



BILL MCKIBBEN

b. 1960

Bill McKibben's *The End of Nature* (1989) has earned a place in the great prophetic tradition of American environmental writing, along with George Perkins Marsh's *Man and Nature* and Rachel Carson's *Silent Spring*. He warns his readers of the grim dangers posed to life on earth by global climate change and documents the relationship between such change and our addiction to the internal-combustion engine. More broadly, McKibben confronts the reader with an assertion that the traditional idea of nature as "a world apart from man" is no longer viable and examines the psychological and ethical consequences of "the end of nature." Like Carson's, his book was immediately criticized by established economic interests; like hers, his ecological conclusions have been vindicated by continuing research in the field. As McKibben continues to call attention to the issue of climate change, he has also explored positive alternatives to our society's wasteful and destructive practices. *The Age of Missing Information* (1993) contrasts the historically and sensually impoverished realm of television with the good news offered by the natural world. In *Hope Human and Wild* (1995), he reports on three places, in Brazil, India, and the Northeast of the United States, where communities have made positive choices and where there has been an increase of ecological stability.

From THE END OF NATURE

Almost every day, I hike up the hill out my back door. Within a hundred yards the woods swallows me up, and there is nothing to remind me of human society—no trash, no stumps, no fence, not even a real path. Looking out from the high places, you can't see road or house; it is a world apart from man. But once in a while someone

The End of Nature (New York: Random House, 1989).

will be cutting wood farther down the valley, and the snarl of a chain saw will fill the woods. It is harder on those days to get caught up in the timeless meaning of the forest, for man is nearby. The sound of the chain saw doesn't blot out all the noises of the forest or drive the animals away, but it does drive away the feeling that you are in another, separate, timeless, wild sphere.

Now that we have changed the most basic forces around us, the noise of that chain saw will always be in the woods. We have changed the atmosphere, and that will change the weather. The temperature and rainfall are no longer to be entirely the work of some separate, uncivilizable force, but instead in part a product of our habits, our economies, our ways of life. Even in the most remote wilderness, where the strictest laws forbid the felling of a single tree, the sound of that saw will be clear, and a walk in the woods will be changed—tainted—by its whine. The world outdoors will mean much the same thing as the world indoors, the hill the same thing as the house.

An idea, a relationship, can go extinct, just like an animal or a plant. The idea in this case is "nature," the separate and wild province, the world apart from man to which he adapted, under whose rules he was born and died. In the past, we spoiled and polluted parts of that nature, inflicted environmental "damage." But that was like stabbing a man with toothpicks: though it hurt, annoyed, degraded, it did not touch vital organs, block the path of the lymph or blood. We never thought that we had wrecked nature. Deep down, we never really thought we could: it was too big and too old; its forces—the wind, the rain, the sun—were too strong, too elemental.

But, quite by accident, it turned out that the carbon dioxide and other gases we were producing in our pursuit of a better life—in pursuit of warm houses and eternal economic growth and of agriculture so productive it would free most of us from farming—could alter the power of the sun, could increase its heat. And that increase could change the patterns of moisture and dryness, breed storms in new places, breed deserts. Those things may or may not have yet begun to happen, but it is too late to altogether prevent them from happening. We have produced the carbon dioxide—we are ending nature.

We have not ended rainfall or sunlight; in fact, rainfall and sunlight may become more important forces in our lives. It is too early to tell exactly how much harder the wind will blow, how much hotter the sun will shine. That is for the future. But the *meaning* of the wind, the sun, the rain—of nature—has already changed. Yes, the wind still blows—but no longer from some other sphere, some inhuman place.

In the summer, my wife and I bike down to the lake nearly every

afternoon for a swim. It is a dogleg Adirondack lake, with three beaver lodges, a blue heron, some otter, a family of mergansers, the occasional loon. A few summer houses cluster at one end, but mostly it is surrounded by wild state land. During the week we swim across and back, a trip of maybe forty minutes—plenty of time to forget everything but the feel of the water around your body and the rippling, muscular joy of a hard kick and the pull of your arms.

But on the weekends, more and more often, someone will bring a boat out for waterskiing, and make pass after pass up and down the lake. And then the whole experience changes, changes entirely. Instead of being able to forget everything but yourself, and even yourself except for the muscles and the skin, you must be alert, looking up every dozen strokes to see where the boat is, thinking about what you will do if it comes near. It is not so much the danger—few swimmers, I imagine, ever die by Evinrude. It's not even so much the blue smoke that hangs low over the water. It's that the motorboat gets in your mind. You're forced to think, not feel—to think of human society and of people. The lake is utterly different on these days, just as the planet is utterly different now.

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I took a day's hike last fall, walking Mill Creek from the spot where it runs by my door to the place where it crosses the main county road near Wevertown. It's a distance of maybe nine miles as the car flies, but rivers are far less efficient, and endlessly follow pointless, time-wasting, uneconomical meanders and curves. Mill Creek cuts some fancy figures, and so I was able to feel a bit exploratory—a budget Bob Marshall. In a strict sense, it wasn't much of an adventure. I stopped at the store for a liverwurst sandwich at lunchtime, the path was generally downhill, the temperature stuck at an equable 55 degrees, and since it was the week before the hunting season opened I didn't have to sing as I walked to keep from getting shot. On the other hand, I had made an arbitrary plan—to follow the creek—and, as a consequence, I spent hours stumbling through overgrown marsh, battling at ten-foot saplings and vines, emerging only every now and then, scratched and weary, into the steeper wooded sections. When Thoreau was on Katahdin, nature said to him, "I have never made this soil for thy feet, this air for thee breathing, these rocks for thy neighbors. I cannot pity nor fondle thee there, but forever relentlessly drive thee hence to where I am kind. Why seek me where I have not called thee, and then complain because you find me but a stepmother?" Nature said this to me on Mill Creek, or at least it said, "Go home and tell your wife you walked to Wevertown." I felt I should have carried a machete, or employed a macheteist (The worst thing about battling through brake and bramble

of this sort is that it's so anonymous—gray sticks, green stalks with reddish thorns, none of them to be found in any of the many guides and almanacs on my shelf.) And though I started the day with eight dry socks, none saw noon in that pleasant state.

If it was all a little damp and in a minor key, the sky was nonetheless bright blue, and rabbits kept popping out from my path, and pheasants fired up between my legs, and at each turning some new gift appeared: a vein of quartz, or a ridge where the maples still held their leaves, or a pine more than three feet in diameter that beavers had gnawed all the way around and halfway through and then left standing—a forty-foot sculpture. It was October, so there weren't even any bugs. And always the plash of the stream in my ear. It isn't Yosemite, the Mill Creek Valley, but its small beauties are absorbing, and one can say with Muir on his mountaintop, "Up here all the world's prizes seem as nothing."

And so what if it isn't nature primeval? One of our neighbors has left several kitchen chairs along his stretch of the bank, spaced at fifty-yard intervals for comfort in fishing. At one old homestead, a stone chimney stands at either end of a foundation now filled by a graceful birch. Near the one real waterfall, a lot of rusty pipe and collapsed concrete testifies to the old mill that once stood there. But these aren't disturbing sights—they're almost comforting, reminders of the way that nature has endured and outlived and with dignity reclaimed so many schemes and disruptions of man. (A mile or so off the creek, there's a mine where a hundred and fifty years ago a visionary tried to extract pigment for paint and pack it out on mule and sledge. He rebuilt after a fire; finally an avalanche convinced him. The path in is faint now, but his chimney, too, still stands, a small Angkor Wat of free enterprise.) Large sections of the area were once farmed; but the growing season is not much more than a hundred days, and the limits established by that higher authority were stronger than the (powerful) attempts of individual men to circumvent them, and so the farms returned to forest, with only a dump of ancient bottles or a section of stone wall as a memorial. (Last fall, though, my wife and I found, in one abandoned meadow, a hop vine planted at least a century before. It was still flowering, and with its blossoms we brewed beer.) These ruins are humbling sights, reminders of the negotiations with nature that have established the world as we know it.

Changing socks (soaking for merely clammy) in front of the waterfall, I thought back to the spring before last, when a record snowfall melted in only a dozen or so warm April days. A little to the south, an inflamed stream washed out a highway bridge, closing the New York Thruway for months. Mill Creek filled till it was a river, and this waterfall, normally one of those diaphanous-veil affairs, turned into a

cataract. It filled me with awe to stand there then, on the shaking ground and think, This is what nature is capable of.

But as I sat there this time, and thought about the dry summer we'd just come through, there was nothing awe-inspiring or instructive, or even lulling, in the fall of the water. It suddenly seemed less like a waterfall than like a spillway to accommodate the overflow of a reservoir. That didn't decrease its beauty, but it changed its meaning. It has begun or will soon begin to rain and snow when the particular mix of chemicals we've injected into the atmosphere adds up to rain or snow—when they make it hot enough over some tropical sea to form a cloud and send it this way. I had no more control, in one sense, over this process than I ever did. But it felt different, and lonelier. Instead of a world where rain had an independent and mysterious existence, the rain had become a subset of human activity: a phenomenon like smog or commerce or the noise from the skidder towing logs on Cleveland Road—all things over which I had no control, either. The rain bore a brand; it was a steer, not a deer. And that was where the loneliness came from. There's nothing there except us. There's no such thing as nature anymore—that other world that isn't business and art and break-fast is now not another world, and there is nothing except us alone.

At the same time that I felt lonely, though, I also felt crowded, without privacy. We go to the woods in part to escape. But now there is nothing except us and so there is no escaping other people. As I walked in the autumn woods I saw a lot of sick trees. With the conifers, I suspected acid rain. (At least I have the luxury of only suspecting; in too many places, they *know*). And so who walked with me in the woods? Well, there were the presidents of the Midwest utilities who kept explaining why they had to burn coal to make electricity (cheaper, fiduciary responsibility, no *proof* it kills trees) and then there were the congressmen who couldn't bring themselves to do anything about it (personally favor but politics the art of compromise, very busy with the war on drugs) and before long the whole human race had arrived to explain its aspirations. We like to drive, they said, air conditioning is a necessity nowadays, let's go to the mall. By this point, the woods were pretty densely populated. As I attempted to escape, I slipped on another rock, and in I went again. Of course, the person I was fleeing most fearfully was myself, for I drive (I drove forty thousand miles one year), and I'm burning a collapsed barn behind the house next week because it is much the cheapest way to deal with it, and I live on about four hundred times what Thoreau conclusively proved was enough, so I've done my share to take this independent, eternal world and turn it into a science-fair project (and not even a

good science-fair project but a cloddish one, like pumping poison into an ant farm and "observing the effects").

The walk along Mill Creek, or any stream, or up any hill, or through any woods, is changed forever—changed as profoundly as when it shifted from pristine and untracked wilderness to mapped and deduced and cultivated land. Our local shopping mall now has a club of people who go "mall walking" every day. They circle the shopping center en masse—Caldor to Sears to J. C. Penney; circuit after circuit with an occasional break to shop. This seems less absurd to me now than it did at first. I like to walk in the outdoors not solely because the air is cleaner but because outdoors we venture into a sphere larger than ourselves. Mall walking involves too many other people, and too many purely human sights, ever to be more than good-natured exercise. But now, out in the wild, the sunshine on one's shoulders is a reminder that man has cracked the ozone, that, thanks to us, the atmosphere absorbs where once it released.

The greenhouse effect is a more apt name than those who coined it imagined. The carbon dioxide and trace gases act like the panes of glass on a greenhouse—the analogy is accurate. But it's more than that. We have built a greenhouse, *a human creation*, where once there bloomed a sweet and wild garden.

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If nature were about to end, we might muster endless energy to stave it off, but if nature has already ended, what are we fighting for? Before any redwoods had been cloned or genetically improved, one could understand clearly what the fight against such tinkering was about. It was about the idea that a redwood was somehow sacred, that its fundamental identity should remain beyond our control. But once that barrier has been broken, what is the fight about, then? It's not like opposing nuclear reactors or toxic waste dumps, each one of which poses new risks to new areas. This damage is to an idea, the idea of nature, and all the ideas that descend from it. It is not cumulative. Wendell Berry once argued that without a "fascination" with the wonder of the natural world "the energy needed for its preservation will never be developed"—that "there must be a mystique of the rain if we are ever to restore the purity of the rainfall." This makes sense when the problem is transitory—sulfur from a smokestack drifting over the Adirondacks. But how can there be a mystique of the rain now that every drop—even the drops that fall as snow on the Arctic, even the drops that fall deep in the remaining forest primeval—bears the permanent stamp of man? Having lost its separateness, it loses its special power. Instead of being a category like God—something beyond our

control—it is now a category like the defense budget or the minimum wage, a problem we must work out. This in itself changes its meaning completely, and changes our reaction to it.

A few weeks ago, on the hill behind my house, I almost kicked the biggest rabbit I had ever seen. She had nearly finished turning white for the winter, and we stood there watching each other for a pleasant while, two creatures linked by curiosity. What will it mean to come across a rabbit in the woods once genetically engineered “rabbits” are widespread? Why would we have any more reverence or affection for such a rabbit than we would for a Coke bottle?

The end of nature probably also makes us reluctant to attach ourselves to its remnants, for the same reason that we usually don't choose friends from among the terminally ill. I love the mountain outside my back door—the stream that runs along its flank, and the smaller stream that slides down a quarter-mile mossy chute, and the place where the slope flattens into an open plain of birch and oak. But I know that some part of me resists getting to know it better—for fear, weak-kneed as it sounds, of getting hurt. If I knew as well as a forester what sick trees looked like, I fear I would see them everywhere. I find now that I like the woods best in winter, when it is harder to tell what might be dying. The winter woods might be perfectly healthy come spring, just as the sick friend, when she's sleeping peacefully, might wake up without the wheeze in her lungs.

Writing on a different subject, the bonds between men and women, Allan Bloom describes the difficulty of maintaining a committed relationship in an age when divorce—the end of that relationship—is so widely accepted: “The possibility of separation is already the fact of separation, inasmuch as people today must plan to be whole and self-sufficient and cannot risk interdependence.” Instead of working to strengthen our attachments, our energies “are exhausted in preparation for independence.” How much more so if that possible separation is definite, if that hurt and confusion is certain. I love winter best now, but I try not to love it too much, for fear of the January perhaps not so distant when the snow will fall as warm rain. There is no future in loving nature.

And there may not even be much past. Though Thoreau's writings grew in value and importance the closer we drew to the end of nature, the time fast approaches when he will be inexplicable, his notions less sensible to future men than the cave paintings are to us. Thoreau writes, on his climb up Katahdin, that the mountain “was vast, Titanic, and such as man never inhabits. Some part of the beholder, even some vital part, seems to escape through the loose grating of his ribs. . . . Nature has got him at a disadvantage, caught him alone, and pilfers

him of some of his divine faculty. She does not smile on him as in the plains. She seems to say sternly, why came ye here before your time. This ground is not prepared for you.” This sentiment describes perfectly the last stage of the relationship of man to nature—though we had subdued her in the low places, the peaks, the poles, the jungles still rang with her pure message. But what sense will this passage make in the years to come, when Katahdin, the “cloud factory,” is ringed by clouds of man's own making? When the massive pines that ring its base have been genetically improved for straightness of trunk and “proper branch drop,” or, more likely, have sprung from the cones of genetically improved trees that began a few miles and a few generations distant on some timber plantation? When the moose that ambles by is part of a herd whose rancher is committed to the enlightened, Gaian notion that “conservation and profit go hand in hand”?

Thoreau describes an afternoon of fishing at the mouth of Murch Brook, a dozen miles from the summit of Katahdin. Speckled trout “swallowed the bait as fast as we could throw in; and the finest specimens . . . that I have ever seen, the largest one weighing three pounds, were heaved upon the shore.” He stood there to catch them as “they fell in a perfect shower” around him. “While yet alive, before their tints had faded, they glistened like the fairest flowers, the product of primitive rivers; and he could hardly trust his senses, as he stood over them, that these jewels should have swam away in that Aboljacknagasic water for so long, some many dark ages—these bright fluvial flowers, seen of Indians only, made beautiful, the Lord only knows why, to swim there!” But through biotechnology we have already synthesized growth hormone for trout. Soon pulling them from the water will mean no more than pulling cars from an assembly line. We won't have to wonder why the Lord made them beautiful and put them there; we will have created them to increase protein supplies or fish-farm profits. If we want to make them pretty, we may. Soon Thoreau will make no sense. And when that happens, the end of nature—which began with our alteration of the atmosphere, and continued with the responses to our precarious situation of the “planetary managers” and the “genetic engineers”—will be final. The loss of memory will be the eternal loss of meaning.

In the end, I understand perfectly well that defiance may mean prosperity and a sort of security—that more dams will help the people of Phoenix, and that genetic engineering will help the sick, and that there is so much progress that can still be made against human misery. And I have no great desire to limit my way of life. If I thought we could put

off the decision, foist it on our grandchildren. I'd be willing. As it is, I have no plans to live in a cave, or even an unheated cabin. If it took ten thousand years to get where we are, it will take a few generations to climb back down. But this could be the epoch when people decide at least to go no farther down the path we've been following—when we make not only the necessary technological adjustments to preserve the world from overheating but also the necessary mental adjustments to ensure that we'll never again put our good ahead of everything else's. This is the path I choose, for it offers at least a shred of hope for a living, eternal, meaningful world.

The reasons for my choice are as numerous as the trees on the hill outside my window, but they crystallized in my mind when I read a passage from one of the brave optimists of our managed future. "The existential philosophers—particularly Sartre—used to lament that man lacked an essential purpose," writes Walter Truett Anderson. "We find now that the human predicament is not quite so devoid of inherent purpose after all. To be caretakers of a planet, custodians of all its life forms and shapers of its (and our own) future is certainly purpose enough." This intended rallying cry depresses me more deeply than I can say. That is our destiny? To be "caretakers" of a managed world, "custodians" of all life? For that job security we will trade the mystery of the natural world, the pungent mystery of our own lives and of a world bursting with exuberant creation? Much better, Sartre's neutral purposelessness. But much better than that, another vision, of man actually living up to his potential.

As birds have flight, our special gift is reason. Part of that reason drives the intelligence that allows us, say, to figure out and master DNA, or to build big power plants. But our reason could also keep us from following blindly the biological imperatives toward endless growth in numbers and territory. Our reason allows us to conceive of our species as a species, and to recognize the danger that our growth poses to it, and to feel something for the other species we threaten. Should we so choose, we could exercise our reason to do what no other animal can do: we could limit ourselves voluntarily, *choose* to remain God's creatures instead of making ourselves gods. What a towering achievement that would be, so much more impressive than the largest damn (beavers can build dams) because so much harder. Such restraint—not genetic engineering or planetary management—is the real challenge, the hard thing. Of course we can splice genes. But can we *not* splice genes?

The momentum behind our impulse to control nature may be too strong to stop. But the likelihood of defeat is not an excuse to avoid try-

ing. In one sense it's an aesthetic choice we face, much like Thoreau's, though what is at stake is less the shape of our own lives than the very practical question of the lives of all the other species and the creation they together constitute. But it is, of course, for our benefit, too. Jeffers wrote, "Integrity is wholeness, the greatest beauty is / organic wholeness of life and things, the divine beauty of the universe. Love that, not man / Apart from that, or else you will share man's pitiful confusions, or drown in despair when his days darken." The day has come when we choose between that wholeness and man in it or man apart, between that old clarity or new darkness.

The strongest reason for choosing man apart is, as I have said, the idea that nature has ended. And I think it has. But I cannot stand the clanging finality of the argument I've made, any more than people have ever been able to stand the clanging finality of their own deaths. So I hope against hope. Though not in our time, and not in the time of our children, or their children, if we now, *today*, limited our numbers and our desires and our ambitions, perhaps nature could someday resume its independent working. Perhaps the temperature could somehow adjust itself to its own setting, and the rain fall of its own accord.

Time, as I said at the start of this essay, is elusive, odd. Perhaps the ten thousand years of our encroaching, defiant civilization, an eternity to us and a yawn to the rocks around us, could give way to ten thousand years of humble civilization when we choose to pay more for the benefits of nature, when we rebuild the sense of wonder and sanctity that could protect the natural world. At the end of that span we would still be so young, and perhaps ready to revel in the timelessness that surrounds us. I said, much earlier, that one of the possible meanings of the end of nature is that God is dead. But another, if there was or is any such thing as God, is that he has granted us free will and now looks on, with great concern and love, to see how we exercise it: to see if we take the chance offered by this crisis to bow down and humble ourselves, or if we compound original sin with terminal sin.

And if what I fear indeed happens? If the next twenty years sees us pump ever more gas into the sky, and if it sees us take irrevocable steps into the genetically engineered future, what solace then? The only ones in need of consolation will be those of us who were born in the transitional decades, too early to adapt completely to a brave new ethos.

I've never paid more than the usual attention to the night sky, perhaps because I grew up around cities, on suburban blocks lined with streetlights. But last August, on a warm Thursday afternoon, my wife and I hauled sleeping bags high into the mountains and laid them out on a

rocky summit and waited for night to fall and the annual Perseid meteor shower to begin. After midnight, it finally started in earnest—every minute, every thirty seconds, another spear of light shot across some corner of the sky, so fast that unless you were looking right at it you had only the sense of a flash. Our bed was literally rock-hard, and when, toward dawn, an unforecast rain soaked our tentless clearing, it was cold—but the night was glorious, and I've since gotten a telescope. When, in *Paradise Lost*, Adam asks about the movements of the heavens, Raphael refuses to answer. "Let it speak," he says, "the Maker's high magnificence, who built / so spacious, and his line stretcht out so far; / That man may know he dwells not in his own; / An edifice too large for him to fill, / Lodg'd in a small partition, and the rest / Ordain'd for uses to his Lord best known." We may be creating microscopic nature; we may have altered the middle nature all around us; but this vast nature above our atmosphere still holds mystery and wonder. The occasional satellite does blip across, but it is almost a self-parody. Someday, man may figure out a method of conquering the stars, but at least for now when we look into the night sky, it is as Burroughs said: "We do not see ourselves reflected there—we are swept away from ourselves, and impressed with our own insignificance."

As I lay on the mountaintop that August night I tried to pick out the few constellations I could identify—Orion's Belt, the Dippers. The ancients, surrounded by wild and even hostile nature, took comfort in seeing the familiar above them—spoons and swords and nets. But we will need to train ourselves not to see those patterns. The comfort we need is inhuman.



JANISSE RAY

b. 1962

In the introduction to the 1990 Norton Book of Nature Writing, the editors remarked on the relative scarcity of reflective environmental writing from the southeastern part of the United States. Janisse Ray is one of several new writers making up for that lack. Her 1999 book Ecology of a

Cracker Childhood both evokes the Georgia landscape in which she grew up and connects the need to conserve it with its cultural values. With her humor, her keen eye, and her narrative gifts, she has brought the map of her region into sharper focus.

BUILT BY FIRE

A couple of million years ago a pine fell in love with a place that belonged to lightning. Flying past, a pine seed saw the open, flat land and grew covetous. The land was veined with runs of water—some bold, some fine as a reed. Seeing it unoccupied, the pine imperiously took root and started to grow there, in the coastal plains of the southern United States, and every day praised its luck. The place was broadly beautiful with clean and plentiful water sources, the sun always within reach. In the afternoons and evenings, thunderstorms lumbered across the land, lashing out rods of lightning that emptied the goatskin clouds; in those times the pine lay low.

The lightning announced itself lightly to the pine one summer evening, "I reign over this land," it said. "You must leave immediately."

"There was nothing here when I came," said the pine.

"I was here," said lightning. "I am always here. I am here more than any other place in the world." The clouds nodded, knowing that lightning spoke true.

In that short time, however, the pine had begun to love the place and called out, "Please. You live in the sky. Let me have the earth."

The clouds glowered and began to thicken.

Lightning was extremely possessive and would not agree to divide.

"Then do what you will," said the pine. For years they warred. The lightning would fling as many as forty million bolts a year at the tree, striking when it could, the pine dodging and ducking. A single thunderstorm might raise thousands of bolts. Wind helped the tree, and although it was struck a few times, the damage was never serious.

After the tree had reached a fair age—old enough for government work, as they say—on the hottest of summer afternoons lightning crept close, hidden by towering maroon thunderheads, and aimed for the tree, sundering its bole crown to roots. When the lightning glanced the ground, such was its ferocity that it dug a trench wide enough to bury a horse before its force subsided. Needles from the pine had fallen about,