The poverty and deprivation that grips sub-Saharan Africa is rooted in the mineralogy of their soils. The young loess and glacial till soils of Iowa are dominated by smectites, illites, and randomly interstratified S/I (not really smectite/illite because the layer charge of the “illitic phase” is way too low, but that is another story). These 2:1 phyllosilicate clay minerals hold water and nutrients and help both to form and to stabilize soil organic matter by adsorbing fragments of biopolymers and physically protecting humic substances from rapid microbial decomposition. Soil organic matter in turn stabilizes soil structure and is a reservoir of slowly released nutrients that nourish crop growth. Iowa soils are incredibly productive! The soils of sub-Saharan Africa are dominated by quartz sands and old, highly weathered Fe- and Al-oxyhydroxide clay minerals. Because these minerals have low-activity surfaces, they are not effective at forming and stabilizing soil-enriching humus. Furthermore, the soils of sub-Saharan Africa have little capacity for retaining plant nutrients and are easily leached and/or depleted of nutrients by cropping.

The challenges facing sub-Saharan Africa have many social, political, economic, and historical causes, but the fragility of their soils has been a major factor reinforcing the poverty trap. We are wise to remember the words of Franklin Delano Roosevelt, “A nation that destroys its soils destroys itself.” But we must also bear in mind that Iowa was endowed with resilient soils, while Africa was given fragile soils; the difference is in the mineralogy.

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The August 2011 issue of *Clays and Clay Minerals* assembles five papers on clay and phyllosilicate minerals in extraterrestrial materials. Four are case studies of mineral assemblages detected by orbital spectroscopy of the surface materials on Mars; the fifth reviews the occurrence and significance of serpentinite-group phyllosilicates in one class of carbonaceous chondrites. This thematic issue embodies the overlapping interests and emerging connections between planetary geologists and clay mineralogists.

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