DIY KIT 2022

GUIDELINES FOR AN EMOTIONAL CARTOGRAPHY OF A GARDEN

CARTOGRAPHY 01

An emotional & multisensorial, not scientific, cartography of a garden.

DÉRIVE CARTOGRAPHY

An unforeseen possibility of chance encounters, of meetings with strangers.

PROPOSED BY

Quo Artis. Art and Science Foundation
Roots & Seeds XXI. Biodiversity Crisis and Plant Resistance

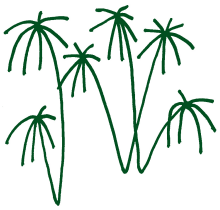
Imagine that you can never leave where you are standing. Imagine that you can see without eyes, listen without ears, speak, and scream without a mouth. Imagine that your brain dwells underground. Imagine that your mind is not one but thousands. Imagine that you are not one single self but a colony of selves. Imagine that you could copy yourself until you cover a continent. Imagine that parts of you die every year. That you are eaten, trampled, and burnt and yet you are whole, still. Imagine that you can live for thousands of years. Imagine that you need to die every single year. Imagine that you can reproduce the shape and colour of animals you have never seen. Imagine that you are the tallest living thing and that most of you will never be seen. Imagine that your skin, your surface, aligns itself with the sun, constantly finding the best exposure. Imagine that you need both sunlight and darkness to exist. Imagine that your very existence is the basis for the existence of almost all life on planet Earth.

Now Imagine that you are a plant. How would you feel if you could never leave where you are now? How would you survive?

It would be rather difficult: we cannot afford to lose a chunk of our body just because another living thing is hungry. We are very concerned about retaining our integrity and we need to move to stay alive.

If there is anything you do not like, or something that calls your attention, we can choose to move. We do not need to keep our head underground; we can have a good look around and choose a better prospect. We are not plants; we are animals, and as such we can see with our own eyes, hear with our ears, and smell the scent of plants with our noses.

We can traverse the landscape and be curious about things, investigate, and ask questions about things that have always been right in front of our own eyes but that we have never seen until now.



We can even connect to plants emotionally and they can evoke memories and sensations in us.

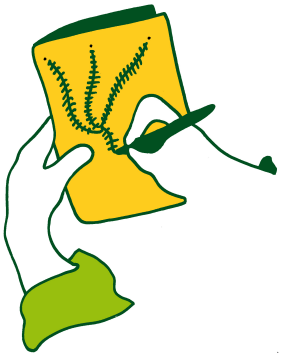
AN EMOTIONAL & MULTISENSORIAL, NOT SCIENTIFIC, CARTOGRAPHY OF A GARDEN

This activity has to be done with a group of friends and/or family members, as one of its nicest outcomes is the conversation and exchange of ideas that is generated at the end of it. It can also be performed with just one dialogue partner, or even by one single person; in this case, be ready for the “introspection discoveries”: write down your thoughts and discover the surprising conclusions that you will arrive at.

WHAT YOU’LL NEED:

- SOMETHING TO DRAW ON: A NOTEBOOK, EXERCISE BOOK, DRAWING PAD, ETC.
- SOMETHING TO DRAW WITH: ONE SINGLE PENCIL COULD BE ENOUGH, BUT, OF COURSE, YOU CAN USE AS MANY (AND AS COLOURFUL) MATERIALS AS YOU WANT.
- FREE TIME AND AN OPEN MIND.

The emotional multisensorial cartography consists of finding one or two plants in the garden, park or forest and drawing them. You can also draw any interactions or processes related to your chosen plants. Do it by yourself or in the company of your life partner, child, grandparent, colleague, or the person you just met. Choose your plants based on the feeling, memory, or association they evoke. Go back in time and find plants that were once relevant to you. Find new ones with the memories they elicit, and what new thoughts they suggest.



You neither need to know their scientific and common names, nor the family these plants belong to. You can search for this information on a specific application but, if you wish, you could just make new names up for them. Remember that, before Linnaeus started classifying all living beings, the same plant could have many different names and the connection between humans and plants was a closer one, based on need and experience.

Do take your time to sketch the selected plants. No matter how "bad" you are at drawing, you will see how rewarding this effort is. Bruno Munari, one of the most creative people of the 20th century, said in his book *Drawing a tree*, that all of us have the potential to do this. You will see how right he was!

Re-group and discuss "your" plants and the reasons why you chose them.

ANOTHER OPTION: *DÉRIVE* CARTOGRAPHY

There exists an unforeseen possibility of chance encounters, of meetings with strangers.

This possibility of transient passage and chance encounters makes us very different from plants. Whilst they are deeply rooted, we have the opportunity to drift, to *dérive*, a chance to be unconsciously intentional.

One can drift and investigate alone, but we tend to go further when meeting people who have reached the same level of awareness. Then we can cross-check different impressions and reach deeper into our observations.

The most fruitful numerical arrangement consists of two or three people working together in a loose arrangement, with some time for individual work and some for working together. Depending on our inclination and the nature of our quest, it may be preferable to change the compositions of these groups from one *dérive* to another.

However, group structure and the issue of how many people should perform a dérive is less important than the overall aim and strategy of the activity itself and what it discovers about the plants it is examining. It is worth remembering that savouring time and taking an existential detour to encounter a better self at the end of the travelled path is more important than reaching a specific destination. Imagine that better you.

Should you wish to *dérive* with us, we have several delirious strategies on offer.

ACTIVITY 01
THINK UNDERGROUND

01

Our brains are formed by a mass of cells called neurons. These cells have extensions called dendrites that are designed to receive communications from other cells. They resemble a tree-like structure, forming projections that become stimulated by other neurons and conducting the electrochemical charge to the cell body. Their name comes from the Greek word *dendron*, for "tree". Until recently, we thought that this was just an analogy for the shape of cells, but we are starting to discover that trees have their own kind of nervous system capable of facilitating reactions, memories and learning. Plants seem to have their own kind of intelligence: they can make decisions and are even able to cry out in pain. This underground network connects plants in such a way that has been named the "Wood Wide Web". It relies on complex relationships with fungi and bacteria to provide plants with a sophisticated awareness of their environment and of each other, allowing them to communicate what they sense, retain some forms of memory, and maybe even pay attention to what we do around them. Just below the surface, plants hide almost as much mass as they display above.

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ACTIVITY THINK UNDERGROUND

Imagine that you can see clearly underground. Choose a group of plants, maybe two or three. Sketch the connections you imagine exist between them, how they might relate to each other. Try to imagine their conversations. Would they use pulses of electricity or chemicals? Or maybe some kind of radiation in a spectrum imperceptible to us... Can you imagine their "voices"?

ACTIVITY 02
FIND THE MINARET

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The Horsetail (Equisetum) is a plant considered to be a living fossil. It has a structure that is very similar to that of a minaret: a kind of telescopic series of towers with a pattern of spacing nodes wherein those toward the apex of the shoot are increasingly close together, each with a narrower diameter than the last, piled on top of each other, finally ending with a tiny little turret at the topmost point. The minaret is not a copy of the plant: it is a human creation that has adopted a form that nature developed millions of years earlier. In nature, matter adopts modes that are inherent to certain molecular structures subjected to stress. Observing the geometry of plants, flowers, or fruit, it is easy to recognize the presence of recurrent structures and forms that appear to our eyes as different forms that have regularities and symmetries. These have several advantages, as they result in forms that are more compact, homogeneous, interchangeable, and efficient when interacting with the environment.

The study of the arrangement of leaves, branches, flowers or seeds in plants, with the aim of highlighting regular patterns is called phyllotaxis. The various arrangements found in nature follow surprising mathematical regularities, and the plant kingdom has a curious preference for closely related numbers and spiral geometries. Leaves spiral around the stem in a regular pattern determined by a fraction with the numerator being the number of turns around the stem and the denominator being the number of leaves it takes to return to the original leaf position.

Nature has adopted many different methods of survival, but the most common pattern usually follows a sequence which is thought to be the design of least resistance to define the density of branches up a tree trunk or the arrangement of leaves on a stem. This may mean maximum exposure to sunlight for leaves or most effective seed arrangement. The reason why certain forms of art adopt nature-like forms without imitating anything found in nature is because the artist is true to the properties of the material it works with and the underlying laws of our world.

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ACTIVITY FIND THE MINARET

Find artistic forms and movements in certain plants. Urban design forms in the bark of trees, architectural shapes in the form of plants and painting periods in the colours of flowers. Try to spot them from a distance and from up close, using a magnifying lens if necessary. What plant offers the most varied repertoire of art-like shapes, patterns and colours?

ACTIVITY 03
BE ULTRAVIOLET

01

Insects' vision generally overlaps with our own, except that insect's eyes are sensitive to different energy frequencies from sunlight than ours are. We can see light in the energy spectrum from red through orange, yellow, green, blue, indigo, and violet; whereas insects cannot perceive red light but can see ultraviolet light, an electromagnetic energy between 40 and 400 nanometers in wavelength, which we cannot normally detect because our eyes have shielding pigments.

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As a result, insects see the world differently than we do, for vital reasons. Ultraviolet light is commonly used to cause visible fluorescent patterns in objects containing special pigments. Many natural objects from rocks and minerals to hard corals and crustaceans fluoresce under ultraviolet light, though its exact function in nature is still insufficiently studied. Researchers have suggested a correlation exists between UV-dark areas of flowers and pollinator navigation, but this has not been completely proven. Research into ultraviolet patterns in the flowers of temperate species has shown that the flowers of about 33 percent of all species strongly reflect this kind of light. About 7% of all flowers show floral patterns that are not evident in visible light.

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Certain chemical pigments both absorb ultraviolet light and reflect yellow light, causing ultraviolet-absorbing areas in flowers and making them seem totally dark to insects. These flowers are usually yellow in the visible spectrum, thus making them seem very bright to us, even though they will be invisible to most insects. Whilst we see flowers as ornamental, insects seek flowers for food and survival. Some species need to consume pollen and nectar before they can fly or become sexually mature. Many flowers rely on insects to be able to produce viable seeds. Hence, plants use a variety of strategies to attract pollinators, such as nectaries and floral scents to attract pollinators, because pollinating insects may have visual memory lapses and rely on chemical cues to find their way to them. It would seem that some plants have garish and elaborate petal colour patterns that are invisible to humans but that work as landing marks to guide airborne pollinators.

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ACTIVITY BE ULTRAVIOLET

What would the world look like if flowers were vital to our survival? Imagine that you can see and be seen in the ultraviolet spectrum of radiation. Attempt to draw plants and flowers as you think they look in this fluorescent dimension. Imagine and draw flowers as an insect would see them, or as you think they should look to make them more appealing. Perhaps you can draw yourself and others in this spectrum too.

ACTIVITY 04
ALL GRASS IS FLESH

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Every species is linked with a multitude of others in an ecosystem. Plants get their energy directly from sunlight, provide food, shelter, and nesting sites for other organisms. Animals consume foods synthesized by plants in the form of fibres and fruits. Many plants depend upon animals for help in reproduction and for certain nutrients. We are all part of food webs that include plants and animals, and diet is as important to us as it is to animals. Most cows, sheep, and goats are herbivores, which means that they are raised on forage and fodder, a diet based on grass, legumes, and silage, which is a form of preserved forage for animal feed in winter. In fact, most cattle are raised on pasture from birth in the spring until maturity, and only some animals are raised on a diet of grain, such as corn or soya beans. Not all herbivores can eat all vegetables, and their diet depends on their ability to digest cellulose and lining, and also on the structure of their digestive system. Cows, sheep, and goats are known as ruminants because they have a four-chambered stomach that can digest grass and hay. These chambers are called the *rumen, reticulum, omasum and abomasum*. The name "ruminant" comes from the rumen, which has been compared to a large food processor because millions of tiny organisms that live there naturally help the animal to get the nutrients it needs from the vegetable fibres. Herbivores mostly eat grasses, but also legumes such as clover, alfalfa, lentils, and beans. The nutritional value of vegetable fibers varies substantially with the seasons and weather, and animals will use them up immediately or turn the carbohydrates they contain to fat for storage.

After a particularly long winter or extremely dry spring, grass will not have the nutrients cattle need to stay healthy, and that is the reason farmers will turn to supplements rich in carbohydrates or proteins to increase their weight. In a push to increase productivity, the farming industry started giving herbivores feed with animal protein, a practice that has proven to have some risks. 1986 saw the outbreak of the Bovine spongiform encephalopathy (BSE) epidemic in the United Kingdom. BSE belongs to a group of deadly neurodegenerative diseases that affect humans and animals, called transmissible spongiform encephalopathies caused by the abnormal form of an animal cell protein called prion. It became a global problem, and epidemiological studies suggested that the source of the disease was feed containing BSE-infected processed proteins, such as meat and bone meal. Since then, the practice has been stopped or severely limited.

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ACTIVITY ALL GRASS IS FLESH

Draw stems, seeds and fruits and other edible parts of plants that you see. Choose a plant unknown to you that you would like to be edible. If you were to cultivate it for people to eat, what should an edible plant smell, taste or look like? If you were an edible plant, how would you defend yourself against animals? Would you grow thorns, or suffuse your flesh with poison?

ACTIVITY 05
THE WRITING TREE

01

Paper is omnipresent in our daily lives and allows us to communicate, teach, illustrate and create in an immediate and simple way. The word “paper” derives from the ancient Greek and Latin name papyrus - *pápuros* and *papyrus*- an omnipresent plant in Lower Egypt and vital as a writing support, probably the first vegetable fibre obtained for this purpose. The invention of paper as such, made from plant fibres, is attributed to China some two thousand years ago.

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From its first invention until the manufacture of paper reached Europe, a millennium passed; and by the twelfth and thirteenth centuries, Spanish and Italian papermakers dipped macerated linen and cotton rags in a solution of animal-derived gelatine to form an opaque, impenetrable surface that was perfectly suited for quill writing and drawing. An 1840 German patent for a shredding machine that would produce paper from wood pulp made the phenomenal growth of the paper industry possible. From then on, trees have become an essential raw material and forestry the basis of the printing industry: one in each three trees felled is pulped to make paper.

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The trees felled for paper are mainly softwood, especially spruce, pine and larch, with the notable exception of Eucalyptus, which is a hardwood. Wood pulp contains cellulose fibre, the most important component of paper, the presence of which determines its quality. It is a long-chain polymer that can be considered the basic structural material of trees and plants and, therefore, of nature. Its chemical structure comprises a repeating chain of carbon-hydrogen-oxygen units that is indigestible for most organisms, apart from some bacteria, and is also used to make forms of plastic. Cellulose content in softwood ranges from 50-90%, which makes it ideal for papermaking, but cotton is almost 100% cellulose and therefore makes the best paper for fine art papers. Before the digital age, most of our writing, reading, and drawing was done on paper, or other vegetable fibres such as wood or linen. In a sense, our entire culture, especially our literature, rests on the plant fibres that we have used throughout the centuries. We write on trees.

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ACTIVITY THE WRITING TREE

Choose a tree or a large plant that seems special to you. Imagine that it is trying to preserve some form of knowledge or memories for future generations. What kind of means would it choose? What material would a tree write on? How would it feel about writing on paper? What colour ink would it use? What kind of symbols would be preferable when conveying meaning to writers without eyes? What kind of stories can a plant tell and to whom? Take time to reflect on what we owe to the vegetal world and what it could tell us if it were able to write.

ACTIVITY 06
THE POSSIBLE RENDEZVOUS

01

Humans share the planet with millions of different forms of life, according to what is being billed as the most accurate estimate yet of life on Earth. However, almost an astonishing 90% of all plants and animals have yet to be named and catalogued. Of what we do know, three-quarters of species, the majority of which are insects, are land dwellers; and only one-quarter live in the oceans. We know little about what is out there, especially about which plants and animals will become extinct before we can even record their existence. Since around the time when Linnaeus devised his method of cataloguing and naming living things, 250 years ago, people have been trying to count and catalogue the living world. The Swedish biologist devised a hierarchical, tree-like structure where each individual living species was classed in a series of progressively larger groups, culminating at the kingdom level.

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The idea of classification and definition of species goes back a long way, to the first formal attempts to precisely define life by ancient philosophers. For a long time, there has been this need to discern what is alive from what is inert, because on the most fundamental level, the difference between an inanimate object and a living one is not so evident, and all matter that exists is an arrangement of particles. We have not managed to define and compile a set of physical properties that includes all things alive and excludes everything labelled inanimate. Seen at the atomic level, life does not actually exist. A dead body and living one contain the same number of molecules. Some exceptions challenge our perception of what being alive means. Mineral crystals are not generally considered to be alive, yet they have a highly organized structure, and they grow. Fire consumes energy and can grow, jumping obstacles even.

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In contrast, living organisms such as bacteria, tardigrades and some crustaceans can enter long periods of dormancy during which they are not growing, metabolizing or changing at all, yet are not technically dead. Defining life as a self-sustaining system capable of evolution implies that certain computer programs are alive. Certain algorithms imitate natural selection to arrive at the optimal solution to a problem, exchanging bits of data, growing, and even reproducing themselves in computer systems. When attached to a tree, a leaf is alive, and its cells work tirelessly to photosynthesize sunlight, carbon dioxide and water into sugars that feed its metabolism. When the same leaf detaches from the tree, its cells do not instantly cease their activities. In fact, one can grow a new tree from a single leaf, or even keep cloning the same plant again and again from a single cell. One could say that life is an invented concept used to simplify an immense spectrum of complexity. In doing so, we have separated ourselves from the universal truths of existence.

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ACTIVITY THE POSSIBLE RENDEZVOUS

Imagine that you have been sent on a rendezvous mission to meet a new form of intelligent life in the form of a tree. Use the plants you know as a reference to draw what it may look like. How would you salute a tree? Would stepping on its root zone be considered polite or rude? What about collecting a flower or picking a fruit? What would be proof of intelligence? How would you exchange information? Draw diagrams and sketches that show the possible interactions.

This kit was developed by Gabino Carballo, a landscape architect and project manager with extensive experience in the application of nature-based solutions, the promotion of urban biodiversity, and the design and management of green spaces. For more than sixteen years, Gabino has worked as an in-house consultant for the municipality of Barcelona, where he was involved in the implementation of naturalisation policies and techniques. Previously, he worked on the design of public, corporate and private gardens and landscapes, both in Spain and the United Kingdom. He is a regular guest lecturer at various academic institutions and author of numerous technical publications, articles and essays. He is also a board member of the Spanish association of parks and public gardens, with responsibility for communication and international relations. He has a long-standing interest in art and design and their relationship with urban design and the environment.

DIY KIT
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TEXTS:
GABINO CARBALLO

ILLUSTRATIONS:
PEDRO STRUKELJ

QUO ARTIS
ART AND SCIENCE FOUNDATION

ROOTS & SEEDS XXI

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