NATURE STUDY

A JOURNAL OF ENVIRONMENTAL EDUCATION & INTERPRETATION

Nature In Your Neighborhood

Volume 50: Numbers 1 & 2, 2000/2001

American Nature Study Society

Won't You Be My Neighbor?

Steve Melcher, President

My father moved our family to the suburbs of Harrisburg, Pennsylvania in the mid-50s. Ours was the second or third house in the new development. A farm was sold and houses built. Our new home stood where corn, soybeans or perhaps strawberries once flourished. I watched houses being built on our street all the way to the creek's edge. The remaining farmland of fallow fields, undeveloped ravines and woodlot and our secret garden became my nature school and sanctuaries.

The neighborhood had a central park complete with swingset, sand boxes and a basketball/hockey court. This park became the village square for summer nature club gatherings of linoleum lice and shagrug rats of the time. The tragedy of this commons is of its present vacancy. I was surprised by the silence during my last visit. Most of the 10-year olds are trapped like veal calves in front of their computers.

What I remember most about our own home is the small garden my father put in every year. While my father turned over the soil, our job as kids was to search for earthworms. Those earthworms were a part of my early nature education. I still remember looking up *Lumbricus rubellus* in our World Book. My father had a difficult time explaining hermaphrodism to an 8-year old, but he did successfully explain to me the earthworm's importance to the soil. Those worms were later used to confirm the food chain in the nearby Yellow Breeches Creek. Many of the fish caught in that creek eventually found their way back into our garden as fertilizer.

I look back now and realize how important those ravines, that small woodlot and the creek were to me. The woodlot was the land of the giants, "God's first temples" with trees towering far above me. The creek was a highway for the Susquehannock tributary with no beginning and only rumors of an end somewhere far away downstream.

A sewage disposal plant stands where my favorite fishing hole was and a spaceship of townhouses has landed where my temple once stood. William Blake writes of, "the tree which moves some to tears of joy, is in the eyes of others only a green thing which stands in the way." Indeed without protection these sanctuaries will disappear.

We protect what we cherish. We cherish what we know and love. We live in neighborhoods. The lessons of nature can be learned by watching an ant hill, measuring greenspace or counting earthworms in a garden, all of which are found in neighborhoods. The key is to have someone there to explain nature's lessons to that naturally curious child.

It takes the neighbors to raise a child — not just a village. As an ANSS member, you possess the ability to translate an everyday backyard occurrence into a life lesson of nature.

Please take the time to pry the hands of a 10-year old from his joystick. Share your knowledge, passion and this journal in your own neighborhood.

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Naturalist's Notebook - Squash Pie.
John Wiessinger ©

From the Guest Editors

by Betty J. McKnight & Margaret A. Barker

Many years of guiding others in their studies of nature and biology have led us to conclude that the nature right around one's own home, wherever that might be, often offers the strongest lessons.

The authors who have been selected for this issue of *Nature Study* have been chosen for their appreciation of nearby nature and their ability to open our eyes to the life that bustles all around us. They help us realize that nature is not necessarily "somewhere else," occurring only in a national or provincial park, for example, or in the rain forests of South America. Instead, you can find plenty to learn from at inner city schoolyards, parking lots, urban parks, tiny apartment balconies, rooftops, as well as suburban and rural residences and set-aside lands, even in a cobwebbed corner of your living room.

Peter Friederici's article, *Etching Childhood Memories of Nearby Nature*, an excerpt from his book, *The Suburban Wild*, sets the tone for this issue as he recalls wildlife experiences in the suburbs of Chicago. Author Scott Weidensaul in *Losing the Links*, reflects on how just a generation or two ago, people had a much stronger connection to nature than we do today. Other articles in this section give tribute to nature close at hand, or, as in the case of Jim Duke's, *Eat Your Weedies!*, the growing things right under your feet. Michael J. Caduto asks us to pay attention to *Treasure in the Trees*.

Have you ever considered learning about your local wildlife like field mice, squirrels, and even ladybugs? Diane Ackerman has. She tells us about the wonders of the pesky squirrel in her article, *Squirrels and the Dark Soul of Night*. In *Distant Neighbors: Global Bonds to Backyard Butterflies*, Fran Ludwig explores the worldly connections some butterflies can make.

Our *Naturalist in the Field*, Professor Linda Rayor, studies nature that might occur inside your house—spiders. She devotes much of her life to helping students trade their arachnophobia for lifelong interest in the eight-legged creatures.

Gray Squirrel

Teacher Tips and Book Reviews provide you with good resources to gain an even keener understanding and appreciation for the natural world in your own backyard.

It is with great pleasure that we present this collection of articles and resources in *Nature in Your Neighborhood*.

May you enjoy and share some of your own 'nearby nature' stories and adventures with others.

Betty J. McKnight is a writer and environmental educator living in Trumansburg, New York. She is a professor emeritus of the State University of New York in New Paltz where she taught Science Education and Environmental Education.

Margaret A. Barker is a writer and environmental educator living in Freeville, New York. She coordinates the Kids Growing Food program at Cornell University and is co-author of the FeederWatcher's Guide to Bird Feeding *published by HarperCollins, 2000.*

Etching Childhood Memories of Nearby Nature

by Peter Friederici
The following is an excerpt from The Suburban Wild.

In looking back on my own childhood, in the Chicago suburbs, I remember a few incidents that stand out as defining moments, as mileposts that help me to understand not only how I became a naturalist, but how I indeed came to chart the course of my life by the workings of the natural world around me. I want to revisit two of those incidents, not because they are any more significant than others but because they illustrate the importance of having places nearby where such experiences can be lived.

The first episode: I remember my father taking me on a nature walk in the Chicago Botanic Garden. He was not a naturalist but he did enjoy a good walk, and some organization offered a group outing early one spring morning. The garden was new then and I remember scraped hills and raw earth. In my memory this experience consists of a few silent snapshots.

Fox
by John Wiessinger

Down along a marshy section Canada geese were nesting. Back then it was still a rare experience to see geese in the Chicago area and, for me, a transfixing one. Snap: we see those impossibly large birds surprisingly close to us. Snap: suddenly a red fox, the first I've ever seen, a glowing ember of an animal, is running toward one of the goose nests. Snap: two geese lunge toward the fox, necks outstretched. Snap: wings beating, ferocious, they drive the intruder away. Snap: we stand there, awestruck.

I'm sure I'd seen episodes of Wild Kingdom or other animal television shows by then. I'd been reading my copies of *Ranger Rick*, and I think I was powerfully impressed by knowing that the same dramas I watched on TV or saw photographed in the magazine existed only a mile from my home.

The next episode occurred even closer to home. One spring weekend the fog rolled in and made the Lake Michigan beach seem endless. It continued on forever into nothing, which in my eyes only increased its appeal, even if the fog reduced my chances of seeing birds. I had walked to the beach that day with a pair of binoculars because I had been reading about birds and bird watching. The Golden Guide Birds of North America was my newly-discovered bible those days.

Out of nothing, suddenly, I saw movement at the edge of the water. Four little birds. I crouched on the sand and stalked slowly forward. I didn't recognize them. They were small birds on long legs. They ran swiftly but comically, seeming to move their bodies hardly at all as their legs flicked. Then they stopped and investigated the spaces between pebbles. This behavior was nothing new, spotted sandpipers and sanderlings were

common visitors to the beach. But I had never seen anything like the color pattern on these birds. Their legs were orange, their bellies pure white as the snow of the Arctic to which, I found out later, they were migrating. Their brown backs were riven with patches of cinnamon orange. But most arresting were their heads, which were splotched with a complex pattern of white and black, a dark eyeline like a glowering brow, another faint dark line below it that stretched to the nape, and a large black bib.

I was mesmerized. I had always accepted, unconsciously, the appearance of the common backyard birds, the brilliant red of the male cardinal, the yellow of the goldfinch, the glossy speckled plumage of the noisy starling. These were the looks of the world into which I had been born and I never questioned them. And now here were these strangers, and I found myself fascinated by their bizarrely complex plumage. No matter how much I drank it in, I was unable to look at it closely enough. I wanted to imprint on my mind the way every feather lay. What possible purpose could those colors serve? I wondered. For what audience were these garish feathers intended? All too soon the birds vanished for good into the fog.

I soon learned from the field guide that these were ruddy turnstones, a beautiful name for a beautiful bird, I thought. I felt proud of myself for having identified them. It was one of the first times I had seen an unknown bird, noted its markings, and successfully looked it up later in the guide. I still have the bird list I drew up, and I turn to the page where ruddy turnstone is listed, between piping plover and Bonaparte's gull. I even included the Golden Guide's accents that guided my fumbling tongue over the scientific name: *Arenária intérpres.*

It was years before I saw others of the same species. But it didn't matter. Those brilliant shorebirds stayed alive in my memory. I found myself almost pleased that I had only seen them once, and that they had run off so swiftly into the fog. Their seeming rarity made the experience of seeing them that much more valuable. I began reading up on the mysteries of migration and evolution. I prowled the beach in subsequent springs and autumns and got to know other migrants.

Canada Geese
by John Wiessinger

With new eyes I began appreciating the more common resident birds, whose plumage and behavior proved equally complex and unfathomable. Those four little birds were no more important ecologically than any others, but to me they became an entree into the infinite world of animals and of nature, an introduction to a world of wings and color and far distances that has fascinated me ever since.

These unexpected encounters with the natural world etched themselves deeply into my memory. There were wonders, I learned, right on my doorstep. And they were there because there was room for them: because the turnstones were able to find food on the beach, because the fox could find sufficient refuge from people in the ravines and brushy edges of the North Shore.

Looking back, I am struck in equal parts by the potency of these experiences, resonating still after some thirty years, and by their tenuousness: in a place booming with new roads and houses and strip malls, we could easily wipe out the possibility of such experiences. It is my hope that we as a species can be wiser than that. It is my hope that we recognize no greater gift to our children and grandchildren than the ability to learn, in their own backyards and in natural places nearby, that they constitute only one sort of animal among many.

Losing the Links

Mankind's survival may well hinge on our rebuilding connections with the natural world right around us.

by Scott Weidensaul

My great grandfather was a child of the late nineteenth century. He grew up on a farm in the Pennsylvania hills, and as a young man joined his father each winter cutting timber on the mountains, hauling it down behind mule teams and selling it for mine supports.

He knew a lot about trees of course; not just how to cut them, but also where to collect the best hickories or the finest black walnuts each autumn. When I was a kid it was my job to strip the thick rinds from the walnuts until the juice soaked through my gloves and stained my fingers the color of coffee. I can remember thinking at the time that it would be easier to buy bagged, shelled walnuts at the store than go through this mess.

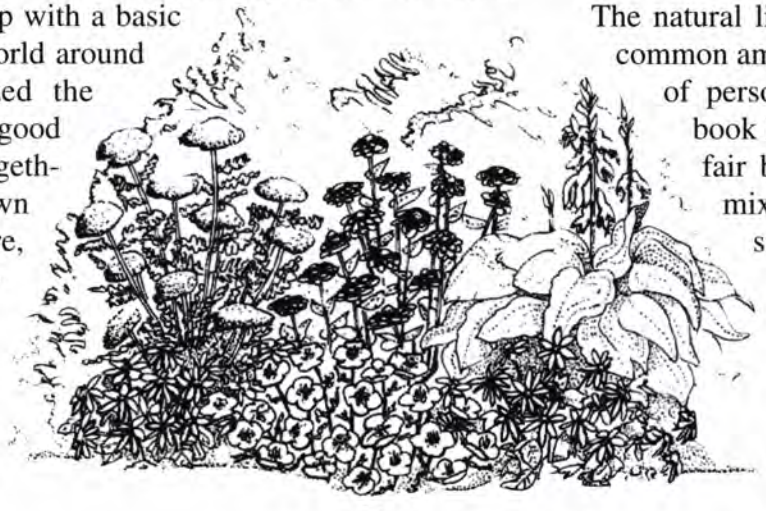
Years later when I was in college, I took my great-grandfather for a ride in the country. A log truck roared past us in a cloud of exhaust and dust, a load of tree trunks strapped to its bed. The whole thing barely registered as a blur to me, but not to Grandpa.

"White oak," he grumped, glancing at it, "And not very mature. They should have left it grow another 20 years."

I was surprised, but I shouldn't have been. When the United States was a predominantly rural society, people grew up with a basic grasp of the natural world around them. They recognized the parts, and had a pretty good idea of how they fit together. It was a rough-hewn knowledge to be sure, missing the scientific niceties; plants and animals were known by a galaxy of descriptive local names, rather than the official labels ordained by specialists. The little brown sparrow in the hedgerow, the one with the streaky breast and the bright, rollicking song, might be known as a "ground bunting" in one area, a "silver tongue" in another, and (because of its song) "everybody's darling" in a third.

Almost no one would have known that science calls it a song sparrow, *Melospiza melodia*, but most country dwellers could have told you that it starts singing in late winter before the other birds; it nests in a little grass cup on the ground in thickets; and when it flies it makes a funny pumping motion with its tail.

Modern education, despite its failings, has worked wonders in promoting literacy in language and science. What we've lost is natural literacy, a fundamental understanding of the world around us. Today, environmental education courses teach kids to identify (by scientifically correct names) the pictures in bird books, or songs on tape. Field experience, however, is a rarity. People can mouth ecological concepts such as balance and interdependence, but relatively few have any meaningful, firsthand contact with the life that underpins those concepts. We've gained the knowledge, but lost the links.



The natural literacy that was once common among us was the result of personal observation, not book learning. There was a fair bit of misinformation mixed in too, beliefs that snakes could sting with their tongues, or that possums mated through their noses, or that all predators were evil. But in the main, folks knew a

great deal about their immediate world, their habitat, if you will. They knew that the gauzy white shadbush would bloom early in April, around the time the blue-backed swallows (tree swallows to us) would return from the South. They looked for the bluebirds to lay their eggs in old fenceposts around the same time the squirrel shoes, as pink lady's slipper orchids were known, came into bloom in the May woods. They knew that jewelweed, which they called touch-me-not for its exploding seed pods, could be crushed on a poison ivy rash to relieve the itching. They knew a dewy morning usually means a dry afternoon, and that the high wisps of mare's-tail clouds portend rain in a day or two.

If people in our rural past knew about their local world, they knew considerably less about what lay in distant regions. Today that is reversed; thanks to television nature shows (which focus on the dramatic and unusual) the average person probably knows more about exotic ecosystems, the plains of Africa, or the Amazon rain forests than the plants and animals that live quite literally on their back doorstep. It is a disturbing irony that the creatures we know the most about are the ones we are likely never to see, while those near at hand are as mysterious and unknown as the far side of the moon.

I recall leading a nature walk at a county environmental center for a group of kids and adults. The subject was supposed to be wildflowers, but walking along a sandy path by the edge of a meadow someone asked about the dozens of small, conical pits in the dirt. They were, I explained, the work of ant lions, the larvae of a graceful insect that looks like a damselfly as an adult. The ant lion nymphs, however, are squat, bristly creatures about 1/4 to 1/2 inch long, with a pair of enormously outsized jaws. They sit buried at the point of the cone, jaws gaping, and wait for an ant or other small insect to tumble into the trap.

If gravity isn't enough to bring the prey within reach, the ant lion will kick sand onto it, knocking it off balance.

Naturally, one or two people scrounged around for sacrificial ants, and we watched the grisly process a few times; then I took out my pocketknife blade, made a quick plunge and flip, and uncovered one of the ant lion nymphs. Everyone was absolutely fascinated, asking questions, taking pictures. We spent more time watching ant lions than we did the wildflowers.

There were 25 or 30 people in the group, and only one had ever seen an ant lion, even though these insects are common wherever the soil is bare and sandy, from city lots to mountain ridges. And I think it especially telling that the only person in the group who knew about ant lions was an elderly man. He said he'd passed many hours as a boy trying to trick doodlebugs into grabbing a blade of grass. Kids of more recent generations have had little time or inclination for doodlebug fishing.

Surprisingly, the loss of natural literacy is not restricted to the developed world. All over the globe, indigenous cultures are eroding in the face of outside influences, leaving a new generation that has lost the detailed, oral traditions once used to teach them about their surroundings.

Losing this knowledge has a direct impact on everyone. For despite all our laboratory wizardry, many of our most promising pharmaceuticals still come from the wild, and native guides are our best source of basic information. I've often walked through the forests of Central or South America with local guides and been treated to running dissertations on the wild medicine around me. I've had cuts numbed with natural anesthetics, then doctored with wild antiseptics, cuts that healed faster than less serious scrapes treated with my own first aid kit.

Biologist Jared Diamond, who has spent years studying the New Guinea rain forest, laments the trend.

"Within a decade or two, drug companies carrying out chemical prospecting will have to go in blind, lacking guidance as to which of tens of thousands of species to collect or what to test each

thousands of species to collect or what to test each species for," he wrote recently.

A similar erosion of folklore has occurred here in North America. My great-grandfather's generation relied on natural medicines to a degree unimaginable in today's world - herbal teas, poultices, and a host of other folk remedies, free for the collecting. Some didn't work, and some were actually harmful to the patient, but many of these home remedies were surprisingly effective. Our ancestors didn't know that the leaves and berries of the native wintergreen contain a chemical known as methyl salicylate, but they did know that eating a sprig was good for fevers and aches.

That is not to suggest that chewing willow bark is a more effective painkiller than two tablets of aspirin, even though the latter is derived from chemicals in the former. Modern medicines, refined and polished from their natural progenitors, are usually better. But by ignoring the wealth of folklore our ancestors accumulated about their surroundings, we sever a vital link to the land and our past. At the least, we forget. At the worst, our perspective may become sadly skewed.

I can think of no better example than goldenrod. Hundreds of species of this native wildflower brighten the late summer landscape, waving their deep yellow flowers almost everywhere: in meadows, along woodland trails, in the shifting dunes of the coast. Yet goldenrod is best known for one thing: a supposed association with hay fever, a malady it does not produce (goldenrod pollen is sticky and borne by insects). The real culprit is European ragweed, which broadcasts its light, noxious pollen to the wind each summer in staggering quantities.

Even though they never saw a microphotograph of goldenrod pollen or a daily pollen count,

Goldenrod

our grandparents knew better than to consider goldenrod harmful. Goldenrod once had a myriad of uses, from tonics to an infusion for bathing wounds. To this day it bears the Latin name *Solidago*, meaning to heal or to make whole.

My great-grandfather could not have told you what a DNA sequence was, but he knew goldenrod's benefits. To our generation the land is just scenery; to his, it was grocery and pharmacy and so much more besides.

Who's to say which of us is the wiser?

...How can I create a psychological climate in which that child will feel free to be curious, will feel free to make mistakes, will feel free to learn from the environment, from fellow students, from me, from experience? How can I help him/her recapture the excitement of learning what was natural in infancy?

Carl Rogers

Teaching Flowery Prose

Journalism Training Includes Outdoor Labs

by Michael E. Abrams

Sometimes it's good to get off the fast track and smell the flowers. That's what I'm preaching to my journalism students. The roots go back many years to when I was a young reporter who knew just about everything.

I came across a yellow butterfly on a bright red and orange flower cluster in the weeds. It was only a block from the newspaper building and a photographer took a beautiful picture.

Problem. We didn't know what the butterfly was, or the flower. We showed the picture to our gruff old-timer editor who loved to roam the national forests in his jeep, and could write about politicians, trees, spiders and assorted creatures of the land.

"Why that flower's a butterfly weed," said Malcolm Johnson, who thought we ought to know such things. He had rescued so many plants from the tractors with his Upsy-Daisy Plant Uplift Society that Charles Kuralt came to interview him in Tallahassee.

The cranky old conservative taught us young whippersnappers something. He may have been the only one in the newsroom who had any idea what to call either the flower or the butterfly.

Now I want my journalism students to appreciate what's growing outside of city hall. I want them to be able to name the trees and flowers, and a lot about the necessity of preserving them. It's a small part of my course, but my favorite part.

We had a visit at our school from a Pulitzer Prize winner who covered the Mississippi floods for the New York Times. Isabel Wilkerson told my students that one of the first things she asked people was what kind of trees grew in the flood plain. Knowledge of nature is a tool of the writer.

We all know this from school days. Chaucer, Shakespeare, Wordsworth all made nature part of literature. Reading the translation of the novel "Madame Bovary" for the first time recently, I was fascinated by Flaubert's exquisite descriptions of the flowers in the village where this tragic drama took place. Flaubert knew his violets, although one wonders how every flower seemed to bloom in the same season for him. Writing about what actually surrounds us is an art practiced by only a few special people. I am reminded of the all-purpose New York Times lead that stereotypically starts out, "This moss-draped Southern town has seen better times," or something to this effect.

Well, at least the reporter could recognize moss. Newspapers, north or south, are always

Butterfly Weed
by W.S. Justice

importing a hired hand from the Sierra Club to write the important nature piece, or farming articles out to the garden editor. In the quick pace of the news business, many reporters move from city to city without much time to think systematically about our wild surroundings or the flower folklore of our communities.

So here's what I do: I ask my sophomore journalism students in my Use of Information Resources class to pick flowers, have them identified by an expert, learn their origins and their distribution. Are they edible? Did they have medicinal purposes? Is there a myth behind them? Truly, this television generation needs to get outside.

"I can't believe you're asking us to do this," said one young lady. "I don't go outdoors. I don't sit on the grass. I don't do any of this. And where am I going to find a flower?" So we walk around campus and we see umpteen kinds of wildflowers around buildings, and even in the cracks in the sidewalk. Surprise, surprise. Students come back to me, flowers in hands, essays and drawings in their notebooks, and plenty on their minds.

One young lady, who described herself as "not the outdoors type," found out that the common spiderwort she picked was used by Indians as a cooked vegetable.

Another student chose dandelions, whose jagged leaves come from the French for "tooth of the lion." She wrote, "I heard my great-grandmother talk about dandelion tea, so the first thing I did with the dandelion shoots I collected was boil them in water."

Spiderwort

Teasel

She found that the Puritans so treasured dandelions that they brought them over from Europe for medicine, including treatment for internal ailments. She discovered they are rich in vitamin A, calcium and iron, and the young shoots make excellent salads.

"The next time I'm in the park," she wrote, "I certainly won't just think, 'My, what a pretty flower.'"

A former student, who now reports for the Tallahassee Democrat, as I did 20 years ago, says she stops to smell the flowers. In her class essay she had written:

"'I will never write a story the same way again. Now I will sprinkle it with details about the weather, flowers on the ground or the fragrance in the air."

That's a big part of what I want to teach.

City Backyard

by Helen Ross Russell

"How can anyone who grew up on a farm, who loves outdoor activities, who has specialized in environmental education, be happy in a city?" The question is most familiar—we must have heard it hundreds of times in the 18 years since we left New England and purchased a house in the city. The answer is simple: "We have a backyard." Not everyone is fortunate enough to have a yard 100 feet long by 18 feet wide, but backyards, front yards, land around apartment houses, parks and mini-parks exist in every metropolitan area. These bits of earth, free from the covering of bricks, asphalt or concrete, can enrich our lives in many ways.

We start our days standing at our bedroom window and looking down on our yard and our neighbors' yards. From the first snowdrops, the crocuses and Christmas rose of March, through the last chrysanthemums of November, there is a steady parade of color. But winter viewing can be equally beautiful when sunlight is fragmented to rainbow colors by snow or ice, when jasmine flowers in December, when snow mounded on shrubs and dried flower stalks fills the yard with soft sculptures.

There is drama to watch too. We once spent a good half-hour in ringside seats watching squirrels give a cat a nervous breakdown. It started with a pair of squirrels chasing each other along the fence tops, a normal wintertime frolic; down on the ground a neighbor's big tomcat entered the game with anything but playful intentions. For a while we wondered if the squirrels were aware of his presence but when he leaped up on the fence and the squirrels used the mulberry-branch bridge to move to safety and then to return and continue the frolic, it was evident that they were enjoying cat-baiting. Eventually one of the squirrels tired of the game and approached the patio where we had scattered some un-popable popcorn. Stealthily the cat crept along the fence and hid behind a large planter, less than 30 inches from the feeding squirrel. Except for his lashing tail, he was motionless. Then he inched forward; the space between them narrowed to 25 then 20 inches from the feeding squirrel. Suddenly the cat dashed, and so did the squirrel. With one flying leap the squirrel climbed to the top of a small garden sculpture. The cat crouched at the foot of it.

The squirrel continued chewing its mouthful of corn, then deliberately turned downward right toward the waiting cat. "Oh, no," we groaned and then in disbelief, "Oh, no!" For half a second the squirrel was airborne on the way to the cat's back. The cat jumped several feet off the ground, dislodging the squirrel in the process, and ran pell-mell with the squirrel in swift pursuit. A minute later the squirrel again leaped and landed on the cat. Again it was dumped on the ground just long enough to make a third jump and a landing on the now frantic cat. As the gray and brown and black fur ball rolled on the frozen grass the cat suddenly burst forth, scaled the fence, and disappeared. The squirrel returned to feeding.

For about ten minutes the cat vented his anger and frustration by challenging a young cat in a neighboring yard. Then having convinced himself by putting it to rout that he was master of all he surveyed, he stealthily crept along the fence and took up his position behind the planter. The squirrel shifted position and went on chewing. The cat climbed into the planter and looked over the rim but quickly realized that it was an unsatisfactory launch pad. So he resumed his position on the ground with head sticking out from the planter. Finally he pulled all his muscles together and catapulted his body toward the feeding squirrel. Fast

by John Wiessinger

but not fast enough, for the squirrel, with a single motion, had vaulted to the top of the garden sculpture.

The cat skidded to a stop, his tail twitched in agitation while every hair of his body stood on end. The squirrel spit out a corn hull; the cat stood up, made a right angle turn and walked down the center of the yard with his body expressing disdain.

While cats and squirrels are the largest animals that come to our yard they are generally not the most exciting nor do they provide the only drama.

Some of the 42 different birds we have watched in our backyard are exciting accidentals like the bittern that spent an entire day alternately standing in the melted snow puddle at the far end of our yard, flying into the mulberry tree and hiding when I went out with a camera; or the female redstart that spent almost a week in September of 1980 feeding in the shrubbery at the end of our yard, preening and displaying in full sight as we lunched with guests under the mulberry tree.

Moments like that are exciting, but perhaps even more satisfying is the regular appearance of towhees scratching in the yard each spring, the later fall settling in of juncoes for the winter, the spring stopover of cowbirds and red-winged blackbirds and the regular appearance of white-throated sparrows. Fox sparrows, chipping sparrows and yellow-throats each come in their own time and season. A regular flight school starts in June with successive classes of fledgling robins, blue jays, starlings and mockingbirds trying their wings from the top of the fence.

The regular appearance of the ruby-throated hummingbird when the bergamot is in bloom provided us with our most exciting bird adventure. I was cutting coral bells (heuchera) when we heard the whirring of wings. The hummer was sipping nectar from the flowers that I had cut and was holding in my left hand. Slowly I raised the bouquet and the bird followed it until the bird and I were practically eye to eye.

We do not feed the birds, but we consciously plant bushes, annuals and perennials that will provide a variety of seeds, berries and shelter.

Once when a bad storm hit the area, the year when the brown thrasher spent the entire winter in our yard, we put out emergency rations until the natural ones were again available. The first guests to arrive were a pair of mourning doves who sat on the fence most of the morning studying the situation, while starlings watched from trees in our yard and neighboring yards. Once the mourning doves started feeding, three juncoes, two bluejays, a mockingbird, two pigeons, a white-throated sparrow and a downy woodpecker moved in. Finally the brown thrasher, though he was slow in arriving, was the only bird who dared eat with the starlings. If they came near he reached over and pecked them, and they retreated to the other end of the food supply.

Besides providing food for birds our yard has a great variety of flowers. It also provides fresh vegetables: lettuce, radishes and onions in the early spring, tomatoes until frost. Then there are the weeds: milkweed, purslane, lamb's quarters, field sorrel, amaranth and chickweed, a ready source of samples for wild food lectures and variety in our own meals.

Like any other piece of land managed on a multi-use principle, our yard is a thing of beauty, a joy to a wide variety of animals and a delightful outdoor living room for entertaining a few people or several dozen. It fills our life in the city with constant contact with the natural world.

Aldo Leopold and My Backyard

by Daniel Kriesberg

How does a wilderness fanatic adapt to life in a Long Island backyard? My plan was to live in a log cabin surrounded by thousands of acres of wilderness. But my only job offer was on Long Island. There, I met Karen, got married and bought a house. Now we have a beautiful three-year-old named Zack. (Scott Walden just joined us April 1, 1998.) I'm stuck here. Karen loves this place. We live in an average size Cape Cod with a lawn small enough to mow in fifteen minutes. There is a lone tree on our property, a spruce that leans at a dangerous angle. Our neighbor thinks we should cut it down because the sap kills the mums. She is probably right but I can't bear to think of living on land without a single tree.

One of my conditions for buying a house was that I could set aside a small area of the yard and let it grow wild. Two days after moving in, I took a break from painting to make a sign that read Round Mountain Wilderness Area to designate the spot. (Kriesberg is derived from the German word that translates to 'round mountain.') Looking out our kitchen window I can survey the seventy square feet of suburban wilderness. The plan was to leave it untouched and watch what happened. I waited anxiously for spring and in the meantime set up a bird feeder.

The first weekend in our house was a hopeful sign. The Virginia creeper growing out of the wilderness was ripe with berries. We watched brown thrashers, tufted titmice, starlings and robins feasting. The black-capped chickadees found the feeder first, followed by tufted titmice, white-breasted nuthatch and downy woodpeckers. Our backyard list is now up to twenty-eight species, including an escaped yellow parakeet and a cooper's hawk. While I write, a fox sparrow visits for the first time. Even Zack watches the birds and can identify several species. He points at each one and, with up-turned hands, wonders where they go.

The birds provide a glimpse of wildlife. Part of what makes wilderness wilderness is watching wildlife in action and learning something about their lives. Living in the suburbs doesn't make them any less wild. According to my copy of Stokes Nature Guide, black-capped chickadees have a rigid hierarchy. Each flock has its own territory. I am watching the flock trying to figure out who is in charge.

In the spring the only thing that sprouted was asiatic day flowers. Nearly every plant was the same. Nothing else came up all summer. The next year the same thing happened. A bit of human intervention was needed.

Around town there are an amazing number of wildflowers growing on the roadsides. Evening primrose, goldenrod, Queen Anne's lace, chicory, asters and many I didn't know growing happily unidentified. It is amazing how much one notices when one starts paying attention. It seemed like I found new wildflowers each time I went jogging. In the fall I collected seeds in my pockets and dispersed them in my backyard wilderness area.

Black-capped Chickadee

by Ngoc, 7th Grade
Bloomsburg Middle School,
Bloomsburg, PA

Over the winter I watched the birds and waited.

In the spring plants began to grow. It was difficult to know what most of the sprouts were. I waited anxiously until they grew big enough to identify, half expecting and hoping they would announce their names when they bloomed. With the help of field guides and a friend I learned the names of some of the plants. The amazing thing was how many plants were growing that ended up there on their own once there was room for other plants. The sky is filled with seeds floating through the air in search of good soil. Seeds amaze me. The smallest crack in the cement is enough room for them to grow. Looking at plants growing out of the cracks it is easy to imagine that after a few years of neglect plants could take over. It is a good image.

The Queen Anne's lace looked just like a carrot lost from its garden. The chicory's blue rivaled my wife's impatiens. Pokeweed grew tall, dominating everything. Wild onions, plantain, lady's thumb and grasses covered the ground. The goldenrod took hold and provided a yellow flame in August. There are some bright yellow flowers and tiny sky blue flowers. At least twenty species are growing now. The identification process continues. It pleases the eye to see a jumble of plants growing all over which way. They blow in the breeze freer and more beautiful than cultivated plants.

While preparing a lesson on colonial times for my fourth grade class, I learned the wilderness area was living history. Native Americans called plantain white man's foot. Plantain is not native to North America; it came with the Europeans. The Native Americans noticed that whenever they saw plantain, Europeans were around. I would love to be that observant. Pokeweed was used by Native Americans and early settlers for dye, food, medicine and ink. Goldenrod was shipped to England for medicine. Chicory was used for food and coffee. Dandelions and wild onions could provide food in a pinch.

When I'm on my wilderness backpacking trips I watch the North Star at night, knowing that same star shines on my family. I'm connected to my home. When I watch the Round Mountain Wilderness Area I am reminded that those wild

places exist even without my presence. The birds connect me too. Out of the northwoods, the northern juncos and white-throated sparrows migrate through and stop in the wilderness area. They need both places just like I do.

Last winter a friend of mine gave me a copy of *Sand Country Almanac* by Aldo Leopold. As I learned more about Aldo Leopold's life and work, my respect grew as well as my gratitude. Many of my backpacking adventures have been through the wilderness system he inspired.

It is good to know that the father of the wilderness system would approve of my backyard wilderness area. He wrote: "All wilderness areas, no matter how small or imperfect, have a large value to land-science."

He also wrote: "There are idle spots on every farm, and every highway is bordered by an idle strip as long as it is; keep cow, plow, and mower out of these idle spots, and the full native flora, plus dozens of interesting stowaways from foreign parts, could be part of the normal environment of every citizen."

Zack loves the little wilderness area. When you are three, a clump of weeds has a lot of potential. My childhood backyard greatly influenced my love for the outdoors. I read books perched in our Norway maple tree. In the small ramble of woods I could escape for a little while. I wrote a book called *The Natural History of 247 Kensington Place* based on my observations of the birds and squirrels.

Pokeweed

I hope that our little patch of wilderness will help connect Zack to the land. We will go to other places but at least he will know wildness survives even on Long Island. There is much to teach him about all the interesting plants, countless insects and beautiful birds. They will spark his curiosity and keep us in tune with the land between backpacking trips.

Backyard Wildlife Habitat

Turn your Backyard into a real wildlife habitat! The Backyard Wildlife Habitat program was started in 1973 by the National Wildlife Federation to acknowledge and encourage individuals who garden for wildlife.

The program encourages everyone—homeowner, teacher, community leader—to plan their landscapes with the needs of wildlife in mind. Today, with over 22,000 sites certified in the program, NWF provides information and assistance not only to homeowners, but also to schools, businesses, and community groups who are interested in creating wildlife and environmentally friendly landscapes.

You can find out how to join, how to evaluate your backyard for the basics and how to create a habitat by visiting the NWF web site at *http://www.nwf.org/habitats/index.html.*

Green Spaces of NYC

by Jayme Hummer

Rocky coastlines, forests, wet meadows, coastal dunes, grassy fields and other natural elements are not only characteristics linked to remote areas throughout the United States. They, along with a list of features such as "chaotic, crowded, polluted and fast-paced", could be used to describe New York City's 26,000 acre network of green spaces. This large acreage is made up of wetlands, woodlands and wildlife. For those who make up the five million people who congest the city's streets, these areas provide alternative playgrounds, picnic groves and beaches among ecosystems for all of nature herself.

The wetlands' ecosystems (made up of both freshwater and saltwater sectors) filter pollutants, reduce erosion, mitigate floods and improve air quality by absorbing carbon dioxide and producing oxygen. These wetlands, which once covered about half of New York City (20,000 acres), also serve as nurseries for many species of invertebrates and fish, which make vital contributions to aquatic food chains. Unfortunately, only 2,000 acres of freshwater and 5,000 of saltwater exist today. Both were virtually paved over by the construction of one of the largest metropolitan cities in the world. Nearly half of the city's freshwater wetlands are shrub and tree swamps. Thickets of buttonbush, spicebush and sweet pepper bush often encircle ponds with trees such as red maple, wet gum, pin oak, white ash and black tupelo close by. However, it is the soil that determines what grows where. The soil composition decides a site's water-holding capability: basins with sandy bottoms drain quickly, whereas clay-lined basins support lakes and ponds.

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Skunk

(c) Grolier Interactive Inc.

Hickory

Woodlands are different from forests. There is much more space between the treetops in a woodland area. New York City has a little bit of both woodlands and forests throughout. Trees vary from site to site as soil conditions, drainage, sunlight and other environmental factors permit. In the poorly drained areas, pin oak, red maple and sweet gum trees thrive.

In the drier areas it is more common to find red, black, white and chestnut oaks along with hickories and, specifically, American beech. Unfortunately New York City's urban forest or woodland area is not pristine. Land use and abuse

have constantly disrupted it. Restoration efforts are in effect that will hopefully replenish an urban forest with a healthier and greater wildlife habitat.

Whether field or forest, wetland or woodland, each ecosystem provides a unique habitat for certain mammals, birds, reptiles, insects and fish. A habitat's value to wildlife is determined by the amount of food, water, shelter and space produced for its inhabitants survival. New York City offers its wildlife a very diverse environment to dwell in because it consists of both woodlands and wetlands. Birds are the most popular wildlife found here, especially along the shoreline. It is very common to see gulls and cormorants perched on dock pilings, while red-tailed hawks and great horned owls can be found nesting in the deep quiet of the of the city's forest canopy. In the winter months these forests or woodland areas are often homes to the tufted titmouse, black-capped chickadee and the white-breasted nuthatch, who often flock together.

It is obvious that the aesthetic beauty of nature cannot go unmentioned. Fortunately, despite all the hustle and bustle a city or urban environment can offer, nature still exists and thrives when given the opportunity.

Cormorant

Resource: *Woodlands, Wetlands, and Wildlife: A Guide to the Natural Areas of New York City Parks.*

Wildlife Habitat:
The Disturbance Community

by Frank Knight

Television nature programs have conditioned us to think that if we want to enjoy wildlife first-hand, we must get up out of our easy chairs, don rugged clothing, board a plane and head for exotic, faraway places. Not so! Wildlife is as close as our high rise window ledge, our city or suburban backyard and certainly our daily trip to and from work or school. Robins pull earthworms from lawns, parks and roadsides. Sparrows catch insects to feed nestlings, and those insects are everywhere. Ants pile sand up between cracks in the sidewalk. Bees fill bulging pollen sacs from dandelions.

At night, raccoons patrol neighborhoods for poorly secured trashcans and skunks dig holes to feed on beetle grubs. Even in the winter, squirrels and birds congregate at feeders or search for tidbits dropped by people. In the park someone is always feeding a flock of strutting pigeons, and gulls dodge cars instead of waves at mall parking lots for dropped food scraps. At aeries on tall buildings or bridges, peregrine falcons also feed pigeons — to their nestlings. Not only have many animals adapted to living in suburban and urban communities, but some thrive very well in these disturbance communities.

Everyone, including city dwellers, can enjoy seeing and hearing wildlife. As John Updike wrote in his essay, *Spring Rain*, "No matter how long we live among rectangular stones, we will listen in the pauses of rain for the sound of birds chirping."

Adapted from a NYS Department of Conservation publication.

Eat Your Weedies

Turn the tables on those pesky garden foes and get super nutrition in the process.

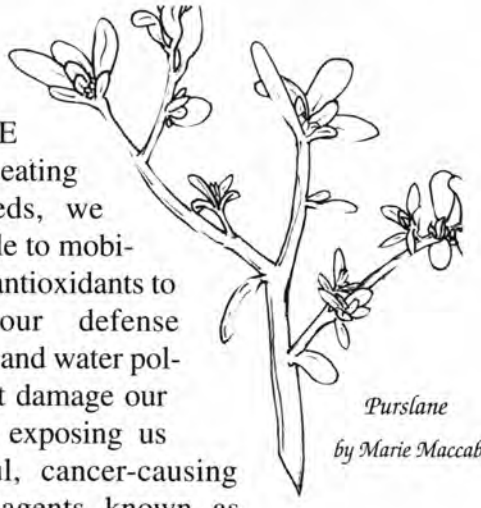
by James Duke

The following is an excerpt from Organic Gardening magazine, *July 1993. Reprinted with permission.*

Weeds we *need*? Weeds that are *useful, edible plants?* That's right—why in my Handbook of Edible Weeds (CRC Press, 1992), I listed more than 100 edible weeds here in the United States alone.

In fact, the world's "10 most serious weeds," as listed in The World's Worst Weeds (Holms et al, East-West Center, 1977) all have edible parts, according to Tanaka's Cyclopedia of Edible Plants of the World (Kegaku Publishing, 1976). If Holms is right (that these are the 10 worst weeds) and Tanaka is also right (that they are all edible), should we have so much starvation in the world?

And some of those weeds are practically living vitamin supplements, rich in antioxidant nutrients like vitamins E and C. By eating these weeds, we may be able to mobilize those antioxidants to act in our defense against air and water pollutants that damage our bodies by exposing us to harmful, cancer-causing chemical agents known as "free radicals."



Purslane

by Marie Maccabee

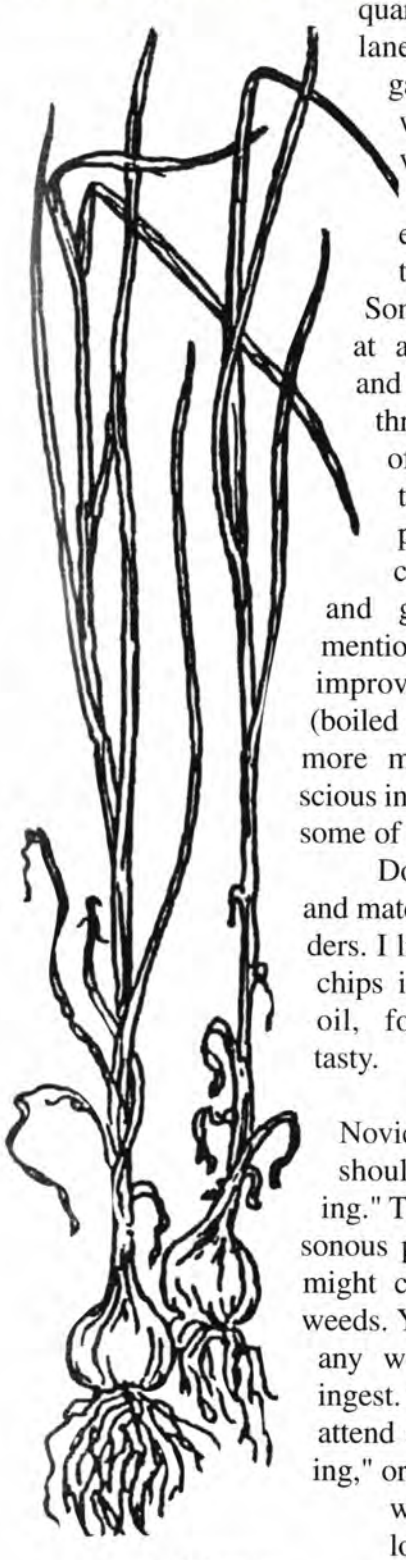
Pigweed

Several cancer-fighting antioxidants occur in one of my favorite weeds, purslane *(Portulaca oleracea*) which grows in all 50 states and Canada. It's loaded with ascorbic acid (vitamin C), beta-carotene (pre-vitamin-A), glutathione (a common antioxidant compound that can even detoxify some pesticides!) and tocopherol (vitamin E)—not to mention its richness in the omega-3 fatty acids that have been linked with lower cholesterol levels. No crop that I know of is better endowed with a richer variety of health-protecting compounds.

Purslane tastes a bit like spinach; in fact, beet tops, chard, lamb's quarter, pigweed, purslane and spinach all belong to a group of plants (technically called the Centrospermae) that share a similar earthy, nondescript, non-acid flavor.

And, just like spinach, purslane is edible raw or cooked. Add tender shoots to soups or garden salads. Matter of fact, you can make quite a good salad with garden weeds, and it won't be as bitter as some of those leaf lettuces you may be

growing! Just be sure to eat 'em young. Most of those "salad weeds" — alfilaria, cheeses *(Malva sylvestris*, a member of the mallow family, not a new product from Kraft), chicory, cress, dandelion, evening primrose, garlic mustard, lamb's-quarter, pigweed, purslane, watercress, wild garlic— get tougher with age (as do cultivated greens).



Wild Garlic

Of course, many edible weeds are tastier when cooked. Some don't taste good at all without cooking and some need to go through two changes of water to appeal to those with normal palates. Burdock, chicory, dandelion and garlic mustard, to mention a few, are much improved by cooking (boiled for me; steamed for more modern, health-conscious individuals) to remove some of the bitterness.

Don't be afraid to mix and match your weedy wonders. I like to fry groundnut chips in evening primrose oil, for instance. Quite tasty.

Know your weeds. Novices to weed-eating should NOT go "grazing." There are a lot of poisonous plants that a novice might confuse with edible weeds. You must be sure of any weed you intend to ingest. You might want to attend a "foraging," "grazing," or "wildcrafting" field workshop with some local experts in your area before you eat.

Dandelions

End the war on weeds! I have launched a personal campaign to encourage the consumption rather than the spraying of edible weeds. More than half of the pesticide expenditures in the United States are spent on weed-killing herbicides. So organic gardeners, join me in my effort to teach the sprayers that it is more environmentally correct (and may quite possibly help prevent cancer) to eat those weeds than to nuke 'em with cancer-causing herbicides.

And there is another reason to eat, not spray, that should make sense to even the most chemically oriented grower. Weeds, like germs, evolve much faster than we do, and if we do manage to wipe out one weed with an herbicide, the one that fills the void will probably be tougher and more resistant to chemicals. So it will always take more and more chemicals to control each new generation of weeds.

Too many Americans wage war on edible weeds— the suburban war on the edible dandelion being a constant foolish example. And our government has warned us already that these suburban lawn-lovers dispense more herbicides per acre than rural farmers!

It would be much healthier in the long run for us, the weeds and the planet, if we eat rather than spray the edible weeds.

Hedgerow — An Unused Resource

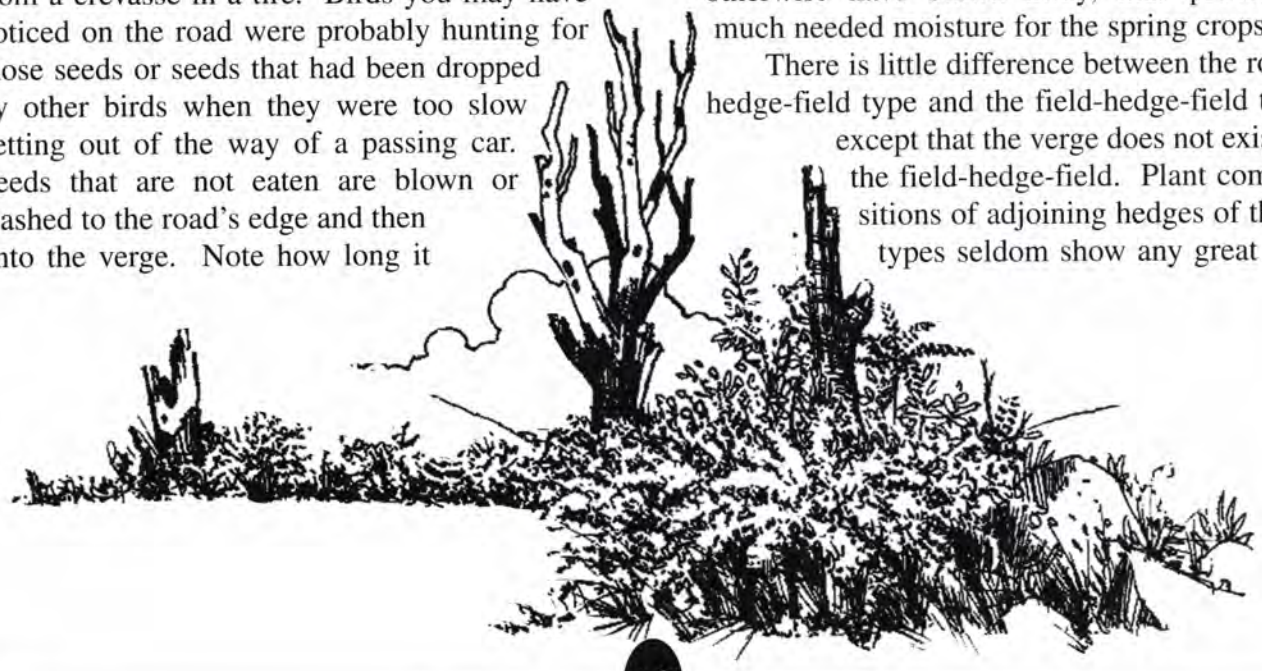
by Darrell D. Young

Hedgerows grace the presence of our roads and byways but are seldom noticed by the harried traveler, or are taken for granted that they should be there and never examined further. Unlike our European counterparts, who have studied hedges in great detail, few Americans have paid them any attention. This is unfortunate because the European naturalists have discovered that these hedges are repositories of many rare and endangered species, including not only plants, but insects, small mammals and birds as well. It is hoped that this short article will stimulate your interest in a habitat that has long been ignored.

American hedges, except perhaps around our houses, are seldom planted. Therefore, they are naturally occurring structures, created by bird droppings, forgotten food buried by mammals for storage, and finally the wind itself. Studies have found that the automobile is responsible for much of the herbaceous growth as seeds caught in the slip steam of a car can be carried for miles before landing on the road or perhaps being dislodged from a crevasse in a tire. Birds you may have noticed on the road were probably hunting for those seeds or seeds that had been dropped by other birds when they were too slow getting out of the way of a passing car. Seeds that are not eaten are blown or washed to the road's edge and then onto the verge. Note how long it takes for the herbs to appear. They are not planted by the highway commission or the contractor, as those folks are planting a quick growing grass to control erosion and then perhaps a few shrubs later. These latter shrubs are evident by their symmetry and can be discounted in any roadside examination.

A proper study of hedges should begin with a classification. One type is the road-hedge-field type. Others would be a road-dry wall-field type, where the dry wall represents a stone wall. Other hedgerow classifications include a field-hedge-wood type and finally a field-hedge-field type. The last is commonly used as a windbreaker to help prevent wind erosion of the soil. These were used at the end of the dust bowl and during the depression when many men in the western states were provided with employment by planting row after row of trees to break up the force of the winds sweeping across the Great Plains. In addition, the trees acted as snow fences during the winter months trapping quantities of snow that would otherwise have blown away, thus providing much needed moisture for the spring crops.

There is little difference between the road-hedge-field type and the field-hedge-field type except that the verge does not exist in the field-hedge-field. Plant compositions of adjoining hedges of these types seldom show any great dif-



ferences, so it is possible to make adequate studies without having to seek the permission of landowners to walk their hedges. But the verge is of much importance as it often provides a refuge for many of our native wildflowers. A growing awareness of this resource is evident in signs along roads indicating the location of wildflower sanctuaries. These are maintained by controlling the time of mowing and waiting until flowering is completed, sometimes even waiting until after seed has set. But for those who would decry mowing, remember that it is necessary in order to maintain the verge because without it the next stage of succession, the growth of shrubs, will take place and the wildflowers will be crowded out of living space.

In addition, the verge contains the ditch. This represents a narrow, but long wetland. With wetlands disappearing rapidly, even these small ones are to be treasured for what they contain. They, like the hedge, are well worth a close examination. I have found rare orchids growing in the midst of the cattails, and if the area is wet enough it is possible to find fish along with various aquatic insects.

Now how to study this habitat: allow me to suggest three different ways to get started. First a cross-sectional or transit approach: every one tenth of a mile walk straight from the road to the hedge, recording everything found along the way. To maintain accuracy, a can of spray paint can be used to mark the edge of the road. To forestall protest about the use of visual pollution, I checked with my local highway department about making a small mark along the road edge and was told that it was ok, but if you are uneasy about this then by all means do a little checking first. The advantage to this approach is that a great deal of distance can be covered, perhaps even through different area habitats, while still maintaining accuracy.

A second approach is to merely take a length of hedge, perhaps one or two miles, and do an in-depth study and catalog of the entire length. The data collected here is obviously more complete than that collected by the first approach but you are more limited by the amount of territory that you can cover.

Finally, a combination of the above two can be used. Catalog short lengths of the hedge,

Raspberry

with 30 meters being suggested as a good length. Again this could be every tenth of a mile. All approaches need to be repeated on a regular basis, as flowers in the herbaceous layer do not all flower at the same time. Even with this regularity, plants will be missed because the flowering period of some plants may be as short as one or two days.

One final note: Don't forget to include the effects of roadside "furniture." I am, of course, referring to telephone poles and fences. We tend to take those for granted and not even note their presence. Note how they are used by birds and what kinds of birds are most affected. Plants use some for support as they reach for the sun And a close examination may well show that a spider has used the wire of a fence as supports for her web, and a wasp may have created a nest on a fence post. The possibilities are always exciting and the results are always different—each trip is a new adventure of discovery.

Mature roadside habitats are also nurseries for those roadsides that have been ill-treated or for reestablishment of plants along new roadside areas. If roadsides are to be planted for the enjoyment of the automobile naturalist then it must be kept in mind that the plants must be planted in clumps, as single plants are difficult to see, let alone enjoy, when travelling at 55 mph.

Treasure from the Trees

by Michael J. Caduto

Fall is a giving season. From fields of farm and garden come the rewards of summer's labors, while orchard trees sag under the weight of apples destined for sauce, cider, juice, and pie.

Yet, there is a fall feast that goes largely to please the palates of squirrels, birds, deer and other animals afield. Nuts by the ton are devoured as they ripen. Many of them never fall from the branches before being eaten or spirited away and stored in a stone wall, a hole in the ground or a hollow log in preparation for the lean months ahead. Some folks take their cue from the animals. They know where to look for nuts and what to do with them once in hand. Byron and Marjorie Churchill scout the banks of the Ottauquechee River each fall for one of their favorites, the ubiquitous butternut.

"We make butternut cakes, and our favorite, Christmas fudge," say Marjorie. They'll pick around five bushels of butternuts in a good year.

That's a lot of shell-splitting, and these are tough nuts to crack. But once you've tasted a tree-ripened butternut, you will have to agree: There is more to the beauty of trees in autumn than meets the eye.

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Butternut

By Jove! Butternut is the walnut of the north country. Its Latin genus, Juglans, means "Jove acorns." The Romans called walnuts acorns, and these branch-bending delights were so prized they were deemed "Jove" or "Jupiter" acorns, after the Roman god of the sky. Today, another member of the walnut family and a close relative of the butternut is used in the southeastern United States to make a favorite treat called "pecan divinity."

Butternut (*Juglans cinere*) grows in open fields, hedgerows and young woodlots. The tree has a characteristic deeply furrowed bark and sparse canopy. Leaves are compound, with spaces between the many leaflets that grow opposite on long, slender stalks. By late summer, the pendulous flowers of springtime produce oblong nuts that are sheathed in a thick, spongy, green husk, covered with short brown hairs and a sticky coating. A yellow-orange dye can be rendered from the boiled husks and, during Colonial times, was commonly used for dyeing wool.

Inside the husk is a thick, walnut-like shell that can be persuaded using a sturdy nutcracker and lots of leverage, a hammer or a rock. Once liberated, the nut meat has a walnut flavor and is high in oil content.

Native American's taught the colonists how to use butternut oil as a hair treatment.

The sap of the tree can be extracted and boiled to make a tasty syrup, but it takes about 160 gallons of sap to make one gallon— four times as much sap as needed to make a gallon of maple syrup!

Hazelnut

The hazelnut has been assigned stories through the ages in which this shrub has been granted magical powers. Swedes believed that anyone holding a hazelnut rod became invisible.

A footnote in Biblical tradition says that when Adam was driven from Paradise, he took a piece of hazelnut, struck the water with it, and a sheep appeared. Eve did the same and a wolf appeared. Adam struck once more to bring forth a dog which killed the wolf.

Young Colonial women coming of age would take a handful of hazelnuts and name each one after a desirable young man. When the nuts were thrown onto the glowing embers of a fire, the nut that burned the brightest was thought to be that woman's "fate" in marriage.

One thing for certain, the hazelnuts that flared in the fireplace were not ripe. After opening countless hazelnuts over many autumn sojourns, I

have never found a ripe one because they are quickly grabbed up by the squirrels and mice. In fact, I have yet to meet anyone who has collected a ripe hazelnut before the squirrels and mice got there! Empty hazelnut shells are one of the most common findings in the winter middens of woodland mice. Don't despair, you can buy them by the pound at the market where they are known as filberts and are a Thanksgiving favorite.

American hazelnut (*Corylus americana*) grows up to 8 feet high and is usually found in hedgerows and moist woodlands. They rival the pussywillow as the first-blooming flowers in the spring. The minute, crimson female flowers are wind-pollinated by the male catkins. Three of these flowers, placed side by side, will just reach across the face of a penny.

During the summer, the nuts are ripening inside husks that have a bristly coat. By fall, the familiar round nuts have formed with their thin shells and sweet meats.

American Beech


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To many people, the beech tree is best known as a live carving post. Some find its smooth, gray bark to be irresistible for etching a love note, greeting, or historical record. In fact, beech comes from the Anglo Saxon "boc," meaning word or letter, and from which "book" is derived.

Still, opening up the bark of any tree exposes it to disease, fungus and decay and can shorten its life span.

Amid the branches of American beech (*Fagus grandifolia*) in the springtime are borne inconspicuous, green, pom-pom-like flowers. Although they bear nuts yearly, beech trees produce a heavy crop every third year.

There are two, 3/4 inch, triangular nuts in each bristle-covered husk. By the time these nuts ripen in the fall, the branches are tipped with cigar-shaped buds that are a favorite deer browse.

Beechnuts were the chief staple for passenger pigeons, which also preferred to nest in beech trees. The decline and eventual extinction of these sleek, graceful birds that used to migrate in such large flocks that they would darken the skies and block the sun from view, followed the destruction of their homes and feeding grounds in beech forests during colonial times. Colonists were known to go outside and fire guns aimlessly into the thick flocks overhead, which were so dense that several birds would fall from each shot.

To the Senecas, one of the six nations of the Haudenosaunee (*Iroquois*) Confederacy of the northeastern woodlands, the beech is sacred.

A beech sheltered Bolaw, one of the great chiefs, who became lost during a blizzard. Bolaw survived for many days in a fallen, hollow beech log. He ate from a mouse's cache of beechnuts and drank from a nearby lake until a search party found him. When Bolaw died in battle many years later, he was buried with his bows and arrows under a large beech tree.

White Oak


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Nowadays, few people think of acorns as being nuts, but acorns were once an important food for the eastern Woodland Indians. Acorns from white oak (*Quercus alba*) and swamp white oak (*Quercus bicolor*) have white meats and are best for eating. The cups are bowl-shaped. The trees are long-lived, with spreading crowns and leaves with rounded lobes. Trees in the black oak group, such as black oak, red oak and scarlet oak, have pointed-tipped leaves. Their acorns contain too much of the bitter-tasting tannins to be useful as a wild edible.

Oak flowers are inconspicuous. The male flowers are the familiar stringy masses that fall from the trees in the springtime. The female flowers of white oaks take one year to mature into acorns, while those of black oaks take two years.

Gather the nuts of white oaks soon after they have fallen, remove the shells, and boil them until the water turns brown. Change the water and repeat the boiling process. Dry the nuts in a well-ventilated place. Once dried, nuts can be toasted and eaten or ground into a flower-like substance that the Indians use to make a simple bread.

Spaces Between

by Janice Levy

Scottsdale, AZ

Ithaca, NY

Hiawatha, KS

Rt. 36, IN

In an attempt to illustrate how the physical boundaries of one's home do not necessarily define the personal boundaries of one's space (I can, for instance, hear much of what goes on in the house next door to me), I began photographing the spaces between houses in Ithaca.

Struck by the fact that I could often not tell where one property line begins and another ends, I focused on the tight tangle of sprawling gardens and the toy strewn lawns that occupy the space between the wood, brick, and stucco structures. These little landscapes expose much about the people whose houses are framed by them and, through close examination, I quickly became fascinated by the worlds they reveal.

A visit to Scottsdale, Arizona exposed a much more conscious delineation of property. There, physical boundaries are firmly defined. Row after row of seven foot walls separate houses of similar design. Privacy, however strictly circumscribed, is merely an illusion, for the parcels of property are so small that even the buff-colored walls do not stop the sounds and smells emanating from the houses they shield.

After my experience in Scottsdale, I traveled across the United States photographing all sorts of "spaces between". I photographed in the urban neighborhoods of mid-sized cities and the rural countryside in the states such as Indiana, Kansas, New Mexico, and Texas. Each region, reflects a unique approach to the use of space and, in so doing, reveals something of the culture it represents.

House Mice

by Jessica Adams

Creepy, disgusting, dirty and gross are all words commonly used to describe mice, particularly the ones that choose to take up residence in the linen closets, pantries, attics, basements, closets and garages of millions of people's homes each and every year. While society in general has associated mice with dirty unkept dwellings, in actuality mice will move into any domestic residence that can provide food, warmth, and shelter for the communities in which they live. Since no one is truly immune from the domestic interests of mice it is important to at least attempt to understand, if not enjoy, the very creatures you may share the same roof with.

Introduced from Europe with the first settlers, house mice (*Mus musculus domesticus*) probably became the quickest breeding species to sail across the ocean and settle in the New World. Rapid maters, these creatures reach maturity at the ripe old age of 35 days when they are able to begin reproduction, and reproduce they do. Unlike the nine months of pregnancy the human female endures, the female house mouse carries embryos for a mere 18 to 21 days, thus allowing her to produce a new litter of around six babies (numbers vary with food supply and genetics) every 40 to 50 days and all in the comfort of your own home. Tiny, frail and lacking in defense against disease and predators, it would appear that their life span would be remarkably short. Think again. While the average house mice can live between fifteen and eighteen months, some feisty creatures can live up to six years.

So what are house mice doing exactly when they are heard rustling through the walls and scurrying behind your refrigerator? Eating. According to a 1944 study conducted by scientists Garlough and Spencer, house mice "eat about the same kinds of food as human beings, including meats, grains, cereals, seeds, fruits and vegetables." Since they are completely sustained by mooching off humans it's no surprise that their tastes teeter-totter on gourmet. No hamster pellets here. Not only are their diets as diverse as those of humans, according to scientist Mills in 1947, house mice eat 15 to 20 times daily, consuming 100 to 200 milligrams of food at each feeding. Primarily they limit their feasting to two main feeding periods, dusk and dawn (don't worry you will hear them), while supplementing their hunger through feeding bursts every 3/4 to 1 1/4 hours apart. Sounds like too much eating but considering they have to consume 10-15 percent of their body weight every 24 hours (eight pounds of food a year) it's no wonder they dedicate their lives to the gathering and devouring of our crumbs.

With house mice spending so much time swallowing enough food to make their consumption quota, it's a wonder they have any time for socializing. But they are actually quite social. In a typical community existing right under your stairs a dominant male mouse presides over lower ranking mice of the same gender. Female mice have no leader, nor do they have exclusive sexual ties to a specific partner within the group. In fact there is so much interbreeding within the clan that the genetic effects of such activities have lead to severe birth defects including a strange waltzing behavior complete with twisting, prancing and pivoting on one foot as well as some mice chirping like crickets. Sexual attraction aside, as soon as a mouse dies all ties of friendship are forgotten. Mice have been known to be cannibalistic, going so far as to eat their own out of glue traps set by human predators.

House mice aren't your pets, they aren't your family, they aren't even your friends but they have chosen to take up your home as their very own permanent residence. Tearing through your hallways at speeds of up to eight miles an hour, littering up to 18,000 droppings and over 3/4 of a pint of urine a year, they have made themselves quite comfortable. You may not love them or even accept them but, sharing the same address, well, at least you're not strangers anymore!

Squirrels and The Dark Soul of Night

by Diane Ackerman

The following is an excerpt from A Slender Thread.

Carrying my coffee into the garden room, I crank open a window and call the squirrels as usual, warbling to them in a melodic two-note that starts high and slides lower: "SQUIR-rels, SQUIR-rels, SQUIR-rels." Then I quickly scatter a mix of peanuts, hazelnuts, Brazil nuts and almonds in a wide arc. The nuts are unsalted and still in their shells, just as squirrels would find them in nature—that is, if they happened to live simultaneously in New York state, Georgia, and the Amazon. Scufflings begin deep in the two acres of woods as squirrels leave the warmth of their leaf nests, rush down the tree trunks and leap across the brush and woodpiles, using their tales to balance, tightrope-walker style.

Knowing this unseasonal bounty will soon be devoured, I sit back and survey the dawn. There's nothing like the fecund beauty of spring in New York state. Separate raindrops lie along the twigs of a maple branch—round, brilliant globules trembling without falling. All the light of the morning seems trapped in their small worlds. You can smell the mixing fragrances of spring, bud-luscious and full of growth. But it's a difficult time for animals. Spring means waking from the long coma of winter into a land of hardship and haste. Roused from their winter stupor, they find food scarce and little yet in bloom. Locating a mate becomes an urgent quest.

A drumroll across the roof grows louder and then stops. I feel something watching me, look up, and see the Pleader—a large muscular grey squirrel—on the roof, examining me, the morning and the sudden appearance of the manna. Whiskers twitching, he leans over the edge and fixes me with shiny dark eyes.

"Breakfast?" I ask.

He coils up fast, raises and lowers his head rapidly, springs off his haunches and leaps eight feet to a slender hickory, is down its trunk in four strides and at the window in two more. It's not that the strewn nuts aren't appealing, it's just that the Pleader prefers walnuts, and as he knows by now, I keep those indoors.

I hold a walnut lightly between thumb and forefinger and offer it to him, feeling the gentlest tug as he lifts it free. Twisting around fast, he takes a watchful position on a rock, turning the nut on the lathe of his teeth and paws until he finds the exact spot to drill a hole. This he does with his two chisel-shaped front teeth, then he carries the nut like a bowling ball as he runs to the large hickory and scampers up its shaggy trunk to the first branch. From that lookout post he can see a mob of squirrels arriving, grabbing nuts and squabbling over territories. He widens the hole in the walnut

and attacks the meat, spitting out the plume of husks.

"What a buzz saw," I say out loud, smiling. He continues to watch me with a look of uneasy vigilance. When he finishes half of the nut, he holds the remainder like a bowl of porridge and carefully lifts out the lung-shaped meat.

I call him the Pleader because of the way he always finds me in my study or my living room and gives me a look of insistence as a placard. When he gets my attention, he runs to the glassed-in garden room, races up to the window and stares. He stands up on his back feet, arms held at his chest, stretching to look in, face alert and expectant. Above all, the Pleader is daring—brave enough not to flee when I open the creaky window. Brave enough to take a large walnut from my hand. Brave enough to drive off competitors from his small pile of food. Often when I open a window he comes up and puts his head inside, watching me as I reach into a half-barrel of nuts. If I leave both the window and the nut barrel open, he will climb right in, help himself and dart outside to eat. When the window is closed he puts his bulging eyes up to it like one of the horses in Picasso's "Guernica" and peers in.

I'm halfway through a two-year research project for National Geographic (which provides the nuts and photographer), studying the secret life of gray squirrels, taking field notes and trying my best to fathom their ways. How could they not become familiar? I haven't exactly adopted the squirrels, it' s just that I worry about their well-being during the hard winters, and I've become fascinated by their relationships, instinctive behaviors and antics, especially the Pleader's. A small irregularity on his left ear is his only marking, but I always know him by his unusual alertness, muscular shoulders and eager, exploratory verve.

Mind you, this is nothing compared to the legendary nerve and insight of squirrels. "Daylight Robbery," a British film about gray squirrels, reveals the high jinks of one who figured out how to break into a vending machine. The squirrel enters through the wide metal flap at the bottom, climbs up inside and moments later returns with a Baby Ruth bar, which it calmly unwraps and eats. I've known people setting obstacle courses for squirrels—the most ingenious one requiring them to climb up a greased pole, leap a wide chasm, tunnel inside a pipe and finally fly across the yard in a red rocketship—all to get hazelnuts. It took the squirrels only two weeks to master. Myself, I put up a squirrel gymnasium, which includes a Ferris wheel of four corncobs, a picnic table with a chair a squirrel must sit in if it wants to eat from the corncob, a "Pandora's Box" filled with peanuts (the lid is too heavy for birds but easy for a squirrel to life to remove nuts one at a time) and a two-armed seesaw with a corncob in the middle. They figured out all five within half an hour and seem to enjoy the challenge each offers. It gives me a better chance to study their stretchings, agility and underparts.

Although when I'm in a rainforest I caress it with all of my senses and am grateful for the privilege, I also love the temperate forests, scrublands, lakeshores, glaciers and even city parks. One doesn't have to leave home to encounter the exotic. Our human habitat encompasses rolling velds and mown lawns, remote deserts and the greater wilderness of cities—all "natural" ecosystems. Many animals inhabit the small patch of woods out back, from deer, raccoons, skunks, wild turkeys, garter snakes and other large fauna down to spiders, moths and swarming insects. I spend happy hours there watching the natural world bustle about its business. The animals all seem caught up in one intriguing drama or another, especially the squirrels. Their small distresses echo the ones I see among my neighbors, their small triumphs teach me about the indomitables of life.

Finding Out About Bluebirds

by Richard B. Fischer

In the 1970s the peregrine falcon and the bald eagle gripped our attention and our hopes that they could be saved from extinction.

But it is the bluebird that prompted Henry David Thoreau to say that it "...carries the sky upon his back." In a similar vein, John Burroughs, New York's celebrated naturalist, mused "When Nature made the bluebird she wished to propitiate both the sky and the earth, so she gave him the color of one on his back and the hue of the other on his breast...." And, yes, this is the bird recently removed from the endangered species list.

We have not been kind to the eastern bluebird, the species I have been researching since 1984. First, we forced him into losing competition with alien cavity nesters in the form of house sparrows and starlings. Then we changed our farming practice from wood to steel fence posts. Bluebirds used to nest in the rotted-out tops of wooden fence posts. Here in the Northeast, farms are going out of production at a fast rate. Meadows and pastures are growing up in brush and second growth timber. This is not good habitat for bluebirds, who are open-country, not woodland, birds. In the early stages of succession brush lots are good bluebird habitat, but they catch the eyes of developers and sub-dividers and soon our good habitat is converted to a mall or shopping center with an immense parking lot.

Two "homegrown" problems for the bluebird are the house wren and the tree swallow. When a house wren discovers a cavity nest containing eggs or even young birds, it throws them out and fills the cavity with twigs. Persons who erect bird boxes in their garden or backyard are aiding the bluebird's mortal enemy. The box should be located at least 100 feet from a garden, yard, hedgerow, or wood's edge.

How can a small bird such as the tree swallow threaten a larger species? Tree swallows are tough and determined. They wear the bluebird down and then they will build their own nest on top of the bluebird's nest. What to do? Research has shown that nest boxes should be erected in pairs with boxes ten feet apart. If the tree swallows take over one box, they will not tolerate other tree swallows as neighbors. But they will accept bluebirds. Similarly, bluebirds will not tolerate other bluebirds.

Most of the bluebirds I work with are banded and I must say that capturing adult bluebirds is a bit like angling for trophy trout. A pull on the string and the bird is trapped inside the box. Since it is a manually operated trap, I can determine which bird gets captured and when. If you have never observed birds from a blind, you have many exciting hours ahead. Obtain a huge cardboard packing box--the kind refrigerators come in. Paint it with white enamel paint to keep it cool, cut a viewing slot at a convenient height and you are ready to see things that are not in books. At first, set your blind about 30 feet from the nest box you are going to observe. Move it a few feet closer each day. Do this when the birds are absent. Cut

Eastern Bluebird
by Kelly, 6th Grade
Lee Middle School,
Ft. Meyers, FL

Charles Harrington/ Cornell University ©
Richard B. Fischer and Linda Buttel of Cornell University check one of the 119 Eastern Bluebird boxes they maintain, while grandsons Dickie, left, and Eduardo Fischer, visiting from Nacadoges, Texas, hold baby bluebirds.

handhold slots on the right and left sides so you can carry the blind as you move closer and closer. Ten feet away is near enough.

Your observations will be varied and interesting. For instance, after hundreds of hours of watching from a blind I have learned much about bluebird behavior. For example, the male of a nesting pair should be captured and banded first because he reacts differently upon capture. Released after banding, he will spend the next 30 minutes or so trying to remove the band instead of feeding the young. She is accustomed to his inattentive periods so she is not bothered. When he does come to the box with food, he does not go immediately to the entrance hole but tarries on the roof. In time he will make a few passes at the hole without landing. Eventually, he will alight at the entrance, look inside and finally enter. Whew! Of course the female is frightened when handled but she loses her fear quickly and is soon flying directly to the entrance and immediately enters. Unlike her mate, she will remain inside for a minute or more until a nestling defecates. Sometimes she stays several minutes to brood the nestlings. He rarely does. So you see, you can determine the sex of a bluebird by watching what it does.

What else have I learned?

About two out of ten adult birds return to the site occupied the previous year. The return rate for birds banded as nestlings are less than one percent for any year. Occasionally a previously mated pair will return, remate and raise young in the box they occupied the previous year. I have no records of nestlings that subsequently returned and mated with their own parents or siblings. Bluebirds older than three years are rarities. (One of my birds reached five years).

These and related questions will be probed as we continue our research efforts to insure the bluebird's future.

See Dr. Fischer's latest findings at:
http://www.news.cornell.edu/releases/july001/bluebird_nests.html

Teach Children the Names

by Maxwell Corydon Wheat, Jr.

Four and a half is not too early
to teach my grandson the names
of those around him.
We don't just look for spiders.
On August evenings,
"Little Max" and I go into the garden for orb weavers.
"What's the name of that orb weaver?" he asks.
He knows Monarch butterflies
and those white ones with the black spots.
"Grandpa, look at the Cabbage Butterfly."
He is the naturalist, arguing his identification.
Sometimes wrong.
Looking at the guidebook photographs,
he insists "swallowtails".
For proof, he points to spurs
of the hind wings.
He draws pictures, freely shaped, of dolphins,
dabs dots on the sides, "Spotted Dolphins"

Ladybugs and Other Household Guests

by Betty J. McKnight

Some wild creatures are given special privilege status when they show up in our backyard. The lady beetles, often called ladybugs, are high on the list of favored organisms. It is probably not just because they are beneficial insects. Perhaps their attractive appearance, with their shiny bright colors and their neatly placed spots, contributes to the general good opinion held by most people. The French call them 'les betes du bon Dieu' or creatures of the good God. The Germans call them 'Marienkafer' or Mary's beetles. Ohioans liked lady beetles so much that in 1978 they designated the convergent lady beetle (*Hippodamia convergens*) as their official state insect.

Lady beetles belong to the beetle family Coccinellidae, which means "little sphere." Members of this beetle family are somewhat spherical in appearance when their brightly colored elytra (flight wing covers) are closed. There are over 350 kinds of Coccinellidae found in North America and they live in a wide variety of habitats. Good places to look for them include trees, shrubs, fields, beaches and sometimes even in your own house.

Like all beetles the lady beetles have four distinct stages in their life cycle beginning with the eggs, which are found in masses of up to a dozen. The eggs are often laid on the underside of leaves or on stems and they hatch in about a week. The larvae, which emerge from the eggs, are often not recognized by people who are very familiar with the adult beetle. They are tiny black and orange, alligator-shaped organisms covered with bumps and spines that give them a rather fearsome appearance. It may be important for curious naturalists to know that the sickle-shaped jaws of the larvae that are so effective in capturing prey, can give a harmless but distinctive nip on one's finger if handled.

The larvae spend a very busy three weeks growing and devouring hundreds of aphids every day. It is estimated that one larva may eat up to 350 aphids in its life span. At the end of three weeks the larva will go into the pupa stage. After one week the adult beetle emerges from the pupa and resumes eating aphids. Just prior to its fall hibernation the adult beetle may eat some pollen which supplies fat for hibernation.

Lady beetles are active in a temperature range between 18 to 37 degrees C (65-100 degrees F). When the temperature begins to dip below 65 degrees these adult beetles will begin to seek shelter for the coming winter. Their hiding places include piles of logs, ground-covering vegetation and buildings. It is this instinct to seek winter shelter that caught my attention and turned me into an ardent lady beetle watcher.

Shortly after I retired from college teaching and returned to my farm in the Finger Lakes

Fourteen-spotted lady beetle

Glacial lady beetle

Parenthesis lady beetle

Courtesy of Mike Hoffman, Integrated Pest Management, Cornell University

area of New York state, I witnessed my first massive migration of ladybugs seeking winter shelter. Since then I have begun a very intimate interest in these little beetles.

In October as the leaves begin to change to their fall colors and the days grow shorter and colder, I begin to think about the ladybugs. I know they will come soon. As I ride my Wheel Horse lawn tractor in circles and in zig-zags, mulching the colorful fall leaves, I keep an eye on the white clapboard siding of my old (1840) farmhouse. One day the right moment arrives and the lady beetle show begins. Suddenly, almost as if by a single signal, they begin to sail in from fields and woods by the dozens and in time by the hundreds. They fly across the open space of lawn and land on the southwest wall of my house. This is where the sun is warmest and brightest. They are not on the other sides of the house. For several hours they crawl randomly in any and all directions or just rest there in the sun. They do not congregate in piles or pay any special attention to each other. Gradually the numbers decrease as they move into some protective niche they deem appropriate for their winter needs.

In time, some of these beetles will reappear inside my house. They choose the south bay window and squeeze into the corners of the window frame. They will not be seen again in the open area of the window panes in any large numbers until next April and May. But throughout the winter a few individuals will come out from time to time and rest in the open area of the glass. That is when my visitors and I get wonderful opportunities to observe them in great detail. We have discovered that the adult beetles do not bite although they do sometimes play dead. We have also discovered that they vary in size, in the color of their elytra, and in the number, size and placement of their spots. We can see their antennae, legs and even their toes. I have discussions with visitors and ask if they also have ladybug guests in winter. Some do and some do not and we discuss the kind of houses and yards they have that might make a difference. We find more questions than answers but we are very satisfied with our adventures.

Other Household Guests

We have recently added some other occasional invertebrate visitors to our list of guests. These guests are to be observed and, according to our house rules, not disturbed by humans. Our list includes a tiny jumping spider, approximately one half-inch long. The jumping spiders are fairly active and do not stay very long in one window. Only one jumping spider has appeared at a time and they seem to be looking for lunch. So far, whatever they are eating is too small to be seen. But we hope to learn a lot more about them in time.

Our most mysterious insect house guest began arriving about two years ago. We first observed it in the bay window by the kitchen table. It was nicely back-lighted as a silouette against the glass. From the first sighting I was fairly sure that this mystery bug was a "new kid on the block." As an amateur naturalist, I look rather closely at what is growing or traveling through my environment. This was not a familiar traveler in my backyard. This insect was approximately three-fourths of an inch long, dull brownish with an attractive, but very faint zig-zag pattern on its back. It was obviously related to other true bugs like the common stink bug because it had a shield shape triangle between its thorax and wing base, and a very long tubular sucking mouth part. But, the most striking feature was the large flat elaborate structures on the tibia of each of its hind legs. These leg gators later proved to be the single feature that enabled me to determine the identity and history

Variegated lady beetle

Thirteen-spotted lady beetle

Two-spotted lady beetle

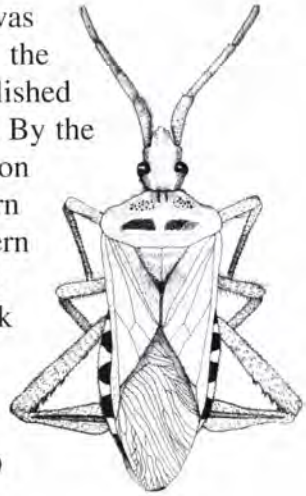
Courtesy of Mike Hoffman, Integrated Pest Management, Cornell University

of this visitor. I watched it for hours as I lingered over morning coffee and it also showed up in my upstairs bedroom, and the upstairs and downstairs bathroom and walking around on the mantle above the stone fireplace in the family room. I asked other people about the possible identity of my mystery bug. I pored through dozens of field guides and professional manuals, all to no avail.

My first breakthrough came when I found a probable relative in a great professional reference used by ornamental horticulturalists. There on page 423 was a marvelous enlarged photo of a plant bug looking much like my mystery bug but with much larger flattened projections on its hind tibiae. This planthopper apparently has the common name 'leaf-footed bug' because of the peculiar shape of its hind tibiae.

My leaf-footed mystery bug belongs to a family called Coreidae. And until recently these leaf-footed bugs were found primarily in the southern half of the United States. They are, as I suspected, "new kids on the block" in the Northeast. This leaf-footed visitor has the impressive scientific name *Leptoglosses occidentalis* (*Heteroptera: Coreidae*). It is actually a western conifer seed bug, which has been gradually expanding its range. It uses its piercing sucking mouth-parts to pierce the scales of conifer seeds and suck out the seed pulp. It has a long list of host plants including white pine, red pine, Scots pine, Austrian pine, mugo pine, white spruce, Douglas-fir and hemlock. If you have any of these trees in your backyard you may be seeing my mystery bug in the near future. It is not yet in large enough numbers to be considered a serious pest. And perhaps it never will be.

This species was first described in the United States in 1910 when it was found in California. In 1956 it was reported in Iowa. By the 1970's it was well established in Wisconsin and Illinois. By the mid-1980's it had moved on to Minnesota, southeastern Michigan and southwestern Ontario. It was found in a home in Orchard Park (Erie County) in January 1990. By 1992 specimens had been collected and recorded from 9 counties of western and central New York. By 1994, my mystery bug was being discovered in Long Island and the lower Hudson Valley.



Coreidae
by Alison J. McLennan

This bug has the habit of entering buildings at the onset of cold weather in late summer or early fall. I was intrigued to discover that on the day that the lady beetles moved to my house enmasse, a few dozen *Leptoglossus occidentalisa* had also tagged along. It seemed that they were not related to each other in any way, but that they follow a similar timing in their decision to move indoors.

This interesting mystery bug is not at all welcomed by most people I have talked to. Their reactions are very negative even though they have no idea what it eats or anything about its habits, its life cycle, or how it may be intertwined in the lives of the other living things in the eco-system. They are in general not the least interested. As a curious naturalist I am disappointed in their lack of interest because all too often the unknowns in our backyards, both plants and animals, are likely to be annihilated.

Ladybug, Come....

Ladybug, ladybug, come to my farm
and eat all the bugs that are doing the harm!
From the vegetable patch to perennial bed,
the very best colors are black spots on red!

- Sally Cunningham
New York State Cooperative Extension, Erie County
Nursery rhyme for daughter Alice

Distant Neighbors: Global Bonds to Backyard Butterflies

by Fran Ludwig

Monarch migration takes place without a single sound—all the way to Mexico—but it creates a great stir of excitement in the hearts and voices of people who witness it.

What are the boundaries of your neighborhood? For children in thousands of schools across the United States and Canada, mountains in Mexico have become part of their living community thanks to an insect that weighs less than a penny.

Monarch Chrysalis
by Frank Knight

The students feed milkweed to hungry monarch caterpillars and watch in awe as each caterpillar transforms into a chrysalis. Many days later the students gather everyone—the principal custodian, parents and other students—to observe the final spectacular show as the bright orange-and- black adult butterflies emerge. When the newly emerged butterflies' wings have unfurled and dried, these insects are finally able to fly.

Each butterfly has an identifying tag attached to one of its wings. It is time to release these tiny guests. They are given a last minute feeding of honey water and, accompanied by the entire class, the monarchs are carried outside where the children bid them, "buen viaje" ("good journey").

As the children watch, the black -and-orange monarchs rise higher and higher and finally disappear as tiny specks on the distant horizon. The children know that their butterflies will soon join millions of other monarchs east of the Rocky Mountains. They will fly south to a small area in the high altitude of the Oyamel fir forests, located four hours west of Mexico City. The children have learned a memorable lesson about a tiny insect whose life cycle requires one type of plant in its eastern breeding habitat and another in its southern wintering grounds.

An open-ended research project called Monarch Watch has been compiling data with the assistance of thousands of students, teachers and

other amateur observers. The volunteers are assigned coded tags, which they carefully apply to the wings of monarchs. The sturdy monarch wings are not harmed by the careful application of the lightweight, waterproof stickers. The tags are the equivalent of a human wearing a watch. Through data gathered from tagged monarchs a great deal is being discovered about monarch migration patterns, effects of weather on migration and the survival rate of migrating monarchs. All information on tag recoveries dates of release and recovery, distance travelled and the name of the tagger are listed in an information-packed annual season summary publication.

Dr. Fred Urquhart heads up the Monarch Watch program at the University of Toronto; Dr. Chip Taylor directs the Monarch Watch project at the University of Kansas; and Dr. Bill Calvert directs the project at the Texas Monarch Watch Center.

During the 1998-1999 season more than 65,500 monarchs were tagged under the auspices of Monarch Watch. Estimates by Monarch Watch biologists indicate that the entire population of North American monarchs east of the Rocky Mountains in 1999 probably numbered about 55 million and occupied a total of only 12 acres in the Mexican state of Michoacan. And in spite of being designated a "biosphere reserve" by the Mexican government, logging continues on a legal and illegal basis in these areas. Poor land owners sometimes need to make a choice between feeding their families and protecting the butterflies.

One organization, The Monarch Butterfly Sanctuary Foundation, supports the development of alternative income projects such as crafts for poor landowners in the monarch reserves and also seeks to improve relationships between conservationists and landowners. They are investigating a program to provide compensation to landowners for not cutting Oyamel trees in the area of the colonies. The Monarch Butterfly Sanctuary Fund is also working with the World Wildlife Fund to develop geographic information systems (GIS) mapping of the butterfly colonies, which will enable the government and scientists to determine what land must be protected. Monarch Watch's "Adopt a Classroom" program organizes kits of materials for teaching science and mathematics in classrooms near the sanctuaries. In addition, school supplies and books are collected for these poorly funded schools. In this way, northern neighbors assist the Mexican communities. This year Millennium Garden seeds for plants that attract butterflies were being sold to fund these efforts. In addition, Dr. Chip Taylor helps to organize conferences in which landowners, conservationists and government officials from three nations discuss the difficult decisions that affect monarchs and people.

Grolier Interactive Inc.

Monarch

Journey North, which is sponsored by the Annenburg Foundation and the Corporation for Public Broadcasting, reveals the extent of the monarch's range and our role as humans in this biological "neighborhood." This program engages approximately 200,000 students of all ages in the United States, Canada and Mexico. By sharing their own field observations of migratory species, including monarchs, robins and hummingbirds, and interpreting satellite data from radio- tagged individuals, such as eagles, whales and loons, students literally watch the food chain come back to life each spring. An abbreviated Journey South segment in the fall tracks monarchs on their way to Mexico and documents the seasonal changes in plant life, air temperature and length of day.

On the Journey North web site, excellent graphics include weekly maps showing sightings of migrating monarchs. By comparing the maps, visitors to the web site can construct their own mental images of waves of monarchs moving south on a continental scale. Journey North advocates an "Unpave the Way for Wildlife" campaign. Links on their web site access examples of schools and individuals who have transformed their own environments into better habitats for monarchs and other wildlife. Planting and preserving milkweed is an important part of the effort.

http://www.monarchwatch.org
http://www.learner.org/jnorth/

Butterfly Gardens

by Jessica Adams

The backyard garden provides homeowners with a private sanctuary that is difficult to top. Through the visual and emotional stimulation produced by curling vines of ivy and the delicate, snow white bells of the lily of the valley, gardeners can find both comfort and drama in the little plot of land that rests behind their house. While individuals carefully plan their outdoor environment, choosing the plants and flowers that provide the most aesthetically pleasing combinations, they spend surprisingly limited time contemplating the insects and other abundant wildlife their garden dwellings could potentially draw. Butterfly gardening, or more specifically choosing plants and a landscape design that would encourage the presence of butterflies, is one way gardeners can further stimulate the activity of their backyard without tampering with the behavior of nature.

How Do I Attract Butterflies To My Own Backyard?

The key to a successful butterfly garden lies mainly in the decisions one makes when choosing plants and flowers. While the majority of flora are potentially suitable for stimulating butterfly interest, color, size and shape play a major role in determining which type of winged creatures your garden will attract.

What Are the Best Kinds of Plants to Use For Attracting Butterflies?

Lilac

When creating a garden with hopes of attracting butterflies, diversity of flowers is extremely important. Butterflies appreciate complex environments, which provide different food plants and thus alternative nectar sources. The following is a small list of varied but successful butterfly-friendly flowers from across the North America:

Lilac	**Calendula**	**Common Day lily**	**Joe-Pye Weed**
Red Clover	**Thyme**	**New Jersey Tea**	**Blazing Stars**
Phlox	**Lavender**	**Tickseed**	**Goldenrods**
Yarrow	**Thistles**	**Sunflowers**	**Zinnia**
Aubretia	**Aster**	**Butterfly Bush**	**Dogbanes**
Cosmos	**Golden Alyssum**	**Butterfly Weed**	**Honesty**

It is said that many of the flowers most populated by butterfly families are red. Adults searching for nectar (the most popular butterfly meal) are especially attracted to this color, along with flowers that are yellow, orange, pink or purple hued. They tend to prefer blossoms that are flat topped or clustered with short flower tubes, which allow the butterflies to reach the nectar with their proboscis. Nectar-producing plants should be grown in open sunny areas because adult butterflies rarely feed on plants growing in shady spaces. Butterfly gardeners must be careful not to overlook the feeding necessities of butterflies in all stages of growth. It is necessary to have plants that serve the needs of all stages of the insect's life (including the larva and caterpillar phases).

How Do I Maintain the Butterfly's Attention?

When interested in keeping butterflies in the garden without altering their natural setting, it is important to do more than attract them to the property. Butterflies are particular about where they deposit their eggs. Making sure their young can feed on nourishing host plants like red clover, dill, or parsley before metamorphosis is the primary goal of the adult butterfly. But different species use different host plants.

In order for a plot of land to be considered sufficient for permanent residence, it must provide all of the components for survival as well as comfort. Many butterflies enjoy gathering at damp sand or gravel. Create a similar small, wet area by filling a plastic container with sand, adding water, and slipping the bucket or bowl between the vegetation of the garden. Butterflies also enjoy warming themselves in the sun. Provide decorative rocks in sunny areas, which will retain heat for additional warmth.

Dill

In the long run, watching butterflies grow and interact with a natural environment that most fulfills their needs will produce the most successful and enjoyable butterfly gardening experience.

For more information, visit the North American Butterfly Association's website where you will find plenty of butterfly gardening information: *http://www.naba.org*

Butterfly Books

Seven Ways to Attract Butterflies to Your Garden, from the Myers Butterfly Farm, 65 Readington Road, Whitehouse Station, NJ 08880.

Butterflies: How to Identify and Attract Them to Your Garden, by Marcus Schneck, Rodale Press, Emmaus, PA 18098.

Butterfly Gardening: Creating Summer Magic in Your Garden, by the Xerces Society and the Smithsonian Institution, Sierra Club, 730 Polk St., San Francisco, CA 94109.

The Butterflies of North America: A Natural History and Field Guide by James A. Scott. Stanford University Press.

Attracting Birds & Butterflies (Taylor's Weekend Gardening Guides, 3), by Barbara Ellis. Houghton Mifflin Co.

Naturalist in the Field
Spider Lessons: Linda Rayor

by Jayme Hummer

Having developed a strong interest in spiders during graduate school at the University of Kansas, Dr. Linda Rayor has chosen to make a career out of studying different types of arachnids such as wasps, scorpions, and of course, spiders. Rayor is currently an entomology professor at Cornell University in Ithaca, New York.

Her class, "Spider Biology: Life on a Silken Thread," has made her very well-known throughout the campus community. Each fall, sixty to eighty students sign up for the course. They come from all different types of majors such as business or engineering, not just science.


Cornell University

Rayor says about one-third of the students are scared of spiders in the beginning of the course and that by the end most of them have conquered their fear. Why do they change? She shows them clips from the bone-chilling comedy, *Arachnophobia,* or, if the students choose, she gives them a baby tarantula to take home and care for.

Aside from her teaching, Dr. Rayor currently has three research projects underway. She is studying the social behavior of talis whip scorpions, the predatory behavior of wasps and she is concerned with genetically modified corn whose pollen acts like a pesticide and has been shown to kill monarch larvae in laboratory tests. Dr. Rayor says, "Monarchs are considered to be a flagship species for conservation. This is a warning bell." To learn more, go to:
http://www.news.cornell.edu/releases/May99/butterflies.pdf.html

Dr. Rayor is primarily interested in tarantulas because they tend to be social. She did her post-doctoral work in central Mexico for eleven months and has also served as a field biologist in Costa Rica. Both of these areas serve as stomping grounds for many of the world's tarantulas because this is where they find prey such as birds, lizards, wasps, and monkeys.

Tarantulas mainly dwell in tropical regions, so most of us in North America, don't have to worry about running into them. However, to my surprise, Dr. Rayor told me that over the past 20 years she has been bitten by more crickets than spiders. She also told me that there are only four poisonous spiders in all of America, the black widow, the brown recluse, the hobo, and the yellow sack.

Rayor finds spiders to be, "charming, fascinating creatures." She adds, "They're a benefit to have in any house or garden."

For more information, go to:
www.news.cornell.edu/releases/June98/spider.bpf.html
www.news.cornell.edu/chronicles/7.13.00/colonial_spiders.html

Book Reviews

Backyard: One Small Square

by Donald M. Sliver, Illustrated by Patricia J. Wynne, New York: W.H. Freeman and Company, 1993. 47 pp.

This book is a definite "must share" with your students. The first things that capture the young or adult reader are the beautiful and accurate illustrations. If you are already fortunate enough to be a somewhat curious naturalist you will appreciate the superb job the author and illustrator have done in sharing their intimate close-up view of backyard ecology. Readers are sure to want to go and see what exactly is going on in their backyards. This book has many helpful suggestions for observing and recording nature in action. It gives many hints and helps readers learn to interpret what they see.

reviewed by Betty J. McKnight,

A Field Guide to Your Own Backyard

by John Hanson Mitchell,W.W.Norton & Company, New York ,1985.

This book is not the conventional field guide one might be familiar with. It is more a series of descriptive short experiences which may be seen at different seasons. The author describes his own delightful encounters with various plants and animals and sends the reader out to experience these natural objects and events. The fact that the book is conveniently organized by seasons increases the probability of success if the reader does indeed explore his own neighborhood. It is an interesting, informative and delightful invitation to explore your own backyard. Even though you may already own many field guides you may want to add this book to your library.

reviewed by Betty J. McKnight

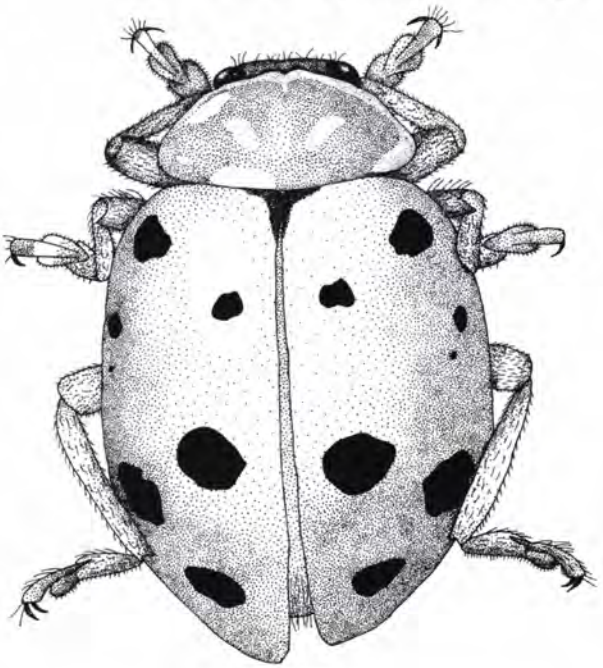
Going Native: Biodiversity in Our Own Backyard

edited by Janet Marinelli, Brooklyn Botanic Garden Publication, handbook #140, Brooklyn Botanic Garden Inc. 1000 Washington Ave. Brooklyn NY 11225, 108 pp.

This publication presents a critical case for the importance of biodiversity in nature. It suggests how the home gardener can possibly play a role in assisting the long-term survival of this country's native species. These native species are plants that are critical to the lives of countless other creatures.

Each chapter is by a different top American landscaper. Authors present helpful information for a biodiverse garden in their region. The regions include the Pine Barrens, the American Subtropics of South Florida, the Midwest, the city, Dallas, Colorado, Arizona, the California Foothills and the Pacific Northwest. It is a valuable reference.

reviewed by Betty J. Mcknight



Ladybug
by Alison J. McLennan

101 Questions & Answers About Backyard Wildlife

by Ann Squire
Illustrator: Jennifer DiRubbio
Published by: Walker Publishing Company, Inc., New York, 1996, Juvenile Literature, 115 pp.

Ann Squires was inspired to write *101 Questions & Answers About Backyard Wildlife* when she and her family moved into a large, old house. There she came face-to-face with a variety of wild animals — ants, termites, wasps, squirrels, and more. Instead of being disgusted, she got curious.

"My research ...has shown me that even the most ordinary creatures can be as strange and fascinating as anything one might encounter on Safari or in the zoo."

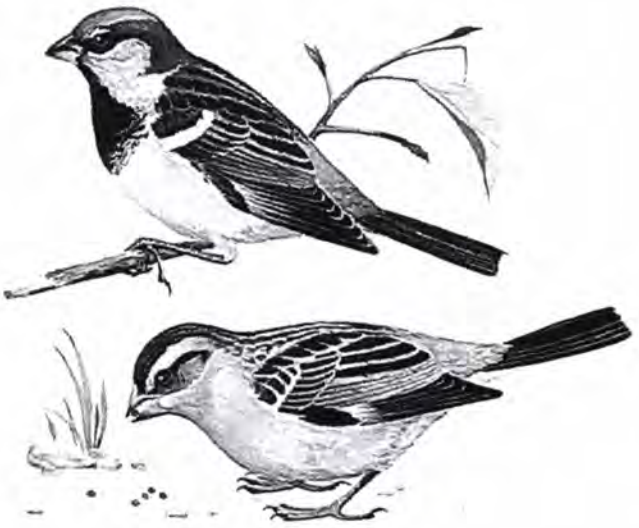
Squire, a trained animal behaviorist, fills this book with the questions she asked about her wild housemates: "What do mosquitoes eat?" "How many eyes do spiders have?"

Would you think to ask, "Why do squirrels have such big tails?" Squire wondered about that. Her research-based explanation — how the squirrel uses its tail for balance and temperature regulation as well as communication — will be uppermost in my thoughts the next time I see my backyard bushy-tails.

Jennifer DiRubbio's clear, simple, and accurate pen-and-ink drawings are the perfect match to Squire's writing.

While this book is catalogued as juvenile literature, there is plenty in here for young and old alike to learn. The reader is treated to clear and generous accounts about backyard wildlife — much more than usual "fun fact."

reviewed by Margaret A. Barker



(c) Grolier Interactive Inc.

House Sparrow

Botany for Gardeners

by Brian Capon
Timber Press, 1998. 220 pp.

Botany for Gardeners probably isn't the most exciting read you could ask for, but it certainly is the most thorough on the subject. It manages everything in layman's terms without oversimplifying or shying away from scientific terminology when it's necessary. It deftly uses diagrams, drawings and photographs to explain botanical concepts from epiphytes to transpirational pull. This book can take any plant lover from simply looking up which plants are shade loving or prefer full sun and which plants like their "feet" wet or need more drainage, to understanding the basis for those preferences.

Just about any type of gardener can find relevant information in *Botany for Gardeners*. Even in my small yard there are wildflowers, vegetables, shrubs, herbs and plenty of native volunteers. The organization of the book allows easy reference as well as fun browsing.

Although the book is written in a scientifically accurate and straightforward way, the author still conveys a fascination and love of the plant kingdom. When speaking of adaptations, he writes: "Earth is blessed with a flora of inconceivable diversity — the outcome of millions of years of natural selection.

There is hardly a place to which one or more species is not adapted. And there is hardly an adaptation that does not engender awe. From the simplest forms to the complex angiosperms and gymnosperm giants, plants are wondrously attuned to the environment."

reviewed by Randy Newcomer

Nature in Your Backyard: Simple Activities for Children *and* More Nature in Your Backyard: Simple Activities for Children

by Susan S. Lang
Published by The Millbrook Press
2 Old New Milford Road
Brookfield, CT 06804

These two books focus on examining and learning about nature around your home and neighborhood through simple activities that can be conducted in a yard with materials found around the home. The author stresses the importance of preserving and appreciating nature and offers tips about how to conduct the activities without damaging the natural resources used within the activities.

Clear-cut descriptions of the activities begin with a list of what materials are required and other important information such as the best weather to perform a certain activity in. The project is then fully described under the headings: what to do, what happens, and why. This clear, organized method allows children to completely understand the activity and know where to look for the information they want.

Both books are beautifully illustrated by Sharon Lane Holm and peppered with interesting facts about plants, insects and animals. Susan S. Lang's books are a valuable resource for any child (or adult) interested in learning more about the nature that surrounds them

reviewed by Victoria Fullard

Eastern White Pine

Hobby Greenhouse

Published by Hobby Greenhouse Association, in the Interest of Plant and Flower Growers (quarterly), Hobby Greenhouse Assoc. 8 Glen Terrace, Bedford, MA 01730, 46 pages. http://www.orbitworld.net/hga

What a delight it was to find the Hobby Greenhouse Association and their Journal. This non-profit association of gardeners is a rich source of self-help and solutions to problems that can befall an amateur greenhouse gardener. However, membership is not limited to greenhouse growers. For instance, a window sill gardener will find pertinent information on household plants.

Plant nutrition, insect control, watering, shade, light and a myriad of problems and solutions are covered in the Journal. Topical coverage includes perennials from seed, cacti and succulents, orchid growing pointers, plant diseases, as well as designs for small greenhouses.

There is a yearly index and member meetings are held in some areas.

When I built my eight foot square solar heated greenhouse (water in plastic bottles) my relatives called it, Russell's Folly! But what a treat to step into it during the middle of winter surrounded by blooming plants.

reviewed by Robert Russell

Bird Feeders

by Helen Ross Russell

Ornithologists (people who study birds) often hide in specially constructed shelters called blinds to observe, photograph and take notes on the activities of specific birds. Some classrooms and school hallways with windows can serve as blinds. Children can stand by the windows to draw and take notes on the behavior of the birds outside. If the windows overlook the nests, feeding trays, or other places where birds congregate, the children may be able to observe more from this vantage point than they could outdoors where their presence would be disturbing. Birds may be attracted to your area by the children planting shrubbery, like holly, red cedar, hawthorn and Russian olive, which provides both food and shelter, or by putting up the feeding stations. Interesting feeders for small birds can be made by stuffing suet or peanut butter between the scales of pine cones and hanging them from trees or from wires. These small swinging feeders delight chickadees and nuthatches but will not be touched by house sparrows and pigeons. Your class may, however, find themselves pitting their wits and engineering ability against the agility and keen mind of a greedy squirrel.

A bird bath filled with clean water is a fine way to attract birds. This can be made from a garbage can lid or it can be constructed by digging a shallow basin ranging in depth from a half inch to three inches and lining it with concrete.

Dust baths are also enjoyed by birds. These are made by digging up patches of soil and pulverizing all the lumps in an area that is fairly dry.

In the spring, nesting materials can be put on a feeder that is no longer needed, or on any accessible spot that can be viewed from the classroom. Straw, packing materials, 15 to 20 centimeter-long pieces of string or yarn, feathers, bits of cotton and hair are all good nesting materials.

American Tree Sparrows
by Jessop, 7th Grade
Hardee Jr. High School,
Wauchula, FL.

courtesy of Helen Ross Russell

Teacher Preparation

If you observe your school ground for a short time both before school begins and from the window during school hours, you will discover some areas where birds habitually congregate. These will be good spots to take your class for making observations. If the children move slowly and quietly, they can frequently get very close to the birds. Even if some birds fly away, they often return if the class waits patiently.

Field Trip Possibilities

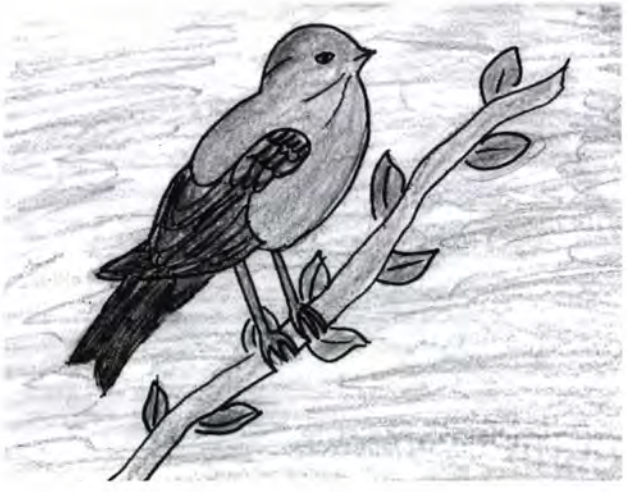
1.) Go outside and watch house sparrows and pigeons as they travel over the ground. Let children pretend they are sparrows or pigeons. Devise games based on impersonation and identification. Observe both types of birds in flight. How do sparrows glide? Pigeons? Let the children use their arms to demonstrate flight patterns. Compare the behavior of other common birds.

2.) Make a map of the school ground and indicate the places the birds commonly congregate. Correlate this with the need for food, water and shelter.

3.) Examine tree trunks for woodpecker and sapsucker drilling. Woodpecker's holes are scattered; sapsuckers' holes occur in horizontal lines. Each sapsucker hole is a little sap well from which he drinks; each woodpecker hole represents one insect taken from beneath the bark.

4.) If there is a bird nest on the school ground, try to devise some technique whereby committees of children can observe and count the number of feeding trips the parent birds make in a school day. This will involve putting the bird watchers in a place where they can see but will not disturb the birds.

5.) If flocks of birds stop near the school ground during their spring or fall migration, take advantage of this unusual occurrence and go out and watch.



Indigo Bunting
by Teashia, 5th Grade
Cottage Hill School
Grass Valley, CA

Trees

by Helen Ross Russell

The study of trees may grow out of many things: a story about a tree, a study of wood or wood products like paper, a picture of a tree, a colored leaf brought to the class by a child, a trip outdoors to draw a tree in an art class, a discussion of plants, or the discovery that trees and other plants help fight pollution. The decision to go outside and look at a tree could also grow out of a vocabulary study. Conversely, a vocabulary study could grow out of an examination of a tree.

Children who have looked at tress on the school ground may be asked to examine the trees along the street as they go home from school. Their reports may raise new questions which can only be answered by going out and looking at more trees.

Leaves can be gathered on a field trip, placed between pages of pulp magazine or an old telephone book and dried, mounted between sheets of clear plastic or placed between two pieces of wax paper and ironed with a cool iron to make window transparencies.

Or the leaves may be used to make leaf rubbings and leaf prints. Of course, making leaf prints can be another way to introduce trees and provide a springboard for further study and field trips.

A chart summarizing measurements and discoveries make a fine follow-up. It also may serve as an invitation to more trips to discover how the tree changes with the seasons.

Teacher Preparation

Trees are dependable. Once you begin to get acquainted with the tree on the corner, you will find that you have established a relationship with a very interesting living thing that will remain on that same corner day after day, week after week, and year after year. You'll soon discover many teaching possibilities that can build around it.

There is no need for you to know its name. If the children ask the tree's name, you can suggest that after they have made a chart of characteristics they can look it up. Even if you do not know the name, this is the best answer you can give youngsters. Learning should be discovery, not memorizing.

Pruning shears or a pocket knife should always be used in collecting twigs so that jagged ends and torn bark do not disfigure the tree and leave it open to disease. Children should be taught that indiscriminate gathering from lower limbs deforms the tree and spoils everyone's enjoyment.

Field Trip Possibilities

1) Get acquainted with one tree. Admire its trunk. Notice the branches, twigs and leaves. The bigness of a tree gives it a special quality. Children enjoy measuring a tree with hands and arms. How big around is the trunk? Can you put your hand around it? Two hands? Your arms? Does it take more than one child to reach around it?

Examine and feel the bark. Look at its ridges and patterns. Feel its texture and hardness. A bark rubbing can be made with a wax crayon and paper as a record of the tree.

Courtesy of Helen Ross Russell

2) Select a tree to visit repeatedly. Observe and record changes. A dated chart with entries such as mounted leaves, twigs, flowers, rubbings, fruit and/or seeds will enable children to make special comparisons. Written summaries can stimulate further reading. If there are several trees of the same kind on your grounds, compare them for size, shape, time of leaf coloration and the time the buds open. If there are differences, can you think of explanations?

3) Make a trip to see how many trees you can find on your grounds or street. You can make a census without listing names by mounting things like a sample leaf, twig, fruit and/or seed from each tree. It is good to have books available for children who may enjoy discovering names by making a comparison of the specimens with the illustrations and printed material.

4) Measure a small tree before the buds open and again in June after the buds open to show how much upward growth has taken place. Look for bark damage. Is there anything you can do to protect trees on your school grounds? Can your class initiate an education program? If you are studying street trees, what things have they done to protect the roots and bark? To provide water?

Explore relationships of trees with automobiles. Are trees at bus stops as healthy as others on the street? Can you relate this to air pollution? Can you find further damage from cars? From people?

5) Make a study of tree flowers in the spring. Tree seeds ripen at different times. Some, like elm, willow, poplar and silver and red maple, ripen in late spring or early summer. Many others ripen in the fall. Still others, like the black oak, pine and spruce, take two or three years to ripen. Many tree seeds are dispersed in winter. Some go sliding over the snow. Field trips to study tree seeds can be just as much of a seasonal study as tree leaves. In the spring, take a field trip to observe tree seedlings. Compare the growth of a tree seedling to the growth of a lima bean. Dig up some seedlings and pot them for a classroom observation. If seedlings are abundant, do a census once a week. What happens to many of the seedlings? Are these population controls important?

6) Go outside in a light rain and notice the effects of raindrops as water drips from branch to branch and finally runs down the trunk to the ground. Imagine the effect of a "roof of trees" like a forest. If your school ground doesn't have a tree, why not plant one? Even an all-concrete school ground could have a large tree in a large container. School grounds with trees might be improved by adding a new kind.

Any school that has maple trees on its grounds can experiment with producing maple syrup. Although sugar maple trees and occasionally red maple trees are the ones used commercially, any maple tree can be tapped. This includes the more common Norway, ash-leaved and silver maples of the city; the English sycamore maple and sugar maple of the South; and the big-leaf maple of the Northwest. The Indians also tapped birch trees and used the sap to make sugar.

Microhabitats

by Helen Ross Russell

A microhabitat is a small unit of the environment especially suited to the growth and development of an organism or group of organisms. In its narrowest sense it may be a small home, in its broadest sense a small ecosystem.

It is frequently associated with a microclimate. The term microclimate refers to the climate of a small unit of land which is different from the total climate of an area. Central Park in New York City has a microclimate. Its trees, grass, soil and bodies of water influence the population level, the temperature, the winds and the effect of precipitation.

Any yard or school ground will have many microhabitats. Whenever a homeowner who enjoys gardening or an apartment dweller interested in house plants asks, "Where will this plant grow well?" he is seeking a microhabitat appropriate to the needs of one living thing.

Field Trip Possibilities

1) In the spring, let the children search for insects that make their own microhabitats. In addition to galls, this may include spittle bugs, which extrude a liquid and beat it into froth; leaf rollers, a kind of caterpillar which folds leaves over its back and sews them down with silk; and leaf miners, larvae of tiny beetles, wasps, flies and moths that live between the top and bottom layers of leaves and feed on the inner cells. Decide how these habitats are different from the surrounding environment. How do they provide food, shelter and protection from enemies?

2) An anthill in a crack in the pavement or asphalt play area is an indication of another microhabitat. The hill is made of sand and soil particles brought to the surface from the underground galleries. What advantage might the area under the pavement provide for these animals that live in tunnels? Observe the ants going about their business. What are they doing? Where do they get food?

3) A stump, a dead log, or a piece of board are often ecosystems. Beetles, beetle larvae, termites, ants, sowbugs, pillbugs, millipedes and other invertebrates feed on the decaying wood. Other beetles and beetle larvea, centipedes, spiders and mites feed on the invertebrates feeding on the decaying wood. Slugs and snails may hide in the holes in the moist interior. Once the wood has been broken down by insects, bacteria and fungus plants, earthworms will begin to live in the soft material. Moss and lichens may grow on the outside. The number of organisms that are found in a microhabitat of this type will be related to both its size and its age. After the class has examined a decaying wood microhabitat, the wood should be returned to its original site if at all possible so it will continue to be available for future study (and soil enrichment).

4) Children may be able to find several microhabitats on a rock outcropping or a stone wall. Are plants growing on the bare rock surface? Are plants growing in the cracks? Are there differences in these plants? How do the habitats differ? The area under a rock is often a good place to discover a variety of animals and animal relationships. Like the dead log, this microhabitat provides shelter and considerable environmental control. It differs from the dead log in not being edible and in being relatively unchanging for a long period of time. It is easy, and important, to return it to its original position.

5) Examine tree trunks for moss and lichens. Do they all grow all around the tree or only on some parts? Students might draw the tree trunks at different hours of the day. Does the sun ever shine on them? Students might make a map of the part of the tree that gets direct sunlight. Compare it to the map showing moss growth.

6) Often galls that started out for one kind of ani-

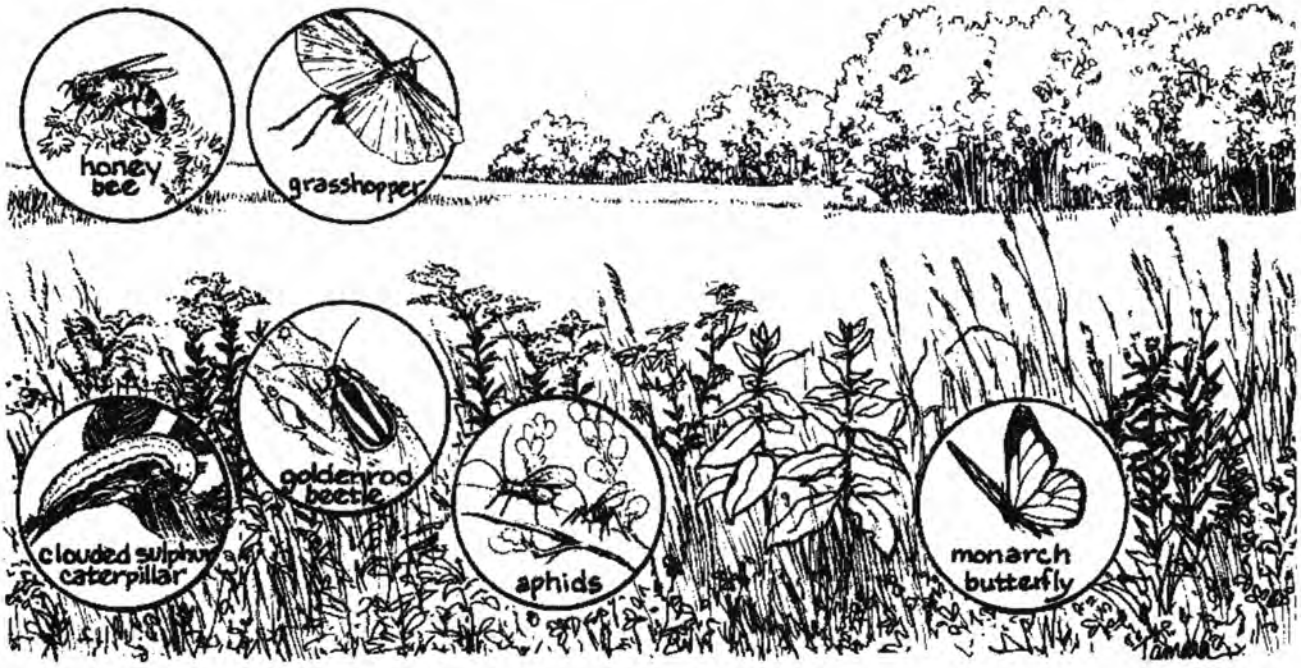
mal become microhabitats for other animals. This is particularly well illustrated by the pinecone willow gall that grows on all kinds of willow trees. The gall is made by a gallfly. The fly larva is an orange grub that lives in a cell in the center o, but other insects lay their eggs beneath the scales. Some of the young insects also feed on the gall. Others, like baby grasshoppers, move out into other habitats. Even after the original owner-builder of the gall has emerged, the old galls often continue to provide microhabitats for other insects. Collecting and taking pinecone willow galls apart can provide a variety of experiences. Even if the galls turn up empty, the way in which the plant grew in response to the insect-deposited enzyme is extremely interesting. (Each scale would have been a leaf on a branch if the gall-maker had not interfered to create a microhabitat.)

7) Often a hole in a tree trunk serves as a microhabitat for a variety of plants and animals. The inside part may show evidence of its return to soil materials both in texture and by the plants growing in it. It may be a habitat for a bird, mouse, a squirrel, or other vertebrate animals, or it may contain invertebrates. Examining the habitat in terms of size, moisture, location, protection from weather and consistency of the wood may help the class to predict the living things that might be there. Discovery of signs such as droppings, nesting materials, shells cracked by squirrels, shells with round holes gnawed by mice and stored food supplies will confirm the presence of some living things.

8) Often, the study of microhabitats can help build an understanding of macrohabitats (large habitats). A hedge is a microhabitat with many of the properties of a forest: dense shade, soil holding, soil production resulting from the dropping and decay of leaves, effect on rainfall and shelter for birds. It can be a good observation and study site for a class that is discussing forests.

9) Lawns, too, are microhabitats similar to grassland macrohabitats. Much of the power and importance of grasslands is in holding soil and water and serving as an active ecosystem. All kinds of producer, consumer, decomposer and nonliving substance relationships can be learned by observation and experimentation with a lawn.

10) While an anthill in a sidewalk crack is the story of a microhabitat under the paving blocks, the cracks between are macrohabitats in themselves. Mosses, grass, weeds, even plants like



ailanthus trees can be found growing there. A class could do a survey of pavement-crack microhabitats. Are there differences between the places where moss is growing and young trees are growing? Can the children find places where the plants have affected or enlarged their habitat? Can they find places where plants have grown their habitats? Is there ever a relationship between anthills and plants? Does the survey turn up any other pavement-crack animal stories?

11) Good gardening is really taking advantage of and/or making a macrohabitat. Suppose a class decides to raise radishes or marigolds. To be successful, they will need to select a sunny spot for either of these plants. Each requires certain soil conditions. If these conditions do not exist, they can add leaf mold, peat, sand, lime, or other materials to make the microhabitat the correct one. What techniques can they work out for providing the right amount of water?

12) Upper elementary grade children in a rural setting could develop a native plant or fern garden. This requires much knowledge of the needs of the individual plant in terms of light, physical and chemical properties of soil, and moisture. It is foolish and destructive to plant a fern that requires limestone soil in a bed of peat, or a fern that requires the acidity of oak leaves on a ledge of lime.

13) Young people can derive great satisfaction from developing appropriate microhabitats and enjoying the success of their venture in the form of a flourishing microbotanical garden.

Related Classroom Activities

A terrarium or aquarium is a classroom microhabitat. It can be extremely interesting to have several terrariums representing different habitats like woods, bogs, desserts and grasslands. To be successful each must be planted in soil from the appropriate area so that the chemical and physical properties of the environment are correct.

The classroom itself may provide several microhabitats. In fact, the topic could be introduced by trying to find the best spot to put some organism. Is the whole room equally good for green plants? For hamsters? For the growth of mold?

Teacher Preparation

A square building has four different exposures to the sun: with extensions, ells, overhangs, and other supplementary structures, the variety of microclimates and macroclimates increases. In fact, two south walls, one shaded by a perpendicular wall and the other jutting forward, can provide excellent side-by-side areas for experimentation and observation.

Rediscovering Bailey's Holy Earth

by Margaret A. Barker

Cornell University Assistant Professor Scott Peters and a colleague are busy retrieving Liberty Hyde Bailey's works and making them known to a broader public, "because we think his ideas and vision have a great compelling freshness today." Peters plans to share Bailey's "prophetic voice" with a modern audience by producing a compendium of the American Nature Study Society founder's works. The volume, tentatively titled, *The New Hold*, is being born out of Peters' ongoing study of Bailey, which had serendipitous beginnings.

One day, as Peters began his research into the connection between the mission of land-grant universities such as Cornell (that aimed to engage students, faculty and community in building a vital rural culture) and the idea of democracy, he ran across an intriguing passage about one "Liberty Hyde Bailey of Cornell." He began a literature search and came up with "an enormous list of more than 200 Bailey-related items." What most impressed him were the wide-ranging titles of Bailey's works:

The Nature Study Idea
The State and the Farmer
The Holy Earth
What Is Democracy?

The writings promised insight into just the questions Peters was pursuing.

"I quickly discovered that Bailey was THE leading voice not only in agricultural and land grant education, but also in the broader country life movement." Peters and his colleague, Paul Morgan, also recognized an environmental ethic and spirituality in Bailey's early twentieth-century writings, unexpected and somewhat maverick for a man considered one of the leading plant scientists in the world.

In Bailey's view, science could be an important tool for helping to build a great rural society. But Bailey's measure for a great rural society included more than material well-being; it also embraced cultural, political and spiritual life. Drawing on Darwin's theory of evolution, Bailey saw nature as "one vast democracy," with cooper-

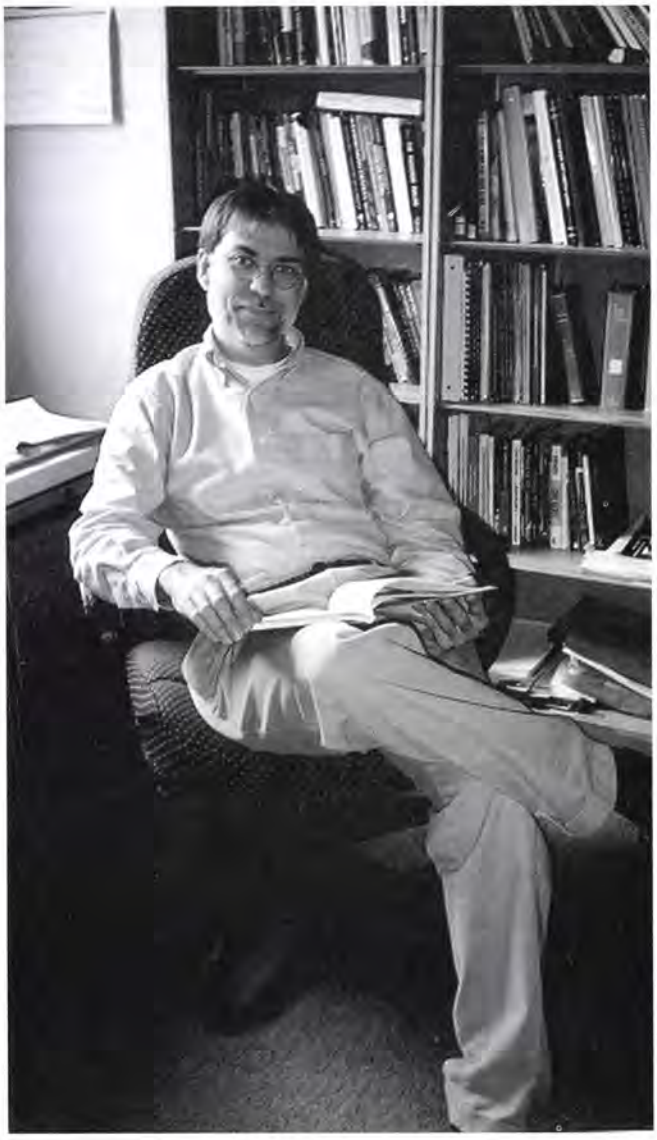


photo by Margaret A. Barker

Assistant Professor Scott Peters in his Cornell University office, Ithaca, New York

ation as the central lesson. For Bailey the great work for education was to help people establish a "new hold" on the planet, which meant developing an agriculture that was more in tune with nature. The Nature Study movement was key to this idea.

"The core of the Nature Study idea, was to help people develop a sympathy with and reverence for nature. Nature Study gave young people personal and original contact with nature, especially nature right in their own neighborhood."

For decades, Bailey's ideas have been overlooked.

Peters hopes to change this by assembling a Liberty Hyde Bailey reader that includes some of Bailey's best works. One quote sure to be found there, is one of Peters' favorites, one he feels gives a true glimpse into Bailey's thinking:

"Spirit counts for more than knowledge"

The Nature Study Idea
Liberty Hyde Bailey, 1903

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From a letter to Steve Melcher, ANSS President:

"I am honored that you want to include my childhood memories about nature, and I am happy to pass that along for the Nature Study journal.

One of my elementary school teachers, Miss Bittner, taught nature study, so her room was filled with plants and animals–lots of growing things. It was probably because of her, to a great extent, that I still love house plants and pets, and all growing things.

For me, it's a personal example of something that we like to offer through our Neighborhood programs–the old Quaker saying that 'Attitudes are caught, not taught!'"

Sincerely,

Fred Rogers

Fred Rogers
Family Communications, Inc.
Pittsburgh, Pennsylvania

Author Biographies

Michael E. Abrams is a journalism professor at Florida A&M University and a member of the Native Plant Society. His article first appeared in the summer 1999 issue of the Society of Environmental Journalists newsletter. Visit his Florida Wildflower web page at http://www.flwildflowers.com/
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Diane Ackerman is a well-known natural history writer, essayist and poet who lives in Ithaca, New York. Among her books are *A Natural History of the Senses* and her latest book, *Deep Play.* She is a visiting professor at Cornell University where she received her PhD. She has been honored with many writing awards, including the John Burroughs Nature Award. The selection included here for Nature Study is from her book, *A Slender Thread:* Random House, 1997.

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Jessica Adams is a student at Ithaca College and an intern with the American Nature Study Society.

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Margaret A. Barker is a writer and environmental educator living in Freeville, New York. She coordinates the Kids Growing Food program at Cornell University and is the co-author of the *FeederWatcher's Guide to Bird Feeding:* HarperCollins, 2000. She is a life member of American Nature Study Society and a member of the North American Association for Environmental Education.

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Michael J. Caduto is an author (*Keeper of the Earth*: Fulcrum, Inc., 1998), storyteller, ecologist, educator, poet and musician. In 1984 he founded P.E.A.C.E., Programs for Environmental Awareness and Cultural Exchange to promote understanding, awareness, appreciation and stewardship as the basis for building a harmonious relationship between people and Earth among the cultures of North America. Michael's first collection of original music, *All One Earth: Songs for the Generations*, received a Popular Award from ASCAP, the American Society of Composers, Authors and Publishers. Books and music can be ordered from:
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James Duke was formerly chief of Medicinal Plant Resources Laboratory of the USDA. He is the author of many books about herbs, including *The Green Pharmacy*: Rodale Press, 1997 and the *Peterson Field Guide to Medicinal Plants and Herbs*: Houghton Mifflin, 2000.
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Richard Fischer is a professor emeritus in the Department of Education at Cornell University where for many years he taught the popular course, Field Natural History. He also lectured and lead trips for Cornell Adult University. A recognized leader in education, he is the recipient of the Association of Interpretive Naturalists special service award. In spring and summer, he is busy banding and observing bluebirds. In the summer of 2000, he monitored 119 nest boxes.

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Peter Friederici is a native Chicagoan who now lives in Arizona where he works as a writer and field biologist. He is a regular contributor to *National Wildlife, WildBird*, and other magazines. The article, *Etching Childhood Memories of Nature*, appears as a chapter in Peter's book, *The Suburban Wild*: University of Georgia Press, 1999. You can reach Peter at:
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Author Biographies continued on next page

Jayme Hummer is a communications student at Ithaca College and an intern for the American Nature Study Society.

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Frank Knight is past president of the American Nature Study Society and current president of the John Burroughs Association, Inc. He is recently retired as Senior Environmental Educator with the New York Department of Conservation and is spending new-found time pursuing his love of photography.

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Dan Kriesberg is an Environmental Education consultant who lives in Bayville, New York on Long Island with his wife Karen and sons Zack and Scott. He is the author of *A Sense of Place: Teaching Children About the Environment with Picture Books* published by Teachers Idea Press (1-800-237-6124). Dan welcomes correspondence. You can reach him at Kriesb@aol.com

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Janice Levy is an Associate Professor of Photography and Chair of Cinema and Photography Department at Ithaca College. Her work is exhibited and published nationally and internationally. She has received numerous awards and grants, including: The Kellogg National Fellowship Award, The New York Foundation for the Arts Fellowship, and the Light Work Grant. In addition to *Spaces Between*, she is working on several other projects including traveling circuses, the only all-women's chain gang, and a book of photographs of Madagascar. If you wish to contact her, you may do so at: jlevy@ithaca.edu

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Fran Ludwig is a K-5 science consultant for the Lexington, Massachusetts schools and has written a course of study called, *Walk in My Moccasins.*

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Betty J. McKnight is a writer and environmental educator living in Trumansburg, New York. She is a professor emeritus of the State University of New York in New Paltz where she taught Science Education and Environmental Education. She is a life member of the American Nature Study Society, the National Science Teachers Association and the New York State Outdoor Education Association.

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Helen Ross Russell is a past president of the American Nature Study Society and past editor of Nature Study. She is a well-known environmental educator, giving workshops on a wide range of natural history and Native American topics. Her book, *Ten-Minute Field Trips*, available through the National Science Teachers Association, is widely used by educators. For twenty-five years, she taught science to students in kindergarten through 4th grade at the Manhattan Country School.

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Scott Weidensaul is the author of *Living on the Wind: Across the Hemisphere with Migratory Birds* as well as many other natural history books and articles. A columnist for the *Philadelphia Inquirer* newspaper, he is also a federally licensed bird bander. Scott lives in Pennsylvania.

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Maxwell Corydon Wheat Jr., of Freeport, New York won the 1990 Poetry Award of Appalachia, awarded by the Appalachian Mountain Club. A retired English teacher, he used nature to teach his students how to write poetry. Among his published works is *God-Hawk: Poems of Nature.*

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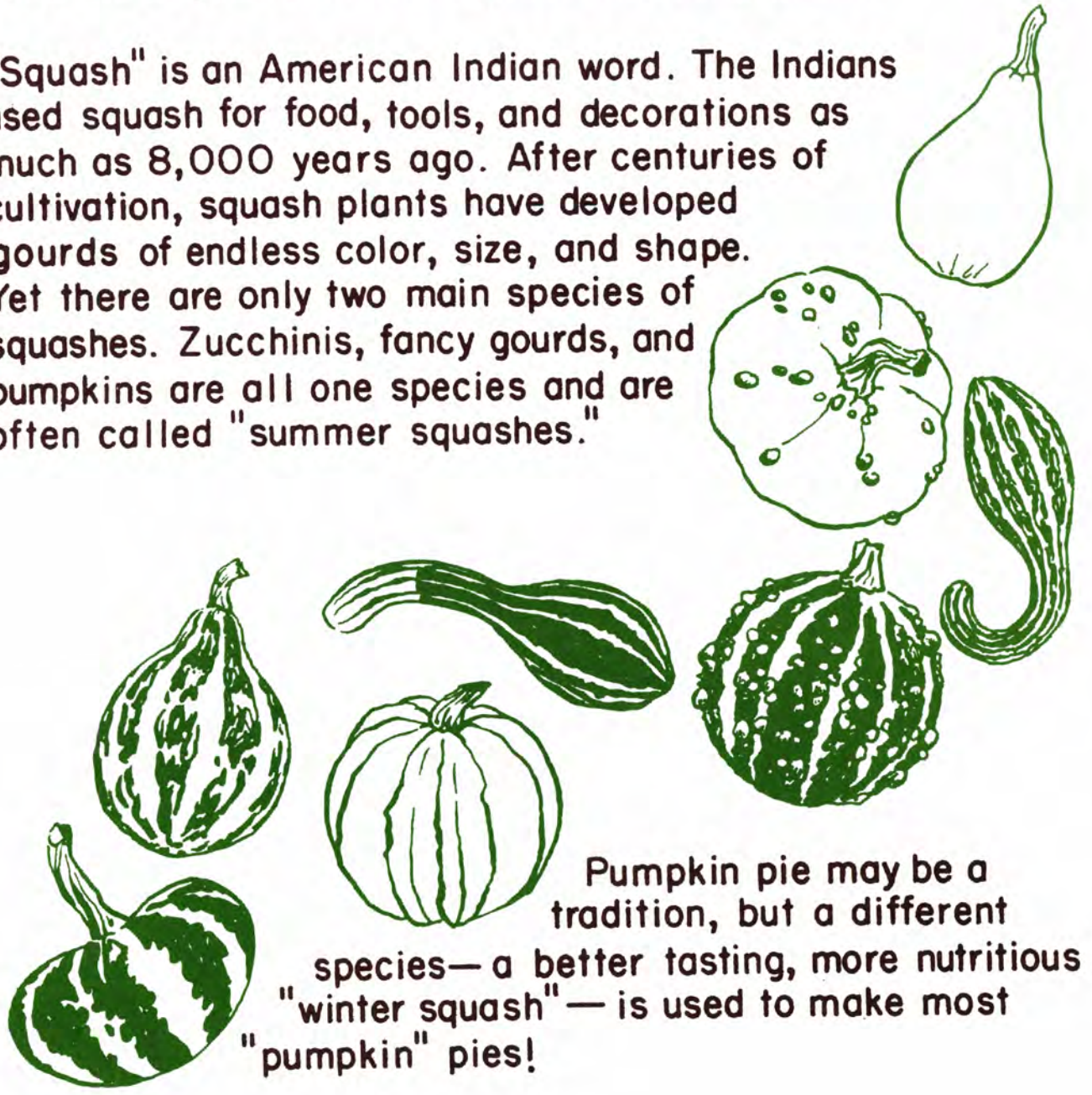
Special thanks to Classroom FeederWatch and the Cornell Lab of Onithology for use of student art.

NATURALIST'S NOTEBOOK

Squash Pie

After the first big frost each fall, squash plants wither and leave their gourds (fruits) exposed on the ground.

"Squash" is an American Indian word. The Indians used squash for food, tools, and decorations as much as 8,000 years ago. After centuries of cultivation, squash plants have developed gourds of endless color, size, and shape. Yet there are only two main species of squashes. Zucchinis, fancy gourds, and pumpkins are all one species and are often called "summer squashes."



Pumpkin pie may be a tradition, but a different species—a better tasting, more nutritious "winter squash"—is used to make most "pumpkin" pies!

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