Wood unveils the secrets of the architectural heritage of Siberia

The scientists of Siberian Federal University have developed a new chronological typology, which allows to reproduce the sequence of wooden build-up of ancient cities and settlements to a high precision. The innovation proposed by SibFU scientists is the introduction of dendrochronological information into the layer of historical and architectural data.

Having studied more than 70 diverse monuments of wooden architecture in the city of Yeniseysk of Krasnoyarsk Territory using the methods of dendrochronology, history and architecture, the scientists have classified them into 4 chronological types of all monuments: residential buildings, back wings, government buildings. The study used traditional sources — for example, 72 passports for objects of cultural heritage of Yeniseysk, information from local residents, etc., as well as dendrochronological analysis data. Thus, thanks to a significant amount of the examined materials, and the dates obtained with an accuracy up to a year, it was possible to reach the level of qualitative generalization of the city planning processes of Yeniseysk.

The proposed method can be effectively used for dating wooden city development of the late 18th — early 20th centuries in Siberian cities according to the experts.

"*Yeniseysk has experienced many shocks over 400 years of its existence — fires, floods and anthropogenic factors have significantly changed the face of the city. There is still a dispute going on about the date of construction of the first stone structure of Yeniseysk — the Voivode's House. It is even more difficult when we're talking about wooden architecture. The owners of wooden houses were most often not merchants, but comoners, so the data on their houses is limited or non-existent. We obtained a unique opportunity to conduct a comprehensive typological study based on an interdisciplinary approach using the methods of history, architecture and natural sciences,*" — said **Zakhar Zharnikov**, co-author of the work, senior researcher at Siberian Dendrochronological Laboratory and associate professor of the Department of History of Russia, World and Regional Civilizations of SibFU.

"*For dendrochronological analysis, thin wooden core samples are carefully extracted from the wood of historical structures, and then examined for the quantity and "quality" of tree rings. So you can date the construction with high accuracy and even find out in which region the wood was from. Unfortunately, it was impossible to date 19 buildings dendrochronologically, in some samples the quality of annual rings was unsuitable for dating, and the owners refused to provide access to the walls and ceilings of buildings for core sampling of 11 others. In most cases, the wood "unveiled the secrets" of the construction of houses from which it was extracted,*" — explained **Vladimir Myglan**, scientific director of Siberian Dendrochronological Laboratory and leading SibFU researcher.

This technique makes it possible to clarify the dating of the earliest wooden structures. It can become a

reliable foundation for chronological attribution and grouping of monuments of wooden architecture not only in Yeniseysk, but also in other Siberian cities. The proposed approach makes it possible to identify in more detail both general and unique trends in the development of Siberian wooden city development in the late 18th and early 20th centuries.

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