

Celebrating Mother Earth
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Excerpts from The Hidden Life of TREES What They Feel, How They Communicate
Peter Wohlleben, 2015

Trees have demonstrated that they have [a language of scent]. For example, four decades ago, scientists noticed something on the African savannah. The giraffes there were feeding on umbrella thorn acacias, and the trees didn't like this one bit. It took the acacias mere minutes to start pumping toxic substances into their leaves to rid themselves of the large herbivores. The giraffes got the message and moved on to other trees in the vicinity. But did they move on to trees close by? No . . . the reason for this behavior is astonishing. The acacia trees that were being eaten gave off a warning gas (specifically, ethylene) that signaled to neighboring trees of the same species that a crisis was at hand. Right away, all the forewarned trees also pumped toxins into their leaves to prepare themselves. The giraffes were wise to this game and therefore moved farther away to a part of the savannah where they could find trees that were oblivious to what was going on.

Dr. Suzanne Simard of the University of British Columbia in Vancouver has discovered that they [trees] also warn each other using chemical signals sent through the fungal networks around their root tips, which operate no matter what the weather. Surprisingly, news bulletins are sent via the roots not only by means of chemical compounds but also by means of electrical impulses that travel at the speed of a third of an inch per second. . . Once the latest news has been broadcast, all oaks in the area promptly pump tannins through their veins.

Tree roots extend a long way, more than twice the spread of the crown. So the root systems of neighboring trees inevitably intersect and grow into one another . . . usually there are fungi present that act as intermediaries to guarantee quick dissemination of news. These fungi operate like fiber-optic Internet cables. Their thin filaments penetrate the ground, weaving through it in almost unbelievable density. One teaspoon of forest soil contains many miles of these "hyphae". Over centuries, a single fungus can cover many square miles and network an entire forest. The fungal connections transmit signals from one tree to the next, helping the trees exchange news about insects, drought, and other dangers. Science has adopted a term first coined by the journal *Nature* for Dr. Simard's discovery of the "wood wide web" pervading our forests.

Students at the Institute for Environmental Research at RWTH Aachen discovered something amazing about photosynthesis in undisturbed beech forests. Apparently, the trees synchronize their performance so that they are all equally successful. . . the trees, it seems, are equalizing differences between the strong and the weak. . . 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. . . [the well-being of the trees] depends on their community, and when the supposedly feeble trees disappear, the others lose as well. When that happens, the forest is no longer a single closed unit. Hot sun and swirling winds can now penetrate to the forest floor and disrupt the moist, cool climate. Even strong trees get sick a lot over the course of their lives. When this happens, they depend on their weaker neighbors for support.

Young trees are so keen on growing quickly that it would be no problem at all for them to grow about 18 inches taller per season. Unfortunately for them, their own mothers do not approve of rapid growth. They shade their offspring with their enormous crowns, and the crowns of all the mature trees close up to form a thick canopy over the forest floor. This canopy lets only 3 percent of available sunlight reach the ground and, therefore, their children's leaves. . . . The method used in this upbringing is light deprivation. But what purpose does this restriction serve? . . . Thanks to slow growth, their inner woody cells are tiny and contain almost no air. That makes the trees flexible and resistant to breaking in storms. . . . A good upbringing is necessary for a long life. . . . Dr. Suzanne Simard, who helped discover maternal instincts in trees, describes mother trees as dominant trees widely linked to other trees in the forest through their fungal-root connections. These trees pass their legacy on to the next generation and exert their influence in the upbringing of the youngsters.

If trees are capable of learning (and you can see they are just by observing them), then the question becomes: Where do they store what they have learned and how do they access this information? . . . along comes the Australian scientist, Dr. Monica Gagliano. Gagliano studies mimosas, also called 'sensitive plants.' Mimosas are tropical creeping herbs. They make particularly good research subjects, because it is easy to get them a bit riled up and they are easier to study in the laboratory than trees are. When they are touched, they close their feathery little leaves to protect themselves. Gagliano designed an experiment where individual drops of water fell on the plants' foliage at regular intervals. At first, the anxious leaves closed immediately, but after a while, the little plants learned there was no danger of damage from the water droplets. After that, the leaves remained open despite the drops. Even more surprising for Gagliano was the fact that the mimosas could remember and apply their lesson weeks later, even without any further tests.

In the case of Switzerland, a whole country is concerned with the species appropriate treatment of all things green. The constitution reads, in part, that "account [is] to be taken of the dignity of creation when handling animals, plants and other organisms." . . . When the capabilities of vegetative beings become known, and their emotional lives and needs are recognized, then the way we treat plants will gradually change, as well. Forests are not first and foremost lumber factories and warehouses for raw material, and only secondarily complex habitats for thousands of species, which is the way modern forestry currently treats them. Completely the opposite, in fact.

All that [we] see – the heaven, the earth, and all that fills it – all these things are the external garments of God. Rebbe Schneour Zalman [1745 – 1813].

In order to serve God, one needs access to the enjoyment of the beauties of nature, such as the contemplation of flower-decorated meadows, majestic mountains, flowing rivers, etc. For all these are essential to the spiritual development of even the holiest of people. Rabbi Abraham ben Maimonides, [1186 – 1237].

Human beings have indeed become primarily tool-making animals, and the world is now a gigantic tool box for the satisfaction of their needs . . . Nature as a tool box is a world that does not point beyond itself. It is when nature is sensed as mystery and grandeur that it calls upon us to look beyond it. The awareness of grandeur and the sublime is all but gone from the modern mind. The sense of the sublime – the sign of inward greatness of the human soul and something which is potentially given to all – is now a rare gift. Yet without it, the world becomes flat and the soul a vacuum. Rabbi Abraham Joshua Heschel [1907 – 1972].

Consider God's doing! Who can straighten what has been twisted? [Ecclesiastes 7:13; translation by Rabbi David Stein in [A Garden of Choice Fruit](#)].

When God created the first human beings, God led them around the garden of Eden and said: "Look at my works! See how beautiful they are – how excellent! For your sake I created them all. See to it that you do not spoil and destroy My world; for if you do, there will be no one else to repair it." Midrash Ecclesiastes Rabbah 1 on 7:13 [600 - 800 CE].

Know that all healing is of the earth – gifts of the trees- especially potent during the month of *Iyyar*. Rebbe Nahman of Bratslav, 1772 – 1810].

When a tree that bears fruit is cut down, its moan goes from one end of the world to the other, yet no sound is heard. Pirke de-R.Eliezer 34 [8th C].

Rabbi Eleazar ben Azariah . . . used to say: One whose wisdom exceeds one's deeds, what is this like? Like a tree that has many branches and few roots, so that when the wind comes, it uproots it and turns it over . . . But one whose deeds exceed one's wisdom, what is this like? Like a tree that has few branches and many roots, so that even if all the winds in the world come and blow at it, they cannot move it out of its place . . . Pirke Avot 3:22 [200 CE].

When in your war against a city you have to besiege it a long time in order to capture it, you must not destroy its trees, wielding the ax against them. You may eat of them, but you must not cut them down. Are trees of the field human to withdraw before you into the besieged city? [JPS translation of Deuteronomy 20:19].

She is a tree of life to those who grasp her, and whoever holds on to her is happy. Her ways are pleasant ways, and all her paths, peaceful. [JPS translation of Proverbs 3:18 & 17. Used liturgically for putting the Torah Scroll away after reading from it].

The sentence we use in singing the Torah back to the holy Ark – *Eitz hayyim hi? – lamahaziqim bah* – is generally thought to deal with the Torah. Reading it however in the context of the Book of Proverbs, it refers to *hokmah*, Wisdom, Sophia. . . . *Hokmah* is the innate wisdom in things that tells even the DNA and RNA what shape to give to growth. . . In Muir Woods in California there is a slice of a trunk of a redwood tree more than two thousand years old that had been sawed through and through. There is a legend beside it pointing to rings showing when great historic events occurred. The rings are not even. Those who know these things can tell about the climate in the years each one of these rings was first shaped. As I stood there and looked, I felt something shift in me. . . The tree grows from the growing edge, nearest the outside bark. . . So every year a new ring begins at that growing edge. It is between the wood of last year's ring and the outer bark. I stood and mused over that for a long time. In the back of my mind another phrase stirred that I had heard from the most recent Lubavitcher Rebbe, Reb Menachem Mendl the second, when I met him first in Marseilles France, about ten years before he became rebbe. The phrase was (Deut. 20:19) *ki ha-adam eitz ha-saddeh*, "For a person is like a tree of the field." An aside: the original meaning of the sentence was an ironic question, meaning to the contrary, i.e., a person is *not* like a tree. . . . But in Hasidic tradition the sentence was read straight, as if it said that the tree *is* like a human being, and conversely a person is like a tree. . . . So here I was looking at a Sequoia and looking at the awesome mystery of the rings, of the way in which that tree had been a witness to so much history. . . . What is most alive in the tree is not its center. . . . The center of the tree is the hardest, least flexible, the driest, the least juicy part. . . . The inner core of the tree was too set, too static. Yet this very quality is also the strength of the tree. The growing edge alone could not hold it up to stand rooted, enduring storms and weather. But the growing edge carries the life from the roots to the leaves and back. . . . When a tree dies it is the growing edge that has died first. . . . I thought of how we as persons grow. Here, too, our encounters with the outer world stimulate the new ring of experience on the tree of our lives. What tells me most about myself. . . is the vital growing edge, the place where I am vulnerable and alive, where what happens on the outside impinges on me and where I digest and assimilate what happens on the outside. . . . So the present consciousness and attitude is the current growing edge of the psyche and the memories and impressions are the rings. Blessed are those who manage to keep the growing edge healthy. Rabbi Zalman Schachter-Shalomi [1924 – 2014].

