Chapter 6

THE NORTHERN WHITE-CEDAR

StandingNation-Human Alliance Bulletin

Mediation, Above and Below

- **TREES help shield humans from ultraviolet rays from the sun with the shade created by their leaves**. The ultraviolet (UV) wavelengths of solar radiation affect humans in both positive and negative ways. While we need UV light on our skin to create Vitamin D for use in our bodies, with excess exposure, UV rays cause sunburn, skin cancer, and cataracts of the eye. "Tree shade can help people enjoy the out-of-doors while avoiding excess UV exposure . . . "[1]
- **TREES and help remove lead from the soil**. Lead is a naturally occurring heavy metal found in the earth's crust that is toxic to plants, animals, and humans. Stored in the teeth and bones, lead can damage parts of the human body, including the liver, kidneys, and brain. "Lead can naturally be released into soil, air, and water through soil erosion, volcanic eruptions, sea spray and bushfires."[2]

However, in the past, lead was used as an ingredient in both paint and gasoline. Lead contamination from these products can be a problem for homeowners because once lead is in the soil, it doesn't biodegrade, remaining

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[1] Gordon M. Heisler, "Tree Influence on Human Exposure to Ultraviolet Radiation" USDA Forest Service Northern Research Station, October 3, 2019, at https://www.nrs.fs.fed.us/urban/public_health/uv_radiation/ (accessed 2/16/21).

[2] "What Is Lead?", *Australian Government Department of Agriculture, Water and the Environment* https://www.environment.gov.au/protection/chemicals-management/lead (accessed 2/16/21).

for thousands of years. Concentrations of lead in the soil are high in many parts of the U.S.

In addition to removing contaminants—including lead—from the air, trees can be used in a process known as phytoremediation—the utilization of the natural properties of plants to remove hazardous wastes—such as lead, from soil. While sunflowers are among the best plants for phytoremediation of lead and other toxins in the soil, trees help, too. More importantly, lead concentrations are lower in areas with greater levels of organic material from plants—such as tree leaves—and decomposition in the soil. "The organic material in the soil binds to the lead and helps move it out when rain and snow falls in the forest."[3]

Diplomatic Relationships

- Known as *gijik* to the Anishinabe/Anishinabeg, cedar is one of the most important Native American plants:

> "Leaves for poultices, a medicine for coughs, headache, or blood diseases, an aromatic purifier in religious ceremonies, a smudge, a tea rich in vitamin C, or a [as a] seasoner [in cooking]; bark rolled for torches, cordage, and woven bags; wood for boards, mats, splints (frameworks) for birchbark canoes, musical instruments, toboggans, sturgeon spears, and fire starters."[4]

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[3] Jeff D. Jeremiason et al, lead researcher quoted in University of Minnesota—Twin Cities research brief "More dead leaves can help remove lead from soils," reporting on article "Contemporary Mobilization of Legacy Pb Stores by DOM in a Boreal Peatland," *Environmental Science and Technology*, February 28, 2018, https://pubs.acs.org/ doi/pdf/10.1021/acs.est.7b06577 (accessed 2/16/21).

[4] Donald I. Dickmann and Larry A. Leefers, *The Forests of Michigan* by (Ann Arbor, MI: University of Michigan Press, 2016), p. 80.

- Cedar leaves and bark are used as medicine plants in many other tribes, including the Iroquois.
- Used by many tribes as a purifying herb, frequently included in medicine bundles and amulets and associated with prayer, healing, dreams, and protection against disease. Cedar is commonly used as incense and as a part of sweat lodge ceremonies.
- In 1536, the Iroquois at Stadaconna (now Quebec City) shared their knowledge and use of the tree they called *Anneda* (also spelled “Hanneda”), making tea from cedar and foliage with French explorer Jacques Cartier, the French explorer who claimed what is now Canada for France. On his second expedition up the St. Lawrence River, he had already lost 25 members of his 110 crew to scurvy. The Vitamin C in the cedar leaves and bark was responsible for the cure.
- Mostly likely the first North American tree introduced into Europe. Cartier brought the *l’arbe de vie* (“the tree of life”) to Paris as a gift to France’s King Francis I in 1536.
- In 1558, the tree was named *Arborvitae,* Latin for “tree of life.”
- The voyageurs of New France, who transported furs by canoe during the fur trade years, 1530s – 1870, used white-cedar leaves to prevent scurvy.
- In the 19th century, white-cedar was commonly used as “an externally-applied tincture or ointment for the treatment of warts, ringworm and thrush, and a local injection of the tincture was used for treating venereal warts.”[5]

[5] David Olszyk, “Thuja Genus (Arborvitae),” *American Conifer Society* https://conifersociety.org/conifers/thuja/?gclid=CjwKCAjwkPX0BRBKEiwA7THxiF2Mu4ALeJKnMQjbRFaF5inF1Y-54hr0idm67ERGhKHTrsAVu-NgtRoCvQoQAvD_BwE (accessed 4/20/20).

- Today claims have been made for white-cedar's ability to treat skin symptoms, which include warts, both oily and dry skin, sensitive, scaly, or itchy eruptions, nail fungus and hemorrhoids.

A Tourist's Testimonial

. . . I can pass days
Stretch'd in the shade of those old cedar trees,
Watching the sunshine like a blessing fall, —
The breeze like music wandering o'er the boughs,
Each tree a natural harp, —each different leaf
A different note, blent in one vast thanksgiving.[6]

—Letitia Elizabeth Landon (1802-1838)

Tree-Tripping

In the teapot

Bring a pot of water to boil while you cut up cedar leaves into small pieces. Once the water is boiling, turn off the heat, add the cedar pieces, cover and allow to steep for 5 to 7 minutes. Strain, and add a sweetener (honey or maple syrup), or not, and enjoy! But, not more than one cup a day, some say not to exceed three cups a week as cedar oil contains thujone, which is very toxic.

In cuisine

Foragers have experimented in using *green* white-cedar cones fresh—used a citrusy herb—or pureed in a marinade as well as brined, pickled, fermented, and cooked in cuisine.

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[6] Letitia Elizabeth Landon, "The Ancestress," *The Poetical Works of Letitia Elizabeth Landon* (Longman, Brown, Green and Longmans, ed. 1850)

In decking the halls

Cedar boughs are often used to decorate interior and exterior spaces during winter holiday times. Fresh greenery will last indoors for about two weeks, longer outdoors, and longest if the display is out of direct sunlight, away from heat sources, and misted daily.

Cedar wreaths are easier to make then other fresh evergreen wreaths because the lacy needles are soft and cedar boughs have a natural curve to them. Invest in a wired wreath form and floral wire. A pair of wire cutters will make handling the latter easier. You may want to hang your cedar wreath once you have the boughs attached, before you trim or decorate, so you can see how it hangs and where you need more or less greens and/or decoration.

Tree Dreams

- What memory or memories does the smell of cedar evoke for you?
- Do you have arborvitae shrubs or white-cedar trees growing in your yard or neighborhood?
- Do you recognize the cedar trees lacy, “scaly,” needle-like foliage in the wild?
- Have you ever felt in communication with a particular specimen of any species of tree?
- Have you had any idea of what was going on underground with the roots of trees in their “wood-wide web”?

Tree's Big Idea: **ROOTS**

Perhaps, like me, you've heard the description of the root system of a tree being an underground "reflection" of the tree's crown. Turns out, that is not the way roots actually grow. Instead, a tree's roots form a very wide spreading and relatively shallow network.

So, forget the taproot image. Unlike what you may have imagined, a tree's roots—long, relatively small, lateral roots—spread out, growing predominantly near the surface of the soil. Over 90% of all roots, and virtually all the large structural support roots are in *the first two feet of soil*. But while roots grow shallowly, they often extend radially for distances in excess of the tree's height, extending well beyond the branch spread, the tree's "drip line." And, the root systems of trees are enormous:

> "While one rule of limb has been that a tree's roots are one and one-half to three times wider than the foliage, other investigators estimate an irregular root pattern four to seven times the crown area; and, still other researchers maintain that the root extension can be four to eight times wider than the dripline of the tree . . ."[7]

Regardless of where it develops in the root system, a root is extremely sensitive and attuned to its environment. When a plant shows some growth movement in response to a stimulus, it is known as positive tropism; if the movement is away from the stimuli, it is known as negative tropism. In 1955, F.G. Wight in *Practical Botany* listed three types of root tropisms: Phototropism, Geotropism, Hydrotropism:"[8]

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[7] Robert Kourik, *Roots Demystified*: *Change Your Gardening Habits to Help Roots Thrive* (Santa Rosa, CA: Metamorphic Press, 2007).

[8] F.G. Wight, *Practical Botany* (London: Edward Arnold (Publishers) Ltd., 1955), p. viii Table of Contents, Section 17.

- Phototropism—Response to light or colors of light by plant. While stems show positive phototropism; roots show negative phototropism, growing away from light.
- Geotropism/Gravitropism— Response to gravity by plant. Stems show negative geotropism while the primary roots and other portions of the root system show positive geotropism. This response helps the root in the absorption of minerals and water from the soil. “Plant roots grow downward by sensing gravity using tiny, stone-like starch balls—called granules—in their cells. When gravity pulls the granules to the ‘bottom’ of a cell, it triggers signals that tell the plan ‘this way is down.’” [9]
- Hydrotropism— Response to water by plant. Roots show a positive hydrotropic response as they move and grow toward water.

In the last 65 years, this list has expanded to contain the many more ways we’ve learned that roots respond to stimuli:

- Heliotropism—diurnal motion or seasonal motion of the roots in response to the direction of the sun.
- Chemotropism— Response to particular substances by plant. Chemical substances bring a curvature movement in plant organs.
- Thigmotropism/Haptotropism— Response to mechanical stimulation by plant. Movement in response to contact with a solid object. Tendrils and twiners

[9] Berly McCoy, “By Making Plant Roots Grow Deeper, These Geneticists Hope to Curb Climate Change”, (*PBS News Hour,* July 17, 2019) https://www.pbs.org/newshour/science/by-making-plant-roots-grow-deeper-these-geneticists-hope-to-curb-climate-change (accessed 9/20/20), referencing: Takehiko Ogura et al., “Root System Depth in Arabidopsis Is Shaped by *EXOCYST70A3* via the Dynamic Modulation of Auxin Transport,” *Cell* DOI: https://doi.org/10.1016/j.cell.2019.06.021.

respond positively, growing toward it, but when a root feels an object, the root grows away from it.

- Hygrotropism—movement or growth in response to humidity or moisture
- Thermotropism—growth of an organism in response to heat. In general, growing roots tend to bend away from warmer temperatures and toward cooler temperatures.
- Traumatotropism—Response to a wound lesion
- Galvanotropism/electrotropism—Response to electric current or field
- Aerotropism—Response to source of oxygen
- Exotropism—Continuation of growth “outward” or in the previously established direction
- Magnetotropism—Response to magnetic fields
- Rheotropism—Response to the current of water

All of these responses, affecting their growth movement, help tree roots more or less successfully fulfill the four primary roles that we have understood roots to play for trees for a long time. Roots help trees by:

- providing support for the tree’s trunk and crown
- absorbing water and minerals (and oxygen)
- transporting the water and minerals inward toward the trunk
- storing carbohydrates.

Note that as tree roots are made of living cells and all cells must respire in order to function, roots must also absorb oxygen—which they acquire from air pockets between particles of soil—in order to perform their cell processes and to grow. Roots,

like all living things, will die without oxygen. Compacted soil or overwatering can prevent roots from being able to absorb the oxygen they need to do their work.

And just how is it they perform their work? Besides providing structural support for the tree, roots pump ions across membranes to pull in water, to concentrate the other nutrients that the tree needs for survival and growth, and to pressurize the tree enough for those nutrients to make it up into the leaves.

But perhaps most interesting,

> ". . . František Baluška from the Institute of Cellular and Molecular Botany at the University of Bonn is of the opinion that brain-like structures can be found at root tips. In addition to signaling pathways, there are also numerous systems and molecules similar to those found in animals."[10]

[10] Peter Wohlleben, *The Hidden Life of Trees: What They Feel, How They Communicate* (Vancouver/Berkeley, Graystone Books, 2015) p.83 referencing František Baluška, et al., "Neurobiological View of Plants and Their Body Plan," in Baluška, Mancuso, Volkmann, eds., *Communication in Plants* (New York: Springer, 2007).