THE BIOPHILIA EFFECT

A Scientific and Spiritual Exploration of the Healing Bond Between Humans and Nature

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Der Biophilia Effekt
Heilung Aus Dem Wald

SOUNDS TRUE
BOULDER, COLORADO

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INTRODUCTION: THE BIOPHILIA EFFECT

We have roots, and they definitely did not grow in cement.

ANDREAS DANZER[1]

I called it my giving tree," Michael Jackson said, "because it inspires me." The King of Pop gave a tour of his estate to the British TV channel ITV2. Michael Jackson continued, "I love climbing trees in general, but this tree I love the most because I climb up high and look down at its branches, and I just love it. . . . So many ideas. I've written so many songs from this tree. I wrote 'Heal the World' in this tree, 'Will You Be There,' 'Black or White,' 'Childhood.'" There was a sparkle in the King of Pop's eye when he said it.

The reporter looked up skeptically at the massive tree. He asked in disbelief, "You're actually saying that you climb that tree?"

Michael Jackson pointed at the tree crown and said, "All the way up to that spot up there, kind of like a deck or a bed." Jackson then took off and, laughing, nimbly climbed the tree like a kid. He sat down high up in the tree, looking over the green lawns through the huge branches with a pensive look on his face.[2]

This old, stately tree with its rough bark was the inspiration for some of the most renowned pop classics of our time. Nature mesmerized Michael Jackson, moved him, and something inside him longed for contact with trees.

Andreas Danzer, musician, journalist, and son of the Austrian rock star, Georg Danzer, is also familiar with the inspiring force of nature based on personal experience. He shared these experiences with me in January 2015. He remembers a place on the coast of Spain from his childhood where he often sought refuge. From a cliff, he could see across the sea all the way to Morocco's mainland. "I went and sat there when I needed peace and quiet or had a crisis. The huge sides of the cliff plunge straight down into the ocean." Still today, Andreas thinks

about this place from his childhood "to deal with stress, like others who take a deep breath or count to ten." He can remember every detail of the cliff. It helps every time.

When Andreas Danzer became sick in 2011, he benefited from the healing force of nature. He was in the hospital for half a year due to pulmonary tuberculosis. In the beginning, he was not allowed to leave his room, which he could not do anyway because he was too weak. But as soon as the doctors gave him the okay, he began to visit a nearby nature area on a daily basis. Every time, he sat on the same old tree stump on the edge of the woods. "There was always this family of deer," he said. "At first they kept a safe distance, but after one or two weeks, they accepted my presence and came closer. I sat right in the middle of them and felt like Dian Fossey in *Gorillas in the Mist*.

Andreas noticed that his feelings of depression from being sick diminished with every visit to the deer family in the woods. "I dared to hope again, and my strength to defeat the illness steadily grew. My fascination with the animals and the woods distracted me from my physical symptoms. The fresh air was good for my lungs, and moving helped build up my muscles after spending so much time in a hospital bed. When I walked up the mountain to my spot, I sweated out the toxins from the medications, and the side effects decreased. I built up my physical and mental strength while a relationship between me and the deer family emerged."

Andreas Danzer perceived himself as part of nature and part of the overall cycle of life. He is convinced, "Everyone feels the need deep inside to be close to nature. We have roots, and they definitely did not grow in cement."

Famed German-born American psychoanalyst and philosopher Erich Fromm (1900–1980) called this longing for nature "biophilia." This is people's love for nature, for the living. The term "biophilia" comes from the Greek and literally means "love of life or living systems."

After Erich Fromm's death, the evolutionary biologist and Harvard University professor Edward O. Wilson adopted this term and introduced the "biophilia hypothesis." Wilson spoke about the "human urge to affiliate with other forms of life," in other words, about our

connection with nature. It is a connection that has evolved over millions of years. Human beings come from nature. We have been formed by our interactions with nature. We should therefore be considered a part of nature, just like all other life forms. The same life force in us also operates in animals and plants. We are a part of the "web of life," as Wilson expressed it.

What I call the "biophilia effect" happens when we connect with our roots—and they do not grow in cement, as Andreas Danzer summed up so succinctly. The biophilia effect stands for wilderness and the conception of nature, for natural beauty and aesthetics, and for breaking free and healing. That is what this book is about.

There is a power in eternity,
and it is green.

HILDEGARD VON BINGEN[1]

1

WHAT HILDEGARD VON BINGEN COULD NOT HAVE KNOWN

How Plants Keep Us Healthy by Communicating with Our Immune System

In the twelfth century, German Benedictine abbess and scholar Hildegard von Bingen wrote down her discoveries about the healing nature of plants. Nearly nine hundred years later, many people still closely associate her name with herbal medicine. She called the power in plants and all other living beings "greening power." Hildegard von Bingen knew about a healing bond between humans and nature, as did farmers in the Middle Ages, who taught her a large part of her knowledge. Today, scientists have discovered breathtaking details and facts that Hildegard could not have known. The same plants that fascinated her so much do not affect us solely through direct contact. Today, modern research has investigated what Hildegard von Bingen might only have suspected and has carried it out of the realm of the mysterious into solid science.

Biological Communication

Plants communicate directly with our immune system and unconscious without us even needing to touch, much less swallow, them. This fascinating interaction between

human and plant is hugely significant for medicine and psychotherapy and is just starting to be understood by science. It keeps us physically and mentally healthy and prevents illness. In the future, contact with plants has to play an important role in treating physical illness and mental disorders. There simply must not be clinics without a garden or access to a meadow and forest, no new neighborhoods without vegetation, and no cities without wilderness.

Plants heal without having to be processed into teas, creams, essences, extracts, oils, perfumes, or drops and tablets. They heal us through biological communication that our immune system and unconscious understand.

This concept might have been beyond even Hildegard's imagination. However, she was at a considerable disadvantage. She did not live in the age of neuroscience, molecular biology, and immunology.

This chapter will focus on plants communicating with our immune system. Our unconscious will be discussed a little later on.

Whispering Leaves: Can Plants Communicate?

When I first began writing this book, I posted the paragraphs about Hildegard von Bingen that you read above on Facebook. I wanted to test the effect it had on readers. Along with interest and curiosity, I noticed skepticism. One user by the name of Hanspeter, who had read my previous nonfiction books, speculated about the content of this book and wrote the following comment: "Um. This book is not one of yours, right? Did I miss something? No, I do not want to read a book that claims plants communicate with my immune system or unconscious without

Plants build alliances and communicate amongst themselves.

FLORIANNE KOECHLIN[2]

even touching me. That is a bunch of esoteric crap and not worth considering further."

Esoteric crap? Not worth further consideration? Hanspeter was simply wrong. I was referring to scientific facts. And they are definitely worth further consideration. They could fundamentally revolutionize how we approach health care.

A heated debate among the users developed on Facebook, and within a mere two hours almost two hundred comments appeared. "Likes" were coming in almost every second. Most users did not have an issue with using the term "communication" for plants. However, Hanspeter and a handful of other users continued to rebel against this usage. The gist of their comments was that anyone who claims that plants can communicate with each other or the human organism is either naive and not trustworthy or wants the media attention. But is that really true?

Hanspeter and his allies might have been subject to a fundamental fallacy that is perfectly understandable and that no one could hold against them. In our daily life, we typically use the term "communication" when we refer to a conversation between people. We talk to each other, write emails and letters, and occasionally enjoy a little chitchat with a neighbor. Without a doubt, when we associate communication with only this kind of social, interhuman exchange using language, then it naturally appears more than daring to claim plants have the ability to communicate. Hanspeter would probably not have anything against me posting on Facebook that dogs and cats can communicate among themselves and with humans. Cats and dogs might not be able to speak a human language, but they usually find a way to convey their needs and moods to us. This nonverbal communication works really well, as most dog and cat lovers could surely confirm.

What is imaginable with animals seems to be impossible with plants. Plants have no verbal language and no vocal organs to make sounds like a dog does. They have no eyes to produce a soul-searching look and have no facial expressions that we can somehow interpret. Most plants cannot actively move at all and are always stuck rooted to the same place. Who can blame Hanspeter for thinking someone is untrustworthy for talking about communication with plants, of all things?

It is easy to pinpoint the problem: our understanding of communication is far too limited. To understand the world in all its complexity, we need to change this. Communication is far more than just talking together or wagging tails at each other, to continue with the dog example. A leading dictionary of psychology defines communication as the transmission of information between a sender and receiver.[3] It is self-explanatory. One person sends out information, and somebody else receives and decodes it. And plants can do just that exceedingly well. They are true masters in emitting, receiving, and decoding information. And that makes them masters in communication. For communication to work, the information has to be coded somehow. We human beings do this through language—for example, certain words carry certain meanings. And we seem to all agree on the meanings, because verbal communication in daily life works. However, the information that we send each other can be coded an entirely different way. For instance, computers communicate using endless rows of zeros and ones. And how do our green companions do it?

Plants, like insects, communicate using chemical substances. They send out molecules, which are tiny chemical units of these substances consisting of atoms. These molecules can definitely be compared with a human language because, just like our words, they carry certain meaning in the world of plants and, therefore, information—a "plant vocabulary." The plant that renders one of these molecules is the sender. The plant that receives and understands the molecule is the receiver. "Understand" in this case means that the plant knows what to do with the message. It knows what is meant and can react accordingly. These procedures fulfill all the criteria that the definition of "communication" dictates.

These substances do not just slip from the plant by accident. Plants emit their communication molecules in a controlled manner and oriented to a particular target. If a pest attacks them, many plants emit substances that alarm other plants in the vicinity. These substances carry the information "Caution, predator!" as well as exact data about the enemy, as we will soon see. Without having come into contact with the pest on their own, the alarmed plants from the surrounding area

that receive the message start creating defenses against the specific pest. Their immune system reacts to the message and is activated. But that is not all. The same communication molecules not only alarm other plants, but also attract natural enemies of the pests. These beneficial insects come and feast on a pest parfait. In this way, plants communicate among themselves and with insects. There is more. Their chemical messages contain information even about the kind of attacker and extent of the attack. The receivers of the message adapt accordingly. Other plants produce the exact antibodies that are needed for this special situation, and the army of beneficial insects assembles its troops based on the needs of the plants in danger.

"Plants can send and exchange outrageously complex information using fragrances," explained Wilhelm Boland, professor of organic chemistry at the University of Karlsruhe and at the Max Planck Institute for Chemical Ecology, to the German magazine *Der Spiegel*.[4] "We hope we can decode this language," continued the professor. He was especially enthusiastic about the fact that "plants not only say I've been hurt; they even say specifically who hurt them." The Swiss biologist, chemist, and science journalist Florianne Koechlin evaluated the communication of plants during an interview with the journal *Ökologie und Landbau* (*Ecology and Farming*). "By now we know of two thousand fragrance words from nine hundred plant families," she explained.[5] We can expect that science will decode countless other plant words. Most of these chemical "words" belong to the terpenes group of substances. It is a very large group of secondary plant compounds with almost forty thousand representatives that fulfill numerous different functions.[6]

Terpenes are additionally found in essential oils and can even be seen at times. You may have noticed a blue haze above the woods when it was really hot outside. When it is hot, trees protect themselves against the direct sunlight. Plants emit terpenes not only as a sunscreen, but also to attract insects or other animals when they need their services, or to warn other plants about pests so that they can mobilize their immune systems. They also produce terpenes as a toxin to actively kill pests or as a bad taste to deter predators. They even use terpenes to chase away "the competition" when these other plants

are not related. Mushrooms also communicate with each other using terpenes, so they can show their gametes the way to a suitable mate.

So, plants can communicate. That is now clear. But that does not necessarily mean that this communication is connected with a consciousness that resembles the human consciousness. For example, we know that our organs communicate with each other and with our brain. Yes, every single cell in our body communicates with neighboring cells, and nevertheless, we do not have to attribute a consciousness to the organs for that purpose. A highly complex regulatory circuit of nature, which does not necessarily require a plant consciousness, also controls communication among plants. It is nature's intelligence at work. Maybe it is something similar to what Hildegard von Bingen considered "greening power."

Another interesting detail biologists have since discovered is that plants communicate with each other using clicking sounds they create with their roots. However, these bioacoustic signals have not been decoded yet. By now, Hanspeter on Facebook should have fewer objections against my posts. Plants can communicate, and they do it using terpenes. But as I asked earlier, what does that have to do with our immune system? Is it just superstition again to believe plants communicate with systems of the human body, without us touching, eating, or taking them as medicine? Let us begin this topic with a Japanese tradition.

Plants' Impact on the Immune System: More Killer Cells and Anticancer Protection

We are currently living in a time of radical change. Scientists make one groundbreaking discovery after the next about our immune systems. Little by little, it is becoming clear how deeply humans are interconnected with their environment. Scientifically speaking, we realized long ago that it was a mistake to observe the human body isolated from its natural environment as if it were a machine. This concept of humans is about to end, and immunology will make an essential contribution to this shift.