

Three Trees

In November 2011, John McPhee—the versatile journalist of the earth, of sport, of people known and not—wrote an essay about composition for *The New Yorker*, the magazine where much of his writing has first appeared before being expanded into a book. In the composition piece, McPhee reveals a formula for structuring successful journalism. For years, he posted this formula on the bulletin board above his desk: ABC/D. Where A, B, and C are different variables, usually people, often with antagonistic differences, and D is a denominator that they'll all share in common, deft journalism following the ABC/D structure can put ostensibly disparate subjects into conversation, and reveal compelling similarities between them. Unfortunately, McPhee realized, good writing seldom starts with its structure. Instead, “you begin with a subject, gather material, and work your way to structure from there.” I take it as sheer serendipity that the subject I'd chosen for this essay fits perfectly into the structure he sometimes preordained.

My subject is the American West. Or rather, in the McPhee model, that's my denominator. It's a daunting and abstract topic, I know. But my specific variables are far more tangible. I'm writing about trees. Three of them, to be precise: the eucalyptus, the mesquite, and the ponderosa pine. A, B, and C. And here's my thesis: together, these three trees tell a story about westernness that's not otherwise being told. It's a story of invasion and loss, of fire and drought and plague, a metaphor but also a history; these trees reveal the tensions and tribulations immanent in the very roots of the American west.

Eucalyptus

If the American west as we know it is a story of expansion and takeover by outsiders, no tree makes a better analog than the eucalyptus. Time was, if you looked at a map of the world, highlighted in those regions that mark the eucalyptus tree's range, you'd see a colorless expanse, save for a bright, opaque block of color in the shape of Australia. That's where eucalypts come from. Today, the same map would be littered with color, whole solid bands of it above and below the equator. Eucalypts are one of the more ubiquitous trees on the planet, found all over South America, India, China, Africa, and beyond. They're even, yes, in the American west.

The eucalyptus first came to America via California, during the gold rush of the 1850s. It's unclear if Americans traveled abroad and brought back eucalyptus seeds from Australia, or if Australians coming for gold brought the seeds here. What's clear is the tree's initial reception. California back then was strikingly devoid of trees. As self-entitled Euro-Americans forced out the Mexicans and Spaniards and nearly all the indigenous Indians, they formed settlements, and to do so felled trees for fuel and construction lumber. The verdant soil everywhere also made trees a nuisance to farmers hoping to work the land for food. And so the inland oak and pine, as with the redwoods of San Francisco Bay, soon were cut down, leaving a bleak, jaundiced land in its place.

In 1850, when California became a state, land travel from the east coast was a cumbersome passage. This was still 19 years before the "last spike" merged the Central Pacific and Union Pacific railroads in Promontory Summit, Utah, to complete the Transcontinental Railroad and make possible an easy overland passage from coast to coast. And with work on the Panama Canal still thirty years off (and finishing thirty-four years after that), any major cargo coming from the east needed to pass beneath the horn of South

America—a long, circuitous, and still dangerous journey. Yet it was around this time, as California tried out its statehood, that people most longed to travel there, feverish with the promise of its golden riches.

As population spiked and cities developed, the need for lumber was as urgent as ever. But faced with the resultant influx of logging, the 1860s saw California legislators issuing lumber laws to curtail the haphazard razing of trees on public lands. Eucalyptus provided the answer. The quick-growing eucalyptus, with its hard wood and versatile oil, with its small seeds easily transported by the thousands from Australia in a Pacific maritime route far easier than any other, became a welcome addition to California's ecology and economy alike. The plant became a kind of "wonder tree," seemingly capable of replacing with its own properties and purpose the native species western migration had promptly set about destroying. By the 1900s, even state government began encouraging their spread as a means of economic growth. Word of the tree's amazing qualities spread as fast as the trees themselves. Seedlings planted one year were 40 feet tall just three years later. After 35 years, they could tower some 175 feet. A miracle of growth! Eucalyptus oil, some claimed, was more than a cleaning agent or decongestant; it could even be used to float gold particles out from the water. Unfathomable! Settlers from out east, accustomed to the clenched forests of their further coast, planted eucalyptus for decoration and shade. In short time the tree became (for a while anyway) indispensable to the sustenance of the new "civilization" that Euro-Americans imagined for the western edge of their developing country. But like most of this emergent "civilization," it wasn't there to begin with. That brings some problems.

Worldwide, there are thought to be some 600 to 700 species of eucalyptus. The Blue Gum is the most common, at least in California. The state's climate accommodates the water-hungry plant, and its high canopy of foliage provides abundant shade beneath which

land can still be used for various purposes. The Blue Gum, however, is also an ecological nuisance. Unlike Oak and other trees that welcome and accommodate biodiversity, eucalypts neither produce acorns to feed local fauna, nor have easily hollowed wood to shelter the nests of birds or squirrels. Birds or butterflies that do make eucalyptus trees their home are often left homeless when winds send their unsecured nests to the forest floor. What's more, eucalyptus flowers are gummy and viscous, often at the expense of short-beaked birds that feast on the plant only to suffocate when the gum clogs their airways. And because of the calcium concentrated in the Blue Gum's leaves, high pH balances in the surrounding soil enable eucalyptus to outmuscle local plants and animals, only further contributing to the tree's invasiveness.

A century later, it's a fine irony that the tree used in the industrial marketplace as the principal ingredient in sinus decongestants all over the world, is now the one most responsible for congesting our forests. Eucalypts are everywhere. In America, they remain principally along the west coast, up into British Columbia, but down into Mexico and, more sporadically, even east through the southern states and Florida. It's such invasiveness that chokes wildfire corridors and, along with the tree's other unique features, makes for an especially menacing wildfire threat. The Blue Gum's dry leaves, bark, and seed pods are slow to decompose, and its limbs break easily, not only threatening those beneath them, but contributing to a ground cover of highly flammable leaves and bark, which releases twice as much heat as grass when afire. And not only do eucalypts pose a fire hazard; they're also hard to extinguish once ablaze because their enormous height makes the upper reaches of each tree difficult for firefighters to access.

The story is often told of white Europeans moving to the Americas, starting a new world in Plymouth and Jamestown by force and by cunning, expanding up and down the

coast, then westwardly, voracious for more to conquer. But the story is seldom told of what happens when they reach the land's end's end: when expansion comes not from east to west, but this time from across another ocean, from an Australian west to a Californian east. The eucalypts brought from Down Under represent a "large weed," noxious in its pervasiveness, but reflective of the very invasive expansion that made it necessary in the first place. Lest we forget, the British had also "civilized" Australia.

Today eucalyptus trees are undeniably an economic boon across the world. They're indispensable "natural" assets in the large-scale production of medicines, cleaning supplies, aromatics, and other products used just about everywhere. Some ecologists these days even herald eucalyptus cultivation as a key resource in the environmental and energy crises American growth has particularly exacerbated. And yet, the eucalyptus is also a danger. Eucalypts fueled the Oakland fires of 1991, which devastated thousands of acres in the Bay Area, and they've fueled fires that destroyed many thousands more acres since then besides. So we're left with a plant still surrounded by an aura of intangible promise. Its expansion has nearly reached its limit, and still we push for more. It doesn't belong, which is to say, it's not native to these lands, but in its non-belonging, the eucalyptus became so entrenched we hardly know our coastal west anymore without it. When you think of the American west, all this starts to sound familiar.

Mesquite

If the story of the eucalyptus is one of large-scale, deliberate international growth, tied integrally to industrialization and global environmental politics to this day, the mesquite's is local story, untold and unnoticed, transpiring in small communities throughout

a desert few outside much care to notice. The eucalyptus owns a tale of expansion and invasion, the mesquite of density and resilience.

Mesquite is the most common tree in the American southwest. It's also native to that area. Mesquite trees, which often don't grow beyond just shrubs, thrive in the desert from western Texas to eastern California, as far north as southern Colorado, and well south across the border into Mexican Sonora and Chihuahua. Both deciduous and leguminous, its pods fall to the earth and yield beans that feed coyotes, birds, livestock, and other animals in its range. Three-quarters of coyote shit is mesquite beans. Folk wisdom once held that mesquite didn't expand north until the Civil War, as ranchers more frequently drove cattle to the northern territories. But such cattle drives and their highwayed remnants today, alongside nomadic coyotes and migratory birds, are now thought to be less responsible for the mesquite's expansive range than its terrific growth in density.

These days, the mesquite is something of a scourge. At least, that's what some ranchers will tell you. It's invasive. It's thorny. It scabs unknowing cattle and shreds the arms of people who dare to cross its path. Mesquites are phreatophytes. That means they have deep roots, sometimes reaching nearly 200 feet underground, and these roots seek out whatever moisture they can find. In the desert where mesquites live, water is scarce, which means mesquite trees can be responsible for lowering the water table, such as it is, and further desiccating the already parched soil. No wonder it's disparaged. Although mesquites can live on as little as 12 inches of water per year, they'll take as much as they can get, and where water is such a limited resource, expecting its equable distribution is a bit like ordering one pizza for a whole football team and expecting the linemen not to eat more than the kickers.

But the same ranchers prone to excoriate the mesquite can sometimes forget their own complicity in the tree's rising density. It's not just animal scat that spreads the tree's growth. Overgrazing by livestock leaves the land bare for mesquite to grow where once its growth was impeded by prairie grass. Fires that once might have devoured a prairie for miles now are seldom seen; human settlers have worn the land barren, and taken measures to prevent the naturally occurring blazes that once checked mesquite growth and kept the trees mostly along rivers and creeks. As ranchers have grown increasingly perturbed by prairie dogs, their eradication, too, has contributed to the increased density of mesquite in the Southwest. Prairie dogs don't just eat mesquite pods or beans; they're known to eat mesquite shoots when the plant is tender and just beginning to grow. Eliminate the prairie dog, and you eliminate a natural enemy of the mesquite.

Probably by now a story is beginning to emerge about how the mesquite figures in the western ethos. It's more, I hope, than just the same hoary tale about human expansion and its capitalist imperatives, about how intervening with nature causes nature to roar and reel in disequilibrium. These narratives are tacit, sure. But the real story is one that locates some of the west's central themes in so unassuming a variable as the mesquite. Like the west itself, the mesquite is rugged, heat scorched. It needs more water. It's been here before people and it will be here when we're gone. Through the lens of the mesquite it's possible to understand the west as a place where water and space are beginning to become problematic. The old story of expansion has given way to a newer story about density. And with density we're forced into a problem we can't resolve with the wholesale genocide that marked the initial phase of western expansion by early Euro-Americans from the east coast. You can no more eradicate mesquite from the west than you can take loneliness from the moon. It survives in dearth of everything else. It's hardy. The problem now, at least now more than

ever (with the old frontier disappearing beneath urban sprawl), concerns how to live together, side by side. Not just humankind alongside nature, but humankind alongside humankind.

The mesquite, of course, is not universally regarded as a scourge. In fact, its history betrays just the opposite. The first documentation of the mesquite tree comes from the Spanish explorer Alvar Nunez Cabeza De Vaca—a heady name if ever there was one. Shipwrecked on what's now the Texas Gulf Coast, he and his crew ventured inland where they encountered various indigenous Indians, and plenty of mesquite. De Vaca wrote about the tree in 1528, well before America as we know it even existed, and hence before anything we might call the American west had been summoned into the popular imaginary. Back then, according to his journal, Indians mashed mesquite beans into a pasty meal that, with water, became a kind of edible mush. Its beans could be winnowed into a flour and in turn made into cakes. The Indians de Vaca encountered treasured in trade the seashells he'd brought from his southern passage—but not for their beauty: rather because the seashells made a superior tool for cutting the mesquite's stubborn beans.

From the outset of its documented history, then, the mesquite has been known to serve the utility of those who live in its company. For Mexicans and Indians—the Aztecs, the Yuma, the Comanches, the Yaqui and others—its gum made glue and waterproofing and dyes; its bark made fibers for clothes; its leaves made medicines to soothe sore eyes, teeth, headaches, and venereal disease. Its wood was tough, not susceptible to rot, and it furnished the indigenous with weapons and tools and shelter and fuel, materials for which were otherwise scarce in the barren desert even hundreds of years ago. Today, of course, we're not as resourceful. Chances are, unless you've lived in the Southwest, or know your trees, you're likely to know mesquite best as a kind of flavor. Mesquite wood, logged or chipped,

burns an aromatic smoke that lends foods cooked with it a mellow, woody richness about like biting into a desert rain cloud—or at least how I'd imagine it. These days mesquite is otherwise used for hardwood furniture or flooring, and for the occasional fence, but that's about it. The value we get from it now comes from cutting it down.

But it's seldom cut down in bulk. The mesquite doesn't grow in forests that loggers can mow down for timber to strip and sell. The mesquite grows out, not up. It's gnarled. It'll reach 30 feet if it has the water, or remain a shrub if that's all the energy it has. Sometimes, you'll see one size beside the other. All three of its most common species—Honey, Velvet, Screwbean—restore nitrogen to the soil, as if giving back in trade for the water it takes to survive. The mesquite is decidedly local. Invested. It needs hands not machines. Its scorched black wood and mottled shade remind us at once of its hardy resilience and its alluring mystique in a western land marked elsewhere by a strangely stubborn evanescence.

Ponderosa Pine

But let's go further back. 1805. America is only inchoate, locked in the east and unsure what lay in the great westward beyond, but hopeful of containing its promise. President Jefferson has sent Lewis and Clark journeying and journaling west, out to explore a “new” west they imagined themselves discovering. Each new day they're charting an unknown space. And by May 11, their expedition is in full swing. In eastern Montana, Captain Lewis notices along the river's shore a peculiar stand of pine. In his journal he remarks, they're “of the pitch kind” but with “leaves somewhat longer than ours in Virginia.” He's encountered the powerful ponderosa: the first for Euro-Americans, but not of course the last. Come September, it will be ponderosa trunks they carve to make their

canoes and complete their final passage to the Pacific. You see, it didn't take them long to exploit its use for timber.

Even today, the ponderosa is the most common and widely distributed pine in North America. There are pines all over the world, but the ponderosa is native to the American west. It can grow over 250 feet high, and is found in mountainous regions everywhere out west from the Black Hills to the Rockies, the Cascades to the Sierra Nevadas. Big heavy, black jack, bull pine, ponderosa goes by several names and over the years has lent its own to television shows, high schools, steakhouses and more.

But the story of the ponderosa I want to tell isn't about its preponderance. Nor is it about its expansion or its growth in density. It's neither a story that crosses oceans nor one that remains in the place it's always been. We've seen those stories in the eucalyptus and mesquite. The ponderosa's story is about its depletion. Oh, it gets logged alright, and not sustainably enough. But the story of the ponderosa's depletion isn't alone a story of human greed or intervention; it's not about our taking it over and making it our own. We did that long ago, as soon as Lewis and Clark crossed its formidable path. Today the ponderosa is disappearing not just under our own empowered hands; it's mostly under the sway of a powerful native, rising up to reclaim, and this time destroy, what once was all its own. Never mind that the native taking charge happens to be a bug no bigger than a pine nut.

The mountain pine beetle goes by the scientific name *Dendroctonus ponderosae*. It attacks other pines, but none so much as the ponderosa from which it takes its name. A bark beetle with a black exoskeleton, at first glance it seems innocuous enough, and in a fair fight, one-on-one, indeed it would be no match for a human. But then, it's ample trouble for western forests. Mountain pine beetles kill them off, tree by tree, day by day, year after year.

Thanks to these beetles, the western states are in the middle of an outright epidemic, a veritable blight of unprecedented and biblical proportions.

Mountain pine beetles do their damage by tunneling under the ponderosa's bark and spreading a blue stain fungus they carry on their head. The fungus spreads into the tree's sapwood, effectively blocking its ability to produce the sap that would protect it from further infestation. After that, the beetles can have their way. In summer they lay their eggs under the ponderosa's bark, then go scurrying about in every which direction until winter comes, when they settle in to stay. See, the mountain pine beetle doesn't kill with its teeth. The fungus they carry to the ponderosa is sticky, and gums up the absorption of water and nutrients that the tree needs to survive. The longer the beetles thrive, the more pervasively the blue stain fungus spores will germinate and spread. When winter ends and summer comes around again, a pine that looked healthy last season now turns brittle and orange. Whole trees go dry, like a Christmas tree left indoors too long. One brush along its side and a flurry of needles come raining across the floor.

Next come the fires. Afflicted trees spread by the millions. From overhead you can see it being painted in time: staining once-lush forests first with rust-colored spots amid a sea of green, then with blotches, soon with uncomely stains, until eventually the green is gone, replaced by a whole sea of dead and rusted pine. It's a tinderbox waiting to burn. The needles that now cover the ground only make things worse. Once started, fires in these regions can go unchecked for miles, hundreds of them, devouring what once was a wilderness, burning it into a wasteland.

And all the while, there go the beetles, just small enough to survive, scuttling down one trunk, across the forest bed and up another. They know no preference and show no pattern. Borders mean nothing to them. Canada has it even worse. Wilderness preserves,

state or national parks, private lands or public, in this takeover they're all the same. The 2011 Report on the Health of Colorado's Forests found 752,000 acres of forest infested by the mountain pine beetle last year alone. More staggering still is the thought that this figure indicates a *decrease* from prior years. Of course, that can be explained because there just aren't as many trees left for the beetles to afflict. And ponderosa forests, once the more resilient of their lodgepole and limber brethren, are actually getting more infested than before. 2011 found 275,000 acres of ponderosa pine forests blighted throughout the state, a figure that's increased from 234,000 acres in 2010, and 22,000 in 2009. All told, since the late 1990s when reports of the mountain pine beetle infestation began, Colorado alone has lost 3.3 million acres of its forests.

The epidemic that came, seemingly from nowhere, in the late 1990s, is usually attributed to two causes. And guess what? Global warming is one of them. Warmer climate conditions have helped beetles survive the winters; their populations are multiplying and dispersing. Hotter, drier summers meanwhile mean pines dry out. They have less water to grow. This makes them weakened and vulnerable in precisely the season the beetle population does its business. Even the powerful ponderosa doesn't stand a chance. And as trees succumb to the beetles, we find ourselves in a vicious cycle, because a forest full of dead trees can no longer remove greenhouse gases from the air. The climate just gets worse.

But it's a vicious cycle like this that makes the second explanation for the beetle epidemic all the more tragic. When new growth is stunted, forests come to have a disproportionate percentage of older trees. These are the ponderosa we love: the large, the majestic, the beautiful. But as it turns out, it's our effort to preserve old forests that in part makes so much of the west susceptible to infestation. Old trees in old forests may be magnificent, but they're also easy targets for the mountain pine beetle. For one, older trees

have a larger surface area, effectively giving them more living tissue, or phloem, to attack. But they're also weaker in their oldness, and without their vigor, less able to fend off the pesky beetles.

This is the west today. Intermittently strong and weak. Stubborn and still changing. Old and new. Native and foreign. The land we've made our own is now being taken away; and this time, we're the ones powerless to stop it. The ponderosa seldom grows alongside the eucalyptus or mesquite, yet together they tell a story of westernness different from any other. In its mythical wonder, the west brings many bounties. We love its space in which to grow, and we love the resolve with which it perseveres. But the promise of the American west is a mystifying disappointment when seen through the trees that tell its story. ABC/D. The variables are many and ostensibly unrelated. These trees come carrying the echoes of the past, roots buried underground that hold the whole equation together. Their divisor is a region like no other, both ruined and sustained by its very promise, a sum of cruel destructions. What's left is a remainder we should be grateful to call our home.