evergreen

Orientation

Common Reads

The Evergreen State College

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Gathering Moss

A Natural and Cultural History of Mosses

by

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Preface:
Seeing the World Through Moss-colored Glasses

My first conscious memory of "science" (or was it religion?) comes from my kindergarten class, which met in the old Grange Hall. We all ran to press our noses to the frosty windows when the first intoxicating flakes of snow began to fall. Miss Hopkins was too wise a teacher to try and hold back the excitement of five-year-olds on the occasion of the first snow, and out we went. In boots and mittens, we gathered around her in the soft swirl of white. From the deep pocket of her coat she took a magnifying glass. I'll never forget my first look at snowflakes through that lens, spangling the wooly sleeve of her navy blue coat like stars in a midnight sky. Magnified tenfold, the complexity and detail of a single snowflake took me completely by surprise. How could something as small and ordinary as snow be so perfectly beautiful? I couldn't stop looking. Even now, I remember the sense of possibility, of mystery that accompanied that first glimpse. For the first time, but not the last, I had the sense that there was more to the world than immediately met the eye. I looked out at the snow falling softly on the branches and rooftops with a new understanding, that every drift was made up of a universe of starry crystals. I was dazzled by what seemed a secret knowledge of snow.The lens and the snowflake, were an awakening, the beginning of seeing. It's the time when I first had an inkling that the already gorgeous world becomes even more beautiful the closer you look.

Learning to see mosses mingles with my first memory of a snowflake. Just at the limits of ordinary perception lies another level in the hierarchy of beauty, of leaves as tiny and perfectly ordered as a snowflake, of unseen lives complex and beautiful. All it takes is attention and knowing how to look. I've found mosses to be a vehicle for intimacy with the landscape, like a secret knowledge of the forest. This book is an invitation into that landscape.

Three decades after my first look at mosses, I almost always have my hand lens around my neck. Its cord tangles with the leather thong of my medicine bag, in metaphor and in reality. The knowledge I have of plants has come from many sources, from the plants themselves, from my training as a scientist, and from an intuitive affinity for the traditional knowledge of my Potawatomi heritage. Long before I went to university to learn their scientific names, I regarded plants as my teachers. In college, the two perspectives on the life of plants, subject and object, spirit and matter, tangled like the two cords around my neck. The way I was taught plant science pushed my traditional knowledge of plants to the margins. Writing this book has been a process of reclaiming that understanding, of giving it its rightful place.

Our stories from the oldest days tell about the time when all beings shared a common language-thrushes, trees, mosses, and humans. But that language has been long forgotten. So we learn each other's stories by looking, by watching each other's way of living. I want to tell the mosses' story, since their voices are little heard and we have much to learn from them. They have messages of consequence that need to be heard, the perspectives of species other than our own. The scientist within me wants to know about the life of mosses and science offers one powerful way to tell their story. But it's not enough. The story is also about relationship. We've spent a long time knowing each other, mosses and I. In telling their story, I've come to see the world through moss-colored glasses.

In indigenous ways of knowing, we say that a thing cannot be understood until it is ·known by all four aspects of our being: mind, body, emotion, and spirit. The scientific way of knowing relies only on empirical information from the world, gathered by body and interpreted by mind. In order to tell the mosses' story I need both approaches, objective and subjective. These essays intentionally give voice to both ways of knowing, letting matter and spirit walk companionably side by side. And sometimes even dance.

After four hours at 32,000 feet, I've finally succumbed to the stupor of a transcontinental flight. Between takeoff and landing, we are each in suspended animation, a pause between chapters of our lives. When we stare out the window into the sun's glare, the landscape is only a flat projection with mountain ranges reduced to wrinkles in the continental skin. Oblivious to our passage overhead, other stories are unfolding beneath us. Blackberries ripen in the August sun; a woman packs a suitcase and hesitates at her doorway; a letter is opened and the most surprising photograph slides from between the pages. But we are moving too fast and we are too far away; all the stories escape us, except our own. When I turn away from the window, the stories recede into the two- dimensional map of green and brown below. Like a trout disappearing into the shadow of an overhanging bank, leaving you staring at the flat surface of the water and wondering if you saw it at all.

I put on my newly acquired and still frustrating reading glasses and lament my middle-aged vision. The words on the page float in and out of focus. How is it possible that I can no longer see what was once so plain7 My fruitless strain to see what I know is right in front of me reminds me of my first trip into the Amazon rain forest. Our indigenous guides would patiently point out the iguana resting on a branch or the toucan looking down at us through the leaves. What was so obvious to their practiced eyes was nearly invisible to us. Without practice, we simply couldn't interpret the pattern of light and shadow as "iguana" and so it remained right before our eyes, frustratingly unseen.

We poor myopic humans, with neither the raptor's gift of long- distance acuity, nor the talents of a housefly for panoramic vision. However, with our big brains, we are at least aware of the limits of our vision. With a degree of humility rare in our species, we acknowledge there is much that we can't see, and so contrive remarkable ways to

observe the world. Infrared satellite imagery, optical telescopes, and the Hubbell space telescope bring vastness within our visual sphere. Electron microscopes let us wander the remote universe of our own cells. But at the middle scale, that of the unaided eye, our senses seem to be strangely dulled. With sophisticated technology, we strive to see what is beyond us, but are often blind to the myriad sparkling facets that lie so close at hand. We think we're *seeing* when we've only scratched the surface. Our acuity at this middle scale seems diminished, not by any failing of the eyes, but by the willingness of the mind. Has the power of our devices led us to distrust our unaided eyes? Or have we become dismissive of what takes no technology but only time and patience to perceive? Attentiveness alone can rival the most powerful magnifying lens.

I remember my first encounter with the North Pacific, at Rialto Beach on the Olympic Peninsula. As a landlocked botanist, I was anticipating my first glimpse of the ocean, craning my neck around every bend in the winding dirt road. We arrived in a dense gray fog that clung to the trees and beaded my hair with moisture. Had the skies been clear we would have seen only what we expected: rocky coast, lush forest, and the broad expanse of the sea. That day, the air was opaque and the backdrop of coastal hills was visible only when the spires of Sitka Spruce briefly emerged from the clouds. We knew the ocean's presence only by the deep roar of the surf, out beyond the tidepools. Strange, that at the edge of this immensity, the world had become very small, the fog obscuring all but the middle distance. All my pent-up desire to see the panorama of the coast became focussed on the only things that I could see, the beach and the surrounding tidepools.

Wandering in the grayness, we quickly lost sight of each other, my friends disappearing like ghosts in just a few steps. Our muffled voices knit us together, calling out the discovery of a perfect pebble, or the intact shell of a razor clam. I knew from poring over field guides in anticipation of the trip that we "should" see starfish in the tidepools, and this would be my first. The only starfish I'd ever seen was a dried one in a zoology class and I was eager to see them at home where they belonged. As I looked among the mussels and the limpets, I saw none. The tidepools were encrusted with barnacles and exotic-looking

algae, anemones, and chitons enough to satisfy the curiosity of a novice tidepooler. But no starfish. Picking my way over the rocks, I pocketed fragments of mussel shells the color of the moon, and tiny sculpted pieces of driftwood, looking continuously. No starfish. Disappointed, I straightened up from the pools to relieve the growing stiffness in my back, and suddenly-I saw one. Bright orange and clinging to a rock right before my eyes. And then it was as if a curtain had been pulled away and I saw them everywhere. Like stars revealing themselves one by one in a darkening summer night. Orange stars in the crevices of a black rock, speckled burgundy stars with outstretched arms, purple stars nestled together like a family huddled against the cold. In a cascade of discovery, the invisible was suddenly made visible.

A Cheyenne elder of my acquaintance once told me that the best way to find something is not to go looking for it. This is a hard concept for a scientist. But he said to watch out of the corner of your eye, open to possibility, and what you seek will be revealed. The revelation of suddenly seeing what I was blind to only moments before is a sublime experience for me. I can revisit those moments and still feel the surge of expansion. The boundaries between my world and the world of another being get pushed back with sudden clarity, an experience both humbling and joyful.

The sensation of sudden visual awareness is produced in part by the formation of a "search image" in the brain. In a complex visual landscape, the brain initially registers all the incoming data, without critical evaluation. Five orange arms in a starlike pattern, smooth black rock, light and shadow. All this is input, but the brain does not immediately interpret the data and convey their meaning to the conscious mind. Not until the pattern is repeated, with feedback from the conscious mind, do we know what we are seeing. It is in this way that animals become skilled detectors of their prey, by differentiating complex visual patterns into the particular configuration that means food. For example, some warblers are very successful predators when a certain caterpillar is at epidemic numbers, sufficiently abundant to produce a search image in the bird's brain. However, the very same insects may go undetected when their numbers are low. The neural pathways have to be trained by experience to process what is being seen. The synapses fire and the stars come out. The unseen is suddenly plain.

At the scale of a moss, walking through the woods as a six-foot human is a lot like flying over the continent at 32,000 feet. So far above the ground, and on our way to somewhere else, we run the risk of missing an entire realm which lies at our feet. Every day we pass over them without seeing. Mosses and other small beings issue an invitation to dwell for a time right at the limits of ordinary perception. All it requires of us is attentiveness. Look in a certain way and a whole new world can be revealed.

My former husband used to teasingly deride my passion for mosses, saying that mosses were just decoration. To him, mosses were merely the wallpaper of the forest, providing ambience for his photographs of trees. A carpet of mosses does in fact provide this lustrous green light. But, focus the lens on the mossy wallpaper itself and the green blur of the background resolves itself into sharp focus and an entirely new dimension appears. That wallpaper, which seemed at first glance to be of uniform weave, is in fact a complex tapestry, a brocaded surface of intricate pattern. The "moss" is many different mosses, of widely divergent forms. There are fronds like miniature ferns, wefts like ostrich plumes, and shining tufts like the silky hair of a baby. A close encounter with a mossy log always makes me think of entering a fantasy fabric shop. Its windows overflow with rich textures and colors that invite you closer to inspect the bolts of cloth arrayed before you. You can run your fingertips over a silky drape of *Plagiothecium* and finger the glossy *Brothere11a* brocade. There are dark wooly tufts of *Dicranum,* sheets of golden *Brachythecium,* and shining ribbons of *Mnium.* The yardage of nubbly brown *Ca11icladium* tweed is shot through with gilt threads of *Campylium.* To pass hurriedly by without looking is like walking by the Mona Lisa chatting on a cell phone, oblivious.

Draw closer to this carpet of green light and shadow, and slender branches form a leafy arbor over sturdy trunks, rain drips through the canopy, and scarlet mites roam over the leaves. The architecture of the surrounding forest is repeated in the form of the moss carpet, the fir forest and the moss forest mirroring each other. Let your focus shift to the scale of a dewdrop, the forest landscape now becomes the blurred wallpaper, only a backdrop to the distinctive moss microcosm.

Learning to see mosses is more like listening than looking. A cursory glance will not do it. Straining to hear a faraway voice or catch a nuance

in the quiet subtext of a conversation requires attentiveness, a filtering of all the noise, to catch the music. Mosses are not elevator music; they are the intertwined threads of a Beethoven quartet. You can look at mosses the way you can listen deeply to water running over rocks. The soothing sound of a stream has many voices, the soothing green of mosses likewise. Freeman House writes of stream sounds; there is the rushing tumble of the stream running over itself, the splashing against rocks. Then, with care and quiet, the individual tones can be discerned in the fugue of stream sound. The slip of water over a boulder, octaves above the deep tone of shifting gravel, the gurgle of the channel sluicing between rocks, the bell-like notes of a drop falling into a pool. So it is with looking at mosses. Slowing down and coming close, we see patterns emerge and expand out of the tangled tapestry threads. The threads are simultaneously distinct from the whole, and part of the whole.

Knowing the fractal geometry of an individual snowflake makes the winter landscape even more of a marvel. Knowing the mosses enriches our knowing of the world. I sense the change as I watch my bryology students learn to see the forest in a whole new way.

I teach bryology in the summer, wandering through the woods, sharing mosses. The first few days of the class are an adventure as my students start to distinguish one moss from another, first by naked eye and then by hand lens. I feel like a midwife to an awakening, when they first discern that a mossy rock is covered not with "moss" but with twenty different kinds of moss, each one with its own story.

On the trail and in the lab, I like to listen to my students talk. Day by day, their vocabulary stretches and they proudly refer to leafy green shoots as "gametophytes" and the little brown thingamajigs on top of the moss are dutifully referred to as "sporophytes." The upright, tufted mosses become "acrocarps," the horizontal fronds are "pleurocarps." Having words for these forms makes the differences between them so much more obvious. With words at your disposal, you can see more clearly. Finding the words is another step in learning to see.

Another dimension and another lexicon open when the students start putting the mosses under the microscope. Individual leaves are removed by painstaking dissection and placed on a glass slide for detailed examination. Magnified twenty-fold, the surfaces of the leaves are beautifully sculpted. The light shining brightly through single cells

illuminates their elegant shapes. Time can vanish in exploring these places, like wandering through an art gallery of unexpected forms and colors. Sometimes, I look up from my microscope at the end of an hour, and I'm taken aback at the plainness of the ordinary world, the drab and predictable shapes.

I find the language of microscopic description compelling in its clarity. The edge of a leaf is not simply uneven; there is a glossary of specific words for the appearance of a leaf margin: *dentate* for large, coarse teeth, *serrate* for a sawblade edge, *serrulate* if the teeth are fine and even, *ciliate* for a fringe along the edge. A leaf folded by accordion pleats is *plicate, complanate* when flattened as if squashed between two pages of a book. Every nuance of moss architecture has a word. The students exchange these words like the secret language of a fraternity, and I watch the bond between them grow. Having the words also creates an intimacy with the plant that speaks of careful observation. Even the surfaces of individual cells have their own descriptors-mammillose for a breast-like swelling, *papillose* for a little bump, and *pluripapillose* when there are enough bumps to look like chicken pox. While they may initially seem like arcane technical terms, these words have life to them. What better word for a thick, round shoot, swelling with water *thanjulaceous,*

Mosses are so little known by the general public that only a few have been given common names. Most are known solely by their scientific Latin names, a fact which discourages most people from attempting to identify them. But I like the scientific names, because they are as beautiful and intricate as the plants they name. Indulge yourself in the words, rhythmic and musical, rolling off your tongue: *Dolicathecia striate/la, Thuidium delicatulum, Barbu/a Jal/ax.*

Knowing mosses, however, does not require knowing their scientific names. The Latin words we give them are only arbitrary constructs. Often, when I encounter a new moss species and have yet to associate it with its official name, I give it a name which makes sense to me: green velvet, curly top, or red stem. The word is immaterial. What seems to me to be important is recognizing them, acknowledging their individuality. In indigenous ways of knowing, all beings are recognized as non-human persons, and all have their own names. It is a sign of respect to call a being by its name, and a sign of disrespect to ignore it. Words and

names are the ways we humans build relationship, not only with each other, but also with plants.

The word "moss" is commonly applied to plants which are not actually mosses. Reindeer "moss" is a lichen, Spanish "moss" is a flowering plant, sea "moss" is an alga, and club "moss" is a lycophyte. So what *is* a moss? A true moss or bryophyte is the most primitive of land plants. Mosses are often described by what they lack, in comparison to the more familiar higher plants. They lack flowers, fruits, and seeds and have no roots. They have no vascular system, no xylem and phloem to conduct water internally. They are the most simple of plants, and in their simplicity, elegant. With just a few rudimentary components of stem and leaf, evolution has produced some 22,000 species of moss worldwide. Each one is a variation on a theme, a unique creation designed for success in tiny niches in virtually every ecosystem.

Looking at mosses adds a depth and intimacy to knowing the forest. Walking in the woods, and discerning the presence of a species from fifty paces away, just by its color, connects me strongly to the place. That certain green, the way it catches the light, gives away its identity, like recognizing the walk of a friend before you can see their face. Just as you can pick out the voice of a loved one in the tumult of a noisy room, or spot your child's smile in a sea of faces, intimate connection allows recognition in an all-too-often anonymous world. This sense of connection arises from a special kind of discrimination, a search image that comes from a long time spent looking and listening. Intimacy gives us a different way of seeing, when visual acuity is not enough.

Teaching
Critical Thinking

Practical Wisdom

bell hooks

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"Human existence, because it came into being through asking questions, is at the root of change in the world. There is a radical element to existence, which is the radical act of asking questions... At root human existence involves surprise, questioning and risk. And because of all this, it involves actions and change."

—Paulo Freire
Learning to Question:
A Pedagogy of Liberation

Teaching 1

Critical Thinking

On the cover of my memoir *Bone Black* there is a snapshot of me taken when I was three or four. I am holding a toy made in vacation Bible school, a book shaped like a dove. I often joke that this picture could be called "a portrait of the intellectual as a young girl"—my version of *The Thinker*. The girl in the snapshot is looking intensely at the object in her hands; her brow a study in intense concentration. Staring at this picture, I can see her thinking. I can see her mind at work.

Thinking is an action. For all aspiring intellectuals, thoughts are the laboratory where one goes to pose questions and find answers, and the place where visions of theory and praxis come together. The heartbeat of critical thinking is the longing to know—to understand how life works. Children are organically predisposed to be critical thinkers. Across the boundaries of race, class, gender, and circumstance, children come into the world of wonder and language consumed with a desire for

knowledge. Sometimes they are so eager for knowledge that they become relentless interrogators—demanding to know the who, what, when, where, and why of life. Searching for answers, they learn almost instinctively how to think.

Sadly, children's passion for thinking often ends when they encounter a world that seeks to educate them for conformity and obedience only. Most children are taught early on that thinking is dangerous. Sadly, these children stop enjoying the process of thinking and start fearing the thinking mind. Wheth- er in homes with parents who teach via a model of discipline and punish that it is better to choose obedience over self-aware- ness and self-determination, or in schools where independent thinking is not acceptable behavior, most children in our nation learn to suppress the memory of thinking as a passionate, pleasurable activity.

By the time most students enter college classrooms, they have come to dread thinking. Those students who do not dread thinking often come to classes assuming that thinking will not be necessary, that all they will need to do is consume information and regurgitate it at the appropriate moments. In traditional higher education settings, students find themselves yet again in a world where independent thinking is not encouraged. Fortunately, there are some classrooms in which individual professors aim to educate as the practice of freedom. In these settings, thinking, and most especially critical thinking, is what matters.

Students do not become critical thinkers overnight. First, they must learn to embrace the joy and power of thinking itself. Engaged pedagogy is a teaching strategy that aims to restore students' will to think, and their will to be fully self-actualized. The central focus of engaged pedagogy is to enable students to think critically. In his essay "Critical Thinking: Why Is It So Hard to Teach?" Daniel Willingham says critical thinking consists

> of seeing both sides of an issue, being open to new evidence that disconfirms young ideas, reasoning

> dispassionately, demanding that claims be backed by evidence, deducing and inferring conclusions from available facts, solving problems, and so forth.

In simpler terms, critical thinking involves first discovering the who, what, when, where, and how of things—finding the answers to those eternal questions of the inquisitive child—and then utilizing that knowledge in a manner that enables you to determine what matters most. Educator Dennis Rader, author of *Teaching Redefined*, considers the capacity to determine "what is significant" central to the process of critical thinking. In their book *The Miniature Guide to Critical Thinking: Concepts and Tools*, Richard Paul and Linda Elder define critical thinking as "the art of analyzing and evaluating thinking with a view to improving it." They further define critical thinking as "self-directed, self-disciplined, self-monitored and self corrective." Thinking about thinking, or mindful thinking about ideas, is a necessary component of critical thinking. Paul and Elder remind us:

> Critical thinkers are clear as to the purpose at hand and the question at issue. They question information, conclusions and point of view. They strive to be clear, accurate, precise, and relevant. They seek to think beneath the surface, to be logical and fair. They apply these skills to their reading and writing as well as to their speaking and listening.

Critical thinking is an interactive process, one that demands participation on the part of teacher and students alike.

All of these definitions encompass the understanding that critical thinking requires discernment. It is a way of approaching ideas that aims to understand core, underlying truths, not simply that superficial truth that may be most obviously visible. One of the reasons deconstruction became such a rage in academic circles is that it urged people to think long, hard, and

critically; to unpack; to move beneath the surface; to work for knowledge. While many critical thinkers may find intellectual or academic fulfillment doing this work, that does not mean that students have universally and unequivocally embraced learning to think critically.

In fact, most students resist the critical thinking process; they are more comfortable with learning that allows them to remain passive. Critical thinking requires all participants in the classroom process to be engaged. Professors who work diligent- ly to teach critical thinking often become discouraged when students resist. Yet when the student does learn the skill of critical thinking (and it is usually the few and not the many who do learn) it is a truly rewarding experience for both parties. When I teach students to be critical thinkers, I hope to share by my example the pleasure of working with ideas, of thinking as an action.

Keeping an open mind is an essential requirement of critical thinking. I often talk about radical openness because it became clear to me, after years in academic settings, that it was far too easy to become attached to and protective of one's viewpoint, and to rule out other perspectives. So much academic training encourages teachers to assume that they must be "right" at all times. Instead, I propose that teachers must be open at all times, and we must be willing to acknowledge what we do not know. A radical commitment to openness maintains the integrity of the critical thinking process and its central role in education. This commitment requires much courage and imagination. In *From Critical Thinking to Argument* authors Sylvan Barnet and Hugo Bedau emphasize that, "Critical thinking requires us to use our imagination, seeing things from perspectives other than our own and envisioning the likely consequences of our position." Therefore, critical thinking does not simply place demands on students, it also requires teachers to show by example that learning in action means that not all of us can be right all the time, and that the shape of knowledge is constantly changing.

The most exciting aspect of critical thinking in the classroom is that it calls for initiative from everyone, actively inviting all students to think passionately and to share ideas in a passion- ate, open manner. When everyone in the classroom, teacher and students, recognizes that they are responsible for creating a learning community together, learning is at its most meaning- ful and useful. In such a community of learning there is no fail- ure. Everyone is participating and sharing whatever resource is needed at a given moment in time to ensure that we leave the classroom knowing that critical thinking empowers us.

Entries into the Forest

charles goodrich

Take Oregon 126 east out of Eugene, then turn upslope onto a gravel road and wind deep into the Cascade Mountains, and park. Follow a duff-covered path into a grove of old-growth conifers, and stand quietly amid the massive boles. Gaze up into the interlaced limbs of the canopy. With the moss-cushioned ground underfoot and the wavering shafts of afternoon sunlight overhead, you may feel yourself opening into a beautifully benign relationship with the forest. The towering scale, the earthy smells, the subtle sounds, the play of light on moss, lichen, fir needle, and fern will inform your whole being that you are in one of the most vivacious places on Earth. You will understand why such groves have been likened to cathedrals.

On the other hand, if you scramble off trail and bushwhack into the tangled understory, you may enter into a different sort of relationship: a wrestling match with the landscape. The terrain will be so steep you'll have to haul yourself uphill hand-over-hand, grasp- ing at vine maple or rhododendron or devil's club. The understory shrubs will be thick in your face, as will, in early summer, mosquitoes. Or if you've waited until fall to avoid the mosquitoes, it will be raining, or if isn't raining it will have recently been raining, and every leaf and branch will sop your boots, your clothing, your naked face.

In the absence of a trail, the forest can seem claustrophobic, disorienting, even maddening. Unless you have a powerful reason to continue—unless you're a hunter tracking a deer, say, or a timber cruiser marking a sale, or a scientist counting salal along a transect, or a poet searching for the genius of place—you will retreat to

the nearest road and look back over your shoulder as if you've survived a mugging. You will feel grateful for the human-made path, for the relatively few and far-between roads that wind through the topographic and vegetative jumble.

Trying to comprehend what these forests *mean* can be just as bewildering. We may intuit and celebrate the wholeness of the forest, but we know it in pieces and threads, by its species and cycles, its products and processes. We come to know the forest via the paths laid down in stories, stories told in anecdotes, photographs, essays, and poems, or in hypotheses, data, and graphs. All these stories are entries into the forest, paths that others have made and which we may follow, perhaps to discover new insights and entice others to enter too.

Throughout most of U.S. history, those entering the forest have done so to hunt, fish, or gather; to harvest timber; or to dig for minerals. Or to raze the forest to convert the land to farms and cities. Forest research is a more recent way of entry into the forest. Since 1948 the entire 15,800-acre watershed of Lookout Creek in the Oregon Cascade Range has been dedicated to the quest, not for lumber or fiber, but for knowledge. The H. J. Andrews Experimental Forest is a storied place among forest scientists. Research conducted here has been instrumental in discovering the unique subecosystems of the forest canopy, the role of dead wood in stream and forest ecosystems, the behavior and ecological role of the spotted owl and other animals, and the nature of old growth itself.

Among the scientists who have worked at the Andrews Forest, some have been especially aware of the importance of framing their efforts in compelling ways. Stream ecologist Jim Sedell, an early proponent for bringing creative writers to the Andrews, was known to ask his fellow researchers, "What's the story here?" It was a conversation between Sedell and writer and philosopher Kathleen Dean Moore that jump-started the creation of the Long-Term Ecological Reflections program.

Since its beginnings in 2003, the Reflections program has made it possible for creative writers—people for whom "What's the story?"

is a primary mode of investigation—to spend one to two weeks in residence at the Andrews Forest. They are invited to pursue their own original inquiries using the methods of the humanities—imagination, metaphor, direct experience, research—to follow paths both literal and metaphorical into the forest. Among the Andrews's ancient, moss-draped trees, its tree plantations after recent clear- cutting, its stream-swept gravel bars, and its hillsides scoured by fire, they are encouraged to walk, observe, reflect, and record their insights.

This book collects some of the best writings from the first dozen years of the Reflections program. In a diversity of forms, including essays, field notes, and poems, by a diverse range of writers—some of whom were trained as scientists, some who are professional writers, some who are both—these cultural data offer a fascinating record of some of the many ways we approach, experience, and understand the forest and the relation between people and the forest. The book, as Robin Kimmerer writes in these pages, is "a chronicle of the land, a witnessing of the world, understanding and wonder," perhaps even "a way to predict our impact on the land." It is, she adds, a way that might even "bring us . . . closer to saving what we love."

. . .

ATTENTION TO PLACE

Reflections is rooted in the belief that when people pay close attention to specific places, their study of place will reveal broad truths that go beyond that place. (As the New Zealand poet Brian Turner wrote during his residency at the Andrews, "remember / this place in other places.") Whether that attention is focused through the lens of science or of art, whether conveyed in the language of fact or of metaphor, there is wisdom to be gained, for the more we know about the natural world and the place of humans in the world, the greater our insight into how we ought to live our lives.

Like other residency programs, Reflections offers lots of un- structured time that allows writers to work on projects of their choice. But unlike most programs, Reflections also asks that each writer enter into the field to visit four sites in the forest, the "Reflections Plots"—a gravel bar created by a recent, major flood, the Log Decomposition Plot, a recent clear-cut,

and an experimental, selectively logged site.

The Andrews contains an intriguing variety of landscapes, from deep forest to open meadows and steep mountain streams. Also evident in the landscape are stream gauges, instrument towers, and the plastic flagging and homemade scientific apparatus cordially referred to as “researcher trash.” In fact, data constantly stream in from all over the forest in real time. With fiber-optic cables in the streams, and other remote sensing devices throughout the forest, researchers can gather data on hydrology, soundscape ecology, air flow dynamics, and other ecological processes 24/7, twelve months of the year. It’s a place where intense natural processes and fruitful human inquiry are conspicuously intertwined.

Therefore, as crucial as designated wilderness areas are to maintaining cultural and ecological resilience, this book is not a paean to wilderness or untouched nature. Instead, the writers who visit the Andrews Forest engage the many, complicated ways that humans alter nature, whether through forestry management or through the interventions of the science itself. They delve into the ambiguities between utilitarian and intrinsic values, and the paradoxes between ecological preservation and active management of a landscape. It’s our belief that creative writers and those who undertake other types of arts- and humanities-based inquires can be especially adept at bringing scientific information and insights into conversation with the complex emotional and cultural relationships that humans have with both wild and managed landscapes.

• • •

MULTIPLE WAYS OF KNOWING

Storytelling and poetry, observation and experiment, myth and mathematics are all authentic windows on the world. There is an unusual richness and joy in the community of the humanities and sciences, in the coming together of insights from many different perspectives and disciplines. Science can deeply and significantly enrich the work of creative writers, artists, and philosophers. Reciprocally, we need creative writing, philosophy, the visual arts, and the other humanities to deepen and enrich science. Creative use of language, concepts, and metaphors shape what we can see and imagine. Fresh

language and original metaphors can allow us to ask novel questions, conceive new ideas, propose innovative solutions, and bring the experienced world more vividly into the presence of others. Creative writers draw on the rich vocabulary and conceptual insights of science to help people understand and value the world. Scientists can learn to better communicate their ideas in stories that can become part of people's lives. In an effort to heal a damaged landscape, for example, science can recommend tree species to plant and strategies for water-quality improvements, but the causes of habitat degradation reside in the stories people tell themselves and others about their relationship with other creatures, with the processes of nature, and with the land. The long- term success of habitat restoration may depend on a "re-storying" of a community's relationship to its landscape by a process that weaves scientific and artistic elements into a compelling narrative for guiding cultural behavior.

Both research and humanities benefit by the sharing, inter- weaving, or "cross-fertilization" of ideas. As conservation biologist and writer Gary Paul Nabhan has observed, "Science, in and of it- self, is seldom enough to reshape public opinion. People have to feel some visceral connection to an issue to act upon it. . . . Artists and scientists . . . need cross-fertilization or else their isolated endeavors will atrophy, wither, or fall short of their aspirations." In rare cases this merging of artistic and technically grounded abilities occurs in individuals, people such as Rachel Carson, John Muir, and Aldo Leopold, who have had a profound impact on thought and action. Since relatively few people embody such multifaceted gifts, perhaps sustained, collective efforts among scientists, writers, and others can offer more than either can separately.

To these ends, Reflections encourages and facilitates opportunities for the resident writers to go into the field with Andrews researchers, offering the writers firsthand encounters with the science and introducing the scientists to the curiosity and insights of the writers. Each writer is taken on a guided, introductory field trip to the Reflections Plots and alerted to the extensive plot descriptions and research information on the Andrews Forest website. At the same time, we remind each writer that we are looking not for science journalism but for original, creative inquiry in the humanities. There are certain kinds of values, such as

beauty, surprise, awe, and humility, that both creative writers and scientists may experience and take inspiration from, but that are for the most part proscribed from scientists' professional communications. Creative writers may be able to give these values fuller expression. After Alison Hawthorne Deming went into the field with the spotted owl research crew, she wrote, "Beauty is what I came here for, a beauty enhanced, not diminished, by science. If I had only my senses to work with, how much thinner would be the experience. What a record we might have of the world's hidden beauty if field scientists and poets routinely spent time in one another's company."

21 April 1972: Dedication / Inauguration / Anti-War Protest

True to form, and setting a precedent for consequential intersections between "current events" and College business, the Dedication/Inauguration ceremony was visited by what Charles Teske in a recent recollection called "a crisis of public relations and political standing with members of the larger community around us":

> On Sunday evening, April 16, President Richard Nixon appeared on national television to announce that, in retaliation against fresh Viet Cong incursions in South Vietnam, he had ordered the resumption of the bombing of Hanoi and the new bombing of Haiphong. The high-altitude attacks by B-52 bombers flying from Guam had already begun. On Monday, April 17, the National Student Association asked for a Day of Moratorium – a nationwide strike of colleges and universities against the escalation of the War – on Friday, April 21, our day of Dedication/Inauguration.

Speaking at the ceremony, Washington State Governor Dan Evans (who in 1967 signed the legislation that established the College, and was to serve as the College's second president), made note of another chronological conjunction:

> I think it's a particularly appropriate date on which we meet here — tomorrow, April 22nd, is Earth Day, or it was a celebration of Earth Day of a couple of years ago and you remember the interest and the nationwide dedication to a quality environment and a better future for this country.

Acknowledging "the turmoil and the activism" by those "who have set out to reorder our priorities and to reorder society," Evans called on his contemporaries "to reach inward, to reach down and touch the troubled spirit of America."

Evans relates these insurgent endeavors to what he understood Evergreen to stand for:

> It is time to confront the issues of poverty and disease and human dignity, which lie beneath the violence that tears at every conscience just as it strikes fear in every in every heart. **But if Evergreen means anything, if it means anything to the faculty, and to the administration and to the student body, and if it means anything at all, to the citizens of this state, then I believe it must mean that the tackling of this unfinished agenda must be formed, that somehow and in some way what Evergreen does helps to replace helplessness with hope.**

Evans proceeds to slide the timeline forward, to imagine the future in overtly utopian terms, and to connect Evergreen to the realization of this vision of abundance, justice, and reconciliation:

> In 28 years, the millennium will have come again. The year 2000 will be here and those of you who are students at Evergreen today, will be my age — heaven forbid. [*audience*

> *laughter*] And I think the question you ought to ask yourselves today, and I hope it is being asked by many, is "what will I face then?" Do you ever really think about it, or do you ever really care? And I think the real question is not what it will be like in the year 2000, but "how can I make it what it should be?" in the year 2000, not for just myself, but for the entire community. **If Evergreen is to fulfill its commitment, it as an institution must dream not the small dreams, but the very large dreams.**
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> I hope by the year 2000 that education will be much more individualized and personalized than it is today, and that much of that education will occur in the community and not solely in the separate and sometimes rather isolated campuses of our colleges, universities, and even high schools.
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> I believe by the year 2000 these will be an extensive interchange of people, from one country and on continent to another, and throughout that exchange and through that better understanding at the person-to-person level perhaps we have the best single hope of reaching a peace that is lasting.
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> By the year 2000 we must have resolved the basic rights of each citizen of this nation to adequate medical care, adequate food and adequate housing for each citizen.
>
> But most of all by the year 2000, I hoped we have reached a society where success is not measured by the accumulation of material goods, but by how satisfying, how useful, and how personally rewarding a life becomes. [*applause*]

Evans continues:

> Some word got around, of this community, that I was going to participate in an unusual event today... [*chuckles, audience laughs*] William Unsoeld suggested that I rappel down the clock tower. [*audience laughter and applause*]

But in fact an even more improbable mode of locomotion was proposed:

> What is vastly more important is that you leave your mark on Evergreen. To President McCann, to students, to the faculty members of this college — today the potential for doing that is unlimited because **you have no footsteps to follow**. Tomorrow's generation will travel in your footsteps, **so I hope and trust that each of you will make these first steps innovative, and bold, and decisive, but most of all, make these first steps taken with a conviction that there is a future, that it is not preordained, but that it will be what we make it.** That must be the Evergreen challenge.

The Governor's remarks were followed by the installation of Charles McCann as Evergreen's first president.