



DIRT SIFTINGS

Michael Engelhard

BORN FROM A NORSE WORD FOR EXCREMENT, dirt teems with negative connotations: “dirt-poor,” “dirty work,” “dirty jokes,” “getting the dirt on somebody,” and the related “muckraker” and “mudlark.” (Among river runners and desert rats, however, “dirt bag” is an honorific.) Dirt is ambivalent.

As a catchall, it contains multitudes: sand, clay, loess, sediment, volcanic ash, minerals, molds, plant debris, and—yes—excrement. It shelters animal life also: worms, insects, rodents, reptiles, amphibians, burrowing owls, bears, and badgers. You can measure and rate biodiversity by sampling soil from different locations and taking a headcount. For the original inhabitants of the Colorado Plateau—human and non-human—dirt has been home, wealth, medicine, and the stuff of creation.

Playing in the dirt not only helps children to literally bond with the earth. According to recent research, exposure to dirt may boost mood, along with the immune system, even in adults. (A friendly soil bacterium, *Mycobacterium vaccae*, has been linked to increased serotonin production in mice.)

In canyon country, dirt is ubiquitous, from dirt roads to dust devils, from cracked hardpan to turbid rivers. Often wind- or waterborne, it runs the gamut from tan to brick red. It clings to your hair, food, and notebooks. It clogs zippers, camp stoves, and nostrils. You wear it like makeup or camouflage. It tints creeks and bushes, your vision, your very soul. It forms red squalls and deepens the color of sunsets. The smell of rain pocking red dirt—wet wool with hints of juniper and sage—uniquely signifies place.

As pervasive as it is, dirt also holds absences, from animal tracks to the chasm of Grand Canyon—grist from erosion’s mill swept to the Gulf or piled against dams. (In pre-dam times, the Colorado hauled more than half a million tons of silt and sediment per day past Bright Angel Point.) Arroyos and fluvial terraces testify to the dustbowl years that broke pre-Columbian cultures. Mudstone and shale keep tactile evidence of fossil dirt: the washboard ripples of ancient shallows. In geological and archaeological layers, dirt preserves a record of place that reaches back without rupture over hundreds of millions of years. It is easy to wax downright philosophical about dirt. We are stardust, dust in the wind. Ashes to ashes; dust to dust. We are dirt.

The following vignettes sift through a little dirt, both the minute and magnificent, to honor the residue of the eons.

It clings to your
hair, food, and
notebooks. It
clogs zippers,
camp stoves, and
nostrils.

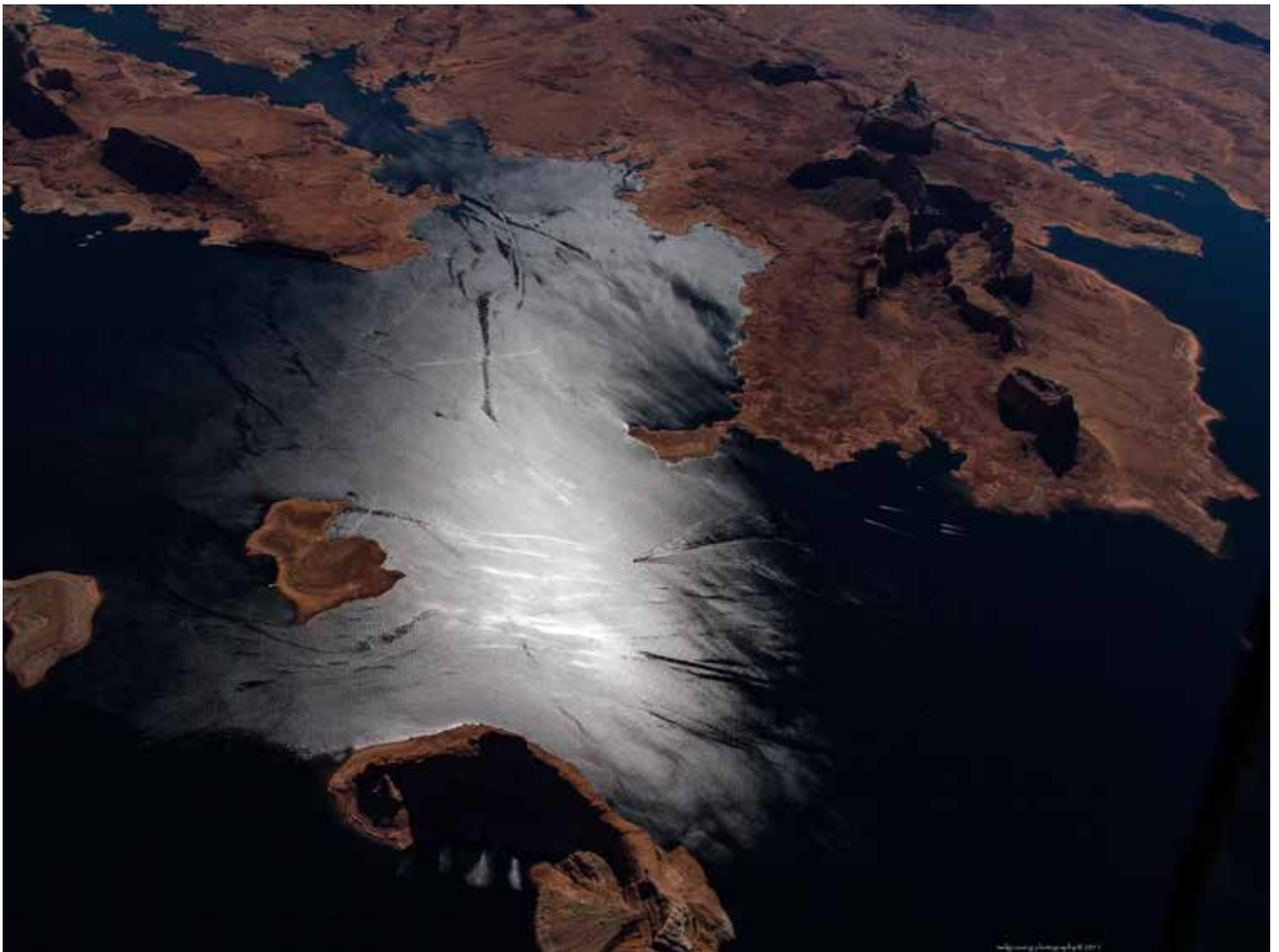
You wear it
like makeup or
camouflage. . . .

FACING: Elve’s Canyon flood.
Photo by Michael Collier.

SILT ONE Where long ago people leaned against sun-soaked walls, coiling clay pots and braiding rope, watching naked children splash in the creek bed below, silt now settles on kiva roofs. Fish swim through windows and doorways. Daubed images praising the life-giving power of rain dissolve in the depths. Gone is the fluting of canyon wrens, the machine-gun hammering of northern flickers. Gone is the swishing of cattails and willows in the breeze. Silence reigns absolute. Even in the unlikely case that the reservoir will be drained the alcoves will have been scoured clean. Pots and ruins will have further disintegrated, arrowheads and metates long been buried under sediment hundreds of feet deep. But at least for now, the ancestors' bones lie undisturbed.

Lake Powell's waters are famously blue. With the river's flow arrested, sediment sinks, trapped behind the dam. Eventually, the reservoir could silt in up to its concrete rim. With the river deprived of its fiber, Grand Canyon beaches melt away. Experimental dam releases that seek to rebuild these beaches—homes to boaters, habitats for plants and animals, and front yards of archaeological sites—need to be timed to coincide with rains that flood tributaries like the Paria River, whose sediment discharge they spread like wealth throughout the main gorge.

In a canyon close by, I sit in the shade of a narrow rock ceiling, among small houses and grain bins fitted into the alcove. Through the eye sockets of one structure I gaze onto emerald cottonwoods. Midday light floods the outside world. A black widow guards the dilapidated entrance, hanging motionless in her silk funnel. Fingerprints show where those long gone pushed river mud between building blocks as mortar. Shriveled corncobs, potsherds, bone splinters, and charcoal nubbins litter the pale dust at my feet. Silence itself seems to crumble. It echoes from the canyon walls that are whittled down grain by grain.



Lake Powell. Photo by Ted Grussing.



Clockwise from upper left: Polychrome Ancestral Pueblo pictographs of human figure with rainbow and bird-like quadrupeds next to staff; pictographs of large white bird, perhaps a duck, over twin flute players with rainbows above their heads; modified Basketmaker/Developmental Pueblo pictograph of human figure with power lines emanating from head; 19th-century Navajo pictographs of horses and riders in charcoal and paint, Canyon de Chelly National Monument, AZ. Photos by Fred Hirschmann.

COLOR FROM THE LAND Traditional Hopi dyes for coloring baskets and wool derived almost exclusively from plant materials. But there is one exception, mineral yellow, which bestowed a good yellow-ochre straight from the land. The Museum of Northern Arizona’s Mary-Russell Ferrell Colton, in her arcane *Hopi Dyes* (1965), drew on the knowledge of indigenous artisans for this beautifully alchemistic mineral yellow recipe:

“Take 1 large double handful of Mancos Shale containing limonite found near Polacca, and cover with 4 cups (1 litre) of water. Crush lumps of earth with fingers and stir the mass every few minutes, then let it settle. A clear liquid will rise to the top as the earth settles and will gradually turn a deep, clear, claret-red color. Allow this to stand overnight. Decant and use as it is, or put through filter paper.”

Minerals also served as “mordants,” fixing plant colors and making dyes water-insoluble. Among popular Hopi mordants were rock salt from the Grand Canyon; copper carbonate from ore mined in the Verde Valley; “crude native alum from efflorescence of drying soil;” and Potato Clay, naturally occurring talc with traces of aluminum. Another kind of dirt, a filtered sheep manure-water mixture, served the same purpose.

For thousands of years, longer than even the Hopi did, artists of the Colorado Plateau refined the purest kind of “dirt” into pigments for rock paintings. The most common colors were red (hematite), white (kaolinite), yellow (limonite), blue and green (copper oxides), and black (charcoal), sometimes combined in a single pictograph panel to Miró-like effect. You can still see such rock art in canyon recesses, though time has muted it.

Moab’s trinket stores now hawk “dirt shirts” to tourists—teeshirts dyed orange with pigments from the slickrock that enfolds town; but you can save twenty bucks and easily fashion your own: just wear a white one for weeks, hiking, biking, and rafting, without ever washing it.

NAVAJO BURIAL Traditional Diné do not believe in an afterlife as such nor does the language have a word for actual death. Some think the afterworld is one of the subterranean realms from which the Holy Beings first emerged. After the spirit leaves the body, it is thought to travel north, following a trail through the mountains. At its end, relatives of the departed meet the spirit and guide it to the underworld.

When a family member became seriously ill, the patient was moved away from the primary homestead, to a lean-to built for that purpose. Children were not allowed to visit. This kept them from getting upset but the custom also reflected the belief that, if the patient took a turn for the worse, the ghost or *chindí* of the deceased might take the living with it. Likewise, children were forbidden to attend burials. The oldest males in the family typically dug the grave while adult female relatives tended to the dying person and prepared the body. These women would not venture to the grave either. While the men dug, they remained silent, as tradition demanded. The oldest male relative would strip to his breechclout and lower the body. The grave’s location was kept secret, and the family observed four customary days of mourning, during which nobody left home or received visitors.

In pre-missionary days, people would bury the body in the dirt-domed family hogan, wrapped in a blanket or buckskin. Family members would tear down the lodge on top of the grave, or at least seal its doorway, before moving on. They also killed and interred the dead person’s favorite horses. They destroyed his or her possessions, so that the ghost would not miss these and return to haunt the living.

Many Diné still avoid contact with human remains, fearing spiritual reprisals. They hold a special purification ceremony if they cannot avoid touching a corpse.

CAVE DIRT With its dry climate and many alcoves, the Colorado Plateau’s stone pockets of dirt—some filled with the dung of extinct troglodytes—have attracted scientists since the 1930s. One of the most famous is the Grand Canyon’s Rampart Cave, discovered in 1936 by Willis Evans, a Paiute Indian foreman of a CCC camp at Pearce Ferry. The cave contained the hair and fossilized feces of Shasta ground sloths, grizzly-size browsers with a stout tail and grapple-hook foreclaws. This organic dirt, which can be radiocarbon-dated, had accumulated to a depth of sixty inches. It showed that sloths denned in this cave for 25,000 years. Among the deposits, paleontologists also found signs of marmot, desert tortoise, lynx, cougar, lizard, ringtail, mountain goat, mountain sheep, and horse. Pack rat middens and pollen further aided in reconstructing the cave’s Late Pleistocene surroundings, proving that a mix of woodland and desert plant species had colonized this region 30,000 years ago.

To prevent vandalism of the site, the Park Service had a steel gate installed. But locked doors entice certain characters even more, and in 1976, someone forced an entrance; somehow the remains caught on fire and a priceless record of the past was destroyed.

Roughly synchronous with Evans’s discovery, the Grand Canyon ferryman Merle “Pop” Emery stumbled upon a hole filled with pay dirt of a different kind. Beneath a ceiling of live furry bodies, a crust of dark-gray matter coated the floor: bat guano, a great natural fertilizer. A mining engineer estimated there to be 100,000 tons of it; at a price of about \$100 per ton, the cave looked like Aladdin’s. After a small airstrip and a tramway to Hualapai lands on the West Rim had been constructed, mining of this “ore” began in earnest in the late 1950s. Hoes and rakes broke up the dry fecal matter, which a giant suction pump then vacuumed into a cable car. Alas, the hoard contained mostly fool’s gold—only 1,000 tons of guano. The rest was mere limestone rubble, and the venture was a bust.

EARTH AS A DUTCH OVEN

Dirt nourishes, through nutrients, and even helped people with food preparation. In the old days, lucky Navajo sheepherders sometimes would kill a porcupine. Women and children could do this with a stick. After thanking the animal's spirit, the cook would singe off the quills. He would then heap dead piñon branches over juniper twigs and dry leaf kindling in a pit and light it. While the wood burned to embers, he would dress the porcupine, which could be the size of a small sheepdog, pulling out entrails and splitting the breastbone to open the animal like a book. He would then place the porcupine face down on the coals, covering it with more branches. After the fire burned down, he would throw dirt over everything and build another fire on top.

He would restart the fire repeatedly throughout the night. When the sun rose, the fragrance of roasting, entombed porcupine would waft through camp. The meat would be tender, juicy, and fat, tasting like pork.

This method of cooking has a long history in canyon country. At lower elevations of the western Grand Canyon, downstream from Middle Granite Gorge, agave (*Agave utahensis*) and mesquite, which abound were an important food source. One thousand to seven hundred years ago, Puebloans of the Virgin River branch of Anasazi were roasting agave in pits, augmenting a diet rich in corn.

The Cerbat descended from the South Rim in early spring to forage for agave, supplementing mule deer and bighorn sheep meat. Roasting pits possibly are the most common archaeological sites in the canyon, and some were in use until the 1900s.

In 2008, archaeologists excavated a roaster near the Bright Angel Trail—the oldest thermal oven identified in the park; over the course of 2,500 years, different peoples prepared animals and the sweet, starchy hearts of agaves there, on rocks they heated and buried.



Agave parryi is native to much of the Southwest. Scosens/Dreamstime

SILT TWO “The river is so dirty,” a guy in my raft says. I tell him that’s the sediment that gave the Colorado its name. I tell him how once we’ve used up the tap water we carry on this trip we’ll let river water settle in five-gallon buckets overnight, then decant and filter it. But it’s not dirt, it’s *giardia*, a parasite residing in cow dung and human waste and a waterborne bug you don’t wish on your worst enemy, that we should worry about. “I’d be more concerned about what you cannot see,” I tell him: traces of radioactivity from the Atlas Mine tailings piles near Moab, upstream, or from naturally occurring uranium in the Grand Canyon’s Horn Creek, petrochemicals from the boaters recreating on Lake Powell, and wastewater from the reservation. “It’s not dirty enough,” I say when I feel especially pesky. The river’s particulate load, after all, replenishes beaches on which we camp in the canyon—except when it doesn’t.

To help fine-tune the dam’s flow regimen, Adopt a Beach—a service project organized by the National Park Service—enlists commercial river outfits to monitor assigned beaches and document changes by replicating photos taken after each artificial flooding.

There are fish in these waters that turbulence streamlined, such as the endangered humpback chub. Biologists think that its prominent bulge diverts the flow of water around the body, allowing the chub to keep its position in swift currents. The largest remaining population, fewer than 10,000, lives and spawns near the mouth of the Little Colorado River. A toxic spill in Cameron, where Highway 89 crosses the tributary, could wipe out the entire clan. Biologists therefore established a second population farther downstream, at the mouth of Shinumo Creek.



CAPTION. Photo by Bronze Black.

By the end of the trip, our clients—smarter now, about beneficial silt—filter and drink the river like pros. They no longer mind sand in their bedding or food. They have become certified dirt bags.

DARKLING BEETLE Because the larvae of scarabs or dung beetles emerged from underground brood chambers, ancient Egyptians believed that these beetles were created spontaneously—*ex nihilo*—from the earth. They therefore associated the scarab with immortality.

Resembling a black olive on legs, a different beetle—the darkling beetle—is a conspicuous ground dweller throughout the Southwest. More than 120 species of it enliven the soils of the western United States, and its sheer numbers and habits make it one of the most commonly encountered desert insects. After hatching, the larvae burrow into the soil where, like Egyptian scarabs they transform into beetles and surface as if resurrected.

Darkling beetles feed on dead plant matter and fungi. Even when they hide under rocks, logs, or in detritus you can spot their zipper tracks in fine sand or the dust in alcoves. One of the great walkers of the beetle world, this seasonally nocturnal one seems to wander at random, finding food by its odor. The hard wing covers of this flightless migrant are fused together, which reduces evaporation, and it can metabolize all necessary water from its diet. A few species can spray noxious fluid from the tip of their abdomen while doing a “headstand”—hence their popular names “clown beetle” and “stinkbug.” Undeterred by defensive posturing, grasshopper mice push darkling beetle hind ends into the dirt and will eat the more palatable fronts.



Popular attitudes toward this amazing critter have found expression in Clint Eastwood’s movies, where gunslingers crush them under boot heels or douse them in well-aimed spurts of chewing tobacco juice.

According to some Hopi elders, bad people were reborn as darkling beetles.

The Latin name of the family (*Tenebrionidae*) suggests shadows and darkness—things obscure, secretive, underhanded. An anthropologist with the Hopi considered beetles that had fallen into the pit of an old kiva “the perfect picture of lost souls as they lumber about futilely looking for a way out.”

TRAILS “For untold thousands of years we traveled on foot over rough paths,” writes the historian and geographer John Brinckerhoff Jackson, “not simply as peddlers or commuters or tourists, but as men and women for whom the path and road stood for some intense experience: freedom, new human relationships, a new awareness of the landscape.” With slapping sandals and pounding boots, on the tracks, often, of mule deer or bighorn sheep, humans have spun a web of connectedness. Compressed dirt snaking between patches of plants links the South Rim and the North Rim, the canyons and California’s coast, us with the earth and each other. *Homo ambulans* leaves marks tangled like storylines on the land.

Near backcountry campsites or water sources trails often fray, fork, or proliferate, proof of our urge to rush, or else, to nose around. In national parks such “desire paths” require replanting the damaged vegetation. Like water—and people—erosion seeks venues of least resistance; gully washers and cattle, mule hooves and dirt bikes further entrench ruts, following fall lines rather than switchbacks.

Foot traffic degrades fragile places as easily as too many cows will. Revisiting a favorite haunt in the Escalante watershed for the first time in ten years, I was struck by the changes. Trails marred crypto-biotic soil carpets, shortcutting across canyon meanders. Campsites appeared strangely denuded even for this arid environment. Signs now announced compost toilets that lay barely hidden from view.

While it grounds us, walking on dirt keeps our minds on the stars. “I can only meditate when I am walking,” confessed Jean-Jacques Rousseau. An entire school of Greek sages—the peripatetic philosophers—thought best on their feet. Pacing in dusty courtyards, they delivered life-and-death discourses and contemplated the potentiality of everything, including including the value of dirt.

Former Flagstaff resident **MICHAEL ENGELHARD** now lives a stone’s throw from Nome’s gold-bearing beaches. He still misses red dirt.