Adaptation and Defiance

DO NOT GO GENTLE INTO THAT WARM FUTURE

by Jeffrey A. Lockwood
illustration by Rick Wheeler

The forests of the West are preternaturally red. Not the red of spilled blood or stop signs. Rather, a post-industrial, city-grimed, rusty red. Having succumbed to the onslaught of bark beetles, the trees are like corpses, disturbing in the recentness of death. Within a few years, however, the red needles fall and the forests fade into a forlorn gray as life dissolves into leftovers. By the time a sun-bleached tree comes to resemble the chalky bones of a deer, the beetles have long since moved on—and we have become resigned to death.

The bark beetles are native to the West and their outbreaks are familiar. What's worrisome now is the scale. Sometimes big is more than just different—ask the people in the paths of Hurricane Katrina or Hurricane Sandy. Until recently, the largest spruce beetle infestation in British Columbia was less than a square mile. The current outbreak has killed more than 1,300 square miles of forest as part of an unfolding ecological conspiracy.

Conspirators literally breathe together. The respiration of human industry has warmed the planet to the point that not only do the beetles survive the winter, but some even produce an unprecedented second generation in one summer. As we exhale carbon dioxide from our cars and power plants, our six-legged accomplices breathe a contented sigh—while other creatures depending on the forests gasp.

Natural systems adapt, but the first lesson of biophysical adaptation is that there are winners and losers. The bark beetles are flourishing, while the Clark's nutcrackers (cheeky slate-gray birds that depend on pine seeds) are in trouble. With the loss of pine nuts, scientists also expected the grizzly bear population to decline, but it turns out that miller moths thrive with extra warmth—and these insects are lusciously fatty morsels. So the moth-eating bears are expanding their range and running into humans, which are also edible if you're a grizzly. There's no assurance that we'll win the game of adaptation.

Even among humans, technological adaptations play out in different ways. Just as the Cold War fed the military-industrial complex, the Warm War fuels the environmental-industrial complex. Rich nations can afford clever fixes. Without an extraordinary sense of justice in distributing financial costs and social benefits, however, money and technology will collude to assure that wealthy "beetles" survive and poor "nutcrackers" suffer.

The climate is changing—and so is our relationship to this warming planet. The focus of scientists, politicians, and the public is shifting from prevention to adaptation. The evolutionary metaphor of adaptation implies that we must respond to unchangeable circumstances. The rabbit does not try

to alter the course of the oncoming coyote but blends into the landscape or dashes into a thicket. We are scared bunnies, hearts pounding as the climate bears down on us.

I'm all for survival. But we created the coyote of global warming, and hunkering down or running away seems timorous, even cowardly. We are not as helpless as bunnies. As sentient beings responsible for changing the earth's climate, we can plan, invent, build, and relocate. But hunkering down behind seawalls and dashing to higher ground feel to me like surrendering our responsibility and dignity. Adaptation can become moral capitulation or spiritual resignation.

Our mountainsides are changing from deep green, to burnt orange, to ashen gray.

Wendell Berry tells us, "When despair for the world grows in me . . . I go and lie down where the wood drake rests in his beauty on the water, and the great heron feeds." Living in Wyoming, I head to the mountains. To understand the mechanisms of adaptation and to reconstruct a past world, Charles Darwin studied island finches; as an entomologist-turned-philosopher seeking to grasp the meaning of adaptation and imagine our future, I contemplate beetle-infested forests. I turn to nature not expecting that evolution fosters goodness but because wildlands are a boundless gift for the imagination.

In Wyoming, we're getting used to haze. Last year, the forests began burning in May and were still smoking in December. The fires thrive in dry conditions with lots of crispy fuel, which is a pretty good description of a rust-colored, beetle-killed forest—at least until the needles drop. High school chemistry taught us that fire is rapid oxidation (the rusting of iron being a slower version), and high school biology taught us that metabolism is also a form of oxidation (rather faster than rusting).

Mild winters and hot summers are stoking a metabolic wildfire of beetles, and the drying forests are fueling conflagrations that sweep through mountainside communities. Behind all this warming is the combustion of oil, gas, and coal. And where did these come from? Plants, of course—the source of fossil fuels as well as the producers of oxygen.

So the whole thing is the plants' fault. No plants would mean no coal, no oxygen, no combustion, and no beetles to destroy the trees. The forests couldn't imagine the price they'd one day pay for photosynthesis.

The Babylonians were burning petroleum in their lamps 5,000 years ago. However, large-scale combustion of fossil fuels didn't get under way until the 1700s, when we started using coal to heat homes and power machinery. Nobody could have imagined that the coal mines of Britain, which were developed because the country was running out of trees for fuel, would end up catalyzing an energy revolution that is now decapitating and deforesting mountains—and depopulating coastlines.

Such is the nature of unintended consequences. Trees adapted to the abundance of solar energy; we adapted to an abundance of fossil fuel. And now, we believe, the solution is to adapt to climate change. Expect some weird ecological karma, not because nature is trying to even the score but because the game is more complex than we can imagine.

Winning a game involves keeping score, and I love numbers. Across North America, bark beetles have infested 234,000 square miles of forest—or about 94 million square city blocks, forty-two Connecticuts, four New Yorks, or almost one Texas. There are around 7 billion beetles alive at any given time (I'll spare you the details of my back-of-the-envelope calculation), which works out to about one for every human on Earth.

Math and science are vital to coming up with technological adaptations. But we can't calculate or upgrade our way out of the climate crisis. We have to figure out how to downgrade. There are just too damn many of us. Maybe we could take a mathematics lesson from the whitebark pines. These trees don't begin to produce cones for twenty years on the best sites, and reproduction peaks at sixty years.

RESOURCES FOR ACTION

- **Unitarian Universalist Ministry for Earth** (*uuministryforearth.org*) offers an environmental film library, a 2-volume Global Warming Action Kit, and a links to activism opportunities.

- **UU United Nations Office Climate Change Task Force** (*climate.uu-uno.org*) provides action alerts and informational resources.

- **Statement of Conscience: Threat of Global Warming/Climate Change**, adopted by the 2006 UUA General Assembly (*uua.org/environment*)

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Bark beetles thrive in a warming climate, and have infested 234,000 square miles of North American pine forests, such as Boulder Mountain in Montana (above). Once infested with beetles, which bore through its trunk (lower right), a tree is doomed. Dying trees endanger other species, like the Clark's nutcracker (top right), which eat whitebark pine seeds.

So a whitebark pine typically starts a family at forty years. What if we did the same? Human fertility drops by half at this age, which means that we'd ratchet down our population—and the number of problems that we cause—pretty quickly.

That isn't about to happen, but here's the reality. Even if all of the green technologies on the horizon come to fruition and are adopted worldwide, most of our environmental problems will continue unless there are fewer people. A world with a billion electric cars will require a whole lot of power plants, most of which will burn fossil fuels. By mid-century, the human population will approach 10 billion people. It's simple math: We need fewer of us making winters warmer, beetles happier, and trees sicker.

Our mountainsides are changing from deep green, to burnt orange, to ashen gray. I wonder what would happen if other things changed colors even more dramatically and unexpectedly. Entities that we take for granted might become keenly evident, while objects that now catch our eye could be easily overlooked. If tomorrow the sky was chartreuse, I bet we'd spend hours staring in amazement. And if stop signs turned brown, I suspect there would be a lot more accidents. But here's what would really make us see and think—maybe even act—in a radically different way. What if one day, all of the reddening trees were invisible but carbon dioxide was red?

I worry that we are becoming accustomed to the re-coloration of our forests and that our children are getting used to expanses of dead and dying trees. Adaptation can mean no longer seeing—and no longer caring.

Humans are biophysical creatures as well as beings with the capacity for thought, empathy, and goodness. We discern that the forests are in trouble, but we know terrestrial ecosystems will persist. If trees don't return to the mountains, perhaps there will be a surge of shrubs, or maybe the grasses will have a heyday. Ecologically speaking, meadows are just as good as forests. Humans couldn't extinguish life on this planet if we used every ounce of our ingenuity and every megawatt of our power. Life is too persistent to succumb to a bunch of flabby, naked apes. We don't need to worry about the Earth. The quality of human life, however, is another matter.

A century from now, visitors to the Rocky Mountains will find whatever life forms have adapted to a warming climate. But people may not see ancient whitebark pines clinging tenaciously to rocky outcrops or towering ponderosa pines creating living cathedrals. Farmers in the heartland will have realized that the rains no longer support corn in Illinois, while families on the coast will have abandoned their beach houses in the Carolinas. Will

future generations know what they've missed? Does it matter?

A forest without venerable trees will be a lesser place, not merely different. I won't become an ecological relativist to assuage my sense of responsibility. Their loss will diminish us. But children born into a land littered with the skeletons of once-magnificent trees will take the meager undergrowth to be natural—or at least normal. I worry that we will adapt.

I am amazed and frightened by our capacity to renormalize our perceptions, to habituate to stench, noise, and ugliness. I don't doubt that we can adapt to the consequences of climate change. But should we? We don't ask people to reconcile themselves to hunger, sickness, or violence. We don't want our children to "get over" the suffering of others.

We can adapt to the consequences of climate change. But should we?

Done well, perhaps adaptation is like forgiveness. Both are about accepting what is, but neither entails forgetting. So if we adapt to a world with grinding droughts, violent storms, and flooded coasts, let us remember that the mountains once held crystal clear lakes fed by blue-white glaciers and rimmed by magnificent forests. Perhaps our children can understand—possibly even forgive—our having failed to act, but let's not ask them to forget.

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Unsure that some species will recover, scientists are collecting seeds with the thought of growing pest-resistant forests from scratch. Talk about the audacity of hope. During my hikes, I half expect to come across a botanist with half his face painted blue like Mel Gibson's character in *Braveheart.* Although the Scots were annihilated, it's possible that the ecologists will win despite absurd odds. Then everything will be OK. Right?

If scientists rescue the whitebark pine, it will be tantamount to a trauma surgeon saving an automobile accident victim. Such a medical marvel would be a good thing. But it wouldn't mean that the drunk driver was off the moral hook. We should not confuse the recovery of the victim with the innocence of the perpetrator. The offender should be amazed at the skill of the surgeon and the resiliency of the body. But that driver should also be ashamed. And if the driver was instead so fortunate as to swerve and miss the oncoming car, the conclusion should not be that it's alright to keep driving drunk.

An ecosystem adapting to climate change (perhaps with our help), may avert biophysical disaster, but it cannot absolve us of moral culpability. Maybe we can fix the atmosphere, maybe trauma surgeons can reattach a victim's limb, and maybe we can even make school uniforms bulletproof. But shouldn't we deeply regret that such technological cleverness is needed?

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A tree infested with bark beetles is doomed. Seeing a lodgepole pine oozing sap is like hearing the cry of "Dead man walking" as a prisoner is taken to be executed. It's not the same as the diagnosis of a terminal illness, as there is typically nobody to blame for cancer. Rather, the tree is lethally injected by our collective actions.

Watching the death of a lone tree is more heartrending than seeing the demise of an entire forest. I'm not much for anthropomorphizing (although it's surely a lesser sin than anthropocentrizing), but one sun-drenched summer morning, I came across a magnificent spruce. Most of the needles were yellowing and some had reddened. Life was draining away. Not sure what to think, I knew what I felt and whispered, "I'm sorry, tree."

It was a pretty pathetic apology, but nobody was around to critique my eulogy. I suspect many hikers have become desensitized to forest death, like kids watching hours of violence in video games. After seeing thousands of dead trees, how much tragedy lies in a single spruce? In adapting to the "big picture" of war and famine, we run the risk of overlooking each unique individual killed or starved. Sure the collective matters; human society and the planet are important, but so are the homeless veteran and the dying tree.

BIOLOGY AND PSYCHOLOGY HAVE LIMITS. So do forests. As a new generation of beetles emerges from dying trees, the insects seek the faint scent of their companions establishing a new colony. But in many places, the beetles are running out of suitable trees. They have no choice but to launch themselves into the unknown, betting that in the course of their desperate journey they will find another forest. Humans like to imagine that if the Earth becomes uninhabitable, we can launch ourselves into the cosmos. The beetles have incalculably better odds, but in the end there are no infinite forests.

For some, spirituality lies beyond the threshold of the material world. But I'm not willing to launch

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This whitebark pine tree near Crater Lake in Oregon was 450 years old when it finally succumbed, like many other whitebark pines, to beetle damage.

myself entirely into this realm or even to see religion and science as, in the words of Stephen Jay Gould, "non-overlapping magisteria." I reject the easy escapes provided by the religious imaginings of heaven and the science fictions of terraforming other worlds. My spirituality is woven into the ragged edges of this warming, seething planet.

Spiritual adaptation entails respecting material constraints—and perhaps transcending an important evolutionary limit. No other species has developed the capacity to anticipate its own future, to forgo present desires to meet future needs. Medieval stonemasons worked on cathedrals that they never saw completed. What is our spiritual building project?

Perhaps modern society should be judged not in terms of what we choose to construct through technology but with regard to what we choose to preserve by way of humility. A fitting monument to the human spirit would be a livable Earth for our great-grandchildren. Instead of building massive seawalls, let our legacy be sustaining sea levels. Spiritual adaptation may involve a kind of making—the making of sacrifices manifest as the renunciation of arrogance, the forsaking of luxury, or the forfeiture of extravagance.

Near a popular highway pullout, there is a 450-year old whitebark pine with shades of gray ranging from nearly bleached white, through silver and lead, into the darkness of an angry thunderhead. An award-winning photograph of the tree was taken in 2006. Two years later, she was dead (calling the tree an "it" seems callous, and there's no doubt that she exudes a grandmotherly feeling).

What's strangely disturbing is that the tree is gorgeous. Her gracefully twisted trunk and gnarled branches with spidery tips are evocative. Somehow, she's both wizened and sensuous.

I initially thought that there should be a sign directing people across the road to the tree, to see what we have wrought. But that would be a terrible idea. Nobody would feel remorse. It would be like an open casket funeral for a matron whom the undertaker made more dignified in death than she was in her final years of life. I wish, in a perverse way, that this tree looked more like a grotesquely gaunt, disease-riddled cadaver.

Sometimes, nature is too gentle with us—and we are too gentle with ourselves. Aligning our inner lives to the truths of the world demands that we see deeply and reflect honestly. Religion should afflict the comfortable (and comfort the afflicted). Spiritual adaptation means coming to terms with what we are doing, being brutally honest with ourselves, changing our lives in ways that cause us to attend to, rather than acclimate to, our disturbing similarities to the voracious, unrepentant bark beetles.

In Dylan Thomas's "Do Not Go Gentle into That Good Night," the poet pleaded with his elderly father to "rage, rage against the dying of the light." Adapting to death was too easy, life was too precious. I imagine that the venerable whitebark pine raged during her last, beetle-infested winter. At least she clung fiercely to the Earth. If religion is a "conspiracy of the good" as some have proposed, then let us find inspiration in the tenacity of that tree. When we sing that we are a "gentle, angry people," let us cultivate a righteous anger and not be too gentle with ourselves. Let us take a deep breath together and rage against the warming of the planet and the dying of the forest. ❖

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