**Tree Friends**

In *The Hidden Life of Trees* German forester Peter Wohlleben writes: “Why are trees so social? Why do they share food with their own species and sometimes even go so far as to nourish their competitors? The reasons are the same as for human communities: there are advantages to working together. A tree is not a forest. On its own, a tree cannot establish a consistent local climate. It is at the mercy of wind and weather. But together, many trees create an ecosystem that moderates extremes of heat and cold, stores a great deal of water, and generates a great deal of humidity. And in this protected environment, trees can live to be very old. To get to this point, the community must remain intact no matter what. If every tree were looking out only for itself, then quite a few of them would never reach old age. Regular fatalities would result in many large gaps in the tree canopy, which would make it easier for storms to get inside the forest and uproot more trees. The heat of summer would reach the forest floor and dry it out. Every tree would suffer.” [3-4]

Wohlleben explains that forest trees communicate through their entangled root systems and via the fungi networks that “operate like-fiber-optic internet cables.” A teaspoon of “forest soil contains many miles” of these this filaments called “hyphae.” Of course, fungi are looking out for themselves and receive nutrients from the tree roots in exchange for providing water as well as information about soil conditions and tree health. “In the symbiotic community of the forest, not only trees but also shrubs and grasses—and possibly all plant species—exchange information this way.” [9-11]

Students at the German Institute for Environmental Research have also verified that in the beech forest they studied trees were equalizing the nutrients derived from photosynthesis. “Apparently, the trees synchronize their performance so that they are all equally successful. And that is not what one would expect. Each beech tree grows in a unique location, and conditions can vary greatly in just a few yards. The soil can be stony or loose. It can retain a great deal of water or almost no water. It can be full of nutrients or extremely barren. Accordingly, each tree experiences different growing conditions; therefore, each tree grows more quickly or more slowly and produces more or less sugar or wood, and thus you would expect every tree to be photosynthesizing at a different rate. And that’s what makes the research results so astounding. The rate of photosynthesis is the same for all the trees. The trees, it seems, are equalizing differences between the strong and the weak. Whether they are thick or thin, all members of the same species are using light to produce the same amount of sugar per leaf. This equalization is taking place underground through the roots. There’s obviously a lively exchange going on down there. Whoever has an abundance of sugar hands some over; whoever is running short gets help. Once again, fungi are involved. Their enormous networks act as gigantic redistribution mechanisms.” [15-16]

Scientists now agree that “the root network” coordinates all the chemical exchange and interactivity of trees. “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.” Root tips are able to sense the living-world around them and make choices about the direction and rate of their growth. “If the root encounters toxic substances, impenetrable stones, or saturated soil, it analyzes the situation and transmits the necessary adjustments to the growing tip. The root tip changes direction as a result of this communication and steers the growing root around the critical areas.” [83]

Ecologists remind us that in addition to adding absorbing carbon dioxide and adding oxygen to the atmosphere, trees exhale water they’ve used to transport nutrients from the soil to the living cells of the tree. Also, trees emit chemical molecules into the air to defend themselves against pests. For conifers, after these molecules are in the air: “moisture condenses on them, creating clouds that are twice as thick as the clouds over non-forested areas. The possibility of rain increases, and in addition, about 5 percent of the sunlight is reflected away from the ground. Temperatures in the area fall. Cool and moist—just how conifers like it. Given this reciprocal relationship between trees and weather, forest ecosystems probably play an important role in slowing down climate change.” [107]

Wohlleben explains that trees can “see” light and count and remember. “Beeches, for example, don’t start growing until it is light for at least thirteen hours a day.” Furthermore, “They wait until a certain number of warm days have passed, and only then do they trust that all is well and classify the warm phase as spring. As deciduous trees are without leaves until they begin to grow again in the spring, it’s likely that the buds have the ability to “see” light and either transmit this information to the roots to be remembered or also remember and then trigger the spring growing cycle. [148-149]

Wohlleben concludes with an eco-choice challenge. “The real question is whether we help ourselves only to what we need from the forest ecosystem, and—analogous to our treatment of animals—whether we spare the trees unnecessary suffering when we do this. That means it is okay to use wood as long as trees are allowed to live in a way that is appropriate to their species. And that means that they should be allowed to fulfill their social needs, to grow in a true forest environment on undisturbed ground, and to pass their knowledge on to the next generation. And at least some of them should be allowed to grow old with dignity and finally die a natural death.” [242]

Peter Wohlleben, *The Hidden Life of Trees*, trans Jane Billinghurst (Greystone Books, 2016).

**Consider the trees in your living-world. Might you welcome these trees as friends? Might you regard these amazing beings with respect? Gently touch their bark. Would getting to know these trees be a transforming eco-choice for you?**