

open and close,
their gills,
they are fed,
they breathe.

The gods
are not large,
outside us.
They are the fish,
going on
with their own concerns.



Our Deepest Affinity

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Still dark. We crouch low, careful not to wobble the narrow dugout canoe, wary of the Black Caimans known to lurk in the water of this lagoon, off a side-channel of a tributary of the Rio Napo. A few miles downstream this major branch of the Amazon will become the border between Ecuador and Peru. As daylight gradually suffuses the Amazonas dawn, six of us—four travelers led by two young Kichwa guides—silently skim across the lake’s surface. Grays imperceptibly shift into greens. Loud squawks and whistles signal the hidden lives of birds, emphatically calling in a new day. We cross the length of the lagoon in twenty minutes, then turn up a narrow black-water stream. Tiger-Herons stride the dank sandbars. At this low-water season, the canoe bumps into downed logs, and we grab the gunnels to steady ourselves.

We arrive at an indistinct trail through the forest, clamber out of the canoe back on to terra firma, and begin walking—away from water, deeper into this “green lung of the world.” This is not my native habitat—I lean toward open deserts, stone canyons, and windy alpine reaches—but I’m awestruck by this diversity, this clamor of life upon life. Whichever way I turn my head, I observe a dozen or more types of trees, most

unknown to me. Each flash of wings is likely that of a new species of bird or butterfly: wafting butterfly flight sparkles azure in the glinting sunlight; manakins, gold and black, flick from shadow to shadow. A troop of diminutive Squirrel Monkeys leap through the branches above us, babies clinging to their backs, while we hear the far-off roar of Howler Monkeys, a sound strangely akin to distant aircraft engines.

Finally, we reach an enormous Kapok tree—the most massive plant I’ve ever seen in the tropics. It would take a dozen people clasping hands to encircle this tree, which stands well over two hundred feet tall, with a straight, clean trunk. The immense erect form of this giant would not be out of place in a Pacific Northwest conifer forest, or a California redwood grove. The local Kichwa community has built an immense ladderway up into the green. Our guide’s father and uncle were among those who climbed, unroped, to scout the canopy when the local community first determined to build this elevated window on the forest.

We ascend the two hundred stairs, and then step out onto the broad wooden planks—truly, the highest tree house I’ve ever seen. From this vantage point, near the top of the forest’s tallest tree, we can look *out* upon something usually not visible, the broad unbroken expanse of the rainforest, and *down*, onto the canopy, the roof of this forest community. Enormous pale branches curl dozens of meters outward toward the gauzy-blue morning sky, as if my own arms extended out to embrace the world. Leaves of every green hue and a hundred different shapes and ruffled textures unify into a billowing surface pulsing with life.

Here, we indulge our eyes and hearts for the next two hours—a parade of birds arriving, departing, sometimes landing on the very branch that cradles our airy platform. In this

pair of hours, I see twenty-two new species of birds, all of them astoundingly beautiful. I’m not the sort of birdwatcher that fixates on numbers or tallies, but still, the flood of new sensations—new colors, sizes, shapes; whole new families of birds—*electrifies* me, as if sparks flash from the perimeter of my body, mix with the pulsating energy of this greatest of Earth’s forests.

Just below us, on the next tree, two toucans clap their outrageously large and cumbersome bills—almost as large as their bodies, like polished, gilt-edged sheaths for giant curving daggers. An owl-like Great Potoo sits stock-still, staring at us from our own branch, while a nunbird—black body, curving golden bill—perches upright for long minutes from the next tree. The iridescent blue-violet head and luminescent golden legs of a Purple Honeycreeper flit between glossy leaves of the tree immediately below me. Others of the exquisite tanager tribe—Silver-beaked, Turquoise, Opal-rumped, Masked Crimson—also dazzle us, revealing shockingly vivid colors—scarlet, azure, saffron—as they methodically probe branch crevices and leaf surfaces for insects.

Suddenly, shrieking with sociality, a dozen *Amazona* parrots, each as long as my arm, fly close by, well below us, and disappear into the humid void.

Who knew that angels’ backs glistened metallic green?

Or that we, mere bipeds, could ever observe them from above?

Another season, another place.

The crimson bird perches, almost motionless, on the stout horizontal branch of the Velvet Ash, twenty feet above my head. Every few seconds, its substantial bill opens slightly as it

chirps loudly—*pitúk*. For almost ten minutes, I quietly watch and listen to this repetitive behavior. The only other sound and motion: wind tousling these oasis trees, ruffling the surface of the deep green pool, beneath the abruptly rising russet limestone cliffs.

My daughter, soothed by the day, just finished with a year of college, dozes peacefully on the sand, a few feet behind me.

It's no accident she and I are here together in this moment, able to witness this Summer Tanager, far northern outlier of a group of wonderfully colorful tropical birds, seemingly out of place in North America's desert Southwest.

It had been a hard week—stresses at work that swallowed days, created unexpected meetings, and traced shadowy outlines of loss in the lives of friends. Losses of jobs and identities, and, in one especially tragic case, the loss of life, when a colleague, riding his bike home from work through the desert, was abruptly smashed to the pavement and sudden death by a drunk driver.

All this—convening coworkers, responding to somber concerns, explaining decisions and actions—kept me tethered to a computer screen, the flat face of illusion and anonymity. On my way home from a culminating, especially draining meeting, bruised by the challenges and sorrows within my community, I realized my spirit needed rejuvenation. I needed *beauty*. So I proposed to my daughter—a healing balm in her own right—that we hike together into one of my favorite canyons the following day.

We drive through the parched tan landscapes of upland Arizona in June, the edgy time of year when subtropical moisture amasses into towering clouds, but monsoon rains—that

for which generations of rain-dances were danced—taunt us with their nonappearance. We cross the crest of Mingus Mountain, passing through cool pine forests, then descend into the heat of the valley on the steep downside of this fault-block mountain. We swish and sway down the curves of the two-lane road, finally turn off and cross the green river, true to its name—Verde—and then veer onto ten miles of bumpy dirt.

We scramble out at the trailhead, and descend quickly toward the lush beauty of a spring-fed wilderness canyon. From one moment to the next, as we arrive at the canyon bottom, we leave behind the heat and the dust, and are enveloped by deep shade, and the shifting burble of moving water.

In we walk, enfolded within shimmering green, with red cliffs at the perimeter of vision, bolstered by the promise of watery escape. This new world is rich with birdsong and tantalizing flicks of yellow, red, and blue amongst the fluttering leaves.

Whenever we feel like it, we stop and sit quietly at the edge of this stream, rushing with this great arid-lands miracle: abundant clear water in motion. Like the stream, our conversations meander—new job, new relationship, upcoming travels. Like the smooth sandstone ledge we sit upon, our minds begin to still.

What I never doubted, nor even had to consider: that coming here would heal us. That the cradling embrace of this bio-diverse canyon would be good medicine.



Our world desperately needs more people to be more in love with it. Anyone reading a newspaper, browsing Facebook, searching the Internet, or, sometimes, just walking down the

street, knows we live in a challenging time. We're routinely confronted with conspicuous anxiety, depression, violence, with evidence and news of climate change and terrorism. Too often, people conspicuously mistreat each other, and blatantly disrespect the natural world.

But the Earth is a gift, not a problem—and loving the world is as important as grieving for it. Being an awake and engaged human being is rooted fundamentally in an unequivocal love of the world. Our deepest affinity is for this rich and remarkable world we live in—our fellow beings, the textures and colors of landforms, the luscious scents of each place we touch. The term “biophilia” indicates our innate urge to affiliate with other forms of life.

As we fall more deeply in love with the world, we learn to love ourselves more fully, and learn to care for our surroundings and our fellow beings more completely. Paying attention to nature—something beyond ourselves—is how we develop, nurture, and express our love of the creation. All good things emanate from this affection for the world—caring, compassion, deep engagement, and meaning. So it behooves us to consider: what fosters passion for the planet?

The attentive practice of natural history—which I've previously defined as “a practice of intentional, focused attentiveness and receptivity to the more-than-human world, guided by honesty and accuracy” is, essentially, the practice of falling in love with the world. Such practice can involve watching birds at a backyard feeder or in alpine tundra; tending the garden or observing old growth forests; sketching flowers, watching butterflies, fly-fishing, or counting migrant hawks. In short, natural history involves mindful observation.

Natural history, then, is a verb, not a noun—a *practice*,

something we *do*. And attention, as the Buddhist psychologist John Tarrant has pointed out, is the most basic form of love. Human beings are designed by natural selection to do natural history—our senses, our limbs, our whole bodies have evolved for attentiveness. Natural history is humanity's oldest continuous endeavor. No wonder—our survival has wholly depended on our capacity to pay attention to the encompassing living world, full of threats, foods, and delights.

Yet, we live in a very odd historical moment: there has never been a time in the history of our species when so few of us have paid attention to the world that surrounds us. The current gush of social dysfunctions—violence, depression, anxiety, alienation, lack of *health* in so many ways—coincides with the mass sacrifice of human interaction with nature, the greatest dearth of natural history in human history. We have come to see the world as a funhouse built of human mirrors, where we see only ourselves, and narcissistic distortions of ourselves. Without attentive immersion in the larger-than-human world—the exact immersion for which we are biologically adapted—we dissolve into individual and collective malaise.

Natural history combats arrogance, tackles despair. Attentiveness to the world around us engenders humility and open-mindedness. It humanizes and grounds us by offering a larger perspective on the world. Humility—so sorely needed in our social and political discourses—can only be taught through modeling. Some human elders do a fine job of this. But immersion in the complexity, unpredictability, and, occasionally, the ferociousness of the natural world almost always teaches humility.

Natural history makes us healthier as individuals and, collectively, as societies. Engagement with the beauty and power of Nature brings out our best behavior, supports our best selves.

The expansive attentiveness of natural history is ultimately hopeful. For we're all wired to pay attention to nature. Human consciousness developed in natural history's forge—our patterns of attention were sharpened as we watched for danger and sought food. Practicing natural history is our natural inclination. We are all born with the capacity to attend the world with wonder—just watch any child—and so recovering a collective sense of stewardship is within our grasp.

When we love the world we can love ourselves. And vice versa.

Each moment we pay attention reverberates with heightened perception, as awareness from the past intersects with that of the present.

Just now, a tiny pale butterfly tumbled past in streamside flight, and I caught the briefest glimpse of orange at the outer margin of the wings. Based on many past observations, I recognized this as a Desert Orangetip. Instantly, based on past study, a notion of this lustrous insect's life enters my mind: what it eats, where it will lay its eggs, how long it will live, that it can persist as a chrysalis for several years, that its caterpillars eat wild mustards, that its adults gather in fluttering hilltop congregations.

One quick burst of quivering white, laced with orange, and I'm connected with the here and now of communion, and the practice of empathy.

The more we pay attention, the more we find beauty. Natural history opens up entire worlds: the remarkable golden hairs on the anthers of a *Penstemon* flower; the graceful tilting flight of a harrier just above the field where it hunts; the glossy green sheen on a tiger beetle's carapace; the bold rings

of orange, black, and white that encircle a Sonoran Mountain Kingsnake; the sudden flash of scarlet when a male blackbird displays its wing patch; the lustrous surface of sandstone traced by our fingertips. The facets of beauty available for us to notice are, truly, beyond counting.

It's easy in our troubled times to think that something as simple or abstract as beauty should be shunted to the sidelines, that it is overly self-indulgent to care about the beauty of this world. Or to remember that we humans are lovely, fragile, flawed—but, still, beautiful beings. But I concur with *The Idiot*. The title character in Dostoyevsky's novel declared, "beauty will save the world." As an evolutionary biologist, I'm often struck by the implausible reality that the world is more beautiful than it needs to be. We could have a functioning "system" with fewer parts, less extravagance, perhaps more efficiency.

But each day we start anew and walk out into a world that is full of sorrow and injustice, yes—but that is also heartbreakingly beautiful. Despair must not overrun our appreciation for this world—plant and animal, stone and sky, and human souls—that is immeasurably lovely, more beautiful than it needs to be, in spite of the grief that is embedded within it. As Terry Tempest Williams asserts, "beauty is not a luxury but a strategy for survival."

Our capacity for honoring beauty is interwoven with our aptitude for compassion. Compassion—literally, *feeling with*—occurs when we encounter others with open hearts. It has often been noted that we are less able to respond to human suffering when it is on a massive, impersonal scale—tales of far-off flooding, yet another shooting, or even genocide. But when a story becomes individual, our psyches can respond more compassionately to *this* victim, *this* survivor, *this* neighbor in need. It works the same way when encountering our non-

human neighbors. When we connect with individual, specific lives—*this* flower blooming in this parched mudflat, these muskrat eyes looking back at me from the desert pool—we can transcend nebulous notions like “Nature” and replace them with texture, depth, and a realm of specificities. Natural history, then, is a path of compassion.

Of course, there’s no shortage of wonderfully selfish reasons to care about nature—because it’s good for us.

“Nature Deficit Disorder,” a term coined by Richard Louv, has focused public attention on the notion that immersion in nature is essential for human health. The idea garnered some persuasive power by utilizing the jargon of medical science—“deficit,” “disorder.” As yet, there’s no formal medical disorder, nothing listed in the *Physician’s Desk Reference*, concerning lack of nature. But perhaps there should be. When one peels back the guard hairs of cognitive science and starts reading what’s buried in technical journal articles, it’s stunning how remarkably *healthy* time outdoors turns out to be. Again and again, the conclusion in a wide variety of psychological and medical studies—published in such respected journals as the *Proceedings of the National Academy of Science*, *Journal of Experimental Psychology*, *Environmental Health and Preventative Medicine*, *Journal of Cardiology*, and many more—is that it’s simply healthier, both physically and emotionally, to spend time outdoors than in more human-dominated urban settings, to walk in forests rather than along city streets.

The documented benefits of what healthcare professionals now sometimes refer to as “nature therapy” or “forest therapy”—simply put, being outside—are striking, and diverse. People who spend time outside have less stress, improved memory, stronger immune systems, better vision, increased

creativity and problem-solving capacities, reduced inflammation, improved concentration, and are, well, happier.

Immersion in nature reduces stress, and this can be measured by standard physiological metrics like heart rate, heart rate variability, and blood pressure. A Harvard study demonstrated a direct linkage between exposure to green spaces and mortality rates: of the more than 100,000 female nurses monitored, those living in the “greenest” areas had a twelve percent lower mortality rate than those living in human-dominated habitats, and cancer risk declined even more. In other words, living closer to nature can help us live not only better, but longer.

Several studies have demonstrated that urban people living near parks or greenspace have lower levels of incidence of psychological problems, and that people who visit such greenspaces have lower levels of stress hormones than their peers who had not been outside recently. One study concluded that “stressful states can be relieved by forest therapy.” In another, people who walked in parks showed lowered blood flow to the part of the brain where brooding (“morbid rumination,” to the psychologist) takes place. The researchers concluded that getting out into natural environments could be an easy and almost immediate way to improve moods of city dwellers. In another study, a controlled experiment revealed a direct relationship between separation from nature and increase in risk factors for mental illness. These researchers concluded that “accessible natural areas may be vital for mental health in our rapidly urbanizing world.”

A study in Toronto quantified the health benefits of living in neighborhoods with a higher density of trees: having eleven more trees on a city block decreased cardio-metabolic conditions (heart disease, hypertension, high cholesterol, stroke, and so on), in ways comparable to a boost in annual personal

income of \$20,000, or being a year and a half younger. Living with trees, one could say, makes a person richer and more youthful. A large body of research, from several nations and continents, has documented that outdoor activity in children reduces their risk of nearsightedness as adults. Playing outside, in other words, literally helps us see the world more clearly. Time outdoors has been correlated with boosted immune systems in general, and there are indications that forest environments may stimulate production of anti-cancer proteins.

These are but a few snapshots of the exploding scientific literature on the healing power of nature. The bottom line: nature is good for us. This is no longer just the murmurings of nature poets or the trumpeting of conservationists, but the prescription from a wide variety of cutting-edge, peer-reviewed studies in cognitive and medical sciences.



It's the final night of a week-long group backpack into red earth. After a late supper and lingering conversation, two of us lay back, stunned into horizontality by the night sky. In this canyon of smooth stone, deep in the heart of one of the largest roadless areas in North America, our eyes gaze intently where they rarely focus—upward. The dome of stars is phenomenally textured, with vast depth visible within the Milky Way. Swirls and eddies of pulsating light contrast with the velvet black of infinity. Arcing downward, the gaudiest shooting star I've ever seen blazes brilliantly for a full twenty seconds as it angles toward Earth. Its long tail remains gleaming even after I close my eyes.

It's a brief interlude of extended psyche, as our minds momentarily stretch beyond their usual boundaries—a sense of delighted union with the larger forces of not only this world

of green, but the universe that surrounds it. And better for sharing it with a close friend.

Lying, face-up to the heavens—dazzled, humbled, entranced by the endless array of light—provokes a fundamental feeling of kinship with people through times and cultures. We all look up, and wonder.

And on these sandstone slabs, in front of this long-inhabited alcove, near thousand-year-old petroglyphs and discarded clay pots, we see the same framing of the universe as our ancestors—unchanged through human time, but for the occasional steady scoot of a tiny satellite's light.

In these singular moments, we are the outbreath of galaxies.