



Colony of Wild Leeks

Each Year in the Forest: Spring

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Illustrated by Rachel D. Davis

I spend the last weeks of each February brushing leaves aside, anticipating spring shoots. The first I find is often false mermaid, born beneath the maple litter. Its three-lobed leaves fold over themselves like the fingers of a glove. The fleshy cotyledons, newly hatched from the seed, are embedded a millimeter or two below the surface of the soil, soft and green on their inner surfaces, roughened on the backs where the clay and sand cling. The roots are spidery and translucent, barely a fifth of the height of the plant. The long petiole is ghostly white at the base and striated with elongating cells. It gradually darkens to a pale green just below the leaf blade, while the rest of the plant unrolls at the base.

Once the false mermaid is out, I know all hell is about to break loose in the understory. Soon wild leeks prick from the soil's surface, pale at the tips with crimson sheaths. Cut-leaved toothwort arches as it extracts its inflorescence from the soil. Its leaves are feathery and purple. Spring beauty reclines beneath the duff accumulated at the bases of the tree trunks or matted on the forest floor, fragile white stems spreading into green, strap-like, delicious leaves that

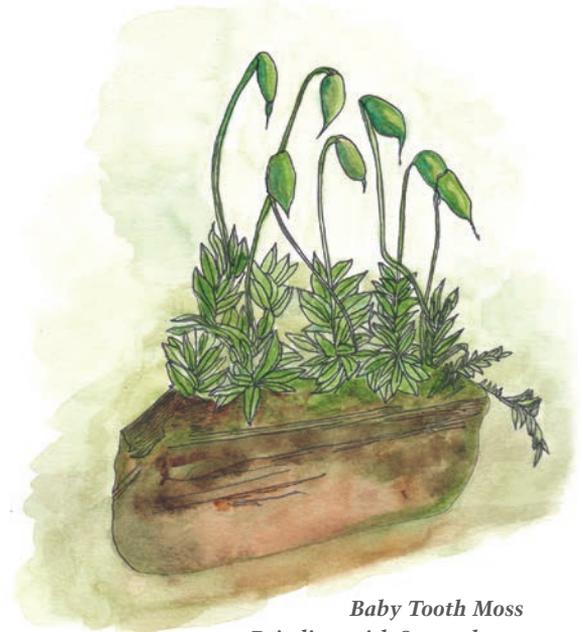
have not yet become bitter. Some of the spring beauty grow so far in search of light that their stems become threadlike. Bullet-shaped mayapple shoot-tips cluster at the bases of the oaks, each tip a half-inch high, clothed in white scales, like a goblin's fingertips. Wood violet rhizomes squeeze out infinitesimal soft green leaves. Rain buries the rhizomes in floods of soil and washes them downslope. Still they continue to grow.

Mosses green up on decomposing logs and on soil that was sterilized by the burning of cut buckthorn in previous years. The mosses form a bed for flowering plant seedlings and a barrier between spongy, rotting wood and the desiccating air.* Mats of wavy starburst moss bristle with sporophytes, capsules at the tips of the filaments popping open to release a little dust storm of spores when I brush them. The spores float off and settle onto nearby plants and logs. Sporophytes wearing slender hoods emerge from a tussock of baby tooth moss, resembling bristles on a hairbrush. The leaves are as thin as the pages of a Bible, with the smallest possible teeth on the margins. Over the next few days, the capsules begin to swell and bend, and soon they are nearly perpendicular to the sporophyte stalks. The hoods split along the side. Within two or three weeks, they will be fully reflexed. They produce spores before most flowering plants in the woods start exchanging pollen.

Evergreen leaves that have been working all through the winter give way. White bear sedge sends up blue-green shoots from broad-leaved, leathery rosettes. Pennsylvania sedge produces slender tillers, and even the leaves that overwintered brighten up. Winter leaves of white avens and strawberry and hepatica continue photosynthesizing as they pass the baton to the young leaves, which emerge as wrinkled as newborns, readying themselves to become next year's evergreen foliage.



False Mermaid



*Baby Tooth Moss
Bristling with Sporophytes*

*White Bear Sedge**Pennsylvania Sedge*

Infant soil centipedes curl on red oak chips that are decomposing in beds of earthworm castings. Chorus frogs sing and then retreat as the temperature swings. Spring peepers awaken and accompany me on my morning walks with strident, individual squeaks. I follow them into a weedy marsh, and suddenly I am in a fog of peepers blasting away, chorus frogs creaking behind them, but not a one to be seen. As I walk away, their calls attenuate, and in two hundred feet I no longer hear them. It is this way with peepers: a person could go through an entire spring within a quarter mile of a pond of peepers awakening and wooing in springtime and never know they were there.

II

That was the first week of March. Soon, wild garlic sprouts from gravelly roadsides and trail edges, slender as grass. Scales loosen on the flower buds of silver maples growing along city streets and creeks. The scale margins whiten with hairs, then the buds open and spill out a handful of stamens or dark-red, tentacular paired styles. Hazelnut catkins descend and are at first stiff, then looser a few days later, bracts cupped like umbrellas over the anthers balled up inside. Then they relax just a bit more and the anthers open. I cannot resist tapping the catkins growing together on a shrub, making them wobble like rows of prayer wheels and release clouds of pollen.

Male woodcocks skate through early March mornings, peenting in openings in the grasslands before soaring overhead, making a distinctive kissing sound

when they reach the top of their aerial dance. On my bike ride into work at the Morton Arboretum, in the western suburbs of Chicago, I often hear the woodcocks spinning over the arboretum's easternmost marshes and fields as I unlock the gate. It is still dark out, and they are flying high overhead before they drop onto gravel roads, openings in the marshes, or mown fields around the cultivated collections. When I hear one calling from the ground, I will sometimes wait for the flight upward, then race to where he was. Almost invariably he drops down too far away, and I don't find him. Once last spring I succeeded in seeing one drop back and resume his dance. He barely lifted his chin when he called. After each "peent," he paused and did a head-nodding shuffle forward and then backward before calling again. He seemed to wait for a response each time, shuffling as though in anticipation of the next call, a restless suitor. He called about five times before growing silent and then abruptly flying off to circle overhead.

We'll have a few weeks of dancing woodcocks before they grow quiet and a portion of the flock moves farther north. We'll see them again on their way back through in the fall. Flocks of juncos buzz and pop in the shrubs, tails flashing as they whip back and forth over the trail. Last year's stump puffballs show up crushed against logs, and expired earthstar fungi nest in the wood chips. White ice fills ephemeral pools like congealed clouds on days when the temperatures rise to 50°F (10°C). The ice then melts outward from the maples and elms that perforate the pools, until the water is wide open, with only a glaze of clear ice returning on late-March mornings when temperatures dip below freezing. False mermaid, now a few inches tall, bunches up in openings in the oak leaves.

Bluebirds perch on the lateral branches of bur oaks and scan the thawing turf for insects. Eastern phoebes return. One day, near the end of the month, I hear the protracted bubbling song of the winter wren. It stops for a few seconds, then starts again, five seconds of a complex line. The song twists around tree trunks and lichen-covered branches that were knocked to the ground by winter storms. I follow it and, if I am lucky, find the wren picking its way among mosses and scraps of soft wood, from one end of a rotten log to the other. A flock of American robins spreads out across the forest floor, solitary birds flipping leaves over one by one, looking for millipedes and pillbugs. It will be completely silent except for an occasional chuckle from the robins and the sound of leaves rustling, which might be the wind's doing if it were not the robins'.



Early April stammers as temperatures drop. This is the lull before the pandemonium of spring wildflowers. False mermaid is widespread, but not thick anywhere. It bolts, overtops the mottled sheets of oak and sugar maple leaves, and spreads across the bare soil of ephemeral watercourses. A week later, it carpets the woods. Spring beauty sprawls beneath the oaks, flower petals streaked with pink. Bloodroot flowers emerge, stalks wrapped in the solitary leaf. Rain a few

days later knocks their petals to the ground. Jewelweed cotyledons pop out on bare upland soil and floodplains, each the size of a nickel, fleshy and bitter. The lavender flowers of hepatica arise beside its light-green, rubbery new leaves, often at the bases of oaks where the plants are protected and where they can soak up rain that flows down furrows of the bark. The white flowers of false rue anemone pool in colonies scattered throughout the woods.

One morning, on my bike ride into work, I find the field sparrows have started claiming territory. Their bouncing song rings through the woods for a minute before I reach a field embedded in the woods. Chipping sparrows trill and harvest insects from the swelling oak buds. Tree swallows patrol the birdhouses. Ruby-crowned kinglets flit in the lower areas of the woods, moving continuously, singing an uncontrollable song that breaks open and spills through the leaves around me. Chorus frogs and spring peepers are exuberant and everywhere. I park my bike and walk in, and when I pause to list the birds I've been hearing, the first tick of the season crawls across my notebook. Mourning cloak butterflies come out from beneath panels of tree bark where they have slept out the winter. Bumblebees and painted ladies cross the trail.

Then a late-season snowfall buries the wildflowers. Mayapples huddle in bunches against the snow, like passengers waiting for the bus in a blizzard,



False Rue Anemone



Jack-in-the-Pulpit

leaves tucked tightly under their chins. Spring beauty in full flower reclines against a log where it is protected from the drifts. Wild leeks and Virginia bluebells are rigid, frozen in mid-expansion, figures in a wax museum. Then the next morning it is 60°F (15°C), and the snow melts away.

By mid to late April, Dutchman's breeches forms puddles of foliage on slopes and disturbed trail margins. Its flowers school above the leaves. When the plants first emerged in early March, I hardly noticed them, flower buds condensed like frog eggs on the translucent scapes. Now, the white flowers mature from bottom to top, petals stretched back into deep spurs, stigmas arched at the snout. Jack-in-the-pulpit spears upward through the foliage before it grows tall enough to spread its wings. Soon it sends up a slender, fleshy inflorescence axis packed densely with pistillate or staminate flowers that I only see by carefully peeling back the hood. Wild ginger leaves appear at the tips of the rhizomes, folded over one another as they emerge, light green and hairy among trampled dead maple leaves. They spread open as soon as their blades are free of the earth, then lie back to sop up the sun. Jewelweed cotyledons I noticed in early March give way to scallop-margined foliage. And leaves begin to come out on the trees, unfurling like wet handkerchiefs on sugar maple seedlings and dripping from the tips of the hackberry branches.

False mermaid has grown lanky. One day I notice its three diminutive petals, about two-thirds as long as the green sepals that alternate between them. They form a crown around three or six stamens, tipped with yellow anthers, and two or three prickly ovaries. The flowers, like the plants themselves, are easy to miss if you are not watching closely, and I sometimes miss their opening. If I have been particularly inattentive, the ovaries may already be swelling by the time I first see the flowers. The first plant I watched for in February does not flower until the spring ephemerals—toothwort, spring beauty, Virginia bluebells—are already in full bloom.

IV

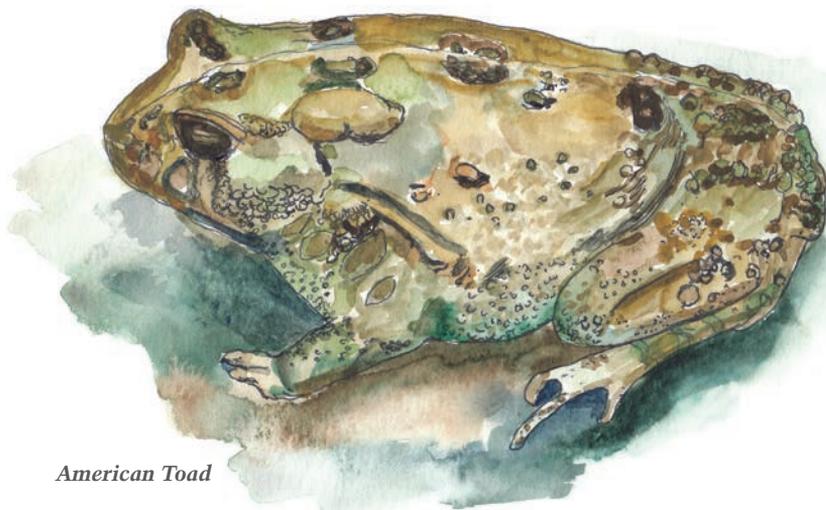
Yellow-rumped warblers appear near the middle or end of April with little warning. I typically hear them before I see them, singing from high in the canopy, and I struggle to remember whose song it is until I see the warblers stalking among the branches or catching flies midair. I will perhaps have already noticed blue-gray gnatcatchers bizzing and wheezing along the tree branches. Soon after, black-throated green warblers show up in the neighborhood, singing in the highest tree branches on our street as they warm up in the mornings. I know we are in the thick of warbler migration when I hear the lazy "bee-buzz" of the blue-winged warblers coming from trees along the edges of fields. Ovenbirds call insistently from the shrubbiest areas of the woods. Black-and-white warblers squeak in the midstory like rusted bearings. Last year, one struck an herbarium window at the arboretum and lay stunned. His eyes closed slowly, and he rolled onto his side on the window ledge. I reached out to retrieve him, but he flipped over and flew off between the branches of the European beech that shades the window.

At about the time that the yellow warblers and common yellowthroats start singing, wood thrushes return to a stand of closely planted spruces embedded in the arboretum's East Woods. The stand is low, with intermittently running water and a thick undergrowth of wood nettles that by this time is tall enough to sting my knees. This habitat seems to be just right for the wood thrushes. In the afternoons, orioles will be tearing at catkins in the tops of the red oaks and piping their hearts out. One evening, American toads begin droning from the marshes. Their song spills out into the adjacent forest. There are a few more weeks left in spring, but we are at the turning point to summer.

Wildflowers flood the woods, running in sheets across the fallen oak leaves and overtopping the spring foliage that has carpeted the woods in the past two weeks. Spring ephemerals have peaked and begun to fruit, as they race to complete their entire annual life cycle on the sunny forest floor before the leaves are fully out on the trees. Cut-leaved toothwort, which flowers with petals the size of a child's incisors, produces siliques, slender capsules that crack open along the sides to release an abundance of small seeds. The flowers on Dutchman's breeches ripen to capsules. Rivers of Virginia bluebells flower, then the corollas fall off, leaving the capillary style ringed at its base with swelling hard nutlets.

The first flowers of wild ginger open beneath the foliage, a pelage of long hairs combed over the backsides of the calyx, purple sepals tipping backwards. Anthers dangle from tiny flowers on male plants of early meadow-rue, and the females' flowers are frosted with stigmas. Rue anemone forms beds of beautiful, full-faced white blooms, some doubled so you might take them for cultivars. Glaucous branches of blue cohosh twist like dancers. Capsules swell thick as bullets on bloodroot.

As the canopy begins to close, the wildflowers of late spring take over. Wild geraniums form lavender seas. The trilliums flower: first bloody butcher with purple petals arching upward, then large white trillium, and then nodding



American Toad



Wild Ginger

trillium, petals stretching out from between the sepals. Flowers dangle like bells in the leaf axils of Solomon's seal and hairy Solomon's seal; their leaves resemble those of the false Solomon's seal and starry Solomon's plume, but the flowers of those species form bouquets at the tips of the stem. The understory burns with wild hyacinth.

V

Everything that was brightest and most beautiful in mid-May is overrun by the end of the month, as wild lettuce reaches to my knees and orchard grass stretches out along the road through the arboretum. The false mermaid I found the first week of March is yellowing and flattened like seaweed against a boulder, pouring its last into the nutlets ripening at its apex. The forest floor is a bed of jewelweed. Yellowing leaves of white trout lily and variegated leaves of toothwort and wild leek stand out in the darkening understory beside the last flowers of false rue anemone. The first flowers of great waterleaf open as the hairy, spiderlike inflorescence branches unroll atop the plants. Bloodroot leaves swell to the size of my hand with fingers fully outstretched and lay back to absorb what sunlight they can through the closing canopy.

Maple and elm seeds rain down overnight, clogging the gutters. Mayapple flowers become the lights of the woods, shining from beneath their great green umbrellas. For a week or so, I can hear golden-winged and black-and-white warblers, northern parulas, black-throated greens, all passing through, alongside the birds of summer: pewees and great-crested flycatchers, kingbirds, phoebes, gnatcatchers and red-eyed vireos, tanagers, ovenbirds, buntings, wood thrushes, and orioles. An olive-sided flycatcher calls an insistent "quick three beers!" Mosquitoes become pesky in the evenings. Spring peepers grow silent. American toads drone on.

The onslaught of spring has come to a close, that time when I see each plant from all sides and keep thinking, what will happen tomorrow? Because for a few weeks, everything is happening at once. No one could catch it all in one year. A person needs year after year in, ideally, a single forest to get the sequence straight.

* For more on the ecology, beauty, and importance of mosses, read Robin Wall Kimmerer's magnificent *Gathering Moss: A Natural and Cultural History of Mosses* (2003, Oregon State University Press).

PLANTS REFERENCED

<i>Acer saccharinum</i> – silver maple	<i>Geranium maculatum</i> – wild geranium
<i>Acer saccharum</i> – sugar maple	<i>Geum canadense</i> – white avens
<i>Allium canadense</i> – wild garlic	<i>Hepatica acutiloba</i> , <i>H. americana</i> – hepatica
<i>Allium tricoccum</i> – wild leek	<i>Hydrophyllum appendiculatum</i> – great waterleaf
<i>Arisaema triphyllum</i> – Jack-in-the-pulpit	<i>Impatiens capensis</i> , <i>I. pallida</i> – jewelweed
<i>Asarum canadense</i> – wild ginger	<i>Lactuca</i> spp. – wild lettuces
<i>Atrichum altecristatum</i> – wavy starburst moss	<i>Laportea canadensis</i> – wood nettle
<i>Camassia scilloides</i> – wild hyacinth	<i>Maianthemum racemosum</i> – false Solomon's seal
<i>Cardamine concatenata</i> – cut-leaved toothwort	<i>Maianthemum stellatum</i> – starry Solomon's plume
<i>Carex albursina</i> – white bear sedge	<i>Mertensia virginica</i> – Virginia bluebells
<i>Carex pensylvanica</i> – Pennsylvania sedge	<i>Plagiomnium cuspidatum</i> – baby tooth moss
<i>Caulophyllum thalictroides</i> – blue cohosh	<i>Podophyllum peltatum</i> – mayapple
<i>Celtis occidentalis</i> – hackberry	<i>Polygonatum biflorum</i> – Solomon's seal
<i>Claytonia virginica</i> – spring beauty	<i>Polygonatum pubescens</i> – hairy Solomon's seal
<i>Corylus americana</i> – hazelnut; you may also have <i>C. cornuta</i> in your area	<i>Rhamnus cathartica</i> – buckthorn
<i>Dactylis glomerata</i> – orchard grass	<i>Quercus macrocarpa</i> – bur oak
<i>Dicentra cucullaria</i> – Dutchman's breeches	<i>Quercus rubra</i> – red oak
<i>Enemion biternatum</i> – false rue anemone	<i>Sanguinaria canadensis</i> – bloodroot
<i>Erythronium albidum</i> – white trout-lily	<i>Thalictrum dioicum</i> – early meadow-rue
<i>Floerkea proserpinaca</i> – false mermaid	<i>Thalictrum thalictroides</i> – rue anemone
<i>Fragaria virginiana</i> – strawberry; you may also encounter <i>F. vesca</i> as a common species in your area	<i>Trillium flexipes</i> – nodding trillium
	<i>Trillium grandiflorum</i> – large white trillium
	<i>Trillium recurvatum</i> – bloody butcher
	<i>Viola sororia</i> – wood violet

Andrew Hipp is the senior scientist in plant systematics and herbarium director at the Morton Arboretum in Lisle, Illinois. He conducts research on the origins and implications of plant diversity, with a focus on oaks, sedges, phylogenetic ecology, and trait evolution. You can read about his research at <http://systematics.mortonarb.org> and follow his natural history blog at <https://botanistsfieldnotes.com>.

Rachel Davis is an independent visual artist in the Chicago area. She works at the interface of natural science, abstract painting, printmaking, and textiles, integrating the formal and empirical elements of the natural world in her work. You can see more of her work at <https://artbumblr.com> and follow her on Instagram: @art_bumble.