

The transformation of the cultural landscape of Latvian rehabilitation gardens and parks

Aija Ziemeļniece, Linda Balode, *Latvia University of Life Sciences and Technologies*

Abstract. The research on the impact of the healing power of the natural base on the human health in Latvia has begun in the 15th century. For several centuries to the present day, it has been proved that the exposure link between the natural contribution during rehabilitation of the patient and the duration of the recovery of the patient only in the inside of the in-patient care health facility makes a dramatic difference. The patient's visual linking with the landscape space creates positive emotions that have a healing effect, demonstrating positive changes in the equalization of the blood circulation, cholesterol, and psycho-emotional level in the body. Most gardens and parks provide aesthetic enjoyment but the rehabilitative sensory and therapy gardens are designed to functionally stimulate the human senses (vision, touch, smell, taste, and hearing). The rehabilitation garden or the park is a place that promotes physical, mental health, and well-being, and it should be designed near medical institutions where the moments of psycho-emotional feelings of the patient and his relatives are the most delicate.

Keywords: rehabilitation, healing, psycho-emotional level, landscape space

Introduction

In the early 19th century, the start of development of parks in Latvia is related to the location of springs and the possibilities of using the natural base in the process of the medical treatment of patients. The study compares not only the impact of the expression of the natural base and the underground natural resources on the development of balneology but also the political and economic situation in the country [2]. The two world wars, the change of political power and the fluctuations of economic policy also affected the transformation of the landscape space of the parks and gardens of the sanatoriums. In the 60s–70s of the 20th century, an intensive building of rehabilitation centers started in Latvia, which brought an exaggerated scale and infrastructure load in the scenically fragile and picturesque cultural and historical environment.

The study of the healing landscape space is related to the environmental science, mathematics, philosophy, art, psychology, promoting knowledge of the impact of the environment on the human being and the impact of the human being on the outdoor space, which in general forms the so-called environmental psychology. Its understanding is needed by architects, landscape architects, and spatial planners. In the world, there is a growing interest in studying the relationship between the human and the environment, which proves that the functional and the compositional structure of the outdoor and indoor spaces solved at a highly professional level strengthens the psycho-emotional stability of people.

Most gardens and parks provide aesthetic enjoyment, but the rehabilitative sensory and therapy gardens are designed to functionally stimulate the human senses (vision, touch, smell, taste, and hearing). The task of gardens is to improve the health and well-being of people, to promote faster recovery through contact with nature. Recreation and treatment at a site rich in natural healing resources shorten the time of medical rehabilitation and recovery of the human body. The development of health care gardens in the 21st century in Latvia is gradually growing and they have become functionally important outdoor spaces that provide patients with therapeutic benefits. In practice, there are various health gardens featuring attractive landscapes. Some of them lack essential landscape elements of rehabilitation and several important parameters that optimize safety and rehabilitation. Poorly designed care gardens can cause a psycho-emotional harm to patients, which is unacceptable in the medical environment. The summarized visual aesthetic, ecological, and social criteria of medical gardens and parks can be used by industry professionals – architects and landscape architects.

Research methodology

The therapy or the rehabilitation garden is an outdoor space designed to improve the physical and mental health of people, to develop feelings and senses for young children, the elderly, hospital patients, visitors, and the staff. In the late 20th century,

the planning of the rehabilitative landscape started in the world, which is connected with the summarizing of interdisciplinary researches (architects, landscape architects, therapists, doctors, psychologists, psychotherapists, sociologists, etc.). The development of rehabilitation gardens and parks in Latvia began in the late 19th century. Many historic rehabilitation gardens and parks of Latvia are a cultural and historical heritage that has also brought about a change in the structure of populated areas due to the development of spas. Climate, attractive surroundings, and proximity to the sea were important at the balneological resorts. The construction of summer cottages and well-houses formed a new language of the architectural form design. During the Russian province times under the order of the imperial government in 1884, the health resorts in the Baltic States – Ķemeri, Baldone, and Druskininkai acquired significance.

In Latvia, the early 20th century as the interwar period is characterized by the spread of tuberculosis, which was caused by inadequate food and living conditions. In the 20s–30s of the 20th century, under the influence of land reform, the sanatoriums Krimulda, Īle, Tērvete were built in alienated manor centers. New sanatoriums were built in Ķemeri, Tērvete, Ogre, Cēsis, Inciems, near Lake Rāzna [10].

The aim of the research is to make a scientifically sound assessment of the aesthetic, ecological, and functional quality of rehabilitation gardens and parks, taking into account the regional features of the areas and the specificity of the natural base.

The research assignments touch two main criteria:

- to provide an overview of the history of the development of rehabilitation centers in Latvia in the planning of gardens and parks;
- to determine the types of Latvian medicinal gardens and their compositional structure.

The applied research methods: the comparative method – the scientific literature on sanatorium parks and healing gardens of Latvia from 1739 up to the present day has been compiled and analyzed. The current situation of the landscapes of Latvian rehabilitation gardens and parks, their spatial structure, and the diversity of small land plots, natural environmental processes, space and time scales, visual dynamics of landscapes, and their interrelationship research in local, rehabilitation garden, and park areas are compared. Not only the geometric characteristics of the elements of landscape structure but also the ecological and functional significance of individual elements is important for the ecological planning of the landscape.

Macroecologically, the spatial research method is based on the assessment of the application of the spatial diversity and ecological solutions in landscape planning:

- the ecological functions (biologically high-quality landscape spaces);

- the visual and aesthetic quality (attractive landscapes of the natural base by estimating sight lines and points);
- the quality of the cultural and historical environment (historical sights, the historical land use);
- the role of recreation and tourism (relaxation, education, cognition, and rehabilitation);
- the resources and the functional role of the area (settlements, forest landscape, agricultural landscape, etc.).

Along with the medicine boom in monasteries at the world scale, folk medicine also developed in Latvia. In 1220, in Riga, the first St. George's Hospital, "pharmacy booths" selling herbal preparations, various spices, and alcoholic beverages are opened. In the 14th century, in Riga, and a little later in towns of the Latvian province, the first pharmacies appeared with pharmacy gardens, where medicinal plants were grown for health purposes [7]. The folk medicine, springs were divided into three groups:

- *eye springs*, where the sick washed their eyes. According to the chemical composition, the water of these springs was solid and thick, saturated with *gypsum*;
- *holy springs*, for the healing of bone pain and skin diseases, where the sulfur springs helped. For good healing success, people donated pieces of money throwing them into the water of the holy springs (historical coins were found in the springs of Bārbele, Baldone, Ķemeri, and Pēterupe);
- *the devil's eyes*, spring waters which left a bad impact on people according to patients' observations [17].

The development of Latvian historical health resorts in the late 20th century was determined by the climate and the hydromineral factors, being the basis for the effect of climate therapy on human health.

Each of the sanatoriums in Latvia is located in different regions with different climate impacts, which are subordinate to the effects of the elements of the natural base:

- the assessment of the landscape space of the seaside resorts (Liepāja, Jaunķemeri, Vaivari);
- the context of the relief, forest landscape of the resort (Īle, Tērvete, Rāzna, Krimulda);
- the context of the river or lake landscape space (Baldone, Rāzna, Baltezers).

Latvian rehabilitation gardens and parks are classified into two groups according to their historical origins:

Group 1 – gardens and parks established in historic open-air places (Baldone, Ķemeri, Bārbele);

Group 2 – gardens and parks passed down from manors after the agrarian land reform in 1922 (Krimulda, Rāzna, Īle, Baldone, Ziedoņi, Tērvete (until 1932), as the adaptation of the historical site to

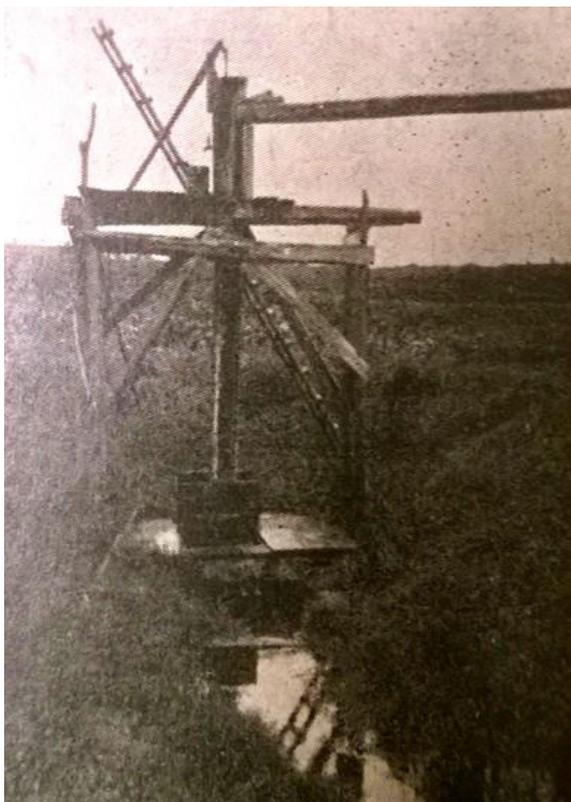


Fig. 1. Bārbele Sulfur Spring in the early 20th century.



Fig. 2. Bārbele Sulfur Spring. Photo by the authors, 2017.

rehabilitation contributed to more rapid initiation of therapeutic treatment of patients.

One of Latvian oldest healing sulfur springs is Bārbele. In the historical materials mentioned since 1739 when by the order of Duke Ernst Johann von Biron, the land around the hydrogen sulfide deposit was bought and a sulfuric bath healing facility was built. Bārbele Sulfur Spring was studied, and soldiers of various diseases were healed there (Fig. 1, 2). In the 19th century, the concentration of hydrogen sulfide in the spring fell and the Bārbele sulfur spring resorts and later Ķemeri gained more popularity [5]. A park was planted, and a dance floor was opened near the spring. During World War II, the Bārbele

health resort was destroyed. Currently, only the spring has survived.

When compared, it is evident that the three oldest Latvian health resorts – Bārbele, Baldone, and Ķemeri are united by the sites of the hydrogen sulfide springs but the difference is in the climatic conditions. In the Ķemeri health resort, the air has a higher degree of humidity than that in Baldone or Bārbele, as it is adjacent to the bogs and the sea. In turn, there are no bogs near Bārbele and Baldone and both spas are surrounded by a picturesque park with a forest landscape. Latvian health resorts, located in natural subterranean areas (forests, bogs, proximity to the sea) gradually began to be formed as landscaped areas. In 1818, H. G. von Korff in Baldone near the Ķekaviņa River, created a health resort park with paths, the compositional structure of which is subordinate to the picturesque line of the river bank. The central dominant of the park is the parade courtyard with a building (Fig. 3).

The trees in the park are planted in separate groups, forming a certain compositional and dendrological characteristics for the purposes of coloring, branching, sunlight (oaks, linden trees, maple trees, ash trees, black oaks, etc.). The landscaped space around the springs of Baldone was emotionally amplified by a church with a sacred grove and a stacked stone fence (16th / 17th century). On the left bank of the Ķekaviņa River, the second part of the historic sanatorium park is located.

The spatial plan of the sanatorium included seven blocks of the health resort. One of them is the bathhouse or the so-called “White Castle” (1890) around (Fig. 7) which rare species of trees and shrubs were planted: larches, spruces, cedar pines, Manchurian cork trees, silver firs, red oaks, as well as a pond and a canal were excavated that have overgrown with time. The total area of the park is 2.7 ha and it merges with the adjacent forest. The coniferous forest started behind the health resort. Each of the blocks of the health resort was subordinate to a different landscape space (Fig. 5, 6, 8).

In the engraving of the late 18th century, the landscape of the well-house of Baldone was drawn, where in 1795 above the sulfur spring outlet, a pavilion with a domed roof was built, and to the left of it - a health resort where sulfur water was used for both drinking and procedures (Fig. 4). From a small historic sulfide mineral water spring (the 15th century), in the 30s of the 20th century Baldone Spa had developed into a picturesque site with a park and several well-houses, occupying an area of about 6 ha. The building of a settlement with a street network gradually began in rings around it. In the early 20th century, the health resort of Baldone was treated as a balneotherapy and mud-bathing facility with pine needles, salt, and carbonic acid baths. The spring gave about 86000 liters of water a day, which was enough to make 500 sulfur water baths. In the spring of 1927,



Fig. 3. Plan of the park of sanatorium "Baldone" (H. G. Korff, 1818). Archive of Baldone Municipality Council.



Fig. 4. The landscape of the well-house in Baldone, the late 18th century [8].

the first part of the building of the healing mud bath was ready and put into operation, but the second one – in 1928 [17]. In the 20s of the 20th century, a bathhouse with baths was built, also adding the largest open swimming pool in Latvia with a bath and a mud treatment block (architect Artūrs Krūmiņš, 1939). The park planted by Baron von Korff in the late 19th century with walking paths, squares, and bridges in the 20s–30s of the 20th century was supplemented by romantic stone sculpture works at the outlet sites of the sulfur springs. The works of art, whispering of the spring water, and the picturesque park psycho-emotionally empowered the patients.

Baldone Health Resort was developed until the mid-19th century, where people were treated with hydrogen sulfide baths and mud applications. Hydrogen sulfide baths were prepared in combination with the conifer extract, cooking salt, and carbon dioxide. Carbon dioxide baths were used to treat cardiovascular diseases. The picturesque park along the banks of the Ķekaviņa River with bridges, well-kept in the early 19th century had great importance in the healing process. The growth of the health resort was reduced in 1877 by the railway line to Ķemeri opened in 1877. The rebirth of Baldone Health Resort began in the mid-20th century, regaining its historic glory by receiving large funding for the expansion of the sanatorium. Unfortunately, the ill-conceived scale of the new volume of the building, along with the historical cultural space, disrupted its peace and balance. In 1838, a chapel was built in Ķemeri, which is located 6 km from the sea between lakes and bogs, rich

in springs and containing sulfur waters used in folk healing (Fig. 10).

In Ķemeri, the first bathhouse with a bath section was built, which until 1880 was the oldest building in Ķemeri. An Orthodox wooden church was built in the park area, as well as promenades, and recreation sites were created. The wooden bathhouse built in the late 19th century was combined in 1924 with the mud healing complex designed by architect E. Štālbergs (1883-1958). In 1838, with the permission of Tsar Nicholas I, on the state land the first state healing sulfuric spring bathing facility with 32 seats was built [6]. The resort was popular not only among the locals but also in the Russian Empire, therefore in 1912 a railway line "Ķemeri- Moscow" was opened. The five-story sanatorium building with roof terraces and a tower opened in 1936 was the culmination of the boom of the health resort (architect E. Laube) (Fig.14).

The beautiful building effectively located in the park embodies an image of a castle called the "White Ship", which is "stuck" in the forest landscape. Regular plantations were located around the building, which further merged with the picturesque Ķemeri Park, which consisted of a network of winding paths, pavilions, rotundas, bridges, and artificially created canals connected with the Vēršupīte River flowing through the park. The park was arranged in 1851–1861 under the guidance of the gardener M. Wagner (Fig. 11, 12, 13, 15). The beginnings of folk medicine in Latvia gave rise to the development of natural healing (springs, mud, pine needle extracts, carbon dioxides, bog climate, etc.). Healing sites or areas were the beginning of the development of certain building infrastructure.

The area of Ķemeri Spa is characterized by several landscape spaces – the forest, the park with tree groups, alleys, lines of trees and fields, watercourses, and buildings. The natural base, which consists of a forest, the Vēršupīte River, its branch and floodplains, makes 9.03 ha or 34.9% of the park area. In turn, the well-kept park with fields, the pavilion pond with the canal and the ditch make up 14.07 ha or 54.5% of the park area. Buildings with hardcover areas - 0.99 ha or 3.8% of the park area [16].

The central part of Ķemeri Park along the banks of the Vēršupīte River was created in 1851–1861. It is a cultivated park with a path system of the park and 13 bridges (Fig. 16). The forest massifs and Ķemeri Hotel Garden (*parterre*) stretch in the north and east of Ķemeri Park but in the south, a park with several fields is open. North of the pavilion pond, a field is located at the lowest point, created in the 1920s–1930s, occupying 0.2 ha or 0.8 % of the whole park. Historically, there has been a tanning place. The park is rich in centuries-old oaks, elms, linden trees, maples, pines, and fir trees.



Fig. 5. The fountain “Vāverīte” (the squirrel) of the sanatorium park in Baldone, the sulfur spring, sculptor Voldemārs Jākobsons, 1938.

Photo by the authors, 2018.



Fig. 6. The fountain “Ķirzaciņa” (the lizard) of the sanatorium park in Baldone, the sulfur spring, sculptor Voldemārs Jākobsons, 1938. Photo by the authors, 2018.



Fig. 7. The sanatorium building in Baldone.



Fig. 8. The sanatorium park in Baldone. Photo by the authors.

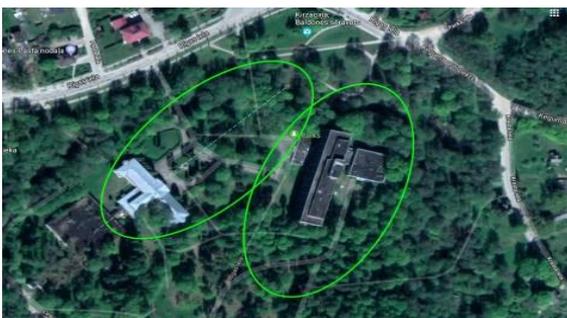


Fig. 9. Baldone Resort Park.
Created by the authors, 2018.

The expressiveness of the park's landscape space is enriched by individual volumes that enhance the emotional perception – the Orthodox wooden church (1893), monuments to the doctors (1861), and those who died in both wars. In the southeastern part – a wooden bath building (the late 19th century), which is combined with a mud healing complex (architect Ernests Štālbergs, 1924). In the 20s–30s, the park was expanded towards Lake Sloka, reaching a total length of 15 km of walkways. By straightening and deepening the Vēršupīte River, the hydrological conditions of the surrounding area changed, therefore the drainage of forests and bogs began to emerge in the Ķemeri area, resulting in a significant decrease in the rate of water flow in the Vēršupīte River. Geologists emphasize that the drainage of sulfur water springs has occurred as a result of these drainage works. Even in the postwar years, the intention was to continue draining the area around Ķemeri on an even larger scale, which would have led to drying up of the sulfur springs and the loss of the status of Ķemeri Health Resort. In the north and east of Ķemeri Park, there is a vast forest area that goes further to the Raganu bog. The biologically high-quality Ķemeri National Park in the 80s of the 20th century was founded to preserve and protect the processes of formation of mineral water and curative mud, which are important for the preservation of the spa values and the historical evidence of rehabilitation [10].

The development site of the historical medical resorts in Latvia was determined by the climatic (bioclimate), landscape, and hydromineral (hydro minerals and curative mud) factors. Bioclimate determines the impact of climate on human health, which can be both positive (used in climate therapy) and negative. Bioclimatic parameters, unlike meteorological parameters, have a complex effect on the human body.

Liepāja has been known as a bathing and healing site with sulfur springs since the 18th century and since 1810 as a resort. The *Merbi* private facility with cold and warm seawater baths started operating in 1834. After 1860, the boom of the city of Liepāja was due to the creation of the dune greenery, which protected the city from traveling sand and turned the coast into a gorgeous park. After centuries of fear of the seashore sand attack around 1867, the creation of a park with trees around the buildings was started. Opposite Peldu Street, in 1870, Jūrmala Pavilion was built and a fountain was created. The architecturally spatial solution of Kūrmājas Prospectus was completed by the architect's M. P. Bertschy (1840-1911) designed well-house with a restaurant and an area with parterre plantings surrounded by a metal fence, as well as creating a concert garden with 500 spectator seats. “*Nicholas Swimming Pool*” was built close to the dune belt, thus protecting the resting area from the



Fig. 10. The well-house plantations in the early 20th century NKMP archive.



Fig.11. Flower beds near the well-house the 30s of the 20th century. Materials of Ķemeri Museum.



Fig. 12. Ķemeri Concert Hall, the early 20th century. NKMP archive.



Fig. 13. A pavilion with a spring, the early 20th century. NKMP archive.

sea wind (1902, architect Paul Max Bertschy) [20]. In 1925, healing mud was discovered in Lake Liepāja and in the 20s–30s, mud baths, compresses, sulfur, and carbon dioxide bath divisions were opened. In 1895, Liepāja City Council took a decision to establish a park between Peldu Street and Krasta Street. The plantations were created according to the project developed by Georg Kuphaldt, the director of Riga Gardens and Parks. During World War I, the city was affected by the outbreak of dysentery epidemic, which led to felling of many trees and shrubs in the southwestern part of the treatment facility area in order to set up tents for patients. There were several tennis courts in the greenery of the seaside park in Liepāja and a sports ground in the south of the park. From 1908, an Art Nouveau fountain started running [9]. The city gardener A. Leimanis made the reconstruction of Jūrmala Park in 1930, forming lines of trees and in the north and middle of the park -alleys, planted the Crimean linden alley, lawns with tree and shrub groups at Jūrmala Street.

Liepāja Seaside Park was the largest in Latvia – it stretched 3 km along the Liepāja beach (now it occupies 70 ha). It was planned that the park would be even bigger - it would stretch from South Pier to Thunder Canal (Fig. 18). There were sports grounds in the park (Fig. 17) with greenery, around 20 different varieties of linden trees (*Tilia*), 23 varieties of maples (*Acer*), willows (*Salix*), birch trees (*Betula*), coniferous trees, as well as exotic trees and shrubs – beeches (*Fagus sylvatica*), red-leaved (purple) beeches (*Fagus sylvatica purpurea Latifolia*), the Manchurian walnut tree (*Juglas mandshurica*), larches (*Larix*), yews (*Taxus baccata*), the black pine (*Pinus nigra*), the cork or velvet tree (*Quercus suber*) (not survived), the tomato shrub, etc..

In total, 130 different tree and shrub varieties grew in the park. The park was the hardest destroyed in the 50s and 60s of the 20th century, there were 113 varieties of trees and shrubs left behind. 32 local and 139 imported tree species were found in the inventory carried out in 2000.

After the change of the groundwater level after World War II, the water level in the pond dropped, the land of the sanatorium area was rapidly bogged, which could be related to the construction of the adjacent Ezerkrasts locality, which changed the groundwater levels of Liepāja. It is known that the bed of the ancient pond was lined with round stones. The inconspicuous development of the drainage systems, the location of dense buildings, the creation of new underground communications routes, etc., is the reason for the depletion of the subterranean depths, which, in turn, reduces the quality of the spa.



Fig. 14. Kemeris Sanatorium in the 30s of the 20th century. Churn groups on the lawn. NJKP archive.



Fig. 15. Walls with climbing plants near the stage, the early the 20th century. NJKP archive.



Fig. 16. The plan of Kemeris Spa with the historical well-house park, 1938. Kemeris Museum.

The value of a rehabilitative environment is determined not only by materials measurable but also by the values of the aesthetic quality. A comprehensively rich application of aesthetic and functional principles in the development of the concept of the outdoor space of rehabilitation centers promotes the harmonious development of the rehabilitation process among patients.

Gardens and parks contribute to the social interaction that improves the immune system, promotes positive mood, and faster recovery. For centuries, health care facilities were hidden behind high walls and fences, which had a significant impact on the perception of patients. Within strictly defined boundaries, a "sick"

and healthy society was separated, not only physically but also psychologically.

The landscaped space and human communication is only possible if it has favorable conditions - the landscape space is easily accessible to patients, families, and the staff. The modern rehabilitative landscape includes high-quality and safe walking paths, easy-to-move rest benches, chairs or loungers.

Psychological perceptions stimulate the patients' perception of the daily rhythm, as well as provide harmonious sense of balance.

If the expressiveness of the landscape space is able to address people emotionally, then it develops as a rehabilitating environment and it is able to generate positive energy that heals the psycho-emotional state of a person. The research proves that in the modern technological society the quality of an emotionally strong architectural and spatial linkage of the construction volumes of the outer space and rehabilitation center is lacking, which, in turn, transfers pulse to the continuation of the medical rehabilitation process [3]. A compositionally balanced structure of gardens and parks develops the world of human feelings in versatile manners and makes them more responsive to what is happening around them. R. Jūrmalietis, a researcher of the Environmental Research Center of the University of Liepāja, describes the landscape as a combination of space with the abiotic, biotic, and social conditions that are physically and psychologically interacting with a group of individuals or individuals within the space, influencing the processes of its life and consciousness [12]. Each landscape space offers the most unexplored and undervalued tools for improving and harmonizing human health, as there is a mutual dialogue that must contain:

- understanding of the functional structure of the environment;
- the assessment of the visual and aesthetic values of the environment;
- understanding of the cultural, historical, and environmental values.

These values in the life of each individual come together with experience of distress and the "intrinsic" value. Coloring in the landscape effectively acts on emotions and imagination. Medical research has shown that being in a green environment, body temperature and pulse are reduced, breathing is smoothed, people become quieter or more relaxed, the blood pressure is lowered, and it is much easier to deal with anxiety. Fragmentation of the urban environment, traffic noise, missing green plantations are tiring and stressful. In view of the above, new areas outside the urban space are being sought for the establishment of rehabilitation centers where not only the architectural

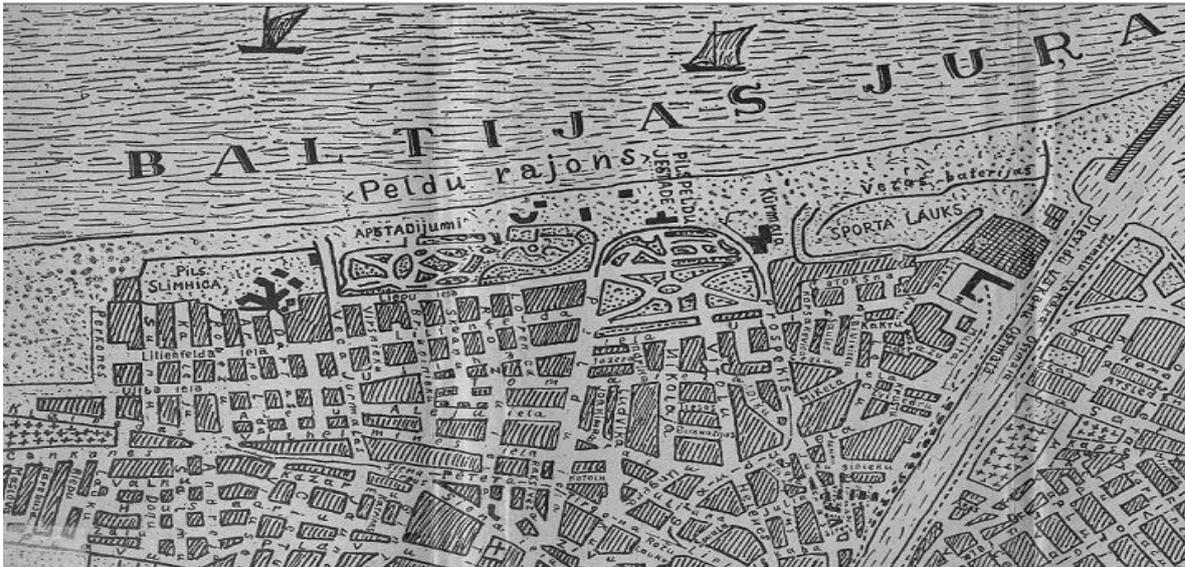


Fig. 17. A fragment of the map of Liepāja. The swimming area, the 20s of the 20th century. Source: The National Library of Latvia, Cartography Department of the National Library of Latvia, Plan for Libau, 1931.



Fig. 18. Liepāja Seaside Park the 30s of the 20th century. Lost Latvia.



Fig. 19. The well-house "Nicholas Swimming Pool" in Liepāja, 1870. Liepāja Museum.

landscape of the rehabilitation centers is important but also the surrounding or the nearby and accessible landscapes. This is especially true of the sight lines that need to be cultivated and preserved in the landscape at the height of both standing and seated people. The same applies to the sight points from the interior.

The research of the aesthetic and functional environment is based on the whole system – the theoretical regularities, practical environmental and interpersonal relations, the mutual expressions of the aesthetics, culture, and art. Human health aspects are seen as one whole. This refers to the level of the human social communication, emotional balance, mental development, and the informative accumulation of the cognition, the acceptance of the spiritual world, the level of physical preparedness, and the level of the personality growth. The design of the landscape space of rehabilitation centers most directly affects the patient's feelings, improves people's communication abilities and attitudes towards each other. In the recovery process, rehabilitation centers must provide *multifunctional garden spaces* that allow each individual to find the most suitable one.

If the expressiveness of the landscape space is able to address a person emotionally, then it develops as a rehabilitating environment and it is capable of generating positive energy that heals the psycho-emotional state of a person. The research shows that the developed society of the modern technology lacks the quality of a harmonious linkage of an emotionally strong outdoor space and the building volume, in turn, transfers pulse to the continuation of the process of the medical rehabilitation.

In the 90s of the 20th century, Latvia experienced a crisis of sanatoriums and health resorts. Many of them were closed, rebuilt, and adapted to other functions (Baldone, 1992, Ķemeri, 1994) [14]. In the 20th–21st century, the economic and political situation in Latvia contributed to the crisis of health resorts, as health resorts could be enjoyed abroad. The public demanded high-quality aesthetic services here and now but failed to implement it for economic reasons. The so-called "scissors" of the economic policy were emerging that destroyed the highly developed cultural and historical heritage. This applies both to the preservation of the

architectural and historical values of buildings and to the areas of historic parks.

More and more people's health in the 21st century becomes dependent on the lifestyle of the society or on the basis of inactivity and chronic psychological tension as it is not enough time to restore physical and emotional forces [19]. It contributes to heart attacks, cardiovascular, diabetic, depressive, schizophrenic diseases, atherosclerosis, and infectious diseases, which are largely related to people's wrong lifestyle, exhaustion, and fatigue [1]. Like any work of art, the healing garden, as a value contains an "open field" for further productive research of reality. People tend to embrace and explore issues from all sides – like how a person experiences nature in his/her body. You cannot ask in the rehabilitation garden where nature ends and where the man starts. In order for the rehabilitating landscape to address the patient, it is necessary to pay attention to the perception of each individual and its determining factors. It is important to consider not only the patient's age group and the direction of treatment but also to make a comprehensive, harmonious landscape space in the planning of a modern rehabilitative environment.

The rehabilitation and sense garden of the 21st century is an endless dialog between the man and nature that invites you to participate and explore, the plans have simplicity of lines that promote relaxation and concentration of patients [4]. After the 50s of the 20th century, there was a downturn of the significance of ecology in the planning processes, which could be explained by the rapid growth of industry and the boom of forestry. In the 21st century, ecological planning of landscapes is gradually gaining new momentum, creating a new approach to the spatial planning through solutions for sustainable landscaping and calling for a balance between the economic interests of the man today and the preservation of natural and cultural, and historical values for the future [15]. At present, the regulatory enactments of the Republic of Latvia do not require the observance of the principles of the ecological planning and the application of the ecological plan for the development of areas but their use in planning landscapes would be only a benefit to Latvian nature.

In rehabilitation gardens and parks, river banks, lakes, bays, canals or ponds form wet areas of varying degrees and they are of particular value to wildlife and wetland plants.

Landscape ecology in the rehabilitative landscape space is expected to have perspective growth and various challenges for a sustainable landscape design. While developing ecological plans for rehabilitation centers, attention should be paid to reducing the consumption of natural resources,

while developing sites with high added value, created by a person with his or her knowledge and professionalism. This is especially true of rehabilitation, thematic activities of healing, and environmental guides in rehabilitating landscapes. Innovative ideas in rehabilitation gardens and parks provide greater financial returns, as well as vary the uses of the scenic park space, attracting groups of visitors of different ages. One of these is the roof garden, which is added to the ecological buildings. As a positive benefit in building roof gardens, the emotionally rich panoramic views are noteworthy to mention that are not perceived at the street level. An eco-planning strategy can help improve biodiversity in rehabilitation gardens and parks, respecting the connections between nature areas to prevent landscape fragmentation with hedges, watercourses, park edges, roads, etc., and to improve the ecological integrity of the area. Focusing on the possibility of free movement of species, the landscape permeability, and animal diversity would improve. In some cases, these zones are also joined by small-scale agricultural, forestry, and also coastal ecosystems, which, as adjacent landscapes, complement the small rehabilitation garden or the park.

The surrounding enclosing nature parks, restricted areas, Natura 2000 areas, and other biologically valuable landscapes are important (the rehabilitation center "Tērvete", Rāzna, Krimulda, Līgatne) [13; 16]. An example of how the aesthetic quality of the landscape today is valued in the material terms is found in the practice of real estate taxation, where the price of land is determined by a set of criteria.

Conclusions

A professionally designed rehabilitation garden contributes to the recovery of a person's psycho-emotional balance. The result of high-quality medicinal gardens is provided by the use of the most suitable plants for the local climatic conditions, as well as a functionally and compositionally structured layout. Recreation and treatment at a site rich in natural healing resources shortens the time of medical rehabilitation and the recovery of the human body, which is also a financially important factor. For people with sensory disabilities and intellectual disabilities, the specificity of the healing gardens must be created not only in the easy-to-understand language of the compositional symbols but also in their visual and aesthetic message of the psycho-emotional ease of perception and laconism.

The use of wide glazing in the construction volumes of rehabilitation centers creates a visually unified outdoor and indoor connection, which is

a good criterion for promoting a positive emotional state of the patient.

With the development of modern buildings alongside the natural depths of the historic spas, the geomorphological structure of the earth's layers must be carefully examined. Without evaluating the findings of the engineering research, a serious change or complete disappearance of the historical chemical composition of healing springs is possible. Over the last hundred years, as the country has changed its political and economic situation, the compositional image of the gardens and parks of the medical centers is changing, which is influenced by the understanding of the size of the new building and the location of the infrastructure in the landscape space.

As the state funding for the maintenance of the historic sanatoriums and the spas decreases and they are closed down, the testimony of the cultural and historical heritage disappears during the boom period of health resorts in Latvia. The site preserves the richness of the natural depths but its historical use and the context with the park disappear. Parks and gardens

are re-planned and transformed from an intensive rehabilitation to a recreational landscape space.

The technological possibilities of the 21st century give high comfort to the process of an intensive medical treatment in rehabilitation centers. Technologies are also applicable to modernized ventilation, recuperation, and conditioning systems that provide high-quality indoor air exchange and patient satisfaction. The comfort offered by technologies indirectly affects the patient by promoting inactivity and indifference. Out of this observation, the newly created physical therapy gardens established in the early 21st century are welcome that promote activities in the "green" outdoor space. The above problem is also exacerbated by the western medical institutions as the rehabilitation gardens are gradually disappearing and parking lots are being replaced instead.

Many of today's patient rehabilitation centers rely more on intensive therapeutic treatment, failing to devote even a small part of the rehabilitation time to movement activities and the "green" outdoor space.

References

1. Aldwin, C. *Stress, coping, and development, 2nd edn.* The Guilford Press, New York, 2007.
2. Balode, L. Environmental Landscape Aesthetic a Healing Factor. *Art Tempus*, 2014, Volume 2, p. 52–59
3. Balode, L. Dziedoņioše sajūtu dārzi un parki. *Latgales Tautsaimniecības pētījumi. Sociālo zinātņu žurnāls*, 2013, Nr. 1(5), 7.–22. lpp. [In Latvian]
4. Balode, L. Therapeutic sense gardens. *BIONet, Biopsychological Basics of Life*, 2014, vol. 2, p. 7–13.
5. Belte, P. *Rīgas Jūrmalas, Slokas un Ķemeru pilsētas ar apkārtni: vēsturisks apskats.* Dubulti: Autora izdevums, 1935, 299 lpp. [In Latvian]
6. Blaus, I. *Baldone.* Rīga: Latvijas Valsts izdevniecība, 1962, 86 lpp. [In Latvian]
7. Bļugers, A. *Populārā zinātņu enciklopēdija.* Rīga: Galvenā enciklopēdiju redakcija, 1984, 623 lpp. [In Latvian]
8. Broce, J. K. *Zīmējumi un apraksti. 2. sēj. Rīgas priekšpilsētas un tuvākā apkārtnē.* Rīga: Zinātne, 1996. [In Latvian]
9. Gaitniece, L. *Dziednīca pie jūras. Versija par Liepājas medicīnas vēsturi.* Rīga, 2017, 29.–30. lpp. [In Latvian]
10. Heerwagen, J. H., Orians, G. H. Humans, habitats, and aesthetics. In: *The Biophilia Hypothesis.* Washington: Island Press / Shearwater Books, D. C. P., 1993, p. 138–172.
11. Horsta, K. *Sanatoriju arhitektūra Latvijā. 1918–1940.* 2018, 256 lpp. [In Latvian]
12. Jūrmalietis, R. *Lekciju koncepti vides psiholoģijā.* Rīga: LU Vides zinātnes un pārvaldes studiju centrs. 1998. [In Latvian]
13. Nikodemus, O. Ainas daudzveidīgais saturs un aizsardzība. *Vides zinātne.* Rīga: LU Akadēmiskais apgāds, 2008, 456.–477. lpp. [In Latvian]
14. Sarma, I. Ķemeru kūrorta vēsture. *Jūrmalas Kūrorta Ziņas.* 2009, 4 lpp. [In Latvian]
15. Schmid, W. A. The emerging role of visual resource assessment and visualisation in landscape planning in Switzerland. *Landscape Urban Planning.* 2001, No. 54 (1–4), p. 213–221.
16. Straupe, I. *Dabas parka "Tērvete" dabas aizsardzības plāns.* http://www.daba.gov.lv/upload/File/DAPi_ap_stiprin/DP_Tervete-09.pdf [In Latvian]
17. Švābe, A. *Latviešu konversācijas vārdnīca.* 1. sēj., 1804 lpp. [In Latvian]
18. Uško, U. *Ķemeru parka dabas vērtības un to raksturojums.* Pieminekļu inspekcija, 2017. [In Latvian]
19. Währborg, P. *Stress och den nya ohälsan.* Stockholm: Natur and Kultur, 2009. [In German]

INFORMATION ABOUT THE AUTHORS:

Aija Ziemeļniece, Dr.arch., Professor at the Faculty of Environment and Civil Engineering, Department of Landscape Architecture and Planning of the Latvia University of Life Sciences and Technologies, 22 Liela iela, Jelgava, Latvia, LV-3001. E-mail: aija@k-projekts.lv

Linda Balode, PhD student at the Faculty of Environment and Civil Engineering, Department of Landscape Architecture and Planning of the Latvia University of Life Sciences and Technologies, 22 Liela iela, Jelgava, Latvia, LV-3001. E-mail: linda.balode2010@inbox.lv

Kopsavilkums. Pētījumi par dabas pamatnes dziedniecisko īpatnību ietekmi uz cilvēka veselību Latvijā ir aizsākušies 15.gs. Vairāku gadsimtu garumā līdz mūsdienām ir pierādīts, ka iedarbības saite starp dabas devumu pacienta rehabilitācijas laikā un pacientu atveseļošanās ilgumu tikai stacionāru iekšējās veselības iestādē, veido krasu atšķirību. Pacienta vizuālā sasaiste ar ainavtelpu veido pozitīvas emocijas, kam ir

dziedinošs efekts, pētījumos pierādot pozitīvas izmaiņas asinsrites, holesterīna un psihoemocionalitātes līmeņa izlīdzināšanai organismā. Vairums dārzi un parki sniedz estētisku baudījumu, bet rehabilitējošie sajūti un terapijas dārzi tiek veidoti tā, lai funkcionāli darbinātu cilvēku maņas (redzi, tausti, smaržu, garšu un dzirdi). Rehabilitācijas dārzs vai parks ir vieta, kas veicina fizisko, garīgo veselību un labklājību, un tie ir ierīkojami pie ārstniecības iestādēm, kur pacienta un tā tuvinieku psihoemocionālo sajūtu mirkli ir vistrauslākie.

Profesionāli veidots rehabilitācijas dārzs veicina cilvēka psihoemocionālā līdzsvara atgūšanu. Kvalitatīvu ārstniecības dārzu rezultātu nodrošina vietējiem klimatiskajiem apstākļiem piemērotāko augu izmantošana, kā arī funkcionāli kompozicionāls sakārtots plānojums. Atpūta un ārstēšanās dabas dziedniecības resursiem bagātā vietā saīsina medicīniskās rehabilitācijas un atjaunošanās laiku cilvēka organismam, kas arī finansiāli ir svarīgs faktors. Cilvēkiem ar sensoro funkciju un intelektuālās attīstības traucējumiem ārstniecisko dārzu specifika veidojama ne tikai viegli saprotamā kompozicionālā simbolu valodā, bet arī to vizuāli estētiskais vēstījums ietver psihoemocionāli vieglu uztveramību un lakonismu.

Rehabilitācijas centru būvprojektos pielietojot plašus stiklojumus, tiek veidota vizuāli vienota ārtelpas un iekštelpas sasaiste, kas ir labs kritērijs, lai veicinātu pozitīvu pacienta emocionālo stāvokli. Mūsdienu jaunajai apbūvei attīstoties līdzās vēsturisko kūrvieta dabas dzīlēm, ir rūpīgi jāpārlicinās par ģeomorfoloģisko zemes slāņu uzbūvi. Neievērtējot inženiertehnisko pētījumu slēdzienus, ir iespējama nopietna vēsturiski dziedniecisko avotāju ķīmiskā sastāva izmaiņas vai pilnīga izzušana.

Pēdējo simts gados, mainoties valstī politiski ekonomiskai situācijai, mainās ārstniecisko centru dārzu un parku kompozicionālais koptēls, ko ietekmē jaunās apbūves mēroga izpratne un infrastruktūras novietojums ainavtelpā. Samazinoties valsts finansējumam vēsturisko sanatoriju un kūrvieta uzturēšanai, un tās slēdzot, izzūd kultūrvēsturiskā mantojuma liecība par kurortoloģijas uzplaukuma laiku Latvijā. Vieta saglabā dabas dzīļu bagātību, bet vēsturiskais to pielietojums un konteksts ar parku izzūd. Parki un dārzi tiek pārplānoti un veidojas to transformācija no intensīvas rehabilitācijas uz rekreatīvu ainavtelpu.

21. gadsimta tehnoloģiskās iespējas dod augstu komfortu intensīvam ārstnieciskajam procesam rehabilitācijas centros. Tehnoloģijas ir attiecināmas arī uz modernizētām vēdināšanas, rekuperācijas un kondicionēšanas sistēmām, kas nodrošina kvalitatīvu gaisa apmaiņu telpās un apmierina pacientus. Komforts, ko piedāvā tehnoloģijas, netieši ietekmē pacientu, veicinot mazkustīgumu un vienaldzību. Izejot no šī apsvēruma, ir apsvēkami 21. gadsimta sākumā jaunizveidotie fiziskās terapijas dārzi, kas veicina aktivitātes “zaļajā” ārtelpā. Minētā problēma ir saasinājusies arī rietumvalstu medicīnas iestādēm, jo rehabilitācijas dārzi pamazām izzūd un to vietā tiek iekārtotas autostāvvietas.

Liela daļa mūsdienu pacientu rehabilitācijas centros uzticas vairāk intensīvai ārstnieciskai terapijai, neveltot pat nelielu daļu no rehabilitācijas laika kustību aktivitātēm un “zaļajai” ārtelpai. Daļēji tas liecina par rehabilitācijas centru teritorijas zemu estētiskās kvalitātes līmeni un nespēju piesaistīt pacientus. Ainavu ekoloģijai rehabilitācijas ainavtelpā ir sagaidāma perspektīva izaugsme un dažādi izaicinājumi ilgspējīgas ainavas veidošanā. Izstrādājot ekoloģiskos plānus rehabilitācijas centriem, uzmanība jāvērs uz dabas resursu patēriņa samazināšanu, turpretī attīstot objektus ar augstu pievienoto vērtību, kuru veido cilvēks ar savām zināšanām un profesionalitāti. It īpaši tas attiecināms uz rehabilitācijas, dziedniecības tematiskajām aktivitātēm un vides gidiem rehabilitējošās ainavās. Inovatīvas idejas rehabilitācijas dārzos un parkos sniedz lielāku finansiālo atdevi, kā arī dažādo ainaviskās parku telpas izmantošanas iespējas, piesaistot dažāda vecuma apmeklētāju grupas. Viena no rehabilitācijas formām ir jumta dārzs, kas pieder pie ekoloģiskām būvēm. Kā pozitīvs ieguvums jumta dārzu izveidē ir atzīmējami emocijām bagāti panorāmas skati, kas ielas līmenī nav nojaušami.

Ar ekoloģiskās plānošanas stratēģiju ir iespējams rehabilitācijas dārzos un parkos uzlabot bioloģisko daudzveidību – ievērojot savienojumus starp dabas teritorijām, lai novērstu ainavas sadrumstalotību ar dzīvžogiem, ūdenstecēm, parku malām, ceļiem utt. un uzlabotu teritorijas ekoloģisko vienotību. Pievēršot uzmanību sugu brīvai pārvietošanās iespējai, uzlabotos ainavas caurlaidība un dzīvnieku daudzveidība. Dažos gadījumos šīm zonām pievienojas arī nelielu platību lauksaimniecības, mežsaimniecības un arī jūras piekrastes ekosistēmas, kas kā blakus esošas ainavas papildina nelielo rehabilitācijas dārzu vai parku. Piemērs tam, kā ainavas estētiskā kvalitāte mūsdienās tiek novērtēta materiālā izteiksmē, rodams nekustamo īpašumu taksācijas praksē, kur zemes cenu nosaka noteiktu kritēriju skala.