bow trout, which spawned around that time, weren't swept out of the nests or buried lethally in silt. The creek did go brown with turbidity, during runoff, from the discharge of several small tributaries that carried meltwater out of the mountains through an erosional zone, but the color would clear again soon.

Insects continued hatching on this creek through the coldest months of the winter. In October and November, large brown trout came upstream from the main river and scooped out their spawning nests on a bend that curved around the sheep pasture, just downstream from the car bodies. In August, grasshoppers blundered onto the water from the brushy banks, and fish exploded out of nowhere to take them. Occasionally I or the other fellow would cast a tiny fly and pull in a grayling, that gorgeous and delicate cousin of trout, an Arctic species left behind by the last glaciation, that fared poorly in the warm summer temperatures of sun-heated meltwater rivers. In this creek a grayling could be comfortable, because most of the water came from deep underground. That water ran cool in summer, relatively, and warm in winter, relatively—relative in each case to the surrounding air temperature, as well as the temperature of the main river. In absolute terms the creek's temperature tended to be stable year-round, holding steady in a hospitable middle range close to the constant temperature of the groundwater from which it was fed. This is what spring creeks, by definition, do. The scientific jargon for such a balanced condition is *stenothermal:* temperatures in a narrow range. The ecological result is a stable habitat and a 12-month growing season. Free from extremes of cold or heat, free from flooding, free from ice and heavy siltation and scouring, the particular spring creek in question seemed always to me a thing of sublime and succoring constancy. In that regard it was no different from other spring creeks; but it was the one I knew and cared about.

The stretch of years came to an end. The marriage came to an end. There were reasons, but the reasons were private, and are certainly none of our business here. Books were pulled down off shelves and sorted into two piles. Fine oaken furniture, too heavy to be hauled into uncertain futures, was sold off for the price of a sad song. The white-stockinged mare was sold also, to a family with a couple of young barrel-racers, and the herd of trap-lame and half-feral cats was divided up. The man and the woman left town individually, in separate trucks, at separate times, each headed back toward New York City. I helped load the second truck, the man's, but my voice wasn't functioning well on that occasion. I was afflicted with a charley horse of the throat. It had all been hard to witness, not simply because a marriage had ended but even more so because, in my unsolicited judgment, a great love affair had. This partnership of theirs had been a vivid and imposing thing.

Or maybe it was hard because two love affairs had ended—if you count mine with the pair of them. I should say here that a friendship remains between me and each of them. Friendship with such folk is a lot. But it's not the same.

Now I live in the city from which college students flock off to the Fourth-of-July rodeo in that little town, where they raise hell for a day and litter Main Street with beer cans and then sleep it off under the scraggly elm in what is now someone else's front yard—the compensation being that July Fourth is quieter up here. It is only an hour's drive. Not too long ago I was down there myself.

I parked, as always, in the yard by the burn barrel outside the stucco house. The house was empty; I avoided it. With my waders and my fly rod I walked out to the spring creek. Of course it was all a mistake.

I stepped into the creek and began fishing my way upstream, casting a grasshopper imitation into patches of shade along the overhung banks. There were a few strikes. There was a fish caught and released. But after less than an hour I quit. I climbed out of the water. I left. I had imagined that a spring creek was a thing of sublime and succoring constancy. I was wrong. Heraclitus was right. ◻

Willows

THERE'S A CERTAIN small song that seems to stay with me—I can't recall where it came from, but it faithfully expresses one of my basic attitudes:

"Oh, I wish I was a willow on the riverbank
'Cause I'd never have to make a living then.
Just look up the river, and down the river,
Then up the river again. . ."

That's about all I remember. Still, it shows what some of us have in common with willows—not just a singular lack of ambition, but an attraction to such appealing places as the banks of bright little trout streams, the sandbars of slow brown catfish rivers, and marsh edges and alpine meadows.

Willows have a way of inhabiting some very good places, growing as trees or shrubs from beach dunes at sea level to the upper tree line of our highest mountains, from desert arroyos to Arctic barrens. They go by many names. Some are named for a physical feature: the crack willow, peachleaf, red, black, white, shining, heart-leaved, weeping, littletree, felt-leaf, yew-leaf, balsam, satiny, and pussy willows. Others wear place names: sandbar, arroyo, river, meadow, Northwest, Florida, Missouri, Pacific, Sitka. There are willows named for their describers: Bebb, Tracy, Gooding, Hooker, Scouler, Bonpland, and Hinds.

It's not clear how many distinct species of willows exist in North America. No tree family appears to be tougher to systematize; willows can be a field naturalist's nightmare and a plant taxonomist's dream, for they have a maddening tendency to hybridize. One authority cites "over a hundred species." Another puts the total at "more than sixty-five species." Still another just notes that "from eighty to a hundred species" are distributed from the Gulf to the Arctic Circle. Swedish botanist Eric Hulten lists over fifty distinct species of willows for Alaska and its neighboring territories alone. There's not even a consensus on how many willows are actually trees. Fewer than half our North American willows ever reach tree size; most range from large shrubs to low, sprawling mats, and one botanist notes that only about twenty-five species of willows ever attain tree size. Another puts the number at about thirty-four, while that estimable naturalist–writer Donald Culross Peattie sensibly straddled the issue by noting that "all the tree species are also frequently shrubby, while many of the habitually shrubby species are sometimes twenty to twenty-five feet tall." Anyway, there are at least eighty species of North American willows, sharing membership in the family Salicaceae with ten species of poplars. All in all a northerly family, and nearly all our willows, poplars, aspens, and cottonwoods are in temperate or north temperate climes.

The willow genus *Salix* is derived from the Celtic *sal*, meaning "near," and *lis*, meaning "water." Almost without exception, willows are inordinately fond of water—ask any householder who has planted a willow over a sewer line. Here in our corner of the world along the Upper Mississippi, they are the trees closest to the river, crowding down past the low banks and growing in great profusion out there on the mudflats and sandbars.

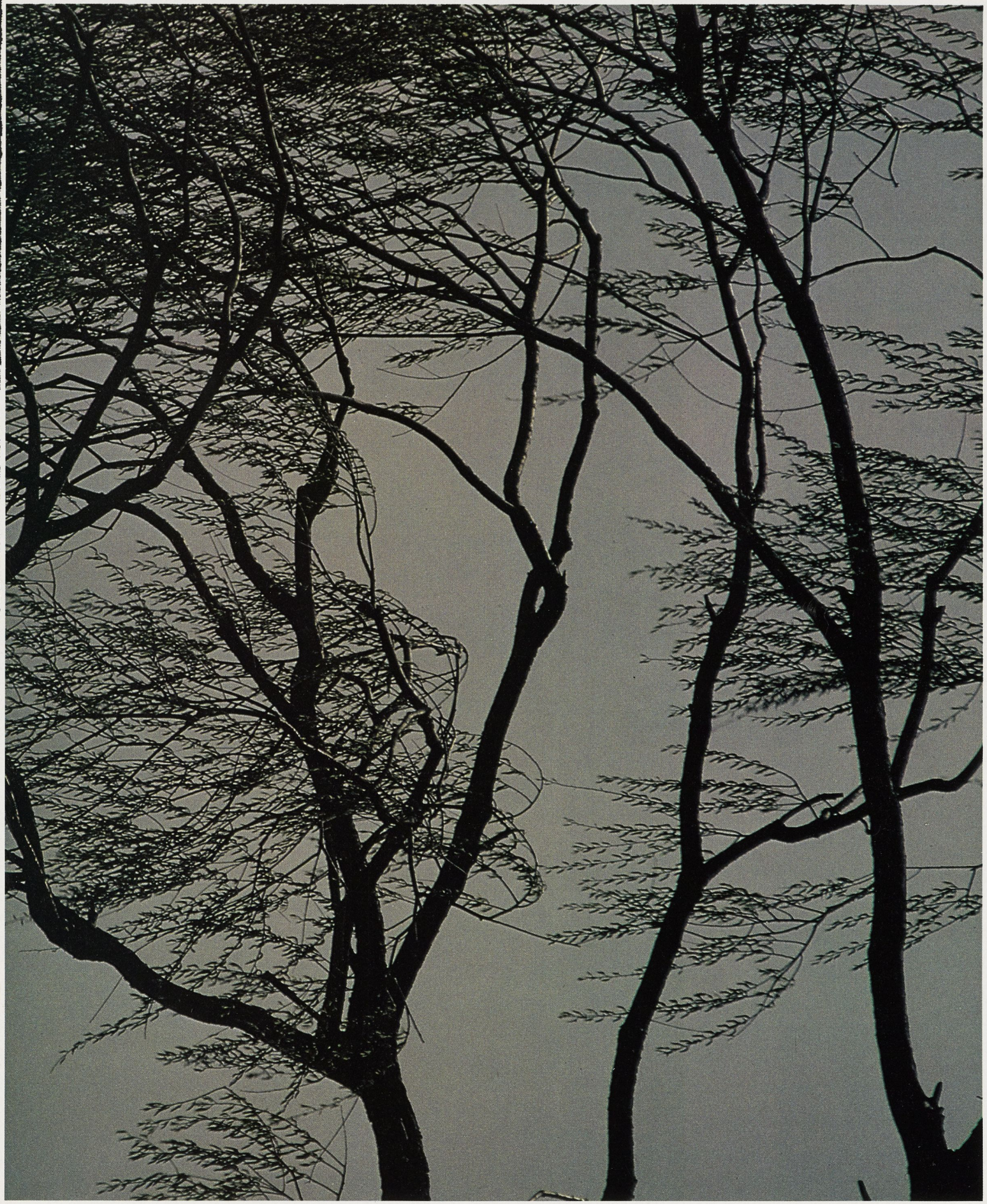
The Mississippi is a river of willows. From its source all the way down its main stem to its mouth, the river's banks, islands, and low flats are clad with willows. When new sandbars are thrown up by floodwaters or Corps of Engineers' channel dredging, or mudflats are revealed during prolonged low water, some of the first plants to pioneer these raw, naked places are willows. They come on in dense knee-high stands, sometimes as many as 10,000 seedlings on a half-acre of mudflat. Just behind them, on somewhat higher ground, may be older stands of larger willows—venerable trees nearing the end of their forty-year life span—backed, in turn, by towering cottonwoods or silver maples.

Willows are finely tuned to life along the water. Their sexual cycle begins in early spring, and the seeds ripen at about the time rivers and creeks are bank-full. The mature willow catkins emit clouds of light, silken fluff. Each bit of fluff carries a tiny seed and is light enough to be airborne but not so light that it flies for great distances. If the airborne seed only manages a few yards between the tree and the nearest water it will have followed its flight plan and its manifest destiny, for some willows are more readily distributed by water than any other means. At least this is true of such riverine species as the peachleaf, Missouri, and sandbar willows. A willow embryo has a very thin covering and can germinate within a few hours but only if it finds a moist seed bed. Otherwise, it loses viability within two or three days. Seeds falling on dry ground, especially on dry, shaded ground under old trees, have hardly a chance.

River willows seed at a prodigious rate; there are times in spring when calm Mississippi sloughs appear to have been sprayed with silvery flocking, when the edges of sandbars and mudbanks are whitish mats of new willow seeds, and some of the channel catfish taken in our basket traps have bellies full of the stuff. But even if most of the seeds strewn so lavishly along a mudflat manage to germinate and produce a dog-hair stand of sprouts, and even if most of these survive further immersion by more high water, the process of natural culling is in play from the very beginning.

by JOHN MADSON

TLE, AND GROW KITTENS



Pacific willow (Salix lasiandra), Idaho, by Joanne Pavia; facing page: pussy willow (Salix discolor), Maine, by Dwight R. Kuhn.

Most will perish as the stand grows older and some saplings begin to overtop others, for shade is deadly to willows. Floods they can take—and burning sun and the abrasion of blowing sand, and hunters cutting them by countless boatloads for brushing duck blinds—but shade is intolerable.

WILLOWS ARE A NOTABLE part of any fine Mississippi River day—and are just as notable on a summer night.

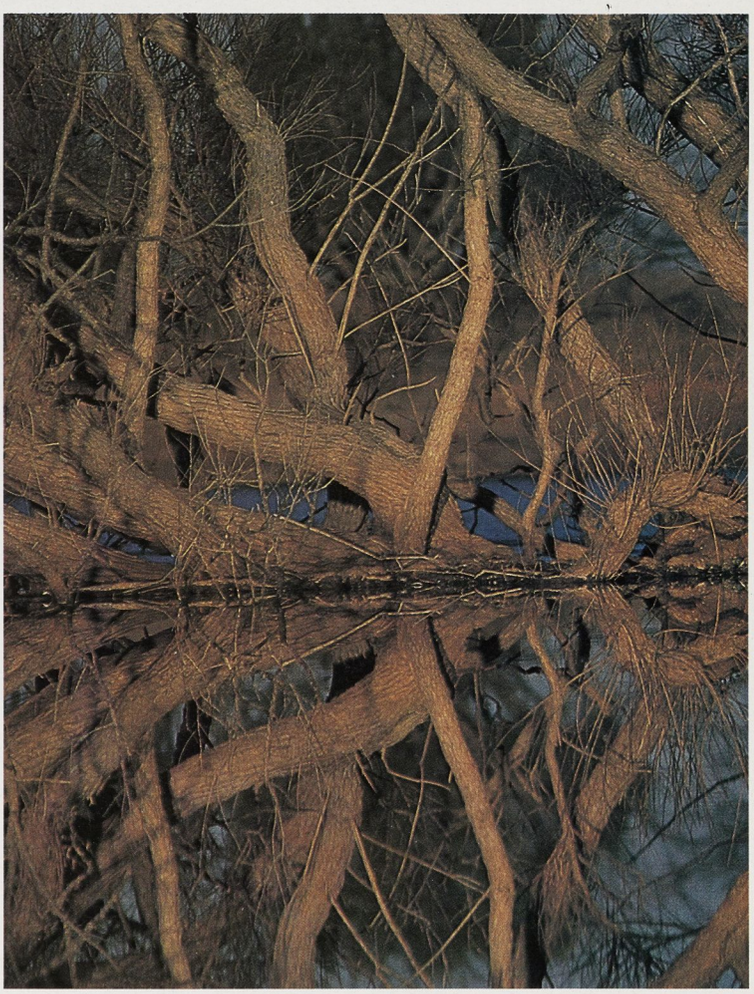
There are special smells to night water and wet sand that go with tending trotlines from an island camp. There's the clean, fresh smell of the catfish taken off the lines under the summer stars, and the blessed coolness that has pooled under the limerock ledges of places like Infidel Hollow and then flowed down the creekways into the main river valley with the breath of ferns and wet stone and hidden spring seeps that have never known the sun. And there is the night breath of willows—a subtle pungency from the tiny resin glands of millions of leaves warmed by the summer sun and now cooling at night. In her fine book *River World,* Virginia Eifert remarked on this "perfume of the Mississippi." She noticed it most strongly one night on the lower river when she was a passenger on a towboat: "To me, the first time I smelled it, it was a haunting, honeysuckle-like fragrance. I asked what it was. 'That's the willow smell,' said the captain, almost reverently."

Most of these river willows are the ubiquitous sandbar willows, pioneers of the mudflats and new sandbars, first of the trees to establish beachheads on new ground. They never grow to much more than twenty feet, with spindly trunks only a few inches thick, but in addition to thickly seeding a barren sandbar these willows can also send out undergrown stems to form dense thickets or "willow bats." (I've never been able to learn the origin of that term. But there's no doubting the origin of "willow slaps," which means the same thing. Just walk closely behind someone through a dense stand of willows and find out.)

Another major Mississippi River willow is the black willow, largest of all American willows. Here along our Upper Mississippi we rarely see one much over fifty feet tall, but far downriver in the rich bottoms of the Lower Mississippi it is a giant of a willow that may be 140 feet high with a trunk nearly four feet in diameter. It's also one of the few willows with any commercial lumber value. Not that it rates very highly. The wood is soft, light, and not very strong. Still, it has uses. It isn't easily split by nails, and its springy fibers tend to grip nails better than most woods. Black willow lumber is very durable in water and has the unusual ability to sustain bad dents and bruises without splintering. Just the thing for waterwheels and certain boat keels. But one of its greatest values—and one shared by most of the river willows—is a masterful capacity for tying down easily eroded riverbanks.

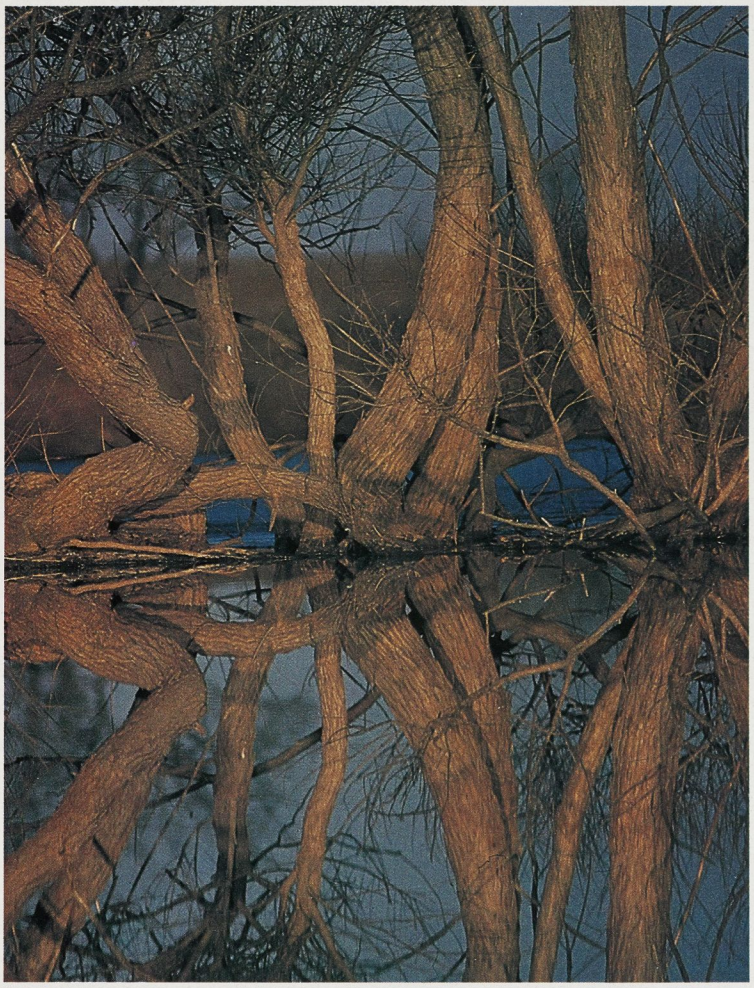
Willows are professional erosion-controllers. It is their business to lock riparian soils in place; they and their ecological niches depend entirely on their success in doing so. They accomplish this by rapid growth, swift development of the matted, densely tangled root systems, spreading by underground stolons, and the ability of odd bits of broken green parts to take root and sprout. For protecting streambanks from severe cutting, willows can be more serviceable and practical than masonry walls or shields of the heavy rock facing called riprap. One of the many enigmas of modern agribusiness is why some landowners permit streams to gnaw at their richest fields when the problem might be solved with a bit of bulldozer work and some green willow sticks.

Lindheimer black willow (S. nigra lindheimeri), Texas, by Wyman P. Meinzer.



If a stream's banks are vertical and caving, it is probably necessary to do some grading (during low-water periods) to create gradual slopes that can be planted with willow cuttings. These can range from green wands cut from year-old shoots to green stakes several inches in diameter. Stick them into the soft ground with the larger stakes down toward the water's edge and they will all grow vigorously. On the bends of small streams whose banks already have some natural slope, willow stakes up to four inches in diameter can be driven rather closely together from the water's edge on up the bank. The spaces between these green stakes can be filled with green cuttings from willow trees. Such cuttings should touch the ground as much as possible; even better, they can be lightly buried. Any part of a live willow will grow vigorously if placed in moist soil.

On a steep, caving bank where grading may not be practical, another tack can be taken. Willow poles about twenty feet long are cut in spring before growth begins and laid on the ground near the streambank several feet apart, butts toward the stream. Woven wire fencing is fastened to the poles, with two feet of each pole projecting below the wire if the stream edge is soft mud, and less for a firm bank.



With wire fastened to the poles—in sections about a hundred feet long—the whole thing is pushed over so that the butts of the poles sink into the soft mud at the water's edge. As the banks cave away, some of the soil will lodge on the wire and partly bury the poles, which take root and grow.

Primeval belts of floodplain timber that flanked the old Mississippi prevented the sort of terrible erosion that began with settlement. But as the riparian forests were cleared for farm fields and cut for steamboat fuel, the unprotected banks were devoured by the ravenous river—especially on the outer swings of bends where the current was most violent.

Enter a young captain of the Army Corps of Engineers, Oswald Ernst, who reported to the St. Louis district office in 1878 and proceeded to enlist willows in his personal war against riverbank erosion. Ernst pioneered the use of huge willow "mattresses" as part of bank revetments along the Mississippi. At a problem area he would first divide the eroding bank into three zones: from the lowest point of erosion up to the low-water mark, from there up to the level where willows would grow, and from the "willow zone" up to the top of the riverbank.

The commonest willows at hand (peachleaf, sandbar, and black) were woven into huge mats that were usually about 1,000 feet long, 250 feet wide, and a foot thick. These were pulled out into the river and sunk under a ballast of heavy rock with the upper portions of the mattress at about the low-water mark. Above that mark the bank was graded to a 1:3 slope and paved with heavy rock; willow mattresses were not used because that zone would be alternately above and below water and a mattress would quickly rot. (A constantly submerged mattress might last thirty years.) From the riprapped zone of rock to the top of the bank, Ernst planted willows—an indigenous river tree that he had studied intensively, just as any good engineer studies the structural components of his profession.

At about the same time, settlers in the central prairie states were finding that willows were the answer to a sodbuster's prayer for a faster-growing, hardy windbreak. Better hardwoods and conifers would follow, of course, but there was no beating willow (especially crack willow) as a nurse tree: It was easily planted, fairly long-lived, needed little care, had some fuel value, and was able to reproduce vigorously from the stump.

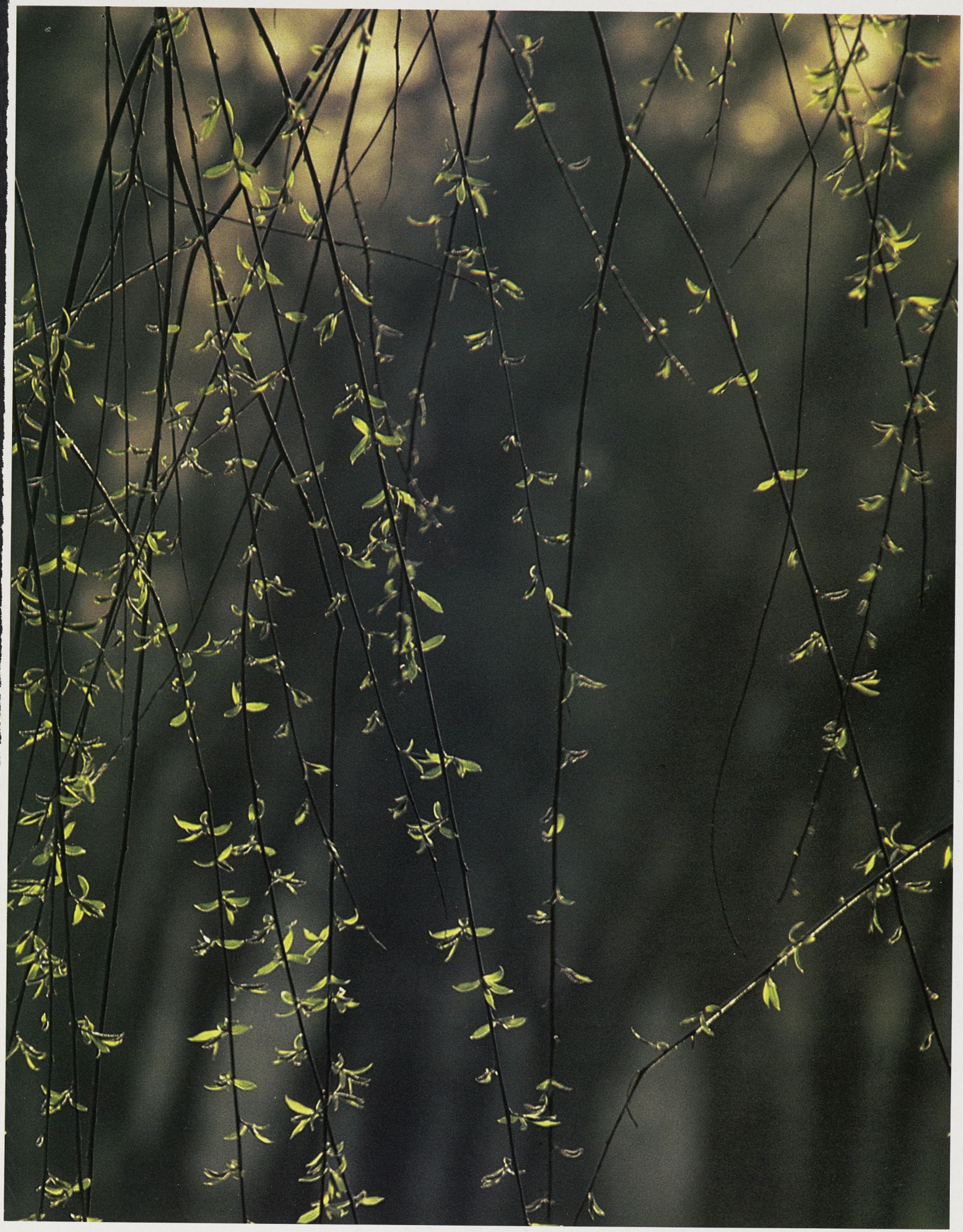
In those earliest days of the frontier, however, certain drawbacks to willows had been noted. In 1833 Prince Maximilian von Wied Neuwied was at Fort Osage on the Missouri River, where he collected the Missouri willow and was the first to describe it. He also reflected in his notes: "The driftwood on the sandbank, consisting of the trunks of large timber trees, forms a scene characteristic of the North American rivers; at least I saw nothing like it in Brazil, where most of the rivers rise in the primeval mountains, or flow through more solid ground. On the banks which we now passed, the drifted trunks of trees were in many places already covered with sand; a border of willows and poplars was before the forest, and it is among these willow bushes that the Indians usually lie in ambush, when they intend to attack those who tow their vessels up the river by long ropes."

WILLOWS ARE OFTEN ASSIGNED the gloomier corners of folklore and literature. Take, for example, the chilling short story "The Willows" by Algernon Blackwood, one of England's masters of the supernatural genre. Two young canoeists are on holiday on the Danube. In near-flood conditions, they make camp on a willow-grown island and soon learn that the island is one of those dread places where "the veil is thin" and forces in the Fourth Dimension can probe blindly into our world. They are "found" when the canoe is probed and destroyed—and then the terrible groping proceeds to follow them through the willows, leaving pits like giant ant-lion traps. Just the sort of story needed at a float trip campfire.

Then there's the malevolent Old Man Willow in J. R. R. Tolkien's *Lord of the Rings*. This was "a huge willow tree, old and hoary. Enormous it looked, its sprawling branches going up like reaching arms with many long-fingered hands, its knotted and twisted trunk gaping in wide fissures that creaked faintly as the boughs moved." Old Man Willow had a propensity for lulling travelers to sleep under his branches, and then splitting open his trunk and slowly engulfing them.

On the other hand, there's Kenneth Grahame's graceful little classic *The Wind in the Willows*, which deals most kindly with conservative water rats, moles, and badgers, flamboyant toads, and the genus *Salix*. It's an appealing premise, for I've always regarded willows as congenial associates in myriad fine, small adventures.

Peachleaf willow (Salix amygdaloides), Minnesota, by R. Hamilton Smith.



Missouri willow (Salix eriocephala), Minnesota, by R. Hamilton Smith.

Such were the Old Man Willows of my Iowa boyhood—several gnarled old trees clinging to the verge of the prairie creek that wandered through a broad pasture on the next farm. They were the only trees in that piece of grassland, and there was nothing in the least malevolent about them, with roots buttressing the black soil of the creekbank and providing the only eddies deep enough for any worthwhile skinny-dipping—and the only real shade along the creek, to boot.

Green-willow days. With the first real blush of spring, at about the time shadblow was blooming, we'd stop playing "territory" and mumbletypeg long enough to cut lengths of willow as thick as our thumbs and six inches long. A couple of inches from one end, a ring was cut through the bark. At about the same distance from the other end, a deep notch. Then, with that all-purpose, wholly indispensable jackknife, you would tap the green bark of this willow piece until it began to loosen and could be pulled off as an intact cylinder. The bare wood of the notched end would be whittled to form an air passage and air chamber. The tube of bark would be slipped back into place, notch properly aligned over the air chamber, and the tranquillity of a soft spring day would be rent with piercing shrills.

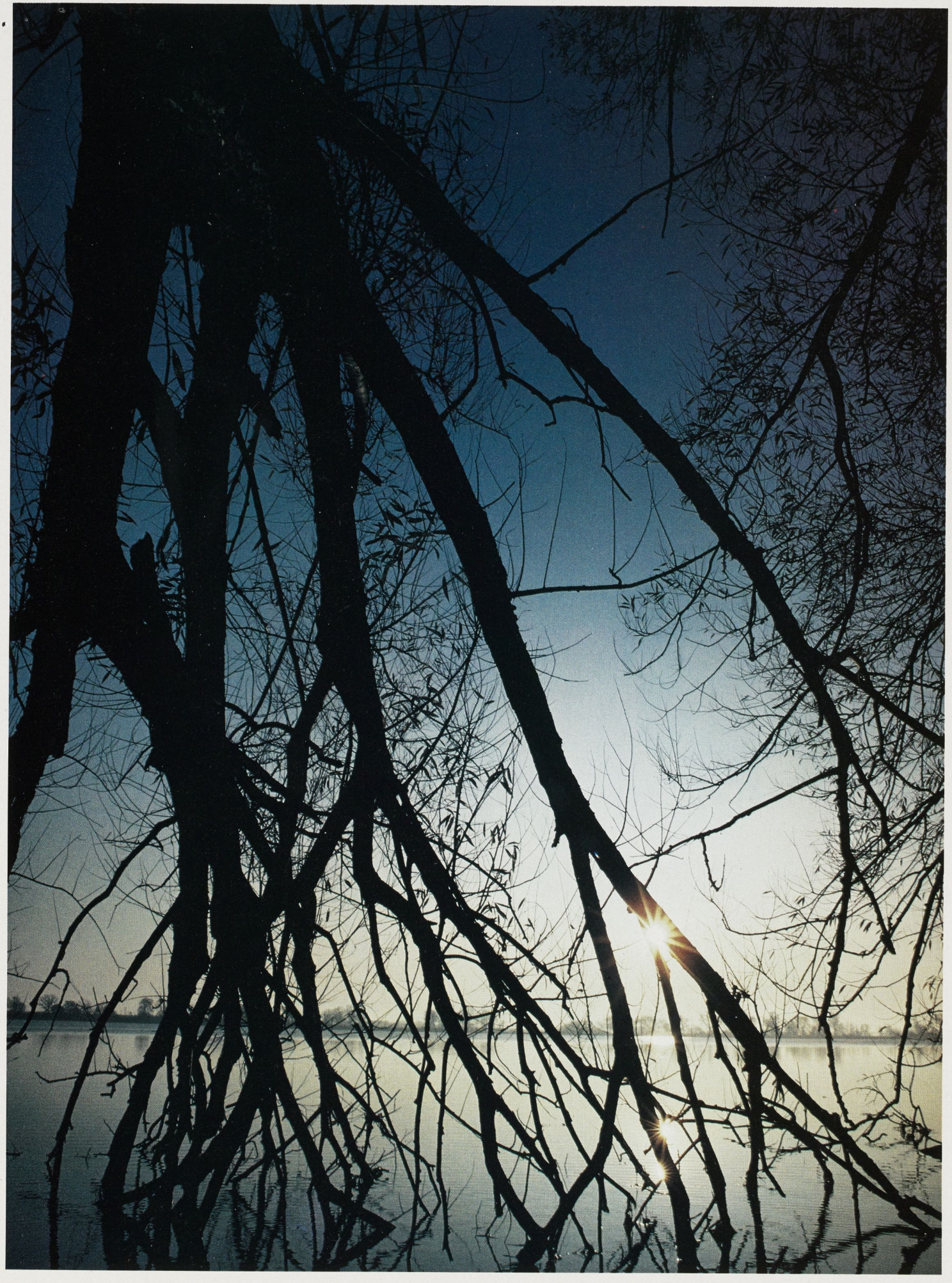
Then summer came on—the season reigned over by his freckle-flanked majesty, King Catfish—and there was nothing handier for carrying home a mess of fresh-caught "fiddlers" than a limber switch of sandbar willow run through mouths and gills and then knotted at the tip.

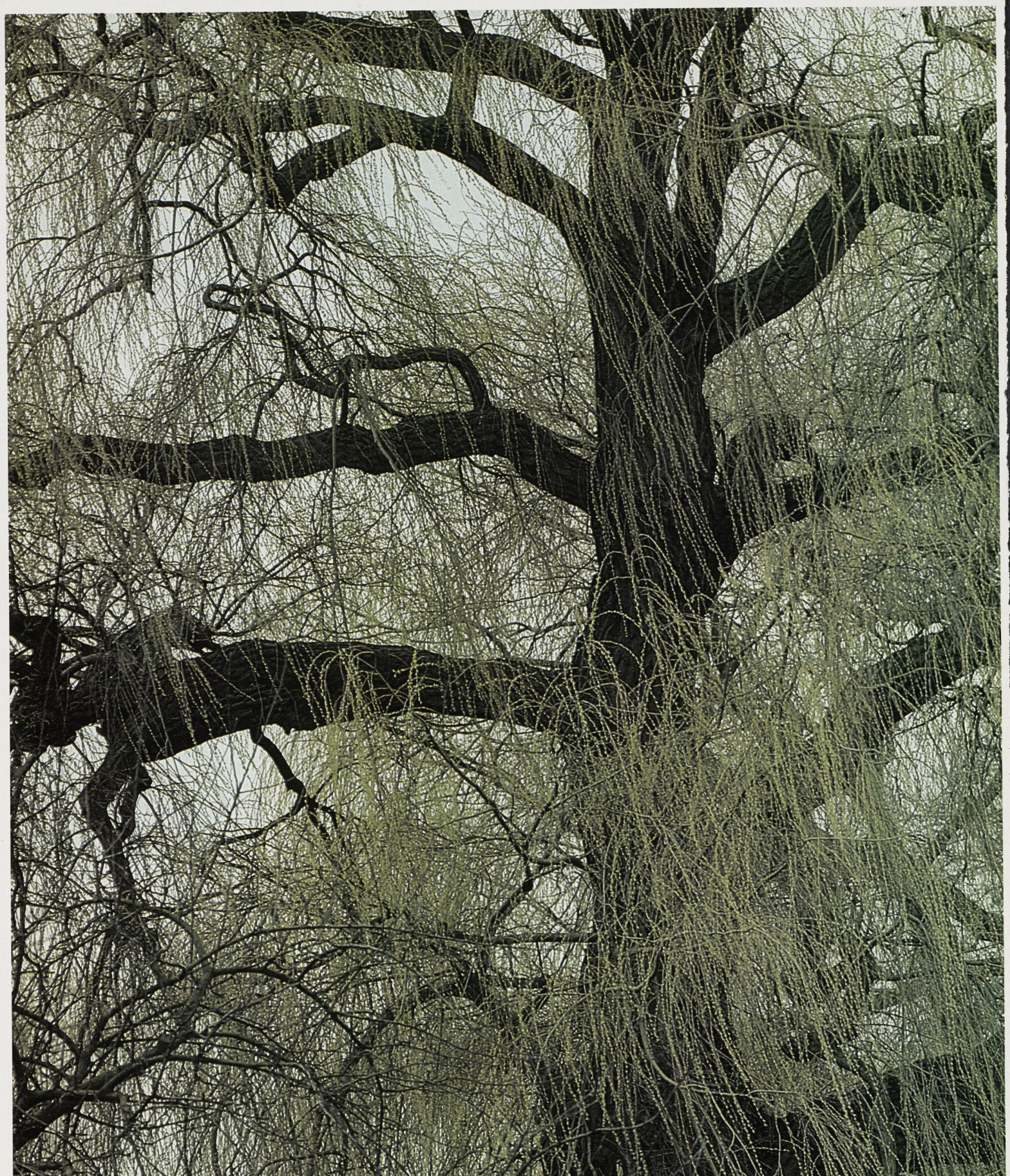
Even in winter there were uses for willows. Somewhere—probably in *Deep-River Jim's Trail Book*—I read that it was possible to make emergency snowshoes from the easily bent willow branches. This was eventually accomplished with several sandbar willows and lengths of binder twine. I never did get the harness right and was unable to stride over the drifts as old Deep-River said I could, but the outfit worked after a fashion. In the process, though, we learned another good thing about willows—that certain dense willow slaps within the bends of our home river could be expected to feed and shelter substantial numbers of cottontail rabbits during the harshest winter weather. In years to come, we would learn that the same thing applied to Alaskan moose and willow ptarmigan.

No doubt about it. Willows were useful for lots of things, not all of which were necessarily good. Pity the kid with a weeping willow in the yard and a mother who yelled: "I've had all the sass from you I can put up with! You go out and cut a good strong willer switch *and bring it in here to me!*" (Dr. Spock, where were you when we needed you?)

Of course, Indians knew how to use willows in many ways, and not just for ambushes along the Big Muddy. The sweat baths of the plains tribes, those ritual saunas so important in certain purification rites, were often small domes of bent willow poles and branches covered with buffalo hides or blankets. Sweat baths completed, the warriors might confer while smoking kinnikinnick, an aromatic mixture whose formula varied with different Indian nations

Black willow (Salix nigra), Minnesota, by R. Hamilton Smith.





Weeping willow (Salix babylonica), Holland, by Kees Van Den Berg (Photo Researchers).

No doubt about it. Willows were useful for lots of things, not all of which were necessarily good. Pity the kid with a weeping willow in the yard.

but often contained the dried inner bark of dogwood or red willow. The bark would be shaved from twigs, spread out to dry, and then finely crushed with hands greased with buffalo fat which would leave just enough grease adhering to the flakes to make them burn well. Too bitter to be smoked alone, willow bark was usually mixed with a bit of Arikara twist tobacco, and some fragrant roots or herbs. Then, as likely as not, this would be smoked by a senior warrior as he took his ease against a handsome backrest of slender willow rods sewn together, while outside the entrance flap of the lodge hung his buffalo-hide war shield with a frame of bent willow.

Nowhere are willows more prevalent than in the Far North, and the Ojibway and other northern people use willow to smoke-cure some of their leathers. From my study wall hangs a pair of knee-high moosehide winter moccasins, handsomely trimmed with bear fur and bands of appliqué with colored woolen tassels hanging down the sides, and the soft leather still carries the sweet incense of the willow smoke with which it was cured.

Those moccasins came from beyond the upper end of Lake Athabaska in country that is increasingly given over to willows until, as one comes out into the great barrens, there is nothing that can really be called a tree. The stunted firs and spruces of the *tit-chin-nichile* or "land of little sticks" begin giving out, surrendering to muskeg and the scrub willows that are eventually reduced to sprawling mats only a few inches high.

A stand of scrub willow in the Far North can be terrible stuff to walk through—a dense, thigh-deep fastness of tough stems and branches too high to step over and too low to bull your way through as you might in a stand of taller willows. To make it worse, such willows are often the vegetative pioneers that overlie glacial rubble and old rockslides, and under the tangle of branches is the sort of footing that breaks bones. Still, nothing is all bad. As firewood, the dead, bleached willow stems and twigs of the tundra are far better than the next best thing, which is no fuel at all. One of the finest meals we've ever eaten, after an unbroken diet of dehydrated food, was of savory caribou cutlets broiled to a turn over a little fire of willow twigs in the Alaskan barrens.

Certain low, dense configurations of willows also occur in the High West and can be just as maddening. O frustration, thy name is Bebb willow as it grows along the banks of little cutthroat trout runs in the High Country! By arching entirely over those little brooks, or crowding in closely enough to block any real flycasting, or by conspiring with tag alders around certain beaver ponds, willows can be some of the best friends a trout has.

OF ALL THE WILLOWS of North America the best known to the public at large (and usually the *only* ones known) are the weeping willow and pussy willow.

The weeping willow is native to China, coming to North America via Europe. It's a favored ornamental that gets up to sixty feet high, its long, slender, drooping branches sweeping the ground, inspiring melancholy and such song lyrics as "Willow, weep for me," and "Come all ye young maidens, and Listen to me/Don't hang your hearts on the green willow tree." Sad willow songs go back a long way; the first may have sprung from the grief of the Israelites and out of the harp of King David himself, who sang in the 137th Psalm: "By the rivers of Babylon, there we sat down, yea, we wept, when we remembered Zion. We hanged our harps upon the willows in the midst thereof."

This inspired the great taxonomist Carolus Linnaeus to name the weeping willow *Salix babylonica,* although certain botanical agnostics have challenged this, claiming that the trees of the rivers of Babylon were almost certainly alders or poplars, and most assuredly not weeping willows. Anyway, it was under a weeping willow on St. Helena that Napoleon Bonaparte dreamed in exile of *his* lost Zions. He was buried near that tree, and for many years its cuttings were in demand for transplanting through much of Europe—but, presumably, not in Russia.

The weeping willow was introduced into North America in 1730 and soon became a favored carving for headstones, along with index fingers pointing skyward over the legend "There is rest in Hev'n." When weeping willows fell out of fashion for headstones, they began appearing in lithographs, their drooping branches framing copiously weeping ladies with such captions as "News From The Battlefield."

At least as well known as the weeping willow, but a lot more cheerful, is the pussy willow, *Salix discolor.* This is mainly a tree of the Northeast and Upper Midwest, and in late winter or very early spring the leafless branches suddenly produce ranks of the velvety, silver-gray male catkins that are sure signs of better times ahead even though there are still patches of snow along the northerly hillsides. After a week or two the furry catkins mature and begin producing pollen of the brightest gold. One of my earliest fishing memories is of chubs in the ice-cold prairie rivers of March with the first of the wild honeybees working at clumps of pussy willow. The land belonged to winter as much as spring, but the bees had found the golden dust of the mature staminate catkins and were busily making "bee bread."

Most people never see the willow flowers that succeed the famous immature catkins in a week or two. The pussy willow twigs are usually discarded when they enter what Peattie called "the awkward age in which they have lost the charm of babyhood and not gained the splendor of maturity." It's worth keeping those twigs in water and enduring their floral adolescence to see those gorgeous golden stamens.

By the way, I just remembered another line of that song:

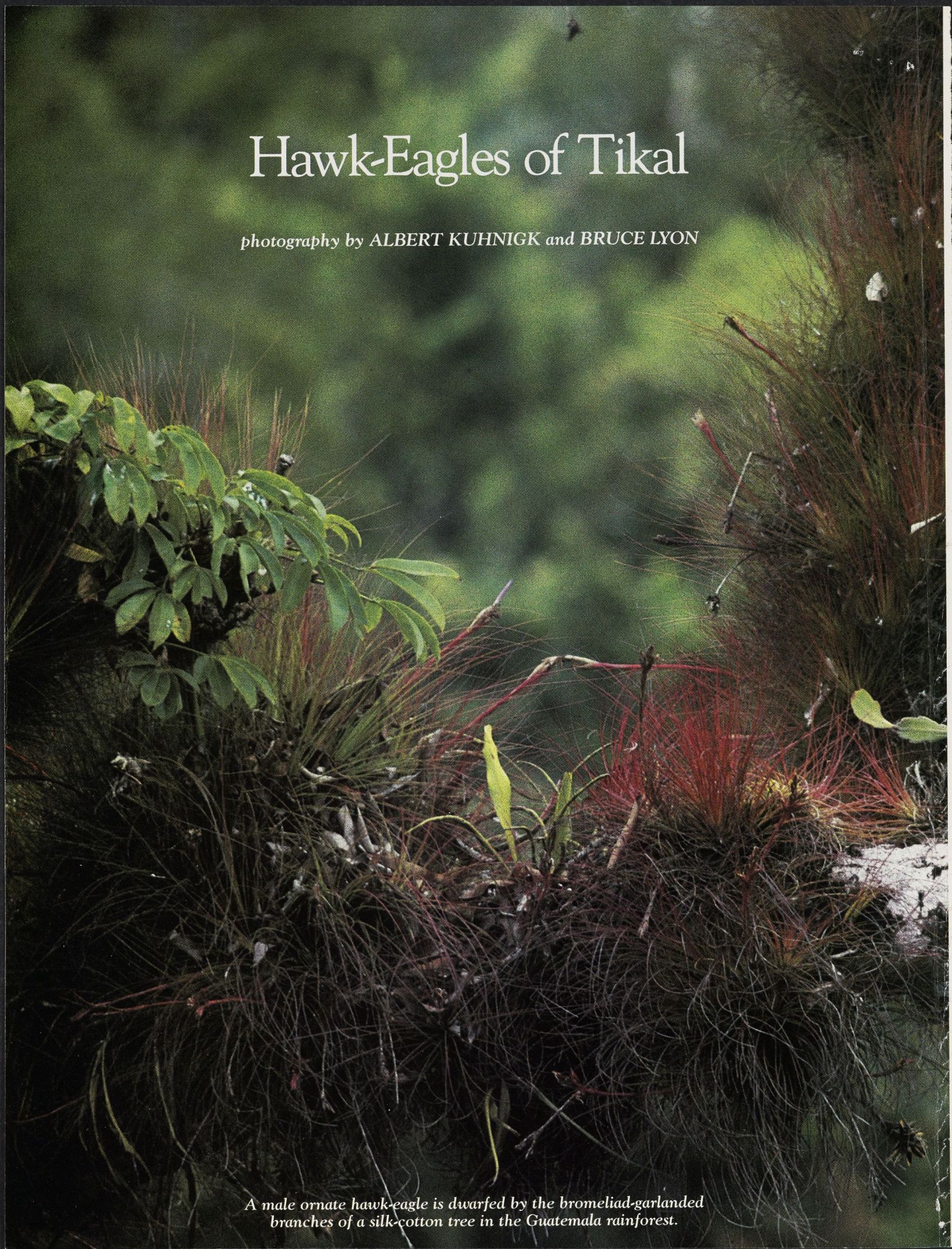
"But I'll never be a willow on the riverbank . . ."

Maybe not, but I'll keep working on it. ▲

Leaves of Lemmon's willow (Salix lemmonii), California, by Steve Terrill.

Hawk-Eagles of Tikal

photography by ALBERT KUHNIGK and BRUCE LYON



A male ornate hawk-eagle is dwarfed by the bromeliad-garlanded branches of a silk-cotton tree in the Guatemala rainforest.

THE SMALL-

BY BYRON W. DALRYMPLE

A husky percentage of the continent's largest and most important duck concentrations are presently under control of clubs and guides who lease extensive acreages. It is a discouraging development to the average hunter who can't afford the expense of hunting leased land. Twenty-odd years ago when this trend was all too evident and I was feeling the pinch, I had a delightful experience that turned my attention emphatically to small-water ducks.

A friend invited me that summer to bass fish with him on a tiny 5-acre lake which he owned. One shore was a solid swath of lush smartweed—the pink-flowered emergent stalks forming a tall, dense stand that reached 50 yards into the lake. Feeding bass incessantly splashed in this maze, but they couldn't be reached. We caught a couple along the outer edge, but too often hung our lures in the aquatic plant's tough stems.

"You ought to spray that smartweed," I remarked. "Once it's killed, the bass will scatter."

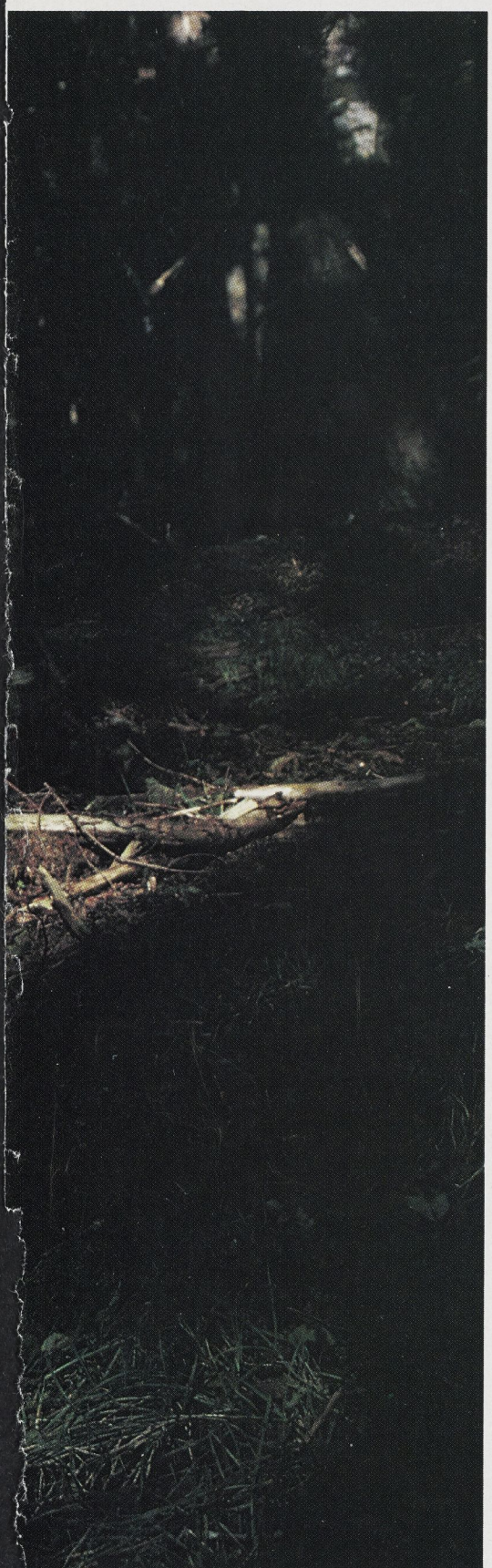
He smiled and said, "I kind of like it this way. Come fall I'll show you why."

In November he called me to come over, and told me to bring waders, camouflage gear, and shotgun. He'd contrived a comic but ingenious setup by placing folding lawn chairs out in the shallows of the smartweed patch. When we sat, the stalks came up around our shoulders. Gone were the pink flowers; their spikes were now loaded with black seeds—a gourmet delight, I knew, for puddle ducks.

Within 2 hours, without hearing any other hunter's shots or boat motors—or any sounds other than the occasional *quack* of an incoming duck—we collected two greenheads, a widgeon, and three teal. Peaceful and pleasant, it was a more enjoyable and productive hunt than many I could recall that had cost me much travel and labor, plus a bundle of money.

As we picked up our birds, I said, "Don't spray the smartweed!"

DUCKWEED COONTAIL



BY HENRY BUCK

The rise of land behind my house might be called Heartbreak Hill. It gains about 800 feet in elevation in little more than a third of a mile, a pitch that discourages a fair number of hunters. I like it for that reason. But usually I wheeze and pant up the slope, with little attention to hunting, until I reach less precipitous terrain.

One day last fall, however, a fresh snow combined with a cold snap made me approach the climb with a bit more finesse. Conditions seemed right for game to be seeking warmth anywhere across the southwestern slope, so I took the hill one slow step at a time with long standstills in between. It's a pace that has prompted friends to comment, "Curtis must be after snails again."

It is a slow pace, I must admit. Well over an hour after I'd started, I was just approaching a little knob where I knew the topography would give me some relief. It was there that a large patch of light brown hair brought me to a standstill. The midsection of an elk standing between two large fir trees less than 50 feet away is enough to give a rush of buck fever to any hunter. And it did to me. But still I did not budge.

The tag in my pocket was for a bull elk, and both ends of the beast before me were hidden behind tree trunks. I moved nothing but my heart and my eyeballs for what seemed like hours—perhaps 5 minutes. Fifteen years ago, maybe even ten, I would have inched 2 feet to the left for a look at the elk's head. Instead, I stood like a statue.

The elk moved forward an inch at a time; it was probably just getting out of bed, still half asleep. It might have been a cow with others bedded over the rise where I couldn't see them, but I was betting on a lone bull. So, when the elk's nose finally poked into view, I wasn't surprised to see the spikes that soon followed. Aiming carefully and without hurry at the bull's neck, I fired. And the spike dropped in his bed.

The pattern of that hunt is the same one that has provided me with my most successful deer and elk hunting tactics for the past decade. Slow and careful stalking has gotten me within sight of game without spooking it. Then statue-like patience has allowed me to take clean shots at stationary targets of my choosing. In essence, this is hunting at a standstill, because even though you aren't always standing still, your moves are made in a way that minimizes the *detection* of movement.

Standstill hunting has the advantages, without the disadvantages, of both stand hunting and stalking. When standing, you greatly decrease your chances of being detected by game because you make no movement. You can concentrate on looking for game instead of looking where you are going. But while stalking, you cover ground, increasing your chances of seeing game and affording a change in scenery. You are also physically involved in the hunt.

Deer and elk depend largely on the motion of things to locate and identify them by sight. Although the structure of their eyes gives them excellent vision forward, sideways, and even back along their flanks, it is the movement of objects that alerts them to danger. On numerous occasions in a variety of situations I have stood quietly in the presence of deer and elk that—without scenting me—have behaved as though I were just another pine tree or huckleberry bush.

So, the key to the slow-motion hunting tactic is giving the appearance of standing still even when you aren't. This requires coordination, balance, and muscle control. Think of it as a series of motionless standstills connected by a series of fluid steps. The steps should be graceful. Jerky movement is a *(Continued on page 102)*

Henry Buck is in the foremost rank of the 5,337 outdoor writers in Montana.

PHOTO BY BILL McRAE

WATER SMARTWEED CURRY PONDWEED FLOATING PONDWEED

Almost all huntable duck species favor a relatively few favorite foods. Here are some of the staples.

WATER FACTOR

My experience succinctly illustrates what I call the small-water factor: despite the large duck concentrations on large waters, which mesmerize many hunters, there are plenty of birds left for the average shooter. The birds are simply scattered in small groups over thousands of small lakes, ponds, sloughs, and streams.

Not all these waters offer good shooting. The astute waterfowler quickly discovers that of scores of possible locations in a given area, only a few appeal to the birds. Invariably such spots are the ones where duck forage is not only abundant but consists of plants that the birds prefer. So to find if a small water is likely to attract ducks, check the grub list. It's possible to do it quickly and successfully, because there are no vast expanses to case, and hotspots are easily pinpointed. All it takes is an ability to recognize favorite duck foods, and when a small water with an abundance of the most desirable items turns up, it's almost certain to provide excellent, and extremely economical, shooting.

Because there are numerous duck species ranging across the continent, all of them eating scores of different plants and seeds, complications in the grub-list scouting game might seem insurmountable. The bright side is *(Continued on page 96)*

The author, a Texan, has hunted ducks since the days of Fred Kimble. Well, almost.

It's the huge flights on the big waters that fill our dreams, but it's the small flocks on ponds and streams where there's food and cover that will put a duck dinner on your table.

PHOTO, LEFT, BY GARY R. ZAHM; ABOVE PHOTO BY DALE C. SPARTAS; ILLUSTRATIONS BY REBECCA MERRILEES

The Art of Driving Deer

BY JIM BASHLINE

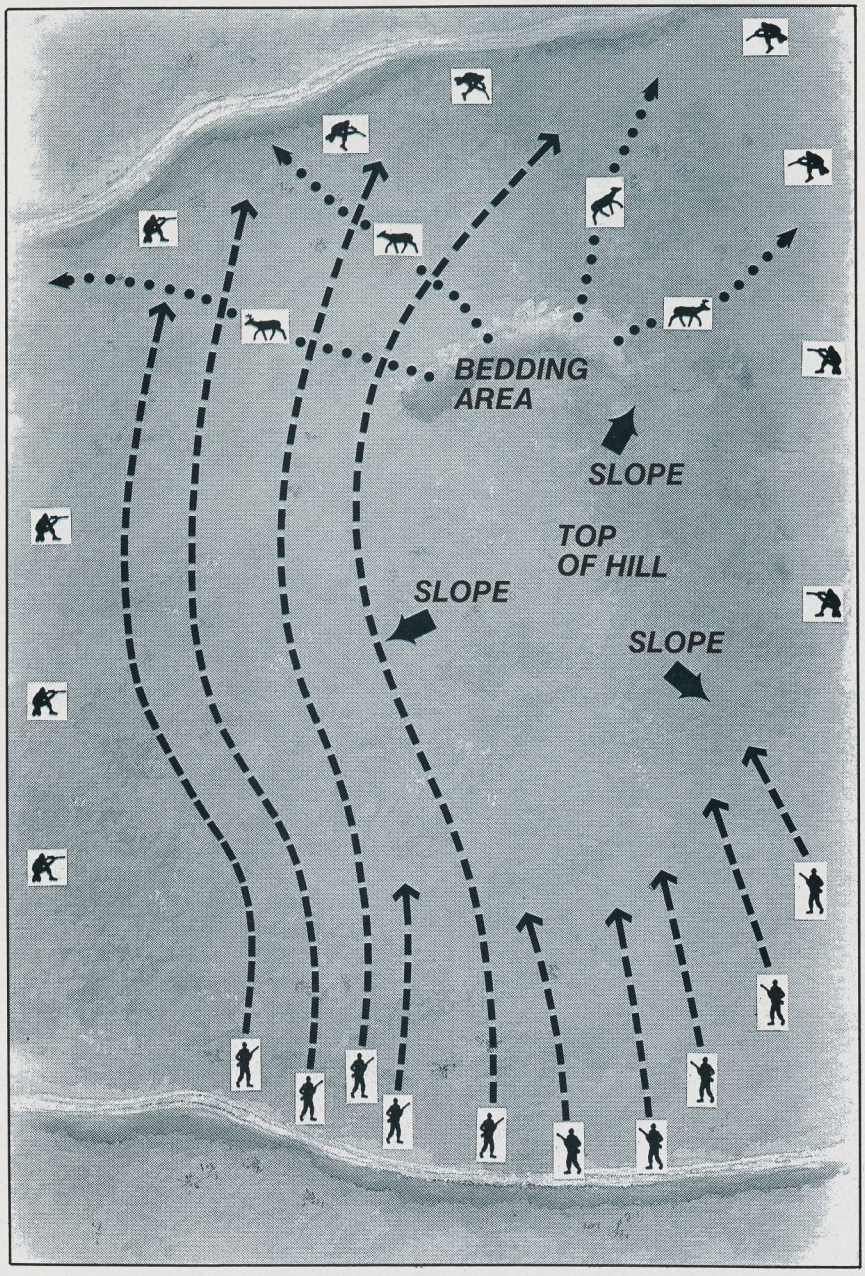
The Nevada cowboy was adamant: "Chasing deer in the direction of a lazy stump-sitter is nothing more than an unfair ambush. Get out there on a good horse, scout the territory, find a decent buck, and then get on your two hind legs and stalk him. Now, that's a deer hunt!"

"Yeah, sure," came the retort from an Eastern woods hunter, "and you can substitute a pick-up truck for the horse and it becomes unethical, too. Besides, how can you guys out West ever miss a deer with high-powered scopes, no brush to shoot through, and practically tame deer? Organizing a deer drive requires more than a teaspoon of brains if it's done right."

The exchange was becoming heated, and, fortunately, someone defused the argument by changing the subject to ducks. But the pros and cons of drive-hunting deer have lengthened many a late-night conversation with differing degrees of enlightenment.

Variations on primitive deer-driving techniques were undoubtedly refined in the hills of Pennsylvania, New York, and New Jersey and later adopted in Michigan and Wisconsin as a way to counteract the natural advantages deer possess and to work dense cover. In these states, lumbering had removed big trees from the forests nearly a 100 years ago, forcing hunters to move the deer through and out of the dense stands of brush that had quickly replaced the towering pines and hemlocks. A lone hunter pussyfooting through the kind of cover that forms after a mature forest is removed may stumble onto an easy shot, but as much luck as skill is needed. With shorter seasons being instituted each decade, the hunters of the early 1900's had to drive deer if they wanted to up their chances of getting deer.

There was a time in Pennsylvania (before the number of hunters banded together for a deer drive was limited to twenty-five) when forty or more hunters would line up and march across a 300-acre hillside attempting to push deer to an equal number of watchers. Such operations were once conducted in my home country with the precision of a marching band's halftime show. *(Continued on page 92)*



A large-group drive (twenty or more hunters) can work a scouted area more thoroughly than any other method. Here, drivers walk up the opposite side of a hill from a bedding area, making a "whoop-whoop" call to signal their position. Standers encircle the area waiting for deer to exit. All participants should wear hunter orange and be absolutely sure of their targets. More diagrams appear on page 92.

PHOTO BY DAN J. COX; ILLUSTRATED BY JOHN RICE

SMALL WATER

(Continued from Page 61)

that you'll be dealing for the most part with puddle ducks, ten kinds in all. Of these, the ones abundant in your area will probably number no more than five.

Further, of the scores of foods ducks eat, only a couple of dozen favorites make up some 90 percent of the plant diet of all these birds. And of those, no more than half are prime choices. In most areas, only a half dozen or fewer of the top choice duck foods grow abundantly. The species vary from region to region, so if you learn to recognize even three or four of the ones in your bailiwick that ducks relish most, you're in business.

The aquatic plants that ducks utilize fall into three general groups. The emergents are plants such as bulrushes that are rooted in shallows. Their self-supporting stalks thrust above surface. Submergents are plants—pondweed and coontail, for example—that are usually rooted deeper; this group has limber water-supported stems that reach toward the surface, and a few species have meager tops that float. Floating plants (duckweed is one) are found right on the surface. Their short rootlets dangle underneath the floating leaves. Virtually all important vegetative duck foods—except acorns, waste grains, and the seeds of a few water-oriented shrubs and trees like water willow, buttonbush, and bald (deciduous) cypress—come from these plant groups.

BURREED

Small-water hunters should try to find several likely locations, each with different favored forage. This enhances both the success potential, and the variety of birds. One year I discovered a small timbered slough where abundant acorns were dropping in and near thin water, attracting wood ducks and mallards. A second location was a small lake thick with pondweed that drew in a small flock of gadwalls. A third spot was a pond with a mud flat that bordered an inlet which served as a conduit for burred seeds during high water—a spot tailor-made for teal. I staggered my shooting at the three locations, resting each in between, and put ducks on the table all season.

Before you settle in for the season, note

WILD MILLET

whether your spot is favored by resident or nonresident ducks. Resident ducks can only be disturbed a couple of times before they'll abandon the spot, putting you out of business. The very best small-water spots are those that cater to scattered groups of nonresident ducks. If the place is within a few miles of an area where a large duck concentration is located, disturbed birds (singles to half dozen) may drop by for a meal every day. You can shoot at such a spot every day because you'll always be seeing new birds. Later in the season, when ducks have been harassed for months and trade about in small groups seeking safe haven, or when they're nervously preparing for the northern migration, the hunting should be quite good.

On tiny ponds you can make quickie sneaks, get one or two shots in the morning or at midday, and repeat the performance in the afternoon. If you're in an arid region, birds will fly from pond to pond, and they'll be reluctant to leave available water. I've shot with friends in the south-Texas cactus country when we posted a hunter at each of several cattle tanks a mile apart. Birds flushed from one tank would fly to another. By leaving the ducks a safe tank where no shooting occurred, we occasionally had all-day sport. Backwoods beaver ponds are also good bets for mallards, black ducks, and teal. Most produce abundant food that the ducks relish as well as furnish them with seldom-disturbed hideaways.

What equipment do you need? Not much. I seldom build a blind. Small waters are too easy for ducks to study in detail with a single overflight, and any built blind arouses suspicion. I've flopped down atop a beaver house, hunkered among dead cattails, sat or stood with gun upright and dressed in full camo (including headnet and gloves) against a fencepost where a wire fence crossed a shallows, sprawled against a down tree or a rotting log on a lake shore, knelt beside a cattle tank surrounded with cactus in desert country, and squatted on a tussock among cypress knees in a slough with my wader-clad feet in the water. The rule is: scheme to become part of the scene. If you do, you'll put skittish ducks at ease and in the pot.

If you try decoys, make your spread match the waters—small. Use a call if you must, but sparingly. Do take along a casting rod and surface plug—a great way to retrieve birds on still days. Above all, remember that *abundance and desirability of available food is the key*. Pick the places that display heaps of gourmet duck grub in a compact showcase, and the quality of the ensuing sport will surprise you.

FAVORITE FOODS OF SMALL-WATER DUCKS

■ **WOOD DUCK:** Partial more than any other duck to pin and white oak acorns in flooded, timbered bottoms. Seeds of burreed, buttonbush, and bald cypress. Where natural foods are unavailable, waste corn.

MALLARD: Utilizes domestic crop grains more than any other duck—corn, rice, barley, soybeans, and wheat. Wild seeds: smartweed, wild millet, pondweed, bulrush (fresh and brackish), burreed, buttonbush, and acorns. Leaves and stems: pondweed, coontail, and duckweed.

BLACK DUCK: Seeds: waste corn, sedge, bulrush, burreed, wild millet, pondweed, smartweed, pickerel weed, acorns, buttonbush, bald cypress, and yellow pond lily. Leaves and stems: coontail, eelgrass (wild celery, freshwater), and duckweed.

PINTAIL: Grains: rice, barley, wheat, oats, and sorghum. Wild seeds: smartweed, pondweed, bulrush, wild millet (one species brackish), water hemp (fresh and brackish), burreed. Leaves and stems: pondweed.

WIDGEON: Prefers leaves and stems rather than seeds: eelgrass, pondweed, coontail, and in some areas, clover and pasture grasses. Where no leafy foods grow, seeds of wild millet, smartweed, buttonbush, and crop grains.

GADWALL: Prefers leaves and stems to seeds: pondweed, coontail, eelgrass, salt grass (salt, brackish, inland, alkali), and spike rush (fresh and brackish). Where leafy forage is unavailable, seeds of bulrush, wild millet, smartweed, and buttonbush. Crop grains seldom eaten.

TEAL: Greenwing, bluewing, and cinnamon teal have rather similar feeding habits. The greenwing favors seeds over leafy plant parts, which the bluewing prefers. Both like to feed on mud flats. Cinnamon teal show little preference between seeds and leaves. Greenwing: seeds of smartweed, water hemp (fresh and brackish), wild millet, bulrush, spike rush (fresh and brackish), pondweed, milfoil, sedge, burreed, and some grain. Bluewing: leaves of duckweed, coontail, and pondweed. Seeds: smartweed, wild millet, water hemp (fresh and brackish), bulrush, and sedge. Cinnamon: seeds and leaves of pondweed, bulrush, saltgrass (salt, brackish; alkali inland), plus foods of other teal.

SHOVELER: Unusual feeding habits; strains plankton from water as well as small crustaceans, mollusks, insect nymphs from shallow bottoms, through sieve-edged bill. Vegetative forage includes seeds of bulrush, pondweed, smartweed, spike rush (fresh and brackish), wild millet, buttonbush, water willow, and bald cypress.

"HOW MY MOTHER INTENDS TO FREE UP THE MOVEMENT OF ARMS THROUGHOUT AMERICA."

—Tim Boyle

"All those who think their current hunting jacket doesn't restrict arm movement, raise your hands. Slowly.

"See. There *is* a tugging that starts at about 90°. And the heavier the jacket, the more it resists. Enough, actually, to affect your shooting.

"As President of Columbia, my mother looked at this inherent design flaw in virtually every jacket ever made and asked a simple question, 'Why?'

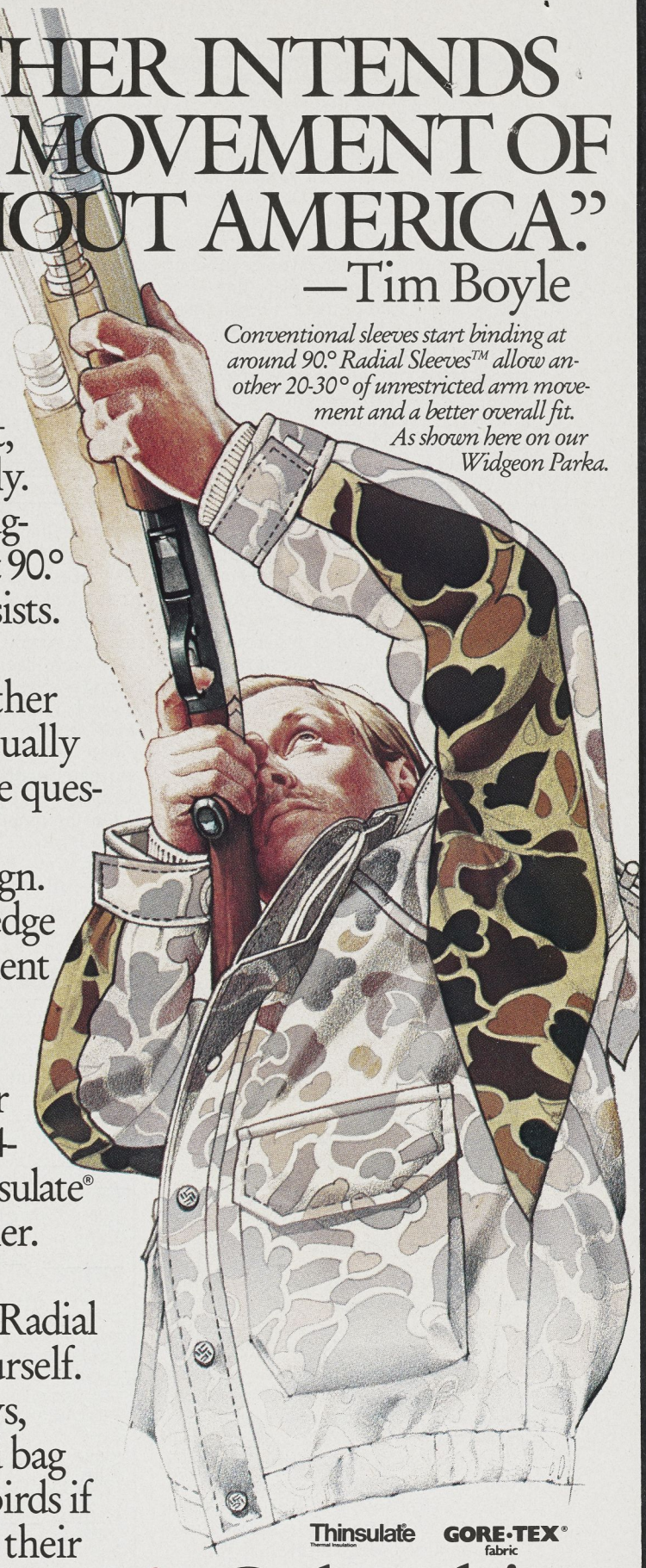
"Result: Our new Radial Sleeve™ design. And I mean NEW. A diamond-shaped wedge under the arm allows a freedom of movement like you've never experienced.

"It's on all our best hunting parkas including the Widgeon IV™ and our longer Quad IV™ (shown below). Two amazing 4-in-1 Gore-Tex® fabric/Stealth™ Cloth/Thinsulate® parkas that can change as fast as the weather.

"Try on our patent-pending Radial Sleeve™ for yourself. As Mom says, 'Guys could bag a lot more birds if they'd solve their underarm problem.'"

Still available, naturally, is our famous Quad Parka, which started it all.

Conventional sleeves start binding at around 90.° Radial Sleeves™ allow another 20-30° of unrestricted arm movement and a better overall fit. As shown here on our Widgeon Parka.



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Stegner Fan

¶ Congratulations on "Typewritten on Both Sides" (by T. H. Watkins, September). I have enjoyed the writings of Wallace Stegner for many years. I particularly love his descriptions of wild places. Environmentalists are lucky to have someone with his intelligence and gift with words to champion their cause.

JOSEPHINE BRIGGS
Arlington, Texas

High on Flies

¶ Fly-tiers and fly-fishermen alike were delighted with your magnificent portrayal revealing some of the esthetic qualities of our pastime ("A Salmon Delights in Gaudy Colors," September). Author Tom Rosenbauer and photographer G. Allan Brown are to be congratulated.

Several references were made to our founding editor. The correct spelling of his name is Dick Surette.

RICHARD B. STEWART
Editor and Publisher
Fly Tyer Magazine
Intervale, New Hampshire

Murder, They Wrote

¶ Your September cover was not what I've come to expect from *Audubon*. I grant you, the feathers are beautiful, and the fishing fly is made of lovely materials, but the fishhook is an instrument of death just the same. Seeing it treated with such sensuous delight gives me the creeps.

Just what are you saying with all these ill-gotten yet beautiful and exotic feathers, dyed squirrel skins, etc.? I hope you're not saying that such beauty makes the flies beautiful, too. Surely those opposed to animal abuse and hunting for sport find them repulsive. No amount of nostalgia for a simpler time can make them less so.

M. TETARCHIK
San Anselmo, California

¶ I was appalled and disgusted by *Audubon*'s insensitivity in the September issue—appalled by the full-color picture displaying dead tubers around a bowl of so-called "milkweed edibles." Disgusted that my once-favorite magazine, having glorified the slaughter of fur, fish, and game, should now sanction the destruction of tuberous vegetables.

As you should know, there is a substantial body of scientific evidence that

—Mrs. James S. Brady—

"Help me fight the National Rifle Association."

"Six years ago, John Hinckley pulled a $29 revolver from his pocket and opened fire on a Washington street. He shot the President. He also shot my husband.

I'm not asking for your sympathy. I'm asking for your help.

I've learned from my own experience that, alone, there's only so much you can do to stop handgun violence. But that together, we can confront the mightiest gun lobby—the N.R.A.—and win.

I've only to look at my husband Jim to remember that awful day... the unending TV coverage of the handgun firing over and over... the nightmare panic and fear.

It's an absolute miracle nobody was killed. After all, twenty thousand Americans are killed by handguns every year. Thousands more—men, women, even children—are maimed for life.

Like me, I know you support *stronger* handgun control laws. So does the vast majority of Americans. But the National Rifle Association can spend so much in elections that Congress is afraid to pass an effective national handgun law.

It's time to change that. Before it's too late for another family like mine... a family like yours.

I joined Handgun Control, Inc. because they're willing to take on the N.R.A. Right now we're campaigning for a national waiting period and background check on handgun purchases.

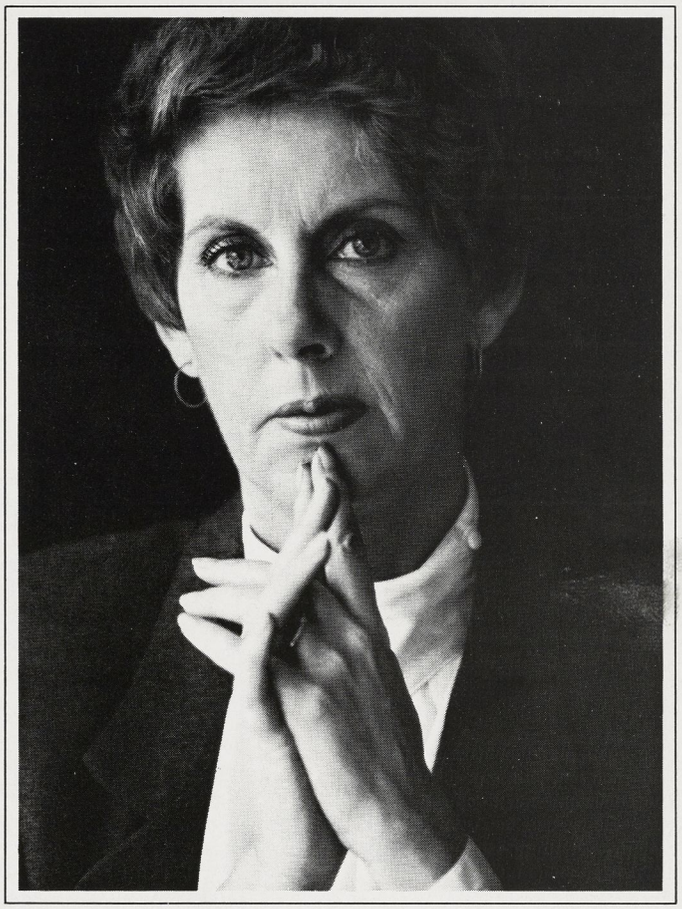
If such simple, basic measures had been on the books six years ago, John Hinckley would never have walked out of that Texas pawnshop with the handgun which came within an inch of killing Ronald Reagan. He lied on his purchase application. Given time, the police could have caught the lie and put him in jail.

Of course, John Hinckley's not the only one. Police report that thousands of known criminals buy handguns right over the counter in this country. We have to stop them.

So, please, pick up a pen. Fill out the coupon. Add a check for as much as you can afford, and mail it to me today.

It's time we kept handguns out of the wrong hands. It's time to break the National Rifle Association's grip on Congress and start making our cities and neighborhoods safe again.

Thank you and God bless you."



"Together we can win."

Dear Sarah,

It's time to break the N.R.A.'s grip on Congress once and for all. Here's my contribution to Handgun Control, Inc., the million-strong nonprofit citizens' group you help direct:

☐ $15 ☐ $25 ☐ $35 ☐ $50 ☐ $100 or $_____.

☐ Tell me more about how I can help.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

A

HANDGUN CONTROL

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tubers such as potatoes, onions, and carrots have highly developed nervous systems which may exceed even those of shrubs and trees.

The next time you promulgate the consumption of tubers, please stop and think: How would you, Mr. Editor, like to be pulled up by your roots?

SYLVESTER VESTERPUE
Poverty Hollow, Connecticut

¶ As a new subscriber to your magazine, I was truly perplexed with the first issue I received (July). Page after page details death, maiming, and destruction of animals, habitat, people. I consider myself a conservationist–environmentalist, but never expected such "heavy" material, page after page. Somehow I anticipated some focus on beauty, of which there was precious little.

CAROLYN J. THERRIO
Los Angeles, California

Defenders of the Wild

¶ In the September "Dialogue," Sallie Andrews said she found the photograph of the leopard devouring the antelope (July) to be repulsive and that she subscribed to *Audubon* to see the "beauty in nature."

What I saw in the photo was an example of an extremely *beautiful* hunting animal which has indirectly helped the antelope as a species by weeding out an old and sick animal. To me, the most beautiful facet of nature is that it is entirely self-sufficient. The balance of hunter to hunted is eternal—until an outside force such as human beings interferes.

BRIAN S. MILLER
Glenwillard, Pennsylvania

¶ If you want fairy-tale illustrations, look to Disney. For myself, I prefer magazines such as *Audubon* that present the facts—pleasant or unpleasant.

EDELL MARIE PETERS
Milwaukee, Wisconsin

Green Bay Poetry

¶ Thanks to Marc Hudson and *Audubon* for the July article, "Warning: The Friday Night Fish Fry May Be Hazardous to Your Health." For years I have hoped *Audubon* would publish something on the Fox–Wolf watershed of Wisconsin. Hudson's work adds the important poetic dimension to problems with the Green Bay ecosystem.

However, the "sediment" signature attributed to the Landsat satellite photo of Lower Green Bay represents principally phytoplankton biomass and organic detritus originating from the upper watershed. It is important that your readers not be confused on this point, lest they erroneously construe that wastewater discharges to the Lower Fox and Green Bay are solely responsible for satellite-viewed turbidity.

Your readers should also consider the role of the average citizen in contributing toxic materials to our surface waters. The dust from worn tires, the drain oils and leftover home pesticides spilled into storm sewers, as well as agricultural pesticides, must be viewed as potential risks to the Green Bay and similar fisheries.

The good part of this story is that the people of Green Bay certainly care about their environment and probably understand the possible link to their own health and economy. They now know for certain that the whole nation is waiting for the outcome of their concerns and the new research. I thank Marc Hudson for adding to our perspective on a problem of national importance.

JOHN LAUMER, Manager
Environmental Health Programs
National Safety Council
Chicago, Illinois

Costly Woodpeckers

¶ Roger Di Silvestro's article concerning two Florida land developers and the red-cockaded woodpeckers ("Nature Stories: Endangered Species? Load the Shotgun," September) was almost Orwellian. Please let us know what happens to this case.

FRANK L. SPREYER
Barrington, Illinois

According to the United States Attorney's office, Middle District of Florida, in Jacksonville, the case came to trial on September 15th. After entering guilty pleas, the three defendants were sentenced, but jail terms were suspended. Development and Construction Corporation of America, Inc., was placed on three years' probation; President Kulbir Ghumman and vice-president Herbert Von Kluge were put on probation for two years. In addition, Von Kluge was fined $1,000 and Ghumman agreed, in lieu of paying a fine, to donate $300,000 to the National Fish and Wildlife Foundation, earmarked for red-cockaded woodpecker recovery projects.

Plants That Roar

Urushiol, nature's "pretty" poison, can cause you misery, but relief is close at hand.

by George R. Beinhorn

Say "poison ivy" and everybody smiles. There's perverse humor in nature's pestiferous creations: bees, brambles, hornets and nettles. But a seriousness lurks in the smiles of those who've lived around poison ivy.

The name recalls a special brand of suffering—a grown-up, X-rated version of the measles—in which weeks pass while large patches of skin itch like a fresh mosquito bite.

Few people realize just how much poison ivy there is within the borders of the contiguous states. Dr. Alexander Fisher, a specialist in the treatment of "poison ivy dermatitis" with New York University's School of Medicine, estimates upward of 50,000 cases occur during a single spring/summer season.

That figure may be just one-tenth of the true statistic. Dr. Peter Van Houten, one of 74 family physicians practicing in Nevada City, a small rural community within California's huge poison oak range, says he treats as many as 200 cases a year. And for every case that reaches the doctor's office, many more are treated at home.

Poison ivy, poison oak, poison sumac and poison wood are closely related members of the same family of plants, genus *Toxicodendron*. The extremely potent oil that causes the characteristic weeping sores and itching in humans is called urushiol. A blend of several powerful skin irritants, urushiol varies only slightly in its chemical makeup from one branch of the family to another. Poison sumac gets first prize for potency, though, as it contains a slightly greater proportion of one of the stronger chemical factors.

Resin channels carry urushiol to all parts of the plants; the roots being most abundantly supplied are therefore more dangerous than the leaves. Since resin channels don't break the surface, an undamaged plant will have no urushiol on its exterior and won't be able to

Illustrated for *Sports Afield* by Cathy Johnson

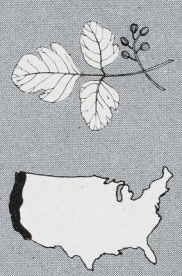
Washing the infected area with plain soap and cold water prevents further penetration.

POISON PLANTS

COMMON POISON IVY, *Toxicodendron radicans,* found throughout the United States (except Nevada) and in Canada from coast to coast. Its familiar three leaflets have smooth or notched edges that are green in summer and turn a beautiful reddish-orange color in fall. It grows as a woody, ropelike vine, a trailing shrub or an erect shrub. Its berries are white and clustered.

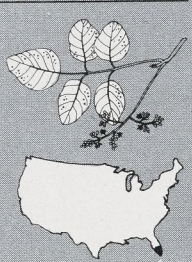
EASTERN POISON OAK, *R. quercifolia,* ranges through the southeastern states from New Jersey to eastern Texas. Leaflets are in threes; the center one looks similar to an oak leaf. Grows only as a shrub. Berries are white and clustered.

WESTERN POISON OAK, *R. diversiloba,* common on the Pacific Coast from Canada to California. In fact, it is California's most widespread shrub. May grow as a 30-foot-high vine on trees or telephone poles, but is most commonly found as spreading clumps up to six feet tall, or as individual shrubs. Central leaflet resembles an oak leaf; side leaflets are irregularly shaped. Berries white, grouped.



POISON SUMAC, *R. vernix,* found only in damp, swampy areas throughout the country, especially east of the Mississippi. A coarse, woody shrub, never a vine, its berries are white and waxy and droop in clusters. Seven to 13 leaflets pair along a central rib, with one leaf at the end. Nonpoisonous sumacs have red berries.

POISON WOOD, *Metopium toxiferum,* found only in the Florida Everglades. This tall shrub or small tree has five to seven leaves on mature branches, one leaf at the tip, the others opposite each other.



give you the rash.

I remember an unbelievably lucky day when, faced with walking through 100 feet of poison oak or backtracking and taking the long way home, I ran through the poison oak—in swimming trunks!—and escaped totally rash-free. But don't count on copying my luck—bug chewings open holes in nearly all plants, as do wind and weather.

Birds enjoy eating poison ivy seeds and account for the plant's tremendous range and "favorite" location under trees and telephone poles. Poison ivy will grow just about anywhere, from sea level to 5000-foot elevations, and will thrive in wet and dry years. It's extremely hardy, too. From San Francisco backyards to dry hills on the Mexican border, poison oak enjoys California's hospitality and is the state's most widespread shrub.

I learned about urushiol's virulent power firsthand when I pinched off a tiny poison oak leaf to warn fellow hikers of the plant's presence. I threw the leaf away and observed a speck of oil barely visible on my fingers, which I wiped on my heavy corduroy pants. The next day a rash eight inches in diameter had blazed across the thigh where I'd wiped my fingers. No wonder botanists respect urushiol as nature's most potent skin irritant.

Poisons as strong as this call for careful handling. Severe cases of poison ivy have resulted in death, the immediate cause being kidney collapse. Trying to "tough out" a very bad case without seeing a doctor is therefore ill-advised.

When urushiol touches the skin, the body's immune system sends lymphocytes to repel the foreign invader. The battle that ensues is what causes the red, raw, itching sores. Cortisone, which suppresses the immune defenses, is the most effective treatment. (It's not a cure, however, merely a suppressor of symptoms. Stop taking cortisone before the rash has run its course and it flares up again.)

Prompt treatment with over-the-counter cortisone creams works well, but after scabbing and oozing have begun, such creams can't penetrate and you may have to ask your physician for a cure.

Oddly enough, the immune system doesn't recognize urushiol at all the first time around. Depending on the sensitivity of your individual immune defenses, you may break out on your second or sixty-second dose. True lifelong immunity is rare. Those pals who chortle "I can wade in the stuff—never bothers me!" while you scratch will one day learn hard lessons in humility.

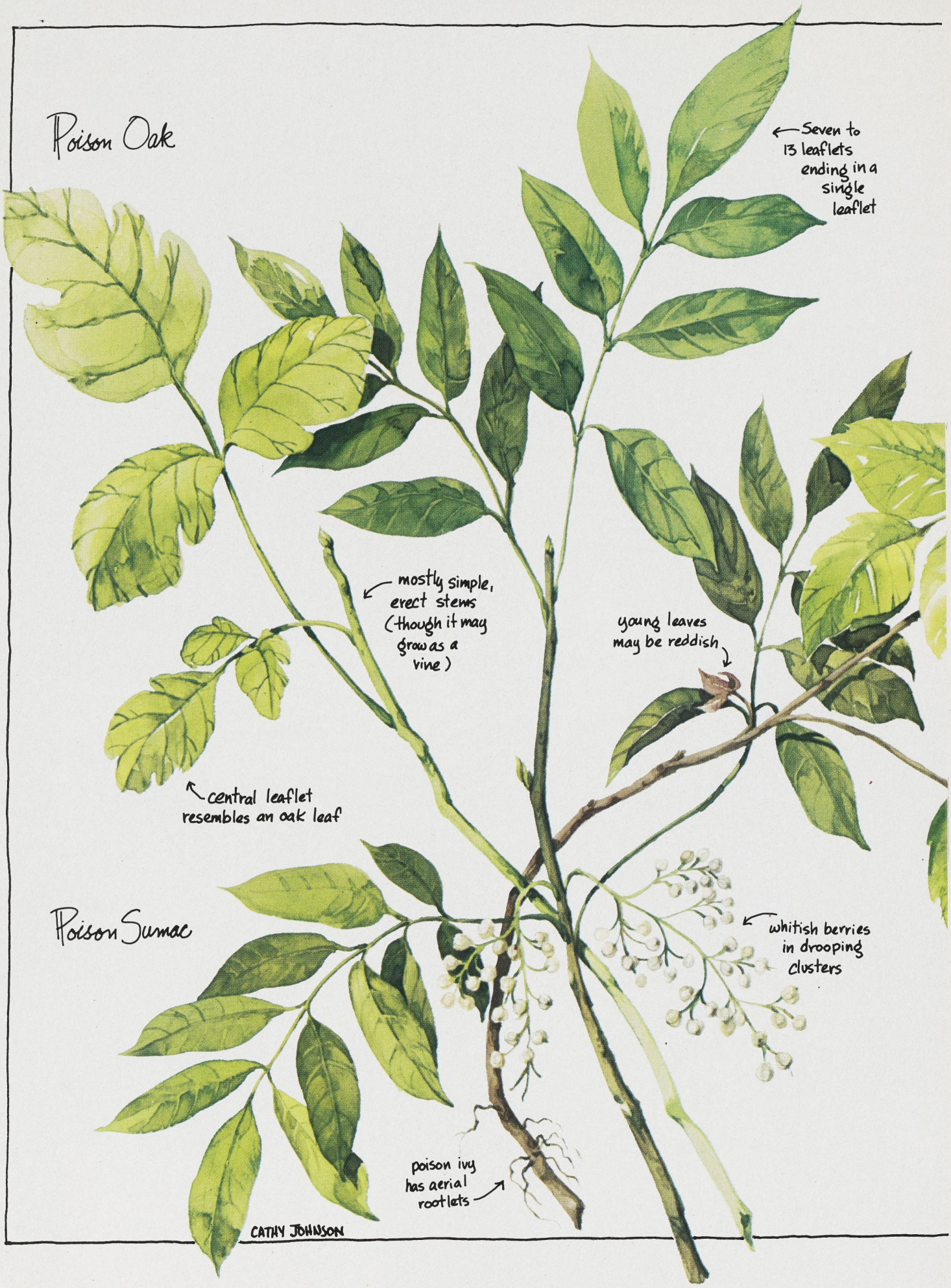
Researchers have discovered that it takes urushiol less than one minute to combine irreversibly with flesh proteins. Therefore, the quicker you wash it off your skin, the less you'll suffer. Ordinary hand soap and cold water will do the job. (Cold water closes the pores, preventing further penetration.) Plain water also reacts chemically with urushiol to change it into a relatively harmless substance. So if you brush against poison ivy and there's no soap at hand, soak the affected area in the nearest stream for a few minutes.

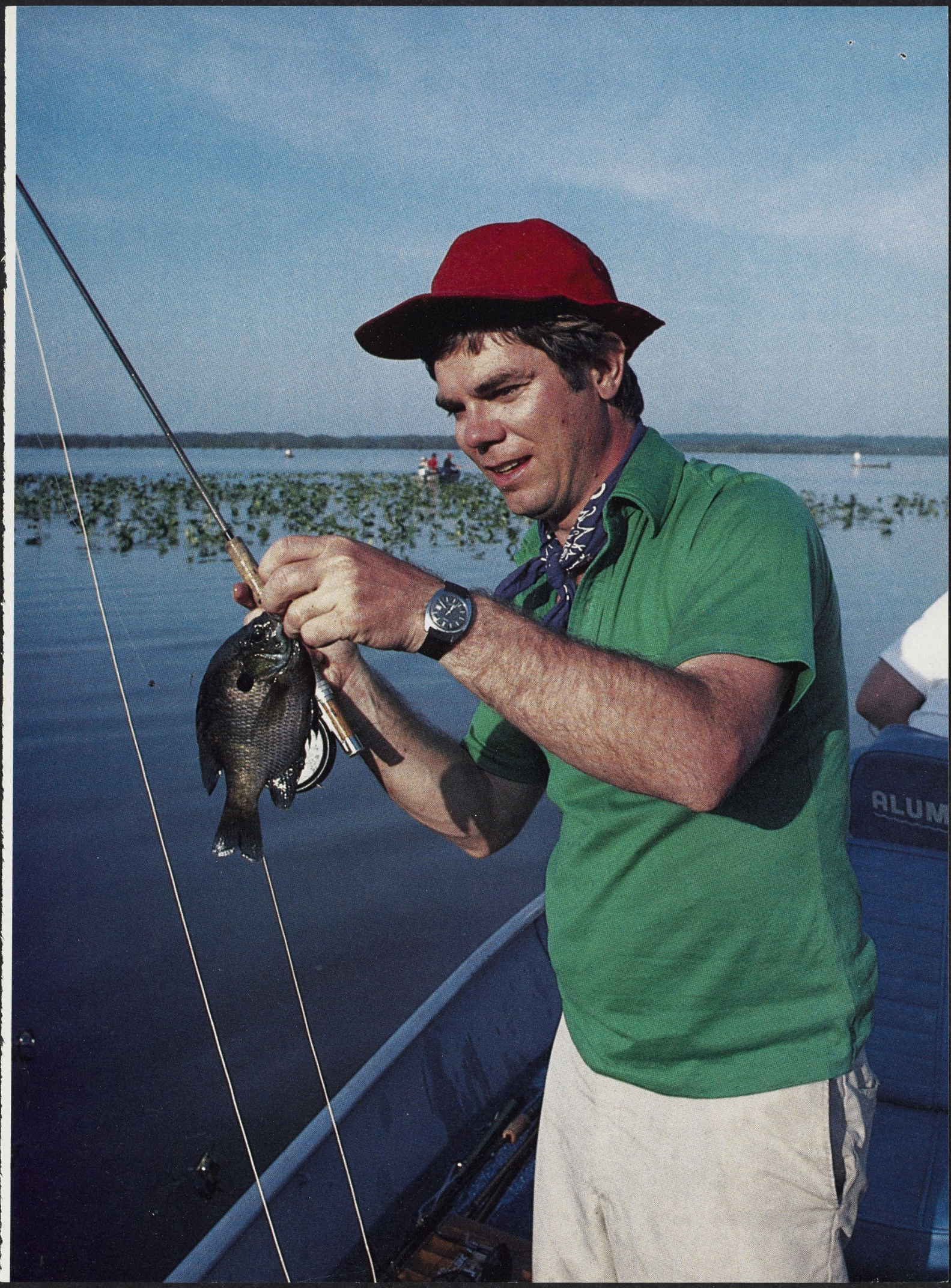
It usually takes the rash about 24 hours to show up, though the time lapse can vary from six hours to a week. Meanwhile you've touched the original contact area and spread urushiol all over your body. "You'd think I'd *rolled* in it!" cry many an indignant sufferer. The resulting "spontaneous" sores account for old wives' tales such as the one that says you can get poison ivy "just by standing by the bush;" or that poison ivy spreads through the body's internal passages, affecting distant areas.

Equally false is the notion that hot showers "open the sores and let the poison spread around." Researchers have found no traces of urushiol inside poison ivy blisters. Once you've washed the irritant oil away, the rash can spread no farther. In severe cases, though, formerly affected areas may flare up again.

Urushiol is incredibly stable. Botanists have gotten the itch after handling plant specimens *hundreds* of years old. So be sure to throw your clothes into the washer after walking in known habitats. Not only is urushiol potent and stable, it'll pass through just about any barrier of clothing you can devise, including leather, and

(Continued on page 157)


Poison Oak
Seven to 13 leaflets ending in a single leaflet
mostly simple, erect stems (though it may grow as a vine)
young leaves may be reddish
central leaflet resembles an oak leaf
Poison Sumac
whitish berries in drooping clusters
poison ivy has aerial rootlets
CATHY JOHNSON


ALUM

Fillet Blades

(Continued from page 89)

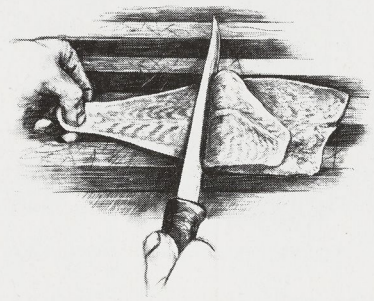
saddle soap or another leather cleaner. For extended storage, I put a thin coating of petroleum jelly on the blade, to guard against pitting, before putting it in the case. Don't overlook the handle when cleaning the knife, either. Accumulated fish scales or innards can cause the knife to slip in your hand.

The most important maintenance you will perform for your knife is sharpening. Proper sharpening will make the difference between getting clean, smooth cuts or jagged, messy fillets. The new ceramic stick sharpeners make it especially easy to sharpen a fillet knife. The sticks are set at the proper angle, and the manufacturer's instructions are clear and straightforward.

There are times when I feel that there is nothing like a hand-honed edge. Such times usually occur when I am in a particularly ambitious mood. It doesn't seem to matter if the whetstone is used wet or dry, either. Some people say that the whetstone produces a finer edge when it's lubricated with a little oil, as the oil floats some of the fine metal particles away from the blade. The wet method, on the other hand, is somewhat slower than the dry method.

The best angle to hold the blade against the stone is about 15 degrees. Give each side of the blade a dozen or so passes over the stone. Work the blade along the stone's face as if you were trying to shave off a little of the stone.

The setting of the edge of a newly sharpened blade is as important as the sharpening itself. This process is known as aligning the blade. If you look through a microscope, you'll see that a newly sharpened blade looks as if it is feathered. These feathered particles have to be aligned. A leather



strop, or in some cases the knife sheath, can be used to "set" an edge. Use only light pressure and run the knife over the strop at about a 20-degree angle, like the barbers with straight razors used to do in the old movies.

When actually filleting your fish, keep in mind that a fillet knife has a very fine, very sharp blade. Make sure that it is sheathed when not in use, that you have a good grip on the handle while you're using it, and that your fingers are out of the way.

With a reasonable amount of care, a good fillet knife will last until you wear down the blade from use. By investing in a good knife, the chore of filleting will not be difficult, and you can produce fillets you will be proud to serve. The following guide should help you find the fillet knife that fits your particular needs.

Buck Knives, Dept. SA, P.O. Box 1267, El Cajon, CA 92022.

One of the nation's largest manufacturers of knives, Buck Knives suffered for many years because it lacked a good fillet knife. The company did have several models that could double as fillet knives, but I found that the knife edges and blade flexibility did not fit my criteria. That has all changed now. Recently, Buck Knives introduced its "Mate" series. I tested the six-and-one-half-inch model called the "LakeMate." The shaped handle, with finger grooves, proved to be very comfortable to hold. It features a textured, tacky finish for good grip, even when wet and slimy from fish entrails. The blade was extremely sharp and held a good edge. In fact, the edge was so sharp that I ended up poking it through the case a few times, a problem that has since been corrected by a new

Plants That Roar

(Continued from page 88)

because it's oil-soluble it can even penetrate rubber gloves.

There's an old and widespread belief that the American Indians used to *eat* poison ivy buds in the spring, thereby gaining season-long immunity. But there's no reliable documentation for this fable (which was propagated by, among others, the late Euell Gibbons, author of books on wild edible plants). Dr. Peter Van Houten, the California physician who treats several hundred poison oak sufferers every year, has seen leaf-eaters hospitalized with severe oral and anal itching and bloody stools.

People whose work takes them into poison ivy territory—telephone linemen, foresters and firefighters—are given purified urushiol in tiny doses to build their immunity. But the desensitizing procedure takes four months and is fraught with side effects. Over-the-counter desensitizers (ImmunOak, homeopathic pills) should never be taken during an outbreak of the rash, as they merely increase the discomfort, notes Dr. Fisher.

There's a saying among herb-gatherers: "Stand by a poisonous plant and stretch out your arm; you'll find the antidote within reach." The most popular natural remedy for poison ivy is jewelweed, which does in fact grow more or less in the same range. (But unfortunately not in the range of poison oak.) Plant-stalker Gibbons claimed that after adding handfuls of jewelweed to his bath water, he could walk through poison ivy with impunity.

Looking even closer than arm's length for remedies, a University of Mississippi chemist, Dr. David P. Borris, found enzymes in the soil surrounding the base of poison ivy plants that effectively neutralized urushiol. Difficulty in putting the enzymes into a stable solution prevented him from marketing his discovery, but a California herbalist subsequently reported she'd protected herself for many years by rubbing soil from the base of poison oak plants on her skin.

Aloe vera juice, available in drugstores, seems to accelerate healing and definitely soothes the itch. But the most effective itch-stopper is also the simplest: plain water. Bathing the affected areas in very hot shower water will cause what can only be described as "ecstatic itching." Following this treatment, you'll be completely itch-free for four or five hours. Dr. William Epstein, leader of a team of poison ivy researchers at the University of California Medical Center in San Francisco, acknowledges the effects of hot water, but is at a loss to explain them.

If contact with poison ivy is unavoidable where you work or walk, ask your druggist to order Kerodex 51 (Ayerst Laboratories) or Toxic-Guard (Reynes Products, Inc.). These barrier creams, applied before you touch the plants and at regular intervals during the day, have been praised by forest service personnel and archaeologists.

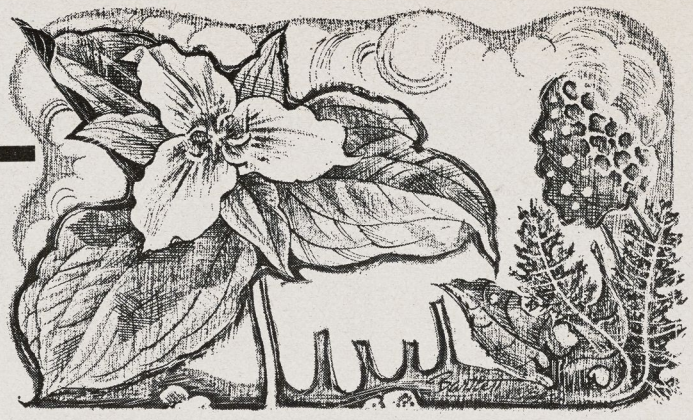
Among the far-flung relatives of poison ivy are the cashew and mango plants. Cashew shell oil is used in the manufacture of wiring for aircraft, and electricians working with this type of wire are occasionally treated for poison ivy dermatitis. The pedicel of the mango (the cup that attaches the plant to the stem) contains urushiol, which may drip onto the fruit.

Another exotic member of the varied poison ivy family is the Japanese lacquer tree. The beautiful black lacquer used to decorate fine furniture and jewelry boxes from Japan is, in fact, dried urushiol, and must be gathered with extreme care.

I once read an interesting 1920s book on poison ivy in which the author dedicated a whole chapter to the question: "Why did God create poison ivy and other annoying plants and animals?" Naturally, I've pondered that question myself, and the only thing I've come up with is that the Creator wanted us to develop a philosophical turn of mind. In plain English that means: If you choose to live in the country, you'd better have a sense of humor. SA

FIELD & STREAM
Naturally

Trilliums



BY LES LINE
EDITOR, AUDUBON MAGAZINE

I had staked out the clump of trilliums a couple of days after they first pushed their way into the warming April air through soggy woodland soil and its blanket of leaf litter. The plants were on the hillside above my creek, now rushing along with the burden of those showers that bring May flowers. And on or about May 1st, I knew there would be a spectacular bouquet of wine-red, three-petaled blossoms to photograph—perhaps two dozen or more in an area the size of a bushel basket.

Our woods, if this modest stand of locust, ash, birch, and maple can qualify as such, reaches above the creek only a long stone's throw before ending abruptly at the bounds of my dairy farmer neighbor's expanse of winter rye.

The trilliums, we were certain, would be of the red variety commonly known as wake-robins, for they grew near a seep trickling into the creek. Wake-robins love wet places.

Some words about trilliums: These wild members of the lily family are, in my estimation, the finest of all woodland wildflowers. The name "trillium"—the scientific and popular names are identical—derives from the Latin word for "three," because all the parts of these plants come in threes. There are three leaves, a single flower with three green sepals and three petals, six pollen-bearing stamens, and a three-chambered pistil, the female reproductive part which produces a three- or six-sided berry.

Across North America there are some thirty species of trilliums, with a great variety of flowers. Certainly the best known, and a prize for those May baskets that children of another era gathered to surprise and please mothers and girlfriends on May Day, is the large white trillium (*Trillium grandiflorum* in Latin that requires no translation). In my part of the country we also find painted trilliums, with delicate white petals that are circled with magenta at their base; and the nodding trillium, whose tiny flowers hang *below* the umbrella of three leaves. The Southeastern part of the country, meanwhile, has toadshade, trilliums with red or yellow petals that stand straight up!

And from Quebec and Ontario southward to Georgia there is the wake-robin, so-called because it blooms when robins have returned from their winter holiday. But there are other names, hardly so esthetic. Wet-dog trillium is one; and stinking Benjamin. No one seems to know who the honored Benjamin was, and why he smelled so bad, but the flower of the red trillium does indeed have a foul odor like putrid meat, or perhaps a golden retriever that has wallowed all day in a salt marsh. That smell attracts carrion flies, which pollinate the flowers.

Indians, herb doctors, and early settlers had several uses for the wake-robin. Plants often were chosen for specific medicinal purposes because of such things as the shape of their leaves, flowers, or roots—what herb doctors called the "doctrine of signatures." Hepatica, another spring woodland flower, was used to treat liver ailments because its leaves are shaped like a human liver—its signature. Since the wake-robin smells like rotting flesh, its roots were used to treat gangrene. And Indians chewed the roots to combat diarrhea, and gave their squaws a decoction to ease childbirth, while pioneers made a poultice to treat snakebite.

But no one would pick wake-robins for a May basket—at least more than one of them. Which is why we were puzzled, a week later, when with camera in hand we searched vainly for the clump of red trilliums on our hillside. No leaves, no buds, no flowers could be found. Only, as my wife Lois finally discovered, a grotesque circle of naked stems pointing skyward, each plant severed at the same height. And, in their midst, one pathetic little flower that was late in emerging and had escaped the devastation.

By whose hand? Or, rather, teeth—since the plants had obviously been *chewed* off just below their lush green leaves.

The answer stared down at us from a bump in the greening ryefield.

A ravenous woodchuck.

No finicky eater, this beast. As W.J. Schoonmaker wrote in *The World of the Woodchuck,* "practically all succulent green plants found in the wild or cultivated state afford the animal with tasty meals at one time or another."

As we mentioned last month, the woodchuck is a vegetarian—at least 99 per cent of the time. (These big rodents consume some insects, largely grasshoppers and June bugs, and rarely raid the nests of ground-nesting birds.) It likes clover and alfalfa best, says Schoonmaker.

Woodchucks will also climb fruit trees to gobble apples and plums. And invade gardens, decimating beans, peas, lettuce, carrots, squash, corn, even pumpkin vines.

Their appetite is immense. The woodchuck's stomach can hold a pound and a half of greens, and a chuck may consume a third of its weight a day, trampling other plants in the process. "If a 180-pound man were to do this," Schoonmaker writes, "he would consume 60 pounds of food in about twelve hours."

Like humans, a woodchuck eats regular meals three times a day—morning, afternoon, and evening—napping the rest of the time. Often a chuck eats while sitting upright, holding its meal in its forepaws, scanning the landscape for enemies.

Probably, at the time my trilliums were being chomped on, there were baby woodchucks in the den in the ryefield. In upstate New York, female chucks give birth between April 1st and May 15th—just four weeks after having mated. The average size of the brood is four, but there may be as many as nine naked, pink newborn woodchucks that are only 4 inches long and weigh about an ounce.

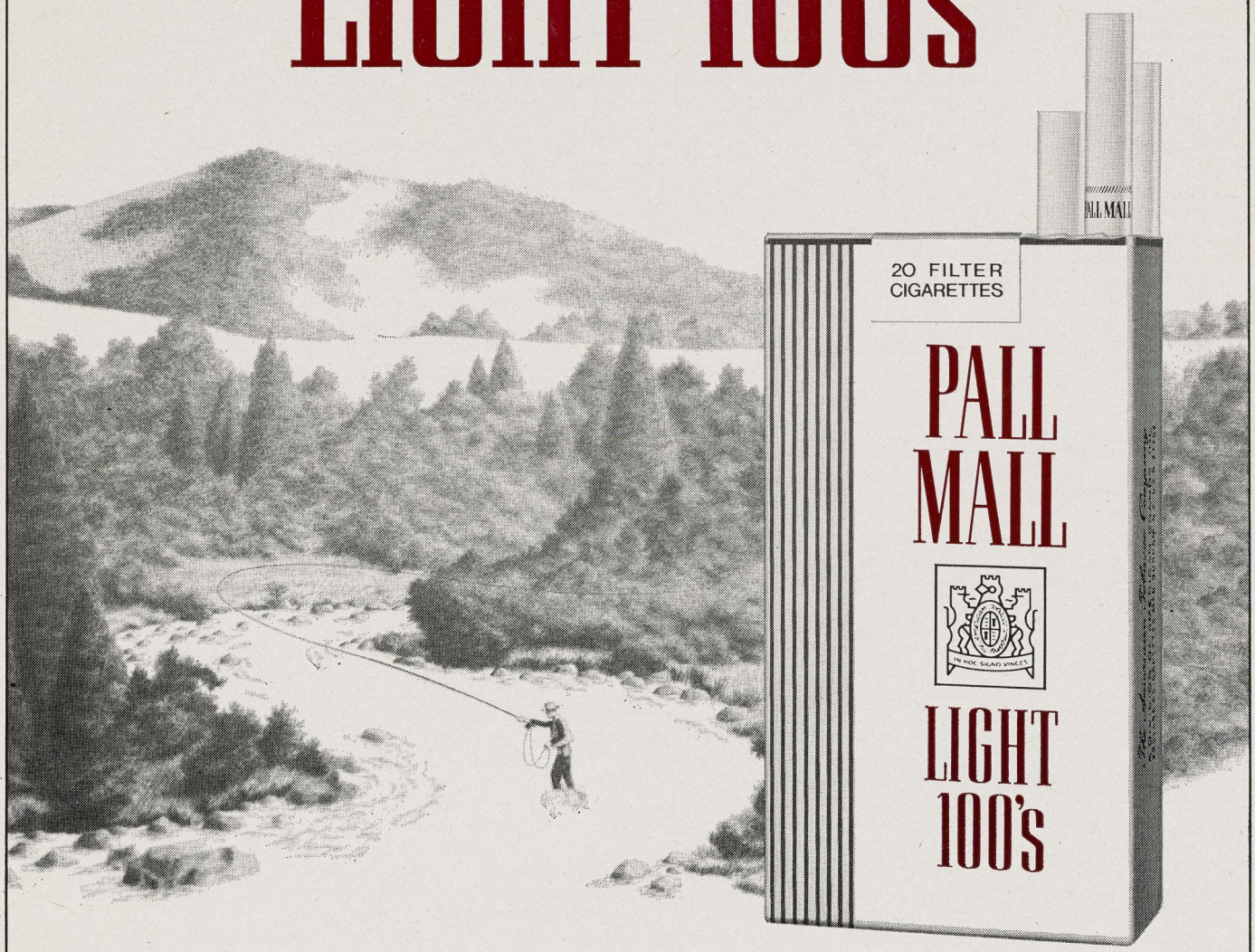
For a month they remain blind, depending on their mother's milk for sustenance. Then, when their eyes open, they venture to the den's entrance and begin to nibble green food. By midsummer they will be encouraged by their mother to seek their own residences, though she will watch over her brood until they scatter to new territories in the fall.

As for the sacrifice of my wake-robins, I will accept that loss so long as mama chuck and offspring stay out of our garden. I can find other trilliums to photograph. But my asparagus is inviolate.

ILLUSTRATED BY WILLIAM BARTLETT

Decisions...decisions...Make your decision

PALL MALL LIGHT 100's



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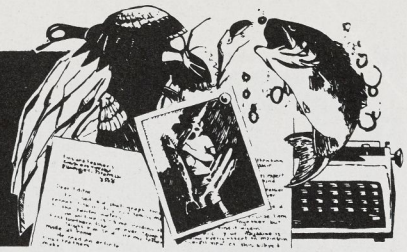
We Get Letters



Do you have questions about outdoor recreation? Comments — pro or con — about articles? We'll try to respond, as space permits, in this department. Send your questions or comments to: Letters, P.O. Box 967, Harrisburg, PA 17108. Sorry — because of volume, we can't furnish personal replies, even if you send a return envelope.

Gentlemen:

This is in response to your "Muskie Mania" article in the July 1983 issue of *Pennsylvania Fins and Feathers*.

The 32-pound, 47-inch muskie I caught on May 17, 1983, at Raystown Lake near Huntington attests to the fine muskie fishing in Pennsylvania. This was my first successful catch after several losing battles. The "mania" is worse than ever! The satisfaction and thrill of boating this fish will be with me for a long time. Continue your great work in *Pennsylvania Fins and Feathers*.

Jim Woolcock
Millville, PA

Dear Bill:

I read your article on the "Best of the Bait-casting Reels" and was wondering if you could help me out a little more. I am a beginner at bait casting, but I have been fishing for quite a few years with spinning gear. I bought a Penn 920, spooled it with 12-pound trilene, and mounted it on a 6-foot spin-cast Shakespeare Ugly Stick. I usually use spinnerbaits or plastic worms, but I can't seem to cast them more than 30 or 40 feet. I know I need more practice, but should I be able to get more distance with my outfit? Also, what does a palming plate and totally free spool mean? I hope you can help me with my questions and give my any other tips on bait casting you might think of.

Edward V. Ludwig
Philadelphia, PA

Dear Ed,

I can't think of a more appropriate place to own a Penn reel than in the home city of the manufacturer, but you may have a problem with trying to use your 920 with light line and lures. I mentioned in the article that all the reels but the Penn could cast 70 feet or better with the ¼-ounce plug and 12-pound-test line. With the Penn set for the "beginners" setting, I could get about 50 feet, so the 30 or 40 feet you've been getting doesn't seem too far off.

There are a couple of things you could do to increase distance. First, practice until you can remove all the antibacklash control without backlashing. This includes removal of the centrifugal antibacklash system inside the reel. This will give you more distance, but the reel will be much more likely to backlash on a careless cast.

To help achieve this, you could switch to braided line instead of using monofilament. While you can get a little more distance out of mono with practice, the braided line will cause much less problem with backlash. I'll often do this, and add a 6-foot length of mono on the tip of the braided line to reduce visibility. If you add the mono make sure it's short enough that when the lure is tied to the end, all of the monofilament is in the rod guides with none on the reel. This keeps the knot from hanging up in the reel.

The best bet in the long run is to obtain a reel that's designed for the lighter lines and lures. Non ball-bearing versions of higher-priced reels are available from Garcia, Shimano and Daiwa, and while they cast about as well as the ball bearing models, they cost appreciably less. I'd suggest the Daiwa PS10, the Shimano Bantam 10 or the red Garcia 1000.

The Penn is a fine reel, but I use mine on a heavy-duty rod and use it for lures from ½ to 1 ounce, where it works just fine. You could do the same — simply use heavier lures, but often the ¼-ounce versions are the most effective.

As to what's a palming plate; well, it's just a fancy name for the left cover of the reel, where the antibacklash control used to be found on all reels. After Lew Childre introduced the smooth left side without a knob, it started to be called a palming plate because it was cupped against the palm of the hand on the retrieve. Only a few freshwater reels now have a knob control on the left side.

Total-free spool means that only the spool moves on the cast. On reels like the Penn, the Shakespeare and the earlier Garcia Ambassadeurs, the handles and some gears were disengaged when you pushed the free spool botton, but the level wind still went back and forth on the cast. On a totally free spool reel, the level wind stays in one place and doesn't move during the cast.

As far as additional tips on bait casting go, I could suggest you try to improve your casting on a different rod than the Shakespeare spin-cast Ugly Stick. Most spin-cast rods have a fast taper, with a lot of flex in the very tip and a relatively stiff shaft and butt. This flips the lure out at high speed, which is great for spin casting, but makes bait casting more difficult. A slow taper rod, which bends relatively evenly from tip to butt, is easier to control because it gives a relatively slow push to the lure. The best current example I can think of in this type of rod is the Skyline graphite rod. Regardless of what kind of rod you consider, glass or graphite, look for one that flexes fairly evenly at least two-thirds of the way from the tip to the butt.

Good Luck!

Bill Resman

Dear Sirs:

I enjoyed the article by Keith Sutton, "Leaves Three, Let it Be."

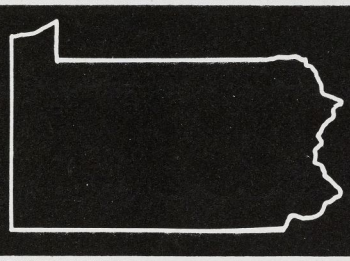
Poison ivy can be a real problem and is very common, causing many people great discomfort if not treated promptly.

A remedy handed down through the years in our family, and one unknown to many or most people, is rubbing juice from rhubarb leaves on the affected area. It is very effective in the advanced stages of the rash and at the first symptoms. It stops the itching in just a few minutes and will dry up the rash and cure it in 36 to 48 hours. Crumple a leaf of rhubarb and rub the juicy leaves on the rash. Do this three times a day or more often if the itching starts again. Generally speaking, the rash will dry up in three or four days.

I have found this to be a better cure than the "touch-me-nots" and much more available.

Robert Miller

Thanks for the tip. Though we've not tried this remedy, we'll pass on the suggestion to our readers.



Keystone Country

Western Pennsylvania Conservancy

Many Pennsylvanians, and especially sportsmen, have heard of the Western Pennsylvania Conservancy (WPC), but few know what the organization is, or what it does. Even its description as a "private, nonprofit land conservation organization" tells little about the association.

On the other hand, mention McConnell's Mills, Slippery Rock Gorge, Ohiopyle State Park, Fallingwater, Wolf Creek Narrows and various other state park and natural areas, and most sportsmen will not only recognize the names but, in most cases, will have visited some of them. Yet these, and many other natural land areas that have come into the public domain, have only done so because of the untiring efforts of the Western Pennsylvania Conservancy.

Perhaps a better definition of what the WPC does is contained in the words of its president, John Oliver, who says, "We are in the real-estate business, but we are in the real-estate business for land conservation." With a land-acquisition fund of several million dollars, the WPC can move quickly to acquire a choice parcel of land. Such parcels are later transferred at cost to state agencies, such as the Fish Commission, the Game Commission or the DER, to be utilized for the benefit of all residents and visitors of the state.

And "cost" for this sharp operation is really a bargain for the state. The WPC's full-time staff includes an attorney, real-estate experts and a botanist-naturalist, who can assess the value of a property as a natural area and negotiate a price for the parcel that is favorable to the buyer. Nor is the seller taken advantage of, for these Conservancy specialists are masters of the tax shelter, tax deduction and property easement, permitting them to acquire property at less than fair market value while permitting the seller to realize a net favorable return on the transaction.

In its fifty-year history, the Conservancy has acquired more than 85,000 acres of forest, waterways, fields and wetlands, most of which have already been sold to the state or the federal government for recreational purposes. This land includes some of the most scenic and wild areas of the state, and is scattered throughout about 25 counties in central and western Pennsylvania.

With 9,500 members, dues help provide the funds needed to operate the WPC and to purchase land. However, the WPC's primary income is from its approximately 80 institutional backers, a list that reads like a Who's Who of Pennsylvania business and philanthropy.

Basic memberships are $15 annually, with other classes of membership ranging up to life membership at $1,000. Interestingly, when asked to name the benefits of membership in the Conservancy, the first one named by Bill Randour, its public-relations specialist, was "Helping save the land and its beauty." And this is indeed the greatest appeal of the Conservancy.

Other membership benefits include member outings, such as canoe trips, cross-country skiing, backpacking, cave exploring and guided trips through natural areas. All outings are supervised by staff members who are familiar with the areas to be toured. Such trips are usually filled up quickly. There is no charge for the outings, except for out-of-pocket expenses.

The Conservancy's largest land acquisition is Cherry Run, 12,670 acres of mountain wilderness in Centre and Clinton counties, adjacent to Bald Eagle State Forest. The tract has five mountain streams, including Cherry Run, a stream so pure and remote that the Fish Commission has designated it a "wilderness trout stream." The land includes mixed oaks, hickory, elm and cherry trees, as well as a good population of whitetail deer, black bear and wild turkey. The tract has been sold, at cost, to the Game Commission, and is now a valuable addition to our state game lands. Naturally, it is open for hunting, fishing, backpacking, hiking and other outdoor activities.

Perhaps the wildest and most scenic acquisitions were those along the Youghiogheny River and the west slope of the Laurel Ridge. Hikers on the Laurel Highlands Hiking Trail can enjoy a spectacular view of the Youghiogheny Gorge far below, and whitewater rafters setting out from Ohiopyle State Park can enjoy world-class whitewater rafting on a river that drops 90 feet in less than 2 miles. In the same area the Conservancy is responsible for public ownership of Laurel Ridge State Park, Bear Run Nature Preserve and the Frank Lloyd Wright-designed house at Fallingwater.

A special acquisition program of the 70s was a large-scale program to purchase land along the Allegheny River. The Conservancy's interest was two-fold. First, it wanted to protect the upper Allegheny River watershed. Second, it wanted to acquire islands and key shoreline areas for recreational access and camping or stopover sites for a boat trail from the Kinzua Reservoir to Pittsburgh. To date, the WPC has acquired over 9,000 acres of land, primarily in the free-flowing section of the river above East Brady. However, the acquisitions have included several islands and access areas in heavily populated Allegheny County.

Though some state legislators would like to limit the acquisition of public land for recreation and conservation, the philosophy of the Western Pennsylvania Conservancy is that more public land is needed to offset the increase in land being posted or developed. Any sportsman who agrees with the Conservancy, and would like to help save the land and its beauty, can get a packet of information and a membership application from the Conservancy at the following address: Western Pennsylvania Conservancy, 316 Fourth Avenue, Pittsburgh, PA 15222. □

— Howard Bach

bobber is used. The jig is allowed to fall to within a half foot or so of bottom. After a minute or two, it's lifted smoothly a foot or two, and again allowed to fall. Fish tend to hit at the end of the drop.

The third approach is an attractor method that works best when fish are in a more aggressive mood. Here, a jigging lure such as the Swedish Pimple, Kastmaster or mini-Dardevle is lowered into the water and allowed to settle near bottom. Then it's slowly jigged back up a few feet and allowed to fall again, so that the fluttering glitter attracts nearby fish and, one hopes, goads them into striking. It's nearly always a good idea to sweeten the spoon with a dead, head-hooked minnow—a small one that doesn't inhibit the lure's tumbling action. Smart anglers vary the method and cadence of their jigging, keeping note of exactly how the lure is working, searching for the one retrieve that produces the most strikes. Another wise tactic is to use this jigging technique alongside a still-fished live bait. Fish attracted by the flashing lure may be more willing to actually bite on the slow-moving live bait. This approach doubles the options.

Last, there is the technique of active jigging, which, logically enough, works only when matched with active fish. The two favorite lures here are the Jigging Rapala (a minnow-shaped lure bearing an upturned hook at nose and tail, with an eyelet in the center of the back) and an "airplane" jig (which looks like a standard leadhead jig with miniature airplane wings jutting out on both sides. My favorite designs are made by the Northland Tackle Co., Dept. SA, 3209 Mill St. N.E., Bemidji, MN 56601). Both of these lures have an active swimming motion, describing half circles or even full circles as they're worked through the water. Airplane jigs are especially murderous on lake trout.

One of the high points of the icefishing game is watching a trout or walleye fidget near your jig or plug, uncertain, while you experiment with jigging speed and seductive twitches, trying to find the action that brings in the fish. (A parka pulled over your head eliminates glare and provides a clearer view of down under.) Such moments can be very intense. The feeling is much like that of a diver lost in another world; time passes with incredible swiftness. Coming back to the daylight terrestrial world is a bit of a shock, like coming back from a dream.

All of these techniques work, but they rarely work at the same time. By which I mean, these approaches range from still-fished bait for sluggish, reluctant feeders to comparatively fast-action methods for aggressive fish, with intermediate slots in between. The wise angler starts on either end of the spectrum and works toward the other side until something produces strikes.

Where you fish is vitally important, of course, and it may be true that the hardest part of catching gamefish through the ice is finding them. Pike and largemouth bass prefer bays, often near standing dead weeds or cattails, and are also found off points that connect bays to deeper water. Smallmouths, walleyes and saugers like to relate to submerged reefs and deepwater points. Lake trout can be anywhere, but seem to prefer rock-bottomed shoals and the deep water off boulder-ridden drops and bars. Rainbow and brook trout also like shoal water, as well as the hard-bottomed sections of comparatively shallow bays, especially where an inlet stream flows beneath the ice. On unfamiliar lakes it pays to consult other fishermen and to look for those areas where shanties or open-air fishermen congregate. Those with a technological bent may wish to use depthfinders to locate good structure. Simply pour a small puddle of antifreeze/water mix onto the ice and place your transducer in it to get an underwater, under-ice reading.

Last, the successful icefisherman is often the one who drills the most holes, working an area thoroughly before moving on. This requires either a strong back or a power auger. Those lacking the first are strongly advised to invest in the second. It's very common for the first 10 holes to produce nothing, while the 11th—or 18th—strikes gold.

Note: For the latest in ice shelters, see "High Tech in Old Shantytown," page 49.

Coming Soon: Gerald Almy on cold-weather stripers.

GEORGE HARRISON

Nature

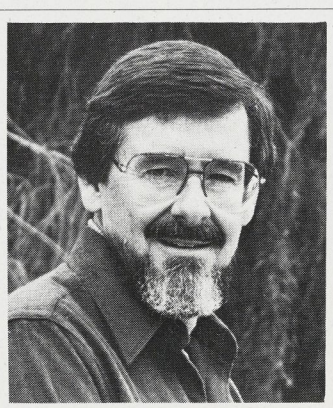
The Unsung Hemlock

White-tailed deer love hemlock and spend a great deal of their lives in and around the trees during all seasons.

In deep snow, hemlock can be the difference between life and death for deer. The tree's feathery leaves and thick canopy act as a roof over their heads, reduce snow depth beneath, and provide a thermal shield that helps protect deer from the cold.

Though not the most nourishing of food, hemlock boughs and seedlings will sustain whitetails during the lean days of winter. Many a starving deer has survived by browsing on hemlock, which is sometimes the only edible plant left for the deer.

"From a wildlife viewpoint, hemlock is a very valuable tree," claims Forest Service wildlife biologist Richard M. DeGraaf. "Any tree that offers food, nests or den sites and especially cover to wildlife throughout the year, as hemlock does, is certainly an asset to the woodland community."



But some foresters disagree. They don't like hemlock because it takes up space in the forest where more valuable hardwoods could grow. These professional foresters are more interested in the number of board feet a forest will produce than in benefits to wildlife.

Unfortunately, this negative

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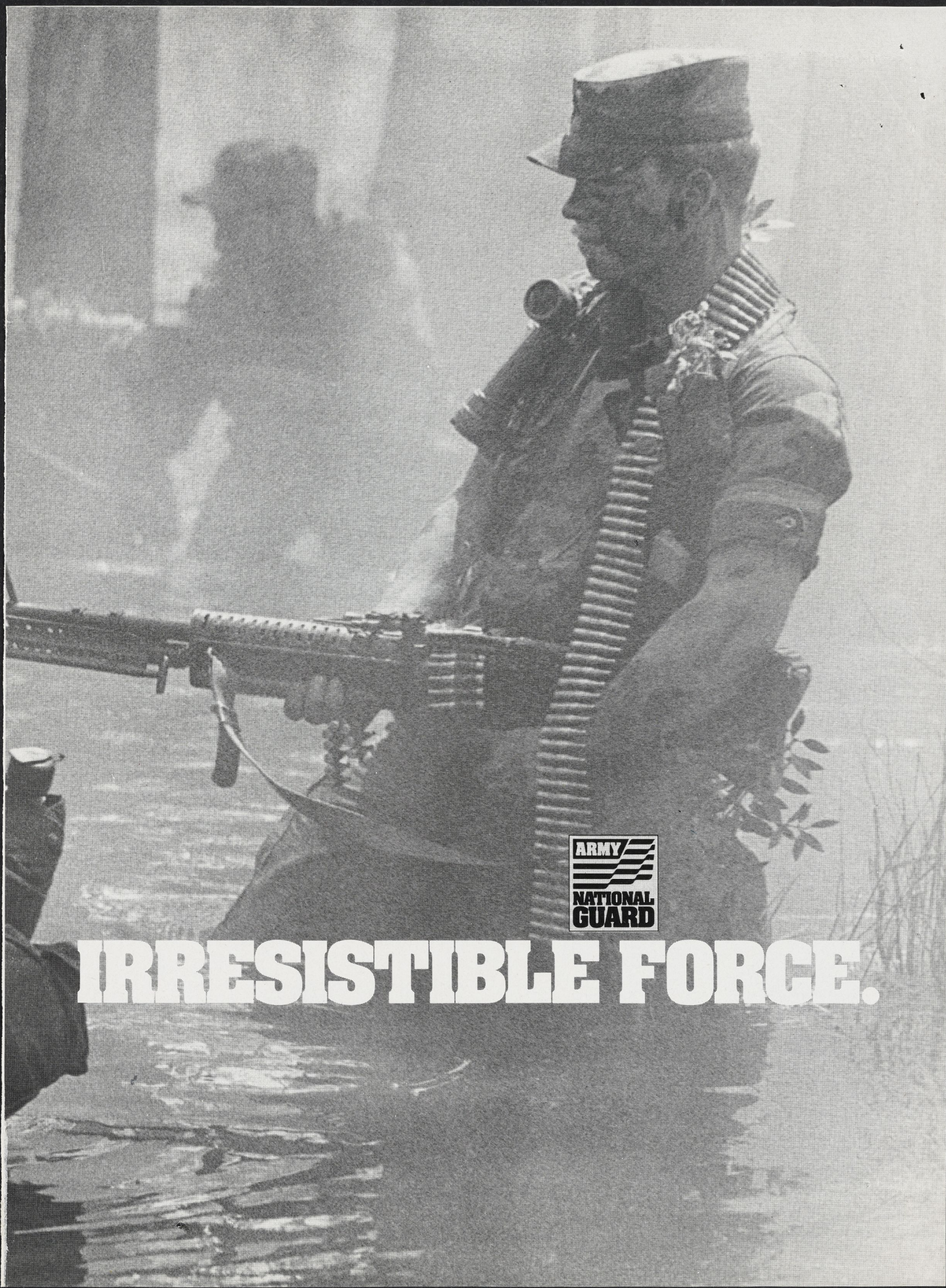
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attitude toward hemlock has prevailed through much of this century. "The U.S. Forest Service selectively thinned stands of hemlock for many years" and in some districts "removed large volumes of hemlock," according to the Wisconsin Department of Natural Resources (DNR) 1978 Pittman-Robertson Fund Report.

Yet, in the same report, the DNR acknowledged hemlock's value: "Hemlock is an important biological resource of Wisconsin. It has ecological, scientific and aesthetic values which necessitate special management procedures and considerations . . . scattered hemlock trees and small hemlock stands act as islands of green cover and add habitat diversity to the northern hardwood forest."

Among the 28 species of birds and 10 or more mammals that depend upon hemlock trees for their survival, the white-tailed deer is probably the most important to man. "But hemlock is a drawing card for a variety of other kinds of wildlife species as well," notes Tony Rinaldi, wildlife biologist with the Nicolet National Forest in Wisconsin. "When a stand, or even a single hemlock tree, grows in the middle of hardwoods, the hemlock acts as an oasis to which wildlife is attracted," he told me.

Rinaldi has a special interest in hemlock and is trying to change the attitudes of forest managers who disregard the value of the tree to the overall forest ecosystem. "There is a whole predator/prey community dependent on the hemlock," Rinaldi said. "Predators, such as the pine marten, fisher and bobcat, prey on the snowshoe hare, porcupine, red squirrel and red-backed vole, all of which live in and around hemlock," the biologist explained.

In his book *Trees, Shrubs and Vines for Attracting Birds,* Richard DeGraaf states that "hemlock is the preferred nesting site of the American robin, blue jay and wood thrush, among others. The seeds are eaten by red crossbills, white-winged crossbills, chickadees, pine siskins and American goldfinches."

U.S. Forest Service

Hemlocks offer food, nests and dens for a wide variety of wildlife.

Rinaldi said that in the Nicolet Forest, blackburnian and pine warblers, sharp-shinned hawks and ravens nest in the boughs of hemlock trees, while yellow-bellied sapsuckers make a living off the trees' sap. As a dead tree, hemlock develops into a soft snag favored by downy woodpeckers, chickadees and red-breasted nuthatches. "The hemlock tree is very special to the Nicolet Forest. Forest guidelines still allow some hemlock to be cut, but this should be the exception rather than the rule," Rinaldi concluded.

The hemlock belongs to the genus *Tsuga,* which includes 10 species of evergreens growing in North America, Japan, Formosa, China and the Himalaya.

The four species native to North America are eastern (Canada) hemlock and Carolina hemlock in the East, and the western (Pacific) and mountain hemlock in the West.

Hemlock bark is reddish brown to gray and deeply furrowed. Its flat one-third- to two-thirds-inch-long needles are dark green on top and lighter below. Hemlock's evergreen boughs form a matlike roof under which wildlife finds protection throughout the year.

In the hemlock, unlike some other tree species, both sexes occur separately on the same plant. The flowers it produces in May and June are inconspicuous, but the resulting fruit—cones—are one-half to three-quarters inches long and remain on the trees for wildlife to eat well into winter.

It is in the winter that small, winged seeds are shed from the cones. Some two months later, 20 to 30 percent of the seeds that fall to the ground germinate. The most successful are those that land in the cool shade where moisture is abundant and only about 20 percent of the sunlight penetrates.

Seedlings develop slowly during their first growing season, with shoots sprouting only an inch or so by their first autumn. Thereafter, they may grow eight to 12 inches per year. By the time the hemlock is 40 years old, it may be only 16 feet high and two inches in diameter.

U.S. Forest Service

Hemlock needles are dark green on top, lighter below. Cones measure about half an inch.

Like all living things, hemlock trees have deadly enemies: deer and hares that browse on boughs and seedlings, fire, drought, 24 species of insects, a number of diseases and, of course, the chainsaw.

Yet "hemlock is one of our most tolerant and longest-lived trees," DeGraaf wrote. Eastern hemlocks occasionally survive for 450 years, growing to 60 to 70 feet high and three to five feet in diameter. He pointed out the amazing fact that "a hemlock with only a one-inch-diameter trunk may have survived for as many as 100 years."

The age record for the eastern hemlock is 988 years. And, according to the American Forestry Association, the largest eastern hemlock is a giant living in Aurora, West Virginia, which rises 120 feet into the sky and is 224 inches in circumference.

The record western hemlock lives in Olympic National Park, Washington; it is 164 feet high and 328 inches in circumference.

My experiences with hemlock have largely taken place in Pennsylvania, where it is the official state tree. I have hunted, fished, watched birds, skinny-dipped, courted, and slept under hemlocks. I know of two hemlock old-timers living in Alan Seeger State Park, Huntingdon County, the larger of which requires the outstretched arms of at least three members of my family to surround its crumbling trunk. However, it's not as large as the 124-foot monarch with an 18-foot circumference, the state's largest, living in Cook Forest State Park.

Through most of the 19th century, the Northeast and upper Midwest, and adjacent Canada, were nearly covered with hemlock. But the huge forests were cut for the tannin in the hemlock's bark, which

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