vastly greater quantity of dirt was neither practical nor financially feasible. Instead, I resolved to remediate what we already had.

Learning how to do so transformed much more than our yard — it completely changed the way I think about soil, and about our planet as a whole. I now see soil not simply as a medium for life, but as a living entity in its own right — one that is rapidly going extinct.

In some parts of the world, intensive farming, overgrazing and deforestation are destroying soil up to 1,000 times as fast as the base line rate of erosion. If current trends continue, [90 percent](#) of the planet's habitable land areas could be substantially degraded by 2050, causing crop yields to drop by an average of 10 percent — and up to 50 percent in some areas — and most likely forcing up to hundreds of millions of people to migrate.

The eradication of soil could culminate in the collapse of complex terrestrial life — unless we rethink our relationship to the world beneath our feet.

Soil is the result of eons of planetary evolution — billions of years of the elements weathering rock and more than 425 million years of interactions with complex life. A single inch of fertile topsoil requires centuries to develop.

Microbes, fungi, plants and animals create and maintain soil through myriad processes: by breaking apart rock with roots and secreted acids; enriching fragmented rock with their own remains and byproducts; and circulating air, water and nutrients via crawling, slithering and burrowing.

Although science [still lacks](#) a consensus definition of life, textbooks highlight criteria widely considered to differentiate the living and nonliving. Soil meets many of them: It has a highly organized structure. It grows. It breathes. And it can die. All life-forms are systems of interconnected animate and inanimate components. Think of a tree, which is mostly made of dead wood laced with strips of living tissue. In this respect, soil is no different. Soil further demonstrates what many experts agree is life's most essential characteristic: a capacity for active self-preservation. Soil keeps itself alive. Even the [Soil Science Society of America](#) and [the U.S.D.A.](#) have characterized soil as alive.

Recognizing soil as a form of life reframes our perception of another interconnected, self-regulating system: Earth. We owe many of Earth's defining features — its breathable atmosphere, blue sky, mineral diversity, ocean chemistry and wildfires — to life. Over time, Earth and life, much like soil and the organisms that maintain it, formed a single evolving system that has endured for billions of years. The living earth beneath our feet mirrors our larger living planet.

The challenge before us, then, is not simply to amend Earth's soils, but to revitalize them before they're lost forever. Modern agriculture must respect soil as a wondrous yet vulnerable living entity. Two core principles can guide this

shift: minimizing soil disturbance and emphasizing biodiversity. In practice, this entails significantly reducing tillage; rotating crops; prioritizing organic inputs over synthetic fertilizers; integrating crops, trees and livestock; and shielding soil from erosion with cover crops, among other interventions.

My partner and I have tried to apply such methods in our garden. Where once there was only turf grass, we have created a pond, a rock garden, a wildflower meadow, drifts of drought-tolerant flowering perennials and raised beds for vegetables. We installed drip irrigation and a compost bin. We sow winter cover crops and let vegetation decay in place. And we have introduced a wide variety of plants that shelter soil from the elements and reinvigorate its ecological communities.

Last month, I decided to relocate a flowering plant called a penstemon that had grown too big for its allotted space. The soil in this part of the garden was previously so compacted that I'd needed a pickaxe to dig through it. Now it was loose and soft. As I lifted the penstemon, all manner of life emerged. Earthworms dangled from the roots. A daddy longlegs scurried to safety. Below the plant I glimpsed the fine white lattice of a fungal mycelium.

Running my fingers through the soil, I understood, more clearly than ever before, that it was not simply a layer sitting atop the planet, but an extension of Earth itself — that soil, like all life, is not so much an inhabitant of the planet as an expression of a living world.

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