own time. Sometimes I go there when I'm mad—and then, just with the peacefulness, I'm better. I can come back home happy, and my mom doesn't even know why."

Then she described her special part of the woods.

"I had a place. There was a big waterfall and a creek on one side of it. I'd dug a big hole there, and sometimes I'd take a tent back there, or a blanket, and just lie down in the hole, and look up at the trees and sky. Sometimes I'd fall asleep back in there. I just felt free; it was like my place, and I could do what I wanted, with nobody to stop me. I used to go down there almost every day."

The young poet's face flushed. Her voice thickened.

"And then they just cut the woods down. It was like they cut down part of me."

Over time I came to understand some of the complexity represented by the boy who preferred electrical outlets and the poet who had lost her special spot in the woods. I also learned this: Parents, educators, other adults, institutions—the culture itself—may say one thing to children about nature's gifts, but so many of our actions and messages—especially the ones we cannot hear ourselves deliver—are different.

And children hear very well.

Richard Louv, Last Child in the Woods

2. The Third Frontier

The frontier is a goner. It died with its boots laced.
—M. R. Montgomery

On my bookshelf is a copy of *Shelters, Shacks and Shanties*, written in 1915 by Daniel C. Beard, a civil engineer-turned-artist, best known as one of the founders of the Boy Scouts of America. For half a century, he wrote and illustrated a string of books on the outdoors. *Shelters, Shacks and Shanties* happens to be one of my favorite books because, particularly with his pen and ink drawings, Beard epitomizes a time when a young person's experience of nature was inseparable from the romantic view of the American frontier.

If such books were newly published today, they would be considered quaint and politically incorrect, to say the least. Their target audience was boys. The genre seemed to suggest that no self-respecting boy could enjoy nature without axing as many trees as possible. But what really defines these books, and the age they represented, is the unquestioned belief that being in nature was about *doing* something, about direct experience—and about not being a spectator.

"The smallest boys can build some of the simple shelters and the older boys can build the more difficult ones," Beard wrote, in the forward of *Shelters, Shacks and Shanties*. "The reader may, if he likes, begin with the first [shanty] and graduate by building the log houses; in doing this he will be closely following the history of the human race,

because ever since our arboreal ancestors with prehensile toes scampered among the branches of the pre-glacial forests and built nest-like shelters in the trees, men have made themselves shacks for a temporary refuge." He goes on to describe, through words and drawings, how a boy could build some forty types of shelters, including the Tree-top House, the Adirondack, the Wick-Up, the Bark Teepee, the Pioneer, and the Scout. He tells "how to make beaver-mat huts" and "a sod house for the lawn." He teaches "how to split logs, make shakes, splits, or clapboards" and how to make a pole house and secret locks and an underground fort, and, intriguingly, "how to make a concealed log cabin inside of a modern house."

Today's reader would likely be impressed with the level of ingenuity and skill required, and the riskiness of some of the designs, too. In the case of the "original American boy's hogan or underground house," Beard does urge caution. During the creation of such caves, he admits, "there is always serious danger of the roof falling in and smothering the young troglodytes, but a properly built underground hogan is perfectly safe from such accidents."

I love Beard's books because of their charm, the era they conjure, and the lost art they describe. As a boy, I built rudimentary versions of these shelters, shacks, and shanties—including underground forts in the cornfields and elaborate tree houses with secret entrances and a view of what I imagined to be the frontier stretching from Ralston Street beyond the edge of the known suburban world.

Closing One Frontier, Opening Another

In the space of a century, the American experience of nature has gone from direct utilitarianism to romantic attachment to electronic detachment. Americans have passed not through one frontier, but through three; the third frontier—the one that young people are growing up in today—is every bit as much of a venture into the unknown as Daniel Beard experienced in his time.

The passing, and importance, of the first frontier was described in 1893, during Chicago's World's Columbian Exposition—a celebration of the 400th anniversary of Columbus's arrival in the Americas. There, at a meeting of the American Historical Association in Chicago, University of Wisconsin historian Frederick Jackson Turner presented his "frontier thesis." He argued that "the existence of an area of free land, its continuous recession, and the advance of American settlement westward" explained the development of the American nation, history, and character. He linked this pronouncement to results of the 1890 U.S. Census, which revealed the disappearance of a contiguous line of the American frontier—the "closing of the frontier." This was the same year that the superintendent of the census declared the end of the era of "free land," that is, land available to homesteaders for tillage.

Little noted at the time, Jackson's thesis came to be considered one of the most important statements in American history. Jackson argued that every American generation had returned "to primitive conditions on a continually advancing frontier line." He described this frontier as "the meeting point between savagery and civilization." Basic American cultural traits could, he said, be linked to the influence of that frontier, including "that coarseness and strength combined with acuteness and acquisitiveness; that practical inventive turn of mind, quick to find expedients; that masterful grasp of material things . . . that restless, nervous energy; that dominant individualism." Historians still debate Turner's thesis; many, if not most, have rejected the frontier, as Turner saw it, as *the* key to understanding American history and sensibilities. Immigration, the industrial revolution, the Civil War—all had a deep formative influence on our culture. Turner himself later revised his theory to include events that were frontier-like—the oil boom of the 1890s, for example.

Nonetheless, from Teddy Roosevelt to Edward Abbey, Americans continued to think of themselves as frontier explorers. In 1905, at President Roosevelt's inauguration, cowboys rode down Pennsylvania Avenue,

the Seventh Cavalry passed for review, and American Indians joined the celebration—including the once-feared Geronimo. The parade, in fact, announced the coming of the second frontier, which existed mainly in the imagination for nearly a century. The second frontier existed in Beard's words and illustrations, and in the family farm, which, though already diminishing in number, continued as an important definer of American culture. Especially in the early decades of the twentieth century, the second frontier also existed in urban America; witness the creation of the great urban parks. The second frontier was a time, too, of suburban manifest destiny, when boys still imagined themselves woodsmen and scouts, and girls still yearned to live in a little house on the prairie, and sometimes built better forts than the boys.

If the first frontier was explored by the acquisitive Lewis and Clark, the second frontier was romanticized by Teddy Roosevelt; if the first frontier was the real Davy Crockett's, the second frontier peaked with Disney's Davy. If the first frontier was a time of struggle, the second frontier was a period of taking stock, of celebration. It brought a new politics of preservation, an immersion of Americans in the domesticated and romanticized fields and streams and woods around them.

Turner's 1893 pronouncement found its counterpart in 1993. His statement was based on the results of the 1890 Census; the new demarcation line was drawn from the 1990 Census. Eerily, one hundred years after Turner and the U.S. Census Bureau declared the end of what we usually consider the American frontier, the bureau posted a report that marked the death of the second frontier, and the birth of a third. That year, as the *Washington Post* reported, in "a symbol of massive national transformation," the federal government dropped its long-standing annual survey of farm residents. Farm population had dwindled so much—from 40 percent of U.S. households in 1900 to just 1.9 percent in 1990—that the farm resident survey was irrelevant. The 1993 report was surely as important as the census evidence that led to Turner's obituary for the frontier. "If sweeping changes can be captured in seemingly

trivial benchmarks, the decision to end the annual report is one," reported the *Post*.

This new, symbolic demarcation line suggests that baby boomers—Americans born between 1946 and 1964—may constitute the last generation of Americans to share an intimate, familial attachment to the land and water. Many of us now in our forties or older knew farmland or forests at the suburban rim and had farm-family relatives. Even if we lived in an inner city, we likely had grandparents or other older relatives who farmed or had recently arrived from farm country during the rural-to-urban migration of the first half of the twentieth century. For today's young people, that familial and cultural linkage to farming is disappearing, marking the end of the second frontier.

The third frontier is populated by today's children.

Characteristics of the Third Frontier

In ways that neither Turner nor Beard could have imagined, the third frontier is shaping how the current generation of young Americans, and many to come, will perceive nature.

Not yet fully formed or explored, this new frontier is characterized by at least five trends: a severance of the public and private mind from our food's origins; a disappearing line between machines, humans, and other animals; an increased intellectual understanding of our relationship with other animals; the invasion of our cities by wild animals (even as urban/suburban designers replace wildness with synthetic nature); and the rise of a new kind of suburban form. Most characteristics of the third frontier can be found in other technologically advanced countries, but these changes are particularly evident in the United States (if only because of the contrast with our frontier self-image). At first glance, these characteristics may not seem to fit together logically, but revolutionary times are seldom logical or linear.

In the third frontier, Beard's romantic images of the outdoor child seem as outdated as nineteenth-century depictions of the Knights of the

Round Table. In the third frontier, heroes previously associated with the outdoors are irrelevant; the real Davy Crockett, who symbolized the first frontier, and even Disney's Davy, from the second frontier, are gone and nearly forgotten. A generation that came of age wearing buckskin jackets and granny dresses is now raising a generation for whom all fashion—piercing, tattoos, and all the rest—is urban.

- *For the young, food is from Venus; farming is from Mars*

My friend Nick Raven, who lives in Puerta de Luna, New Mexico, was a farmer for several years before he became a carpenter and then a teacher at a New Mexico prison. Nick and I have fished together for years, but we are very different men. I have described him as an undoubting nineteenth-century father; I am a doubting twenty-first century dad. Nick believes fish should be caught and eaten; I believe that fish should be caught and, most of the time, released. Nick believes that violence is inevitable, that suffering is redemptive, and that a father must teach his children about the harshness of life by exposing them to that harshness. I believe that, as a parent, it's my job to protect my sons from the brutality of the world for as long as I can.

In an earlier book, *The Web of Life*, I described the relationship that Nick and his children had to animals and food:

> When Nick's children were small and he and his family still lived on their farm down a dirt road in a valley of adobes and cottonwoods and chiles, his daughter came home one day to find her favorite goat (not a pet, really, but one that followed her around) skinned, gutted, and strung up in the barn. This was a time when Nick's family was short on shoes, and the meat they ate was meat that Nick butchered or shot. It was a terrible moment for his daughter.
>
> Nick insists he has no regrets, but he still talks about it. She was hurt, he says, but she knew from that moment on, and will for the rest of her life, where the meat that she eats comes from, and that meat is not born plastic-wrapped. This is not the kind of experience I would have wanted for my children, but I have had a different life.

Few of us miss the more brutal aspects of raising food. For most young people, however, memory supplies no experience for comparison. More young people may be vegetarians or consume food from the health food store, but fewer are likely to raise their own food—especially if the food is an animal. In fewer than a half century, the culture has moved from a time when small family farms dominated the countryside—when Nick's way of understanding food was dominant—to a transitional time when many suburban families' vegetable gardens provided little more than recreation, to the current age of shrink-wrapped, lab-produced food. In one way, young people are more aware of the sources of what they eat. The animal-rights movement has taught them about the conditions within, say, poultry factory farms. It's probably no coincidence high school and college students are adopting vegetarianism in increasing numbers. Such knowledge, however, does not necessarily mean that the young are personally involved with their food sources.

- *The end of biological absolutes. Are we mice or are we men? Or both?*

The young are growing up in an era without biological absolutes. Even the definition of life itself is up for grabs.

One morning in 1997, people around the world opened their newspapers to see a disturbing photograph of a live, hairless mouse with what appeared to be a human ear growing from its back. The creature was the product of a team of researchers from the University of Massachusetts and the Massachusetts Institute of Technology that had introduced human cartilage cells into an earlike scaffold of biodegradable polyester fabric implanted onto the back of the mouse. The scaffold nourished the ersatz ear.

Since then, one headline after another has announced some potential blending of machines, humans, and other animals. The implications have evaded the public for two decades, according to the International Center for Technology Assessment, a nonprofit, bipartisan organization that assesses technological impacts on society. As of 2000, several hundred

animals—patented life forms—had already been genetically engineered or altered with human genes. Over twenty-four human genes—including those for human growth and nerves—had been inserted into rats, mice, and primates to create creatures called chimera. These new creatures are to be used primarily for medical research, but some scientists seriously discuss the possibility of chimera someday existing outside the lab.

Think what it means for children to grow up now, and how different their experience of nature and definition of life is, or soon will be, from the experiences of us adults. In our childhood, it was clear enough when a man was a man and a mouse was a mouse. Implicit in some of the newest technologies is the assumption that there's little difference between living and nonliving matter at the atomic and molecular level. Some see this as one more example of turning life into a commodity—the cultural reduction that turns living bodies into machines.

As the twenty-first century dawned, scientists at Cornell University reported building the first true nanomachine—near-microscopic robot—capable of movement; the miniscule robot used a propeller and motor and drew power from organic molecules. This development opened "the door to make machines that live inside the cell," one of the researchers said. "It allows us to merge engineered devices into living systems." At Sandia National Laboratories in Albuquerque, a scientist predicted that a system of "massively distributed intelligence" would vastly increase the nanorobots' ability to organize and communicate. "They will be able to do things collectively that they can't do individually, just like an ant colony," he said. Around the same time, an entomologist in Iowa created a machine combining moth antennae and microprocessors that sent signals of different pitches when the antennae picked up the scent of explosives. Researchers at Northwestern University created a miniature robot equipped with the brain stem of a lamprey eel. And a Rockville, Maryland, company engineered bacteria that could be functionally attached to microchips; the company called this invention "critters on a chip."

We can no longer assume a cultural core belief in the perfection of nature. To previous generations of children, few creations were as perfect or as beautiful as a tree. Now, researchers flood trees with genetic material taken from viruses and bacteria to make them grow faster, to create better wood products, or to enable trees to clean polluted soil. In 2003, the Pentagon's Defense Advanced Research Projects Agency funded researchers to develop a tree capable of changing colors when exposed to a biological or chemical attack. And the University of California promoted "birth control for trees," a genetically engineered method of creating a "eunuch-tree that spends more of its energy making wood and not love."

For baby boomers, such news is fascinating, strange, disturbing. To children growing up in the third frontier, such news is simply more hair on the dog—an assumed complexity.

- *A hyperintellectualized perception of other animals*

Not since the predominance of hunting and gathering have children been taught to see so many similarities between humans and other animals, though now those similarities are viewed in a very different, more intellectualized way.

This new understanding is based on science, rather than myth or religion. For example, recent studies reported in the journal *Science* describe how some nonhuman animals compose music. Analyses of songs of birds and humpback whales show they use some of the same acoustic techniques, and follow the same laws of composition, as those used by human musicians. Whale songs even contain rhyming refrains, and similar intervals, phrases, song durations, and tones. Whales also use rhyme in the way we do, "as a mnemonic device to help them remember complex material," the researchers write. According to their study, whales physiologically have a choice: they could use arrhythmic and nonrepeating tunes, but instead, they sing.

Such information is not a substitute for direct contact with nature,

but this kind of knowledge does inspire a certain wonder. My hope is that such research will cause children to be more inclined to cultivate an understanding of their fellow creatures. Sure, romanticized closeness—say, swimming with dolphins at an animal touchy-feely resort—may soften some of our loneliness as a species. On the other hand, nature is not so soft and fuzzy. Fishing and hunting, for example, or the way Nick Raven put meat on his table, are messy—to some, morally messy—but removing all traces of that experience from childhood does neither children nor nature any good.

"You look at these kids [in the animal-rights movement], and you largely see urban, disaffected, but still privileged people," says Mike Two Horses, of Tucson, founder of the Coalition to End Racial Targeting of American Indian Nations. His organization supports native people such as the Northwest's Makah tribe, who are traditionally dependent on whale hunting. "The only animals the young animal rights have ever known are their pets," he says. "The only ones they've ever seen otherwise are in zoos, Sea World, or on whale-watching [now whale-touching] expeditions. They've disconnected from the sources of their food—even from the sources of the soy and other vegetable proteins they consume."

I see more good in the animal-rights movement than Two Horses does, but his point has merit.

• *Contact with nature: so close, and yet so far*

Even as the definition of life itself is up for grabs, the potential for contact with more common wild animals is *increasing*, despite what Two Horses says. In a number of urban regions, humans and wild critters are coming into contact in ways that have been unfamiliar to Americans for at least a century. For one, the U.S. deer population is the highest it has been in a hundred years.

In *Ecology of Fear: Los Angeles and the Imagination of Disaster*, social historian and urban theorist Mike Davis describes what he calls a new dialectic between the "wild" and the "urban": "Metropolitan Los Angeles, now bordered primarily by mountains and desert rather than by farmland as in the past, has the longest wild edge, abruptly juxtaposing tract houses and wildlife habitat, of any major non-tropical city. . . . Brazen coyotes are now an integral part of the street scene in Hollywood and Toluca Lake." A reporter for the British newspaper *The Observer* writes: "[American] settlers and their descendants went about taming the environment with warlike ferocity. After ethnically cleansing the natives, they set about the extermination of bears, mountain lions, coyotes and wildfowl . . . but mountain lions adapted. Los Angeles may be the only city on earth with mountain lion victim support groups."

At midcentury, millions of Americans migrated to suburbia, following the dream of owning their own homes and a piece of land—their own quarter-acre of the frontier. For a while, space was expansive. Today, sprawl does not guarantee space. The newly dominant type of development—with interchangeable shopping malls, faux nature design, rigid control by community covenants and associations—dominates the bellwether metro regions of Southern California and Florida, but also encircles most of the older urban regions of the nation. These dense donuts of development offer fewer places for natural play than the earlier suburbs. In some cases, they offer even fewer natural play spaces than the centers of the old industrial cities.

In fact, parts of urban Western Europe are greener—in the sense of increasing the amount and quality of natural surroundings within urban regions—than most of urban/suburban America, a land still associated with frontier and open space. "An important lesson from many of these European cities has to do with the very perception we have of cities," writes Timothy Beatley, professor in the Department of Urban and Environmental Planning at the University of Virginia, in *Green Urbanism: Learning from European Cities.* Particularly in Scandinavian cities, where green design is gaining popularity, "there is a sense that

cities are and ought to be places where nature occurs. In the United States, a challenge remains to overcome the polar distinction between what is *urban* and what is *natural.* Perhaps because of the expansiveness of our ecological resources and land base, we have tended to see the most significant forms of nature as occurring somewhere else—often hundreds of miles away from where most people actually live—in national parks, national seashores, and wilderness areas."

These are some of the trends that form the American context for a de-natured childhood, something that is perhaps as mysterious as—and certainly less studied than—the march of the nanorobots or the advance of the chimera.

3. The Criminalization of Natural Play

For many years I was self-appointed inspector
of snowstorms and rainstorms . . .
—Henry David Thoreau

Consider Mister Rick's neighborhood.

Fifteen years ago, John Rick, a middle-school math teacher, and his family moved to Scripps Ranch because of its child-friendly reputation. Set in a lush old eucalyptus grove in a northern San Diego neighborhood laced with canyons and linked by walking paths, Scripps is one of those rare developments where parents can imagine their children enjoying nature, just as they did. A sign near its entrance reads, "Country Living."

"We have more Scout troops per capita than just about anywhere else in the country," says Rick. "The planners fought to have vast amounts of open space for kids to play in and parks for every neighborhood."

A few years after moving to Scripps Ranch, Rick started reading articles in the community's newsletter about the "illegal use" of open space. "Unlike where we had lived before, kids were actually out there running around in the trees, building forts, and playing with their imaginations," he recalls. "They were putting up bike ramps to make jumps. They were damming up trickles of water to float boats. In other words, they were doing all the things we used to do as kids. They were creating for themselves all those memories that we cherish so fondly." And now it had to stop. "Somehow," says Rick, "that tree house was now a fire hazard. Or the 'dam' might cause severe flooding."