*Clockwise from bottom left:*
**Waxy caps. Magenta coral fungus. Fading scarlet waxy caps. Angel's wings.**

PHOTOGRAPHS BY ROBERT LUBECK (4)

# Garden of Earthy Delights

## HIDING IN PLAIN VIEW, ADIRONDACK MUSHROOMS AWAIT THE SAVVY FORAGER

*by Adam Federman*

**IN 1907 THE EMINENT LAND SURVEYOR VER-**planck Colvin wrote a letter to his friend Charles Horton Peck. He acknowledged having received Peck's annual report of the state botanist and wrote, "It gives me pleasure to see that you continue to publish plates and descriptions of New York edible fungi, thus affording the public data by which to identify these valuable food plants. Hoping that you will continue this good work, until agriculturalists learn the value of these natural products on our soil."

The beginning of Peck's long career in mycology—the study of mushrooms—coincided with his early trips to the Adirondacks in the late 1860s. He would eventually visit North Elba, in Essex County, more than 25 times and identify some 2,700 species of fungi, many of which were first discovered in the Adirondacks. (A number of species bear his name including *Lactarius peckii*, *Hydnellum peckii* and *Lycoperdon peckii*.) Peck loved the mountains—he was the first to climb Wright Peak and, with Colvin and two guides, Mount Skylight. Peck published a monograph on plants found on

**ATTEMPTS TO NAIL DOWN PRIZED MUSHROOM HABITATS ARE MET WITH POLITE EVASIONS. FORAGERS HAVE A "DON'T ASK, WON'T TELL" POLICY WHEN IT COMES TO WHERE THE BEST EDIBLES GROW.**

Mount Marcy's summit, including fungi that inhabit the dead or dying stems of the tufted club rush.

His longtime assistant, Stewart H. Burnham, once observed that it was not uncommon to see Peck—"sparse and lithe and a little stooped"—in the heart of the wilderness, "examining a vine his sharp eye has detected in the tangled undergrowth." Peck's interest in flowers and plants might be more easily explained than his interest in fungi. Many Americans are afflicted by mycophobia (as with other phobias, it can be overcome) and generally have a deep fear of mushrooms that, to this day, influences everything from research support to popular notions of what we should and shouldn't eat. (As Stephen Jay Gould wrote, "Art and prosperity flower; taxes and urban violence mushroom.") In this light, Peck's devotion to fungi is even more remarkable. He was a pioneer and by the turn of the last century had become America's foremost authority on the subject.

Not only did he inventory many North American mushrooms but he advocated learning about them so that our "fear of the bad would no longer prevent the use of the good." (Even Peck, however, could not free himself of all superstitions. A deeply religious man who remained skeptical of Darwin throughout his career, he believed that irreverence and violation of the Sabbath could cause fungus and insect plagues.) Peck cited a growing popular demand for information about New York's edible mushrooms as reason enough to pursue them and thought that people of limited economic means might benefit from what the forest had to offer.

He felt people should learn about mushrooms—the edible, poisonous and worthless varieties—so that they could eat them safely. (The general public, however, did not always heed his advice. In 1912, five years before Peck died, *The New York Times* reported that there were more than 30 fatalities attributed to mushroom poisoning in the metro region.) If Peck is not a name most would recognize today, it probably has more to do with our relationship to fungi than with his contribution to what Colvin once called the "abstruse branches of your science."

**IT IS FAR EASIER TO FIND MUSHROOMS** (there are an estimated 10 to 20,000 species worldwide, only a small fraction of which have been identified) than it is to find someone who can tell you whether they are edible, poisonous or worthless. (Worthless mushrooms, according to Peck, are not poisonous but are also not worth eating.)

After spending a couple of weekends trying to find Bob Lake, an elusive but well-known edible wild mushroom enthusiast in the Adirondack Park, I'm informed that he has no phone and lives somewhere outside Tupper Lake. On a private dirt road that seems to go on forever I finally encounter one of Lake's cousins, who tells me that if I do find him he probably won't shoot me—which seems fair enough. When I return to find Lake splitting wood on the side of the road, I'm happy to see that he has no gun, only an ax.

"This is prime habitat for wild mushrooms," he tells me, referring, it seems, to the entire park. My attempts to nail down where Lake forages and in what areas prized fungi like the king bolete (*Boletus edulis*), matsutake (*Tricholoma magnivelare*), chanterelle (*Cantharellus cibarius*) or lobster mushroom (*Hypomyces lactifluorum*) can be found are met with polite evasions. Most mushroom hunters are happy to take you into the woods, just not their woods. Lake has a "Don't Ask, Won't Tell" policy when it comes to where the best edibles grow.

Nevertheless, you can find useful information in guidebooks about where and when to look (see page 62). Open up Alan Bessette's *Mushrooms of the Adirondacks* and you'll learn that the king bolete's (*cèpe* in French and *porcini* in Italian) season is roughly from June to October and that it grows on the ground under conifers and hardwoods; that the bright reddish-orange lobster mushroom may appear between July and September and also grows under conifers and hardwoods; or that the chanterelle, one of the best-known wild mushrooms, appears between July and September and, yes, grows under conifers and

hardwoods. The author is not being coy and the lack of specificity is probably a blessing. If you spend any time at all in the woods you will find mushrooms. And it's better to start with the mushroom—their distinguishing characteristics, what they smell like and what trees or plants they grow on or near—than the guidebook.

"The biggest trick is being there when they grow," says Lake. Easier said than done.

Lake, who describes his family as one ruled by mycophobia, studied botany at the State University of New York College of Environmental Science and Forestry, in Syracuse. In the early 1990s he began collecting mushrooms and would bring them to the Park Restaurant, in Tupper Lake, and to the Point, in Saranac Lake, whose chef at the time was particularly fond of angel's wings (*Pleurocybella porrigens*). Lake mostly trafficked in oyster mushrooms (*Pleurotus ostreatus*)—"the most versatile mushroom we have," he says, and a relatively easy one to identify. In his first year gathering he found a flush of yellow-footed chanterelles (*Cantharellus xanthopus*) and picked all day. He carried home 20 pounds. He's found morels *(Morchella)* along sidewalks in Saranac Lake and enough honey mushrooms (*Armillaria mellea*) to fill the back of a pickup truck. He's been thrown off public land for collecting (which is, in fact, perfectly legal, providing it is not for commercial purposes) and says that in all his years of foraging he's never come across anybody else gathering mushrooms. He says he wouldn't be surprised if there are truffles in the Adirondacks. "Why wouldn't there be?" he says, noting that two species grow in Quebec. "I've found indicators of truffles up here. I know they're up here."

When I finally ask Lake if he'll take me into the woods he reluctantly says yes, looking at the large pile of wood still to be split, and only under one condition: that I decide the spot.


**Drawings of the king bolete, from Charles H. Peck's *New York State Museum Bulletin*, 1905.** *Facing page:* **Stropharias watercolor by Vera McKnight.**

BOLETE DRAWING FROM THE ADIRONDACK MUSEUM, BLUE MOUNTAIN LAKE. WATERCOLOR COURTESY OF KARL MCKNIGHT

**SIX MILLION ACRES OF PUBLIC AND PRIVATE LAND** are a lot to choose from. (Picking on private land is illegal without the owner's permission.) You'll greatly increase your chances of finding mushrooms—and the ones you hope to find—if you keep in mind a couple of things: weather, precipitation in particular, and the type of forest. Season, too, is important but you'll learn that most species have a fairly long fruiting period and that temperature, rainfall, soil conditions and a host of other factors determine when a mushroom will appear. Depending on the conditions the same species may surface in June or September. Very few have a truly reliable season—the morel being the most notable exception. It surfaces in spring, usually May, lasts for a short period and then is gone until the following year. But even morels can

## THE ADIRONDACKS—ECOLOGICALLY DIVERSE AND FLUSH WITH RAINFALL—IS AN IDEAL ENVIRONMENT FOR MUSHROOMS. THEY'RE EVERYWHERE.

sometimes be found as early as April and as late as June. The mushroom itself—the strange fruit of a complex underground "root" structure called the mycelium—grows only when conditions are just right.

"[The fungi] are there all the time," says Roy Reehil, a field member of the Central Adirondack Search and Rescue Team who runs a small publishing house called the Forager Press, LLC, in Cleveland, New York. "The only time they worry about throwing up a mushroom to the surface to show themselves is when they're reproducing. So the mushroom is kind of like the fruit of the apple tree. You may not always get fruit, or good fruit. But it doesn't mean that the tree's not there."

When you start looking for fungi it's wise to keep a journal—to note the location, the time of year, the weather (if it's rained recently), plus the trees and plants nearby. Mushrooms are particularly fond of water, and the Adirondacks, which receives 30 to 50 inches of precipitation a year, depending on what part of the park you're in, makes for very good habitat. In addition to their heavy rainfall, Adirondack forests are ecologically diverse.

"It's an ideal growing environment for fungi," says Karl McKnight, an associate professor of biology at St. Lawrence University, in Canton, whose parents, Kent and Vera McKnight, authored the first Peterson's guide to North American mushrooms, in 1987. "So all you have to do is have a little patience and you're always going to find fungi," he adds. "They're everywhere out there."

McKnight, who has spent a lot of time teaching and hiking in the central and northern Adirondacks, says that his father made at least one trip to the park and that some of his collections in the book are almost certainly from the region.

For the McKnights mushrooms were a way of life. Karl says he was "dragged into it," but that he eventually fell in love with them too. ("When other families went on vacations, we went

PHOTOGRAPH BY ROBERT LUBECK. WATERCOLOR COURTESY OF KARL MCKNIGHT

**Late fall oyster mushroom.**
*Facing Page:* **Watercolor of Lepiotas by Vera McKnight.**

# FINDING FUNGI

Some of the finest edible mushrooms in the world can be found in the Adirondacks. But before you eat them, you have to know how to identify them. Don't eat anything if you don't know what it is. Or, as any experienced forager will tell you, "When in doubt, throw it out!"

Below are some of the region's finest edible wild mushrooms, and when and where to find them. **Neither these brief descriptions nor the photographs and illustrations found in this article are meant as a field guide.** Novice foragers should always consult a reliable guidebook (see page 62).

**Chicken mushroom, or sulfur shelf (*Laetiporus sulphureus*)**, is one of the easier fungi to identify. It grows on logs, stumps and sometimes living trees, especially oaks, and can be found from May to November. The chicken mushroom is brightly colored, from pale yellow to orange, grows in overlapping shelves and has no gills. It is best eaten young, when the flesh is still firm, and tastes like chicken when properly cooked.

**Elm oyster (*Hypsizygus tessulatus*)** is a saprophyte found on decaying hardwood trees, particularly elm, beech and maple, from late summer through November. It has a firm whitish or tan cap, firm white flesh and grows singly or in overlapping brackets.

**Hedgehog, or sweet tooth (*Hydnum repandum*)**, is distinguished by the thin white to yellowish toothlike structures that grow on its underside. It has a pale orange or pinkish cap and can be found in the summer and fall under conifers and hardwoods.

**Hen of the woods, or maitake (*Grifola frondosa*)**, has multiple overlapping grayish-brown caps that resemble ruffled feathers at the base of a tree, especially oak and other deciduous trees. It generally appears in the fall.

**Honey mushroom (*Armillaria mellea*)** is commonly found throughout late summer and fall and generally grows in clusters on hardwood trees and stumps. The cap of this mushroom is studded with tiny dark hairs near the center. The honey mushroom can be confused with the deadly galerina (*Galerina autumnalis*), the hallucinogenic big laughing gym (*Gymnopilus spectabilis*) and the poisonous jack o' lantern (*Omphalotus olearius*), so it is critical to identify correctly.

**King bolete (*Boletus edulis*)** generally appears between August and October, but can be found earlier. The bolete is often found growing under conifers, with firm white flesh, a thick bulbous stalk, reddish-brown cap and a spongelike pore surface.

**Lobster mushroom (*Hypomyces lactifluorum*)** is a parasitic fungus that grows on host mushrooms, usually *Lactarius* and *Russula*. It appears in summer and fall and is bright orange to orange-red with fine sandlike bumps on the surface.

**Yellow-footed chanterelle (*Cantharellus xanthopus*)** has a funnel-shape cap when mature, a pale orange-yellow stalk that is sometimes hollow and very thin flesh. It's found from July to October on the ground among mosses and wet woods, especially hemlock and pine. It is similar to the trumpet chanterelle (*Cantharellus tubaeformis*).

WITHOUT MUSHROOMS THE FOREST WOULD LOOK RADICALLY DIFFERENT: TREES WOULD BE SPINDLY AND DWARFLIKE, WOODY DEBRIS AND ORGANIC MATTER WOULD TAKE OVER.

mushroom hunting," Kent and Vera write in the preface to their field guide.) Karl McKnight did his PhD in mycology and botany and studied the evolution and ecology of fungi, which, he notes, are still wide-open fields. When one of his sons fell in love with the destroying angel (*Amanita virosa*), McKnight, rather than warning him off the topic, decided to conduct a father-and-son research project analyzing the poison of this iconic deadly *Amanita*. They collected many of their samples in the High Peaks and plan to publish a paper on the subject. Karl even tried to name his daughter Mycena, after a genus of small saprotrophic mushrooms, but that was where his wife drew the line.

McKnight himself is particularly fond of what he calls the "charismatic megafungi," including the *Russula*, *Cortinarius* and *Amanita*, all of which are mycorrhizal (as are the bolete, matsutake and chanterelle)—a group of fungi that form symbiotic relationships with the roots of trees and some plants. Mycorrhizal mushrooms extend the absorption zone of their host plant and, through their mycelia, capture mineral nutrients and water that trees need. There is also evidence that they help trees and plants resist certain pathogens. In return they receive sugars produced by the plants during photosynthesis. "Mushrooms and trees have love affairs," Paul Stamets writes in *Mycelium Running: How Mushrooms Can Help Save the World* (Ten Speed Press, 2005). Even parasitic fungi capable of destroying thousands of acres of forest, of which the honey mushroom is the best known, can revive and enrich habitats.

Indeed, without mushrooms the forest and the Adirondacks would look radically different. Trees, many of which rely on mushrooms to gather nutrients from the soil, would be spindly and dwarflike. Without the decomposers (such as the chicken mushroom [*Laetiporus sulphureus*] commonly found on oaks), woody debris and organic matter would take over, making much of the region impassable. "You just can't take them out of the equation and come up with even a sci-fi version of what it would look like," says Sue Van Hook, a senior teaching associate in biology at Skidmore College, in Saratoga Springs.

Rather than take them out of the equation, mycologists are devising ways to use fungi to restore damaged ecosystems (mycoremediation), to sustain forests (mycoforestry) and as a membrane for filtering pollutants and harmful microorganisms out of rivers and streams (mycofiltration). Van Hook is the mycological consultant for Ecovative Design, a new company based in Troy whose product Greensulate—a composite insulation made from mushroom fibers and rice hulls—decomposes when you're through with it. The company, founded by two classmates at Rensselaer Polytechnic Institute in 2007, is working toward replacing 10 percent of the current petroleum market that is used to make expanded polystyrenes with biodegradable, eco-friendly solutions—fungi products. The partners, Eben Bayer and Gavin McIntyre, were recently awarded about $650,000 for the best environmental idea at the PICNIC

## THE MYCOFILES:

For information about the newly formed Adirondack Mushroom Club, contact Bob Tatro at bobtatro@yahoo.com. The group meets once a month at the Saranac Lake Public Library and plans to sponsor forays as well as publish a newsletter.

There are also a number of mycological clubs on the edge of the park, including the Central New York (www.cnyms.org) and Mid York (www.mymsnet.org) Mycological Societies. The Adirondack Park Agency Visitor Interpretive Center (www.adkvic.org) in Paul Smiths usually hosts a mushroom walk in September with Bernie Carr, of the Central New York Mycological Society. Roy Reehil's Web site, theforagerpress.com, and David Fischer's www.americanmusrooms.com, answer many basic questions.

Two user-friendly and affordable guidebooks are Gary Lincoff's *National Audubon Society Field Guide to North American Mushrooms* (Alfred A. Knopf, 1981) and Orson K. Miller's *North American Mushrooms: A Field Guide to Edible and Inedible Fungi* (Falcon Press Publishing, 2006).

Alan Bessette's *Mushrooms of Northeastern North America* (Syracuse University Press, 1996), co-authored by David Fischer and Arleen Bessette, is an excellent comprehensive guide. His earlier *Mushrooms of the Adirondacks: A Field Guide* (North Country Books, 1988), now out of print but available at public libraries, works well as a pocket primer.

*Mycelium Running: How Mushrooms Can Help Save the World* (Ten Speed Press, 2005) by Paul Stamets covers everything from mushroom cultivation to mycorestoration, with some useful information on identification as well.

Finally, a great introduction for the beginning mushroom hunter is Sara Ann Friedman's *Celebrating the Wild Mushroom: A Passionate Quest* (Dodd Mead, 1986).


**Morel, left, and destroying angels. Paintings by Louis C. C. Krieger, 1935.**

PAINTINGS FROM *A POPULAR GUIDE TO THE HIGHER FUNGI (MUSHROOMS) OF NEW YORK STATE* (2)

Green Challenge in Amsterdam.

Whether or not mushrooms can help us save the world, as the subtitle of Stamets's book suggests, their many uses are only now being realized. According to Van Hook, *Mycelium Running* "is transforming the globe."

**IT IS A LATE WARM SUMMER DAY** and Lake and I have decided to hike partway up Ampersand Mountain. Not far from the trailhead we find an elm oyster (*Hypsizygus tessulatus*)—"one of the finest eating mushrooms in the world," according to Lake—on a dead maple. He says we'll be sure to take it with us on the way out, not concerned in the least that someone else will see it and decide to put it on his or her dinner menu. The trail up Ampersand is well worn and Lake wanders off frequently without warning, so I find myself trying to keep up as he moves swiftly through the woods. He carries only a small pocketknife, a few paper bags and a hand-rolled cigarette that lasts him all the way to the clearing where the ranger cabin used to be. (If you are planning to pick and identify mushrooms it is a good idea to carry a basket, paper bags or waxed paper for protecting your specimens, and a pocketknife.) Other than the elm oyster we have found only honey mushroom clusters, a couple of solitary boletes and a few dead logs covered with puffballs, a decent edible best known for the spores it emits when crushed underfoot. I wonder if Lake is holding out.

We begin our descent, and maybe a mile from the trailhead, near a stand of towering hemlocks, Lake stops and begins to poke around in the leaves and dirt with his boot. He looks off into the woods and then announces that he's found a yellow-footed chanterelle. I am familiar only with the classic chanterelle, a golden-yellow, sometimes bright-orange mushroom that smells faintly like apricots and is considered one of the finest edibles. The yellow-footed species is smaller, more delicate and much less conspicuous. I would never have noticed it.

Mushrooms beget mushrooms. Once you find a few it is hard to stop looking for more. And once you see them they seem to emerge like elves from the forest. We fill a few bags to the brim with chanterelles, maybe two to three pounds, and Lake discovers a small patch of hedgehogs (*Hydnum repandum*), a mushroom he says he had hoped to find. En route to the trailhead we manage to pass by the elm oyster that we spotted on our way up. It is still there, untouched and probably unobserved. The parking lot is full.

**Chicken mushroom, or sulfur shelf.** *Facing page, from top:* **Watercolor of corts by Vera McKnight. Spore print.**

PHOTOGRAPH BY ROBERT LUBECK. WATERCOLOR COURTESY OF KARL MCKNIGHT. SPORE PRINT COURTESY OF TIM BARONI, STATE UNIVERSITY OF NEW YORK AT CORTLAND

**WHAT PECK DESCRIBED AS** "a much neglected department of economic botany" has become slightly less neglected. The number of wild mushrooms familiar to the average person has probably grown since Peck's day. In the last two decades there has been a profusion of guidebooks (mushroom hunters often say that you can never have too many and that you'll use them all), books on poisonous mushrooms, and accounts of what one writer and mycophile calls "the passionate quest." If the mushroom has long been botany's bastard child, it is finally achieving a certain level of respect. The North American Mycological Association, founded in 1959, now has more than 60 local chapters, and a growing interest in mushrooms has paralleled that of natural and organic foods. The Adirondack Mushroom Club, currently with dozens of members, was launched in October 2008 in Saranac Lake.

There are many reasons to gather mushrooms, not all of them culinary. "I usually don't collect them if I know what they are," says Paula DeSanto, who devotes 60 hours a week to studying mushrooms and conducts fungal inventories of parks near Camden and Mexico, New York. On our walk through a mixed forest of birch, hemlock and beech she carries a jeweler's loupe around her neck and a plastic craft box that is nearly full at the end of our outing (three new species of fungi are discovered every day).

There are more passive foragers too. "I find them when I'm out," says Fred McCulley, of Lake Placid. And, indeed, he does. Three years ago McCulley found nearly 50 pounds of the popular chicken mushroom, or sulfur shelf, on an oak tree near Lake George. He's discovered similarly large amounts of oyster mushrooms on bigtooth aspens near Whiteface Mountain, in Wilmington.

There are also those who love mushrooms simply for their beauty—the bright red and yellow *Hygrophorus* and *Hygrocybe* fungi, the wonderfully named orange earth tongue (*Microglossum rufum*) and the classic artist conk (*Ganoderma applanatum*), a popular canvas for weary hikers—and for what they reveal about the landscape. There are likely hundreds if not thousands of unidentified mushrooms and other fungi in the Adirondacks—wide-open mushroom country that has had few devoted explorers. On more than one occasion, mycologists have said that it would be interesting to return to the areas Peck inventoried and see how they have changed. It's been more than a century.

From an ecological standpoint alone the fact that we know so little about the fungi in our park is surprising. We know a great deal about the biota of our lakes and streams, the flora of our highest peaks and the wildlife in our forests but very little about the fungi responsible for their livelihood. The historical record, compared to Europe's, is thin. So we may never know what kind of impact acid rain and pollution have had on various fungal species. Global warming and species migration may further alter the varieties of fungi we see in the Adirondack Park. "If we have any hope of responsibly managing the Adirondacks over the next 100 years we do need to find out what's living there," says McKnight, referring specifically to mushrooms. "Who's going to do that?"