

Plant totemism. Toward a new maginary of the plants in the Anthropocene

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Abstract *Plant totemism. Toward a new imaginary of the plants in the Anthropocene.* The Italian philosopher Emanuele Coccia coined the concept of “plant totemism” to define the new emerging relationship between humans and plants in the Anthropocene. Recently, the interest in plant life is increasing, thanks to new researches on trees’ ability to perceive the environment they live in and to build social relationships. These topics exert great fascination in the social imaginary since they are rooted in popular culture and return in modern times in many science-fiction stories. Moreover, studies on plant intelligence first emerged in the pseudoscientific milieu of New Age. As a result, new forms of spirituality and pseudoscience emerge, from “forest bathing” to the “bioenergetic landscape”. The article analyzes the different forms the rediscovery of plant life assumes in the modern imaginary, concluding that plant totemism can be considered a case study in social imaginary to understand the emergence of a new scientific spirit that tries to reconcile human and non-human world.

Keywords Plants | Totemism | Antrhopocene | Pseudoscience | Ecospirituality





1. The Word for World is Forest

The Mercadante Forest, in Apulia, part of the Alta Murgia National Park, is an artificial forest: it was built to defend the city of Bari from the recurring flood disasters that struck it in the early 20th century. It is an example of how civilization returns to nature to repair the damages of a wild modernization. Here, around a “suggestive circle of tall and luxuriant oaks,” a group of people gathers on an early September evening with the aim of “rebalancing the energetic body and healing energy leaks.” (Mezzapesa, 2017; translated by the author) They are led by Artiglio Ueman, a shaman of the cultural association “L’arte del risveglio” (*The art of awakening*). He was trained at the Italian Center of Shaman Studies and is currently studying Toltec shamanism. After a walk of about three kilometers to enter the heart of the forest (“dynamic meditation”), participants formed a “shamanic circle” and started playing rattles and drums with the aim of animating the forest and awakening its spirits, which, explains Artiglio, “love the particular vibrations and the music of the rattles that pushes them to make a first contact with the individual self.” (Mezzapesa, 2017; translated by the author) The participants thus experience a slight trance to access the shamanic vision of life that sees the whole of nature as alive and animated. The aim of the experience is to reconnect the human beings with the spirits of nature, rebalancing what modernity, with its clear division between nature and culture, has unbalanced. Even a stone, Artiglio explains, is not simply a stone, but an “energetically animated object that communicates to the individual through shapes and colors.” (Mezzapesa, 2017; translated by the author)

Even those who do not wish to adhere to a vision so radically far from the Western culture can enjoy the healing powers of the forest. In the Kufsteinerland and Olympiaregion Seefeld in Tyrol, one can have a forest bathing with a trainer. Rosanna Battisti, travel blogger, calls Verena Hiltpolt “my Yoda Master in the battle against the dark powers of everyday stress.” (Battisti, 2019) A natural trainer specializing in forest bathing, she teaches how to become aware of tree life and invites participants in her courses to walk without shoes in contact with the forest floor, touching the barks and testing balance and skills by walking with their fingers on wooden sticks.

The practice of forest bathing comes from Japan, where it is called Shinrin-Yoku. Considered a medical practice to reduce stress levels, it is also translated as “sylvotherapy”, the therapy of trees. According to the Forest Therapy Institute it helps to enhance the “awareness of your relationship with nature that supports your healing, meaning and purpose” (Forest Therapy Institute, 2020). Seminal studies conducted in the 1980s claimed that Shinrin-Yoku had therapeutic effects on immune system function (e.g. in increasing natural killer cells and cancer prevention), cardiovascular system (decreasing hypertension and coronary artery obstruction), on the respiratory



system (allergies and respiratory diseases), on depression and anxiety, promoting mental relaxation, rejecting attention deficit and hyperactivity disorder, and increasing the sense of gratitude and selflessness (Williams, 2016). Studies have been conducted over the years to assess the actual benefits of the exposure to natural environments. A 2010 meta-analysis on 25 of these studies provided some evidence of a positive benefit of walking or running in a natural environment in comparison to a synthetic environment, as well as some support for greater attention after exposure to a natural environment, although these benefits can often be overestimated or explained by other factors (e.g. running, listening to music). Furthermore, studies have found no evidence of changes in blood pressure and cortisol contraction (Bowler *et al.*, 2010).

In 1984 the biologist and evolutionist Edward O. Wilson coined the hypothesis of biophilia: living beings spontaneously seek contact with other lifeforms, even very different ones, for a sort of biophilic attraction, a result of the genetic coevolution of all living organisms on Earth (Wilson, 1984). Influenced by Wilson, in 1995 the American developmental psychologist Howard Gardner, author of the controversial theory of multiple intelligences presented for the first time in his book *Frames of Mind: The Theory of Multiple Intelligences* (1983), added to the original seven modes of human intelligence an eighth level, naturalist intelligence:

It seems to me that the individual who is readily able to recognize flora and fauna, to make other consequential distinctions in the natural world, and to use this ability productively (in hunting, in farming, in biological science) is exercising an important intelligence and one that is not adequately encompassed in the current list. (Gardner, 1995)

As is often the case, these controversial ideas have subsequently been incorporated into very different cultural frameworks from their original contexts. This is the effect of what historians of ideas call *concept drift* (Wang, Schlobach and Klein, 2011). A classic example of concept drift is what led Wilson's biophilia to become a "proof" of the healing power of trees and plants, as in the best-seller *The Biophilia Effect* by Austrian writer Clemens Arvay. Here, Arvay explicitly mixes science and spirituality (as the book's subtitle says), proposing to use the powers of meditation to increase the therapeutic effectiveness of forest bathing. For example, he suggests sitting in the trees, breathing hard and then "find an image that symbolizes your natural killer cells, which the anticancer terpenes in the forest air will strengthen":

While the anticancer terpenes in the forest air communicate with your immune system, you are also sending coded, symbolic messages to your immune system. And the message from the outer forest air, as well as the message from your inner imagination, are the same: "More natural killer cells!" Afterward, you can imagine how the killer cells now scurrying around inside you are more active and attack pathogens. Your imagination knows no limits while visualizing this process. (...) I often imagine how they begin to whirl faster and faster, "flailing away" bacteria and viruses. (Arvay, 2018)



While Arvey argues that this is a classic psychotherapy practice, it actually has many traits in common with the beliefs of the “affirmative prayer” and the “law of attraction” coming from the American New Thought (the book, originally published in German, has in fact achieved wide success in its English translation). This “green spirituality” phenomenon, where scientific aspects merge with fitness culture and do-it-yourself spirituality (Camorrino, 2018), has been proved in several studies. A research on members of 20 Dutch nature organizations showed that being in the woods was associated with feelings such as inner peace, interconnectedness, and reflections on the circle of life. Another study of 131 Australians who visited, worked, or lived in the woods show how much transcendent experiences are triggered by nature or wilderness experience. Answers mentioned a sense of union with the universe or some kind of power or entity, sense of timelessness, and strong positive effects (Konijnendijk, 2008).

2. The Secret Life of Plants

Another interesting concept drift concerns the concept of naturalist intelligence, increasingly used to support the theory of plant intelligence. As showed below, the theme of plant intelligence dominates the debate in plant sciences today, but what is interesting to note is its use within a framework that combines modern forms of spirituality and pseudoscience.

Suzanne Simard, a professor of forest ecology at the University of British Columbia in Vancouver, studies the sensitivity and interconnectedness of trees in Pacific temperate rainforests of western North America. She is well-known for her studies on mycorrhizal networks, that is, the underground hyphal networks fungi created to connect trees together and transfer nutrients and minerals. Simard prefer to call them “mother trees” for their “nurturing, supportive, maternal role.” (Grant, 2018) Simard’s research has been reported in the bestseller *The Hidden Life of Trees* (2016) by German forester Peter Wohlleben, which popularized the Wood Wide Web theory, i.e. the hypothesis that trees in a forest would be connected in a network similar to the Internet.

The idea that trees have their own language enjoys enormous popularity and in sylvotherapy contexts it becomes a support for the theory of the healing power of trees. Charlotte Anderson, author of a *Pranic Energy Healing* handbook, argues that we can absorb Prana (the “life force” according to Hindu physiology) from trees. One should just rest under a tree by leaning on its back or embracing tree’s bark, as “tree huggers” do. According to Anderson, “divine energy and prana can be absorbed and used to facilitate rapid healing and improvement of both one’s own life and the lives of one’s clients.” (Anderson, 2013) Matthew Silverstone, a British serial entrepreneur, argues in his book *Blinded by Science* (2011) that by embracing a tree its peculiar “vibrational



pattern” will interfere with the biological mechanisms of our body: since all nature is composed of vibrations, Silverstone says, being able to harmonize the vibrations of our mind with those emitted by trees would cure several diseases without using modern drugs.

That nature is composed of vibrations is a commonplace of pseudoscience (Hammer, 2004; Wynn and Wiggins, 2001), but this idea was applied to the world of plants after the influential book by Peter Tompkins and Christopher Bird *The Secret Life of Plants* (1973). Tompkins, an American scholar of esotericism and occultism who had served as OSS agent in Italy during the Second World War, was prompted by Bird, an American botanist passionate about Eastern and New Age mysticism, to study some heterodox experiments of crank scientists and amateurs related to the alleged “extrasensory perception” of plants. One of the pioneers in this field was Cleve Backster, a CIA interrogation specialist who applied a lie detector to an ornamental plant in 1966, to verify whether plants experimented with some form of consciousness. Backster declared that the plant was able to perceive a danger long before a threat is put into effect: it was enough for him to form in his mind the mental image of a flame with which to burn the leaves that the galvanometer applied to the leaves splashed upwards. The plant would even be able to distinguish between real and simulated intention, or to react when a person who do not like plants come nearby. When Backster accidentally cut off a finger and disinfected the cut with an iodine tincture, “the plant that was being monitored on the polygraph immediately reacted, apparently to the death of some cells in Backster’s finger.” (Tompkins and Bird, 1973) He therefore imagined that the plant was somehow sensitive to life at a cellular, if not molecular, level, a sort of “primitive perception,” as he defined it in an article published in 1968 in *The International Journal of Parapsychology* (Backster, 1968). According to Tompkins and Bird, Backster “appeared to have tapped into some sort of force field not conventionally understood within the present body of scientific knowledge.” (Tompkins and Bird, 1973)

All the following attempts by professional scientists failed to replicate the so-called “Backster effect”, and the theory was dismissed as pseudoscience. These were, in fact, spontaneous reactions unrelated to specific phenomena, let alone sensory or extrasensory ones. But crank scientists insisted on the reality of the Backster effect. For Pierre Paul Sauvin, an electronic technician from New Jersey, a scholar of ESP phenomena and hypnotism, plants “had an energy field similar to the energy field generated by a human being, and that somehow an interaction of these fields could be put to use.” (Tompkins and Bird, 1973) One day he discovered that while he was on vacation with his girlfriend, the plants left at home and connected to a tone oscillator reacted enthusiastically with his orgasm during sex. He therefore proposed that this energy should be the orgone theorized by the American psychiatrist Wilhelm Reich, a form of energy associated with sexual desire (Tompkins and Bird, 1973).

According to Marcel Vogel, a Californian chemist at the IBM San Jose Research Center, a scholar of occultism and ESP, plants “radiate energy forces that are beneficial



to man. One can feel these forces!" He suggested that Native Americans were aware of these faculties, since when in need they would go into the woods and, "with their arms extended, they would place their backs to a pine tree in order to replenish themselves with its power." (Tompkins and Bird, 1973) According to Vogel, this occurs since plants, animals and humans share an equal life force, a sort of cosmic energy, which makes them an unbroken wholeness. Another electronic technician, L. George Lawrence, went so far as to produce "a biodynamic field station designed for interstellar signal reception," in the belief that plants could be able to collect signals from other living species in the cosmos. He claimed that the plants were able to collect signals from the constellation of the Big Dipper, probably produced by extraterrestrial plants.

Actually, the idea of the existence of a "biodynamic field" able to connect all lifeforms to each other is not a New Age invention, but dates back to Rudolf Steiner's anthroposophy: in 1924 Steiner gave a series of eight lectures on agriculture entitled "scientific and spiritual impulses for the progress of agriculture" (Steiner, 2004), proposing some theories on how cosmic and spiritual forces are able to increase soil fertility. But while, at that time, this idea drew strength from occultism, in the 1970s it was included into a sort of para-scientific framework to better adapt it to modern Weltanschauung: "What remains to be done now is to remove all traces of occultism and make plant response, including communications phenomena, a verifiable component of orthodox physics," as L. George Lawrence wrote (Tompkins and Bird, 1973). Similarly, the concept of "aura" made popular in the West by theosophy in the early 20th century was also transformed into a para-scientific concept in the New Age (Hammer, 2004). In the 1960s, the idea that living beings were surrounded by a halo of energy that was invisible except through particular powers was applied to plants by experiments conducted by Semyon Davidovich Kirlian, a Russian amateur electrician and photographer, who claimed to have succeeded in impressing on film evident proofs of energy emitted from leaves. In 1968 a Russian professor, Vladimir Inyushin, published a study on the so-called "Kirlian effect", concluding "that the bioluminescence visible in Kirlian pictures was caused not by the electrical state of the organism but by a 'biological plasma body' which seemed to be only a new word for the 'etheric' or 'astral' body of the ancients." (Tompkins and Bird, 1973). Inyushin's idea of the existence of a bioplasmatic field is today the basis of several pseudoscientific theories that propose the use of plants to rebalance the energy field of human beings. For instance, in a recent popular text, *The Power of Auras: Tap Into Your Energy Field For Clarity, Peace of Mind, and Well-Being* (2013), self-help coach and writer Susan Shumsky proposes the following exercise: "Approach a tree or a plant with L-rods [a concept derived from geomancy] and say, 'Please show me an energy band in this (plat's, tree's) energy field'." (Shumsky, 2013)

3. Plant Revolution



The wide success of Tompkins and Bird's book, from which a famous TV documentary was made in 1978, popularized the idea that plants possess some form of intelligence and communication, but at the same time turned this hypothesis into a pseudoscientific idea. Consequently, researches carried out in the following years by botanists, physiologists and biologists on these topics were invariably mocked or dismissed as fantasies. For instance, in 1983 two studies demonstrating that willow trees, poplars and sugar maples were able to warn each other about insect attacks were dismissed as "talking tree papers" (McGowan, 2013). In 1990 a study led by Ted Farmer, then a postdoc in the Washington State University, where he worked with Clarence Ryan, a plant hormone expert, provided evidences that some plants use methyl jasmonate, an airborne organic chemical, to ward off insect herbivores: putting damaged sagebrush leaves into jars along with potted tomato plants, they observed that tomatoes began producing inhibitors able to harm insects. It was a possible proof of interplant communication for "safety purposes" (Farmer and Ryan, 1990).

In the following years these experiments were repeated with different species and produced further results. This gave rise to a new field of research, called "plant neurobiology," officially launched in 2006 by an international group of scholars in an article in the journal *Trends in Plant Science* titled "Plant neurobiology: an integrated view of plant signaling." (Brenner *et al.*, 2006) At the same time, some of these scholars launched an intense dissemination activity, through public conferences, appearances in scientific festivals and the publication of numerous popular science books, giving rise to a sort of "plant revolution" (Mancuso, 2017), as Stefano Mancuso, an Italian botanist and founder of the Société internationale pour le signalement et le comportement des plantes and director of the International Laboratory on Plant Neurobiology at the University of Florence, defined it. Mancuso argues that plants have sensory activities similar but at the same time different from human ones, since their sensory receptors are not concentrated in a specific part of the body, as in animal brains, but spread throughout the plant. To hear the environment in which it lives, for example, each plant's cell is able to capture the vibrations transmitted through the soil, thanks to the presence of mechanosensitive channels. According to Mancuso, this allows a real communication between plants, thanks to a sort of "distributed intelligence." The language of plants is "made of thousands of chemical molecules that are released into the air or water and that contain information of various kind." (Mancuso and Viola, 2015)

Supporters of plant neurobiology claim that electrical and chemical signaling systems have been identified in plants, as well as neurotransmitters such as serotonin, dopamine, and glutamate (Pollan, 2013). While in the early years attention has been focused on these neurotransmitters, and therefore on the possibility that plants, through the release of chemicals, are able to communicate with insects and other animals (e.g. to coordinate pollination, necessary for plant reproduction, or to defend themselves from attacks by insects or predatory fungi), in recent years research has



focused on roots. For example, it has been claimed that trees are able to recognize the kinships between them, so that when the roots of a tree, in their expansion in the soil, meet the roots of a “relative”, they stop to compete for the expansion underground, and prefer to expand their branches in the open air. For Mancuso, this would be a form of “altruism” which shows that plants have attitudes towards their “blood relatives” similar to those of animals (Mancuso and Viola, 2015).

The so-called root-brain hypothesis, claiming that the intelligence of trees is distributed in the roots, is not so new: its precursor was Charles Darwin, who dedicated his essay *The Power of Movements in Plants* (1880) to this issue. According to Mancuso, this hypothesis is very close to a recent philosophical theory in the field of artificial intelligence, namely the idea of embodied agent, according to which an authentic disembodied artificial intelligence would not be possible, since an agent acquires consciousness and intelligence only through interaction with the world through its physical body (Mancuso and Viola, 2015). To make possible the existence of a kind of plant intelligence in the absence of a brain, supporters of plant neurobiology resort to the concept of network. Just as the development of the Internet (a computer network) allowed the birth of a sort of distributed intelligence, so it is possible that plant networks, through interactions between their roots, can give rise to some form of awareness. For Mancuso,

plants hold the key to a future that will be organized around systems and technologies that are networked, decentralized, modular, reiterated, redundant—and green, able to nourish themselves on light. “Plants are the great symbol of modernity.” (Pollan, 2013)

This idea was popularized by the German botanist Peter Wohlleben’s book *The Hidden Life of Trees* (2016). The trees in the forest, Wohlleben writes, “create what looks like a social network.” In this operation they are helped by mushrooms. Over decades, a fungus’s underground cottony web, known as mycelium, expands. The mycelium creates connections with the trees, penetrating and enveloping tree’s roots but also connecting these roots to the larger web created by fungi that spread underground, throughout the forest. “In so doing, it extends the reach of the tree’s own roots as the web grows out toward other trees. Here, it connects with other trees’ fungal partners and roots. And so a network is created, and now it’s easy for the trees to exchange vital nutrients and even information.” (Wohlleben, 2016) Wohlleben defines this network “the forest Internet”.

Early researches on the forest Internet date back to the studies of Suzanne Simard. In the early 1990s, Simard and her team discovered in the temperate rainforests of western North America the underneath existence of the mycelial web. Using mass spectrometers and scintillation counters, Simard also discovered “carbon being transmitted back and forth between the trees, like neurotransmitters firing in our own neural networks. The trees were communicating through the web!” (Simard, 2016) In 1997 these findings were published on *Nature* and defined by the magazine’s editors



“wood wide web”. (Simard *et al.*, 1997). In addition to arousing renewed public interest in trees, these researches also generated new attention for mushrooms. Even more enigmatic than trees, mushrooms—which are not plants (they do not have chlorophyll) but neither animals, nor minerals—had their great boom in popular culture during the New Age, due to their well-known psychotropic properties; now that a sort of “psychedelic renaissance” (Pollan, 2018) is underway, it is natural to expect that research on mushrooms and their role in the wood wide web will return to the center of popular attention.

Paul Stamets, an American mycologist and essayist, published in 2005 the influential book *Mycelium Running: How Mushrooms Can Save the World*, where he presented his thesis on mycotherapy (the use of fungi to remove toxic substances from the environment) and mycoremediation. After a psilocybin trip, Stamets recovered from a lifelong stutter. Later, he embarked on active entrepreneurial marketing of fungi-based therapeutics and then worked for the Department of Defense on the extraction of new antibiotic substances from fungi. Based on Stamets’ mycoremediation theories, today there are several start-ups that offer the possibility to filter *E. Coli* or heavy metals from polluted water, to reclaim gold from electronic waste, to produce biodegradable packaging (Hsu, 2020). According to Stamets, “mycelium is the neurological network of nature” and it “operates at a level of complexity that exceeds the computational powers of our most advanced supercomputers.” (Stamets, 2005) In his book he presents some particularly evocative images: for example, a computer model of the early universe where the filaments of matter in space resemble the mycelial web, or a computer model of dark matter in universe where he notes that dark matter filaments that bind together the galaxies “interspersed throughout the myceliumlike matrix.” (Stamets, 2005) He defines this filament matrix “the Mycelial Archetype,” an archetypal structure of nature that can be found everywhere, from the patterns of hurricanes to dark matter, from string theory to the Internet. His hypothesis is that hidden relationships exist between these patterns: the mycelial, as well as the wood wide web, would be only one of the forms that life and information assume in nature.

3. Greener Than You Think

In the web television series *Star Trek: Discovery* (2018-ongoing), mycologist Paul Stamets gives his name to one of the show’s characters, the Lieutenant Commander Paul Stamets, astromycologist. His assignment is to test an innovative spore engine that allows the spaceship USS Discovery to move almost instantly to any point in space. To do so, the engine takes advantage of the ability to travel through the mycelial network, a web that extends into the subspace domain for the entire galaxy (perhaps the entire universe), created by the mushroom *Prototaxites starviators*. This fungus is



composed of an unspecified “exotic material,” and its spores are used as fuel. To travel in the mycelial web, however, a “navigator” is needed (this is an idea coming from the fictional universe of Frank Herbert *Dune’s* and its sequels). The navigator is able to plot a route through the mycelial web. After using an unknown specimen of giant tardigrade, Stamets decides to act as a navigator himself, although this involves physical pain and risk of spore intoxication. As a result, Stamets get lost in the mycelial web, described as a sort of afterlife: here he also meets what seems to be the soul of his lover, the ship’s doctor Hugh Culber. Thanks to Culber’s advice, Stamets manages to find his way out of the mycelial web. During this experience, Stamets acquires an ability to see things beyond appearances: he understands, for example, that the spaceship has been captured in a mirror universe and realizes that one of the ship’s officers is actually a Klingon enemy in disguise. Star Trek’s Stamets is a firm believer in the fact that there’s no difference between physics and quantum biology: for him spores are the “building block of energy across the universe.” (Sloat, 2017)

Science fiction has drawn a lot of inspiration from scientific and pseudoscientific attention to the plant world. In the episode *The Troubled Spirit* (1976) of the science fiction TV series *Space: 1999*, the botanist of the Alpha base, Dan Mateo, carries out an experiment halfway between science and esotericism very similar to those described in the book *The secret life of plants* (from which the episode probably draws inspiration): he tries to get in touch with the plants of his hydroponic greenhouse, but in doing so he generates a mysterious force that terrorizes the crew of the base. In fact, the plants have unleashed Mateo’s unconscious spirit, which is defeated after a sort of séance. The theme is similar to the plot of Ursula K. Le Guin’s story, *Vaster than Empires and More Slow* (1971), in which a mission of exploration encounters a planet apparently devoid of lifeforms, covered only by thick vegetation. As explorers stumble into the forest, a frightening fear takes hold of them, driving them almost to madness and making them believe that an invisible threat is approaching. Gradually they realize that trees are connected to each other through their roots, creating a kind of big brain: not only do trees communicate with each other, but they are also able to communicate with humans on the planet through the release of chemicals that induce fear and horror. In the end one of them, Osden, endowed with special empathic abilities, manages to enter into communication with the intelligent forest and reassure it about their intentions, so as to obtain the possibility of future human settlements on the planet (from this plot Le Guin will write the following year her famous novel *The Word for World is Forest*).

Many other science fiction stories seem to suggest a difficult relationship between humans and the plant world. In the classic novel *The Day of the Triffids* (1951) by John Wyndham, an alien invasion is carried out by a new plant species, probably created in lab, which after being cultivated by humans turns out to be anthropophagous. The triffids can communicate with each other and in this way, taking advantage of a cataclysm (a meteor shower), they escape from human control and start hunting the surviving humans by coordinating themselves in bunches. In Ward Moore’s novel *Greener Than You Think* (1947), a genetic engineering experiment aimed at increasing



the productivity of food plants leads a species of grasses to become resistant to any attempt to weed them out until it occupies the entire surface of the Earth sweeping away any other living species. In M. Night Shyamalan's film *The Happening* (2008), plants begin to generate a neurotoxin that is lethal to humans. According to the theory proposed in the finale, it would be a reaction of nature to the destructive threat posed by humans. In Jeff VanderMeer's acclaimed *Southern Reach Trilogy* (2014) the transformation of a part of the world into an alien zone with its own laws involves a total fusion of animals, plants and humans, with the consequence that trees or even mountains can come alive and try to kill the human "invaders". In the absence of classic alien entities, the alien becomes a mutated and anthropomorphized nature.

These stories seem to confirm the theory of the American philosopher Eugene Thacker that horror is a non-philosophical attempt to philosophically think the world-without-us, i.e. the whole biosphere without human beings (Thacker, 2011). The world-without-us has existed in the past and could exist again in the future, but it also exists somehow in the present, if we understand nature as radically separated from culture, that is, the human civilization. Thacker defines "Cosmic Pessimism" as the way we think about the world-without-us, a mixture of mysticism, hermeticism and occultism that seeks to overcome the difficulty of thinking about "a blank, anonymous world that is indifferent to human knowledge, much less to our all-too-human wants and desires." As a result, Thacker says, we unconsciously represent the nonhuman with "the many popular images of nuclear wars, natural disasters, global pandemics, and the cataclysmic effects of climate change." (Thacker, 2011) Thacker argues that this occurs because we continue to anthropomorphize nature, attributing to it an evil or beneficial intentionality (or, in the case of spiritual healing movements, the possibility of securing the benefits of nature through shamanic rituals to ingratiate the "spirits" who inhabit it). But the real cosmic pessimism is to consider nature completely indifferent to the human world, as Giacomo Leopardi argued in his *Dialogue of Nature and an Icelander* (1824). That trees, plants, fungi are in communication with each other but completely indifferent to human beings is such an unsustainable thought that it generates, as reactions, mystical drifts, spiritual conceptions, or horrific visions.

4. Plant Totemism

Supporters of the "plant revolution" are, in many cases, responsible for these spiritual drifts. In his book *La Vie des plantes. Une métaphysique du mélange* (2016), Eugenio Coccia, associate professor at the École des Hautes Études en Sciences Sociales (EHESS) in Paris, writes:

The roots make the soil and the underground world a space for spiritual communication.
The most solid part of the earth is then transformed, thanks to them, into an immense



planetary brain (...) The root is like a second body, secret, esoteric, latent. (Coccia, 2016; translated by the author)

He goes so far as to write of a “cosmic function of the plant,” a “planetary dimension,” since, through chloroplasts, plants are the only living beings on Earth that can directly use the sun’s energy to transform it into nourishment, while at the same time producing a transformation of the entire planet thanks to the emission of oxygen. “Plants are the metaphysical transfiguration of the planet’s rotation around the sun, the threshold that transforms a purely mechanical phenomenon into a metaphysical event.” (Coccia, 2016; translated by the author).

Stefano Mancuso believes that, since plants are sensitive and intelligent beings, we should treat them with some degree of respect, e.g. protecting their habitats from destruction and avoiding practices such as genetic manipulation, growing plants in monocultures, or training them in bonsai—even though he doesn’t go so far as to argue that we should avoid eating them (Pollan, 2013). Suzanne Simard does not hide her frustration with Western science, because its typical reductionism would make it impossible to understand the interconnectivity of the forest and the way plants think, talk and come into contact with each other and with the rest of the environment.

When I walk into a forest, I feel the spirit of the whole thing, everything working together in harmony, but we don’t have a way to map or measure that. We can’t even map the mycorrhizal networks. (Grant, 2018)

These views arouse quite a few doubts in most scholars. According to Lincoln Taiz, a retired professor of Plant biology at the University of California, Santa Cruz, tree roots and mushroom filaments are genetically programmed by natural selection to perform their tasks in an automatic way, “so no overall consciousness or purposefulness is required.” Taiz believes that the great attention research into plant communication and intelligence derives from the way contemporary popular imagery has been able to renew the old myths about talking trees: the success of Hollywood movies like *The Wizard of Oz*, *The Lord of the Rings* or *Avatar*, where this theme plays an important role, would provide an evidence (Grant, 2018). Richard Fortey, a retired paleontologist at the Natural History Museum in London and author of *The Wood of the Trees: One Man’s Long View of Nature* (2016) is similarly very skeptical: “It’s so anthropomorphized that it’s really not helpful,” he says commenting Simard’s statements. “The case is overstated and suffused with vitalism. Trees do not have will or intention. They solve problems, but it’s all under hormonal control, and it all evolved through natural selection.” He strongly sustains the theory of the trees as networkers but commenting Peter Wohlleben theories he specifies: “His trees are like the Ents in Tolkien’s *The Lord of the Rings*”. (Grant, 2018) For Ian Baldwin, a pioneer of plant neurobiology at the Max Planck Institute, to learn what plants are capable of we should stop anthropomorphizing them; instead, we should “phytomorphize”



ourselves. “Imagining what it’s like to be a plant, he said, will be the way to understand how and why they communicate—and make their secret lives a mystery no longer.” (McGowan, 2013)

According to Emanuele Coccia, the renewed interest in the life of plants derives from a gradual emancipation from a “zoological prejudice,” an “animal narcissism” that considers animals the only living beings endowed with intelligence (Venturi, 2019). Using the notion of totemism of the French anthropologist Claude Lévi-Strauss (1962), according to which a human group learn how to think about its own life through the observation of other species (for example, a tribe of hunters identifies with a bear to the point of defining its relationship with other species, e.g. crows, in the same way crows relate to bears), Coccia believes that the new attention to plants as the “nonhuman” par excellence allows humans to better understand themselves and their own existence. Totemism and anthropomorphism would be two identical processes: if we discover that humans have something in common with nonhumans, then we can recognize them traits of humanity; and whenever we attribute a human trait to a plant or an animal, we recognize that there is something non-human inside us (Venturi, 2019).

However, contemporary Western culture does not provide for this reciprocity. Lévi-Strauss used the notion of totemism to define a way of understanding the world by “primitive” cultures, characterized by the confusion between the boundaries of “nature” and “culture”, if not worshipping animals and plants at least taking for granted bonds of kinship between humans and nonhumans species (Launay, 2005). But on the contrary Western modernity is characterized by the tendency to radically divide nature and culture. As a consequence, postmodern Western societies inevitably tend to anthropomorphize nature, giving to nature intentionality and wills it does not possess. However, in the Anthropocene, i.e. the era characterized by human’s dominion over nature, this anthropomorphizing, in addition to producing new phenomena of panpsychism by which some social groups try to mend the rift with the nonhuman, also generates a total inability to understand the nonhuman, even assuming in popular imaginary evil and destructive purposes.

What would happen, however, if, instead of considering anthropomorphism and totemism as reciprocal processes, as Coccia suggests, we took into account only one of the two relational processes, that is to say that, seeing the existence of similarities between human beings and plants, we did not attribute anthropomorphic aspects to plants but plant aspects to humans? This is the “cosmological perspectivism” proposed by the Brazilian anthropologist Eduardo Viveiros de Castro based on his studies on today’s shamanic communities in the Amazon. Cosmological perspectivism argues that nonhumans consider themselves as people. The jaguar does not represent itself as we represent the jaguar but considers itself the central species of the world, as we human beings do: the only species endowed with intentionality, intelligence, and culture. What we consider instinctual animal behaviors are, in this perspective, analogous to the cultural rituals of human beings.



Viveiros de Castro derives from shamanism the idea that, behind a different external form, every living being (human and non-human) hides an internal form that is “an intentionality or subjectivity formally identical to human consciousness” (Viveiros de Castro, 2012). This is not anthropomorphism, because the concept of “human” he uses refers not to the human species, but to the meaning of human as a general condition common to all living species. To clarify this idea, Viveiros de Castro reconsiders the category of totemism, distinguishing it from those of animism and naturalism. While animism sustains the existence of a continuity between nature and culture “founded on the attribution of human dispositions and social characteristics to ‘natural beings’,” and naturalism, on the other hand, provides for a clear separation “between nature, the dominion of necessity, and culture, the dominion of spontaneity,” totemism on the contrary is not an ontology, but a system of correlations, a form of classification (Viveiros de Castro, 2012). The main correlation consists in the fact that what we consider “nature” in nonhuman beings (that is, something opposite to human “culture”), is considered “culture” in nonhuman beings. For instance, the processes of communication between trees, fungi, and other species (e.g. insects or insectivorous animals) that we consider natural can be considered, from their point of view, cultural processes, similar to our language and writing. But this does not mean “humanizing” them: rather, it implies to recognize that these species possess a culture radically different from ours, which we can never understand if we try to apply our category of culture to it.

The philosophical school of thought of the Object-Oriented Ontology (OOO) pushes these ideas even further. Developed quite recently in the field of metaphysics, OOO introduces the new ontological category of “object,” which includes people, animals, plants, natural but also artificial objects and even “hyper-objects,” i.e. objects often abstract, complex, extended in time and space, capable of generating effects on the present, from the European Union to climate change (Morton, 2018). The OOO sweeps away all forms of anthropocentrism. As his main proponent, the American philosopher Graham Harman, explains, the theory is based on the idea that one can never know the *real object*, but only the *sensual object*, the part of the object that appears to our senses. Each of us has a deep and hidden self that is not identified with the self that others see on the outside, and so each object is characterized by an absolutely elusive, fathomless, true essence, which is something other than its sensitive expression. We are not far from Viveiros de Castro’s idea that all living beings (humans, animals, and plants) share an equal way of seeing the world but under different sensitive aspects. The difference lies in the fact that in the OOO the concept of perception, i.e. the ability of self-conscious beings to experience reality, is replaced by the concept of *prehension* derived by Alfred North Whitehead. Prehension is a primitive form of relation shared by all objects, conscious or unconscious. It is the attitude of the real object to come into contact with other objects through the sensual object. “The important point is that objects do not perceive insofar they exist, as panpsychism proclaims. Instead, they perceive insofar as they relate.” (Harman, 2011) Humans and trees share this faculty,



but this does not mean attributing to the tree a consciousness analogous to the human one. "Instead of placing souls into sand and stones, we find something sandy or stony in the human soul." (Harman, 2011)

OOO is therefore opposed to panpsychism as a way of understanding relations between human and non-human beings. As Harman writes:

(...) no one is claiming that inanimate entities possess the full human toolbox of mental abilities, including such talents as language, emotion, cognition, foresight, or dreams. There is no evidence that trees and houses write poetry, suffer nervous breakdowns, or learn from their mistakes. The question is whether this obvious difference between humans and non-humans deserves to be made into a *basic ontological rift*. (...) Instead, the basic rift in the cosmos lies between objects and relations in general: between their autonomous reality outside all relation, and their caricatured form in the sensual life of other objects. Whatever the special features of plants, fungi, animals, and humans may be, they are simply complex forms of the gap between objects and relations. (Harman, 2011)

5. Conclusions

The new scientific imaginary about plants, here summarized using Cocchia's concept of "plant totemism," represents a perfect case study to understand how the process of construction of scientific knowledge on the one hand, and the process of reception of scientific knowledge on the other, are today deeply influenced by the imaginary. In the age of Anthropocene, science and society are increasingly driven to question the divide between nature and culture: indeed, this divide is considered one of the main obstacles to the formation of a new scientific spirit, in the sense expressed by Gaston Bachelard (1934), by which science and philosophy can be reconciled. This reconciliation is considered the best way to curb the devastation of nature produced by modern science to the point of compromising the very survival of human life on Earth.

In this sense, the revival of spiritualistic and animistic elements on the borderline between new spirituality and pseudoscience affecting the way society interprets the relationship with the non-human world certainly has some elements in common with what Bachelard called "the animist obstacle" to the formation of scientific thought (Bachelard, 2002), but at the same time naively reflects a new general awareness of the need to rethink the non-human. Animism has been considered by Bachelard a peculiar characteristic of the pre-scientific mind. The animistic view of the world identifies connections between humans, animals, plants and inanimate objects through the notion of energy, always interpreted as a life force: the various examples of alleged connections between plant consciousness and energy collected in Peter Tompkins and Christopher Bird's book or modern references to plant healing energy or biodynamic agriculture can therefore be considered examples of a return to the animistic thinking. The humanization of trees of which numerous examples have been reported in this



essay is also a typical trait of the pre-scientific mind and has been analyzed in this key by Gilbert Durand in his *The Anthropological Structures of the Imaginary* (1999).

However, precisely through the comparison with the classical theories of the sociology of the imaginary we can understand how modern plant totemism is rather the symptom of a wider attempt to question the axioms of modernity also within contemporary scientific thought. In his foundational book *The Elementary Forms of Religious Life* (1912), Émile Durkheim addressed the theme of totemism from the point of view of the modern Man, to understand its origins but above all what totemism can tell us about modernity. Durkheim rejected the classical theses that explained totemism as the evolution of an ancestral form of religion, of animistic or naturalistic kind, able to merge them both into a unique cosmological vision. For Durkheim, totemic symbols are not inhabited by souls or spirits, so they have nothing animistic; rather, they are characterized by the fact that totemic groups recognize the existence of elements in common between the animal or plant the totem represents and the human beings.

But Durkheim also made another observation: why, he wondered, although totemism can take on both plants and animals as symbols, did it in most cases take on animal forms? The answer is that “the things had to be from among those with which the men of the clan were most closely and habitually in contact. Animals met this condition best” (Durkheim, 1995), as totemic tribes base their survival on hunting, and only later they begin to give increasing importance to plants with the introduction of agriculture. Following Durkheim’s theories, plant totemism can therefore represent a paradigm shift in the relationship of contemporary society with plants. The concept of “biophilia” analyzed in section 1 symbolizes a renewed attention to the way plants forge the human world, and the need for a closer and more symbiotic relationship with them, necessary for the very survival of civilization, in a way similar to how totemic clans represented animals—essential for their survival—in totems.

Therefore, plant totemism is not a symptom of a return to an animistic, pre-scientific thought, but a peculiar feature of postmodern times. Assuming Bruno Latour’s position that moderns think they have succeeded only because they have carefully separated humans and nonhumans (Latour, 1991), the fascination and at the same time the eerie this new interest in the plant arouses contribute to further demolishing the Great Divide that modernity has built to keep away the primitivism and naturalism of pre-modern society. Even the phase of reception of this new scientific spirit into social imaginary take place within the conceptual frameworks of postmodernism: the re-enchantment of the world that characterizes postmodernity does not occur through a questioning of science in favor of the magical or the occult (the “extraordinary”), but through a “scientization” of these elements. Science fiction, from this point of view, “presents a context where science is viewed as magical” (Locke, 2010), as section 4 showed. Pseudoscience acts in a similar way. Simon Locke prefers to talk about “mundane mysteries” rather than pseudoscience: mundane mysteries are contemporary unexplained facts or issues that challenge established knowledge. They may be scientific phenomena that will find an explanation in the future, or they may



remain inexplicable and generate occult or pseudoscientific conceptions (Locke, 2010). Surely, the interest in plant life is a mundane mystery. We still do not know if it will generate new scientific knowledge (as the supporters of plant neurobiology claim) or forms of enchanted science such as plant totemism. But, without doubt, this interest is the mirror of a new social imagery of nature meant for change our relationship with the non-human world.

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