

# Wooden houses of Penza Town of the 19<sup>th</sup> - early 20<sup>th</sup> centuries and the problem of heritage preservation

E G Lapshina and D V Eshchin

<sup>1</sup>Penza State University of Architecture and Construction, 28, Titova str., Penza, 440028, Russia

E-mail: [elenlaps@mail.ru](mailto:elenlaps@mail.ru)

**Abstract.** The article presents the data on the influence of historical conditions on the formation of the architectural image of a wooden residential building. The problem of preserving wooden architecture as a historical and architectural heritage is considered. Material conservation is possible for the types of residential buildings that were built in the city of Penza in the first and second half of the 19<sup>th</sup> century. Wooden Art Nouveau houses built at the turn of the 19<sup>th</sup> and 20<sup>th</sup> centuries have been lost for today. The construction of their virtual models is proposed.

## 1. Introduction

The architectural image of a wooden residential building was investigated taking into account the historical stages of the development of wooden architecture during the 19<sup>th</sup> - early 20<sup>th</sup> centuries. Each of the three distinguished stages: the first, second half of the 19<sup>th</sup> century, the turn of the 19-20<sup>th</sup> centuries, is characterized by special historical conditions. At each stage, various creative methods were used to form an architectural image of a residential building - from traditional folk architecture to professional architectural projects. At the last stage, updating the creative method of the architect made it possible to form a residential building in the "wooden modern" style, which practically did not survive in the historical environment of the city of Penza.

## 2. Materials and methods

The research materials are presented by published and unpublished documents, including archival sources (documents of the state archive of the Penza region); scientific, reference and encyclopedic literature; materials of periodicals, results of field examinations. Research methods were the principle of consistency, a comprehensive analysis, field surveys and photo fixation of wooden residential buildings that have survived for this period.

## 3. Discussion and results

The wooden buildings of the historical settlements that took shape from the 16<sup>th</sup> to 17<sup>th</sup> centuries, the architectural and artistic elements of residential houses and churches created the distinctive look of the city. The characteristic features of each city reflected the influence of local conditions and the specifics of the region throughout its history [1, 2].

The objects of wooden architecture for the Russian people have always been closely associated with the idea of man about the beauty of the world. The canons of this art were passed down by



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masters from generation to generation, improved over the centuries, while maintaining the traditional foundations. So a special branch of all Russian architecture was formed - folk wooden architecture. This art was created through the accumulation of collective experience. It made a great impression with the wisdom of traditions, the unity of style and the depth of ideological and figurative content. Russian architects could not refuse the established methods of wooden construction for a long time, until the 18th century. And in the 19th century, a wooden residential building remains the most massive element of urban development.

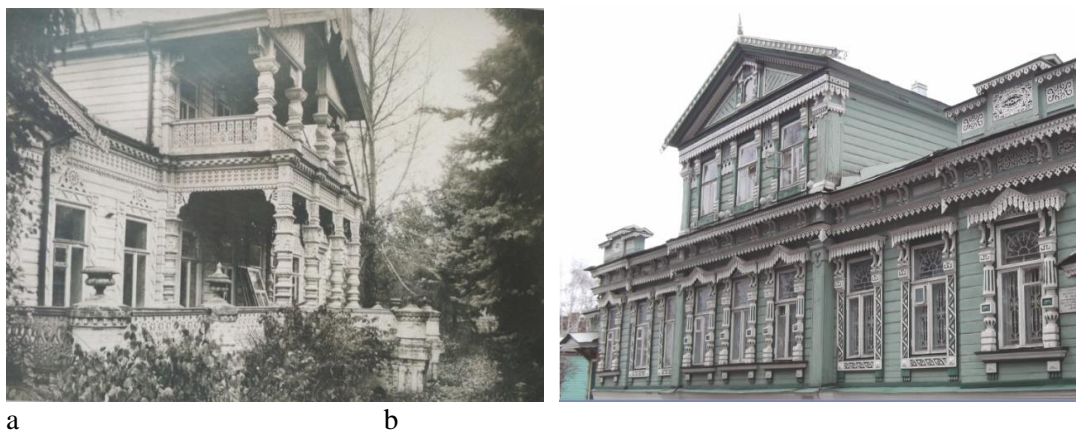
However, wood as a building material is not durable. It is subject to burning, decay. In modern cities, monuments of wooden architecture also disappear due to increased man-made and man-made impacts. Penza region in this regard is no exception. A huge and extremely important layer of traditional Russian culture disappears. A comprehensive study of this architectural heritage is needed. Of particular relevance is the problem of preserving wooden architecture.

During field surveys of wooden residential buildings in the city of Penza, 210 objects were identified, of which 15 objects of cultural heritage. The classification is carried out and the types of wooden houses are identified according to a number of grounds [3]. The characteristic features of house carving, its ornamentation and symbolism, reflecting the peculiarity of the Penza region, its traditions and history, the diversity of the artistic and mythological world, built by local craftsmen and craftsmen, are revealed.

In the process of researching a residential wooden house in Penza, the following historical stages of the development of the architecture of residential buildings - in general, and wooden houses - in particular, during the 19th century and at the beginning of the 20th century (until 1917) were identified. The first stage - the first half of the XIX century (until 1861), is associated with the development of the construction of noble estates, including in urban areas. The second stage - the second half of the XIX century - is associated with the restructuring of former noble estates by merchants. Often such a restructuring of the estate was associated with adapting it to production functions. The third stage - the beginning of the twentieth century, is associated with the construction of residential houses for citizens of various classes and property status.

Consider examples of wooden residential buildings built at each stage and determining their respective types.

In the first half of the 19th century, the main house of the city noble estate Zagoskina (the last owner - Tyurin) was built, located today at the address: Penza, Kuybysheva St., 45a. The house was built according to the traditional folk canons of wooden architecture. Figure 1 show photos of this house.



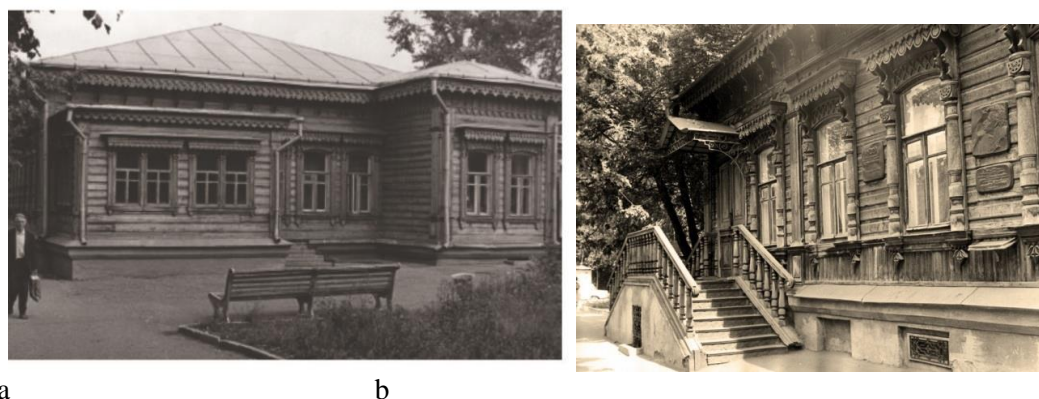
**Figure 1.** Wooden residential building of the noble estate of V. Zagoskina: a - western facade; in - east facade. Built in the first half of the 19th century in the tradition of wooden folk architecture

At the end of the XIX century, the main house of the city estate of the merchant Meyergold

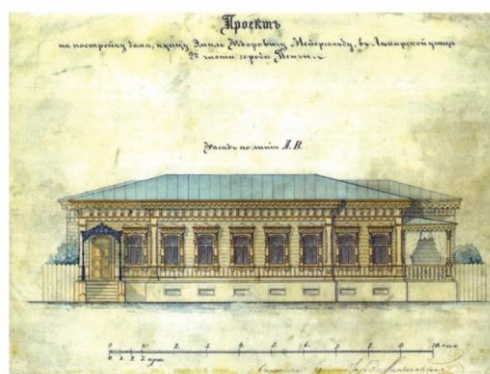
was built, located today at the address: Penza, Volodarsky St., 59. Figure 2 shows photos of this house. The house was built according to the project of the younger architect Edmund Semenovitch Milyanovsky, who used elements of traditional wooden architecture. Figure 3 shows drawing of this project.

At the beginning of the twentieth century, a residential building was built on Klyuchevsky St., 3. Figures 4 and 5 show photos of the Art Nouveau wooden house. Since 1905, it did not last long. The house was lost in the second half of the 20th century. The residential building was a vivid example of Art Nouveau - a new architectural form made in the traditional building material - wood.

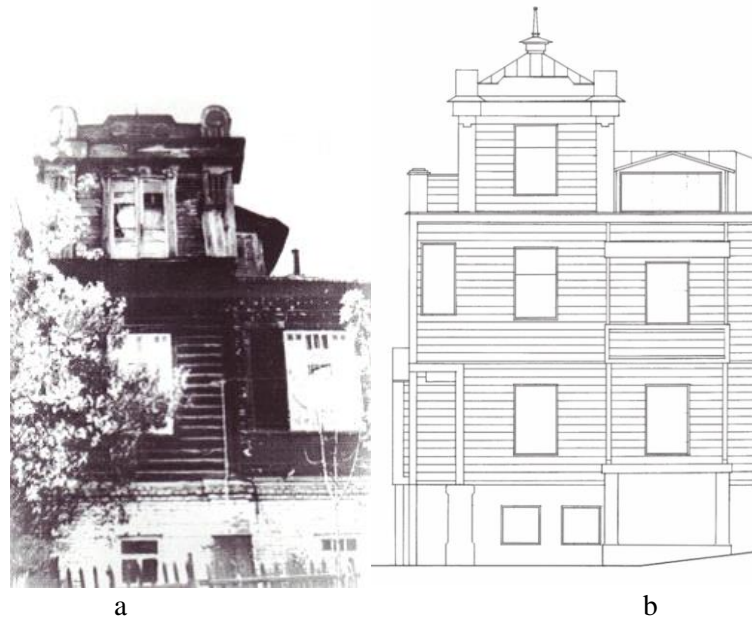
In order to convey the architectural image of a wooden residential building in its original expression to future generations, it is necessary to preserve the architectural heritage, which is dilapidated and is in a deplorable state. The problem of preserving the heritage, including the noble and merchant city estates in the capitals and in the provinces, is becoming ever more acute. The professional community of architects and the public are all preoccupied with impending losses in the designated cultural field. The estates represent an entire era of Russian life, a unique layer of its culture. Their slow fading began in the 19th century. After 1917, they underwent barbaric mass destruction. Most of the estates are already lost. Houses are destroyed, burned and plundered. Homesteads, which housed various institutions: resorts, clubs, schools, were more likely to survive. Only a few have been preserved in their original form as museum complexes. Two wooden houses from the estates described above are examples of this kind.



**Figure 2.** Wooden residential building of the noble estate of the merchant E. Meyergold: a - southern facade; in - the western (main) facade. Built in the second half of the 19th century according to the project of the younger architect E.S. Milyanovsky (1881).



**Figure 3.** Project for the construction of a house to the merchant Emil Fedorovich Meyergold, Lekarskaya str., the 2nd part, Penza Town. Facade along the line of A.B. (Drawing was signed by Milyanovsky).



**Figure 4.** Art Nouveau wooden house. Built in 1905 on a hillside along Popovka St. (Klyuchevskogo St., 3): a - a fragment of the side facade (archive photo), c - a fragment of the side facade (measurement drawing).



**Figure 5.** Measurement drawings of a wooden residential building on Popovka St. (Klyuchevsky St., 3): a - a fragment of the main facade, in - the main facade and plan.

The question arises of how to preserve that part of wooden architecture that can still be restored, how to preserve the architectural heritage by integrating it into modern life, into the urban environment. This problem can be solved in different ways, including adapting historical and cultural monuments to modern conditions, adapting them to a new function [4, 5]. To ensure a long life for a wooden house, scientists are conducting research on the properties of wood as a building material, and how to protect it and modernize it in order to extend its life. To solve this problem, scientists at the Penza State University of Architecture and Construction (PGUAS) examined the technological aspects of thermal and chemical modification of building wood. Pine wood was chosen as the object of research; organic modifiers of the hydrophobic and hydrophilic type were studied [6].

Modern developments of modified building wood can be used, including in the process of restoration of monuments of wooden architecture. As for physically lost wooden houses, there is only one way to preserve the memory of them - to create their virtual doubles. For example, to recreate individual objects - such as the original Wooden Art Nouveau house on the street. Klyuchevsky. It was building in Penza Town and now this house is lost. Its shape can be recreating as model in the material or a virtual object - a computer 3D model. Such an approach will make it possible to assemble from the models a peculiar museum of wooden architecture located on the territory of the university complex serving both as a visual aid on the history of wooden architecture and as an experimental site for PGUAS students.

#### 4. Conclusion

Thus, we show the various types of residential wooden houses that have formed in the provincial city of Penza. The dependence of the architectural image of the house on the historical conditions and creative methods used in its formation is indicated. An analysis of the compositional basis of the house and its decorative elements at each stage of development showed the characteristics of each type of wooden house. The first half of the 19th century is characterized by the presence of the creative method of craftsmen, using the traditions of wooden architecture in the process of creating a home. In the second half of the 19th century, professional projects and people appeared - architects and engineers who use individual elements of traditional wooden architecture. At the turn of the 19th and 20th centuries, separate buildings appeared in the city of Penza, made in the style of wooden Art Nouveau. The creative method of the architect designing an Art Nouveau residential building is fundamentally different from the traditions of wooden architecture. However, in Penza, only one residential building was identified, which is considered a particularly vivid representative of the Art Nouveau style. In general, Penza's wooden Art Nouveau appears discreet, contains only individual facade elements made in the fluid, flexible forms inherent in Art Nouveau. Wooden Art Nouveau in the city of Penza lost. To recreate it, the implementation of virtual models is proposed.

#### 5. Acknowledgments

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