

### Nature-Deficit Disorder

The overarching importance of this research combined with our knowledge of other changes in the culture demands a shorthand description. So, for now, let's call the phenomenon *nature-deficit disorder*. Our culture is so top-heavy with jargon, so dependent on the illness model, that I hesitate to introduce this term. Perhaps a more appropriate definition will emerge as the scientific research continues. And, as mentioned earlier, I am not suggesting that this term represents an existing medical diagnosis. But when I talk about nature-deficit disorder with groups of parents and educators, the meaning of the phrase is clear. Nature-deficit disorder describes the human costs of alienation from nature, among them: diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses. The disorder can be detected in individuals, families, and communities. Nature deficit can even change human behavior in cities, which could ultimately affect their design, since long-standing studies show a relationship between the absence, or inaccessibility, of parks and open space with high crime rates, depression, and other urban maladies.

As the following chapters explain, nature-deficit disorder can be recognized and reversed, individually and culturally. But deficit is only one side of the coin. The other is natural abundance. By weighing the consequences of the disorder, we also can become more aware of how blessed our children can be—biologically, cognitively, and spiritually—through positive physical connection to nature. Indeed, the new research focuses not so much on what is lost when nature fades, but on what is gained in the presence of the natural world. “There is a great need to educate parents about this research—to awaken or inspire the parents’ pleasure with nature play—as the necessary context for continued nature experiences for their children,” says Louise Chawla.

Such knowledge may inspire us to choose a different path, one that leads to a nature-child reunion.

## PART II

# WHY THE YOUNG (AND THE REST OF US) NEED NATURE

*Those who contemplate the beauty of the earth  
find reserves of strength that will endure as long as life lasts.*

—RACHEL CARSON

*From wonder into wonder existence opens.*

—LAO-TZU

#### 4. Climbing the Tree of Health

*I bet I can live to a hundred if only I can get outdoors again.*

—GERALDINE PAGE AS CARRIE WATTS, IN *The Trip to Bountiful*

ELAINE BROOKS'S GRAY HAIR WAS wound around her head in a great nest. A pencil was stuck through the bun to hold it up. Climbing a hill, she passed quietly through a stand of native vegetation: black sage, laurel leaf sumac, and wild morning glories. She trailed her fingers through non-native species—exotic invaders, she called them—such as oxalis, with yellow blooms that mirror the sun. She enjoyed a special relationship with this stretch of forgotten land. She brought to mind writer Annie Dillard's words about needing to “explore the neighborhood, view the landscape, to discover at least where it is that we have been so startlingly set down, if we can't learn why.”

“You know, in three years coming to this open space, I have never seen kids playing here, except on the bike path,” said Brooks. She bent to touch a leaf that looked like the paw of a slender cat. “The native lupine is a nitrogen fixer,” she explained. “The roots house their own foreign invader—bacteria—which collect nitrogen from air in the soil and transform it into a modified nitrogen that plants need.” Some lichens, a complex organism of symbiotic fungi and algae, also feed nitrogen to their neighbors and can live for more than a century.

When land like this is graded, lupine and lichen are destroyed, along

with the ecosystems they support. Plants live together, she said, and they die together.

For years, as a community-college teacher, she brought her students here to expose them to the nature many of them had never experienced. She taught them that land shapes us more than we shape land, until there is no more land to shape.

She haunted these thirty acres of lost La Jolla, and filled fifteen notebooks with pressed plants, rainfall measurements, and observations of the species that live here. An island of grass, succulents, and cacti, this is one of the last places in California where true coastal sage and a variety of other rare native plants can still be found so close to the ocean. Not that anyone planned it this way. In the early 1900s, a light-rail line ran through the patch of wildness, but its tracks were abandoned and pulled up. The land waited. Then in the late 1950s, the city set the corridor aside, assigning to it the forgettable name of Fay Avenue Extension. The plan was to build a major street through this part of the city. But the idea faded. And for nearly half a century, as the town boomed around it, the parcel was forgotten — except for the creation of an asphalt bike path that covers the ghost rail line.

Wearing jeans, a frayed flannel shirt, and hiking boots, Brooks stood in a field of wild onions, prickly pear, and native nightshade. The pleasant scent of licorice arrived from a patch of Mediterranean fennel, first brought to California by pioneers in the 1800s and used as a condiment. Wild oats, also an exotic, towered over most of the desert-designed native plants, which clung to the earth. If you're a plant in this environment, it's safer to keep your head down. "Look here, at the native blue dicks," she exclaimed, pointing to violet, long-stemmed flowers next to wild chrysanthemums. The last, while not native, are as familiar as grinning daisies. It's hard to dislike them.

One wonders: Why would anyone spend so many hours and days in what amounts to a big vacant lot?

One answer is that Brooks was a throwback, a rarity in her profes-

sion. In the 1940s and 1950s, the study of natural history — an intimate science predicated on the time-consuming collection and naming of life-forms — gave way to microbiology, theoretical and commercial. Much the same thing happened to the conservation movement, which shifted from local preservationists with soil on their shoes to environmental lawyers in Washington, D.C. Brooks was uncomfortable in either environmental camp. For years, she worked at the Scripps Institution of Oceanography as a biologist and oceanographer. She became a plankton expert.

She liked teaching better. She believed — as do many Americans — that she should pass along her love of nature. Plus, teaching at the community-college level afforded her the time she needed to know these hills and fields. No one paid her to study this land, but no one said she couldn't.

Brooks was a throwback in another way. The admirable vogue in ecology is to focus on preserving networks of natural corridors, rather than isolated islands of life, which are usually deemed beyond saving. In principle, she agreed with that philosophy. But as Elaine Brooks believed, isolated patches of wild land are valuable to know, as are isolated people.

These islands of nature are most important for the young who live in surrounding or adjacent neighborhoods. She pointed to the scars of a bulldozer that came through years ago. Despite what developers will tell you about restoration, she said, once a piece of land is graded, the biologic organisms and understructure of the soil are destroyed. "No one knows how to easily re-create that, short of years of hand-weeding. Leaving land alone doesn't work; the natives are overwhelmed by the invaders." Spot bulldozing is common across the county, even on land that is supposedly protected. "Much of this destruction is done out of expediency and ignorance," she said. She believed people are unlikely to value what they cannot name. "One of my students told me that every time she learns the name of a plant, she feels as if she is meeting someone new. Giving a name to something is a way of knowing it."

She trotted down a narrow footpath and then over a rise. A red-tailed hawk circled above. On a slope ahead, rivulets of fire-retardant, non-native ice plant had turned into a flood and would soon cover the hillside. But clusters of native agave—a cactus-like succulent from which tequila is made—made their stand. The agave blooms once in its long life; it grows for two decades or more and then in a final burst of energy shoots up a single, trembling flower stalk that can be up to twenty feet high. At dusk, bats dance in the air around it and carry pollen to other flowering agave.

Brooks stopped below a small hillside covered with original native bunch grass, a species that dates from pre-Spanish California, from a time before cattle were introduced. Just as tall-grass prairie once covered the Great Plains states, bunch grass carpeted much of Southern California. (In the Great Plains, botanists can still encounter remnants of tall-grass prairie in deserted pioneer graveyards.) There is something fine about touching this grass, in knowing it.

### The Ghosts of Fay Avenue Extension

As we continued our walk through Fay Avenue Extension, Brooks made her way to the highest knoll. From here she had a view of the Pacific Ocean. She often sat alone on this elevation, inhaling the nature and the long view. “One day I caught a movement out of the corner of my eye. A tiny brown frog was sitting on a bush next to me. I said, ‘What are you doing here?’”

Sometimes, as she sat here, she imagined herself as her own distant ancestor: One step ahead of something large and hungry, she had leaped into branches and shinned up a tall tree. At these times she looked out over the rooftops toward the sea, but did not, she said, see the cityscape. She saw savanna—the rolling, feminine, harsh yet nurturing plains of Africa. She felt her breath slow and her heart ease.

“Once our ancestors climbed high in that tree, there was something about looking out over the land—something that healed us quickly,”

child Brooks. Resting in those high branches may have provided a rapid comedown from the adrenaline rush of being potential prey.

“Biologically, we have not changed. We are still programmed to fight or flee large animals. Genetically, we are essentially the same creatures as we were at the beginning. We are still hunters and gatherers. Our ancestors couldn’t outrun a lion, but we did have wits. We knew how to kill, yes, but we also knew how to run and climb—and how to use the environment to recover our wits.”

Today, we find ourselves continually on the alert, chased by an unending stampede of two-thousand-pound automobiles and four-thousand-pound SUVs. Even inside our homes the assault continues, with unsettling, threatening images charging through the television cable into our living rooms and bedrooms. At the same time, the urban and suburban landscape is rapidly being stripped of its peace-inducing elements.

A widening circle of researchers believes that the loss of natural habitat, or the disconnection from nature even when it is available, has enormous implications for human health and child development. They say the quality of exposure to nature affects our health at an almost cellular level.

Brooks taught her students about the ecology of vacant lots through the lens of “biophilia,” the hypothesis of Harvard University scientist and Pulitzer Prize-winning author Edward O. Wilson. Wilson defines biophilia as “the urge to affiliate with other forms of life.” He and his colleagues argue that humans have an innate affinity for the natural world, probably a biologically based need integral to our development as individuals. The biophilia theory, though not universally embraced by biologists, is supported by a decade of research that reveals how strongly and positively people respond to open, grassy landscapes, scattered stands of trees, meadows, water, winding trails, and elevated views.

At the cutting edge of this frontier, added to the older foundation of ecological psychology, is the relatively new interdisciplinary field of

ecopsychology. The term gained currency in 1992, through the writing of historian and social critic Theodore Roszak. In his book *Voice of the Earth*, Roszak argued that modern psychology has split the inner life from the outer life, and that we have repressed our “ecological unconscious” that provides “our connection to our evolution on earth.” In recent years, the meaning of the term “ecopsychology” has evolved to include nature therapy, which asks not only what we do to the earth, but what the earth does for us—for our health. Roszak considers that a logical extension of his original thesis.

As he points out, the American Psychiatric Association lists more than three hundred mental diseases in its *Diagnostic and Statistical Manual*, a large number of them associated with sexual dysfunction. “Psychotherapists have exhaustively analyzed every form of dysfunctional family and social relations, but ‘dysfunctional environmental relations’ does not exist even as a concept,” he says. The *Diagnostic and Statistical Manual* “defines ‘separation anxiety disorder’ as ‘excessive anxiety concerning separation from home and from those to whom the individual is attached.’ But no separation is more pervasive in this Age of Anxiety than our disconnection from the natural world.” It’s time, he says, “for an environmentally based definition of mental health.”

Ecopsychology and all of its budding branches, reinforcing Wilson’s biophilia hypothesis, have fueled a new surge of research into the impact of nature on human physical and emotional health. Professor Chawla, the international expert on urban children and nature, is skeptical about some of the claims made in the name of biophilia, but she also argues that one does not have to adopt unreservedly the entire thesis to believe that Edward O. Wilson and the ecopsychology movement are on to something. She calls for a common-sense approach, one that recognizes “the positive effects of involvement with nature on health, concentration, creative play, and a developing bond with the natural world that can form a foundation for environmental stewardship.”

The idea that natural landscapes, or at least gardens, can be thera-

peutic and restorative is, in fact, an ancient one that has filtered down through the ages. Over two thousand years ago, Chinese Taoists created gardens and greenhouses they believed to be beneficial for health. By 1699, the book *English Gardener* advised the reader to spend “spare time in the garden, either digging, setting out, or weeding; there is no better way to preserve your health.”

In America, mental-health pioneer Dr. Benjamin Rush (a signer of the American Declaration of Independence) declared, “digging in the soil has a curative effect on the mentally ill.” Beginning in the 1870s, the Quakers’ Friends Hospital in Pennsylvania used acres of natural landscape and a greenhouse as part of its treatment of mental illness. During World War II, psychiatry pioneer Carl Menninger led a horticulture therapy movement in the Veterans Administration Hospital System. In the 1950s, a wider movement emerged, one that recognized the therapeutic benefits of gardening for people with chronic illnesses. In 1955, Michigan State University awarded the first graduate degree in horticultural/occupational therapy. And in 1971, Kansas State University established the first horticultural therapy degree curriculum.

Today, pet therapy has joined horticultural therapy as an accepted health-care approach, particularly for the elderly and children. For example, research has shown that subjects experienced significant decreases in blood pressure simply by watching fish in an aquarium. Other reports link pet ownership to a lowering of high blood pressure and improved survival after heart attacks. The mortality rate of heart-disease patients with pets was found to be one-third that of patients without pets. Aaron Katcher, a psychiatrist on the faculty of the University of Pennsylvania’s Schools of Medicine, Dentistry, and Veterinary Medicine, has spent over a decade investigating how social relationships between human beings and other animals influence human health and behavior. Katcher and Gregory Wilkins, an expert on animal-facilitated therapy in residential treatment centers, tell of an autistic child who

spent several sessions with passive dogs before encountering Buster, a hyperactive adolescent dog brought from a local animal shelter. At first the autistic child ignored the dogs—but at a later session, “without any other change in regimen, the patient eagerly ran into the therapy room and within minutes said his first new words in six months: ‘Buster Sit!’” The child learned to play ball with Buster and give him food rewards—and also learned to seek out Buster for comfort.

The evidence of the therapeutic value of gardens and pets is persuasive. What do we know, though, about the next step—the influence of unstructured natural landscapes and experiences in nature on human development and health? Poets and shamans have recognized that link for millennia, but science began to explore it relatively recently.

Most of the new evidence connecting nature to well-being and restoration focuses on adults. In the *American Journal of Preventive Medicine*, Howard Frumkin, M.D., chairman of the Department of Environmental and Occupational Health at Emory University’s School of Public Health, wrote that he considered this a mostly overlooked field in modern medicine, even though many studies credit exposure to plants or nature with speeding up recovery time from injury. Frumkin pointed to a ten-year study of gallbladder surgery patients, comparing those who recovered in rooms facing a grove of trees to those in rooms with a view of a brick wall; the patients with the view of trees went home sooner. Perhaps not unexpectedly, research revealed Michigan prison inmates whose cells faced a prison courtyard had 24 percent more illnesses than those whose cells had a view of farmland. In a similar vein, Roger Ulrich, a Texas A&M researcher, has shown that people who watch images of natural landscape after a stressful experience calm markedly in only five minutes: their muscle tension, pulse, and skin-conductance readings plummet.

Gordon Orians, professor emeritus of zoology at the University of Washington, says such research suggests that our visual environment profoundly affects our physical and mental well-being, and that modern humans need to understand the importance of what he calls

“ghosts,” the evolutionary remnants of past experience hard-wired into a species’ nervous system.

The childhood link between outdoor activity and physical health seems clear, but the relationship is complex. The Centers for Disease Control (CDC) reports that the number of overweight adult Americans increased over 60 percent between 1991 and 2000. According to CDC data, the U.S. population of overweight children between ages two and five increased by almost 36 percent from 1989 to 1999. At that time, two out of ten of America’s children were clinically obese—four times the percentage of childhood obesity reported in the late 1960s. Approximately 60 percent of obese children ages five to ten have at least one cardiovascular disease risk factor, while the *Journal of the American Medical Association* reported an upward trend in high blood pressure in children ages eight to eighteen.

Because of this fundamental concern, pediatricians now warn that today’s children may be the first generation of Americans since World War II to die at an earlier age than their parents. While children in many parts of the world endure hunger and famine, the World Health Organization warns that the sedentary lifestyle is also a global public health problem; inactivity is seen as a major risk factor in noncommunicable diseases, which cause 60 percent of global deaths and 47 percent of the burden of disease.

In addition to possible links between child obesity and various genetic complexities, a common virus, and even sleep deprivation, the current debate circles two obvious contributors: First, television and junk food are linked to child obesity. The CDC found that the amount of TV that children watch directly correlates with measures of their body fat. In the United States, children ages six to eleven spend about thirty hours a week looking at a TV or computer monitor. Medical researchers in Seattle found that by three months, about 40 percent of children regularly watched TV, DVDs, or other videos. The second factor: More exercise would help.

But what kind of exercise, and where? Parents are told to turn off the

TV and restrict video game time, but we hear little about what the kids should do physically during their non-electronic time. The usual suggestion is organized sports. But consider this: The obesity epidemic coincides with the greatest increase in organized children's sports in history. Experts on child obesity now concede that current approaches don't seem to be working. What are kids missing that organized sports, including soccer and Little League, cannot provide?

Oddly, the word "nature" has seldom shown up in the literature of child obesity, though that may be changing. Generalized, hour-to-hour physical activity is the absent ingredient in this discussion. The physical exercise and emotional stretching that children enjoy in unorganized play is more varied and less time-bound than is found in organized sports. Playtime—especially unstructured, imaginative, exploratory play—is increasingly recognized as an essential component of wholesome child development. Research findings on outdoor play often minimize types of activities, such as bicycle riding in the neighborhood, with findings more specific to the nature experience. Additional rigorous, controlled studies are needed to sort out correlation, cause and effect. However, when recent studies are considered together, they do lead to strong hypotheses.

"Play in natural settings seems to offer special benefits. For one, children are more physically active when they are outside—a boon at a time of sedentary lifestyles and epidemic overweight," according to Howard Frumkin, M.D., now director of the CDC's National Center for Environmental Health.

Recent studies describe tantalizing evidence that links time spent outdoors to other health benefits, beyond weight control, that may be specific to the actual experience of nature. In Norway and Sweden, studies of preschool children show specific gains from playing in natural settings. The studies compared preschool children who played every day on typically flat playgrounds to children who played for the same amount of time among the trees, rocks, and uneven ground of natural

play areas. Over a year's time, the children who played in natural areas tested better for motor fitness, especially in balance and agility.

Adults, too, seem to benefit from "recess" in natural settings. Researchers in England and Sweden have found that joggers who exercise in a natural green setting with trees, foliage, and landscape views feel more restored, and less anxious, angry, and depressed than people who burn the same amount of calories in gyms or other built settings. Research is continuing into what is called "green exercise." These studies are focused mainly on adults.

But what about children's emotional health? Although heart disease and other negative effects of their physical inactivity usually take decades to develop, another result of the sedentary life is more readily documented: kids get depressed.

### **Biophilia and Emotional Health**

Nature is often overlooked as a healing balm for the emotional hardships in a child's life. You'll likely never see a slick commercial for nature therapy, as you do for the latest antidepressant pharmaceuticals. But parents, educators, and health workers need to know what a useful antidote to emotional and physical stress nature can be. Especially now.

A 2003 survey, published in the journal *Psychiatric Services*, found the rate at which American children are prescribed antidepressants almost doubled in five years; the steepest increase—66 percent—was among preschool children. "A number of factors acting together or independently may have led to escalated use of antidepressants among children and adolescents," said Tom Delate, director of research at Express Scripts, the pharmacy benefits group that conducted the survey. "These factors include increasing rates of depression in successive age groups, a growing awareness of and screening for depression by pediatricians and assumptions that the effectiveness experienced by adults using antidepressant medications will translate to children and adolescents." The growth in such prescriptions written for children occurred even

though antidepressants were never approved for children younger than eighteen—with the exception of Prozac, which was approved as a treatment for children in 2001, after the rise in juvenile prescriptions began. The findings were announced a month after the Food and Drug Administration asked pharmaceutical companies to add explicit product labeling warnings about alleged links between antidepressants and suicidal behavior and thoughts, especially among children. In 2004, data analysis by Medco Health Solutions, the nation's largest prescription benefit manager, found that between 2000 and 2003 there was a 49 percent increase in the use of psychotropic drugs—antipsychotics, benzodiazepines, and antidepressants. For the first time, spending on such drugs, if medications for attention disorders are included, surpassed spending on antibiotics and asthma medications for children.

Although countless children who suffer from mental illness and attention disorders do benefit from medication, the use of nature as an alternative, additional, or preventive therapy is being overlooked. In fact, new evidence suggests that the need for such medications is intensified by children's disconnection from nature. Although exposure to nature may have no impact on the most severe depressions, we do know that nature experiences can relieve some of the everyday pressures that may lead to childhood depression. I've mentioned the Ulrich study and a few others that focused on adults; in *The Human Relationship with Nature*, Peter Kahn points to the findings of over one hundred studies that confirm that one of the main benefits of spending time in nature is stress reduction.

Cornell University environmental psychologists reported in 2003 that a room with a view of nature can help protect children against stress, and that nature in or around the home appears to be a significant factor in protecting the psychological well-being of children in rural areas. "Our study finds that life's stressful events appear not to cause as much psychological distress in children who live in high-nature conditions compared with children who live in low-nature conditions," according to Nancy Wells, assistant professor of design and environ-

mental analysis in the New York State College of Human Ecology at Cornell. "And the protective impact of nearby nature is strongest for the most vulnerable children—those experiencing the highest levels of stressful life events."

Wells and colleague Gary Evans assessed the degree of nature in and around the homes of rural children in grades three through five. They found that children with more nature near their homes received lower ratings than peers with less nature near their homes on measures of behavioral conduct disorders, anxiety, and depression. Children with more nature near their homes also rated themselves higher than their corresponding peers on a global measure of self-worth. "Even in a rural setting with a relative abundance of green landscape, more [nature] appears to be better when it comes to bolstering children's resilience against stress or adversity," Wells and Evans reported.

One reason for the emotional benefits of nature may be that green space fosters social interaction and thereby promotes social support. For instance, a Swedish study shows that children and parents who live in places that allow for outdoor access have twice as many friends as those who have restricted outdoor access due to traffic. Of course, no one would argue that nature's solace is *entirely* dependent on the social interaction that nature may encourage.

Nature also offers nurturing solitude. A study of Finnish teenagers showed that they often went into natural settings after upsetting events; there, they could clear their minds and gain perspective and relax. After a classroom discussion I conducted at the University of San Diego about nature and childhood, Lauren Haring, a twenty-year-old student, described the importance of nature to her emotional health:

Growing up [in Santa Barbara, California], I lived in a house that had a fairly big back yard and a creek across the street. It was when I was by myself that the environment meant the most to me. Nature was the one place where, when everything in my life was going bad, I could go and not have to deal with anyone else.



My dad died of brain cancer when I was nine. It was one of the most difficult times for my family and myself. Going out into nature was one outlet that I had, which truly allowed me to calm down and not think or worry.

I really believe that there is something about nature—that when you are in it, it makes you realize that there are far larger things at work than yourself. This helps to put problems in perspective. And it is the only place where the issues facing me do not need immediate attention or resolution. Being in nature can be a way to escape without fully leaving the world.

Richard Herrmann, a nature photographer, also understands the healing qualities of nature, which helped him through a tragic time. He told me:

My first memories of being affected by the natural world were from my youth growing up at Pacific Grove, not far from the burned-out cannery of Cannery Row. I remember being four years old, and looking into a tide pool, and being mesmerized by the tiny fishes swimming through the shimmering water, and the anemones and crabs scurrying about. I was transfixed; I could have looked at the same pool for days. To me, the tide pool represented perfection, and calmness. I also remember my father returning from fishing in the bay with sacks of colorful rock cod . . . I found them beautiful. They represented special treasures from the sea.

I was a kid who could not sit still for more than a few minutes, so school was painful for me. But nature always gave me this incredible calmness and joy. I could literally sit and fish, or crab, for hours without getting bored, even if I wasn't catching anything.

Later, I needed this calmness again when my father was killed in a car accident when I was fourteen. I was lost, and the temptations and distractions were many in the late sixties. Drugs were everywhere. I remember being absolutely in pain and stress most days, but I would find solace by walking by myself to an area of coast oak woodland—just walking, looking at the undercover of poison oak . . . seeing sala-

manders, colorful mushrooms, and lichens. It all made sense to me. I experienced great calmness there that I could not find anywhere else.

As an adult, giving presentations at local high schools, I noticed that I can get teenagers to focus and calm down by showing images of the natural world. Being close to nature saved my life.

Herrmann's own experience helped him encourage his fourteen-year-old daughter—who is dyslexic—to employ nature to balance her life and reduce her stress. Finding solace raising lambs in a 4-H program has, he says, “really turned her around in school.”

Elsewhere, in Wellesley, Massachusetts, the Institute for Child and Adolescent Development's Therapeutic Garden won the President's Award for Excellence from the American Society of Landscape Architects. In an interview with the online professional journal the *Massachusetts Psychologist*, Sebastiano Santostefano, director of the institute, explained his view that nature has power to shape the psyche, and that it can play a significant role in helping traumatized children. He found that playing outdoors, whether along a river or in an alleyway, “is how a kid works through issues.” “We have a small hill, a mound—and for one kid at a certain point in therapy it was a grave; for another, it was the belly of a pregnant woman,” he said. “The point is obvious: children interpret and give meaning to a piece of landscape, and the same piece can be interpreted differently. Usually, if you [use] traditional puppets and games, there are limits. A policeman puppet is usually a policeman; a kid rarely makes it something else. But with landscape, it's much more engaging, and you're giving the child ways of expressing what's within.”

### The Re-naturing of Childhood Health

With a sense of urgency, some health professionals say that we should act now on the available knowledge. For example, the CDC's Howard Frumkin suggests that public-health experts expand their definition of environmental health beyond concern about, say, toxic dumps, to encompass how the environment can heal. He recommends that

environmental-health research be done in collaboration with architects, urban planners, park designers, landscape architects, pediatricians, and veterinarians. Others argue that increased awareness of nature's power to improve physical and emotional health should also guide the way classrooms are conceived, houses built, and neighborhoods shaped. And, as the coming chapters explain, the evolving research can help us rediscover the link between human creativity and experiences in nature, and could offer a new branch of therapy for such syndromes as attention-deficit disorder.

Elaine Brooks taught her community college students that each of us—adult or child—must earn nature's gift by *knowing* nature directly, however difficult it may be to glean that knowledge in an urban environment.

How ironic it is, Brooks told me one day, that the reality of life in beautiful California “is that we rarely experience any of these natural settings directly and intimately, but rather live our lives in large, sprawling urban areas.” Even when we drive to mountains and deserts, “it is not unusual to make a day trip, stopping only for coffee or a snack along the way. The entire experience occurs within an automobile looking out.” Yet, “the look, feel, odor, sounds of a landscape surround every individual from the very beginning of life. The landscape is the place where we exist, where our real daily world is bounded.” As a species, we crave the very shapes we now allow to be scraped away.

Brooks's students are grateful for what she taught them. So am I. She would have been the first person to point out that the natural world offers us no warranties. Elaine passed away in 2003. As she lay dying from a brain tumor, drifting in and out of a deepening sleep, her friends pinned snapshots of Fay Avenue Extension to the walls around her bed, and took turns sitting beside her. Perhaps, as she traveled a topology of dreams, she saw the future from the branches of that imaginary tree, high above the savanna of La Jolla.

## 5. A Life of the Senses: Nature vs. the Know-It-All State of Mind

*I go to nature to be soothed and healed,  
and to have my senses put in tune once more.*

—JOHN BURROUGHS

CHILDREN NEED NATURE for the healthy development of their senses, and, therefore, for learning and creativity. This need is revealed in two ways: by an examination of what happens to the senses of the young when they lose connection with nature, and by witnessing the sensory magic that occurs when young people—even those beyond childhood—are exposed to even the smallest direct experience of a natural setting.

### The Boyz of the Woods

In just a few weeks, a group of boyz of the hood become the boyz of the woods. At the Crestridge Ecological Reserve, 2,600 acres of mountainous California between the cities of El Cajon and Alpine, a dozen members of the Urban Corps, ages eighteen to twenty-five—all but one of them male, all of them Hispanic—follow two middle-aged Anglo women—park docents—through sage and patches of wild berries.

As members of the city-sponsored Urban Corps, they attend a charter school that emphasizes hands-on conservation work. They've spent the past few weeks at the nature preserve clearing trails, pulling out non-native plants, learning the art of tracking from a legendary former Border Patrol officer, and experiencing a sometimes baffling explosion