Farabi's contribution to the architecture of Central Asia.

Akhmatov Nemat, Senior Lecturer, Samarkand State Architectural and Construction Institute.

It is our sacred duty to preserve the priceless treasures left to us by scientists who lived and worked in the past. In particular, the fact that Farabi's studies of the laws of society and nature have not yet been fully elucidated encourages us to work and research more. This article discusses Farabi's ideas about geometric constructions and measurements.

Keywords: Architect, structure, geometry, triangle, dimension, cube, cone, cylinder, sphere, prism, pyramid, volume, art, builder, obvious.

Admiring the magnificent old buildings, unique paintings and architectural works created in our sacred land, we feel a sense of pride in the art and craftsmanship of architects, painters and sculptors who have created such high art. In particular, the works of such great scientists as Abu Nasr al-Farabi, Muhammad al-Khorezmi, Abu al-Wafa Buzjani, Abu Raikhan Beruni, Abu Ali ibn Sina, Kamoliddin Behzod are an invaluable encyclopedia of medieval science. This is even more evident in the architecture of Central Asia.

Each architectural gem of the Central Asian past is associated with centuries-old historical documents, events, brochures, works of art, paintings or inscriptions on buildings. They are a valuable source of information on the history and theory of architecture, which is an important source in the study of the history of architecture. However, there are many unexplored historical mysteries of our architectural heritage, including incomplete aspects of the study of the great philosopher and encyclopedic scientist Abu Nasr al-Farabi about the laws of society and nature.

Farabi has successfully done excellent research and advocacy in various fields of science. He attended meetings of scholars and artisans, spread education and put his knowledge into practice.

He points out that in defining aspects such as quantity and quality, a rough estimation method can lead to very large errors and can lead to big tragedies, therefore it is necessary to create various measuring instruments. For example, for architects, the use of tools such as suspension, plan, compasses, tape measure (ruler) emphasizes the achievement of a serious "law" in the construction of a building.

From time immemorial, architecture has been likened to frozen music. - By the way, Farabi emphasizes that the main signs belonging to music are present in architecture. Indeed, the foundations of music - melody, rhythm, proportions, composition, motive, leitmotif and other concepts - lie precisely at the heart of architecture. It is clear that Farabi, who created such a monumental work on music theory as “Kitob al-Kobr Musiqa”, also had a deep understanding of architecture.

In his book "Ixso al-ulum", Abu Nasr al-Farabi divides mathematics into seven parts, among them arithmetic (ilm al-handasa), music, optics, gravity and details are also directly related to construction work.

Geometry is related to all disciplines, and its theoretical and practical sections help to solve complex life problems. Geometry is the study of points, lines, planes, dimensions, equations and shapes, order, and finally angles. He checks the proportionality and non-proportionality of the dimensions. He explores the methods of construction (Al-Farabi. Philosophical treatises. - Alma-Ata: 1972, pp. 107, 147, 148).

Farabi stresses the need for practical geometry, especially for carpenters, blacksmiths, builders, hairdressers, surveyors and master craftsmen. In his books, he explores three-dimensional objects such as cubes, cones, cylinders, spheres, prisms and pyramids. These objects confirm that they form the basis of geometric construction methods, drawings and calculations, widely used in the history of architecture.

Determination of the center of a circle in the ancient geometry of Abu Nasr al-Farabi, methods for creating equilateral shapes (triangles, quadrangles, pentagons, hexagons, heptagons, octagons, and so on), regular polygons drawn inside and outside the circle, methods of construction, creating shapes, triangles, quadrangles , tasks such as dividing a rectangle, reducing a regular polygon, multiplication, proportional change are given in different situations, the simplest ways to solve them are given. The interesting thing is that all these geometric problems are solved with a simple compass and a ruler, that is, almost all problems are construction methods, which in the practical work of a builder are carried out using simple piles and a plan.

The examples given are closely related not only to the construction of buildings, but also to the methods of making walls and other decorative ornaments - geometric ornaments. It is especially difficult to apply it in practice without knowing the laws of creating complex geometric patterns (ornaments), called weights. Their creation is almost impossible without theory.

In another case, Farabi shows two ways to construct a parabola. Using these techniques, he drew a parabola sketch of various architectural arches and noted that a special pattern (mastara) had been made to redraw it.

It turns out that various arches and domes used in the architecture of Central Asia originated from this part of the parabola.

Farabi's contribution to the development of Central Asian architecture is enormous and significant as he dealt with many issues such as urban structure, community governance, population order and living conditions.

Farabi's research and ideas on architecture due to his great scientific heritage Oriental architecture played an important role in the development of architecture, especially in his homeland, Central Asia. It is well known that his mathematical treatises have been a program for architects and builders for centuries.

The fact that future architects will study these rare works, apply them in their experiments and enrich these ideas with new evidence in future research will make a worthy contribution to the development of our national architecture.

List of used literature

1. Mansurova A.S. Spiritual and moral formation of man and philosophical views of Al-Farabi // News. NAS RK. - 2011. - No 6 (279). - p. 38–43.
2. https://fayllar.org/ozbekiston-respublikasi-oliy-va-orta-maxsus-talim-vazirligina-v56.html?page=6
3. https://hozir.org/reja-estetika-fanining-predmeti-obekti-va-falsafiy-mohiyati.html
4. https://doi.org/10.47494/mesb.2021.16