Chapter

Historical Gardens as an Inspiration for the Future of Urban Horticultural Gardens

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Abstract

Throughout the history people incorporated designed gardens in their closest living environment. They shaped their environment in such a way as to make it more useful, pleasing, and nicer. The old ancient civilization already created gardens that amazed anyone visiting the city—a good example are the great cities of Mesopotamia with hanging gardens and city entrance gardens dedicated to flowers, shrubs, and trees, creating a feeling of being in paradise. Renaissance gardens brought a great diversity of new garden motifs and innovations, while Baroque gardens presented the whole city in themselves, creating green walls and green architecture. The nineteenth century with its industrial revolution offered new technologies, new ways of designing and adjusting the nature to man's need. The twentieth and twenty-first centuries brought to us various ways to include green elements ranging from small to large-scale in our living environment, (from greenhouses in the parks to green walls inside the buildings). Through different motifs of historical gardens, we can find possibilities for today's and future urban horticultural gardens.

Keywords: historical garden, urban horticulture, prospects, water motif, green wall, pot cultivation, art projects, Baroque garden, Renaissance garden

1. Introduction

We humans are very practical creatures. We modify our surroundings to suit our needs—thus, we have been reshaping nature so that it would serve us best in a utilitarian and/or aesthetic sense. Throughout the history, a variety of gardens has been created—historical gardens (preserved or merely written about)—that today can give us a good insight into how resourceful humans were in a particular period of history or even provide us with ideas for our own living environment. Today, the term urban horticulture has become impossible to overlook—as stated by the United Nations: "today, 55% of the world's population lives in urban areas, a proportion that is expected to increase to 68% by 2050" [1]; therefore, it is even more appropriate to look back—just to see the future more clearly.

The definition of horticulture emphasizes the scientific and artistic way of managing plants with the goal of obtaining food and different materials or providing comfort and decoration. We can trace the origin of horticulture back to ancient civilizations—the Persians were great experts in this field. As Relf [2] nicely pointed out when interpreting the definition of horticulture as a synthesis of plants and humans, horticulture "encompasses PLANTS, including the multitude of products

(food, medicine, O_2) essential for human survival; and PEOPLE, whose active and passive involvement with 'the garden' brings about benefits to them as individuals and to the communities and cultures they comprise." Humans and plants are therefore an essential part of horticulture. It was man's desire to take a particular plant from its natural environment and integrate it into the environment close to his home, which led to the emergence of designed gardens. And the idea of a designed garden could only be born when the people's goal was no longer survival and when the individual had free time and energy to beautify his or her surroundings [3].

Gardens have grown over time, as human knowledge has grown (in the fields of horticulture, mechanics, construction, etc.), and today historic gardens are a wonderful treasure trove of examples and ideas of how humans once incorporated nature into their living environment and how they can do that today or in the future. In this chapter, we will look at some examples from the history of garden design, and through these we will try to present some possibilities for future urban horticultural gardens.

2. A variety of water features

Among most popular garden motifs are water motifs. While these require mostly engineering skills, knowledge of aquatic plants, including their specificities, and requirements is an important part when designing a water motif. The Renaissance brought a real wealth of water motifs which were further enhanced by the Baroque. Renaissance cascades,[1] for example, at Villa Lante in Italy, and water jets splashing out of sculptures or directly from the water surface, for example, at Villa d'Este in Italy (e.g., **Figure 1**), were common garden features which later, in the Baroque period, grew in magnitude, as evidenced by, for example, the cascades in the German Kassel (e.g., **Figure 2**) or the pompous fountains with ruler iconography in Versailles (e.g., **Figure 3**; [4, 5]). However, even if these motifs seem to be suitable only for aristocratic gardens and are a remnant of past ages, contemporary landscape architectural projects indicate the opposite. Namely, such historic examples

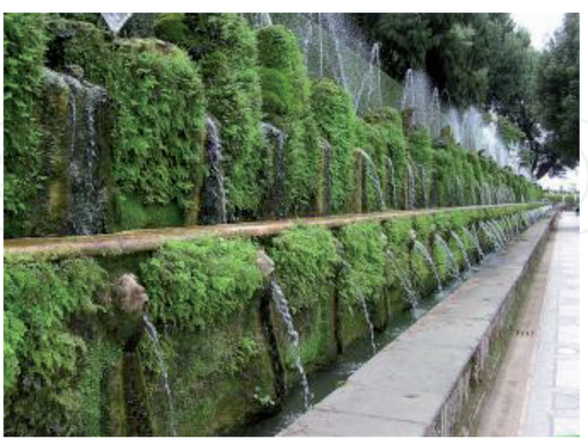

Figure 1.
The One Hundred Fountain (Le Centro Fontane) at the Villa d'Este, Tivoli (near Rome), Italy.

[1] Cascades are a water motif in a garden where water slowly flows (usually down a steep terrain) into lower basins. Such water "steps" can be natural or man-made. In gardens, these motifs were popular for their sound effect. They were common in sixteenth-century Italian gardens and from there spread into French gardens. There are beautiful examples in the gardens in and around Rome (the Villa of Lante, the Villa of Aldobrandini, the Villa d'Este, etc.), which are also rich in sculptural motifs [6, 7].

Figure 2.
Herkules with Oktogon and Großen Kaskaden, Kassel-Wilhelmshöhe, Germany.

Figure 3.
Bassin du char d'Apollon, fountain in the Parc de Versailles, France.

of water motifs were a useful source from which masters, such as the American landscape architect, designer, and teacher Lawrence Halprin (1916–2009), have drawn their ideas. Halprin created several recognizable water features with cascades in which the art of Renaissance and Baroque as well as the art of unspoiled of nature are combined (e.g., Franklin Delano Roosevelt Memorial in Washington DC from 1997). Today, water has also entered urban areas in such a way that it is no longer clearly separated from its surroundings—as was the case with water motifs in historical gardens. Today water is a part of the surface on which the user of the garden (or open public space) walks; it has crossed the borders and become a part of public surfaces. An example is the water motif above Ross's Landing Riverfront Park in Chattanooga, Tennessee, where water flows down multiple levels, connecting the city and the river. Similarly, high water jets, the most prominent element of Baroque fountains, are today merged with town squares and offer playgrounds to children and adults, allowing them at least to cool down on hot days (we could find examples all over the world—let us only mention Smale Riverfront Park, Cincinnati, whose planning stared in 1997 [8], and Viertel Zwei in Vienna whose construction started in 2007 and where the water jets are placed in a small square connecting newly built apartment buildings and service facilities (e.g., **Figure 4**). Among the variety of water motifs in today's cities, we can also find dry motifs that turn into water motifs only when water (mostly rain) is provided. An example is a canal on a narrow medieval street in Ljubljana, Slovenia, where small sculptures of a prominent Slovenian sculptor Jakob Brdar are placed in a canal and a vertical pedestal, also marked by

Figure 4.
Water jets in Viertel Zwei (after 2007), Vienna, Austria.

the sculptor's work, points to the change in horizontal structure of the street. When it starts raining, the canal is filled with water and the sculptures look like they are swimming in the canal (e.g., **Figure 5**).

The abovementioned water motives include waterfalls or spurts of water in fountains, but in historical gardens there where also calm surfaces of water reflecting the sky and sun and the objects near the water, usually emphasizing their meaning. Narrow or wide canals or smaller and larger pools were initially meant to provide water for the gardens. Thus, ancient civilization used them as part of their irrigation systems. However, in the New Ages, the canals and pools provided other uses closely tied with symbolic meaning. The best example is king's garden in Versailles, the gardens of monarch Louis XIV, who wanted to be presented as an absolute monarch, untouchable and distant, as the Sun King, and to demonstrate his absolute power, even over nature. There is an abundance of motives filled with symbolic meaning in the Versailles garden, but let us look at the water parterre composed of two large pools near the Versailles castle. Those pools had a very practical purpose, as well as a symbolical one. The pools reflect the sun's rays and light up the outside wall of the Hall of Mirrors, bringing the light

Figure 5.
Architectural biro Medprostor and sculptor Jakob Brdar (project realization in 2014), Ljubljana, Slovenia.

also inside, increasing the lightness of the Hall. One of the pools was decorated with sculptures representing male allegorical figures of four main rivers in France, emphasizing the greatness of the king's territory. The magnificence of the ruler was celebrated also in the grand canal which was about a mile long; it was used for naval demonstrations and had gondolas donated by the Republic of Venice, steered by gondoliers. Furthermore, large water surfaces that provided space for such demonstrations (water battles and rides with gondolas) were not so rare, - they could also be found in the Baroque king's gardens in Hanover and München (Germany; [4, 9–11]). The reflective quality of the still water that doubled the presence, beauty, or power of the surrounding objects and also gave an observer a second window to what he/she gazed upon (calling into question the limits of the present world) was popular in Baroque and Rococo gardens (e.g., **Figure 6**). In the late seventeenth and eighteenth centuries—with the new English landscape garden—calm water surfaces gain new role. They become a part of an idyllic pastoral landscape that the new garden style aimed to create. Lakes and ponds in the garden were walked around or crossed over. They had natural shapes and in their vicinity there was usually a pavilion or some other smaller architectural object. Their main aim was to create a romantic, even sentimental atmosphere, to bring tranquility to to the garden's users and to create a picturesque scenery for walkers to enjoy with each step they made. This role of the lake or pond that recreated a part of natural scenery in a human made garden was transferred into cities. It became a part of the human quest to bring nature into the city. A good example is Central Park in New York, where the landscape architect Frederick Law Olmsted and the designer Calvert Vaux created a city park with lakes in 1857 (completed in 1876). Today lakes and ponds are part of numerous city parks. When a new neighborhood that includes green designed spaces is planned within a city, such lakes and ponds are often part of the built area. A nice exampl is Viertel Zwei in Vienna, where a lake

Figure 6.
Water canal in Rococo garden and summer residence Sanssouci in Potsdam, Germany.

is the central point of the open space between the business buildings, providing a calming view through the window and a soothing atmosphere for lunch breaks (e.g., **Figure 7**; [12]).

Water is an important element in the human environment. It has always been attractive to people, not only because of the necessity of survival but also because of the cold, humidity, relaxation, and play that it offers during the hot months. Water is invigorating, not only visually and haptically but also in an auditory sense. The murmur of water inspired the old masters to seek ways to give the water even more voice. To this end, hydraulis, an organ-like machine, was created in antiquity. It was a manually operated machine. During the Renaissance, which is certainly considered to be the most innovative era in the history (especially the garden history) of the western world, the so-called hydropneumatic automatophone was created. The beginnings of this Renaissance invention date back to around 1550 at the aforementioned Villa d'Este, where Cardinal Ippolito II d'Este (1509–1572) created a magnificent Renaissance garden with numerous water features: 500 liters of water per second passed through 51 wells, 364 fountains, 220 pools, and other water motifs. Pirro Ligorio, who created the garden, gathered his knowledge by examining the nearby Hadrian's Villa. The creators and the garden owner himself also drew knowledge from older literature, e.g. Vitruvius' *De architectura libri*

Figure 7.
Lake in Viertel Zwei (after 2007), Vienna, Austria.

Figure 8.
Fontana dell'Organo (when no water is running, the organs are visible), Villa d'Este, Tivoli, Italy.

Figure 9.
Nikola Bašić, Sea organs, Zadar, Croatia.

decem, which was translated into Italian in 1567 and contains chapters on hydraulic installations. In the garden of the Villa d'Este stood the Fontana dell'Organo (organs fountain; e.g., **Figure 8**) and Fontana della Civetta (owl fountain), made by the French engineer Luc Leclerc and his nephew Claude Vernard. Both fountains created special sound effects for the visitors to enjoy, imitating the birds chirping (at the owl's fountain) or the sound of water organs (at the organs fountain), accompanied by richly decorated surroundings. The Fontana dell'Organo (consecrated in 1571) had a sophisticated mechanism hidden behind the fountain. Water was routed through pipes, canals, across a wheel, through smaller pools—sounds were produced by both water and displaced air. The visitors who came to see and listen to those fountains could witness a real concert [13]. These water instruments were popular in antiquity and afterwards in the early modern times, and they persist; even in modern times they have not been forgotten. In Zadar, Croatia, sea organs designed by architect Nikola Bašić were presented in 2005 as part of the Old Town Coast restaurant project (e.g., **Figure 9**). Sea organs are an architectural object and at the same time an experimental musical instrument. They are designed as a group of pipes which are placed under large marble steps leading to the sea and are hidden from the view of the observer (as was the case with aforementioned Renaissance organs). The waves hitting the pipes and filling them with water create air pressure that produces random but at the same time harmonious tones in the pipes.

This luxury of water motifs, which are already successfully integrated into urban tissues offers many opportunities for urban horticulture. Irrigation systems, or even more complex food production systems, such as those found in aquaponics, can include water cannons, cascades, walk-on water surfaces, and even water organs—hydropneumatic instruments.

3. Indoor

Closely related to water is another garden motif created in the Renaissance—the *grotta*.[2] In built cavities, garden visitors and users were able to escape from

[2] The grotta (It.) is an artificial cavity or a cave that mimics natural cavities. The grotta can be artistically sophisticated (such as nymphaeum), or it may have humorous motifs, or be focused on sound effects. It was already popular in the Renaissance and even more so in the time of Mannerism. It was first mentioned by Leon Battista Alberti. With its humid and cool climate, it is a pleasant place to stay in the summer. Grottas are usually decorated with shells, snails, pebbles, and minerals (oysters, pearls, brass, tuff, colored enamel, etc.; [6, 7]).

the heat or hustle and bustle of events in the garden, to cool themselves down, marvel at the sounds of water and wind, read stories embodied in sculptural decoration, and chase the glare of water on artificial cave walls, often claded with shells. For urban horticulture, these artificial caves could be quite interesting because it is not difficult to integrate them into the built structures of cities. They could find their place in a small square, on the roofs of apartment houses, or in steep slopes of riverbeds. A grotta has its own closed water system and can even allow plants to thrive in its wet and humid environment. In addition, in Baroque gardens the grotta was often a part of an architectural structure that provided space for an artificial cave in the lower part, while in the upper part one could find a pavilion, a festive hall, or a kind of viewpoint. Here, the visitors liked to linger, enjoy the view, and listen to the sounds of water coming from the grotta. Often, the sound of the water was also used as an accompaniment to small concerts on the upper floor. Such two-story garden facilities in historic gardens were also intended for other functions (the range of garden houses and architectural scenery in gardens expanded in the late eighteenth century with the English landscape style); from banquets, events, spectacles, games, music pavilions to guest rooms in the upper floor and to retreat rooms, artisan workshops, or cold stores in the lower part. The lower part of such buildings was often dug into the slopes, thus providing a constant temperature. Already in the Baroque period (or since the time of Catherine de'Medici in the sixteenth century when ice cream was invented), the nobility liked to place cold stores in the vicinity of their mansions. Ice was brought into these cold rooms in the winter, accumulated in large quantities in the middle of a usually centrally designed room, where it was preserved and helped refrigerate food for as long as 6 months [9, 14, 15]. Would such a cold store also benefit a modern city in the time of global warming (instead of electronic devices which, when cooling, also emit large amounts of heat)?

4. Green verticals

Among the more prominent and enthusiastically accepted projects of urban horticulture are certainly green walls, also called living walls or even vertical gardens. After the botanist Patrick Blanc created his first successful large indoor

Figure 10.
Patrick Blanc (with architect Jean Nouvel), an outdoor green wall, Musée du quai Branly, Paris.

green wall in 1986 (Cité des Sciences et de l'Industrie in Paris), these structures started springing up indoors and outdoors, in small or large scales, monocultural or mixed, creating patterns, images, or just a pleasant green "screen" of plants (e.g., **Figure 10**). Origins of green walls can be found already in the hanging gardens of Babylon, however, it seems more plausible that the idea and form of green walls stem from the green walls of Baroque gardens—the *bosquett*.[3] In Baroque, the typical garden design was based on regular, geometric patterns. The so-called formal garden design emphasized the rational supremacy of man over nature—this was reflected not only in the floor plan of the garden but also in the plants. These were sheared and shaped into certain straight lines, images of things, animals, or even human-like shapes. This art of shearing and growing plants was called *ars topiarium*. It was used by the old Greeks and Romans and revived in the Renaissance. Thus, in Baroque, garden designers continued and upgraded this art of plant designing by creating long green walls, corridors, or even streets with high and sheared trees and shrubs (e.g., **Figure 11**). Green borders led the view into infinity, giving a sense of the grandeur of nature controlled by man as well as offering a retreat into the green spaces behind the green walls. There were smaller spaces of a more intimate nature inside such bosquetts—such rooms contained benches, wells, or even additional green architectures (e.g., treillage).[4] Today's green walls are no different from those of Baroque gardens: when observing tall buildings clad in green walls, they appear as green corridors in Baroque gardens along which gentlemen walked after they left the parterre.

Figure 11.
Bosquett in Versailles, France.

[3] Bosquett (Fr.) is a wooded part of a designed garden or a carefully groomed woodland in garden designs. High sheared hedges create special spaces—green rooms, cabinets (Gartenraume, nem.; Salle de verdure, Fr.). These can have different functions and motifs (corridor, a ballroom, a pond, a lounge, an amphitheater, etc.). In Baroque gardens, bosquett was most often arranged behind the parterre. It was popular in the mid-seventeenth to mid-eighteenth centuries in major formal garden designs [6, 7].

[4] Treillage (Fr.) is a green corridor consisting of a wooden or steel frame on which the plants climb—it has an architectural character. Most often the frame is made of green- or white-painted wood. These green hallways have pavilions at their intersections or corners. They offer walks and contemplation in the shade. Trellis (Fr.) is merely a framework for climbing plants; it is simpler and smaller in size than treillage [6, 7].

5. Ornamental parterre

The parterre[5] is another interesting element of historic gardens. In Baroque gardens, parterres were usually arranged next to the mansion. Thus, the first (or second) floor of the mansion offered the most beautiful view of the parterre. Parterres featured different colors, materials, and patterns. Their appearance varied throughout the year—to keep up with vegetative seasons, gardeners needed to quickly change the plants. Of course, there were also parterres (mainly Renaissance ones) composed of only box trees, sand (of different colors), and grass. However, in the seventeenth century, parterres that included diverse selection of flowers became more numerous. To allow the flowering pattern to be changed quickly and efficiently (to replace color, height, texture of the plant, etc.), the plants were often planted in pots (pot gardening). Thus, the plants no longer in bloom were easily replaced with the then flowering plants. This kind of gardening practice is still used today except that we do not put the containers into holes in the ground (now we have other materials and techniques), but distribute them in groups on paved surfaces and places where the plant is not in direct contact with the soil (greening of terraces). Thus, we can see that Baroque parterres were already quite dynamic structures which could be adopted to a greater extent in today's cities. The idea that plant species were strictly separated in parterres is not quite correct, as it was a common practice to mix different plants and, in some ways, already follow the perma culture as we know it today. Notably, the eighteenth century, which brought an interest in the natural sciences and the development of botany, brought a different perception of plants and their coexistence. Thus, botanical enthusiasts, such as Baron Erberg in Carniola (a part of the present-day Slovenia), began assembling their flower patterns. The Baron notes in his description of the garden from 1822 that red pelargonium and pink evergreen are a good combination[6] even though the difference in height was considerable between the plants at the time (it should be borne in mind that this was a time when pelargonium had only just begun to be cultivated and the plant could then reach 1.5 m in height). Parterres were therefore quite colorful—in terms of color and species. This can also be clearly seen in today's successfully restored gardens, such as the Baroque garden of the Hof manor in Austria. The garden began to emerge after 1725 and was owned by Prince Eugene of Savoy [10]. The idea of renovation was born in 1986, but major works were not completed until 2007 and 2019. Today we can stroll through the representative terraces

[5] Parterre (Fr.) is a surface formed with different patterns, usually arranged close to the residence. The parterre should be located near the castle or mansion, as it is best observed from above (from the piano nobile) to make it easier to understand its ornamental pattern. Augustin-Charles d'Aviler, then Dezallier d'Argenville, and others wrote about parterre patterns. We distinguish between several types of parterre: parterre a l'anglaise (rectangular lawn parterre, sometimes lined with flowers); parterre de broderie (embroidery parterre, adorned with a fine interweaving line resembling embroidery, from 1620 to 1720 it was the more common motif of formal gardens; the pattern consists of low sheared bush, flowers, multicolored pebbles, sand, gravel, and the like); parterre de broderie melee de massifs de gazon or Parterre melee (composed of diverse patterns of grass belts); parterre de compartiment (the pattern consists of bands of grass, bush, and flowers, mainly used in the second half of the eighteenth century; it is similar to embroidered the but parterre only maintains symmetry in the longitudinal and transverse axes); parterre de pieces coupees pour des fleurs (the floral parterre was intended primarily for decoration of smaller garden areas); parterre d'eau (incorporating water surfaces); parterre gazon coupe (shaped lawn belts; used after 1720, it replaced the embroidery parterre) [6, 7].

[6] "... Die Streife sind am gefalligsten, wenn niedere Pflanzen dieselben, und zwar ja nicht gedrangt besezen. Die rothe Pelargonien und *Vinca rosea* sind fur jeden Fall allein hinreichend" [16].

Figure 12.
The Baroque gardens of Schloss Hof, Austria.

with the ground floor and water motifs and admire the aforementioned "mixed" ground floor at the greenhouse (e.g., **Figure 12**).

6. High above

When examining historic gardens, one can also come across mentions of roof gardens. Again, we can think back to the Babylonian structures, where they already had troughs filled with soil and an irrigation system and drainage so successfully constructed that the gardens thrived even in high positions on the skeletons of buildings. The old civilizations favored roof gardens (even the ancient Romans). In the Middle Ages, the interest in them somewhat diminished, but one could still find examples of small gardens consisting of flowerpots or similar containers placed on raised fortifications, monasteries, etc. The interest in roof gardens grew again in the eighteenth century, as enthusiasm for the plant world took over all layers of people, and many had only a window shelf on which they could observe the growth of primula, pelargonium, or perhaps hydrangea. Even the kings suffered from such "botanical" fever, among them the Austrian King Franz I. (1768–1835), who was named *Blumenkaiser* or "the flower emperor" because of his passion for plants [17]. The flower emperor arranged a terrace on the roof of his city castle, which housed plant pots, hotbeds, and even a greenhouse. It was a place where the emperor spent a lot of his time [18]. Today's roof gardens are of course technically advanced and much more common in urban structures. One of the reasons for that lies in various studies proving the positive cooling effect of the environment (especially in cities, where solar radiation is absorbed by roads and buildings and this heat accumulates in the building material).

7. Shelter from cold

We have successfully adopted a lot of knowledge from history—bosquetts have been transformed into green walls, fountains into water jets freely arranged on the surfaces of city squares, and various parterre bordures into mixed (permaculture) gardens. Furthermore, facilities for overwintering delicate plants have also been upgraded. Greenhouses flourished in the time of introduction of non-native species into Europe [19]. In the second half of the eighteenth century, the introduction of alien, exotic fruits onto the tables of the nobility brought even greater diversity of such plants. The always fresh and varied fruits and vegetables on the gentleman's table were among the significant qualities of a higher class. They were a kind of status symbol, and many noblemen arranged greenhouses and other winter facilities for their cultivation. In addition to the well-growing figs, lemons,

oranges, or pomegranates, melon[7] and pineapple played an important role in the eighteenth century. In Versailles, melons were a popular fruit of the French court (they had to provide 100 melons a day in 1688), but they were also grown in large numbers at many other courts (e.g., at the Prussian court, where even *Melonerie* was held in Sanssouci near Potsdam). Melons retained their popularity, although cultivation of this fruit required a great deal of work [20]. Pineapple was also very popular, as evident from the following description: "The excellency, frangrancy, and flavor of the fruit which this plant produces needs no commendations, as it is well known to excel all the fruits hitherto cultivated; so that it is no wonder every gentleman of taste and fortune is the foundation of this polite article of gardening" [21]. Taste and money were necessary to grow this plant, as it originated from South America and Africa, thus it required a special heated greenhouse. Protective facilities for non-native plants varied and ranged from glass bells that covered individual plants, to low warm beds or large greenhouses where the south glass wall was inclined to maximize the warmth of the sunlight. There were greenhouses that fascinated with new technology in the nineteenth century and, as mentioned greenhouses that were only heated by the sun, a furnace, or a kind of hot water system. The variety of the greenhouses depended also on the plants and of course the (financial) ability of the owner. Today's greenhouses are just as diverse. Sometimes gardeners used (plastic) bottles to protect iindividual plants from frost (which is similar to the practice of protecting the plants from frost with glass bells), while large gardens usually have more sophisticated glasshouses. Maybe modern urban horticulturists could follow the example used in the Rococo garden of the summer palace of Frederick the Great, Sanssouci in Potsdam (built between 1745 and 1747), where a combination of solar heat and partial glazing is used (e.g., **Figure 13**). Namely, the palace stands on the top of a hill that was

Figure 13.
The south-facing garden façade of Sanssouci in Potsdam, Germany.

[7] Until the nineteenth century, melons were considered the perfect fruit to have in the garden. In everyday use, melons were not exactly distinguished—the name "melon" was used for several different species, including melons, pumpkins, cucumbers, zucchini (from the seventeenth century onwards), and other fruits or vegetables [20, 22].

transformed into terraces. Trellised wines from Portugal, Italy, France, and from nearby Neuruppin were planted along the brick walls of the terraces. Between them 168 glazed niches were created in which figs trees grew [9, 22]. An ideal place for a king to relax and forget his worries.

8. Coherent thought

A quick look at the historic gardens and their motives and elements should give a slightly clearer picture of what man has already adapted to his needs in his gardens, and what we can draw from past knowledge. It becomes clear that man has increasingly consciously included nature in his world. Perhaps this was most evident in the 19th century, when Ebenezer Howard (1850–1928) intensely researched the idea of the ideal city and, based on the study of past thinkers (such as the Renaissance architect Filarete), he first created a plan for his ideal city. However, while the past thinkers looked at a city only as a built structure, Sir Howard incorporated the natural and cultural landscape into his city. He introduced his garden city in his publication *To-Morrow: A Peaceful Path to Real Reform* (1898), where one can find a Utopian city in which people live harmoniously together with nature. Thus, at the end of the nineteenth century, Sir Howard understood the city in a wider sense—he saw green-designed areas as essential components of the city. Whether we talk about gardens, parks, river landscapes, or cultural landscapes, it is not as important as the fact that built structures cannot exist without the nature. That was clear to people even before Howard's realization. For example, in the second half of the century, a city park was created in Bremen, Germany. However, the investor was not the ruler or the land, state, or any other corporation. The townspeople themselves set up the park and a society to maintain it [23]. A similar example can be found even earlier in the nineteenth century in the city of Ljubljana (now the capital of Slovenia). At the edge of Ljubljana, the idea of a great tree avenue that would provide a pleasant walking area and a space for amusement and relaxation for the citizens arose under the French government in 1813. In 1814, when the new Austrian government came to power, the project was begun but not completed. Thus, in the same year the initiative to complete the avenue was taken by the citizens, and the so-called Lattermann avenue was completed no later than 1816 [24].

More than a hundred years have passed since Howard's idea (and the realization of his garden city), and more than 200 since the citizens of Ljubljana created their own designed green space on the outskirts of the city. Today, we can praise the utopian idea of the "garden city" and admire the determination of the mentioned townspeople who connected the natural wooded hill and the old city with a designed green structure. In comparison with our surroundings, they had more natural areas at their hand, and they did not need to incorporate as many green areas into the tightly built cities as possible, the need that we have today.

Urban horticulture helps us create and materialize possibilities of incorporating nature into our cities, and we need to seize them fully so that the prediction made by the Swiss curator Klaus Littmann—that in the future we will be observing nature only in isolated spaces, similarly as we today observe animals in a zoo (especially rare or even extinct ones)—does not come true. Between September 8 and October 27, 2019, Littmann carried out a major project of planting an indigenous Carinthian mixed forest (which has almost disappeared from Carithia as it is continuously replaced by much more profitable conifer monocultures) in the Klagenfurt football stadium (e.g., **Figure 14**). This intervention that attracted masses of people is not just

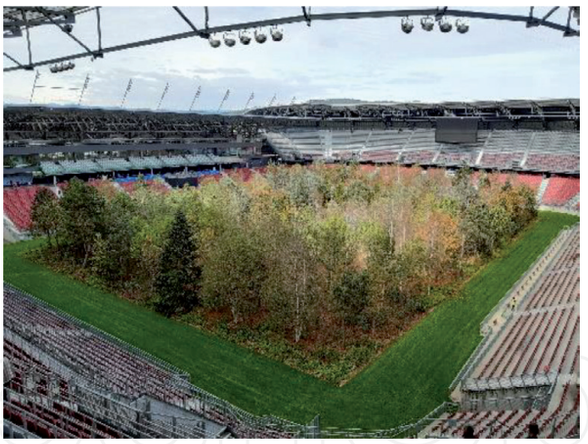

Figure 14.
Littman, For forest (2019), Klagenfurt, Austria.

an art project but also a warning appeal and a warning echo started by artists such as Robert Smithson (his well-known Spiral Jetty created in 1970 is located outside the urban environment, on the North Salt Lake near Rozel Point in Utah), or Christo and Jean-Claude (they wrapped around 178 trees in Basel in 1998) or even Joseph Beuys (he introduced and subsequently implemented the project *7000 Eichen—Stadtverwaldung statt Stadtverwaltung*, at Documenta 7 in 1982; [25, 26]).

9. Conclusion

We have investigated historical gardens and their water motives in all their variety. We have taken a peek at small garden objects—those in the form of nature-like cavities—and others following contemporary architectural styles. We have found the similarities between bosquetts and green walls, and seen that the art of cutting trees and shrubs was an art of itself—which is well known by those who preserve historic (mostly Baroque) gardens [27]. We have outlined the diversity of parterres whose its ornamental lines are filled with plants that were changed according to their blooming periods—gardening that resembles today's pot cultivation (or container gardening). At the same time, we saw that the plants in the bordures of parterres were not monoculture, but contained many different species—parterres were closer to today's understanding of permaculture. We also briefly discussed roof gardens and green houses for more delicate plants. In these examples the enthusiasm for botany was presented—the enthusiasm that was not foreign to many rulers of the late eighteenth and nineteenth centuries. Kings and queens included new plants, their exploration, and the designing of gardens (where they liked to include different rare plants) in their schedules, devoting much of their time and finances to this love of botany. Not only did they build large botanical gardens, greenhouses, and collections (the most famous example is certainly the Kew gardens, royal botanical garden in England), but they also had small gardens just for themselves (sometimes on the roofs of their castles). They studied plants in their botanical cabinets, collected botanical books, and made notes, herbarium, and botanical journeys. This enthusiasm was the result of the development of interest in natural science, which has evolved into disciplines that today provide us with the knowledge of plants to the extent that we can integrate nature into our urban centers.

Furthermore, we have seen that, especially in the nineteenth century, urban residents understood the importance of green spaces in the city, to the extent that they themselves (at their own initiative and at their own expense) set up city parks. Even though the green surroundings of the city were still unspoiled at the time,

and the cities were not as big and densely built as they are today, they knew how important it was for a person to have access to the natural environment every day. The emphasis on this importance is attributed to the industrial revolution, which, in addition to technological advancement, brought with it a well-defined working schedule. Leisure days were rare (initially only one day a week was free), and in those days people loved to spend their time in the soothing embrace of nature (far from noisy and dirty machines and enclosed industrial halls).

So, let us look ahead and make sure that nature is preserved for the next generations, and that it retains in its original form and activity. By integrating different ecosystems in our cities, we can enable this. In this way, plants will contribute to the improvement of living conditions (reducing pollution, reducing the impact of global warming, offering space for relief and contemplation, etc.) as well as provide fundamental links for the nature, enabling it to be coherent, improving conditions for its reproduction and transmission of the information it needs for its existence. Furthermore, with a good insight into the past, we can make the greening of our cities easier. Street façades could all be dressed in green—not only as green walls but also as a structure for trees and shrubs and climbers to grow on. When visiting Viertel Zwei in Vienna, we can see a ten storey "vertical green" residential building, where an additional structure for plants was made in front of the actual façade, creating a tangible green space for the residents (e.g., **Figure 15**). Thus, when creating a new neighborhood in the city, we should devote special attention to its "green" part. Trees should be planted along the streets—all the art of shearing trees and shrubs in Renaissance and Baroque could be used on the narrow streets. Cascades and fountains should be part of city squares; they could cross the edges of pools or stairways and provide play space (or even generate electricity). Lakes and ponds could offer more peaceful areas in neighorhoods. In the spaces between larger apartment buildings, gardens could be arranged that would follow the schemes of Baroque gardens and offer beautiful views of the colourful design of parterres when looked at from higher floors of buildings.

Figure 15.
Vertical green building in Viertel Zwei (built 2017), Austria.

In the centre of such garden, a garden architectural structure could be built, in which a grotta would be arranged in the lower part, and on top of it a room for socializing, listening to music, playing cards, or even a greenhouse. Aquaponics could be included in the grotta and greenhouse system. Green roofs and terraces could be used to grow exotic, heat-loving plants. With all this in mind, let us not forget about water instruments (organs) that could be part of such grottas or they could be used to liven up roadside green patches where rain water in roadside channels could be used.

Nature can be introduced into almost every element of a tightly built city. Following the example set by many art projects—be it wrapping trees in decomposable materials, placing tiny sculptures in a narrow street waiting for rain, planting oaks in the city, etc.—through joint collaboration we should make sure that authentic forests will not be only recreated in stadiums.

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