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Finding a Wild, Fearsome World Beneath Every Fallen Leaf

By JAMES GORMAN

CONCORD, Mass. — Dr. Edward O. Wilson, Pellegrino university research professor and honorary curator in entomology of the Museum of Comparative Zoology at Harvard University, winner of two Pulitzer prizes and scientific honors too numerous to recount, is on his hands and knees, pawing in the leaf litter near Walden Pond.

He eases into a half-sitting, half-reclining position and holds out a handful of humus and dirt. "This," he says, "is wilderness."

Just a dozen yards from the site of Thoreau's cabin Dr. Wilson is delving into the ground with a sense of purpose and pleasure that would instantly make any 10-year-old join him. His smile suggests that at age 73, with a troublesome right knee, he still finds the forest floor as much to his liking as a professor's desk.

These woods are not wild; indeed they were not wild in Thoreau's day. Today, the beach and trails of Walden Pond State Reservation draw about 500,000 visitors a year. Few of them hunt ants, however. Underfoot and under the leaf litter there is a world as wild as it was before human beings came to this part of North America.

Dr. Wilson is playing guide to this micro-wilderness — full of ants, mites, millipedes and springtails in a miniature forest of fungal threads and plant detritus in order to make a point about the value of little creatures and small spaces. If he wrote bumper stickers, rather than books, his next might be "Save the Microfauna" or "Sweat the Small Stuff."

He begins his most recent book, "The Future of Life," with a "Dear Henry" letter, talking to Thoreau about the state of the world and the Walden Pond woods.

"Untrammelled nature exists in the dirt and rotting vegetation beneath our shoes," he writes. "The wilderness of ordinary vision may have vanished — wolf, puma and wolverine no longer exist in the tamed forests of Massachusetts. But another, even more ancient wilderness lives on."

In their world, centipedes are predators as fearsome as saber-toothed tigers, ants more numerous than the ungulates of African plains. And, in contrast to the vast preserves required by the world's most revered megafauna — grizzlies and elephants, jaguars and condors — maintaining biodiversity among the little creatures, shockingly rich in unexplored behavior and biochemistry, can be done on the cheap, in relatively tiny patches, as small as a few acres, around the world.

Dr. Wilson is by no means turning from the grand plans for conservation. Indeed, he has suggested that 50 percent of the globe ought to be reserved for nonhuman nature. But he is a realist, and, as he describes himself, "a lover of little things."

He has been turning over logs and rocks looking into the world of insects and other tiny creatures since he was a boy in Alabama and Florida. And he has not stopped. During the walk, he talks enthusiastically about a coming field trip to the Dominican Republic to investigate ants there, and about the publication this fall of a book-length monograph

on the genus *Pheidole* describing all 625 species of ants, including 341 new to science.

Researchers tend to share a kind of acquisitive passion to see, touch, grasp the world. Nothing passes without comment. As he strolled along the shore of Walden Pond, on the way to the woods, Dr. Wilson spotted a butterfly and interrupted his discussion of the sizes of reserves needed for mammals, reptiles and amphibians, complete with references and citations to scientific studies.

When the butterfly landed on the beach, Dr. Wilson stopped, leaning forward like a heron on the hunt, and peered at it. "It's hard to identify," he said. "It's a very beat-up little butterfly," probably the variety called a question mark, because of the design on its wings.

Having reached the woods and having begun to talk about what lay under the surface of the forest floor, he held the crumbled leaf litter and humus in his hand as if he were savoring what lovers of certain wines call the "goût de terroir," or taste of the soil, a certain earthy specificity that the wine owes to the ground, not the grape.

"When I go on a field trip," he said, "providing you can get me up to the edge of a natural environment, I usually don't go more than a hundred yards or so in, because when I settle down immediately I start finding interesting stuff."

"This ground," he said, "we see it as two-dimensional because we're gigantic, like Godzilla. When you just go a few centimeters down, then you're in a three-dimensional world where the conditions change dramatically almost millimeter by millimeter. In one square foot of this litter you're looking at into the tens of thousands of small creatures that you can still spot with your naked eye."

The ground was drier than usual, and Dr. Wilson speculated that the drought might have affected insects. Some he had hoped to see were not there. "If we looked long enough," he said, breaking open several rotting acorns, "we would find entire colonies of very small ants living in an acorn."

As he moved on, from log to log, he uncovered relatives of cave crickets, predatory rove beetles, termites, several varieties of ants, spiderlings, beetle larvae — not quite in the abundance he had hoped for. Still, the small wilderness was teeming.

"The exact perception of wilderness is a matter of scale," he writes in "The Future of Life," going on to say that "microaesthetics" is "an unexplored wilderness to the creative mind." But he also notes that while microreserves are "infinitely better than nothing at all, they are no substitute for macro- and megareserves." He continues, "People can acquire an appreciation for savage carnivorous nematodes and shape-shifting rotifers in a drop of pond water, but they need life on the larger scale to which the human intellect and emotion most naturally respond."

Dr. Wilson is no sentimentalist, about nematodes or people. His proposals for microreserves are practical and hard-headed. The idea is fairly simple. While areas of nearly 25,000 acres are needed to have a good chance at preserving most large forms of life, plants and insects can sometimes be preserved in plots of 25 or even 2.5 acres.

In the Amazon, for instance, Dr. Wilson said, where the land is being savaged, "You'll see hanging on the side of a ravine somewhere a patch a farmer hasn't farmed, one hectare, to maybe 10." Such a small area may not catch the eye of most conservationists, he said, but, he added, "The entomologist and the botanist is likely to say, hold on a minute."

A researcher, he said, may find species not found anywhere else, and such plots can grow, with care and reseeded of the surrounding area. "You can do this in most parts of the world, in most developing countries, where a farmer or village elders would happily take a thousand bucks for you to set aside 10 or 100 hectares and even hire them to help with the reseeded," he said.

But it is not just the developing world where biodiversity can be preserved, bit by bit. City parks may hold small wonders. Even at Walden Pond, in the midst of the Massachusetts suburbs, he said: "Many of the species you find

here are new to science. The basic biology of most of these things is poorly known or not known at all."

In the Walden woods live two relatively unknown ant species in the genus *Myrmica*. "They've been noticed, but not named or described," he said. As to the nematodes and mites, he said, lifetimes can be spent and careers can be made studying them.

It is not, of course, entomologists, or even weekend naturalists, who need convincing about the richness of the forest floor. And there are many reasons to try to preserve biological diversity at the near-microscopic level and below. There is always potential economic value in new biochemical discoveries. There is real and present economic value in clean air and water, to which the plants and insects and microbes contribute. In fact, Dr. Wilson points out, the life of the planet is built on a foundation of tiny creatures. In ecological systems it is the giants that stand on the shoulders of mites.

Finally, there is the simplest argument of all, that life itself, in all its variations, is astonishing and mysterious, and that humans have a responsibility to preserve it.

Under one log turned over on our walk, the environment was moist enough to provide a widely varied selection of insects. Dr. Wilson picked up a gooey white worm without a trace of discomfort. "That is a fly larva, a maggot actually," he said. "I don't know the kind of fly. It's very slimy."

Asked if he might be demonstrating the very reason many people do not like to turn over logs and dig under leaves, he laughed. "I'll admit it's an acquired taste," he said. "Don't mistake me, I don't expect legions of people, particularly Americans, going out and seeing how many different kinds of oribatid mites or fly larvae they can find."

"But," he continued, "they can get a feel, one way or the other, that what's at their feet is not dead leaves and dirt, but a living world with a diversity of creatures, some of which are so strange to the average experience that they beat most of the things you see in *Star Wars*."

It is not so hard to imagine. Butterfly fanciers are legion. Dragonflies are now attracting watchers with binoculars. "But mainly," he said, "there's got to be some sense of the beauty and integrity and the extreme age of these areas."

At the next and last log, he pointed out a predatory rove beetle, a millipede (a detritovore), a spiderling, a nematode he caught only a glimpse of ("like a very tiny silvery strand"), more ants and a wood cockroach. As he began to describe the thousands of inoffensive species of cockroach throughout the world, a siren went off on a nearby street, a reminder of where he was.

Dr. Wilson looked up from the timeless environment under the log, "That's sure a sound that Thoreau never heard."

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