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All the wild and lonely places

Lawrence Hogue

The University of Montana

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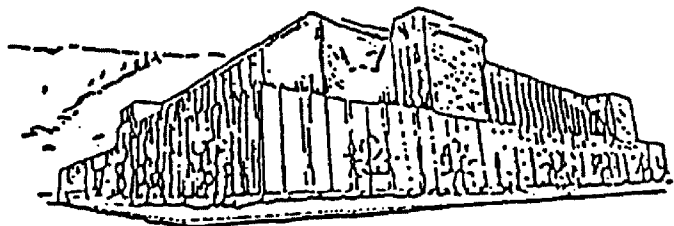
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All the Wild and Lonely Places

by

Lawrence Hogue

B.A., Occidental College, 1983

Presented in partial fulfillment of the requirements

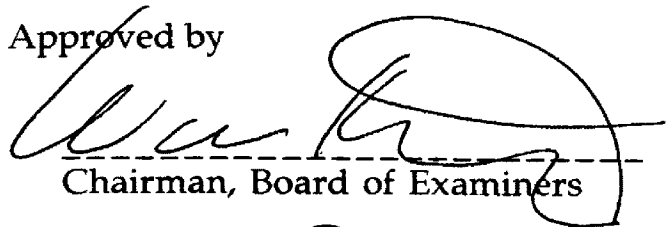
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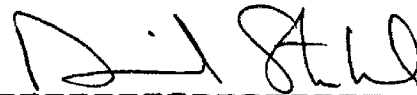
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cup 6

All the wild and lonely places, the mountain springs are called now. They were not lonely or wild places in the past days. They were the homes of my people, who lived contented and happy. Sometimes an Indian goes back into the mountains to a spring of water. There he visits, alone, the home of his ancestors.

--Chief Francisco Patencio

Stories and Legends of the Palm Springs Indians

PREFACE

This is a work in progress, an environmental history of a place that is special to me: Anza-Borrego Desert State Park east of San Diego. The finished book-length work will explore the way my view of this place -- as a wilderness which works best if we leave it alone -- changes as I encounter two fields of study: environmental history and modern ecology.

Through the lens of environmental history, I look at the ways other peoples have seen and affected this desert, an area we are encouraged to see as pristine or untouched. The ways Europeans have affected this place -- and all of North America -- are generally well known; the ways Native Americans changed environments for thousands of years are less understood. Accepting that they did change this environment forces me to change my view of it as a wilderness -- at least as I've commonly understood that term -- and to question my own need to see a place as empty and untouched by humans.

The second thrust of the work looks at the ways in which modern ecology changes my view of this place and how we should treat it. The old model of ecology was that ecosystems would maintain a natural balance if humans didn't meddle with them. Humans were the principle agents of change, and often of destruction. Modern ecology finds little balance in nature. Instead, there is nearly constant change, not only from humans but from natural forces such as fire, storms, earthquakes, and climate change. How does this new view force us to change our ideas about preserving environments?

The answers I'm pointing to hinge on the concept of biodiversity. If we have to discard romantic notions of wilderness as a place untouched by humans, preserving a diversity of plant and animal species is still a good reason to keep these places. Ironically, that preservation doesn't necessarily mean leaving them alone; it could mean actively managing the wilderness to promote the diversity on which wild things depend. And if we have to discard notions of preserving some sort of balance in nature, biodiversity provides a different yardstick for preservation efforts. We may need to promote some kinds of change -- fire, for instance -- while barring others -- like the rampant spread of housing tracts across the hillsides of southern California.

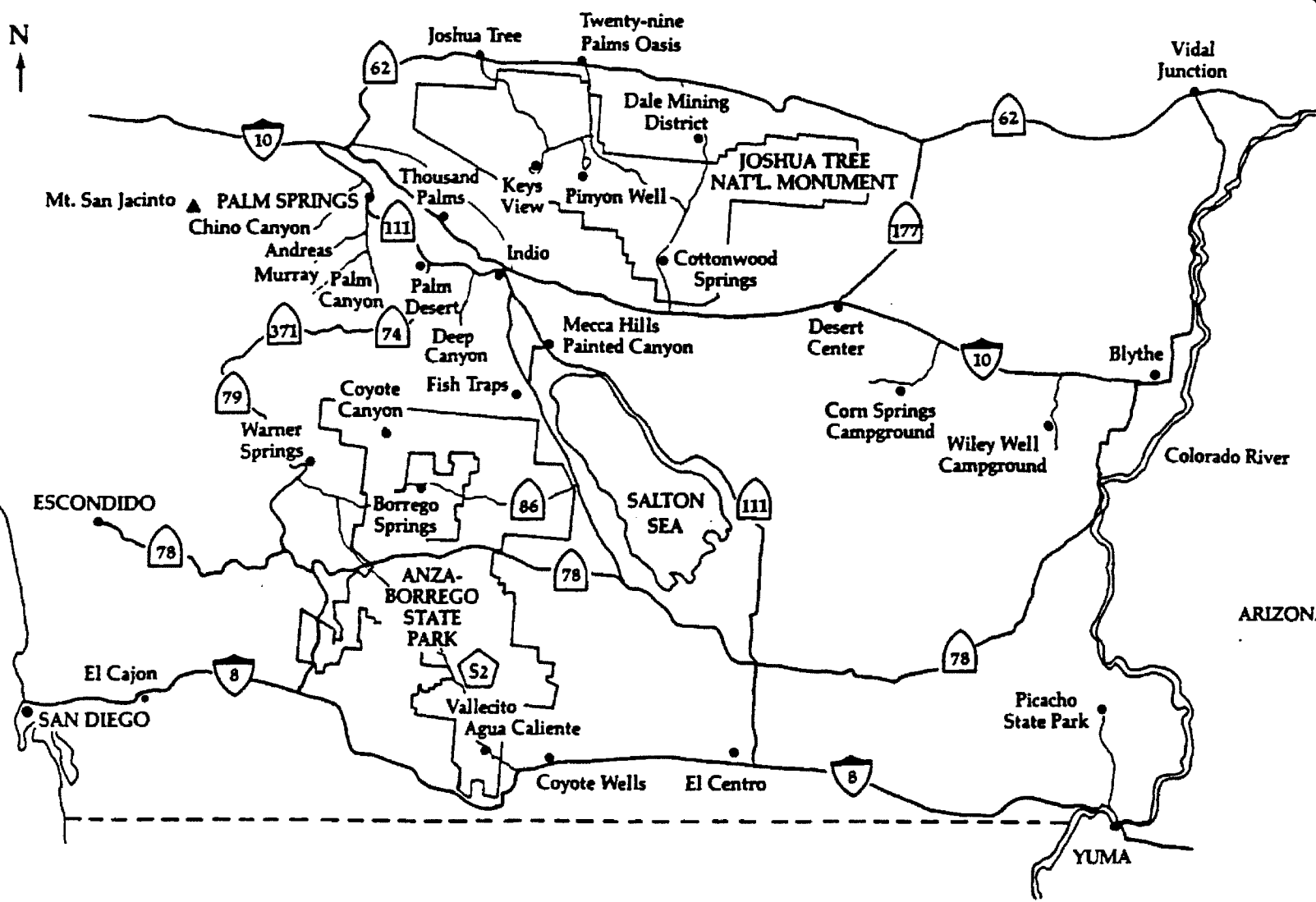
This is about one-third of the entire work, which will probably come in at around 300 manuscript pages. The first seven chapters presented here will appear at the beginning of the book, while the last two will appear at the end.

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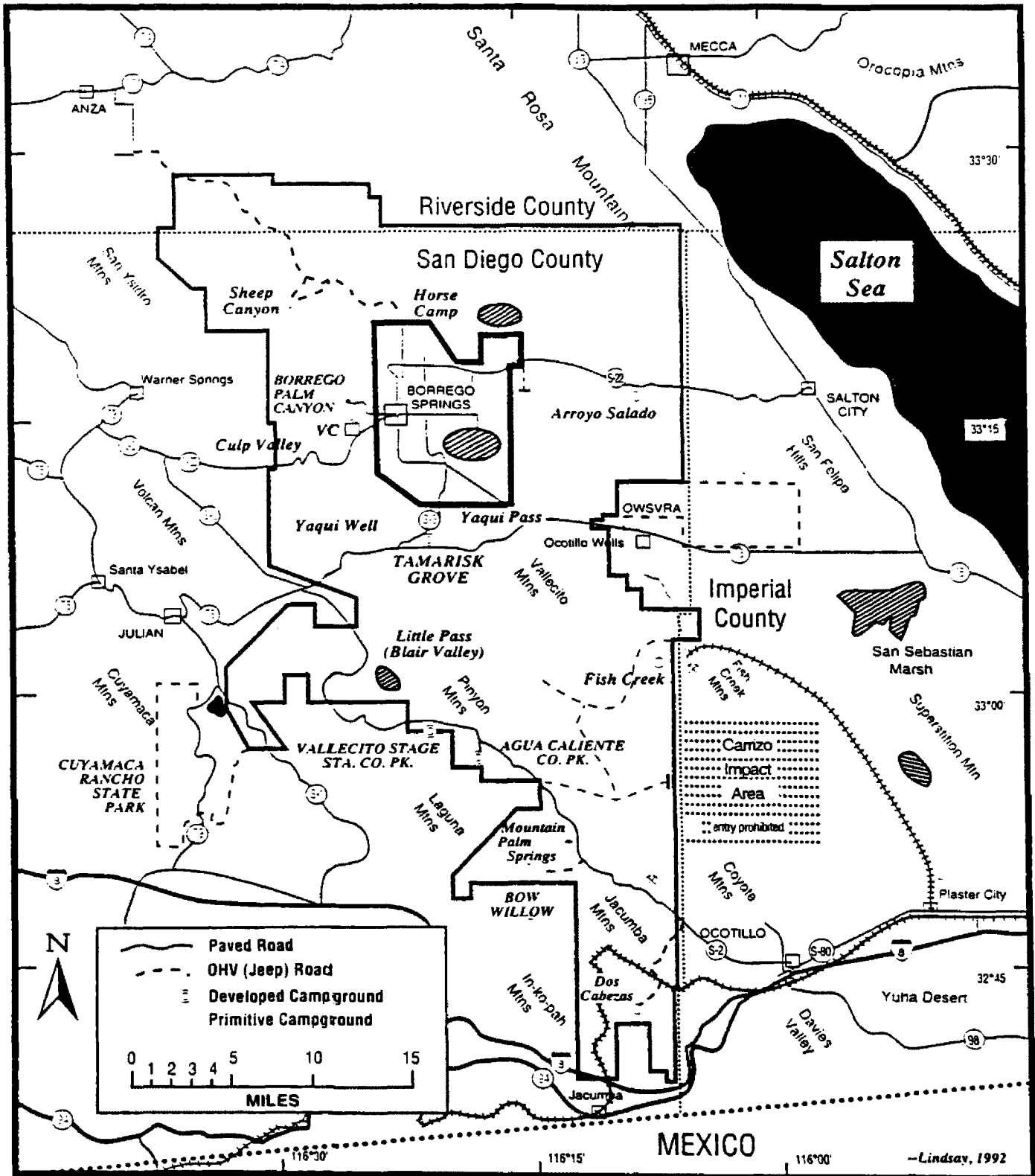
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ANZA-BORRREGO REGION



INTRODUCTION

Imagine the shape of the land, here in California's southwest corner. Moving inland from the coast, it rises up in successive mesas and canyons, ascending gently to the first foothills. The grade becomes steeper, through foothills and mountain valleys to the Laguna Mountains, part of the Peninsular Ranges, the long backbone running down to the tip of Baja California. Then, in one dramatic plunge the land falls away to the Anza-Borrego Desert six thousand feet below. Those mountains create the arid country to the east, blocking moisture from Pacific storms. Out there, there's nothing but desert — desert plains, desert sinks, desert mountains. The people in the Imperial Valley will tell you their green fields are not desert. But the selenium building up in their fields tells you otherwise.

On a September morning three years ago, I stood on a high peak in the Laganas, waiting for the desert to reveal itself. The place felt like home, though I was only a visitor. At first it was all black below, the eastern horizon marked by the outline of distant mountain ranges silhouetted against the lightening sky. The desert plain in between grew lighter. The shapes of nearby peaks began to emerge from the darkness. Just below the horizon, forty or fifty miles away, a silver shimmering appeared: the Salton Sea. That body of water looked blue and clear from where I stood, but I knew better. The sea is the final stop for the selenium and pesticides draining out of the Imperial Valley.

This is the land of my dreams. I dreamed about it that September morning. And I dream about it now that I'm far away: a land of pinyon-clad

peaks, sun-blasted ridges, narrow canyons, rocky alluvial fans, creosote-dotted plains, and nearly-barren badlands. A land of dreams and nightmares, where the waking world meets the fantastic shapes and bent forms of imagination: spiny cholla, dagger-like agave and incongruous fan palm. A landscape laid bare, showing the effects of water everywhere, though water itself is seldom seen.

This is the western margin of the desert, and of what I think of as the southwest. Behind me, west of those mountains, it was all California; east of them, the land has more to do, ecologically and culturally, with Arizona and the Colorado River country. Basin and range country begins here too. Isolated mountains jut east of the Peninsular crest, creating a landscape of desert peaks, alluvial fans and dry sinks. They've literally slid off the Peninsular Crest. Crowned with juniper and pinyon pine, they look like ships sailing out into the desert sea. Here and there, especially along faults in the bedrock, springs well up to create lush oases. Deep canyons cut the mountain flanks, tracing courses across alluvial fans and bajadas covered with agave and ocotillo, through creosote-covered flats and desert badlands, running finally into the largest basin of them all, the Salton Trough.

A wind howled at my back, rushing out to meet the rising sun. It gusted and played around the peak, trying to brush me off. I reveled in the wildness of the moment, relishing the unobstructed view. The dawn light ignited the rocky summits of Toro Peak in the north. Next it caught Whale and Granite Peaks directly west of where I stood. Their flanks took on a warm orange-red glow. The contours of the mountains stood out in relief as the ridges and buttresses caught the first light, the deep chasms in between plunged in

shadow. The lowlands, the basins and badlands, were dark still, lost in the dawn glare.

This was a familiar landscape. I could pick out peaks I'd climbed and canyons I'd explored as they became visible, and new places I planned to go in the coming year. I had hiked many times to the summit of Whale Peak, the massive ridge in the heart of the park; this year I wanted to spend a few nights amid the dark frowze of pinyon pine and juniper at its summit. The Santa Rosa Mountains extended further into the desert, framing the view to the north. Beginning at 8,000-foot Toro Peak this rugged range drops in a series of ridges and peaks nearly to the Salton Sea, 230 feet below sea level. In the coming year I hoped to traverse the range from east to west, as the Cahuilla Indians had done centuries before.

South and east of Whale Peak, the sunlight hit the Carrizo Badlands, a multi-colored landscape of mud hills cut by sandy washes, a giant layer cake seen in cross-section. Beyond the badlands and the Fish Creek Mountains, a wide sandy plain stretched away to the Salton Sea. Water draining from the east slope of the Laguna Mountains flows down Carrizo Creek as it passes through a wide gap between the Fish Creek and Coyote Mountains, then turns north to the sea. Little of the water makes it that far; it sinks into the sand long before making the 40 miles across creosote flats.

None of that water finds its way to the ocean — all the land I could see, from north to east to south, tilts into the long Salton Trough. This basin is the focal point from any high spot in the mountains or desert surrounding it. It's like looking down into a vast, oblong bowl with rough sides and a flat center. The Salton Sea shimmers in that basin, taking on a blue tint when the sky is clear or silvering under the too-frequent haze of the Imperial Valley. From

the Laguna Mountains on that September morning, the lake looked like a pristine jewel set against the tan background of the desert.

Much was hidden from my mountain-top perspective, especially the effects humans have had on these lands. Native Americans dwelt here for thousands of years before Europeans came; old footpaths, rock art, pieces of pottery, even remnants of their dwellings dot the landscape. The changes they made in this landscape are less apparent. To them, this was home; today, we call much of it a wilderness. The Spanish arrived over two centuries ago, followed by American mountain men, pioneers and forty-niners. Many of them passed through the badlands and the valley directly below Garnet Peak, where old wheel ruts can still be seen. More recently, ranchers ran cattle in the desert, fattening them on the spring wildflower bloom. Those who know where to look can find dilapidated line shacks holding a set of rusting bed springs. Early in this century, a twisting, impossible rail line was built through Carrizo Gorge and on out to El Centro. Finally, much of the land in the foreground, at the intersection of mountain and desert, was set aside as Anza-Borrego Desert State Park. Now half a million visitors each year come to see sunrises paint the rocks red, smell the flowers in April, and try to find a moment of silence.

But the image that stays with me is that of the Salton Sea. Perhaps this is the best emblem for the whole area I surveyed from my vantage on Garnet Peak. From there, it looked like a natural lake filling the Salton Sink. But that view is deceptive: the water's presence is actually the result of a poorly

engineered irrigation project in 1905, intended to bring the water of the Colorado to the Imperial Valley. The Salton Sea is in part a man-made lake, but it simulates the ancient Lake Cahuilla, an even larger body of water that filled the basin as recently as 500 years ago. Behind what I saw as simply a wilderness, there is layer upon layer of irony. Somewhere in that story of boosterism gone wrong lie clues to the way to see this place.

The desert is partly a romantic landscape, a place for photographers to snap pictures of sunsets, a place to get lost in silent slot canyons. This is the side of the desert that kept me returning every fall for seven years. But the desert is also a place where people intrude, where dirt bikes tear at the fragile surface of the desert and Navy flyboys break the sound barrier a hundred feet off the ground. The desert is a place where men go to commit suicide after murdering their families in posh Rancho Santa Fe, where wounded lovers take the dismembered bodies of their ex-girlfriends. Mexicans cross into the U.S. near desert towns. Many of them come to work in the fields irrigated by the Colorado; they are dominated by the same forces that dominate the river, and suffer some of the worst working conditions in the United States.

I knew all of this when I stood on Garnet Peak that September day, but I chose to ignore much of it. There were plenty of murders, drugs, and poverty back where I lived in San Diego, and my trips to the mountains and deserts were an escape from all that. Down in those canyons I expected to find a kind of mystery, transcendence perhaps. So I framed my view, just as photographers do to avoid the annoying telephone wire or building they don't want to intrude on their nature scene. I ignored all the pieces of the desert that didn't fit my romantic imaginings.

In a way, the place was already framed for me by the boundaries of the state park. *This* is the sanctioned playground, the boundaries told me. Outside those boundaries I was more likely to run into someone I didn't want to meet: an off-roader, a target shooter, a psycho with a car full of guns, or maybe just the desert rats who I thought were crazy to live out on the flats where the wind never stops. Inside the boundaries, it all seemed safe — just a few rattlesnakes and tarantulas, mountain lions and coyotes.

Even within the boundaries of the park, more cropping was required to see the place as pure nature. There was too much evidence of human occupation. Maybe I could view the pottery shards and rock art, the line shacks and broken water troughs, as part of the romance of the past, but it was harder to ignore the dirt roads snaking across the park, and the cars and trucks that used them. I used those roads too, driving to favorite hiking spots. Then I planned logistically elaborate expeditions to get as far from those roads as possible. And even this wasn't enough. I hike ten miles into the backcountry and I see a desert bighorn. Chances are that sheep has been banded and counted and inoculated. Or I hike up what seems to me a pristine desert canyon, and find a pretty green shrub with reddish bark, and a spray of pink flowers. It's a tamarisk and it doesn't belong here; it's an invading species, part of the war on diversity our species seems to carry with us. Or maybe I *don't* find that tamarisk. Chances are a restoration crew has come through here and removed it. Grooming the wilderness. I've had to revise everything I think about nature, and about wilderness. And what I come around to is that maybe it's all natural, but in a way I'd never thought of before.

I want to go back to the desert. I want to see everything that's there without cropping or composing it. I want to get everything inside the frame.

INITIATION

Bells chimed in the Bodhi Tree Bookstore. Incense drifted on the air and New Age music played in the background. A bearded man in natural fiber clothing spoke softly with a customer, conducting the commerce of enlightenment. A young woman browsed the shelves. The door closed behind us, shutting out the noise of Melrose Avenue — people heading for brunch at places with coyote statuettes on the tables and wood carvings of cactus on the walls.

I was thinking about lunch too, but my friend Doyle wanted to stop here first. He was on a spiritual quest, one that would lead eventually to a radical sect of the Russian Orthodox Church. I was his reluctant fellow traveler for the day. I felt more than my usual skepticism, and being hungry didn't help. Nothing like earnest mysticism on an empty stomach. Maybe Doyle wanted to emulate the Zen monks who lived on handfuls of rice, but I could think only of a thick burger and a cold beer.

While Doyle looked for the book that would unlock the mysteries of life, I wandered around the store, ducking under the wind chimes and playing with the little brass Buddhas. Rubbing their bellies was supposed to bring good luck. Next I found a display of wall calendars. One had pictures of the Himalaya. Idly, still thinking about lunch, I leafed through the pages of icy peaks and fluted ridges, massive glaciers and sheer canyons, monasteries in green valleys. The images were stunning.

It's been years now since I've seen Doyle, but that day stays with me. Looking back, it seems one of the pivotal moments in my life. As I stood

there looking at those images, I knew I wanted to go to this place, to be among those peaks, maybe even learn to climb them. Looking at a particular photo of a corniced ridge stretching away to the sky, nothing but thousands of feet of vertical fall on either side, I wondered how it would be up there, walking that line between solid mountain and empty space.

To be honest, I had my own sort of spiritual quest on that day, too, though one that didn't seem to be satisfied by a place like the Bodhi Tree. In those years, something in me wanted to lose itself in that space I saw in those photographs. Before that, the space I had been attracted to was the ocean. This seemed to be the closest I could come to an idea of the infinite, which may be a way of saying an idea of God.

Up on those Himalayan peaks, it was all an icy desert. Ten years later, I still haven't been to Nepal or India or Pakistan. But my passion for those mountains led me to another kind of desert.

A few months and a move to San Diego later, my wife Diane and I went camping in the Cuyamaca Mountains east of San Diego with our friend Tim. With its gold and tan meadows ringed by forests of manzanita, oak and pine, the small state park always reminds me of Northern California. A storm had moved in overnight, and now, driving up the winding mountain road, the mist enveloped us. We had the campground to ourselves.

That afternoon, the three of us sat in the back of the truck, snug under the camper shell, sipping tea and listening to the storm. It rained steadily now, and an occasional gust rocked the truck. We took turns reading *The*

Hobbit aloud, imagining Bilbo and Gandalf and the dwarves riding day after day through rain as we sat warm and dry.

Then I spilled my tea. "Oh fuck!" I swore as the tea spread across the old carpet we used to cover the truck bed.

"Larry, don't get so upset," Diane said as she reached for a towel. "It's only a little tea." Tim pulled his sleeping bag out of the way.

Only tea, I thought. Sure. But what if we had been camped at 21,000 feet on the shoulder of Mt. Everest? Then such a simple mistake, or a series of them, could lead to catastrophe. I was warm, dry and well-rested, and I could still do a stupid thing like this. How would I perform at altitude after a day of kicking steps, carrying loads, and breathing the thin air?

I had been reading too many books about mountaineering.

In fact, I was obsessed with them. All that winter, I was absorbed in accounts of expeditions to the world's highest peaks. I read a lot of Galen Rowell — *High and Wild*, and *In the Throne Room of the Mountain Gods*. I was impressed with the epic accounts of British colonialists wading through deep snow in bitter cold as they explored high Himalayan passes, and of the climbers who first ascended the peaks. The story of Mallory and Irvine's disappearance on Everest fascinated me. Did they fall through a cornice? Or did they become giddy in the thin air and forget to come down? The romantic in me wanted to see their story as some sort of encounter with the infinite.

In *Annapurna*, Maurice Herzog's account of his French team's first ascent of that peak in Nepal, mountaineering took on a mystical quality. He wrote of climbing a peak as "fulfilling an ideal." The nature of that ideal remained fuzzy, but apparently it was worth losing all his fingers and most of his toes. What drove these men — and women, in the latter half of this

century — to risk their lives just to stand on a little patch of rock and snow that happened to be higher than most others in the world?

While I was less obsessed than these professional climbers, my hiking had always centered around getting to the top of something, getting a view. Diane always kidded me about this “obsession.” Later, when we began backpacking in the Sierra Nevada, she was most content walking along forest paths while I only wanted to be up in the alpine zone, among the granite peaks.

Now, on our weekend outing with Tim, the same issue came up. After a night in the storm, testing our new tent, we awoke to a clear morning. It had turned colder, too. The trees dripped ice and the ground crunched under our feet. We huddled in the truck again, drinking hot coffee, deciding on where to hike. Cuyamaca occupies a high plateau in the Peninsular Range, a series of valleys with forested mountains on either side. In the center of one of those valleys is Stonewall Peak, a bare granite knob thrusting above forested slopes. On its south side the granite face falls sheer for two or three hundred feet. Of course, I wanted to follow the trail up to that summit, while Diane wanted to explore the meadows and forests below it. Tim was most concerned with what he called the “hike-to-view ratio;” the less hiking and the better the view, the better he liked it.

We compromised on a loop that would take us through the meadows and up the back side of the peak. This sounded like a little too much hiking to Tim, but he reluctantly agreed. By the time we were on the trail, the sun had begun to warm the meadows. Steam rose from them, white curtains catching the sunlight. The sound of our footsteps on the trail seemed to echo through the silence. Much of the hike followed a fire road, and occasionally we came

upon other human artifacts: a log bench by the side of the trail, a piped spring emptying into a water-trough. It was all very pretty and bucolic, very pastoral.

Still, I couldn't help feeling a little enclosed. This feeling increased when we got into the denser pine forest on the north side of the peak. In Southern California, these evergreen forests are a rarity, offering relief from the browns and tans of the chaparral on the lower slopes. Remnants from the last ice age, when the climate of the region was wetter and cooler, forests of pine and fir became stranded on mountain-top islands like this one as the glaciers receded. I always enjoyed a visit to these forests, a chance to smell the scent of fir trees or the vanilla-bean smell of Jeffrey pine, but it wasn't long before I'd grow itchy. Now, with the trail switch-backing up-hill through the forest I became disoriented. After that cloud-enclosed drive up into the mountains and the camp-out in the forest last night, I was beginning to feel a little claustrophobic among all those trees. I wanted to be up above the forest so I could get my bearings and get a view.

Finally, we reached a spot where the trail simply stopped at the base of an outcrop of granite. We had to scramble up the sloping rock face under and between the branches of oak trees. Beyond this opening we could see the summit just a hundred or so feet above us. It was all granite now, a sloping ridge with a sheer drop on either side. On the left side and just below the ridge was a stair-like progression of steps in the rock. It would have been a perfect climb, but for one thing: a handrail, made of steel pipe drilled and cemented into the rock, ascending the peak alongside the steps, which I now saw must have been carved or blasted into the rock. What could have been a mildly spine-tingling climb had been turned into just another walk, a stairway with a view.

At the summit, the rail wrapped around to encase us on three sides. We felt no more sense of danger here than we would have felt standing on the roof of a building or walking across a bridge. Still, even with that rail, looking down that hundred-foot drop-off raised the hair on the back of my neck. I had that pleasurable sense that wasn't quite fear but a sort of frisson.

This was another thing that Diane mistrusted about my obsession with getting to the top of things. I always had to stand right on the edge of whatever brink we had reached, and she would always tell me not to stand so close. I'm sure she was glad of the rail that separated us from the edge of this cliff. It was all I could do not to climb over that rail and lean out into space to see how it felt. I looked at the hard, fissured granite plunging down into the void, and wondered how hard a climb it was, and if I would ever learn to climb something like that. Being down there on the face of that near-vertical rock must be something like flying, I felt.

Later, I'd have the same feeling, only more intensely, as I began climbing rock faces like the one on Stonewall. During those moments of rest at the top of each climb, I'd have this nagging thought: "Now how the hell am I going to get back down?" Nothing was left but the abyss on every side, and it seemed to reach out to engulf me. In those moments of half-fear, half-elation, I felt more present, more alive, than just about any other time I can think of. Back in the mid-1700s, Edmund Burke called this feeling the sublime, a "delightful horror, a sort of tranquillity tinged with terror." He believed this was one of the strongest emotions the human mind was capable of feeling, and that it offered a way of glimpsing the infinite.

This is a little unnerving, finding someone writing over 200 years ago who could describe so precisely the feeling I had on Stonewall Peak. A long

tradition of romantic writing has trained us to expect our responses to nature to be spontaneous and unique. But if you took the trouble, you could trace a line from Burke's theories about the sublime down through the Romantic movement in literature and art, on through the Preservation movement responsible for our national parks, the photographs of Ansel Adams right down to modern backpackers, climbers and trekkers. The sublime was what I had glimpsed in that wall calendar in the Bodhi Tree, and it's what I felt, in a small way, on Stonewall Peak.

Moving my eyes from that vertical plunge, I noticed another kind of vastness, out toward the east. Stonewall pokes just high enough above the valley and mountains surrounding it that we could see over the Laguna crest and down into the desert. The storm hadn't let up north of us, and we could see clouds pouring over the edge of the mountains and out into the desert where they vanished in the dry air. Directly east stretched a series of dry mountain ranges, and then — from this vantage, since we couldn't see the desert floor — nothing. If what I had seen in that wall calendar and had been reading about in mountaineering books could be called the vertical sublime, then what I saw in that stretch of desert east of us was something different: a sublimity of emptiness.

A month later, Diane and I drove down into that desert. It's a two-hour drive east from San Diego on Interstate 8, over the Laguna Mountains. Once we left the city of El Cajon and the suburban sprawl of Alpine behind, it was all chaparral-covered slopes. The freeway follows a low spot on the southern

edge of the Lagunas and never gets close to the elevation of the pine forests further north. With the freeway's ups and downs it was hard to get a feeling for how high we had climbed. We got the first hint of being in a mountain range after the village of Jacumba, where the freeway passes through a deep, boulder-strewn canyon. Out the other end we glimpsed the desert, thousands of feet below. But, driving, I barely had time to notice it as the car swooped through the tight curves and I watched for slow trucks ahead.

We were on our way to the first outing of the Sierra Club's Basic Mountaineering Course. I was still pursuing my dream of climbing big mountains. Diane was skeptical about this fascination, but she liked the outdoors and saw the course as a good way to meet people. Between the two of us, she had all the outdoor experience. Until now, I had only camped next to my car, surrounded by RVs; she had backpacked most of the Appalachian Trail. I had a lot to learn if I wanted to get to the Himalaya. Descending into the desert, those shimmering peaks seemed a long way off.

As we came out of the mountains and onto the broad, creosote-dotted plain of the desert, the land seemed barren. It was late morning, the light was flat, the mountains one monotonous light tan. This reminded me of other drives through the desert on long, cross-country trips. I'd look out at the vast expanses of nothing rolling past the windshield, see old shacks and mobile homes standing out in the distance, and wonder what in hell people could do in places like that. Topping a rise and heading down into a wide basin, I'd try to guess how far it was to the mountains on the other side. An hour, two hours later, and I still hadn't reached them. There was something terrifying in those distances, yet thrilling, too.

Of course, the impression of emptiness in this desert landscape was just an illusion created by the speed of the car. But this illusion would persist long after I'd learned the desert was really full of life. I had a deep need to see this place as empty, I still wanted to lose myself in that emptiness. I was already making the desert what I wanted it to be.

We met our group in the little town of Ocotillo, then headed north a short distance into Anza-Borrego Desert State Park. Turning left off the paved county road, we drove on a jeep track up a long, sloping bajada to the base of the Jacumba Mountains, offshoots of the Peninsular Range. The desert floor here was all sand dotted with creosote, brown shrubs loosely spaced. Later, we'd learn that the creosote kept its distance from other plants by secreting a poison from its roots. The steep mountain slopes were a jumble of granitic boulders and, higher up, pinyon and juniper. We camped right up against the mountains at a place named Dos Cabezas for the two house-sized boulders that sat up on the shoulder of the mountains, looking out on the desert like sentinels. Nearby, a mesquite grove grew around a piped spring feeding an old water trough used by cattlemen early in the century.

Looking back toward the main road, I was surprised at the elevation we'd gained. Running at the center of the valley, the road looked far away, and the Coyote Mountains rising on the other side seemed not much higher than we were. Our perspective had changed.

We set up camp, then set off on our first hike. Cal, the leader, warned us about the cactus, pointing out the particularly dangerous cholla, agave and ocotillo. The cholla grow in spiny balls that drop off and lie waiting to attach themselves to boots and pantlegs and flesh. Agave form clusters of stiff, dagger-like fronds radiating out from a single base, perfect for lancing a shin

or calf. The ocotillo also grow from a single base, long, whip-like stalks with sharp thorns at eye level.

It's hard to remember how strange plants like this looked when I first saw them. Now they seem as familiar as pine trees in the mountains or the chaparral along the coast of San Diego. But back then they must have seemed bizarre. This is how the ocean floor must look without the water, I remember thinking. The cacti and succulents seemed vaguely aquatic, grotesque. The first thing we learned was that some of these plants could be dangerous.

"In between looking down to avoid the cholla, and looking up to avoid the ocotillo, you won't be able to look at the view," warned Cal. "If you do want to look around, it's best to stand completely still." As one of my fellow students put it after being lanced several times, "The plants out here either stab you or grab you."

We began our hike, heading cross-country toward a notch in a ridge. At one point, Diane asked Cal if he knew the name of the little red flowers growing in a wash.

"Those are little red desert flowers," Cal replied. We wouldn't learn much natural history on this hike. The Cahuilla and Kumeyaay who lived in this desert had precise names and descriptions of the thousands of plants they used for food or medicine. The few plants they didn't use were lumped in the category of useless plants. We modern hikers have a different taxonomy. We learn the names of the more dangerous plants first, as a matter of necessity. It's much quicker to warn someone, "Watch out for that agave!" than to have to stumble for a name. Precision has practical consequences. In the years since then, I've had to force myself to learn to identify the plants that didn't press themselves on my attention.

If we didn't learn much natural history on that trip, other kinds of history were more apparent. Our goal for the hike was a place called Indian Hill. People lived here for thousands of years, the archaeologists say. On the way, we passed more recent human habitations. One was a cattleman's line shack, probably built in the 1890s. Tucked away in a little draw, it was barely visible from the wash below. Its wooden beams had fallen in and the dirt floor was covered with cholla balls. Slowly, the desert had begun to absorb the building, making it a part of the landscape.

Further on, we came to a railway camp, built to service the construction of the San Diego & Arizona Eastern railway in the teens. The camp perched on a sandy slope out in the open. Bits of machinery and rusted, five-gallon nail cans lay about, and the shack itself was made from these cans cut lengthwise. A couple of posts stood out away from the shack, an iron bar suspended between them. One of our group used it to do pull-ups. Even out in the open, and as out of place as this machinery was, the camp seemed to fit in with the desert, almost as if it had grown up out of the granite soil. A row of hills rising to the north matched the color of this debris.

This wasn't raw nature we were seeing, but nature worked on by people. We had driven across the San Diego & Arizona Eastern tracks on our way in, and our entire hike was circumscribed by a loop the railroad made as it came down out of the Jacumba Mountains. In its day, the railroad was an engineering marvel, negotiating the deep chasm of Carrizo Gorge as it made its way out of the Jacumba Mountains and onto the desert floor. The bridge across Goat Canyon is the longest curving wooden trestle in the world, a big deal in its day, the cutting edge of technology. At one time, this place was an interface between industry and the natural world. Now, 75 years later, that

interface seems porous, the technology has blended with the desert in unexpected ways.

At Indian Hill, we saw evidence of a much older culture, one that left fewer marks on the land. By now, whatever marks the Kumeyaay made here have mostly been absorbed into the desert, or stolen by amateur archaeologists. There are a few morteros — grinding holes — in a flat rock. A low overhang is blackened by centuries of fire. But the reason people visit Indian Hill is the pictographs. A wall of about 6' by 4' is covered with yellow and rust-colored markings. There are no human or animal figures here, just many strange designs.

I've been to this spot several times now, and I've watched the puzzled expressions of people seeing it for the first time, the surprised "Huh!" Then they turn their gaze out into the desert, as if looking for the object those designs represent. I feel the same way every time I see them. We expect some message from the past, a picture that would show us what life was like for these people, and perhaps illuminate our own. We expect representation, and we get abstract art. Where we expect meaning, there are only symbols that mean nothing to us. Who knows if they meant anything even to the Kumeyaay? Even anthropologists can't agree on the purpose of much of this rock art.

On that day, I learned that the desert isn't just a place to get away from civilization, but a place where various cultures have left their marks. In this spot, at least, I couldn't pretend I was the first one here. Instead, I had to see it as a place where people had made their homes, some permanently and others only temporarily. That, in the end, is as interesting as seeing nature "unmarked by the hand of man."

The next morning, I walked down the jeep road just before sunrise. Birds, probably bush tits, flitted about in the creosote as I walked. Except for an occasional twitter from them, silence reigned. There was no wind now, no insects buzzing, no frogs croaking. It had been a long time since I'd heard that intense quiet. Coming from the city, with its constant, monotonous background hum, this was a balm.

Somewhere out in the distance was the paved road, but I couldn't make it out in the glare of dawn. Across the valley, the sun caught the peaks of the Coyote Mountains. The canyons cutting into the mountains' flanks were still shadowed, dark, mysterious. I wondered where those canyons led, how it was up in the heart of the mountains. The Jacumba Mountains rising behind me looked barren from a distance, yet now I knew they contained springs with mesquite and native palm trees. Did the mountains across the way hold equal surprises? They seemed intriguing to me now, even inviting.

This is what I've come to love about the desert: this friction between its harsh, barren face and the pockets of life, even lushness you sometimes find. Exploring the desert, I walk that line between hot and cool, the harsh and the tender, the barren and the plentiful. I can sit at the edge of a pool, in the shade of a native palm, and look out across miles of sun-scorched rock and sand. If I choose, I can walk out there, savor that emptiness.

Later, I would realize the drawbacks to this sublimity of emptiness I found so attractive. It's a way of depopulating the desert, of ignoring what's there and what was there a hundred or a thousand years ago. But for years, that search for the sublime, even just for an expansive view, kept me going back.

DEEP TIME: UNZIPPING CALIFORNIA

I'm standing on a nameless peak at the southern edge of Anza-Borrego Desert State Park. It's part of a range bearing the name Coyote Mountains, but it seems more like a hill compared to the 5,000-foot wall of the Laguna Mountains rising west of here. The particular bump where I'm standing is only 1,600 feet above sea level, and rises only 500 feet above the surrounding plains. Despite the hill's diminutive height, I can pick out every peak in the park from this spot, and to the south I can see far into Mexico.

Even for this desert, this is a particularly barren spot. The swales between peaks support a few whip-like ocotillo and fuzzy-spined cholla, but on the peaks, nothing much grows. There's no water up here, so I carry a two-days' supply — about 15 pounds — in addition to my regular camping gear. It's hard to say exactly what draws me to places like this, so I always have to have an excuse. Today, my excuse is geology.

From this vantage, it's easy to drift back in time. The only visible sign of a human presence is a horizontal line of a jeep road tracing across a mountain slope a couple of miles away. Distance blurs other evidence of the 20th century, like the irrigated farmland in the Imperial Valley, 30 miles east of here. In the foreground, the Carrizo Badlands look prehistoric. The badlands are a jumble of water-sculpted mud hills that look like pieces of layer cake, dark toward the bottom, light pink and white at the top. Except for the ribbon of green down at Carrizo Marsh, this could be a landscape from a time before plants roamed the earth. Or it could be the floor of the ocean,

which is what it was, five million years ago. Back then I would have needed diving gear to get to where I'm standing now.

More immediate evidence of the marine history of this desert lies at my feet. This sloping, crumbling sandstone hilltop is covered in fossilized seashells, sand dollars mostly. The fossils are fragile — many have broken out of the loose sandstone where they've lain embedded for eons, and now lie strewn in fragments across the slope. I pick up the loose ones, taking care not to break them as I inspect the delicate fluting of the shells' imprints.

Think in deep time. That's the lesson of standing on an ancient sea-bed at 1,500 feet elevation. Keep in mind the malleability — the unpredictability — of this landscape. What I see here today might not be what was here even a thousand years ago, let alone a million. Thinking in geologic time is the only way to begin to understand this place.

The Indians who lived here knew this. They even had a word that embodied the fact that the land was constantly remaking itself, often cataclysmically. *?iva?al* was the power source behind the entire universe, one that was “quixotic” and therefore unpredictable. Lowell John Bean, a historian of the Cahuilla, says this concept conveyed the “all-pervasive and intense feeling of apprehension of the Cahuilla toward the present and future.” Their stories are filled with earth-shakers, like Tamaioit, one of the two original beings who created the earth and still lives in it, shaking it out of anger at his brother. Their stories tell of streams changing course or becoming intermittent, of springs going dry. Four hundred years after Lake Cahuilla evaporated, the Cahuilla were still telling of the time when their grandfathers were fishermen. Keeping this unpredictability in mind, they stayed mobile and adaptable — though they had permanent villages, they could easily

rebuild in a new place when an earthquake or a flood wiped out their homes. And they didn't accumulate a lot of things that could be lost: when a person died, the family burned the deceased's hut and possessions to the ground.

That we moderns tend to see the landscape as fixed is evident from our shock at each new earthquake, mudslide or firestorm. Everyone wants a house on a hilltop in the midst of a thicket of native shrubs. Sometimes those show houses even have shake roofs. I look at those places and think, *nice view if you can afford the fire insurance*. We have a lot of faith in fire departments and the engineers who say we can build houses on steep slopes. The stands of chaparral are so dense it seems there has never been fire here. The hillsides look stable enough when it's dry — which it is, most of the time. We know this is earthquake country, mudslide country, fire country, but our actions continue to flout this reality.

Out in the valley east of where I'm standing now, flouting reality has become a specialty. Irrigated with Colorado River water, the Imperial Valley's green fields deny that this is a desert. The buildup of selenium in the fields and in the Salton Sea are the price of that denial. Further south, lost in the haze, is the town of Calexico, where another remarkable example of this denial stands. The new jail in that town rests square on top of the San Andreas Fault. The engineers assured the Sheriff and the townspeople that this was a suitable building site, but it is composed of such unconsolidated material that the construction crew couldn't find a solid footing. When the big earthquake comes, we'll have a new definition for the term "jailbreak."

If they should survive the earthquake and escape the jail, the inmates might not get very far without surfboards. Calexico, you see, lies nearly a hundred feet below sea level. The only thing separating Calexico and the rest

of the Imperial Valley from the placid waters of the Gulf of California is a 40-foot-high natural dam, composed of unconsolidated sand deposited here by the Colorado River. When the big one comes, that dam could break and the sea could rush in to fill the basin it once occupied.

That basin and these mountains are like opposite ends of a see-saw. Once, about five million years ago, the see-saw was level. The rock down in that trench, stretching 60 miles from just south of the border up beyond Palm Springs, and the rock of the Laguna Mountains lay at one elevation. Now, this end of the see-saw has tipped upwards. The Laguna Mountains west of here form the raised end of that see-saw. Here in the Coyote Mountains, I'm standing closer to the pivot point. Calexico is near the opposite end, sunk down in the trench known as the Salton Trough. If you could somehow remove the millions of years worth of sand deposited here when the Colorado River carved the Grand Canyon, the end of that see-saw would rest 20,000 feet below sea level. It's enough to give me a case of vertigo.

Today, these mountains are still rising, and that trench is still sinking and spreading, making it one of the most tectonically active areas in the world. The story of how this landscape was shaped, and is still being shaped, is filled with volcanoes erupting, tectonic plates colliding, rock twisting into fantastic shapes, and mountain blocks tilting and sliding like dominoes. It features not one, but two types of faulting. And, in the end, it explains why this place is a desert and not a tropical jungle lying at a low elevation. It explains why the peoples who have lived here — until recently at least — have had to rely on sophisticated ecological adaptations to an arid, hot environment.

The first significant event in this story took place not five million but a *hundred* million years ago: the creation of massive amounts of granitic bedrock beneath the earth's surface. By massive I mean blocks of rock the size of mountain ranges, strung together in a chain that forms the Peninsular Range, running nearly a thousand miles from Mt. San Jacinto to the tip of Baja California. This massive block of granitic rock is known as the Peninsular Batholith, and it dominates the landscape in more ways than one. There is older rock in Anza-Borrego, some of it laid down 500 million years ago on the bed of the Pacific Ocean. Not much of that ancient rock remains. You can see stripes of it in the Santa Rosa and San Ysidro Mountains, but it's the granitic rock that makes itself felt in the shape of the land.

Like just about everything else in the geology of California, this granitic bedrock was formed by the forces of plate tectonics. 105 million years ago, one large chunk of the earth's crust, the westward-moving North American plate, collided with the eastward-moving Farallon plate. The North American won the battle, riding over the Farallon and driving it deep below the surface of the earth. The pressure heated the sedimentary rock of the Farallon plate until it became molten and welled up underneath the rock of the North American plate. The intruding magma didn't form mountains yet, but cooled slowly underground, crystallizing into hard, granitic rock. Had it burst through the surface of the earth and cooled rapidly, there might be no mountains here at all: rapidly cooled lava erodes more quickly than hard granite.

To think of any of this happening in its present location is a little misleading. It's like driving from Mexico City to San Diego and saying you're still in the same place — in the driver's seat. These rocks may occupy generally the same position relative to the rest of Anza-Borrego's landscape, but that whole landscape has careened northwest like a bumper car at a county fair. The Peninsular Batholith started its journey hundreds of miles southeast, in the tropics. That explains why the first mountain range the batholith formed, about 70 million years ago, had such a short life. As the same plate tectonic forces that created the batholith pushed it upward, 50 inches of tropical rain a year wore the new mountains down. By 53 million years ago, southwestern California was a level plain, with rivers running all the way from the mountains of Sonora, Mexico, to the coast. Fortunately for today's mountain climbers and skiers, that period of erosion wiped away only a portion of the granitic batholith. Beneath the earth's surface, thousands of feet of solid bedrock lay waiting for another mountain building episode.

That episode began about 7.5 million years ago, when Baja California began splitting away from the mainland. This time, though, the mountain building process was more complex than two plates crashing into each other. The North American plate continued riding westward and collided with an area known as the East Pacific Rise. Here, the spreading of the sea floor thinned the earth's crust enough to allow molten rock to break through and create new sea floor. Overriding this hot spot, the western edge of the North American plate began to break apart. Baja California separated from the mainland and rotated westward, attaching itself to the Pacific Plate. At about the same time, the Pacific Plate began moving northwest, grinding laterally against the North American Plate. The line between those two plates is the

San Andreas Fault, which runs from the Gulf of California nearly to San Francisco Bay. The result is that Baja and southwestern California are moving closer to San Francisco by about two inches each year.

Two kinds of plate motion occurred here, and continue to occur, simultaneously: the divergent or spreading plate motion that created the Gulf of California and the Salton Trough, and the transform or lateral plate motion of the San Andreas Fault that has caused the major earthquakes in California. As Baja pulled away from the Mexican landmass, the land in between sank underneath the level of the sea. By about four million years ago, this sinking and spreading had reached the area of present-day Palm Springs. Blocks of the eastern portion of the Peninsular Batholith plunged into the depression known as the Salton Trough. What was once a level plain now became a deep trench reaching up through southeastern California. The Gulf of California extended into this gash, depositing the seashells and marine sediments visible today in the Coyote Mountains and the badlands of Anza-Borrego.

As the Salton Trough continued to spread and the Peninsula continued to rotate westward, the granitic bedrock on the western edge of the trough began to rise. The eastern end of the see-saw had tipped down into the trough; now, about 1-2 million years ago, the western end rose nearly to its present height. As it rose, the bedrock simultaneously tipped downward toward the west, creating the characteristic gentle western slopes and steep eastern plunge of the mountains. Great chunks of the batholith broke away and slid down those eastern slopes toward the trough, creating the stair-step effect of the Coyote, Vallecito and Fish Creek Mountains. The block that slid the farthest

east formed the Superstition Mountains, low hills barely poking above the sand that will one day drown them.

Around this time, changes were taking place in the Salton Trough, too. For millennia, the Colorado River had been carving down into the rising Colorado Plateau. Think of the vast trench of the Grand Canyon; now think where all that excavated sediment went — enough rock and gravel and sand to build mountains, a whole upside down mountain range, carried by the Colorado River to its delta on the Gulf of California. As the Salton Trough sank as much as 20,000 feet, the Colorado dumped enough sand and silt to nearly keep up with the sinking. Two million years ago, at a point just south of today's boundary between Mexico and the U.S., the river did keep up with the sinking, building a bar of sand and silt 40 feet above sea level and 30 miles wide. This sand bar cut off the northern arm of the Gulf, creating an inland sea. When this inland sea evaporated, it exposed three million years worth of marine sediments.

After creating this dam across the Gulf, the Colorado exhibited a fickle nature. Sometimes it ran south of the dam and into the Gulf; at other times it turned northward into the dry Salton Trough, forming vast freshwater lakes. The lakes crested at an elevation of 40 feet, when they spilled over the delta dam and back into the Gulf. These lakes, collectively known as Lake Cahuilla could last for hundreds of years until the Colorado shifted its course once again, leaving the Salton Trough to return to a dry basin 275 feet below sea level. Since the Colorado River played such a large part in the creation of this desert, creating the dam that makes it dry land instead of a sea-bottom, the horseshoe-shaped area around the head of the Gulf, and including Anza-Borrego, has been named the Colorado Desert.

Today, the power of the Colorado to change the landscape has been tamed, but tectonic forces continue to shape the region. The Peninsular Range continues to rise and the Salton Trough continues to sink. Earthquake “swarms” plague the Imperial Valley, greater threats than the swarms of killer bees that seem to have stopped their westward migration at the Colorado River. Baja and southwestern California keep moving north, and the Gulf continues to widen. One day, the floor of the Gulf will spread and sink enough to breach the delta dam. In geological time, that day isn’t far off at all. The waters of the Gulf will once again claim its northern extension in the Salton Trough. No engineering fix can stop such forces. The people of the Imperial Valley can only hope that the inevitable breach, so close in geological time, remains far off on the human time-scale.

By the end of the last ice age, roughly 12,000 years ago, the landscape of Anza-Borrego and the Colorado Desert looked much like the landscape I see today: The Peninsular Ranges rising to the west, desert plains sloping to the Salton Trough in the east, rugged badlands and isolated peaks causing a momentary interruption in that eastward drainage. With the retreat of the glaciers that had pushed into the middle of the continent, the climate also began to resemble the conditions of today: a Mediterranean climate on the coast and western foothills, temperate conditions in the highest mountains, and a dry, hot climate in the desert. The mountains rake moisture from Pacific storms, casting a rainshadow on the desert. They can get 30 inches of rain in a year, and the elevations above 8,000 feet often hold snow into May and sometimes

June. The desert just east of the mountains, in the Coachella, Borrego and Imperial Valleys, gets as little as three inches of rain a year. Out on the creosote flats below sea level lies some of the hottest and driest desert anywhere in North America.

Yet the mountains also act as storehouses of moisture. Right at the edge of the desert, a kind of paradise springs up where year-round streams bring water out of the mountains, or where faults allow water to spring from underground. These are the oases where the fan palm grows, as well as cottonwood, willow, alder, mesquite, cattails, reeds and bulrushes. Birds come to feast on the berries and seeds, roost and nest in the branches, while bighorn sheep and mule deer browse on grass and leaves. Before the last of them were killed in the 1940s, desert pronghorn roamed these canyons and plains.

But there is another kind of abundance on this desert margin, separate from the streams and oases. The dramatic rise of the Peninsular Range from the desert floor creates a variety of ecological life-zones from lower Sonoran to Canadian-Hudsonian. One can, in terms of plant communities, travel from the sub-tropics nearly to the Arctic Circle in a matter of miles. Each of these life-zones contains a number of different habitats and plant associations, depending on type of soil, angle of slope in relation to the sun, and supply of water. Today this variety in flora and topography attracts hundreds of thousands of visitors to Anza-Borrego each year. Hundreds of years ago, it made life possible for the Indians of the desert and foothills.

The Lower Sonoran is probably what most people think of when they think desert: a land of sand and dry washes, coyotes and road runners, and a flora that could have come from the mind of Salvador Dali. Where it is flat — and generally at elevations below 1,000 feet — the Lower Sonoran zone is

dominated by the drab, brown to olive-green creosote bush and a small sage, the white bur sage. This is the monotonous desert one sees driving the interstate highways through much of western Arizona and southeastern California. It's also the kind of desert I passed through to reach these mountains. Temperatures here stay over a hundred degrees throughout the summer, and the thought of moisture is like a faded memory.

But there are pockets of abundance even in this hot corner of the country. The Colorado River runs — or these days, stagnates — through the eastern margin of the Colorado desert, separating California from Arizona. Closer to the Peninsular Range, runoff from the mountains extends underground far out into the desert, sometimes welling up in marshes and springs supporting stands of mesquite. From my hilltop, I can see one of these oases, the green ribbon of mesquite and tamarisk five miles away at Carrizo Marsh. At higher elevations, where the alluvial fans begin sloping up toward the mountains, other plant forms take over, taking advantage of the courser soils and increased moisture: the cacti — cholla, barrel, and beavertail; the succulents — agave and many varieties of yucca; the sub-trees: palo verde, mesquite, catclaw, desert apricot; other shrubs: Mormon tea and brittlebush, which turns desert slopes yellow with flowers in spring.

Moving up into the mountains, juniper appear. The pinyon pine begin a little higher, usually around 5,000 feet. This pinyon-juniper association is characteristic of the Upper Sonoran zone. Manzanita and scrub oak also grow here, and other shrubby chaparral varieties like chamise and ceanothus. Boulders seem to grow here, too, some as large as houses. They've fractured away from the granite bedrock that forms these mountains, and they're just beginning their journey down into the desert flats. By the time they get that

far, they will have eroded into fine sand. But up here, they create welcome shade on a hot day, a micro-topography to match the macro-topography of the mountains.

Further west and higher still is the crest of the Peninsular Range. Because these summits are the first to receive moisture from Pacific storms, they support different plant associations than summits of equal height further east. An elevation of 4,500 feet in the Cuyamaca Mountains can support lush meadows and oak forests. A little higher, and especially on north-facing slopes, there are forests of Douglas fir, and Jeffrey and sugar pine. These forests are remnants from the last ice age, when the climate of southern California was both wetter and cooler. As the glaciers receded, more drought-tolerant plants took over the lower elevations, but the mountain forests persisted. Even during the hottest Santa Ana winds, these mountains remain cool — the air rising rapidly from the desert floor is super-cooled to a comfortable 70 degrees.

Moving north up the spine of the Peninsular Ranges, elevations increase. The San Jacinto Mountains at the northern end of the range push up into the Canadian-Hudsonian zone, above 8,000 feet. As the name suggests, this life-zone has more in common with the Boreal forests of the far north. Oaks have disappeared by this point, leaving the high elevations to evergreens like lodgepole pine. There are a few meadows here around 8,000 feet, but nearer the summits it's mostly rocks and trees and sky. The soil is coarse granitic sand, sometimes covered with a layer of forest duff where the trees grow dense. Where water is abundant, ferns and a kind of heather grow. Summer temperatures rarely push above the mid-seventies, while winter can bring heavy snow.

Here is the variety for which Southern California is famous. Vacationers can stand in winter sun in Palm Springs and stare up at the cloud-covered peaks of the San Jacintos as they receive a dusting of snow. The clouds just disappear as they pour over that crest, evaporating as they hit the dry desert air. This is the rainshadow effect at work. After finishing their round of golf, the vacationers can travel a couple of hours up the palms-to-pines highway and throw snowballs at each other. Or they can ride the Palm Springs Aerial Tramway, and stand in that snow in a matter of minutes. While the region's diversity of landscapes and plant life made it possible for Indians to live here in the past, today it's one of the things that has made southern California too popular for its own good. People move here to escape the harsh winters of the midwest or east. If they begin to miss the seasons, they can just take a daytrip up into the mountains.

About the time that the glaciers receded and the modern, arid climate developed, the first people entered and settled in southern California. People may have arrived even earlier than this, as much as 20 or even 40 thousand years ago. Those earlier dates are based on radiocarbon dating of human remains, and archaeologists are divided over the accuracy of this method. The earliest they can agree on humans entering this landscape is around 10 or 12 thousand years ago.

By about two thousand years ago, two distinct groups of Indians occupied this desert. The Cahuilla lived in the northern portion of what is now the park, from the Borrego Valley up through Coyote Canyon and Rockhouse

Valley. Their territory extended northward to include the Santa Rosa and San Jacinto Mountains and San Gorgonio Pass, westward to the San Jacinto Plain, and eastward to the Coachella Valley. South of them lived the Kumeyaay, separated by mountains, desert, and a language as different from Cahuilla as German is from English. Previously known as Diegueño, these loosely affiliated bands extended from the coast at San Diego (thus their Spanish name) eastward nearly to the Colorado River, and from a northern limit roughly marked by modern Highway 78 down into Baja California.

At some point midway into their occupation, probably around 900 or 1,000 A.D., the final formation of Lake Cahuilla provided desert dwelling Cahuilla and Kumeyaay with an ample source of food. The lake teemed with fish, and it was a stop-off on the Pacific flyway for geese, ducks, cormorants and grebes. Around its edges grew reeds, willows, cottonwoods and palms — good habitat for game. The Indians probably had permanent villages around the shore of the lake, the Cahuilla around the northern end, the Kumeyaay at the southern. The Cahuilla alone numbered around 10,000 souls during this period, giving them a population density of 4 persons per square mile. They built stone fish traps to catch fish with the rise and fall of lake tides. With the Santa Rosa mountains nearby, they probably ventured into the canyons and up the slopes to supplement their diet with agave and other plant foods. The living must have been relatively easy. I imagine this half-millennia as a kind of paradise.

Then the lake began to evaporate. The Colorado shifted its course back to the Gulf, and the lake's source of fresh water disappeared. The water receded gradually. The Indians probably noticed the change immediately, saw wetlands going dry, trees dying. The Kumeyaay, living around the inlet

streams where the New River is today, must have noticed the dry riverbed and predicted the outcome. No wonder they viewed the universe as unpredictable. How must it have felt to watch the source of their subsistence evaporating? In 60 years, the lake had vanished.

Long before that, the wetlands and the shorelife around the lake's original margin would have died. The people would have continued fishing for a few more years, but at some point increasing salinity wiped out the aquatic animals. Cahuilla legend has it that the people fled the coyotes and predators coming down to feast on dead and dying fish. Eventually, the Cahuilla moved up into the mountains, making their homes around springs and streams. Deprived of the lake's bounty, the population of the Cahuilla shrank to an estimated 6,000. On the lake's south shore, the Kumeyaay retreated to New River, to the Colorado, and westward to the Laguna Mountains.

Later, the Indians moved back to reinhabit the Coachella Valley as mesquite colonized the dry lakebed. In Cahuilla stories, coyote is revered, because he brought the mesquite seed down from the mountains. This is probably a literal version of events, since coyotes are known to feed on the mesquite bean, and the seed is not digested. Soon the lake was filled with a sea of mesquite, providing the people with a high-energy food in the form of seed pods. After that, the Cahuilla held the coyote sacred and never killed him. Around 1700 A.D., and only 74 years before their first contact with the Spanish, new villages were settled. When the first Spanish came through in 1772, these peoples were in a state of flux, continually adapting to a changing environment and evolving as a culture.

GARDENS IN THE WILDERNESS

It's the first day of June and I'm hiking up Borrego Palm Canyon toward a grove of California fan palms. The little thermometer dangling from my backpack reads 100 degrees. Up on the canyon's west-facing slopes, boulders the size of boxcars bake in the sun, radiating heat. My brain feels like it's baking, too. I can't wait to get into the shade of the palms, and take a dip in the natural pool in the heart of the grove. Up ahead, about a quarter-mile away, I can see the green palms against tan rock.

As hot as it is, it feels good to be outside. It's four o'clock, and I've spent the day indoors, reading archaeological reports and old journals in the library at Anza-Borrego Desert State Park, 60 miles northeast of San Diego. Now, I want to stop for a swim and wait for the sun to disappear behind the mountains to the west. Then I'll hike further up-canyon to bed down for the night — cheaper lodgings than either a hotel in town or the public campground at the mouth of this canyon.

I reach the first palm trees and feel welcome relief as I step into their shade. It must be twenty degrees cooler here. The palms grow thick on both sides of the little creek. The younger palms sport tan skirts of dry fronds, making them look like high-rise grass huts. The older trees have bare trunks, blackened by fire. A slight breeze is blowing, making the fronds rustle like shredded paper.

Rounding a boulder, I find the pool I've been dreaming about for an hour. It's filled with teenagers. It's a small pond, about the size of a

stand-alone backyard swimming pool, and eight rowdy teens make the place feel cramped. They splash in the water, shouting and laughing as they dunk each other under a waterfall. Someone's mom sits at the pool's edge, smoking a cigarette, ignoring them.

I drop my pack and sit down on a rock. Even after hiking only a mile, the heat has made me feel light-headed. I'll just sit here and wait my turn. But it's hard not to resent this crowd. When I come to the desert, I want to get away from people and every sign of their presence. I usually avoid busy places like this, only a mile from the visitor center and the most popular spot in the park. It's hard to remind myself that I'm really here for a cheap place to sleep, not for a wilderness experience.

Signs all around tell me this is a natural area, one that should be treated with environmentally-correct, "leave only footprints, take only memories" behavior. At the edge of the creek is a barricade made from downed palm trunks, and a sign warning visitors not to cross it — too many people tramping around among the palms compact the ground and make life difficult for the trees. Beyond the barricade, dry, fallen palm fronds cover the ground. Another sign explains the blackened trunks on some of the trees: "This fire was set by careless individuals."

While some careless individual may have set a fire here in the last century, a book I came across in the library tells a different story. In *Gathering the Desert*, Gary Nabhan says that these groves were burned frequently by the Cahuilla Indians who lived in this desert for thousands of years. Burning cleared out the old, dry fronds, leaving the fire-resistant trunks unscathed. Desert writer Randall Henderson suggested that the Indians torched the palms to drive away evil spirits. Chief Francisco Patencio of the Palm Springs

Cahuilla found this explanation ludicrous. They burned the palms to increase the date yield. It's basic fire ecology — burning returns nutrients to the soil, prompting new growth. And since the accumulated litter of palm fronds made good cover for rats, burning it was just good housekeeping. Burning also killed red spider mites and date scale, both of which reduced the date harvest. After years of research, the USDA rediscovered this technique in the 1930s and recommended it to date farmers.

Besides burning the palms, the Cahuilla may also have planted them. In doing so, they may have extended the range of the fan palm beyond its "natural" boundaries. While coyotes can also disperse palm seeds after eating the dates, some palm groves are so remote from their nearest neighbors that they must have been planted by humans. Chief Patencio tells a tale of humans spreading palm trees in *Stories and Legends of the Palm Springs Indians*. In that story, a man became a palm tree to benefit his people. "The people carried the seed to their homes, and palm trees grew from this seed in many places. The palm trees in every place came from this first palm tree."

The Cahuilla were still carrying the seed around in historical times. One account tells of a grove planted in the 1890s, high on Mt. San Jacinto. Near some groves, the Cahuilla built villages, using the palm fronds for thatching on their houses and ceremonial buildings. They channeled stream water to garden patches, or impounded it to create bathing ponds.

All of these manipulations seemed to be good for the palms, and for the Cahuilla. But once Americans took over these lands just before the turn of the century, the numbers of palm trees began to decline. No one planted palm seeds or burned the groves. Our idea of preserving a place was to put a boundary around it and not touch it. James Cornett of the Palm Springs

Desert Museum believes this decline continued until 1945, when, ironically, a fire regime returned to the desert with more people settling in and visiting the region — the “careless individuals” referred to on the sign here in Borrego Palm Canyon.

Now, the descendants of the Anza-Borrego Cahuilla live in cities or on the reservations in the mountains west of here, and we view these partly man-made oases as natural recreation areas. I’m not sure whether the Cahuilla planted this particular grove or not. But the idea that they manipulated it for their own ends screws up my notion of this desert as a place where man is a visitor but does not remain. I’ve always viewed these trees, especially those that hadn’t been burned, as the true wild palms of California. Unlike the glitzy imports lining the streets of Beverly Hills, these natives seemed to exist for their own sake. I would hike for hours to find a remote, untouched grove and think I was having a wilderness experience. Yet the scene I have before me right now — kids splashing in the water, enjoying the relief from the surrounding heat — probably has a lot more in common with what this place was like 500 years ago than does my view of the desert as a vast emptiness.

The Cahuilla’s conception of this place was far different, even into modern times. In 1943, Chief Patencio put it this way: “All the wild and lonely places, the mountain springs are called now. They were not lonely or wild places in the past days...no. Sometimes an Indian goes back into the mountains to a spring of water. There he visits, alone, the home of his ancestors.” In our modern, crowded world, we’re liable to long for that solitude. But for him, the word “alone” must have been a lament. Escaping from society — lighting out for territory, one of our culture’s most cherished

dreams — wasn't a possibility or a desire for Patencio. Every place in this landscape was part of his people's history, from the creation time to the present. Even the sacred places, where only the *puvulam* — what we would call shamans — could go, had stories. This place was simply home.

At last the teenagers leave and I have the grove to myself. I wade into the cold water and plunge my head under. Then I climb out onto a smooth boulder and feel the chill of water evaporating from my skin. Suddenly, the place does feel empty, lonely. Now I have the solitude I've been looking for.

I try to imagine how this place might have looked a century and a half ago: the women grinding hard date pits in stone morteros, the men getting ready for a hunt or an agave roast. But this kind of imagining only makes the place feel more lonely. The fences and the signs warning me not to touch make me feel like an outsider. Across the fence where I'm not supposed to walk, the creek bank is covered with the trash of fallen palm fronds. And the date scale and spider mites are back, ruining the date crop.

This place hasn't been a wilderness for thousands of years. A hundred years ago it was someone's garden. Now it's a garden gone to seed.

THE PRISTINE MYTH

If you watched television in the 1970s, you saw the anti-pollution commercial featuring Iron Eyes Cody. Against a backdrop of factories billowing smoke, and dressed in full Indian war bonnet, Cody turns to the camera, revealing a tear running down his cheek. The artificiality of that tear — really a drop of glycerin — was only the beginning of the hokum in that image. But it was a contrivance based on a prevalent myth in our culture, one that has been especially important to the environmental movement: the Indian as “first ecologist.”

The persistence of this myth was evident again at the 1996 Academy Awards, when the composer of the theme from “Pocahontas” thanked Chief Seattle, whose famous speech had inspired him. Chief Seattle, of the Coast Salish, did give a speech at a treaty signing in 1855. It was written down twenty years later from memory by a white man who had heard the speech. But it wasn’t this faulty and little-known version the composer was citing. The famous Chief Seattle speech, the one that became a popular children’s book, the one that makes the worldwide rounds of the Internet, was written by a Hollywood screenwriter for a film in the early 1970s. Though it contains many historical inaccuracies — the “Chief” speaks of seeing buffalo, which never lived anywhere near Puget Sound, and of the railroad, which didn’t make it to the Northwest in Seattle’s lifetime — the message of the speech obviously answers some deep need on the part of Euro-Americans.

The message of the first-ecologist myth goes something like this: Life in North America before Europeans was one big low-impact camping trip. The natives were children of the earth living in harmony with Nature, changing the continent so little that when the white man got here, it was a pristine landscape. As soon as Europeans arrived everything went directly to hell.

Like any stereotype, this one contains a kernel of truth. Native Americans by necessity had a deep familiarity with their local flora and fauna and the relationships between them. This is a kind of ecological knowledge, and its loss is one of the tragedies of the European conquest of the Americas. And though the Indians did change the environment around them, they didn't have nearly the impacts we have had in the last 150 years. But in the first-ecologist myth, Indians didn't just have limited impacts on the landscape, they didn't change it in any appreciable way. This is part of a larger myth of pre-Columbian America as a second Eden in which Indians lived with the innocence of Adam and Eve. Europeans were the snakes in this New World Garden, which was lost in a swift second Fall from Grace. This myth tells us very little about actual Native American cultures, but it says a lot about what we Euro-Americans need them to be: a virtuous, environmentally aware people whose image we can use to flagellate ourselves for what we've done to them and to the continent.

It also tells us a lot about what we need *nature* to be. For a large portion of the environmental movement, the only nature worth saving is the capital-N variety, Nature "untouched by the hand of man," as the saying goes. This is the kind of nature people had in mind in preserving wilderness areas. This is the nature that Kirkpatrick Sale, in *Conquest of Paradise*, says existed in America before 1492. It's also the nature whose demise Bill McKibben laments

in *The End of Nature*. We've changed the climate of the planet so thoroughly, he says, that there is nowhere on earth that the "hand of man" hasn't touched. For McKibben, this is lamentable not just because of the negative impacts of climate change, but because Nature, as we Europeans have thought of it, no longer exists. This is not the death of a specific place, the end of a species or an ecosystem, but the death of an idea.

The reality is that the kind of untouched Nature McKibben mourns hasn't existed in the Americas since the arrival of the first people something over ten thousand years ago. If there ever was a time when this was an untrammelled wilderness, this was it. Like any people, the newly arrived hunters had impacts on the landscape — they made mistakes, overextended themselves and their resources, faced environmental catastrophes. If paleobiologist Paul Martin is right, they were partly responsible for the extinctions of the large mammals in North America between 10 and 12 thousand years ago. Even more recently certain Indian peoples may have brought environmental collapse upon themselves. Some researchers believe the Anasazi, the ancient people of the southwest, may have overrun the capacity of the area to sustain them. Pueblo ceremonies seem to be warnings about what *not* to do in order to avoid a similar environmental catastrophe.

For a cynic, untouched by current romances about Native Americans, little about this history might come as a surprise. What might be more surprising is the news that — in some places, at some times — Native Americans actually increased the diversity and health of the environments in which they lived. They weren't simple children of nature, but developed sophisticated ecological knowledge through centuries and millennia of trial and error. As an example, the Tohono O'odham (formerly known as the

Papago) of southern Arizona used irrigation ditches to irrigate the corn, beans and squash they grew. They practiced an intentional program of limited ditch maintenance. Spillage from the ditches created miniature wetlands that attracted a variety of birdlife. The diversity and bird-watching potential of the area was so great that in 1937 it was turned into Organ Pipe National Monument. Now the Indians have been removed, and the diversity of birdlife has plummeted. Maintaining a wetland for birds in what is “supposed” to be desert just isn’t natural.

This kind of history has shaken some of my long-cherished beliefs, just as the history of Anza-Borrego’s palm groves shook my belief that the palms were wild. What happens to the vision of an American Eden when we realize that America before the white man might not have fit this strict definition of Nature? Let’s say we’ve been defending a forest from clearcutting. We’ve used all the tried-and-true catchwords like “ancient,” “timeless,” “trackless,” and “pristine.” Then we find the forest isn’t really timeless but has a history: it’s only 150 years old, the product of fire suppression dating from the time of the first white settlers. Before that the local Indians burned the area for hundreds, even thousands of years, maintaining it as grassland. This burning had a genotypic influence on the grasses that grew in the prairie, affecting the way they evolved. What arguments can we use to save the forest now? This scenario is something akin to the dilemma the environmental movement presently faces. The debate over what to do now threatens to divide the movement against itself. Those who are calling attention to the implications of this environmental history, especially for wilderness preservation, are being labeled traitors to the cause.

Yet knowledge about what Native Americans actually did on the continent seems crucial, for two reasons. First, it might tell us something about the actual nature of the continent we modern Americans inhabit. This in turn forces us to question why we've chosen certain environments for protection. Why, for instance, do we spend so much effort protecting forests and so little in protecting grasslands? This predisposition has little to do with what is "natural" for a particular ecosystem and a lot to do with the images of dense forests we Euro-Americans brought from the Old World. And how do we decide what is natural, anyway, since both the grasslands and the forests of North America were heavily influenced by Indian patterns of burning? Anthropogenic — human-caused — fire kept the forests more open than they otherwise would have been; it kept the grasslands from becoming forests themselves. After thousands of years of this burning, is it "natural" for forests to grow into dense stands of trees that are susceptible to fire? Is it "natural" to let forests take over grasslands? These are thorny questions, ones not easily solved with slogans like "pristine" and "timeless." In the case of the hypothetical forest we're defending from the chainsaw, turning it back to prairie could be the most ecologically sound course of action, since grasslands in this country have been destroyed even more thoroughly than our forests.

The history of how Native Americans lived on the land is important for another reason: We may, after all, have something to learn from the way they inhabited this place, from the way they viewed it and themselves. The minute I say that, I'll be charged with romanticism. Any lessons we may extract from Indian ways of living seem to have little to do with modern America. We are too busy covering hillsides with housing tracts to think that what Native Americans did here hundreds of years ago has anything to teach

us. When there's a living to be made, holding up Indians as any sort of model seems nostalgic at best. But as great as the dangers of romanticism and sentimental nostalgia are, equal dangers lurk in ignoring the fact that Native Americans existed here at all, and still exist here in the present. And that seems to be what we as a culture have done for a long time. Charting a course between sentimentality and denial is dangerous, but necessary.

BUSHWHACKING WITH PEDRO FAGES

I'm struggling through a stand of chaparral in the Laguna Mountains, trying to follow the trail of Pedro Fages. Sharp, stiff branches of ceanothus and scrub oak clutch at my arms and legs as I push my way through the brush. Where the growth is too dense, I back up and look for a more open route. But sometimes branches from two bushes have grown together, and I have to unknit them by bashing through. Other times trying to move a stout branch is like trying to bend the leaf-springs from a car. The chaparral is head-high here. One branch snaps back and whips me across the neck.

I hate bushwhacking. But at least it's not April, when the ceanothus blooms and fills the air with a nauseating aroma that's something like very powerful Koolaid.

I'm about 50 yards off the Pacific Crest Trail, and I have about 50 more to reach the top of this small rise. This is the trail that Captain Pedro Fages took following deserters from San Diego in 1772, three years after the establishment of the first mission in California. His trek took him over the Cuyamaca and Laguna Mountains, down across the desert, then north through the San Joaquin Valley to San Luis Obispo. This made him the first white man to see and cross what would become known as the Anza-Borrego Desert. Later he would become the governor of California, but during this period he was the *comandante* of the "New Establishments" in California, including the missions. He had just had a row with Father Junípero Serra over the number of soldiers the new missions would need.

Local historians have made a lot of Fages' journey because it puts him in the Anza-Borrego area first, ahead of the more famous Juan Bautista de Anza, for whom this desert was named. Fages was also the first to traverse what became known as the Carrizo Corridor, an important segment of the Southern Emigrant Trail later used by '49ers and stagecoaches. The romance of this "discovery of the desert" is attractive. One author, Hero E. Rensch, traced the route and published evidence for it. In the guidebook I have with me, *Afoot and Afield in San Diego County*, Jerry Schad gives detailed directions for finding this spot.

I'm here because I want to see part of the trail Fages took. I want to imagine how it must have felt to see this land for the first time. Right now I'm wondering how the hell he got a horse through here at all. It must have been one bloody ride.

I work my way around the south side of the little hill, hoping the chaparral is more open than on the northern side. I crest the rise and get my first view of the desert. As many times as I've stood in these mountains looking down into the brown expanse, the exhilaration has never worn off. Cresting a rise like this, I always suck in my breath. It's almost like being punched in the stomach. Today, the horizon is obscured by haze, the Salton Sea barely visible — probably smog coming down through the San Geronio Pass from the L.A. basin.

I like to imagine it the way Fages may have seen it, the air crystal clear, his horse pulled up short at the sudden drop into the desert vastness. I wonder how he felt, after having climbed the gentle western slopes of the mountains, to find himself suddenly on this brink. Exhilarated the way I am? A little afraid, confronted with this barren country and the steep descent into

it? Or just pissed off by the thousands of square miles for the deserters to have lost themselves in? On such matters, his journal is mute.

I find an open, rocky area about twenty feet square on the summit's east side. This seems to be a tiny micro-environment, created by heat radiating from these rocks, or maybe by courser soil here. The plants seem to have migrated up from the desert — yucca, prickly pear, and another heat-loving flower, the reddish-orange Indian paintbrush. The slope of the mountains here isn't quite as steep as other places in the Lagunas. This hillside slopes down to a flat bench, and then drops down into Oriflamme Canyon which empties out into the desert at Mason Valley. On the far side of the bench, I can make out a bare strip of ground, a remnant of Fages' trail maybe. I can imagine it dropping down into the canyon where chaparral grades into yucca and cholla and barrel cactus and the going gets easier. But between here and the trail, the chaparral makes a solid carpet, denser even than on the west side where I came up.

Even today, the route Fages took onto the desert flats seems obvious. From here, the canyons and hills make a series of overlapping Vs. After striking Mason Valley, the way appears to be blocked by the mass of Whale Peak on the opposite side. But there's a clear route southeast connecting Mason Valley, Vallecito (Little Valley), and Carrizo Creek. The latter passes out through the gap between the Coyote and the Fish Creek Mountains, then turns north toward San Felipe Creek and the Salton Sea. Fages wound up on the shores of the lake, dry during those years, then headed back northwest through Coyote Canyon. The only tricky part of the route was right here, getting down into the desert.

The route must have been even more obvious to Fages. Before and after he traversed it, this was an Indian trail, possibly the major trade route known as the Yuma Trail. The Kumeyaay moved seasonally along this trail between the Cuyamaca Mountains and their wintering grounds in Mason Valley. Desert dwelling Kumeyaay may have come the same way as they moved up into the mountains for fall acorn gathering. And if it was a trade route, then traders from the Yuma on the Colorado and points east, as well as Kumeyaay from the coast, must have used it. With that much regular traffic, the trail probably looked like a highway.

Did Fages think of himself as an explorer here, “discovering” this country, or as just a guy following an Indian thoroughfare? His journal is unclear on whether he had an Indian guide at this point in his journey, but a passage from his “Historical, Political and Natural Description of California” is illuminating. Speaking of methods of communicating with Indians farther north in his journey, he says “they in like manner indicated to us the road, the watering places, and other matters concerning which we required information for our guidance on the march.” Fages hardly sounds like an intrepid explorer — more like a tourist asking directions.

There is one more difference between the slope before me and the place Fages saw. The whole chaparral-covered hillside was probably much more open because of burning by Indians. This could account for a passage so easy it merits little notice in Fages’ account of the trip. He was here in the fall, one of the times of year when the Indians intentionally set fires. The clear air and blue skies I imagine Fages enjoying could just as easily have been more smoke-filled than the smoggy air out over the Imperial Valley I see today.

Was he already so used to the burning that he didn't mention it in his journal?

The first thing the Spanish noticed when they arrived in San Diego was that the Indians burned the hell out of the place. That's why the first explorers called San Diego the "Bay of Smokes." Sailing past the bay on November 9, 1602, Vizcaino saw "so many columns of smoke on the mainland that at night it looked like a procession and in the daytime the sky was overcast."

After the missions were established, the soldiers and priests taking over California didn't find the fires quite so picturesque. On May 31, 1793, Governor Arrillaga called attention to "widespread damage which results to the public from the burning of the fields, customary up to now among both Christian and Gentile Indians in this country, whose childishness has been unduly tolerated."

Yet, just a year earlier, naturalist José Longinos Martinez seems to have found the burning reasonable. "In all of New California," he wrote in his natural history journal,

from Fronteras northward the gentiles have the custom of burning the brush, for two purposes: one, for hunting rabbits and hares...; second, so that with the first light rain or dew the shoots will come up which they call *pelillo* (little hair) and upon which they feed like cattle when the weather does not permit them to seek other foods.

Some facts do creep in here, amid the bigotry apparent in the comparison to cattle. Longinos' description of burning sounds a lot like modern fire ecology. Researchers believe the Indians burned the chaparral not only to flush rabbits, as Longinos seems to suggest, but to increase the abundance of game by encouraging the sprouting of annuals and other plants for browsing. The

Spanish did report great numbers of rabbits and deer, as did Americans on the Southern Emigrant Trail in 1848. Burning may also have made travel easier by keeping the country open, and it encouraged other plants the Indians depended on.

Some fire ecologists suggest that the Indians burned only patches of the chaparral to increase the number of ecotones (borders between different life zones) rather than wide areas. Anthropologist Florence Shipek goes further to suggest that the Indians burned most of the landscape, depending on the plants they wanted to encourage. A hillside could be burned on a 5- to 20-year cycle, and the Indians knew which cycle would promote which plants. This would have created a much more open, less densely vegetated landscape than the one we see today.

The extent of burning in the Anza-Borrego region is unclear. In places like the eastern slopes of the Lagunas where chaparral grows dense today, it's reasonable to assume that it was burned. But that only accounts for a fraction of the total landscape. Other life zones, such as the pinyon-juniper belt over on Whale Peak, were probably not burned because they didn't tolerate fire. But fire was used on mesquite to thin it, improve its yield of seed pods, and to kill back the parasitic desert mistletoe.

In a widely quoted paper in the *Annals of the Association of American Geographers*, Homer Aschmann suggests that as long as there has been chaparral in Southern California, people have been burning it. During the Wisconsin Ice Age, which ended about 10,000 years ago, the climate of Southern California was much wetter and cooler, supporting forests of pine and fir trees. When the glaciers receded, creating more arid conditions, the

drought-tolerant plants such as scrub oak, chamise, and ceanothus came to dominate slopes below 5,000 feet.

As the chaparral communities developed, the first humans, according to the current best estimates, moved into the area. These hunter-gatherers probably used fire the same way the Kumeyaay of more recent times did. If so, then for the entire time there has been chaparral in Southern California, people have burned it regularly. Some fire ecologists estimate that this pattern of burning doubled the frequency of naturally occurring fire. Burning could even have exerted an adaptive influence on the chaparral plant community. Thus, we can't look at the modern dense stands (known as climax stands in ecology) of chaparral as "natural" since they are a purely modern invention, based on our own belief in fire suppression. There is no primeval chaparral removed from human influence, at least not in Southern California.

I sit down on a rock in the chaparral opening to make some notes and try to picture the whole mountain slope looking this open, with a clear trail running down to the drop into Oriflamme Canyon. I can almost see the horses' tails disappearing over that edge, Fages' helmet glinting in the sun. Then I realize I'm not sure whether Fages wore a helmet at all. Maybe the Spanish army had taken up some other head gear by this point.

Not that it much matters anymore what he once wore. I can't make up my mind what I think about Fages. Was he a daring explorer facing an unknown, harsh land? Part of me wants to see his journey as a trip into the

unknown. This probably says a lot about the age I live in, when we know so much about every place on earth. The idea of encountering something unexpected and new is seductive.

Standing here today, looking down into that hazy brown desert, his route certainly looks forbidding. It's 75 degrees up here at 5,000 feet, and probably twenty degrees hotter than that down in the desert. At those temperatures, even sitting on a horse all day, the body needs at least a gallon of water a day to keep going. And there isn't much water between here and the Salton Sea. The "creeks" Fages' route follows are mostly dry, sandy washes, with two exceptions: Carrizo Marsh where Vallecito and Carrizo Creeks join, and San Felipe Marsh, nearly to the Salton Sea. There are springs here and there, if you know where to find them. Two sure sources of water in 40 miles of hard slogging through sand. When I imagine that trip, I imagine a solitary march of four or five days, seeing no one the whole time.

But the other part of me knows that Fages had three soldiers with him and that the journey would have been a lot faster on horseback. I also know that there were native villages at many points along the way where he could have received water. And he may even have used a Kumeyaay guide. He may have been filled with wonder at this new place, or with dread at the expanse of terrain before him, but he wasn't discovering anything. The Indians who pointed out the way for him probably thought they were simply showing him around their neighborhood.

My reverie is interrupted by a deep-throated roar coming from behind the peak across the way, Granite Mountain. A jet fighter shoots straight up from behind the peak, then banks left and levels out, heading east. Another jet follows a few seconds behind the first. I hate this intrusion. They're

thousands of feet in the air now, but I wonder how low they were on the other side of Granite. The Navy, the BLM and the state park service have worked out regulations to keep the Navy flyboys from going too low, but I see them breaking the rule all the time. The noise of the jets stresses the endangered bighorn sheep, increasing their susceptibility to disease. The sheep in this park have such a precarious hold that any additional stress could put them over the edge into extinction. But I know if I had a toy like that, I'd probably do the same thing.

I have a more selfish concern. Those jets probably took off from Miramar Naval Air Station, over on the coast; they probably took about 10 minutes to get out here. They are just one more reminder of how small the world has become. They fly across this desert in a matter of minutes — this desert that the Spanish called *la jornada del muerto*, journey of death — and make a mockery of any notion of vastness this place conjures up in me.

Now I realize at least part of what I'm doing out here: I'm imagining that this land is still as big as it was when Pedro Fages rode through it. Today, I can fly from San Diego to New York in less time than it would take me to hike down into the desert from the spot where I'm sitting. That compression of time and space makes the land in between seem unimportant. The world becomes a series of airport lounges and cab rides and Holiday Inns, a world contained by metal, concrete and plastic. It's easy to forget that there's any other world besides the one we've created. Some people have visions of a future in which the whole world has become a plastic bubble; some people even think we could live that way. Following an old trail like this is a way of keeping alive the idea that there is something bigger in the world than our own human pursuits. I cling to that idea like a life preserver.

AN ISLAND CALLED CALIFORNIA

Sometimes, when work has kept me indoors or I'm feeling homesick for a particular landscape — it used to be northern California; now that I'm in Montana it's the desert — I'll pick up a natural history guide. These can be dense and formal, a lot of serious information and Latin names, or they can be breezy travelogues. The best are sort of virtual reality nature excursions that attempt to conjure the feeling of being in a particular forest or on a particular shoreline. They work best when the reader has some familiarity with the plants and animals the natural history discusses.

One day, scanning the shelves in the University of Montana's library, I came across *An Island Called California* by Elna S. Bakker. I had heard of the book before, but I'd never read it; it was just what I needed at that moment. (Such moments of serendipity always seem to happen to me in libraries. As an undergraduate, working on my senior thesis on *Gravity's Rainbow*, I kept stumbling across books on V-2 rockets and the German SS in odd places in the library, as if someone were planting them for me.) I had been in Montana for about a year and a half, and I had just passed my first summer in eight years without visiting the Sierra Nevada. I pulled the book off the shelf, hoping to find descriptions of those mountains that would in some way take the place of actually being there.

As it turned out, school kept me too busy for much of that kind of recreational reading, but I recently returned to the book to find out what it had to tell me about southern California's deserts. The book seems to

combine a breezy, sometimes breathless style, with more information about flora and fauna than it seems possible for one person to know. In the forward, Bakker writes that she is “a self-taught naturalist blessed with a biologist for a husband.” One passage caught my attention in particular. Bakker spends two pages describing the unlikely plant associations found in the deserts and mountains of southern California. Nothing stays where it’s supposed to. The region’s flora has been moving around, intermingling like guests at a multicultural cocktail party for plants. She writes:

On both sides of the mountains that abut the deserts, many of the natural communities have been modified and their species rearranged to a bewildering degree. ... California juniper, chamise, coast live oak, and cholla cactus, all distinctive members of four different natural communities, are closely associated in Big Tujunga Wash, a finger of semidesert that slips over a low ridge into the Los Angeles Basin. Another anomalous extension has found its way to the Coast Ranges, southwest of Bakersfield. Sagebrush, Mormon tea, pinyon pine, juniper, and rabbit-brush — all typical plants of the Great Basin — come within shouting distance of the sea. ... Valley oaks, of all things, have crept through the Tehachapi Pass to the desert edge where they grow with Joshua trees and cactus. ... Low passes, ranges of moderate elevation, and a climate of fairly uniform aridity permit such strange floristic goings-on.

Refraining from speculating on *who* is responsible for rearranging these plant communities, Bakker seems to assume that this is some unexplainable natural phenomenon, part of the wonderful diversity of California. Plants haven’t migrated across mountain boundaries, they’ve “leaked” as if by accident. But I wonder — most of the plants Bakker mentions were used by southern California Indians. One particular item catches my attention: “Two native palm oases, on the north side of the Little San Bernardino, are far from similar communities in the Colorado Desert to the South.” That’s probably too far for a coyote to spread the seeds. Knowing the history of the

Cahuilla and palm groves, the implication is clear. Were the Indians responsible not only for these out-of-place palm groves, but for the other “strange floristic goings-on”?

Florence Shipek believes they were, and that the Indians’ actions weren’t strange at all — just a rational approach to sustaining themselves in an unpredictable environment. Shipek is an anthropologist and ethnographer who has worked closely with the Kumeyaay since the 1960s when their land rights were challenged. In the literature on southern California’s Indians, her name crops up in quotes and bibliographies again and again. Confronting those who use the Indian-as-first-ecologist myth as an excuse to take land rights away from Indians — sometimes environmentalists arguing against development of Indian land, sometimes developers seeking to build a dam or place powerlines on reservations — Shipek argues that the Kumeyaay did have sophisticated ownership concepts and that they did change the land in significant ways. One of those ways was transporting plants from one plant community to another, either by seed or by cuttings.

The reason for this tactic has to do with California’s varied and unpredictable climate. The Kumeyaay’s territory stretched from the coast at San Diego, through the mountains and desert, nearly to the Colorado River where the Yumas lived. Bands living in these different environments developed different ways of getting a living. Their lifeways were so varied that there has been considerable confusion over whether they are one people or several distinct groups. It’s not even clear whether they thought of themselves as one group. Focusing on their material culture, which varied from what seemed to be simple hunting/gathering on the coast to fully agricultural in the Imperial Valley, Alfred Kroeber divided them into

Northern and Southern Diegueño along the coast and in the mountains, and “Kamia” in the desert. More recently, anthropologists have focused on the shared language of all of these people and settled on the name Kumeyaay, an Indian word which the Kumeyaay themselves have adopted.

The natural bounty of this varied landscape is one of the stereotypes about California that goes along with stereotypical views about these Indians as “diggers.” Life was supposedly so easy here that there was no need to develop a sophisticated material, political or spiritual culture. The Indians dug a few roots, plucked shellfish from the ocean, ground acorns for meal, shot a deer now and then just for the fun of it, and — *voilà!* — the needs of subsistence were met. They could spend the rest of their time in indolence. This belief that life in California is so easy that its inhabitants’ higher faculties remain undeveloped persists to this day. Among American Indians, these were the airheads and valley girls.

The reality is that while in some years the flora in southern California is remarkably productive, in other years drought can limit the “bounty of nature.” Historically, drought cycles occurred regularly, sometimes lasting more than 20 years. At other times, flash flooding or simply *too much* rain could limit the harvests the Indians depended on. In response to this unpredictability, the Kumeyaay experimented with growing food plants in areas where they wouldn’t normally be found. They moved mountain flora down to the lowlands, desert plants over to the coast, coastal shrubs into the desert. The idea seemed to be that if a drought limited the harvest of a water-dependent crop, acorns for instance, then the drought tolerant plants would help fill the gap. In addition, the rain that does fall in drought years tends to fall out of season. Planting crops that would respond to this unusual rain

pattern alongside plants that thrived in a normal season ensured that *something* would be available for harvest. This was a managed system of hedging their bets.

The person who managed this system was the shaman for each village. He experimented with the different plants, decided which areas should be harvested when, and, through a system of religious rewards, encouraged village members to develop knowledge about alternate food sources. Like the modern grape growers in the Temecula Valley, the shamans — Shipek calls them religious plant specialists — knew that southern California is a land of microclimates. They planted seeds and cuttings in as many of these microniches as possible. They weren't interested in developing domesticated crops with larger seeds than their wild counterparts, as modern horticulturists are. Instead, they focused on developing the variability of each crop, and the number of locations in which it grew. According to Shipek, "Southern California Indians, rather than reducing plant diversity by concentrating on a few highly productive species, increased diversity and numbers by experimentally interplanting each food in every eco-niche, even experimenting with seeds traded from other regions."

Shipek also believes that southern California was a much wetter place when the Kumeyaay ran things. One of the first "historical" sites in California is Padre Dam in Mission Gorge, just outside the community of Santee. The historical marker at the site states that this was the first dam in California, built for the mission in San Diego. Actually, that dam was built on top of an older Indian dam. According to Shipek, the Indians weren't interested in storing large amounts of water, as the Spanish were. Instead, they simply blocked the river enough to create a wetland, to raise the surrounding water

table enough to charge nearby springs. In this wet environment, plants important both to the Indians and to wildlife grew. The Kumeyaay also practiced erosion control, planting willow cuttings along stream banks and placing lines of rocks on steep slopes to slow run-off. "You had that system all over Southern California," she says in an interview with Ruth Held of the San Diego Historical Society. "You had marshes in valley after valley after valley. Everybody talks about this always being a desert — *we've turned it into one.*"

So if the Indians were so busy managing their landscape, why didn't the Spanish see and record these manipulations? Shipek says they did see them, but the changes the Indians made blended into the landscape so well that the Spanish didn't know what they were seeing, or didn't take the time to understand it. Sometimes, the "natural productions" of the landscape that the Spanish did comment on — lush grass, an abundance of small game — were products of those Indian manipulations. In 1769, for example, Father Juan Crespi saw "wild" grapevines near the port of San Diego that "look as if they had been planted." Further north, he described the valley of San Luis Rey (present-day Oceanside) as "a large and beautiful valley so green that it seemed to us that it had been planted." According to Shipek, it *had* been planted by broadcast sowing, and what Crespi thought of as grass was really a small grain about half the size of wheat. The Kumeyaay didn't just plant this grass along the coast, but also in the desert, along the New River.

Green leafy plants were intercropped with the grass, and these matured before or at the same time as the grain harvest. Even when Francisco Palou noticed the Indians gathering the grass into sheaves the way the Spanish did with wheat, he couldn't make the connection to agriculture. Accustomed to

neatly laid-out fields containing monocultures of highly-bred grains, he just couldn't see it. After harvest, the grass stubble was burned, and then the field was planted again. This wilder form of agriculture blended in to its surroundings so well that it was nearly invisible to the Spanish. When they put their horses to pasture in these grain fields, they wondered why the Indian farmers protested.

If it was hard for the Spanish to recognize this cultivated grass, it was even harder for them to recognize that "wild" plants had been planted or cultivated in other ways. The Kumeyaay planted oak trees, and each family claimed ownership of the trees they planted. They planted chaparral plants such as manzanita and ceanothus along the coast, as well as the desert mesquite. Near their homes, they maintained "kitchen gardens" where they planted greens, sage and cactus. Though there is debate on this topic, there is considerable evidence that they raised corn, beans and squash long before the Spanish arrived.

Desert dwelling Kumeyaay also cultivated wild plants. They planted mesquite to increase its numbers and burned it once a year to remove yield-reducing parasites like desert mistletoe. They may also have planted agave. In the desert, Shippek has found stands of agave planted in rows. You can only see the rows from above, though. Did the Spanish ever climb to the peak of a hill and wonder at those lines of "wild" plants? More likely, they simply assumed these were more "natural productions" of the desert.

The Spanish weren't the only blind newcomers to this place. In 1848, an American named Cave J. Couets passed through the desert, crossing the Colorado River at Yuma. He noticed an area "which bears every sign of once having been *extensively* cultivated. The irrigating ditches are very numerous

and as plain as if now in use. The whole is now but one mesquite thicket." Coutts never considered the possibility that the irrigation ditches might have been intended for the mesquite. He assumed that irrigation was for cultivated crops, not wild plants. He just couldn't believe his own eyes. One hundred and twelve years later, the editor of Coutts' journal couldn't believe Coutts' eyes either. In a footnote to the above passage, Henry F. Dobyns wrote that the Yuma Indians "altered the natural landscape very little by their agricultural activities. Coutts' 'irrigation ditches' were evidently natural drains, possibly enlarged by the Yumas." The "digger" myth dies hard.

That myth influenced Coutts when he arrived at the grassy meadows at New River. He wrote in his journal, "This particular place of the river, favored with such luxurious grass, can only be the work of an Invisible Hand, to aid the thousands of distressed emigrants." Removing humanity from the landscape and looking instead for the hand of God (or Nature) is a refrain that persists to this day.

What do all these manipulations add up to? The Indians were changing not only the appearance of the landscape in southern California, but also the region's basic ecology. Along the coast and in the foothills, their burning practices may have exerted a genotypic influence on the chaparral — in other words, changing the nature of the plants themselves. All of those chaparral species are fire-adapted to the extent that they need fire to germinate or sprout. Hybridization was another way the basic character of plants changed. Shipek believes that by moving plants from one community to another, the Indians encouraged them to hybridize. Today, there are oak tree hybrids in southern California that are found nowhere else, crosses between varieties

that don't naturally grow in the same area. The same is true with certain chaparral species.

The Kumeyaay changed the ecology of desert areas, too. At San Sebastian Marsh, between Anza-Borrego and the present-day Salton Sea, dense stands of mesquite grow. In an ecological study of the marsh, University of California at Santa Cruz researcher Charles Convis calls this stand the best developed, most pristine mesquite woodland in the Sonoran Desert. Nearby is the largest area of mesquite dune habitat in the world. Because of impacts from off-roaders, the area has been labeled an "Area of Critical Environmental Concern" by the Bureau of Land Management. These stands of mesquite probably owe much of their existence to Indians — probably Kumeyaay, though anthropologists aren't sure. The Indians may not have planted the original mesquite here, but they may have increased their density by saving the seeds, and planting the ones that sprouted. They probably burned the stands regularly. And, because it's located farther from the water, the size of that mesquite dune habitat may be due to irrigation by the Indians.

This is important not just for the mesquite but for the ecology of the habitat where it grows. According to Convis, the tree "has a strong ecological influence upon the surrounding community." Mesquite not only provides food and shelter for animals and birds, its ability to "fix" nitrogen — pull it out of the air and make it available in the soil — means it benefits other plants. "When it is provided with sufficient nutrients and water," Convis writes, "mesquite can achieve a high level of productivity; an individual plant can be the primary supplier of nutrients and vegetative food to the surrounding plant and animal community." The Indians who tended these groves were contributing not only to their own subsistence but to the overall

diversity of the place where they lived. This wasn't necessarily altruistic behavior; their actions did have some negative impacts on diversity. Burning the mesquite to remove mistletoe, for instance, also removed a primary food source for birds.

Many of the natural areas we value — the areas we value *because* we view them as natural — have been influenced by humans, may even owe their existence to humans. The palm groves, the mesquite *bosques*, and the oak groves are there partly because the Kumeyaay and the Cahuilla put them there. The chaparral that we see today, the dense stands of shrubbery that cloak the hillsides, only exists because we have replaced the Indians' program of fire ecology with one of fire suppression. The wetlands they created are gone, converted either to dry valleys traversed by eroding gullies or, in a few places, to deep lakes. We could bring those wetlands back, if we wanted to. But the grass the Kumeyaay planted — the one with the seeds half the size of wheat — is gone for good. Shipek believes it had been semi-domesticated, since it disappeared so rapidly once the Indians lost their lands and Europeans introduced exotic species. The lush grass the Spanish remarked on depended on the Indians for its survival. Now, the loss of California's "native" grasses is one of the things we lament about the changes that have overtaken the state's biota since the arrival of the Spanish.

I take from all this a deep suspicion about what is natural or wild in southern California, or anywhere. Yet learning to question these familiar terms is more comforting than alarming. I could persist in seeing the desert as an emptiness, a place hostile to humans, a place to relive the pioneer myth. But it's better to see this as a place where people tried to make their homes, and succeeded. They didn't live according to some idealized notion of "living

lightly on the land," making no changes to their environment. They manipulated that environment partly through technology and partly through an elaborate environmental knowledge. The lesson is that humans really do have a place in nature; it's still nature, even when we change it.

WEEDING THE WILDERNESS

The shrub is about the size of a desert willow, with green foliage and red bark. Its tiny blossoms make a coral-pink spray that contrasts nicely with its green leaves. The shrub and thousands of others like it are growing in a sandy desert wash, in among the desert willows and cottonwoods; together, these water loving plants form a strip of green in a landscape of mostly tans, browns and grays. The slopes of the canyon are decomposed granite supporting cholla and barrel cactus. High up on the ridgeline the first junipers and pinyon pine appear — all with the more characteristic muted olive of desert and chaparral. A hiker coming across this canyon from the ridges above would likely find the streamside a welcome sight; the shrub with the bright green foliage and pink blossoms might catch his attention first.

On this last day of May, this hypothetical hiker would see three figures moving up the canyon, two of them wearing clumsy contraptions strapped to their backs: a five-gallon plastic tank filled with a bright blue liquid, a hose leading from that to a hand-held spray nozzle. The figures look out of place, like visitors from another planet; perhaps these tanks are part of their life-support system. As they walk up canyon, the pair with the tanks — a man and a woman — stop occasionally at the bright green shrubs. They paint the shrubs' lower stems with the blue liquid. Perhaps at this point, the hiker catches a whiff of diesel fuel drifting across the dry desert air.

Without warning, the man with the spray contraption begins kicking at a particularly large shrub — it's almost a small tree. He swears as he works to expose the stems deeper down. He seems to harbor some sort of anger toward this innocuous, even pleasant-looking plant. He sprays it, then moves on.

What would the hypothetical hiker viewing this scene do? Hike quickly down the canyon to notify a ranger that someone is destroying the flora of this fragile desert oasis? According to the state park brochure, "all features of the park are protected." But then he might notice the brown park service uniforms worn by the two figures with the backpacks. And he probably doesn't know the name of the shrub: *Tamarix chinensis*, more commonly known as tamarisk or saltcedar.

Except for those figures with the backpacks, nothing seems out of place here. Taken as a snapshot in time, everything is as natural as could be; the tamarisk seems to fit right in with its surroundings. But add the element of time and the picture looks far different. Sixty years ago there were no tamarisk, and a lot more cottonwood and willow. If you could project this picture into the future, you might see nothing but tamarisk, and fewer native birds and animals. As alien as the two backpack-laden figures look, this innocent-looking shrub is the real invader here.

I'm watching this scene too, but I'm a participant as well as an observer, hiking along with the man in uniform, Mark Jorgensen, chief naturalist for nine state parks in the deserts of Southern California, and his assistant, Heidi Person. We're moving slowly up Horse Canyon in the heart of Anza-Borrego Desert State Park, about as far away from civilization as we can get in this overcrowded corner of the country. Horse Canyon is a tributary of Coyote Canyon, a lush riparian oasis in the heart of the desert, San Diego County's only year-round stream. These two canyons are also two of the most

tamarisk-infested areas in the park. Mark and Heidi are here to wipe out the tamarisk. In other areas, this is known as tamarisk bashing.

We're just starting our foray up Horse Canyon, and already it's been a long day. I met Mark at 6:00 a.m. at the ranger station, then we stopped for Heidi at her trailer at Coyote Canyon's entrance. We drove for two hours up the kidney-jarring four-wheel-drive track that parallels and sometimes crosses Coyote Creek.

Mark pointed out landmarks for me, the idle tourist. Before entering the canyon and the park, we passed through a new orange grove. "This used to be one of the finest stands of ocotillo anywhere in the area," Mark said. Now it was a monoculture of orange trees. Field hands wearing facemasks climbed around on a big white tank next to a tractor. I wondered what they were preparing to spray on the grove.

"When they were clearing this field, it was all I could do to keep from coming down here and bustin' some dozers," Mark said.

Mark and I had met five years earlier when I was doing an article on off-roaders and their fight to be allowed to ride in the park, after being banned from it in 1987. Mark staked his career on keeping them out of the park, opposing the director of the State Park System, several state congressmen, the huge off-road lobby, and many residents of Borrego Springs and other towns bordering the park. He succeeded though, and today only highway-legal vehicles are allowed in the park. I had painted Mark with kid gloves then; I didn't want to make him out as too much of a firebrand. Now, listening to him talk about this orange grove, I wondered again about how many of his off-the-cuff comments I could use. He's in a high position within the park service, but he still has the heart of a monkey-wrencher.

As we drove, Mark described some of the other battles going on in the park. He had proposed removing feral horses from the canyon. Borrego residents want the horses left alone because they're part of the cattle-ranching tradition. Some park visitors felt this way too. A friend of mine had just driven the length of the canyon; she talked with enthusiasm about seeing the "wild" horses, much as she would if she had seen a mountain lion or desert bighorn. Mark points out that the horses probably went feral around 1910, not long enough before the park was created to make them part of a "tradition." And they're competing with wildlife for sensitive water resources.

Mark was in hot water with the four-wheel contingent once again for a proposed closure of Coyote Canyon to all vehicle traffic. People, including park rangers, had been driving right through the stream in Coyote Canyon for years. The town of Hemet runs a jeep cavalcade down the canyon every year. Off-roaders point to the traditional use of the canyon as a travel corridor, beginning with the Cahuilla Indians, passing down through the Anza expedition to the Clarks and the Reeds, and finally to the jeep drivers of the '30s and '40s. But in the last twenty years the damage to the riparian areas has become more evident. Mark points out that even the Army Corps of Engineers' guidelines for treatment of wetlands don't allow driving vehicles across a stream, let alone through it. The whole canyon is already shut down from June through September to protect the bighorn sheep's watering rights through the stressful summer months. And a godawful bypass road was routed around Lower Willows in 1987, after the endangered Least Bell's Vireo (the bird that has stopped construction in other places in California) was found nesting there. Recently, the vireos were found in Middle Willows,

another spot where the road runs right through the stream, but where building a bypass road is impossible because of the canyon's narrow walls.

Mark believes the canyon should be closed above and below Middle Willows, but this isn't a fight he's willing to stake his career on. "The off-road-vehicle issue affected the character and integrity of the whole park," he says. "Middle Willows is one 54-acre riparian area where bad things are happening, but it's not the whole park." So he and the Park Superintendent are letting the State Director make the decision. Now I'm beginning to see the wily bureaucrat hiding behind the monkey-wrencher exterior.

While orange growers and off-roaders make convenient villains, it's hard to find a bad guy in this war with the tamarisk. The shrub was first imported to the U.S. from Europe as an ornamental in the early 19th century. Early in this century, ranchers in the Southwest planted it for shade, windbreaks, and stream bank consolidation. It probably escaped cultivation in the 1920s, and began to spread rapidly across the Southwest in the 1940s. Mark guesses tamarisk got into Coyote Canyon along with cattle feed, or maybe with the cattle themselves. As far as anyone knows, the shrub variety was never intentionally planted here.

All those actions are far in the past, though, and now the only enemy is the tamarisk itself. The "good guys" in this battle are the cottonwoods and willows that the tamarisk chokes out. Hiking up Horse Canyon, Mark points out a stand of young cottonwoods. "I'd like to see this whole canyon filled with those," he says.

When Mark sees a tamarisk seedling it's as if he's seeing the scene from *Alien* in which the baby monster bursts from the astronaut's stomach. He knows that soon this small plant will become a nearly unstoppable opponent.

Listening to him describe tamarisk's spread across the Southwest, it does seem a formidable foe. Since the 1940s, the shrub-like tree has spread to over a million acres, converting native riparian areas to virtual monocultures. It has spread as far north as Oregon and Idaho and as far east as Nebraska. It lives below sea-level and as high as 7,000 feet in the southern Rockies.

Conventional weapons like chainsaws and fire do nothing to stop it. It can survive up to 70 days of total submergence. "Go ahead," says the tamarisk. "Burn me, chop me, drown me — I'll come back stronger!" Like the insect critters of the movie, the tamarisk is an alien invader; it may not threaten us with gruesome death, but it threatens the diversity of the few natural riparian areas left in the Southwest.

If nothing is done to stop the tamarisk, Mark sees a bleak future for Coyote Canyon — one of his favorite places in the park where he's worked most of his professional life. He has a picture of this future on his desk back at park headquarters — maybe this accounts for his rage out here in the field. It shows the lower Colorado River, about a hundred miles from here, and the banks are covered with nothing but tamarisk. Well, almost nothing — one surviving cottonwood pokes its head above the sea of saltcedar.

Which is why he and Heidi are walking along Horse Canyon with awkward backpack sprayers, painting the lower stems of every tamarisk they see with a mixture of diesel fuel and the herbicide Garlon 4, tinted with a bright blue dye. They make a good, if oddly matched team. Mark is 40-something, big, bearish, bearded and balding. He wears a park-service-brown baseball cap, sings "Country Boy" by Hank Williams Jr. and puffs on a cigar as he walks. "Get that one, mama," Mark calls to Heidi in his southern accent. Then he scrambles up a slope to get a particularly hard to reach plant. Heidi

has short-cropped blond hair, wears wrap-around shades, and doesn't seem too phased by the 35-pound pack on her back. If she minds Mark calling her "mama," she doesn't let on. Heidi has been Mark's assistant for the past six years. They're also golf partners; they won the last park service tournament, mainly because Heidi is good enough to tour with the PGA pro tour in Europe.

It's ten o'clock, and we've hiked for half a mile or so. Already it's eighty-five, ninety degrees. I call that hot; Mark and Heidi say it's just good hiking weather. I stop for a swig of water, and Heidi breaks out a pack of sunflower seeds, salsa flavor. She offers me a handful and I accept, wondering what I'm going to do with the shells. She and Mark each take a handful of the seeds and then begin spitting the shells out on the sandy streambed. I'm momentarily taken aback by this flagrant violation of the "leave only footprints, take only memories" ethic drilled into me by outings with the Sierra Club. But I figure if the rangers are doing it, why shouldn't I? Compared to the herbicide and diesel fuel the rangers are spraying on the trees, a few sunflower shells seem like peanuts. I follow their example.

Down in Coyote Canyon, Mark hires a contractor to come in with a crew — the Orkin of the wilderness. They use the "cut-and-spray" method of tamarisk control — cut the trees at ground level with chain-saws or loppers, then spray the exposed stump with pure Garlon. Triclopyr, Garlon's active ingredient, mimics plant hormone auxin, causing disorderly growth that kills the tree. At least that's what Mark and the contractors hope; they often have to re-spray the specimens that refuse to die.

Mark and Heidi are using the basal bark method of spraying, since getting up here with a chainsaw is difficult. The solution they use is 25 to 30

percent Garlon; the diesel fuel helps transport the herbicide through the bark and into the cadmium layer. They have to keep the spray away from any water in the canyon — there's not much in June — since Garlon 4 and diesel are toxic to aquatic animals. Around running water, they use Rodeo, which is not as toxic, nor as effective on the tamarisk.

Today's mission is to get the "mother of all trees," at the head of Horse Canyon. Mark suspects this huge tamarisk is responsible for a lot of the young seedlings down here in the lower reaches. A secondary goal is damage assessment of last fall's spraying. On that trip, Heidi and another worker had worked their way nearly to the top of the canyon, but had run out of spray before reaching their target. Now Mark counsels Heidi to conserve her ammo. He has trouble following his own advice, though. Many of the tamarisk have survived the previous spraying. In one place new tamarisk seedlings make a carpet like a lawn on the gravel creekbed. Mark seems filled with a kind of rage. Soon he's spraying even the smallest seedlings. He keeps asking me how much juice he has left.

Some of the bigger shrubs are partly dead, with some bare branches and others covered with new green foliage and pink seed pods. "I know we got this one last time," Heidi tells Mark, pointing to one that sports a particularly luxurious growth. Mark forces his way under the tree's low branches, and kicks them viciously, trying to expose the trunk where it enters the ground. The problem seems to be that the branches radiate up from ground level, rather than growing from a single trunk. "You've got to hit these bastards low," he says.

Earlier, Mark told me, "We're supposed to be out here hugging bunnies and feeling ferns, and here we are spraying tamarisk and hauling out wild horses."

Heidi laughed and said, "I don't think I've hugged one bunny since I've been working for Mark." Now I see what they mean; this isn't what I expected to see rangers doing out here.

Even in its "home range," tamarisk is an aggressive colonizer. The genus originated in India and the middle east. From those two areas it spread east to China and Japan and west to Africa and Europe. It seems to have speciated rapidly as it spread. The species hybridize with one another, and there is no consensus on whether the species are really distinct. Some, like the tree-sized *Tamarix aphylla*, are readily distinguishable from the smaller, varieties. But those smaller, shrubby species are so similar as to be indistinguishable in the field. *T. chinensis* and *ramosissima*, have been lumped under the species name *pentandra*. As John Rodman has pointed out, "there is no consensus on whether saltcedar ... should be thought of as one species, several distinguishable species, or a group of highly adaptive, rapidly speciating forms." Many authors call all the shrub-like species of tamarisk by their common name, saltcedar. Mark calls them all tamarisk.

Whatever you call it, the plant is uniquely suited for colonizing riparian areas, especially those that have been disturbed. It grows as much as ten feet in a year, or two inches in a day. Tamarisk is also very efficient at taking water in, but not very efficient at using or storing it. Researchers can't agree on

exactly how much water tamarisk uses, but 200 gallons a day is one estimate for a mature tree. Its root system is versatile, spreading widely under the surface of moist sand banks, or sending a taproot up to 90 feet down to find the water table if surface moisture is lacking. With this vast water use, stands of tamarisk can dry up desert springs and seeps that cottonwoods and wildlife depend on, and even turn a perennial stream into a dry gulch. But tamarisk is a "facultative phreatophyte" — even though it uses a lot of water, it can survive long periods of drought. Tamarisk's native competitors — cottonwoods and willows — are much better at water conservation, but they are "obligate phreatophytes," meaning they need a constant supply of water.

Another weapon in tamarisk's arsenal is its ability to tolerate salinity. The tree simply passes the salt out to its leaves. When these drop to the ground, they add to the salinity of the soil, creating a salt crust around the base of the tree and discouraging the growth of non-salt-tolerant natives.

But the big test of tamarisk's competitiveness is not how well each tree does — it's how many off-spring each one produces, and how many of them survive to produce more tamarisk. Tamarisk reproduces copiously — up to half a million tiny, almost weightless seeds in a year. And it starts producing these seeds almost from its first moment of life. No idyllic childhood, no bothersome puberty rituals. It just pokes its head up through the salty, sandy soil, puts out a few branches and pretty soon one of those branches is covered with small pink flowers. Mark, Heidi and I saw one of these in Horse Canyon, a foot-high plant with a four-inch spray of tiny blossoms. Cottonwoods and willows, on the other hand, take years to reach seed-bearing age. They're dioecious, which means only about half the trees bear seeds, while all of the monocious tamarisk can reproduce by seed. Tamarisk can also reproduce

vegetatively: stems broken off in a flood will root quickly if they come to rest on a moist sand bank.

With all of these advantages, tamarisk seems ideally equipped to create monocultures. Even in the Middle East where it's a native, it's an invasive species. On a trip to the Dead Sea basin, Mark found a monoculture of tamarisk. "I had expected there would be a diversity of natives, like we find in a riparian area here where you'll find fifteen or twenty species mixed together and filling their own niches." Instead, he found a situation similar to the lower Colorado River: nothing but tamarisk.

We're used to thinking about balance in nature — for every critter or shrub that's likely to overrun the planet, there's another shrub or critter that preys on it or competes with it, keeping it in check. For every elk herd there's a pack of wolves, for every run of salmon a family of grizzlies. We're used to thinking of humans as the agents that screw up this delicate balance — we wipe out the wolves and so the elk population goes through the roof, or we wipe out both the grizzlies and the salmon. But a tree like tamarisk seems to defy these easy classifications. How does the idea of balance in nature explain a species like tamarisk? What was nature thinking when it created such a formidable plant?

Nature, of course, wasn't thinking anything. Random permutations just happen, and some succeed while others fail. At one time, ecologists thought that evolution, if left alone, led to a balance and to diversity. It was supposed to work like one of those new, non-competitive games the people in *Outward Bound* like to play, the ones where no side ever wins. But nature doesn't always work this way. Increasingly, ecologists are discovering that nature can be like a game of monopoly, where one player ends up with all the real estate.

Evolution can lead just as easily to species that wipe out everything else, leading to monocultures and a lack of diversity.

The tamarisk invasion might not be so significant if it provided good habitat for native wildlife. Since it's an exotic, though, native species don't make much use of it. One study on the lower Colorado River found that one hundred acres of native vegetation supported 154 bird species while a hundred acres of tamarisk supported only four. In another, tamarisk supported half the number of species of birds in native vegetation, and one-quarter to one-third the total number of birds. Dense tamarisk stands contain little in the way of food for birds: no fruit, no edible seeds (tamarisk seeds are too small and offer little protein), and few insects. Native riparian bird habitat in the Southwest is especially important, since over forty percent of native bird species depend on it. As good native habitat is replaced with poor tamarisk habitat, these species are pushed to the edge of extinction. Larger animals like deer and bighorn sheep find little nourishment in tamarisk's tiny, scale-like leaves.

There is one time that tamarisk can be beneficial to bird populations, however. One researcher reported heavy bird use of piles of tamarisk brush following eradication efforts. The only good tamarisk is a dead tamarisk.

What I have just outlined is the "devil theory" of tamarisk, the idea that it is an almost invincible invader with malicious intent. According to environmental geologist Benjamin Everitt, this theory holds that tamarisk "is somehow capable of actively destroying preexisting plant communities and of occupying their territory." But Everitt and other researchers believe that tamarisk could never have spread so widely without human help. While it does well in disturbed environments, Everitt says that tamarisk "does not

compete well in established communities — certainly not a very 'aggressive' tendency... Most exotic species are not successfully introduced without assistance."

These ecologists point out that tamarisk only really took off in the Southwest with the combination of intentional planting of saltcedar for bank protection and other human-induced changes in the environment. Some of these changes had been around for a while: brush clearing, plowing of floodplains and grazing. But a big change that came in the '20s and '30s was the damming of the Southwest's major rivers. Could it be that changes in river flow helped the tamarisk invasion?

Some studies have shown that lowered floodpeaks on dammed rivers have reduced the survival rate of cottonwoods, since this species is specifically adapted to rivers that rise with snowmelt in the spring and recede later in the year. That's one way dams helped in tamarisk's competition with native species. Another is the large muddy banks created by reservoirs — ideal habitat for a phreatophyte. Since these areas frequently lacked riparian vegetation before the construction of the dams, there was no established community for saltcedar to compete with — it started with a level playing field.

Some researchers have even suggested that simply removing these human impacts will curb the tamarisk invasion; once "natural" conditions are restored, native trees will be able to out-compete this exotic that isn't really adapted to local conditions. The assumption here is that without human interference, nature is a balanced community free of disturbance.

Mark Jorgensen disagrees with these theories, because they conflict with what he's seen on the ground in Anza-Borrego. While there's no doubt that

human impacts have helped tamarisk take over the Colorado River, the plant does well under natural conditions as well. Discussing tamarisk, Mark places as much emphasis on natural disturbance as on the more familiar human-caused variety. "I call 'em catastrophes, whether they're fires or floods or droughts," he says. "They all favor tamarisk."

The trend he sees in Anza-Borrego is for more tamarisk, unless managers take a stand against it. "I can show you hundreds of places in Anza-Borrego that you cannot attribute any human impacts to that are overrun with tamarisk. I see no reversal of the trend."

Coyote and Horse Canyons, for instance, never faced the kind of human impacts Everitt describes in other areas. While ranchers ran cattle from the late 1890s through the mid-1960s in Coyote Canyon, there has never been a dam on the stream, the flood plains have never been cleared, and, as far as anyone knows, no one ever planted tamarisk intentionally. Ranchers interviewed in the early '70s recall no tamarisk in the canyon before the 1930s, and only a few beginning in the '40s. So most of the invasion occurred in a 30 year period, from the mid-'40s to the mid-'70s, at the tail-end of the cattle ranching days. The main impacts since then have been caused by jeeps and off-road vehicles driving through the center of the stream at Upper, Middle and Lower Willows — yet tamarisk also does very well above those spots, where there has been very little off-road activity.

By the early '80s, the most heavily invaded riparian areas displayed eighty percent tamarisk coverage — not quite the monocultures of tamarisk seen along the lower Colorado River, but close. And this invasion occurred without the changes in flood regimes supposed to be the culprit on dammed rivers like the Colorado. In the case of Coyote Canyon, Mark believes natural

flooding caused the principal disturbance that let tamarisk get a foothold in the canyon. In Carrizo Marsh, toward the south end of the park, the situation is even worse. Here, hurricanes in 1976 and 1977 scoured the marsh clean of cattail, carrizo cane and willow. As vegetation grew back, tamarisk came to cover ninety percent of the marsh.

Evidence like this leads Mark to believe that tamarisk will continue to dominate desert riparian areas unless managers step in to control it. Not that he is without qualms about the implications of invasive management in natural areas. He worries about the effects of herbicides on the riparian areas where they are applied. "It's a two-edged sword," he says. "On the one hand we're supposed to be environmentalists, but on the other, we're out here using herbicides."

Other people are questioning the contradictions in these efforts at ecological restoration. Does it make sense to restore islands of native vegetation in the midst of a sea of non-natives? Is this just more fiddling with nature, making it even more unnatural? Who are we to decide the tamarisk is harmful and needs to be eradicated?

A friend of mine took a commercial raft trip down the Colorado. As they floated past a stand of tamarisk, the guide mentioned that rangers were trying to eradicate the species from the park. Many of the rafters felt this was an unnecessary intrusion into a natural setting, one more attempt to control nature and remove the wild from wilderness. We've done enough to screw

nature up, they were saying; now we should just leave it alone. Humans have no role in nature, this view holds.

But when was there pure nature, removed from human influence, here in the deserts of Southern California? For at least the last two thousand years, the Anza-Borrego region was not pure nature, or pure wilderness. I think of the Cahuilla planting palm groves, burning them every four years, burning the chaparral for game openings, digging irrigation trenches to “wild” mesquite bosques. They played a role in nature, though a far different one than we do today. To some extent, they managed the environment for their own ends. “Managed” is a loaded term, of course; it implies a whole Western mindset of control over nature which the Cahuilla would probably have found laughable. Maybe “manipulation” would be a better term. But the difference seems to be more one of degree rather than of kind. The Cahuilla chose rabbits and other small game as their favored species, and burned the chamise and toyon of the chaparral. Today, we choose cottonwood and willow and desert bighorn, and we cut and spray the tamarisk. Maybe, with all our past screw-ups in mind, we’ve become gun-shy

These acts of restoration let us play a productive role in nature, a rare opportunity in a time of rapid species loss and habitat destruction. As John Rodman points out in “Reflections on Tamarisk Bashing,” those involved with ecological restoration become more than “mere esthetes entranced by pretty pink flowers... mere birdwatchers or backpackers who pass like angelic, incorporeal tourists leaving no trace upon the land...” These experiences can teach “what it feels like to participate once again as actors in a natural system.”

Rodman has thought a lot about the implications of ecological restoration, in this case "tamarisk bashing." A professor of environmental studies at Claremont College, he has volunteered his time to the Nature Conservancy's tamarisk control efforts at the Coachella Valley Preserve. He acknowledges that restoration efforts do run the risk of "playing God," deciding which species live and which ones die. He also questions the categories of "native" and "non-native." "In what sense is a genus that starts out in India 'native' to China or Spain but 'exotic' to the United States?" he asks. Is the difference one of the speed of movement? Of traveling over land versus crossing an ocean? How wide does a body of water have to be before crossing it constitutes an invasion? Or is it simply that Europeans brought tamarisk with them that makes it an exotic? If we could imagine tamarisk crossing the ocean in some other way — carried by migrating birds, perhaps — would we consider it "natural" or "native"? What if it had crossed the Bering land bridge ten thousand years ago?

But tamarisk didn't cross that land bridge, and, until recently, species didn't migrate between Europe or Africa and the Americas. That separation between the continents is the main reason there are distinct species on the two land masses. Diversity is partly a result of independent evolution separated by uncrossable barriers. For the past five hundred years humans have been crossing those barriers and mingling species that had been kept separate. We live in a period of rapid homogenization of the world. We are the chief cause of that homogenization, but it's out of our control. We make feeble efforts to control it, like the one here in Coyote Canyon. Such efforts are perhaps doomed to failure, but they must be made.

Instead of thinking in terms of natives and exotics, it makes more sense to talk about beneficial and noxious species. Again, we're back to playing God, making judgments between species. What criteria should we use in those judgments? The first, and most recent, criteria is diversity. Those plants and animals that fill niches in a diverse habitat are "good." Those that tend to destroy that diversity and create monocultures, like tamarisk and spotted knapweed, are "bad." Another attribute contributing to diversity is uniqueness or rarity. Those species that are somehow unique, that exist only in a small area of the world, are more valuable than those that are common everywhere. Wolves are more valuable than coyotes, mountain lions more valuable than house cats.

Following these lines, ecological restoration doesn't seek so much to restore or recreate nature, but to defend the indigenous, the rare, and the different. Rodman talks about the way liberation imagery keeps cropping up among volunteers engaged in tamarisk bashing. These volunteers "free" a pond from the tamarisk that had dried it up. Once the tamarisk is gone, the pool fills with water. This view is a good antidote to an endeavor that can easily seem xenophobic, with its rhetoric against invading immigrants and terms like "tamarisk bashing." Instead, Rodman sees these actions growing not out of a "nativistic fear and dislike of immigrants, but a commitment to the defense, preservation, and restoration of indigenous, balanced communities." This is an attractive image — we humans have a chance to take nature's side instead of playing our more familiar role of destroyer.

As with any war, though, casualties can happen. I wonder about the potential for "friendly fire" in this war against the tamarisk. What kind of damage could Garlon do to the very habitat the restorationists are trying to

protect? The only person involved in tamarisk control who seems to be asking these questions is Mark Jorgensen. But he sees as much risk in taking no action as he does in spraying Garlon. "Twenty years from now," he says, "we may find that Garlon has damaged the environment here. But the alternative is to wait for the tamarisk to wipe out all the native growth in the canyon." For him, the latter choice is clearly the worse of two evils. As with many environmental problems, this isn't a question of risk versus no risk but of weighing two different kinds of risk. The problem is we don't know how to weigh the different risks against each other.

How much risk does Garlon present to the ecology of Horse and Coyote canyons? After that hike with Mark and Heidi, I began looking at studies done on Garlon 4 and on triclopyr, its active ingredient. It wasn't long before my head began to spin with a jumble of numbers. The research begins with numbers like 630 to 729 milligrams of triclopyr per kilogram of body weight (the median amount of Garlon necessary to kill a rat — a little over an ounce will do it for an average-size human). Then there's a study showing that a concentration of 1.4 parts per million of Garlon 4 can kill a salmon. More to the point in the desert, 2.4 to 4.8 parts per million of triclopyr can kill or paralyze newly hatched tadpoles. Then I try to compare those numbers to the amount of the chemical that Mark and Heidi actually put into that two-mile stretch of desert canyon — probably two gallons of Garlon, or 1.33 gallons of triclopyr. Even though they use it away from water, and it's supposed to break down rapidly, is there a chance that the chemical is getting into the water somehow? How much would have to be sprayed here to add up to 2.4 parts per million when the canyon flows with water?

I posed this question to Len Broberg, professor of Environmental Studies at the University of Montana. He gave me a horrified stare. In a telephone interview with Norma Grier, executive director of the Northwest Coalition for Alternatives to Pesticides, I could picture her eyes glazing over as I asked her the same question. She referred me to several studies that show triclopyr is more persistent than originally indicated. The chemical does have a rapid half-life, but smaller residues can remain in the environment for up to two years. Three researchers measured triclopyr in streams near an Oregon pasture that had been sprayed with Garlon; they found 14 parts per billion. But that's in Oregon, where the factors affecting triclopyr persistence differ from those in Anza-Borrego. Short of actually testing the water in Coyote and Horse Canyons, there is no way to compute the amount of triclopyr that may be entering the water.

Norma Grier believes we should be concerned with parts per billion of triclopyr in water, not parts per million. "If you're going to protect aquatic resources," she says, "triclopyr ester cannot be greater than three parts per billion. So we're starting to talk these really small numbers." Those are the numbers that would provide absolute safety to all the wildlife downstream from Horse Canyon. But the wildlife isn't safe as long as tamarisk continues to invade the canyon. Allowing San Diego's only year-round stream — and one of the few natural riparian areas remaining in Southern California — to become a tamarisk monoculture is not an option for Mark or for many others who love the desert. So we return to the question, how much are we willing to risk to return Coyote Canyon to a more pristine, "natural" condition? Despite the input of science, it's really just a crap-shoot.

As we make our way up Horse Canyon, the double-edged nature of the endeavor becomes clear. In one spot, a tamarisk has grown up around a barrel cactus, making it hard to spray one without hitting the other. It's as if the tamarisk had taken the cactus hostage, using it as a shield. Mark curses the tamarisk, then sprays it. He has one remark in situations like this: "Shoot 'em all and let God sort 'em out." Collateral damage is what the military might call this.

The presence of plants like the barrel cactus is encouraging, though. This canyon hasn't become a monoculture yet. As we hike, we see wildflowers, lupine mainly, a sign that we're gaining elevation. Catclaw acacia and desert apricot cloak the streams edges. As we move further upstream, the canyon narrows. We enter an area of reddish soil; where water runs it has the same rust red color. In places, the banks below high water mark are covered with saline deposits. I wonder if these could come from tamarisk, but reject the idea. Even tamarisk isn't that evil. The studies I've read suggest only the area around the base of the tree would have a saline crust. But I can see why tamarisk has taken so readily to this canyon.

There's plenty of wildlife in this canyon, too. Mark keeps his eye peeled for animal sign. A deer hunter, he has a sharp eye. On the drive in, going twenty miles an hour up the sandy wash of Coyote Creek, he'd stopped the jeep suddenly to look at a set of deer tracks crossing the canyon. From the splayed prints, Mark concluded the deer had been running fast, but he couldn't find tracks of a predator chasing it. Now he calls us over to where he's standing at a muddy spot in the stream bed. "Look at this," he says,

pointing to a large print — “mountain lion.” I bend down — the print is as large as my hand spread wide.

Around a bend of the canyon, we come to a single tamarisk, the largest we've seen so far. This one had been sprayed last time, and now it's dead. Mark christens it the father of all trees, since it's nearly as big as our target, which should be just ahead. Buoyed by this sense of victory, as well as the lightened loads they're carrying, the rangers forge ahead. They ignore all the little tamarisk now, minds set on getting to that last big one. They each have maybe a quart of spray left.

Finally the big tree appears. Seeing it is a little anti-climactic — it's just another big tamarisk. The rangers go to work on it, soaking its base with the last of the spray. Then the mission is accomplished. Mark lights another cigar, and we head back downstream.

On the way out, talk turns to plans for the evening. Heidi's going to drive into San Diego — a two-hour trip — to see “Hello, Dolly,” with Carol Channing. The heat has sapped my energy, and I can't imagine driving anywhere. I just want to go soak my feet in the pool up in Palm Canyon. But as Heidi and Mark have been telling me all day, 90 degrees is just pleasantly warm hiking. I should come back in August, Mark says.

When Mark stays behind to take a pee, Heidi confides to me that there's really no such thing as tamarisk control. She believes it's an unwinnable war.

Around the next bend, as if on cue, Mark stops still and gives an exclamation. Heidi and I both look in the direction in which he's staring. Up on the bank of the stream, a ledge about ten feet above us, is another huge tamarisk. This one's alive.

"How'd we miss that bastard?" Mark exclaims. This one is at least as big as the mother of all trees, and it's covered in flowers. Backpack sprayers empty, there's nothing the rangers can do about it. This one will have to wait for another expedition. But by then, this tree may have seeded out, producing hundreds of new tamarisk seedlings downstream. Those will have to be sprayed too. Mark and Heidi may have won one battle, but the war seems to go on forever.

EYES IN THE DARK

The sheer strangeness of the sound wakes me from a deep sleep. It's like nothing I've heard before: a rasping, coughing sort of croak, something like a crow with a bad cold, or a frog after a few days out in the desert sun. And it's *loud*. It sounds like it's about twenty feet from my tent. I'm camped alone in Anza-Borrego Desert State Park, about two miles up from the large campground at the mouth of Borrego Palm Canyon. I can't see my watch but it must be sometime after midnight.

This is the kind of moment when our ancestors must have reached for a firebrand to thrust at those eyes in the night. Now, even a burning palm frond would do. But fires have been declared unnatural in this park — they leave too many unaesthetic black stains on the ground, and they separate visitors from the wildlife they've come to watch. I reach for my flashlight.

And immediately ruin my night vision by illuminating the mesh walls of the tent. To whatever is out there, the tent is now glowing from within like a Chinese lantern. I'm not sure what impression this will have on my nocturnal visitor. I feel like I'm in a *Far Side* cartoon, the one with the polar bears standing over an igloo, one saying to the other, "I love these things — crunchy on the outside, chewy on the inside."

I tell myself that this must be some kind of bird, with that croaking noise it's making. But I want to find out for sure, so I unzip the tent door and shine the flashlight straight ahead.

Two yellow-green eyes stare back. They're maybe 15 yards away from the now open door of my tent. Then they disappear, only to reappear a dozen paces to the right, as rapidly and silently as if they had flown. Again, the coughing, rasping noise. Maybe it's an owl, except an owl's eyes are perfectly round; these are oval. I know better. The eyes squeeze shut with each cough, and I imagine the nose wrinkling up, the fangs bared, a glimpse of pink tongue, hot breath escaping. Then the animal seems to move its head left and right — one eye disappears to the side, then the other. I think I can almost see the outline of its head now, and imagine ears perked and expectant.

For someone being watched by a mountain lion, I am remarkably calm. All of my attention is telescoped into this moment, watching those eyes, alert for any sign of attack. And I am armed with technology, even if it is just a flashlight. I cling to this puny defense like the French to the Maginot Line. But I know who is in charge here.

A hunter from the Cahuilla Indian tribe that used to live in these parts would make a prayer to the mountain lion, warning it to go away before it got hurt (not out of any abstract reverence for the lion, but because it could actually be a *puul* — a shaman — in disguise). I'm praying the lion will go away without hurting me. Any vague wish to see a mountain lion in the wild went out the window the minute I saw those eyes. A cougar viewed through binoculars on a distant ridge, sure, even a glimpse of a tawny rear-end disappearing into the chaparral, but this is too close to home. I feel like *prey*. A friend of mine writes poetry about wanting to experience this feeling. He can have it.

I can't tell how long I spend looking at the lion. She's stopped the coughing now. (Later, I'll learn that this coughing noise is usually made only

by females with young cubs.) Gradually, I realize she's not going to pounce on me, and I decide I want to see something more than her eyes. I turn my flashlight off, hoping to catch her outline in the light of the half moon riding over the canyon. But my night vision's shot, and I see only the dim shapes of boulders. She's chosen a good spot to blend into. I turn the flashlight on again, and the eyes are still there. Finally, the eyes just disappear without a sound. I flash the beam around hoping to catch sight of her moving away, but I see nothing. After a few moments of lighting up the rocks like a boy scout on a campout, I zip up the tent and turn the light off and try to calm down.

Now that she's gone I have time to be afraid. Is she circling around the tent, planning an attack from behind? But this fear is mixed with exhilaration — my first mountain lion sighting. Some people spend their whole lives in places like this and never see one. I close my eyes and try not to think about all I've read about mountain lions. About how they kill with a bite to the head or the neck. About how perhaps, just maybe, sometimes, they eat their prey while it's still alive. Most of all, I try not to think of Iris Kenna, the 56-year-old woman who was killed and partly eaten by a cougar in the mountains west of here just six months ago. Sleep comes slowly.

Considering how much we've studied them, and how many of them we've killed, we know very little about mountain lions. This is a constant theme in the literature. We have several names for them: cougar or puma in the west, panther in the southeast. Most of what we know about them comes from observations made after a cat has been treed by dogs or sedated with a dart, or

from the virtual reality of radio-telemetry. It's hard to get a good long look at these animals in their natural setting.

We do know a few things, figures mostly. We know that an adult male weighs in at around 150 pounds and measures four feet long, with another two or three feet of tail. We know they hunt alone. They kill in a short burst of acceleration, rather than a long chase. They prefer large game like deer, but will resort to rabbits and other small catches when times are lean. When they do get something large, they drag it off to feed in privacy. They cover the leftovers with dirt and leaves, and feed off the same carcass for as long as two weeks. We also know that mountain lions are territorial. A single mountain lion's home range can vary from 25 to 300 square miles. A male's territory can encompass several females' home ranges, but rarely will it overlap that of another male. These cats need plenty of room.

Apart from figures, we know the mountain lion moves with the grace of a house cat and the power of a sprinter. It travels silently and, in the right terrain, is almost invisible. If you go into cougar country, you can bet a mountain lion will spot you before you spot it. Most often you'll have no idea you're being watched. These cats are ghosts in the hills.

Which is one reason we don't even know how many are out there. There is no annual mountain lion count, as there are for birds and bighorn sheep. Even with radio collars, it's hard to get an idea of lion populations. Everyone agrees that, in many parts of California, cougar numbers have increased considerably from an estimated low of 600 in 1970. Whether you call that growth an explosion or a return from depressed levels depends on your point of view.

Another thing we don't know: why a lion sometimes forgets its reclusive nature and attacks a human. We have theories, though. In California, one theory holds that they've lost their fear of us since we stopped shooting mountain lions for sport in the state. Yet half of all recorded attacks have occurred in British Columbia, where 200 lions, or 10% of the total population, are killed each year. The hunting-equals-fear theory doesn't seem to hold water.

A better theory is that the increase in both lion and human numbers in California has created an inevitable collision of cultures. While mountain lions have made an outstanding comeback, we humans have done even better, tripling our already-abundant population in the last 40 years. One has only to look at the Southern California hillsides covered with tract homes to see how the increased human population has affected former cougar habitat.

Another theory — one that fits in with habitat loss — is that most aggressive lions are juveniles recently pushed out of their mothers' home ranges. Unaccustomed to fending for themselves and unfamiliar with their new territories, they try out a variety of prey: calves and sheep in rural areas, house pets near towns, and sometimes children and small adults. Perhaps aggressive behavior can win them a territory of their own, and then they can go back to being shy and secretive.

It's those aggressive, young lions that we've been hearing a lot about lately. The debate over California's Proposition 197, the initiative to legalize mountain lion hunting, reveals how divided we are about these predators. I have mixed feelings about mountain lions, too. Part of me rages against shooting them. We've covered most of the canyon bottoms and hillsides in Southern California with houses and parking lots and shopping malls, and

pushed the big cats into the backcountry. I want to know that they're still out there, living their lives separate from us, mysterious in some way.

But another part of me knows that you can't have lions running around people's backyards. I don't quite buy the Sierra Club's approach: lots of pictures of lions in majestic poses or grooming their kittens. No bared fangs, no cats feeding on a kill — no blood. If it was my three-year-old son at risk, I would want to keep the lions away from the suburbs, too. Sometimes, we may need to kill a mountain lion.

Perhaps we can learn something from the Cahuilla on this score. Like everything else in their physical environment — plants, animals, rocks, mountains — the mountain lion had a spirit. The relationship between mountain lion and human was essentially a *social* one. If this sounds fuzzy-headed and romantic, then consider that the Cahuilla also seem to have killed mountain lions at every opportunity. That hunter who made the prayer to the mountain lion would come back later with a hunting party. If the lion was still around, they would kill it. For the Cahuilla, the mountain lion was a powerful animal; only very powerful hunters could kill one. They had to treat the mountain lion's body with respect as they dressed it and prepared to eat it. This was an act of *exchange* between human and lion.

We seem to have forgotten this — sometimes, you have to kill what you love and honor. This doesn't mean that I want sport hunters out killing mountain lions. The Cahuilla had a professional hunter class, and so do we: the Department of Fish and Game. Both sides in the Prop. 197 fight have charged the DFG with failure to protect the public from mountain lions. As with any public debate, the finger-pointing is mind-numbingly Machiavellian. But it's really quite simple: the Department of Fish and Game

has the authority to shoot or remove “problem” mountain lions, and they should be allowed to exercise that authority.

The real solution to the mountain lion problem, though, is to stop letting our cities sprawl out into mountain lion territory. Until we can do that, the idea that we can live in this state with its mountain lions and never kill one is naive. As long as humans and mountain lions compete for the same territory, there will be casualties on both sides.

In the morning, I eat breakfast sitting on the tan boulder where the mountain lion must have sat watching me. The perch is even closer to my tent than I had judged in the dark. I still feel like I’m being watched. But she’s probably long gone by now, holed up in some cave or under a rock overhang, waiting out the daylight. For me, the morning light is comforting. I feel like I’m back in control of things. I could say that the lion was just as scared of me as I was of her, but I don’t think that’s true. I remember the way she turned her head calmly from side to side as she perched above me on that rock, weighing the situation.

In all my desert travels, I’ve never had this feeling of confronting another being with a will of its own. I’ve seen thousands of birds, hundreds of jack rabbits and cottontails, now and then a coyote, once or twice a band of bighorn sheep — all of them flying, or jumping or running at the sight of me. Even the one or two rattlesnakes I’ve run across slithered off into the cactus at the first chance. From experiences like those, I could easily conclude that we humans stand at the top of a great chain of being. But last night’s encounter

shattered any illusions I might have had in that direction. The mountain lion wasn't frightened by my waving flashlight. A little confused by the strange object of the tent, maybe, but she was still in control of the situation. I knew absolutely that she had a will of her own, and she was confident in exercising it.

The Cahuilla called this quality power, but we have a different word for it: wild. It's a slippery word, with about as many meanings as there are people who use it. It has its roots in the idea of will. To me, a wild animal is one with enough power or will to shatter my illusion of always being in control.

As much as we've hunted, poisoned, tagged, collared and studied mountain lions, they still elude our grasp. As long as we don't cover all of their territory with houses and shopping malls, they'll still be out there, shocking us out of our complacency when we happen — or are lucky enough — to encounter them. I was frightened last night, but this morning I wouldn't trade the experience for a whole lifetime of safe deer-sightings.

I pack up, wash in the cold stream and head out, hopping over water-polished boulders. The canyon seems somehow more alive than it did yesterday evening. I feel more alive, too. Ahead, the palms of Borrego Palm Canyon are improbably green and tall in the morning light. It's only another mile back to the parking lot and my car. This place is too close to town to be a wilderness; it has too much history to be a wilderness. But despite those odds, I know I've been touched by something wild.