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BELLYING UP TO THE WORLD

We want to reach the heart of the world, but first must know the surface. The problem is, there's no end to the surface.

When my sons were young they led me to amazing new places I had never thought to visit. Aaron, at four, said, "Dad, you're a kid in your brain and I'm a man." He collected seashells, old coins, basketball cards, and feathers, attaching deep and equal value to each, ready at any moment to abandon them all. One afternoon, as we walked in the meadow near our home, he watched fascinated as hundreds of starlings passed overhead in streaming, switching undulations, like a river of birds. Brimming with mission, I explained what they were doing, and why. I was in teacher mode, trying to share the information I was sure he would need to find his way in life. But he wasn't listening. He stretched out in the grass and crawled, following the trails of beetles and meadow voles, already immersed in some private immensity.

I followed him. I ruined the knees on my Dockers but, by God, I got down in the dirt with my son and became lost. And while I was there,

happily nosing around among creatures I hadn't paid attention to in years, it occurred to me what an enormous kingdom there is among the grass stems and spider holes. I knew then what the nineteenth-century zoologist and geologist Louis Agassiz meant when he said, "I spent the summer traveling. I got halfway across my back yard."

Myrmecologists take note: My sons in their backyard travels have devised an effective technique for observing the foraging behavior of ants. Begin by placing half a teaspoon of granulated sugar in your mouth and swish it around to stimulate the production of saliva. Allow the solution to linger a few seconds on your tongue (especially near the tip, where, as three-year-old Nick explained, the taste "bugs" are most receptive), then with careful aim allow a drop of richly sugared saliva to fall to the ground, ideally in the path of a solitary ant. In our yard, the best ants for the purpose are the tiny red ones that have demonstrated their love of sweets by colonizing our kitchen. Their single-file trade route leads around the perimeter of the floor, up a wall, across the counter, and to the back of a cupboard where there's a ruptured bag of jelly beans left over from Easter.

Aaron, while mastering the saliva/sugar technique, noted that it takes a while for the scout who discovers the bounty to rush back to camp with the news and return with a company of workers. He noted also that the workers seem to follow a scent trail laid down by the scout but don't follow it unerringly. There is a certain amount of weaving and crisscrossing involved, reminiscent of the way a river in a delta divides into braided channels, as individual ants lose the trail then pick it up again and are followed by others who digress from the secondary trail, and so on. Eventually the ants create a wide, well traveled highway over the shortest practicable route from nest to food source. Soon a line of workers is busy transporting the dissolved sugar back to camp a bellyful at a time.

Once you start noticing the little worlds around you, there's no end to them. One spring the boys and I became interested in a tiny reservoir of water we found in the crotch of one of our yard maples. It was early

April, still cold enough to harbor a few patches of snow on north-facing slopes and too early for the black flies and mosquitoes that in a few weeks would be on the wing and on the hunt. The only insects we had seen until then were the small, pale-colored moths that emerge from leaf litter as soon as the snow is gone, before the insect-eating birds return to spoil the party. The boys and I peered into the cavity in the crotch of the maple and saw a glint of water deep inside. We inserted the nozzle of a squeeze-bulb device designed to draw samples of antifreeze from car radiators and drew out a half-pint of murky, odorous water, emptied it into a jar, and carried it inside the house. We placed the jar on the windowsill in the kitchen and waited for the sediment to settle. Soon we could see dozens of minute, nearly microscopic larvae wriggling in the water.

Within a few days the larvae had grown to an eighth-inch in length and were suspended head down from the surface of the water like slender bats hanging from the roof of a cavern. We noticed they were sensitive to shadows and vibrations: Pass your hand over the jar or tap it with a finger and the larvae would panic and begin frantically flexing their bodies. Nick was enchanted. He was convinced that we had discovered a new species and wondered if we could call a scientific hotline of some sort, register our discovery, and make taxonomic history.

Marston Bates, in *The Forest and the Seas*, talks about insects that have colonized the pools of water in “rot holes” in trees in South American rainforests and others that live their entire lives in the rainwater trapped among the leaves in bromeliad plants. He also describes a species of North American mosquito that deposits its eggs only in the reservoirs of water inside Venus flycatchers. Life sprouts anywhere it can—*everywhere* it can. Ecosystems—communities of interacting plants and animals and the environments they live in—are large or tiny, remote or close-at-hand. Within each community is a food chain of producers and consumers dependent upon one another. If the community is complex, as it almost always is, the food chain is more properly known as a food web. Countless complex dramas take place every moment in

the hollows between the nodes of bamboo stalks, within the fruits of fig trees, and in our own backyards.

My half-educated guess was that our tree-hole wrigglers were the larvae of midges, those tiny harmless Diptera you see on spring and summer afternoons hovering in clouds above the ground or water. They often swarm in beams of sunlight, where they catch rides on subtle thermal currents. Entomologists have discovered that each swarm maintains a semi-permanent position near a “swarm marker” such as a tree branch or a patch of ground vegetation. Picking out a spatial locator apparently ensures that males and females congregate close enough to one another to increase their chances of meeting and mating.

While our larvae grew in their jar on the windowsill, we spent a lot of time outside observing the midges that gathered in swarms of thousands in our yard. They suspended in the air as if tethered to invisible cables to the ground, but when we walked among them they exhibited some of the same defensive alertness as the larvae in the jar. They moved out of our way, closing in behind us, careful to avoid contact but always quick to return to their hovering formations.

Meanwhile, our captive larvae fed on microorganisms in the surface film while breathing through miniscule snorkels, and grew to a quarter-inch in length. I was a bit of a hero in Nick’s eyes, at least until the first of the larvae changed to pupae and metamorphosed into adult mosquitoes rather than midges. Mosquitoes are Diptera also, and are closely related to midges, but that’s like comparing piranha to goldfish. Our neighborhood is infested every summer with small fast-flying mosquitoes the boys call “kamikazes” because they attack so viciously and apparently have no fear of dying. Now we know they hatch from tree holes. It’s worth noting that they attack just as viciously indoors as out.

My sons have always been very good at reminding me how tiresome it can be to fill one’s head with trivia. They didn’t care a lick about the taxonomy of the mosquitoes in our house or of the tiny crustacean we found scabbling among the pebbles at the beach. They wanted to know what it *is*, not what it is called. The goal, they reminded me, is to keep our

eyes open and become one who notices and appreciates the bountifulness of the world. When they carried home bird's nests and owl pellets, wounded dragonflies and the dried claws of crayfish, it was pure booty. For a kid, observing and collecting are inseparable activities.

Those activities can be practiced year-around, but summer is the high season for low-level observations. Early on a summer day, when you kneel in wet grass and start searching, you become an explorer in exotic lands. A backyard, it turns out, can be as engaging as a rainforest. Within that fragrant jungle of weeds and grasses is an enormously varied biota of animals. Beetles lumber past in slow and clumsy gait. Leafhoppers poise on a leaf tip, then, at the first hint of danger, fling themselves into the air. Wolf spiders stalk, pause without moving for minutes at a time, then rush forward at terrible speed.

When adults explore the world at kid-level we're reminded that life thrives in such variety and complexity that we'll probably never be done cataloguing it. Also, and perhaps more importantly, we teach our children by example that it's okay to appreciate nature—that it is not just child's stuff.

In our age of instant entertainment and easy indoor diversions, children sometimes need to be encouraged to go outside. With a little nudging they'll explore the backyard in the old-fashioned, down-and-dirty way, with grubby fingers and muddy knees, carrying a fruit jar, a magnifying glass, and a butterfly net fashioned from cheesecloth and a coat hanger. Belly up to the world with a kid and you can form a bond for life. You might end up with a house full of mosquitoes, but surely that's a small price to pay.