FOREIGN EXPERIENCE IN CREATING GREEN ZONES FROM THE ROOFS OF HOUSES

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ANNOTATION

The article explores foreign experience in creating green zones on the roofs of houses. In the Middle East, the construction of gardens on flat-roofed buildings has long been a tradition. The homeland of such events is Babylon and Syria. In these countries, the "Hanging Gardens of Semiramis", built 600 years ago, is recorded as the seventh miracle. During the excavation of a 45-meter-high hill on the left bank of the Euphrates River, the remains of a canopy and a hydraulic structure and a water supply system were found.

Keywords: green roof; hanging garden; terrace; reed; salmon; belt; hydraulic structures; column.

INTRODUCTION

In the context of the growth of large cities of the country, due to the fact that the upper echelons of cities are moving away from the green world, there is a violation of the ecological balance, lack of fresh air. In this sense, the transfer of the green world to the upper horizons of cities, the roofs of buildings, the improvement of the use of roof space is a topical issue today [1]. In this sense, green roofs, it is very important to study foreign experience in their organization.

THE MAIN PART

As an example of a green roof, people of the primitive system can leave the caves and bring to themselves the trunks and branches of trees, tents built using grass, and places of residence. For many years, people covered the roofs of their houses with straw and reeds in order to keep the heat organized inside the rooms. In hot weather, they formed a green environment on the green roofs. The construction of such roofs was a custom in Scandinavia. Such buildings can still be found today, in the old villages of the country, as the houses of the peasants (Fig. 1).

In the Middle East, the construction of gardens on flat-roofed buildings has long been a tradition. The homeland of such events is Babylon and Syria. In these countries, the "Hanging Gardens of Semiramis", built 600 years ago, is recorded as the seventh miracle. During the excavation of a 45-meter-high hill on the left bank of the Euphrates River, the remains of a canopy and a hydraulic structure and a water supply system were found. In ancient times it was discovered that there were legendary awning gardens in these areas. It was noted that the awning gardens were built in the form of a pyramid-shaped ascending system in the form of a staircase, as a constructive solution that ensures a timely and even distribution of loads on the foundation. A smaller porch garden was built on top of the porch garden, and a smaller porch garden (in the form of a staircase) was built on top of it, and the highest garden occupied a place 25 m above the ground. The whole garden faces south. In such gardens, equipped with a special water supply system, the plants are located in the same way as in nature: on the upper porches there are fountains that purify the air, among the plants there are fast-growing mountain trees on the upper porches, slow-growing trees on the lower porches. the water overflowed the barriers, collected, and cooled the environment on its way down (see Figure 2) [2].

Archaeologists have reconstructed a constructive solution of roofing. It was found that the roof coverings consisted of cut flat stones, two rows of bricks on top of it, and lead plates that protected from moisture. Bitumen-soaked reeds over the slabs covered it with fertile soil. It was found that there were pipes in the body of the pillars and through them the water of the Euphrates River was delivered to the highest level of the porch.

Later, Eastern culture moved to Greece, where the roofs and balconies were decorated with flowers and trees in pots, and joined the worship of Adonis, which was celebrated in Rome. Greening the roofs, arranging fruit and decorative trees in pots, beautifying the environment has become a habit.

Excavations in Pompeii have shown that the roofs of the villas are often finished with green terraced terraces. Traces of such solutions were observed on the roofs of the arched structures surrounding the Misterias villa (Fig. 3). In 28 BC, evergreen trees and shrubs grew in the circular terraces of the mausoleum of the emperor Augustus in Rome.

In the 5th century, luxurious gardens were created on the terraces of the upper floors of the palaces (palaces) of many Byzantine emperors. It is known that one of the poets of Justinian's palace recited poems (poems, ghazals) praising the view of the miraculous blue sea among the gardens protected from wind and sunlight.

Correspondence about Byzantium in the XI-XII centuries, addresses read in worship, described the beauty of the gardens, the landscape, the prevalence of such gardens. Over time, the establishment of green gardens on the roofs moved to the northern regions of Europe. In 1487, a green garden with fruit trees, vineyards and flower beds was established in the southern part of the castle of the German Emperor Frederick III in Nuremberg. A similar garden was built by Archduke Ferdinand at his Ambras Castle in Tyrol. Later in Germany, on the roof of the palace of Archbishop Johann-Philippe were planted flowerbeds in the ground, bushes and trees in pots. The green gardens set up on the roofs of Karlsberg Castle in Sweden are also famous.

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During the period of revival and development, the hanging gardens belonging to kings, dukes and other celebrities became more luxurious, in which foreign plants were brought and built. Italy is especially famous for such gardens. In Florence in the 15th century, exotic ornamental trees were planted in the patio gardens on the roofs. In Mantua, a large hanging garden was built on the roof of the castle of Duke Gonzak. Cardinal Andrea del Vale built a museum in Rome in 1530 in the form of a "hanging garden", and in Verona, Count Mafarey built a very beautiful, picturesque garden on the roof of his palace, planting a variety of flowers and trees.

In the 16th and 17th centuries, hanging gardens were created on the porch of the castle on the rocks of the island of Isola Bella, surrounded by the waters of Lake Lago Madjora in northern Italy, which became a model of park art in later development. Above it is an ensemble of several underground caves with beautiful ornamental trees from all over the world, and under the canopies where flowers are gathered, which were a refuge for people on hot summer days (see Figure 4). It was very expensive to build such terrace gardens, so such gardens could be found in the homes of very rich, famous people.

In the early 18th century, the German traveler Johann Folkmer wrote: “In Venice and Genoa, luxurious gardens are in the air above the settlements. In Genoa, most buildings are built on rocky ground, which bears the weight of fertile soil with a roof for plant growth. ” Soon, houses with gardens on their roofs appeared not only in Italy,

but also in relatively northern countries, for example, in the rich cities of Germany - Nuremberg and Augsburg, and even in England. In England, a large area on the roof of the Wilton House, which belonged to the Earl of Pembroke, was greened, and fountains set up.

In the XVIII century, the famous scientist and builder Paul Marnerger recommended the widespread use of the roofs of buildings and structures under construction for domestic services, recreational purposes. In this sense, he advocated the construction of flat-roofed buildings rather than sloping-roofed buildings and proposed the replacement of sloping-roofed buildings with flat roofs. Half a century later, the idea of building flat roofs rose again on the side of Karl Rabitz. Renowned builder and inventor Karl Rabitts, along with construction scientist Marnerger, developed several completely new designs of connected flat roofs. In particular, the influx of reinforced concrete into the construction and the French Le Carbyuze and the American F.L. Thanks to the influx of well-known architects and urban planners such as Wright, flat-roofed garden projects on large surfaces were created and constructed in the late 19th and early 20th centuries. Le Corbuze has developed a series of projects that use pitched roofs, ranging from small villas to large residential complexes, to make roofs an integral part of architecture. Simultaneously with Le Carbuze, similar projects in many other countries were developed and put into practice by other architects, which emerged as a new wave. For example, the Perret brothers designed apartment buildings with terraces and parks in Paris in 1903, a restaurant with a green area on the roof of the Walter Gropius office building in Cologne in 1914, and a green-roofed restaurant building in Chicago using Frank Lloyd Wright. built [4].

From the twenties of the last century, new technical solutions for new pitched roofs began to emerge. The construction of such roofed buildings has spread to many countries. In the 1930s, R. along Kensington-Heath Street in London. Hancock designed a six-story apartment building, based on which Derry and Tomz, Europe's largest garden complex, occupies an area of 0.6 hectares. To this day, there are Victorian “Tudor”, “Spanish” and English landscape style gardens built in different styles (see Figure 5).

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Currently, 10% of all roofs in Germany are green, and in many European countries, including Austria, Italy, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom, work is underway to establish associations that actively promote the idea of green roofs. "Green roofs" are also popular in Canada and the United States, although they are not as numerous as in Europe.

Records and descriptions of gardens established on the first roofs in Russia date back to the XVII century. "Rising Gardens" and "Gardens on Straw" are located on stone domes attached to the palace buildings of the Moscow Kremlin. There were several such parks in the Kremlin. Especially on the banks of the upper and lower rivers, the garden, which in turn is called "red crimson" for its beauty, was very charming. The Lower Coastal Garden was created by Nazar Ivanov in 1623 on the way from the Kremlin to the Moscow River. It was surrounded by a stone fence with windows, from which there was a wide view towards the back of the Moscow River. Later, in 1687, a pool with a depth of 2 arshins (1.42 m) was built in the upper garden, and a tower was built to supply water to the pool, which has survived to this day. A flotilla of small boats was organized in the pool, and the young Peter I swam a lot in these boats, where he developed a love for warships.

The lower coastal red garden, not far from the upper garden, was built in 1681 by King Alexei Mikhailovich. There is also a swimming pool inside. On the inner surface of the stone wall surrounding the garden, there are

inscriptions by master Peter Engels urging people to look to the future with hope, which makes the garden more charming and luxurious.

High-level gardens have emerged as a distinctive type of Russian urban gardens of the seventeenth century. Stretching to the level of the upper floors, these gardens seem to have penetrated into the living rooms of the apartment building. In Moscow in the XVII century "red" gardens belonging to boyars such as Golitsyn and Ordyn Nashokin were popular. In these gardens, tall white birch trees, which provide flat shade and coolness, give an artistic positiveness by adding flowers, medicinal grasses and birdsong, and architectural details.

In 1675, Patriarch Joachim instructed his worshipers to build a stone building in the middle of the Kremlin, consisting of utility rooms, and to create conditions in front of it so that a garden could be planted there. Let it be possible to sit in the garden, relax and worship. Have the opportunity to surround the garden with a stone wall. Let the priests who live and work on the second floor have the opportunity to go directly to the gardens created on the second floor level. In the garden created on the roof of the stone palace, instead of lead planks, beams made of wooden beams are installed. The grooves are provided with soil. Flowers and trees are planted in the soil. The flowers that grow and bloom in the groves are compared to the hanging gardens of Semiramis, where the trees are described as a miracle of the world. Later, in the XVIII century, such gardens were also established in the new capital of Russia, St. Petersburg (see Figure 6).

The introduction of new building materials and structures in the XIX century created opportunities for the construction of such gardens not only for the rich, but also for the general population. In 1839, such a garden was built in the Marfino Square near Moscow (architect M. Bykovsky). After that, the exploited green roofs were built in the Morozov Palace (architect V. Mazqrin), on the roof of Perlov's house on Myasnitskaya Street (architect R. Klein).

At the end of the XIX century, such gardens were built on the roof of the house of Zeytseva on Furshtatskaya Street (arch. M. Bogomolov), on the roof of the house of Orlov on Voznesensk Avenue (arch. I. Markelov) and in other areas.

In the twentieth century, the interest in creating gardens on the roofs journalist I. Vasilevsky's visit to Leipzig was further influenced by his writings describing green roofs, in which he saw the cultivation of mulberries, raspberries, cauliflower, and low-growing fruit trees [Restorator, 1911, №14]. In 1912, the owner of a restaurant on Dorogomilovskaya Street created a garden for visitors to the restaurant on the roof of his house, and the following year a garden on Kalyaevskaya Street with gardens and fountains was created on the roof of the restaurant. By the 1920s, the construction of exploited flat-roofed buildings became an integral part of home construction. Brothers Vesnins and Golosovlao, M. Ginzburg and others created the theoretical basis for such solutions.

World War II delayed the construction of such terrace gardens for a long time. In the 60's and 70's, a single pitched roof was built. In 1976, a 14- and 16-story apartment building was built in Minsk. A two-tiered garden was built on top of the 14-story block. On both terraces connected by stairs, trees, shrubs and flowers are built in concrete vases. Studies on the microclimate of green roofs exposed to direct solar radiation for several years have concluded that such roof areas under open solar radiation can be used by the population for recreational

purposes [6, 7, 8, 9]. In Moscow in 1999, a large garden was established on the roof of the Botanical Garden of Moscow State University. Research is being conducted there to recommend varieties of plants and trees to be grown in roof-mounted gardens [10].

Conclusion. Abroad, a number of studies have been conducted on the transfer of greenery to the roofs of buildings, the organization of gardens, recreation areas on the upper floors, the recommendations have been implemented in some buildings to some extent. However, in no country do you encounter the widespread use of green roofs. It is important to study in depth the possibilities of the use of green roofs in the cities of our country, to study the unexplored areas and to use foreign experience.

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