From Mistletoe to Anthroposophical Architecture: Medicinal Plants Gardens

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Abstract
This article focuses on the Austrian philosopher, social reformer, and architect Rudolf Steiner's approach to design, architecture, and nature through its anthroposophical thinking about life developed in the 1920s and its reflections on urban space. The article aims to establish a new relationship between art, design, architecture, and landscape, based on Steiner's approach to life, and to fill the gap in how to look at our artificially constructed environment, especially in urbanized areas. As a medicinal plant, mistletoe is one of the parasitic plants that points to the interplay that Steiner observed throughout life. In this article, the concept of "from mistletoe to architecture" is evaluated as a metaphor and represents the view through the holistic relationship established between architecture, nature, and landscape. From the architectural point of view of mistletoe, the bond between them is understood with a holistic approach in which different disciplines, knowledge, interaction, and living together with plants are intertwined in modern urban spaces. Therefore, how can architecture, landscape architecture, and design practices integrate living and being in today's world? Deriving from this, the article evaluates the close relationship between human beings and plants through the medicinal plant gardens in Istanbul and especially the Zeytinburnu Medicinal Plants Garden.

Keywords
anthroposophy; holistic approach; design and nature; medicinal plant garden

1. Introduction

Based on the holistic approach to design, architecture, and nature through the anthroposophical thought of the Austrian philosopher, social reformer, and architect Rudolf Steiner, this article focuses on co-existence with plants in the modern urban space. While doing this, the article evaluates this close relationship between human beings and plants through the medicinal plant gardens in Istanbul and especially the Zeytinburnu Medicinal Plants Garden. The article aims to understand the relationship between art, design, architecture, and landscape, based on Steiner's anthroposophical approach. Building on this approach, the research aims to bridge the gap between how we view our artificially constructed environment, particularly in urbanised areas.

The aim of this article is to address the connection between holistic design and anthroposophy. Although Rudolf Steiner is known for his works in architecture, he should be approached from a different perspective because of his versatile scientific perspective. Therefore, this article focuses on the phenomenological approach to understanding architecture from the perspective of nature. What does Steiner's anthroposophical approach remind us of in our contemporary urban nature today? In this article, an evaluation is made on how we interpret the built environment in nature at the intersection of disciplinary knowledge within the framework of the anthroposophical approach.

Rudolf Steiner's idea of life, who developed his theory of anthropology in the 1920s, gains importance because it brings a holistic perspective to life and living things. Steiner's anthroposophical approach is an extension of a world we often refer to today, but because of the disconnection of disciplinary knowledge, there is nevertheless a strong need to reconsider and connect them in our built environments. The anthroposophical approach that Steiner articulated in the mid-1920s may not be easy for the creation of today's complex, heterogeneous and multilayered urban environments, but some of the inferences we make at this point can be useful in remembering or reinterpreting how we position ourselves in the world. Steiner's approach gains importance to show that disciplinary knowledge and expertise can be at different stages and levels in nature's cycle.

In this context, as architect Michael Weinstock mentions:
Non-living forms, the forms of the land, the forms of clouds, of snow and storms, of dunes and rivers, are not permanent, static things but are dynamic three-dimensional patterns that are produced by the continuous physical processes of the natural world, and are constantly being broken down and renewed. Living forms, the forms of grass and trees, of fish, reptiles, birds and mammals, are also subject to change but persistent over time, organised by their internal biological processes and by exchanges with their environment (Weinstock, 2008, p. 21).

This idea of Weinstock is similar to the relationship that Steiner sees in the whole of life. So how can awareness of these patterns be provided in the design of urban areas?

In his work in the 1920s, Steiner discovered the healing properties of mistletoe (*Viscum album L.*) for many diseases and used it in the treatment of patients. As a parasitic plant, mistletoe points to a mutually influencing relationship that Steiner observed across all of life. In this article, the concept of "from mistletoe to architecture" is taken as a metaphor and represents the view through the holistic relationship established between architecture, nature, and landscape. The connection that emerges from the perspective of "from mistletoe to architecture" goes through a holistic view in which disciplines, knowledge, and interaction are involved. After discussing Steiner's approach in the first part of the article, Zeytinburnu Medicinal Plants Garden, which establishes an internal relationship between architecture, landscape, and nature in Istanbul, will be evaluated from a holistic perspective.

2. Rudolf Steiner's Anthroposophic Approach to Life and Health

Rudolf Steiner (1861-1925) is known as the founder of anthroposophy, an approach that ranges in a diverse area of disciplines such as "education, biodynamic agriculture, politics, banking, poetry, and drama (Hammer 2009: 209)" (Cusack, 2012). He "saw architectural creation as a means of apprehending our place in the cosmos and his esoteric system of Anthroposophy aimed to demonstrate the correspondence between the spiritual and material worlds" (Gray, 2010, p. 43).

"The term "anthroposophy" comes from the Greek roots *anthropos*, meaning "human," and *sophia*, meaning "wisdom" (Sokolina, 2016, pp. 53-54). Steiner addressed the spiritual essence of the term: "Anthroposophy is a path of knowledge aiming to guide the spiritual" element in the human being to the spiritual in the universe" (Sokolina, 2016, pp. 53-54). By manifesting the idea of spiritual organic learning as a core value of social development, anthroposophy opposes soulless technical advancement as a means of human survival. Steiner identified bio-spiritual awareness "as an essential need of life", an evolutionary natural experience "of the human being and the universe" (Sokolina, 2016, pp. 54). According to Steiner, "anthroposophy not only deepens our thinking, our intellectuality, but also our feeling—indeed our whole nature" (Steiner, 1924). He combined anthroposophical philosophy with humanities and medicine, theosophy, pedagogy, architecture, and spiritual science. However, knowledge and practice lie at the intersection with an underlying theory-action intersection and an open and fluid approach.

Steiner developed the anthroposophic approach by being influenced by Wolfgang von Goethe's "theory of natural life cycles and studies in biology" (Sokolina, 2016, p. 52). In Dornach, Switzerland, he designed a building named Goetheanum, which he dedicated to Goethe, and repre-

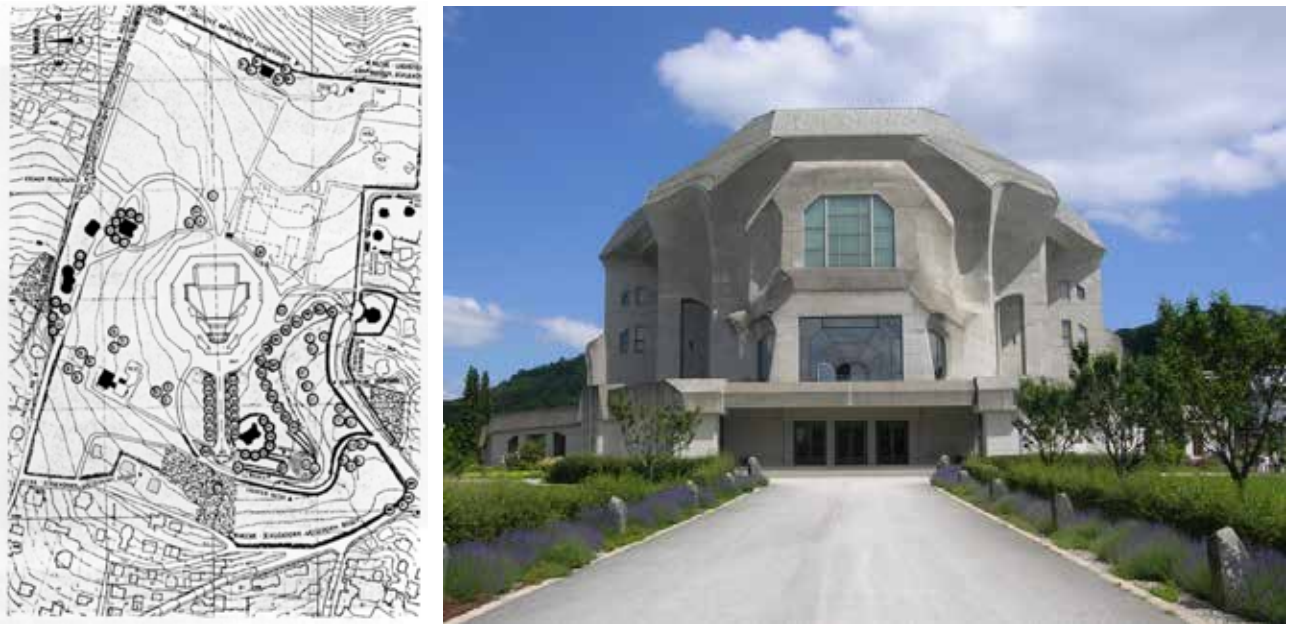

Figure 1. Topography of the region (Marcolung, 2017) (left), Second Goetheanum in 2005, Photo by Roland Halfen. Rudolf Steiner Archive, Dornach, Switzerland (right) (Rudolf Steiner Archive, 2021)

sented his approach to anthroposophy in 1923 (Sokolina, 2016, p. 52). Originally surrounded by cherry trees in a rural area, the Goetheanum building and park serve as research and training spaces with competent groups of gardeners and farmers (Florin, 2022). Located to the west of the Goetheanum, the circular landscape feature footpaths, the "Felsli" feature, and the shaping of the land were all done at the time of the first built Goetheanum building (1908-1925). However, after the first building built as a timber and concrete structure was destroyed by a fire in 1923, a new Goetheanum building was designed and constructed by Steiner between 1924 and 1928. In the process, the park continued to provide various opportunities for "recreation, recuperation, biodiversity, and ecological sustainability" (Goetheanum, 2019, p. 12).

The building emerges not as a concrete spatiality of his thought, but as a practical proposition that evolves into a comprehensive representation of an interdisciplinary vision. Close to the building, there is a therapeutical center for healing that applies anthroposophical knowledge. Steiner mentions:

> ...the world must include not only an understanding of the healing processes but also of the processes of disease. A profound insight into the Cosmos is only possible when we are able to survey not only the tendencies which lead to sickness but equally those which lead to health (Steiner, 1924) (Figure 1).

Goetheanum shows the "spiritual evolution of material living in sustainable balance" which combines "human physicality and spiritual awareness" representing the influence of organic thought on contemporary architecture" (Sokolina, 2016, p. 52). This building becomes a place where anthroposophic medicine, which was founded by Steiner and Dr. Ita Wegman in 1920 as one of the 11 disciplines of the School of Spiritual Science founded by Steiner, is practiced. The school focuses on the "development, teaching, and the practical implementation of its research findings and is supported by the Anthroposophical Society" (Goetheanum-School of Spiritual Science (n.d.)). The Medical Section of this school coordinates not only research and development of anthroposophic therapy but also applies various forms of therapy. In the branch of anthroposophic medicine, drug therapy, body-oriented therapies, nursing

applications, curative eurythmy therapies, art therapies such as painting and psychotherapy, as well as veterinary medicine are used as part of the integrative patient treatments (Anthromedics, Arzneimittel und Therapien, 2018; IKAM Arbeitsfeld Therapien (n.d.)).

In 1920, Steiner introduced mistletoe as a cancer treatment and he "recommended a drug extract produced in a complicated manufacturing process combining sap from mistletoe harvested in the winter and summer" (Szurpnicka et al., 2020, p. 594). Mistletoe (Viscum album L.) as a medicinal plant attracted Steiner and Dr. Wegman, and they used "a mistletoe extract to treat a cancer patient for the very first time", in 1917, before the foundation of the School of Spiritual Science (Iscador AG. (n.d.). They prepared "the basis of the pharmaceutical and therapeutic concept of anthroposophic mistletoe preparations (Iscador AG. (n.d.). Steiner referred to the mistletoe as a parasitic plant as "it grows on trees is compelled to follow a different yearly rhythm from that of other plants, its blossoms have been formed before the trees which are its hosts, put forth their leaves in spring" (Steiner, 1920). Mistletoe is a "winter-blooming plant, protecting itself under the shelter of alien foliage, from the extremes of the summer sun's rays, or better, from the light workings of summer; there is something of an aristocratic attitude about the mistletoe" (Steiner, 1920). A mistletoe also exists in "legends and myths, because it belongs to an earlier planetary condition of our earth and has remained behind as a remnant of a pre-earthly evolution. This is why it cannot grow on the earth but must take root in other plants. Natural science shows us that mistletoe does not have those curious starch cells that orient the plant toward the centre of the earth" (Steiner, 1910). Steiner defines the characteristic of mistletoe as:

...the mistletoe attaches itself to other plants in order to grow and thrive is the essential point: it acquires and appropriates particular forces", "its nature is to oppose all the tendencies of the straight course taken by the organic forces, and to urge towards all that to which the straight course taken by the organic forces is opposed (Steiner, 1920).

Since then, mistletoe has been used especially in integrative oncology, as it has been found to be an "adjuvant treatment of tumorous diseases is developed on the basis of anthroposophic medicine" (Iscador AG. (n.d.)). Today, "anthroposophic mistletoe therapy is widely used. Preparations of white-berry European mistletoe (*Viscum album L.*) are among the most frequently used medicines for cancer" (Mistletoe Therapy, 2020).

Steiner's multifaceted and layered approach to the holism of plants and life is not applied in many societies in today's modern and fast life. In their book, *Time-Saver Standards for Landscape Architecture: Design and Construction Data*, Harris and Dines define the important functions of plants in urban environments as; aesthetics, environmental modification, screening, circulation control, production, bioengineering, and other forms of structural mitigation (1998, p. 550-1). Today, the designs of planting in and around the buildings are gaining importance in the architectural applications made in the cities that are concreted, and the number of alternative landscape designs such as green walls, green roofs, and sky gardens is increasing. Plants are preferred in urban environments for their functions, such as cleaning the air, keeping dust, acoustic comfort, and odour control, as well as their aesthetic value. sSimilarly, many plants have been planted for animal health in cities throughout history. For example, horse chestnut (*Aesculus hippocastanum*) was widely cultivated in İstanbul in the Ottoman Empire in the 16th century, as physician Willem Quackelbeen stated in a letter. During this period, horse chestnut was cultivated to relieve chest complaints of horses used in military power, and for cough and worm disease of sick horses (Lack, 2002, p. 15).

3. Medicinal Plant Gardens

3.1. Medicinal Plant Gardens in the World

Before the development of synthetic chemistry, plants were known as the primary source of medicine. According to World Health Organisation (WHO 2002), many medicinal plants have been "used for healing around the world; in some regions, up to 80% of the population relies on plants as primary sources of medicine" (Cicka and Quave, 2019, p. 17). The use of plants for therapeutic purposes is as

old as human history. As Demirezer stated in 2010, "In the 5000s B.C., the use of plants for therapeutic purposes was encountered in the Mesopotamian civilisation, and it was determined that 250 herbal drugs were used" (Acıbuca and Bostan Budak, 2018, p. 37). The knowledge of ancient civilisations about medicinal plants, the use of plants from the remaining inscriptions, and archaeological materials. It goes back to Sumer, Akkad, and Assyrians from 3000 B.C. according to the inscriptions and archaeological materials of this period. In a papyrus written in the Egyptian period in 1550 B.C., it was revealed that herbal and animal-based drugs were used in the treatment of diseases as a solution to about 450 diseases. Some of these include peppermint (*Mentha x piperita L.*), black mustard (*Sinapis nigra L.*), cassia (*Cassia acutifolia L.*), poppy (*Papaver somniferum L.*), sage onion (*Scilla maritima L.*), and tatula (*Datura stramonium L.*) are medicinal plants. In the Hittite period, plants such as mandrake, hawthorn, barley, wheat, saffron, and garlic were used as understood from the tablets of the same years (Kaya, 2011, p. 12). Many herbal preparations and formulas belonging to the Greek, Roman, and Byzantine periods were found, and during the Islamic Civilization period, physicians such as Al-Biruni, Ibn Sina (Avicenna), and Ibn al-Baytar mentioned medicinal plants, animal, and inorganic origin drugs. In Europe, new plants added after the discovery of America were used for medicinal purposes (Kaya, 2011, pp. 11-12).

According to WHO (2019, p. 8), traditional medicine is "total of the knowledge, skill and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness". Herbal medicines is:

herbs, herbal materials, herbal preparations and finished herbal products that contain, as active ingredients, parts of plants, other plant materials or combinations thereof. In some countries, herbal medicines may contain, by tradition, natural organic or inorganic active ingredients that are not of plant origin (e.g. animal and mineral materials) (WHO 2019, p. 8).

Using traditional medicine and herbal materials in medicine is increasing in the world. However, since agriculture in cities has decreased, the existence of plants in modern cities gains importance not only for cleaning the air and as a visual component but also for healing purposes. This approach mainly appears as a medicinal plant garden in green areas and gardens that appear in the city. In this sense, if handled with Steiner's anthroposophical approach, modern cities gain importance in re-establishing a holistic relationship between nature-human and living things in today's metropolitan and increasingly populated cities.

3.2. Built Environments and Integrative Approach: Zeytinburnu Medicinal Plants Garden

Medicinal plants have been very important in protecting the health of humans and other living things. Medicinal and aromatic plants are not only used as food and spice but are also used to make cosmetics, aromas and perfumes. Components such as phytochemicals isolated from plants are also used for versatile and different purposes such as food preservatives, colorants, sweeteners (Devkota and Watanabe, 2020, p. 44). As research from Willis states, it is known that about 30.000 of the 460.000 plant species known in the world are used for medicinal purposes (Devkota and Watanabe, 2020, p. 44). According to WHO (2005, p. 119), as many as 80% of the world's people depend on traditional medicine to meet their primary health care needs".

Throughout history, many buildings, and especially health buildings, have been designed and built with a holistic perspective, from architectural structure, land selection and location, building materials to interior spaces, landscape, and vegetation selection, and diversity in order to create livable and healthy environments. However, with modern urban planning, it is seen that the relationship of the plant with health is gradually disappearing in the city. Today, plant and landscape design and applications, except for certain health structures, are considered factors of secondary importance for people and all living things living in the city to gain health and healing properties. However, if we take it with Steiner's approach, it is a fact that plants have a very important role in the sustainability of urban life through their medicinal gardens.

Kösa and Güral (2019, p. 47) mention that medicinal aromatic gardens are not only established but also designed as a part of many parks and gardens. As Temel et al. stated (2018) "in the world, various medicinal and aromatic plants are cultivated on an area of approximately 36 million hectares, coffee, cocoa, tea, red pepper are in the first place in terms of production amount" (Kösa and Güral, 2019, p. 444). The size of the world's medicinal and aromatic plant trade is gradually increasing. Important medicinal plant gardens in the world are Chelsea Physic Garden (1673), Camifolia Garden, Chemillé-en-Anjou (1976), Regional Science Center, Medicinal and Aromatic Plant Garden, Guwahati (1994), Indiana Medical History Museum-The Medicinal Plant Garden, Indianapolis (2003) (Kösa and Güral, 2019, pp. 47-48). The common feature of all gardens is that they offer recreational opportunities with their herbal designs and are educational for their users. Most of the gardens have labels identifying the plants. In the garden in Guwati, special arrangements have been made for the visually impaired as "'Touch and Smell' plants. Special paths with checkered tiles are provided in the garden, where visually impaired people can easily walk" (Kösa and Güral, 2019, pp. 47-48).

Medicinal plant gardens in Turkey are Nezahat Gökyiğit Botanical Garden, Istanbul, 320,000 m2 (1995), Izmit Medical and Aromatic Plants Garden, 2000 m2 (2016), Zeytinburnu Medicinal Plants Garden, Istanbul, 14.000 m2 (2005), Lavender Fragrant Village, Isparta (5.000. 000 m2), Batı Akdeniz Agricultural Research Institute Medicinal and Aromatic Plants, Antalya (2010), Çukurova University Ali Nihat Gökyiğit Botanical Garden, Adana, 8500 m2 (2014-2016). Examples in Turkey are organized for educational purposes for their visitors (Kösa and Güral, 2019, pp. 48-50). "Due to the climate and ecological characteristics of Turkey, many medicinal and aromatic plants can be grown or collected from nature as in many parts of the world. Laurel, mahleb, linden flower, sage, rosemary, liquorice root and juniper bark are collected from nature. Cumin, anise, thyme, fenugreek, fennel, mint and coriander are cultivated" (Bayram et. al, 2010, p. 8).

In this context, the first medicinal plant garden in Turkey is the Zeytinburnu Medicinal Plants Garden, implemented in 2005 in Istanbul, with contributions from Zeytinburnu Municipality and Merkezefendi Traditional Medicine Association. Established on 14 acres of land, the aim of implementing this park was to "study and cultivate the plants, ensure the growth and spread of new ones, to protect those under risk, to contribute to biodiversity, to encourage people to recognise medicinal plants and make them a part of the culture, and to train people on cultivation, and efficient and safe use of medicinal plants by benefiting from medical flora" (TR Dergisi and Dinçer (n.d.)). Besides, research on the production and promotion of the effective and safe use of medicinal plants, as well as conservation and development of plant diversity and educational programs, are held in the park (Figures 2, 3).

Figure 2. Left: Site plan showing the Zeytinburnu Medicinal Plants Garden; right: Plan and organisation of the garden (İstanbul Şehir Haritası, 2022)

Figure 3. Some of the plants in the park: *Cynara scolymus*: The leaves of the plant are used in the treatment (left), and *Fragaria vesca*: The leaves and fruits of the plant are used in the treatment (the second on the left) (photos by the authors, June 2022)

The area where the park is in a region with intense urbanisation in Istanbul. In the garden, there are over 700 medical plants processed through the QR code on some labels to promote the growth of medical plants (Zeytinburnu Tıbbi Bitkiler Bahçesi (n.d.)). These medical plants have endemic Anatolian species in the park (TR Dergisi and Dinçer, Murat. (n.d)). Plant wastes are used as natural fertilizers, drip and sprinkler methods are used for irrigation. Synthetic fertilizers and pesticides are not used in the cultivation of plants (Zeytinburnu Tıbbi Bitkiler Bahçesi (n.d.)). Plants are collected when blooming, pressed, dried, glued to the cardboard, kept in the freezer, kept in the freezer, and stored in herbarium cabinets (Herbarium (n.d.)) (Figure 4).

Figure 4. Some of the buildings in the park: Drying room, Herbarium and Laboratory (left), Education research centre building (middle), and Greenhouse (right) (photos by the authors, June 2022)

In the garden, the following facilities exist: Tropical greenhouse and production greenhouse,

- Herbarium-Laboratory: a. Drying of plants, packaging and storage in drug refrigerators. b. Pressing and drying the plants collected in flowering form, sticking to files, freezing and labelling, c. Examining the morphology and anatomy in the laboratory, obtaining essential and carrier (fixed) oil,
- Sundial: daily and monthly movement of the sun; knowledge of how animals, plants and air move during which week of the year,
- Animal shelter-Hives: Peacocks, pheasants, quails, ducks, geese, turkeys, roosters, chickens, rabbits, cats, turtles, pigeons
- There is a seed bank, laboratory, education and research centre and library (Figure 5).

Figure 5. Animals in the backyard garden: Hives and honey cultivation area (photographs by the authors, June 2022)

At the same time, in order to spread the medicinal plant culture, health environment school, home medicine, care, plants, foods, art, workshops with children aged 3-7, 8-12, internship opportunities, student support, volunteer gardening, documentaries as educational activities take place in the garden (Çekin, 2016, pp 134-135).

Zeytinburnu Medicinal Plants Garden is in an isolated area in the city and is surrounded by 1.6-1.8 meter-high walls (Figure 5). It is in an urban area of intensive construction and in a region with air pollution. The visit to the garden is carried out in a controlled manner and in this sense draws a relatively closed spatiality and territoriality. Although this spatial boundary is important for the protection of indoor plants, it reduces the visibility of the garden and nature (Figure 6).

Figure 6. Borders of the park and parking area at the entrance of the garden (photos by the authors, June 2022)

4. Discussion and Conclusions

Steiner addressed "bio-cycles of natural life and the perception of light and colour as the revelation of universal mysteries of mind and soul…." (Sokolina, 2016, p. 52). His approach to life continues to be a source of inspiration for many designers today, with the increasing importance of nature and design philosophy. In his Goetheanum project, which is one of his important works, he emphasised the effect of colour and form and the positive effect of these effects on human memory while emphasising space. In the design philosophy where concepts such as the spirit of the place are discussed, Steiner mentions that what is put into Goetheanum is the soul of the people.

Today, the important issue in urban landscape design that has been going on for centuries and has not changed is that the existence of green areas has a healing effect on people. Many of the researchers who have studied and

continue to work on urban space, such as Claire Cooper Marcus and Naomi A. Sachs (2013), talk about the relationship of green areas with the surrounding structural areas in their studies. In terms of urban landscape ecology, the presence of soil, water, and plants are of great importance in terms of sustainable design management. At this point, the green areas allocated in built cities as an urban design component will increase the quality of life of the people around them. Medicinal plant gardens are areas that need to be taken into account with their recreation, education, and improvement functions as well as meeting the need for green space in cities.

The differentiation of the unique needs and possibilities of the society over the centuries is constantly changing the architecture. However, one of the forgotten issues is that human needs and preferences regarding nature and biophilia remain largely the same. For this reason, nature and design, which Steiner cared about in the 1920s, will gain more importance in different ways in the future and will be a source of inspiration for designers for centuries. One extension of these approaches is that the concept of biophilia and its applications are more important today than in the past. To find the possibilities of intrinsic and natural ways of seeing nature in our densely built environments, the healing properties of plants can remind us how to construct an intertwined form of continuity and flow between architecture, landscape architecture, and design practices. to live and exist in today's world.

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