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THE SECRET LIFE OF A TREE IN THE RAIN FOREST

Deep in the jungles of Costa Rica's Osa Peninsula, 800 animals, plants and insects share the same splendid home.

Two centuries ago an airborne seed touched down on a hillside in Costa Rica and began its journey toward the sun. Since then it has grown some 200 feet and its limbs have become a natural ark for hundreds of animals, plants and insects. It is a tree unlike any other, and yet in one way it resembles millions around the world: It may not have a future. We are told 33 million trees like it are felled each day. But are we listening? If a tree falls in the rain forest, does it make a sound?

FLOOR

Everything that grows and falls in this dim, quiet world will eventually nourish even the highest branches of the tree.

Hidden on the murky and leaf-strewn ground are species that protect themselves with coloring, speed and strength.

The forest floor survives on hand-me-downs from the leafy roof above. All but 2 percent of the sun's rays are intercepted by the canopy, leaving everything below in perpetual dusk. Winds that shake the treetops are mere whispers down here, and rain lands only in drips and rivulets. Yet this cloistered world vibrates with life. Fallen leaves and branches decay into a rich compost that quivers with ants, termites and lizards. The base of the tree itself is sheathed in lichens, vines and molds, and some 65 species of plants, saplings and mosses surround it, pushing up to find a place in the sun.

UNDERSTORY

Each step up brings one farther into light, warmth, wind -- and the sense of life growing

richer and more complex.

At 100 feet, where the trunk first branches, the tree has risen above its 90-foot counterparts, whose tops form a green carpet crawling with birds, lizards and insects. The forest floor and the canopy both have their own characteristic mix of light, moisture, plants and animals. Here in the transition area between top and bottom, the two environments mingle to create a lovely chaos: The understory receives enough light so that its vines sprout leaves, birds dart through the foliage, and monkeys make their boisterous journeys in search of food. Farther up, the tree will start to spread its boughs, as if in celebration.

CANOPY

Scientists consider it the equivalent of a New World, offering secrets, marvels, challenges -- and things to name.

One hundred and fifty feet up, the tree unravels into a massive canopy whose limbs embrace nearly an acre. This is the nerve center of the rain forest, where brilliant sunlight and an annual 200 inches of rain nourish a stupefying abundance of life. Twenty years ago biologists thought there were two million species on earth. With canopy exploration, estimates have grown to as high as 30 million. Many of the insects and animals that live here, traveling a lattice of arboreal paths, will never touch ground -- until, of course, this tree finally falls, bearing its heavy cargo to a newly sunny floor.

IF A TREE FALLS

"There is nothing like a tropical rain forest for replacing arrogance with awe," writes Gerald Durrell. And often awe with woe.

The word green appears so frequently in the journals of Christopher Columbus that one might think the aspect of the New World that most impressed him was not its gold but its rain forests. "I never beheld so fair a thing," he wrote, "trees beautiful and green, and different from ours, with flowers and fruits each according to their kind." Compared with subsequent visitors, Columbus actually sounds rather restrained. Something about the place's sensory overload drives most writers to produce prose that's as purple as their subject is green. The first time I stepped into the rain forest, I was so dizzied and delighted that I scribbled down four second-rate metaphors within a minute -- I was in a cathedral; no, in a terrarium; no, in a greenhouse; no, at the bottom of the sea -- before my descriptive powers regressed to an awed scrawl: "Wonderful! Wonderful! Wonderful!"

Of course, we resort to metaphor because we are grasping for some way to relate the exotic and ineffable rain forest to something we know. Scientists use numbers for the same reason. They tell us that rain forests make up 6 percent of the earth's land surface and estimate that they may be home to as many as 90 percent of its plant and animal species, an abundance felicitously known as "species exuberance." Botanists report that one 20-acre tract in Malaysia supports 750 tree species, more than in all of the U.S.; a single tree in Peru was recently found to host 1,700 species of beetle. Because there may be as many as 27 million insect species in the tropics, as opposed to 100,000 in the U.S. and Canada, each time an entomologist ventures into the canopy, he or she has an excellent chance of encountering a new species.

The scale alone is humbling. As biologist Daniel Janzen has written, "The complexity of New York City is to a square mile of lowland tropical forest as a mouse's squeak is to all music that has ever been produced by humanity." Perhaps our difficulty in appreciating such enormousness is part of what has impelled us, beginning with Columbus, to destroy

the rain forest, even as we profess our amazement at its wonders.

In its 1914 annual report the United Fruit Company, which had been responsible for leveling vast areas of Central America, boasted: "It is a splendid victory over Nature, the stern but fair giantess who enforces the decree that the soil of this earth shall yield its treasures only to those who do battle with her, but who smilingly submits to the ardent and intelligent trespasser on her domains." We no longer justify our rape of the land with such romantic nonsense, but the result is the same. However familiar, the statistics are haunting: 100 acres of rain forest are lost each minute, a section the size of Florida each year. Dozens of plant and animal species become extinct every day. Even those who, like me, eat Rainforest Crunch ice cream and wear T-shirts with images of endangered jaguars are doing more than our fair share to destroy the forest whenever we eat beef, carry leather briefcases, buy teak or mahogany furniture and, yes, read and write magazines. And what do we give back? Avon representatives were recently dispatched to the rain forests of Brazil to hawk mascara and deodorant to the indigenous peoples. It hardly seems a fair trade.

Already, most people who care about the rain forest speak of it with a resigned sigh, what grief experts call pre-mourning. If the current rate of destruction continues, most countries will lose their rain forests within our lifetimes. This doomsday would deplete the ozone layer and calamitously increase global warming. It would also wipe out a potential source of thousands of medicines. Twenty-five percent of all prescription drugs come from plant species, yet only 1 percent of all tropical plants have ever been analyzed for their potential medicinal uses. Whether or not you swallow a pill that the rain forest has indirectly provided, it is hard not to believe that merely standing there among the trees may provide something of a cure. Its sights, sounds and smells make you feel that you're blooming yourself. As conservationist Norman Myers put it after a day of research in Borneo: "I felt as if my whole being were standing on tiptoe." Which, however high, is not high enough to see even a single tree in all its glory.

PHOTO: A baby anole lizard surveys its vast domain. (Photography by Gary Braasch)

PHOTO: Tree in Costa Rica

PHOTOS: Every organism in the rain forest must have a strategy to ensure its survival. This rare mushroom, called a stinkhorn, is no exception. Its olive band is a spore layer that emits a foul odor and attracts flies. When the flies depart after feeding, they carry the spores elsewhere, thus enabling the stinkhorn to reproduce. (Gary Braasch)

PHOTO: Buttress roots, 12 feet tall at the trunk and 20 feet long, help bring nutrients to the tree and stabilize it in the shallow soil. The roots' deep pockets shelter ferns, ants, fungi and spiders. (Gary Braasch)

PHOTO: Most katydids eat leaves. Some, like this nymph, have developed large jaws that enable them to split open and eat the leathery seeds found on the rain-forest floor. (Gary Braasch)

PHOTO: The workhorses of the rain-forest recycling system, fungi like the red pinwheel (above) and white mushroom (top) use enzymes to decompose everything from live ants to dead leaves and release nutrients vital to the tree. In this way, the tree depends on its guests, just as they depend on their host. (Gary Braasch)

PHOTO: Perched upside down, the better to search for crickets, cockroaches and larvae in

the leaf litter below, a male anole lizard flashes his brilliant dewlap in a territorial display. The lizard in turn is prey for birds and snakes. (Gary Braasch)

PHOTO: To camouflage themselves from snakes, birds and baby boas, some frogs can modify their colors to match their surroundings. This rain frog, however, has no such powers and must conceal itself among the leaves . (Gary Braasch)

PHOTO: This wood-inhabiting cockroach has a flat body to help it hide in leaves and crevices, and great speed to help it avoid predators such as birds, lizards and larger insects. (Gary Braasch)

PHOTO: A decaying tree nearby becomes a "nurse log," providing nutrients for moss, mushrooms and ants, as well as a resting place for a nine-foot-long boa. The snake is strong enough to kill a large rodent (if it can catch one) and to risk a brief moment of exposure in the precious sunshine. (Gary Braasch)

PHOTO: Highly sophisticated, paper wasps use chewed-up wood to make their nests and to glue them beneath leaves for shelter. (Gary Braasch)

PHOTO: In their quest for light, vines like this peperomia piggyback on the trunk. In nearby Panama a biologist found a single liana vine connected to 64 different trees. (Gary Braasch)

PHOTO: A spectacled owl searches for insects and small birds. In Costa Rica -- the size of West Virginia -- there are 750 bird species, more than in all of the U.S. (Gary Braasch)

PHOTO: With its prehensile tail, a spider monkey can swing through the trees faster than humans can run, as it searches for figs and other fruit.(Gary Braasch)

PHOTO: Arthropods like this daddy longlegs make up 80 percent of all species found inthe rain forest. The longest limbs on the daddy longlegs are more than four inches. (Gary Braasch)

PHOTO: With its prehensile tail, a spider monkey can swing through the trees faster than humans can run, as it searches for figs and other fruit.

PHOTO: One of many rain-forest species to have evolved cosmetic defense mechanisms, the glass-wing butterfly, which feeds only on the juices of rotting fruit and fungi, has a false eye to trick lizards and birds into striking at a less vulnerable part of its body.
