

A TAPESTRY OF BROWNS AND GREENS

Nalini Nadkarni

The tapestry of life's story is woven with
the threads of life's ties, ever joining and breaking.

—*Rabindranath Tagore, Fireflies*

When I look closely at a hanging tapestry, I observe that the pathways of individual threads wend through warp and woof, each one unconnected to the other. Yet if I stand back and look at the whole tapestry, its intricate and beautiful patterns emerge. In a roomful of such carpets, I observe that those with the most compelling patterns are composed of individual threads that have the highest intensity and most contrasting of colors. When I reflect on the tapestry of my own half-century of life, I see that the threads that have provided the greatest amount of influence on how I understand nature and my place in it are those that came from the vividly mixed ethnic background of my Indian/Hindu and Brooklyn/Jewish parents, threads that set me somewhat apart from the mainstream culture of white middle-class America in which I was raised. Being myself composed of different-colored threads has allowed me to see the complexity of nature, and to communicate them to a wide range of audiences.

It was near midnight at 10105 Dickens Avenue in October of 1966. The sleeping bags of my sixth-grade girlfriends lay like spokes around the central coffee table. Martha Bunn, my best friend since we were seven years old, asked me: Nalini, what does it feel like to look so different from everyone else? I remember opening my eyes wide in the dark room at her question. I had no answer. Until then, I had not realized that I looked different from my white friends in the sleeping bags next to mine. But at that moment, I realized that my mixed heritage apparently did set me apart from others in my suburban Maryland neighborhood—at least from their perspectives. My father was a Hindu who emigrated from India in 1946 for his doctorate in pharmacology. My mother was raised as an Orthodox Jew by parents who had fled the pogroms of Russia in 1916, and who spoke Yiddish in their home in Brooklyn, New York. My parents met in graduate school, married, and moved to Bethesda, Maryland, where my father spent his career doing cancer research at the National Institute of Health.

The five Nadkarni kids were varying shades of brown. I was the third child, and was the darkest of the five, the most Indian in my facial features and body look. In contrast to other immigrant Indian families in the area, who seemed to assimilate into Western culture as quickly as possible, my parents made our home a “Little India.” They gave us all Indian names, which had meanings in Sanskrit: Saroj, lotus flower; Susheela, well-behaved; Nalini, water lily; Vinay, gentleness; Mohan, charmer. Even our dog and cats had Indian names: Tipu, Manya, Nisha. At dinnertime, we sat on the kitchen floor and ate Indian food with our fingers, my mom circling the six of us, doling out curry and vegetable bhaji. We slept on mattresses on the floor, just as my father had done in Thane, the small village of his birth.

Christmas morning brought neither a crèche nor presents from Santa, as it did for all of our school friends. Rather, the family gathered around our fireplace, bereft of Christmas regalia, while my parents read excerpts from writings of Jawaharlal Nehru and Mahatma Gandhi. Each month, we received a letter from my father’s bhataji, or family priest, with a dozen Indian stamps pasted in the corner of the odd-sized envelopes. Even unopened, these were redolent of sandalwood paste and prasad, the sweet powder he would distribute to each of us at the small alter of Ganesha, the god of good fortune and remover of obstacles. The little ivory carving of our family deity resided

on a bookshelf in the kitchen pantry, where we gathered if a family member were sick, or traveling, to give prayers for their health or safe journeys.

Our family found it very natural that that Ganesha sat right next to our Menorah, Haggadah, and Hebrew dictionary, objects that embodied my mother's religion. The image of our elephant-headed god was not at all a strange bedfellow to these three representations of Judaism, a faith that forbids any representation of God. Our two religions lived side by side, just as my sisters and I slept comfortably together on our floor-level mattresses. Although my mother's heritage was not as apparent as the Indian elements, Jewish traditions had a presence in our home. At Passover, we welcomed packages of honey cake and Matzoh from my maternal grandmother, our Bubby. These represented her acceptance of the marriage of her daughter, who had committed the unthinkable action of marrying outside the faith. Out of deference to her own parents, my mother had not told her mother that she was married until after I—the third child—was born, because of the shame it would bring to her family. Civil law at that time also worked against them. My parents were not able to legally marry in Washington D.C.—our nation's capital—because of the miscegenation laws that still ruled seventeen states. These forbade my dark-skinned Indian father—who was classified as a Negro—from marrying my white mother. They had to take a bus to New York and marry there to have their union be legal.

That initial awakening at Martha Bunn's slumber party, reinforced by my family history and the way we lived, made me aware that I was somehow different from others. But those deep cultural differences my family embodied did not create a conflict. Rather, they fostered something enriching, just as different-colored threads created the richness of Tagore's tapestry. It set the stage for the way I have come to view nature—not as consisting of monochromes, but rather as comprising many colors and textures, all necessary to creating a complex and resilient whole.

Nature As Protected and Protector

My early experiences provided me with two seemingly contradictory roles of nature. The natural world both needed protection and provided protection. Although my father was stern and authoritarian, he had a benevolent

attitude toward nature. On weekends, he tended our two-acre lot of garden and trees. I remember the care he showed when we transplanted saplings from one part of our yard to another, a near-reverent tenderness that I seldom saw in him. He made sure that the space surrounding each tree's young roots was big enough to absorb the shock of being uprooted. He would unfailingly water it afterward, to welcome it to its new environment. I liked to pat the soil in the handprints that he had lain down. His big handprint surrounded my little one in the dark soil beside the slender brown trunk that upheld the pliant limbs, so like mine, ready to grow. I have wondered if he saw himself in those transplanted trees, a fellow migrant from his small village in India to the culture of suburban America. Those actions gave me a strong ethic of protecting nature.

I learned also that the converse was true—nature protected me. The elm tree that stood outside my childhood home and tapped companionably on my bedroom window kept me company on scary, windy nights, assuring me that my favorite playmates—the trees that lined our driveway—awaited me outside to join them when daytime returned. Tree climbing was a near-daily pleasure for me. When I got home from school, I chose one of the eight maple trees that lined the driveway to climb for the afternoon. Those perches were refuges from the world of homework, chores, fights with siblings, and strict parental directives. I could look out across my home territory, check on the progress of squirrel nest constructions, and feel the strong limbs of the trees holding me up for as long as I wished. In my imagination, those treetop roosts became in turn a place to sequester Anne Frank, a sanctuary for injured birds, a refuge for wounded soldiers, and a rescue vessel in case of drastic emergency neighborhood flooding. It was my Ark, and modeled nature as a place of safety, a place that protected me and those I cared for.

Nature As an Object of Study

As with many children of immigrants, the strongest directive from our parents was to behave properly: to be obedient, respectful, and studious. Education had been the key element for the success of both of my parents, and they believed it would help us find our place in life. In the tradition of India, girls marry and go off to the family of their husbands, which requires large

dowries, rendering them more of a burden than a gift. As the third daughter in a family of two cultures that value sons over daughters, I worked hard to gather straight A's, played on three varsity sports teams, joined the Latin Scrabble Club, and implemented my own private After School Shakespeare Reading Project. This emphasis on academics created another thread—the use of the scientific process and the intellect—that I wove into my relationship with nature.

In college, I discovered the world of forest ecology through the lectures of Dr. Jon Waage, who carried out research on damselfly behavior. He posed seemingly narrow questions that later turned out to relate to much broader issues about competition and mutualism, and the evolution of life on Earth. Wrestling through the labyrinth of the scientific literature, I learned to trace citations to their sources and recognize the key players in a scientific discussion. I enjoyed the challenge of untangling the endless puzzles I encountered in nature. I entered graduate school in forest ecology at the University of Washington. I took a graduate level field course in tropical biology in Costa Rica. Whenever we struck out on a rainforest trail, my eyes went upward to the plants and animals that I saw in the treetops, located far from the reach of those who were stuck walking on the dark, damp forest floor. At that time, in 1979, almost no one had studied—or even climbed into—the forest canopy. Many of these tropical trees have unnervingly long straight trunks with no branches for one hundred feet, rendering my childhood tree-climbing skills useless. I learned mountain-climbing techniques to climb trees from Don Perry, an early pioneer of forest canopy access, and was on my way to making a niche for myself in the barely existing—but emerging—field of forest canopy studies.

It took some struggles with my graduate committee to help them understand that climbing trees could be serious science, rather than “Tarzan and Jane stuff,” as they called it. Eventually, they helped me carve out a dissertation project, a comparative study of the biomass held within the epiphytes—the plants that grow perched on tree branches and trunks. My fieldwork took place in the spectacular temperate rainforest of the Olympic National Park and the tropical cloud forests of Costa Rica. For four years I identified, marked, and tagged all the trees in study plots at both sites, and collected epiphyte samples to calculate their mass relative to the whole ecosystem.

In the more than twenty-five years that followed, I continued this academic approach to nature, collaborating with students and colleagues to produce scientific papers and scholarly books about canopy ecology. We have learned that treetop versions of traditionally terrestrial invertebrates—beetles, ants, springtails, and even earthworms—are found in this canopy-level soil. We documented that epiphytes intercept and retain considerable amounts of nitrogen from rain and mist. One study involved perching on platforms in trees for six hours each day, revealing the importance of these plants to arboreal animals. Thus, these little-known and structurally small plants that live their lives high above the forest floor are critical threads in the integrity of the complex tapestry of rainforests.

Learning from Many Sources

During my academic appointments at the University of California at Santa Barbara and The Evergreen State College in Olympia, Washington, I immersed myself in the academic approach to understanding nature. I received scientific grants, carried out fieldwork, gave talks at meetings, and published scientific papers, just as my peers did. However, I soon sensed that this world of the ivory towers was incomplete, recognizing that the growing distance between scientists and non-scientists, and the widening gaps between humans and nature were two grave societal problems that most scientists did not seem to address. I found myself compelled to reach out to sources of information outside of academia that seemed equally valid to those inside it—sources recognized the medical, recreational, aesthetic, and religious values of nature.

In 2000, I set out to understand the multiple values of trees and to link these with public audiences outside of academia. I began by speaking to classes of medical students about the relationships between trees and human health. I presented examples of the many medicinal products that are derived from trees. For example, the bark of the Pacific Yew tree (*Taxus brevifolia*) contains taxol, an enormously effective anticancer compound. Trees also reduce stress in psychological ways. In the early 1990s, Dr. Roger Ulrich published studies showing that patients who had a view of a tree outside their window recovered more quickly and with fewer complications than patients

having the same operation whose views were concrete walls. These studies have since been applied to hospital design, and several companies provide artificial tree scenery consisting of backlit panels hung on walls and ceilings of examining rooms. Thus, the many health values of trees can be woven into the tapestry that describes the total significance of trees.

Urban youth is a segment of the population that can be hard to educate about the importance of nature. To connect young people from the inner city with science and natural ecosystems, I engaged a young rapper named C.A.U.T.I.O.N. to interact with field scientists—a marine biologist, a forest ecologist, and an entomologist—along with thirty middle school children from Tacoma, Washington. Each day included field time—with the rapper singing about the trees, clams, and bugs we encountered—and sound studio time—when the students made up their own rap songs about their field experiences. At the end of the week, the children had cut their own CD, which they presented to their families and peers. Their insights also served to open my eyes to the many colors of nature that they saw with fresh eyes in the familiar forest of my own college campus.

The element of formal religion is a powerful force in our society, but one which generally has a low profile in academia. Perhaps communicating how people of different faiths describe trees in their own holy texts and in their own places of worship would inspire its followers to be better stewards of forest ecosystems. To test this, I developed a sermon about trees and spirituality that I offered to deliver in churches, synagogues, and temples. This required that I consider multiple religions without judgment, just as Ganesha and the Menorah sat side-by-side on my family's home altar. For several months before taking the pulpit, I acquainted myself with the tone and practice of each group by attending their services as a guest. I offered clergy my sermon, not as a scholar of religious studies nor as a particularly religious person myself, but rather as a scientist interested in understanding trees with my intellect, and as a human being who cares about forests.

The twenty-two congregations I addressed ranged from fundamentalist to progressive, and included Episcopalians, Baptists, Unitarians, Zen Buddhists, Jews (Conservative and Reform), Catholics, Methodists, and interfaith organizations. My source materials came from the Bible, the Talmud, the Qu'ran, as well as Hindu and Buddhist scriptures. Congregants listened

attentively, participated in discussions after the sermon, suggested texts and hymns that I had overlooked, and passed me on to other churches. On one occasion, I spoke from the *bima* (meaning “high place,” the raised platform from which the holy scripture, the Torah, is read) of the Jewish synagogue in Olympia, Washington. Something of my mother’s teachings about the holidays, coupled with the memory of those packages from my Bubby, made me feel a connection to the sounds and smells of the synagogue. I spoke to the congregants about links between trees, spirituality, and Judaism, and suggested that the holiday of Tu B’Shvat exemplified the relationship between humans and trees. It began by the Torah’s requirement that farmers must give a tenth of all crops grown to the priests of the Holy Temple; Tu B’Shvat marked the date when those taxes were tallied. Gradually, the holiday became a day of celebration of trees, and of Jews’ connections to nature. The day is celebrated with tree-planting ceremonies, and through these actions, modern Jews affirm a future filled with fruit, shade, and beauty for their children.

I also spoke about the role of trees in the Hindu religion in the places of worship I visited, drawing from the teachings of my father. The early inhabitants of India perceived a godly element in places of natural beauty, especially in trees. Centuries ago, many villages set apart sacred land for the “tree spirits,” or *vanadevatas*. Would-be parents propitiated the spirits by tying toy cradles to the branches of those trees. Damage to the sacred grove, especially the felling of a tree, might invite the wrath of the local deity, causing disease or the failure of crops. Over the centuries, spiritual beliefs have been the prime force that preserved these groves into modern times. In many areas, they are the last remaining threads of native, wild biological diversity in a country of one billion people.

Over the past ten years of this type of outreach to non-traditional audiences, I have learned much more about trees than what came from ecology lectures and the tomes that fill library stacks. Science is a domineering force if you choose to take it on, often leaving little room for the dream works of a Mary Oliver or the quiet prayers of a Buddhist monk. I reflect on the affinity between trees and people, the word affinity from the Latin word *affinis*, which indicates a relation by marriage. Although we are not of the same family, we can consider ourselves as being married into each others’ families,

with the challenges, responsibilities, and benefits that come with being so linked. I have found that I must do more than simply carry out another experiment, get another grant, and write another scientific paper to complete my relationship with nature.

Trees and My Own Spirituality

Although the opportunities I have been offered have been numerous and positive, there have been times in my adult life when I have encountered dark colors. Some of the murky times may have been a consequence of my mixed background. Did they stem from struggles to prove myself to my parents and the bigger world? Did I need to show myself and others that a small brown woman is as worthy—or more than worthy—of opportunities as a large white person? Whatever the cause, there have been times when I have misplaced my sense of self, when I have not heard my own voice, when I have nearly drowned in a place of no light.

During those times, I found spiritual solace and guidance by looking to trees and other representatives of nature. One of the most basic ways to gain—or regain—my sense of self was through meditation and conscious breathing, and this, I realized, is also linked to trees. The word spirit is derived from the Latin word, *spirare*, to breathe, the same root for spirituality, inspire, and expire. Although trees do not have lungs or gills as animals do, they breathe. Day and night, plants respire, taking in oxygen and releasing carbon dioxide, which provides energy for growth. They also harvest energy from sunlight, convert it into sugars, and replenish our oxygen supply. Because of the complementary way in which these gases are exchanged, every leaf becomes a connector among living things. Knowing this, in those dark times, I could merely look out at the maple tree in our backyard and be reminded that I am connected to other living things.

Many humans have a sense of spirituality, an awareness that we are linked to something larger than ourselves. Cosmologists have conceptualized the axis mundi, or the central universal pivot of the entire cosmos, portrayed as the imaginary line that links heaven to earth. The Tree of Life and the Tree of the Knowledge of Good and Evil are introduced in the very first book of the Old Testament. Buddha achieved enlightenment as he sat under the

spreading limbs of the Bodhi tree, breathing in and breathing out in silence, as does a tree. On one Sunday when I was visiting churches on my trees and spirituality project, I arrived a bit late to the Westwood Baptist Church in Olympia, and slipped into the back pew to listen. The pastor was speaking on the need for all of us to find an entity that will protect us, and hold us in his arms to help us feel secure when we are frightened, and safe when there is danger around us, helping us to find calm in our lives. I was amazed and pleased that the pastor would include a description of trees and their spiritual benefit to humans in his sermon. I recalled a line from a William Stafford poem: “I rock high in the oak—secure, big branches—at home while darkness comes.” It was only at the end of his sermon that I realized he was talking not about trees at all, but about Jesus. I realized that he and his flock view Jesus the way I view trees, as entities who hold us in their strong limbs and protect us.

Protecting Trees - Redux

This distance between humans and nature is particularly apparent in certain segments of society, and I describe here one project—involving prisons and prisoners—that has addressed the closing of that gap. Prisons epitomize perhaps the most severe endpoint of humans inhabiting built environments without nature. In 2004, I initiated a project to both resolve a pressing environmental issue in the Pacific Northwest—harvesting mosses for the horticulture trade—and bringing together nature with humans who have been denied contact with it. The environmental issue of unsustainable moss-collecting motivated me to begin. The collection of moss from forests in the Pacific Northwest is a growing industry for the horticultural and florist trade. Since 2000, the moss industry has grown rapidly, reaching an economic value of over \$260 million in 2005. This has raised concern among ecologists, because canopy-dwelling mosses fill important ecosystem roles, in nutrient capture and in providing resources for wildlife. When moss communities are disturbed or removed, however, they take decades to regrow, so stripping mosses from trees is not sustainable. This prompted me to learn how to “farm” them in non-forest conditions to reduce collecting pressure.

Unfortunately, methods for moss growing in greenhouses had not yet

been developed. While considering how such methods might be developed, a time- and energy-consuming project, I was reminded of a study by horticultural therapists which found that gardening can be beneficial for incarcerated persons. As a result, I initiated the Sustainable Prisons Project at Cedar Creek Correctional Center, a local prison, to help solve the problem of the non-sustainability of moss harvesting, working with prisoners as partners in exploring ways to best cultivate moss. We used wild moss collected by my students with permits as “seed material.” Our questions were basic: Which species should we use? How much water and nutrients do mosses need? What substrate should we use? We gave each inmate a notebook and pencil to write observations. They quickly learned to identify common moss species, using their scientific names; contrived ways to deliver water with tubing and hardware clamps; and learned how and why to retrieve randomized subsets of mosses for our moss-growth measurements. Prisoners observed and recorded the vigor of moss samples, which we then weighed to quantify growth rates. After eighteen months, the results of the project were dramatic. The corrections center staff were astonished at the energy, interest, and patience the participants exhibited. Several of the inmates found training in the horticulture field after they were released. As an outgrowth, I launched an in-prison lecture series called “Sustainable Living—Sustainable Lives,” in which visiting lecturers from regional universities delivered talks on sustainability and natural history to inmates and prison staff. Participating researchers gained a sense of satisfaction and accomplishment in communicating to an audience that proved to be attentive. This experience reinforced the concept that all voices, all approaches, and all types of people can contribute to keeping the great tapestry of nature intact.

Reflections

In my childhood, I saw trees as my protectors, my refuge from the periodically confusing and chaotic atmosphere of our family. Following my parents’ expectations and my own proclivity to participate in the intellectual world, I jumped into academia and became part of that tribe; approaching the mysteries of nature as puzzles to decipher with experiments and statistics. Frustrated at not being able to disseminate what I had learned from nature

to non-scientists, I explored partnerships that would link my values of trees and nature to the values of others. I moved into the worlds of spirituality and realized that, at times, understanding comes from being open to things I cannot measure. Finally, and in a continuing way, I have moved toward forest conservation, becoming a protector of trees and nature.

What has fueled this journey, which has taken me from the ivory towers of academia to the watchtowers of prison yards? Having a hybrid background allowed me to “see” nature and my connections to it in complex ways, a gift and consequence of my brown skin and my mixed upbringing. It has compelled me to look outside my own discipline to fully understand what I am curious about. The strong colors of the Indian culture of my father and the vibrant hues of the urban Jewish culture of my mother mixed but did not merge. They coexisted, retaining their own purity, and complemented rather than conflicted with each other. This allowed me to see multiplicity in everything around me: the subtle differences between species niches in forest canopies; the multiple values that trees provide humans; and the many valid ways that people come to understand nature and the world. I now see nature as a precious and multicolored tapestry, which has made me mindful about protecting its intricate patterns from raveling, fading, vanishing.