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ARCHITECTURAL FORMATION TRADITIONS IN THE ARCHITECTURE OF THE 18TH–EARLY 21ST CENTURIES (ON THE EXAMPLE OF BUKHARA AND QASHQADARYO)

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Annotation

The article outlines methods for revealing the systematic structure of architectural forms through artistic-expressive means. The study focuses on the cities of Bukhara and Qashqadaryo Province, significant points along the Great Silk Road. Special attention is given to column-beam and arcade-dome structures. Emphasis is placed on the ten principles of double arcades. An architectural analysis is provided for examples such as the Bolokhauz Mosque, the Fayzobod Mosque within the Ark, the Poy Ostona Mosque, and the Sitorai Mokhi Khossa Palace in Bukhara, as well as the Kunduzak Mosque, Langar Ota, and Ishqiy Mosques in Qashqadaryo Province. It is acknowledged that double arcades have been used in structures built over the last decade.

Keywords

folk architecture, double rawaq, artistic formation, methods, column-arched, rawaq-domed, Great Silk Road, mosque, Palace, analysis.

Introduction. The Emergence of New Architecture. Modern architecture took shape following the Industrial Revolution, at the end of the 17th century and the beginning of the 18th century. This architecture brought about changes that were common not only in the conditions of the West and America but also in Eastern countries. On the eve of the revolution, a certain degree of regional distinctiveness was preserved across all parts of the world, yet political and social tensions and

inter-country conflicts prevailed. At the core of these tensions lay the desire of nations to achieve hegemony. This is evidenced by conflicts between khanates in Central Asia, the alliance of Germany and England against France to restore papal authority in Europe, and the wars between the Northern and Southern states in America. In Uzbekistan, one of the clear hallmarks of new architecture is the use of double arcades. Such structures should be incorporated into the artistic-decorative framework of modern architecture.

In the architecture of the 18th to early 21st centuries, architectural formation is manifested in column-beam and arched-arcade constructions and their elements. These include the following: the order system, forms in flat ceilings, arches, double arcades, and muqarnas.

Formation of the Order System. Column-beam constructions, regardless of their location worldwide, were developed in accordance with the laws of gravitational force. Accordingly, Greek, Roman, and Central Asian column-beam systems consist of three fundamental components: the base, the column, and the beam. In Roman orders, the base is called the pedestal, the column is the colonna, and the beam is the entablature. It is known that Greek and Roman orders were primarily executed in stone and marble. Greek orders were initially constructed from wood by the Doric and Ionic tribes. Later, the elaboration of the Ionic order led to the creation of the Corinthian order. The Romans added two more orders to the Greek ones: the Tuscan order, which made the restrained Doric order even more austere, and the Composite order, which enhanced the elegance of the Corinthian order with greater refinement. In any order, measurements are derived in proportion to the lower radius (module) of the column. In the Central Asian order, the module is considered the radius of the column's base.

Central Asian orders crafted from wood, like those made from other materials, consist of three components: the base (kursi), the column (ustun), and the beam (to‘sin). Additionally, in Central Asian architecture, the order system may include the lowest part, called the sufa. In the Greek Doric order, this lowest part is referred to as the stereobate. It is more appropriate to compare the generalized Qashqadaryo order with the Composite order. The proportions of the Qashqadaryo order have also been applied in the Kunduzak Mosque.

Formation of Ceilings (Plafond). The Langar Ota Mosque was constructed in several phases. Initially, a four-columned khanaqah was built. To the south, a five-columned khanaqah was added, and to the east, a portico (ayvon) with two rows of five columns each (a total of ten columns) was attached. In the initial khanaqah (with four columns), the beams in the corner squares were laid diagonally. In the squares between them, the beams were placed perpendicular to the walls. The

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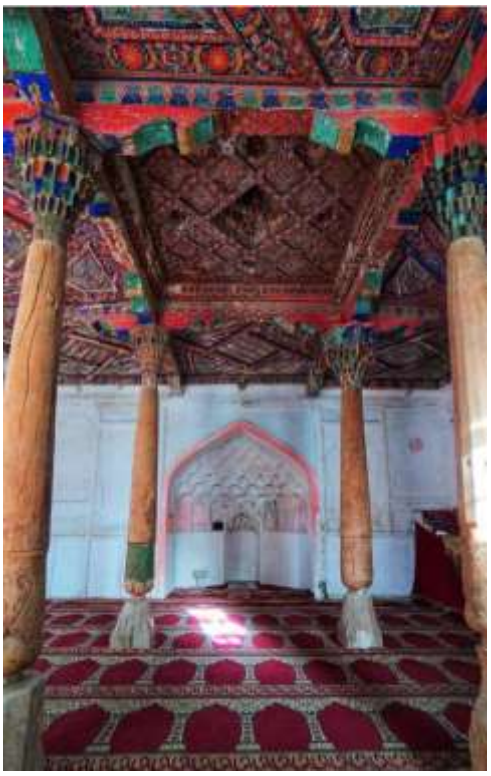
central square also employed a diagonal arrangement. According to the monograph (Sultonov X., Gilmanova N., p. 256), the ceiling's center is depicted as a dynamic square for some reason.

In the larger adjacent khanaqah, a rare feature is observed: the ceiling's square, formed by four columns, is supported at its center by a separate fifth column. In the main part of the ceiling, the beams are laid parallel to the walls. In the corner squares, the beams are arranged diagonally.

For the squares in the portico (ayvon), the beams are laid diagonally. In the adjacent rectangular sections, the beams are placed perpendicular to the walls.

Picture 1. Langar Ota Mosque; on the left – the ceiling of the small khanaqah, in the middle – the ceiling of the large khanaqah, on the right – the portico.



The Abdu Hasan Ishqiy Mosque in Qashqadaryo Province was constructed using a column-beam structure. The ceiling of its khanaqah is particularly noteworthy. The installation of arches and beams has resulted in mutually proportional shapes. With the help of four columns, the arches form nine squares, which can be referred to as outer squares. Inside these, different inner squares are situated.

Double arcades have been used in the entrance section of the Historical Museum building during Russia's eclecticism period in architecture. In the territory of Uzbekistan, it is known that double arcades have been employed in mosques and palaces. Even in the present day, they continue to be used at city entrances and in other functional structures.

Picture 2. The ceiling (plafond) of the Abdu Hasan Mosque in Chiroqchi, Qashqadaryo, as depicted in Pavel Novik's paintings.

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Picture 3. Entrance to Fergana

Picture 4. The iwan of the Tabbad Mosque in Bukhara.

In Uzbekistan, the first structure to use double arcades is the Bolokhauz Mosque in Bukhara. This mosque holds the second position after the Kalon Jameh Mosque in terms of its location. The portico (ayvon) of Bolokhauz was built later than its khanaqah. The two rows of slender columns in the portico, along with their reflection in the pool, lend a captivating charm to the structure. Three arches are crafted in the symmetrical part of the portico, with the side arches being simpler in design. The central arch is distinguished by a double arcade. The mosque inside the Bukhara Ark is modest; it lacks the grandeur of Bolokhauz. From a typological perspective, it belongs to the category of neighborhood mosques; a square-planned khanaqah is adjoined by porticos on the northern and eastern sides. The components of the columns (base, shaft, and muqarnas-embellished capital) are proportionately shaped. The double arcade here is simpler in structure compared to that of Bolokhauz.

Picture 5. Bukhara, Bolokhauz Jameh Mosque with arch and double arcade

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Picture 5. The double-arcaded mosque inside the Ark

The Poy Ostona Mosque (currently the Bukhara branch of the Muslim Board of Uzbekistan) captivates viewers with its intriguing shapes and forms. The mosque reflects modern architectural elements in its design. Its appearance testifies to the high craftsmanship of its architect (or architects?). A striking feature is the unusual placement of the arch.

Typically, an arch indicates the main entrance of a building. For instance, in the Bolokhauz Mosque, the central (double-arcaded) arch serves this purpose. However, in the modest Poy Ostona Mosque, arches are placed in several locations. For example, one arch is constructed at a corner. Behind the arch, a cast decorative element shaped like a small pool (khovuzak) is affixed to the ceiling of the portico, indicating the use of new technology. It appears that restoration work was carried out at the Poy Ostona monument for the first time. The Poy Ostona Mosque can be considered a unique example of folk architecture.

Picture 6. Bukhara, Poyi Ostona Mosque and its schematic view.

Sitorai Mokhi Khossa. Courtyard: Museum Entrance on the Left, Windows on the Right. The Sitorai Mokhi Khossa Palace complex in Bukhara was built over several centuries. It mainly consists of the old palace from the period of Abdul Ahad Khan and the newer constructions from the era of Emir Alim Khan (Nilsson V., pp. 144–148).

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The complex features double arches (twin arches) in several key areas: at the entrance to the museum, in the interiors of the guest rooms, and in the pavilion of the new palace courtyard. These double-arched structures are particularly noteworthy.

At the museum entrance, the sides of the double arch extend downward, making it appear as a self-contained, independent form rather than a supporting element. It is worth noting that our master craftsmen not only incorporated the double arch into architecture but also enhanced and perfected it in their own creative ways.

In the guest room interiors, the double arch is executed in plaster. Its pure white color harmonizes with Usta Shirin Muradov's work in the "White Palace" (Khanai Safed).

The architecture of the pavilion evokes the image of a light, soaring bird. All four sides feature double-arched roofs with lanterns. The tradition of building pavilions with lanterns is reflected in miniature paintings from the Middle East (Islamic Art, ... images).

Picture 7. The bird-shaped arch and the double-arched pavilion inside the Sitorai Mokhi Khossa Museum.

Picture 8. *Other examples of double arches in Qashqadaryo include those found in Kunduzak and the Otalar Recreation Area.*

Basic Principles of Shaping the Double Arch

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1. A double arch consists of post-and-lintel and arched constructions.
2. The double arch is usually shaped in the form of a *Kayvon* (arched gateway).
3. Its composition is organized and built symmetrically:
3.1. The axis of symmetry defines the center of the arch.
3.2. The entablature is constructed in the form of the Cyrillic letter "П" (*Kayvon* shape).
4. The structure of the double arch consists of the entablature, two columns, and the double arch itself.
5. The spacing between the lintels is taken as a large module.
6. Smaller measurements are based on subdivisions of the module: half-module (8p), quarter-module (4p), eighth-module (2p), and sixteenth-module (p).
7. The arches are formed based on compass-drawn lines.
8. The connection point—or "joint"—of the arches (called "*Girka*" in Russian architecture) is decorated with a specific design.
9. The capitals of the columns are composed of *muqarnas* (stalactite-like ornamental elements).
10. The spacing between the axes of the columns is made slightly less (narrower) than the inner spacing of the entablature brackets.

The information presented above allows us to draw the following conclusions:

a) Vernacular architecture from the 18th to the early 21st century, in its essence, continues the traditions of earlier historical architecture within the new (modern) architectural context. This is evident in the depiction of muqarnas columns and lantern-topped pavilions found in medieval miniatures.

b) One of the shared creative challenges in both monumental and vernacular architecture of the Middle East has been how to emphasize the main entrance of a building. As a result of architectural innovations, monumental architecture developed grand entrance portals (*peshtaqs*) from the 11th century, while vernacular architecture formed *Kayvon*-style entrances from the 16th century, or possibly even earlier.

c) Vernacular architectural traditions from the 18th to early 21st centuries are expressed through structural forms such as column-beam systems (orders, ceilings, *Kayvon*), double arches, volumetric ornamentation (e.g., *sharafa*, *muqarnas*, *iroqi*), and their polychromatic decoration.

d) In the artistic and architectural shaping of column-beam and double-arched constructions, proportionality (modularity) played a key role. In column-beam systems, the lower radius of the column shaft, and in double arches, the spacing between the beams (*khossa* length), were used as modular units.

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