Human-plant relationships in the Anthropocene

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Nowadays, there is more and more talk about the fact that we are living in the Anthropocene era, although this is not necessarily what is being referred to directly. The global warming of the planet and man's influence on it through CO2 emissions are becoming increasingly important. This is being referred to in various connotations, ranging from the personal responsibility of the individual in a consumerist and consumerist way of life, to governmental and supranational policies. The European Green Deal, for example, seeks to achieve carbon neutrality by 2050 through a political agenda to reduce CO2 emissions (European Council, 2024).

There is talk of the need to be environmentally friendly, green and sustainable in urban lifestyles, cities and the environment in which cities are located. It is spoken in the context of the challenges that are present in urban local landscapes, whether it is the ageing population, fishing in coastal areas, or the problems associated with local landscape microclimate systems such as the warming of the local landscape or the loss of water in a given place (Bruyninckx, 2021). It refers to a system of interacting environmental and energy influences that are interdependent and need to be systematically corrected and addressed. It is the reflection along the lines of the interconnectedness of the various systems of planet Earth, the consideration of its unstoppable unending planetary flow of energies, and their mutual influence, together with the influence of humans on this flow, that characterizes the consideration of life in the context of the Anthropocene (Hamilton, 2020; Vine, 2018)

Although the concept has been varied, expanded and adopted by other scientific disciplines, it is originally a geological concept. The notion that we have entered the Anthropocene was first suggested by Paul Crutzen at the turn of this millennium (Crutzen & Stoermer, 2000). The origins of the Anthropocene are a matter of dispute. For some, the Anthropocene begins with the start of agriculture, when the landscape began to be significantly transformed for cultivation and farming. Others date the beginning of the Anthropocene to the Industrial Revolution, when humans began to use technical rationality and planning to process resources to power machines and to make more use of and emit carbon stored in the earth. It was from the late 18th century that increased concentrations of CO2 and methane appeared in the polar ice (Crutzen & Stoermer, 2000). It is also a period of great acceleration, with rapidly increasing atmospheric CO2 concentrations, rising temperatures, species extinctions and biodiversity loss (Bonneuil & Fressoz, 2017).

In thinking about the future, both contemporary pop culture and scholarly culture concerned with the Anthropocene and future urbanism often focus on people in cities. According to studies of future population growth and their geographic location, 6 billion people will live in them by 2050. This is equivalent to 85% of the predicted number of people at that time (OECD, 2015). Today, around 56% of the population already lives in an urbanised area (Ritchie et al., 2024) , and we can observe the impact of humans on the transformation of biodiversity in these areas. A French study in 2008 shows that plants in urban areas undergo evolutionary adaptation to the city. They observe this in the plant Crepis sancta, which has both dispersing and non-dispersing seeds for its reproduction. They find that dispersal seeds of Crepis sancta are 55% less likely to become established in built-up areas than non-dispersal seeds. That there is a higher proportion of non-dispersing seeds in the built-up area than in the undeveloped area, and there is an increase in the size of these seeds. They also estimate that this evolution corresponds to approximately 5-12 generations of selection (Cheptou et al., 2008). The city

is a place full of networks and relationships that are both human and inhuman. A network that is spun by the act of human agency in urban construction, and the actors of the plant kingdom that adapt to it.

In the following section, I therefore discuss 3 types of relations between the urban environment and plant non-human actors. These are the relations between humans and the vague terrain, the relationship between the city and the vegetation through planning, and the relationship between humans and the vegetation that emerges from below and has a community character.

Relations between the city and the vague terrain

An example of a place that is in the web of human-plant relationships is the urban wilderness in Knoxville. This is a collection of land owned by the city, county, state, non-profit foundations, and private owners. The area is 688 acres around the Tennessee River. These lands have been used for agriculture, logging, mining, or homesteads. However, their use in this way ceased within a few decades, which may have begun nature's reclaiming of the area. This part of the city also did not experience as much urban growth, and therefore human management, compared to the rest of the city, due to the hilly terrain. As a result, these lands have undergone many decades of ecological restoration (Zefferman et al., 2018).

Such a place has the potential to provide many social and ecological functions simultaneously. This space thus serves as a place for biodiversity conservation. 724 unique plant and animal taxa were identified here in the initial phase of the intervention, including a significant number of plant and bird species. 250 plant species and 193 bird species were identified. In addition to these ecological functions, the area is also intersected by many social functions, such as recreational activities in the form of hiking and mountain biking. In addition, the site allows for outdoor experiences, environmental education and ecosystem services (Zefferman et al., 2018). It is a space that has been abandoned as the site of a network of rather human relations and is being rediscovered in the context of networks of interaction, care and conversation between human and non-human actors. However, this conversation with the rediscovered place is interwoven with power relations as the place is further intentionally managed by humans to connect networks of human and non-human plant actors. A place that, once rediscovered, has become a project, and a target for intervention and management. However, this management is diverse due to the influence of the different owners of the site and their different objectives for the use of the site. And thus, in turn, to the different ways of managing the place.

There is targeted monitoring of invasive plants, and these have been found to make up approximately half of the total area. It is also interesting to note the high appreciation of the site by visitors, most of whom are people from the surrounding area. 98% of visitors wanted to see the site expanded. In turn, 93% of visitors did not wish for further vegetation removal and modification interventions, despite the need to remove invasive plants being highlighted to them. This suggests that the value lies in the wild character of the site (Zefferman et al., 2018). This place is acknowledged to be wild and untamed, yet there are attempts to tame and domesticate this wildness for the purpose of its convenient use by man. Trails and bike paths are being built to create a boundary between the space of people and the space of untamed nature off the roads.

A different conception of urban overgrowth and its relationship with people is found in the orientation to bush and bushiness found in Město naruby (Haluzík, 2020). Here, the bush is perceived as a natural-contracultural (underground) entity that reaches out and takes everything it can reach, often associated with unused brownfields and vague terrain. Vague terrain here represents a space excluded

by the urban order. A space that is vaguely 'empty and uninteresting'. A space that is a blind spot in our view of our home and the urban landscape, but which is also shaped by the character and product of urban planning and building. Bushiness here is about discovering and piercing this vegetation and terrain (mostly on the periphery) and grasping it. The bushman is one who experiences the inner recesses of the bush. The one who moves through the bush and is not a mere visitor and observer of the place. He is not one who comes and goes without leaving the imprint of his temporary presence. The bushman alters the terrain by his stay and is thus part of this vague habitat. It leaves behind legible traces, such as the stripped layers of leaves after roosting, fire rings, traces of passage through the soft stems of reeds and nettles, apple bites. In doing so, this individual, albeit unconsciously, leaves traces and symbols and instructions on how to use such places (Haluzík, 2020).

The ecological function of the landscape is emphasized in the context of Knoxville. In the context of bushiness, on the other hand, the social and phenomenological context is highlighted. While the vegetation on the Knoxville site is shaped, organized and tended. In bushiness, the vague place is used, felt and co-created with its own habitat. It is not only the landscapes that are wild and untamed, but also the variety of uses and relationships that take place within these environments.

The bush as a vague terrain of the city can also be land escapes, where the bush can be used for escape. It can represent a mass, a hiding place into which we crawl without being seen. It is a place that is laced with various paths, tunnels, rustling. A place in which animals are present and which contains unfertilized plants and a rather unfertilized plant itself. The notion of the bush as a hiding place is different than in the context of bushiness. Bushiness is conceived more in terms of the periphery. Brush as a place of escape is a place between places. It is in the park, but also just beyond the bus stop or shop. The inside of the bush is where its own world with its undefined rules is located and is densely separated from the world out there. It can also be a meeting place with both human and non-human actors (Haluzík, 2020).

Places in between may be bushes on the periphery, bushes behind a bus stop, but also various boundary spaces between two cadastral boundaries, space in a bridge structure, or space under a bridge. It is the place where the culture of consumer society and the culture of recycling meet. The culture of recycling is represented here by homeless people who recycle and revive discarded materials. The places in between are often located near vague terrains. Places that appear to have no owner, even though legally they do. These places can be places of encounter, but they can also be places of connection, connecting two places as a non-place. This interconnection can be used, for example, to shorten one's journey, to wander off to do graffiti, or a place of deliberate encounter with the various non-human actors of the city (Haluzík, 2020). The city is so full of interaction and networks, between human and non-human actors. These networks are outside the boundaries of planning and located in a vague terrain that can, in its simplest form, represent the vegetation between the road and the parking lot, or the vegetation in broken concrete.

Relationships between the city and the planned vegetated terrain

Debates about the future of people evoke the future of humanity in the city, given the demographic developments. But the age of the Anthropocene is also an age of rising temperatures, emissions and urbanisation (Purushotham Reddy et al., 2021) and increasing drought in some areas (Rosner et al., 2019). Studies by Georgi and Dimitriou (2010) shows that greenery in the city has an effect on reducing the discomfort index and temperatures, as it reduces temperature by shading it and increases relative humidity by evaporation. Shade from green vegetation also represents a better comfort index than

shade created from artificial materials. The presence of vegetation in a city also improves its microclimate and optimises its thermal conditions. Green vegetation in the city has also been shown to reduce the effects of heat more than it increases winter cold. Planting trees around buildings can reduce cooling and heating costs by reducing summer heating of buildings and preventing wind cooling. The study also mentions the positive impact of planting trees through tree plantations and parks, due to their encouraging people to walk in their shade, which may encourage less use of the car as a means of transport.

However, this planting of trees and the creation of parks is not always possible due to their space requirements or the possible intervention of root systems in electricity, sewage and water networks. Therefore, different concepts and approaches are being considered for planting green vegetation in the city. One solution is, for example, a green wall and a green roof. These can bring benefits in terms of improved energy consumption, sound transmission or temperature. However, current research on advantages and disadvantages focuses mainly on their quantitative factors and little on qualitative indicators such as promoting quality of life and well-being, ecological protection, biodiversity promotion and aesthetics. Green roofs and green walls have higher installation and maintenance costs, but they also often have a longer lifetime than traditional reflective materials (Manso et al., 2021).

Man's relationship with the flora from below

The third perspective on the relationship between humans and their plant landscapes comes from below, from the actors themselves, who are faced with changing local climates and who are seeking their own individual solutions to their problems. One such example is the changing gardening system in Southern California. In America, people value their nice, big, green lawns. But maintaining it is problematic in California, which has been plagued by a severe drought in recent years, to which the city has responded with an appeal to conserve water. This brings with it a rethinking of what a home is for local people, and experiments with the ecology of everyday life are occurring. These involve practical dealings with material elements that bring a degree of individual financial risk, but also moments of happy accident. These experiments also coincide with the ethos of hard work that is present in this culture. Thus, people are turning their turf into what they call an indigenous landscape. This includes a trough of pebbles with a variety of evergreen trees, flowering shrubs, or experiments with artificial turf. Others, on the other hand, focus on the practical aspect of the garden and have installed water harvesting devices, with a slow drip system to the plants, whereupon they further experiment with their placement according to shade. However, it is not just the garden that is becoming the subject of experimentation in this area. People are also experimenting with home-made separating toilets, the contents of which they then transform into fertiliser for the plants. These experiments are often shared and discussed, forming a collective knowledge in the wake of the everyday. (Vine, 2018)

Other aspects of experimenting with vegetation in the city include, for example, growing fruit and vegetables on rooftops, which can be included in the green roof concept. This brings a degree of heat absorption on rooftops and gives people the opportunity to develop community growing and access to fresh vegetables (Broadway, 2009). This approach to engaging with the landscape can provide aesthetic enjoyment, opportunities for children's play, recreation and a haven for tranquillity (Yuen & Nyuk Hien, 2005). In this way, people create and develop knowledge and relationships between human and non-human actors in a network of relationships both in physical space and on social networks in discussion forums. This knowledge emerges from, from below, through the everyday practice of physical bodies. There has even been a handbook published on the subject of growing on rooftops that advises how to do it, if people are interested (Pryor, 2016).

Conclusion

In the city, many contacts and communications between man and flora can be observed. These interactions arise due to the unintended consequences of urban planning and construction and are characterized as blind spots beyond ordinary perception. The second mode of interaction is the network of relationship through urban design in the form of parks or alleys, although green roofs and walls are also considered. The third mode of interaction is created through ingenuity and experimentation in people's everyday lives.

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