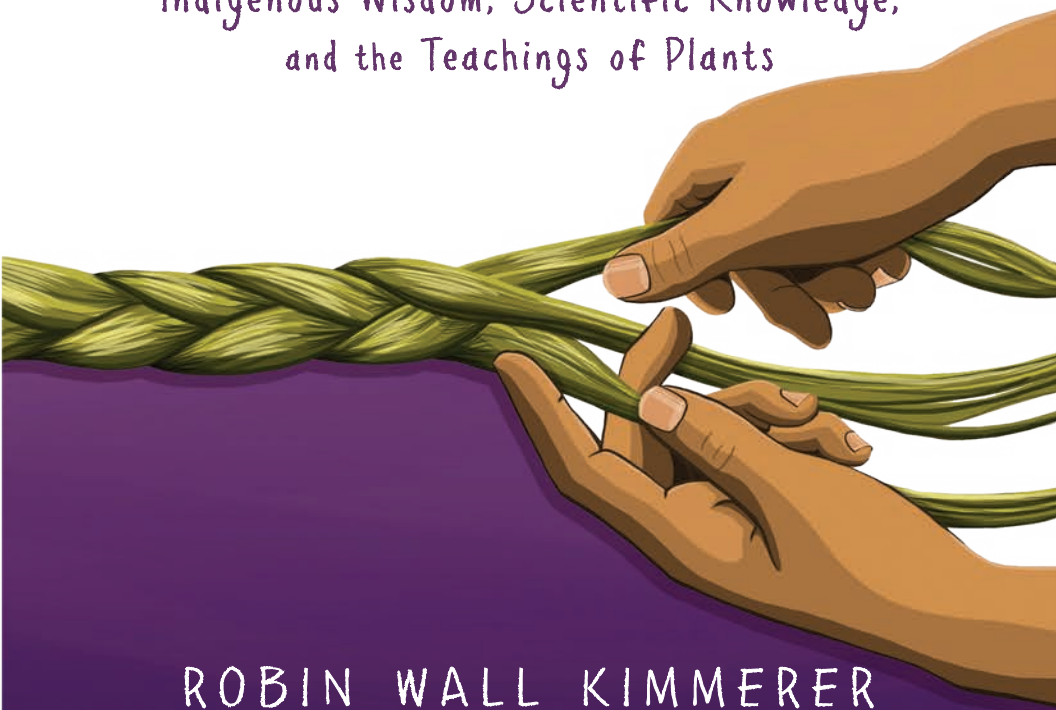
ADAPTED FROM THE *NEW YORK TIMES* BESTSELLER

BRAIDING SWEETGRASS

FOR YOUNG ADULTS

Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants



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MAPLE SUGAR MOON

When Nanabozho, the Original Man of Anishinaabe stories, our teacher, part man, part manido, walked through the world, he took note of who was flourishing and who was not, of who was mindful of the Original Instructions and who was not. He was dismayed when he came upon villages where the gardens were not being tended, where the fishnets were not repaired, and where the children were not being taught the way to live. Instead of seeing piles of firewood and caches of corn, he found the people lying beneath maple trees with their mouths wide open, catching the thick, sweet syrup of the generous trees. They became lazy and took for granted the gifts of the Creator. They did not do their ceremonies or care for one another. Nanabozho knew his responsibility, so he went to the river and dipped up many buckets of water. He poured the water straight into the maple trees to dilute the syrup. Today, maple sap flows like a stream of water with only a trace of sweetness to remind the people both of possibility and responsibility. And so it is that it takes 40 gallons (151 L) of sap to make a gallon (3.8 L) of syrup.

Plink.

manido: a powerful spirit-being

Original Instructions: Indigenous teachings that come from stories, not "instructions" like commandments or rules; rather, they are like a compass: they provide an orientation but not a map. The work of living is creating that map for yourself.

SUGARING

When we first moved to our old farmhouse in Fabius, New York, my daughters

loved exploring the loft above the stable. It was full of things left behind from almost two centuries of families before us. One day, I found them playing with an entire village of little metal pup tents. When they discovered the tents fit over old-time sap buckets to keep out the rain and snow during sugaring season, of course they wanted to make maple syrup. So we scrubbed out the mouse droppings and readied the buckets for spring.

We eagerly waited for signs of spring, watching the calendar and the thermometer because for sap to run, a combination of warm days and freezing nights is needed. *Warm* is a relative term, 35°F to 42°F (1.7°C to 5.6°C), so that the sun thaws the trunk and starts the flow of sap inside.

One day Larkin asked, "How do the trees know it's time if they can't see the thermometer?" Indeed, how does a being without eyes or nose or nerves of any kind know what to do and when to do it? There are not even leaves out to detect the sun. Every bit of the tree, except the buds, is covered in thick, dead bark. And yet, the trees are not fooled by a midwinter thaw.

To collect maple sap, drill a hole in the tree, and in the hole, tap in a tube—sort of like a straw. The tube then opens into a trough about 4 inches (10 cm) long. At the base is a hook to hang the bucket.

Maples have a far more sophisticated system for detecting spring than we do. There are hundreds of sensors in every single bud, packed with light-absorbing pigments called phytochromes. Their job is to measure the light. Tightly furled, covered in red-brown scales, each bud holds an embryonic copy of a maple branch. Each bud wants to be a full-fledged branch with leaves rustling in the wind and soaking up sunshine. But if the buds come out too soon, they'll be killed by freezing. Too late, and they'll miss the spring. So the buds keep the calendar. But those baby buds need energy for their growth into branches—like all newborns, they are hungry.

phytochromes: plant protein pigments that can detect light and initiate growth

We humans look for other signs. When hollows appear in the snow around the tree bases, I start to think it's tapping time. With drill in hand, we circle our trees searching out just the right spot, 3 feet (0.9 m) up, on a smooth part. Lo and behold, there are scars of past taps long healed over, made by whoever had left those sap buckets in our loft. We know what they had on their pancakes.

The spiles begin to drip almost as soon as we tap them into place. The first drops splat onto the bottom of the bucket. The girls slide the tented covers on, and the sound echoes even more. By the time we're done setting them up, the first bucket is already singing a different tune. As the buckets fill, they change pitch. *Plink*, *ploink*, *plonk*—the tin buckets reverberate with every drop, and the yard is singing.

My girls watch in fascination. Each drop is as clear as water but somehow thicker, catching the light and hanging for a second at the end of the spile, growing invitingly into a larger and larger drop. The girls stretch their tongues and slurp with a look of bliss.

When the buckets are full, we pour them into the garbage can. I had no idea there would be so much. The girls rehang the buckets while I build the fire. Our evaporator is just my old canning

kettle, set on an oven rack, spanning stacks of cinder blocks scavenged from the barn. It takes a long time to heat a kettle of sap, and the girls lose interest. When I tuck them into bed that night, they are full of anticipation of syrup by morning.

I set up a lawn chair next to the fire, feeding it constantly to keep up a good boil in the now-freezing night. I taste the sap as it boils down, and with every passing hour it is noticeably sweeter, but this 4-gallon (15 L) kettle will produce scarcely enough for one pancake. As it boils down, I add more fresh sap from the garbage can. Eventually, it gets too cold, and I head inside to my warm bed.

When I returned in the morning, I found the sap in the garbage can frozen. As I got the fire going again, I remembered something I had heard about how our ancestors made maple sugar.

PEOPLE OF THE MAPLE NATION

The original people of the Maple Forest made sugar long before they had kettles for boiling. Instead, they collected sap in birch bark pails and poured it into log troughs hollowed from basswood trees. The large surface area and shallow depth of the troughs was ideal for ice formation. Every morning, ice was removed, leaving a more concentrated sugar solution that was then boiled to sugar. Maple sap runs at the one time of year when this method is possible.

In the old times, families moved together to "sugar camps," where firewood and equipment had been stored the year before. Grandmothers and babies would be pulled on toboggans. It took all the knowledge and all the arms to make sugar. When the syrup reached just the right thickness, it was beaten so that it would solidify in the desired way, into soft cakes, hard candy, and granulated sugar. The women stored it in birch bark boxes called *makaks*, sewn tight with spruce root. Given birch bark's natural

antifungal preservatives, the sugars would keep for years.

antifungal: natural properties that exist in plants that inhibit the growth of fungi

It is said that our people learned to make sugar from the squirrels. In late winter, when the storage of nuts are depleted and the squirrels are hungry, they take to the treetops and gnaw on the branches of sugar maples. Scraping the bark allows sap to ooze, and the squirrels drink it. The freezing temperatures of the night cause the water in the sap to leave a sweet crystalline crust like rock candy behind. The squirrels follow their path from the day before and lick the sugar crystals. Enough to tide the squirrels over through their hungriest time of year.

Our people call this time the Maple Sugar Moon, Zizibaskwet Giizis. The month before is the Hard Crust on Snow Moon, or the Hunger Moon, when stored food has dwindled and game is scarce. The maples carried the people through, providing food when they needed it most. In return, ceremonies of thanksgiving are held at the start of the sap run.

THE MAPLES

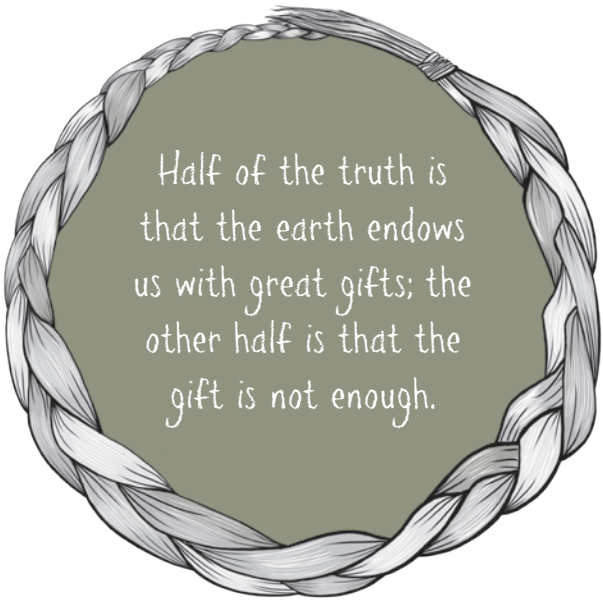
The Maples each year carry out their part of the Original Instructions, to care for the people. But they care for their own survival at the same time. The buds that sensed the initial turn of the season are hungry, and for the shoots to become full-fledged leaves, they need food. When the buds sense spring, they send a hormonal signal down the trunk to the roots, a wake-up call, telegraphed from the light world to the underworld. The hormone triggers the formation of amylase, the enzyme responsible for splitting large molecules of starch stored in the roots into small molecules of sugar. When the concentration of sugar in the roots begins to grow, it creates an osmotic gradient that draws water in from

phloem: a complex tissue in the vascular system of higher plants that takes the nutrients from the leaves back down to the roots

xylem: a complex tissue in the vascular system of higher plants that carries water and nutrients from the soil through the roots to the plant

the soil. Dissolved in this water, the sugar streams upward as rising sap to feed the buds. It takes a lot of sugar to feed people and buds, so the trees use their sapwood, the xylem, as the conduit. Sugar transport is usually restricted to the thin layer of phloem tissue under the bark. But in spring, before there are leaves to make their own sugar, the need is so great that xylem is called into duty as well. At no other time of year does sugar move this way. When the buds break and leaves emerge, they start making sugar on their own and the sapwood returns to work as the water conduit.

Because the mature leaves make more sugar than they can use right away, the sugar stream starts to flow in the opposite



direction, from leaves back to roots, through the phloem. The roots, which fed the buds, are now fed in return by the leaves all summer long. The sugar converts back to starch, stored in the original "root cellar." The syrup we pour over pancakes on a winter morning is summer sunshine flowing in golden streams to pool on our plates.

When my daughters remember our sugaring adventure, they roll their eyes and groan, "That was *so* much work." But they also remember the wonder of drinking sap straight from the tree. Sap, but not syrup. Nanabozho made certain that the work would never be too easy. His teachings remind us that half of the truth is that the earth endows us with great gifts; the other half is that the gift is not enough.

The responsibility does not lie with the maples alone. The other half belongs to us. We participate in its transformation. It is our work, and our gratitude, that distills the sweetness.

If we think about the earth bestowing us with a responsibility to harvest her gifts in honorable ways, how might you reimagine the production of natural resources in your area?