

“You are earth, you feed on earth, and you’ll return to earth”

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The importance of soil to humankind as producer, carrier, filter, and buffer is currently underlined^{1,2}. We feel, however, that soil deserves wider consideration also by virtue of other less obvious functions that fulfill ancestral sanitary, psychological, and social humans’ needs. “Terra es, et de terra vivis, et in terram reverteris” (“You are earth, you feed on earth, and you’ll return to earth”) stated Saint Bernard of Clairvaux (1091-1153) in his work *Meditationes piissimae de cognitione humanae conditionis*. As a matter of fact, our relationship with soil lasts from birth to death, often unconsciously.

The first contact with soil can be the regular and intentional consumption of it, *geophagy*, which is still practiced by pregnant women and children worldwide³. “Edible” earth may supplement poor-diets⁴ and is purchased in markets or taken from termite mounds, hut walls, and riverbeds. Adding earthy material to toxic or bitter foods to enable their consumption is a widespread practice⁵. Carbonates have an obvious antacid effect, while some types of clay are even efficient at removing radionuclides from gastric juices⁶. Furthermore, it must be emphasized that much of the microflora of the gut that builds up resistance to diseases is derived originally from soil. Just from the soil Selman A. Waksman isolated the streptomycin, the first

antibiotic active against tuberculosis⁷. In recognition for his discovery, Dr Waksman was awarded the Nobel Prize in Medicine in 1952. However, realistically there is a great deal of literature reporting negative effects of geophagy, such as anaemia⁸, chronic poisoning by heavy metals⁹, intestinal occlusion¹⁰, perforation of the colon¹¹, and infections with intestinal helminthes¹².

If the internal protective role of soil toward humans is debatable, undeniable is the external role, from both a factual and psychological point of view. Throughout history, most societies have used masks composed of earth materials to disguise or protect the face in battle, theatrical performances, or parties. Nowadays, clay facemasks are used for therapeutic or aesthetic reasons, since they stimulate the circulation of the blood and lymph systems, remove dead skin cells, absorb surface fats, tone and strengthen the connective tissues^{13, 14}. More importantly, soil products are used for protection for humans in the guise of houses. An estimated 1.5 billion people live in houses constructed of unfired earth¹⁵. Plinthite (Gr. *plinthos*, brick) is a iron-rich and humus-poor soil horizon that simply requires to be cut into blocks and left to air-dry to form hard bricks. Soil houses are virtually fireproof and can withstand moderate earthquake shocks thanks to their ductility. Furthermore, the exhalation rate of dangerous radon^{16, 17} from adobes is much less than that from concrete or other building materials¹⁸. Remarkable are the advantages of using such adobes in terms of energy saving, taking into account that the embedded energy required to produce one cubic metre of building material amounts to 10 kWh m⁻³ for sun-dried soil, 590 kWh m⁻³ for perforated fired bricks, 800 kWh m⁻³ for concrete blocks, 2640 kWh m⁻³ for ordinary Portland concrete¹⁵. As a consequence, soil buildings are in increasing demand in many countries¹⁸. Soil contributes to saving

energy also when placed untreated over the roofs and turfed, providing efficient thermal insulation¹⁹.

Soil can also fulfil non-primary needs of humans, such as that of expressing creativity. *Nazca Lines* are hundreds of gigantic individual figures, ranging in complexity from simple lines to stylized human and animal figures drawn on the Nazca Desert, Peru, between 200 BC and 700 AD. These features, the longest of which is nearly 270 m, were made by removing the iron oxide coated pebbles that cover the surface of the desert and that contrast with the light-colored earth underneath. Much more recent is *Marree Man*, the largest manmade artwork in the world. This geoglyph depicts a 4.2-km high man holding a boomerang and was made in Australia by anonymous creators using a 2.5-m wide, eight-tine plough attached to a tractor. The use of soil in art has not been surpassed by the development of more sophisticated materials. In contrast, it has experienced a revaluation thanks to contemporary art. Jean Dubuffet coined the term “art brut” to indicate an art free from intellectual implications, appearing primitive and child-like. Dubuffet himself, Burri, Donati, Fautrier, Mathieu, Soulages, and Tàpies used bulk soil, single size fractions of soil, or tar in their artworks. “Earth art” is a form of art come to prominence in the late 1960s, with personalities such as Heizer, Long, Oppenheim, and Smithson. Earth art uses items from the natural environment, such as soil and rocks, and “earthworks” are prepared in the open air and left weathering there.

After affecting several aspects of life, our final contact with soil in most cases is burial. Soil plays a crucial role in preventing spread of germs from corpse decomposition and, thus, risk of infections for living beings. The decay of our remains within soil implies formation of a discrete, ephemeral ‘hot spot’ of biological activity directed towards the slow release of elements to the wider ecosystem²⁰. Part of “our”

carbon is transformed into adipocere, a mix of waxy grave substances that reside in soil for several centuries²¹ and that could be viewed as our last, small, personal contribution to counteract global climate change, the present-age bogeyman.

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FIGURE LEGEND

In 1998, soil rose to the dignity of the masterpiece *per se* thanks to Maurizio Cattelan:
8x5x5-m soil cube sustaining an olive tree at permanent collection of Castello di
Rivoli, Turin, Italy (photo courtesy of Museo d'Arte Contemporanea)