Mandela: As an Architectural Module of Buddhist Temples in Mongolia

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Abstract

The article examines the problem of using the *mandala* as a design module for creating Buddhist temples in Mongolia. The authors explore the adaptive features of Buddhism in Mongolia and analyse the possibilities of the *mandala* as a module for designing a Mongolian temple. Based on the works of Lokesh Chandra, the authors choose the *mandala* dedicated to the deity Chakra Samvara as an empirical component, which becomes widespread in Buddhist Mongolia due to its compliance with the basis of the Mongolian worldview. The theoretical theses of the authors are confirmed in the recreation of a conventional temple in the traditions of the yurt Mongolian temples of the 18th century.

Keywords: *Mandala*, Buddhist temples in Mongolia, architectural module, Chakra Samvara, Lokesh Chandra.

Introduction

Mongolian architecture is a unique phenomenon of nomadic culture, especially if we consider it in the dynamics of development. From the early Middle Ages to the 19th century, the style of religious construction in Mongolia was formed. With the arrival and consolidation of Buddhism in Mongolia in the 16th - 17th centuries, a system of temple construction began to take shape based on the traditional dwelling of the Mongols - the *yurt*, a kind of nomadic dismountable house, round in shape. However, this is only a formal component of the future Buddhist temple. The *mandala* can be considered as a structural-semantic component, the image and symbolism of which appears in Mongolia with the formation and development of monastic Buddhist culture.

The *mandala* is a multi-layered symbol representing a harmonious relationship of elements and principles of symmetry, making it an ideal design module in architecture and art. As a geometric form, the *mandala* symbolises an ordered cosmos, where the centre and the surroundings are related according to strict symmetrical principles, reflecting balance and cyclicity. The *mandala* is presented in the form of circles and squares, where each element and its arrangement have both aesthetic and symbolic meaning. As a design module, the *mandala* can become the basis for creating compositions that are structurally organised based on the rhythmic repetition of elements. Due to these characteristics, the *mandala* becomes a valuable tool in designing spaces and objects that require integrity, symmetry, and internal harmony. The relevance of the topic lies in the use of *mandala* as a constructive and artistic module in the Buddhist architecture of Mongolia, as well as in the reconstruction of the process of designing a temple based on the *mandala*.

The same analysis of the structure and application of the *mandala* has already been carried out by many researchers, in particular by Lama Purevbat. In his book [6], he describes the *mandala* as a key module in the design of *stupas*, giving numerous examples of structural similarities with small temple architecture and with the traditional *mandala* symbolism. The author briefly touches upon the question of how the basics of the *mandala* can be applied in three-dimensional modelling of architectural forms, creating volumetric structures that correspond to the concept of *mandala* in 3D. This study emphasises that the *mandala* is not only visually but also constructively reproduced in architectural elements, adding symbolic significance and structure to projects.

It is also worth noting that the same study uses the *mandala* to analyze the Mongolian architecture by Kanareva T.N. [2,3,4,5], where a comprehensive approach,

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applied in the analysis of Buddhist temple architecture of Mongolia, including historical and art-history study, consideration of metaphysical aspects and the use of *mandala* as a key symbolic element is shown. This approach allowed not only to reveal the semantics of the temples, but also to identify significant symbolic points connecting architectural forms with the philosophical principles of Buddhism. One of the important results was the identification of Buddhist canons in the sacred architecture of Mongolia.

Thus, the research methodology has proven its effectiveness as a tool for the in-depth study, interpretation and preservation of the unique cultural heritage of Mongolia. In our study, we aim to continue and expand this approach by applying it to the analysis of architecture through 3D reconstruction, which allows for a more complete understanding of the spatial organisation and semantic content of Buddhist temples and an attempt to reconstruct the temple based on the *mandala* structure.

Mandala in the internal and external structure of the Mongolian *yurt* and temple

The empirical data for the analysis are taken from the *Dictionary of Buddhist Iconography* by Lokesh Chandra. Of the entire volume of *mandala* forms dedicated to various deities of the Buddhist pantheon, the most relevant for this paper are the *mandalas*, whose central deity is Chakra Samvara. The fact is that Buddhism, due to its high adaptability, was able to integrate its pantheon into the structure of the traditional shamanistic worldview of the Mongols. Thus, for example, the Dharmapala Mahakala replaces the god of war from Mongolian legends and receives the name Ulaan sakhius – "red spirit" [6]. The Chakra Samvara, an emanation of the Buddha Akshobhya (as well as various hypostases of Samvara), embodying harmonious unity, is also relevant to the foundations of the traditional worldview of the pagan Mongols. Lokesh Chandra in the third volume of the *Dictionary* [7, p. 682] interprets the name of the deity Samvara as "Supreme bliss", and also in the Tibetan interpretation 'precept' and 'unity'. The deity has iconographic variations, but is almost always depicted with the *prajna* (spiritual consort) Vajravarahi. In Mongolian art, the most relevant iconography was that of Sita Samvara, i.e., the White Samvara. The great Mongolian sculptor Zanabazar (1635-1723) cast a magnificent bronze sculpture of Sita Samvara. The deity is depicted not in a dancing pose, but seated. Vajravarahi sits on his lap, embracing him with her arms and thighs. Samvara holds a *vajra* and a bell, symbolising method and wisdom. Method and wisdom are *arga* and *bilig*, the Mongolian teaching, although influenced by Buddhism, which contains the primary dialectic, according to which two polar principles are in constant unity and constant struggle. The male and female principles, night and day, winter and summer, darkness and light, top and bottom - all these relationships are most vividly embodied in the structure of the Mongolian *yurt*, which was formed in the primitive era, but by the developed Middle Ages that already had almost all the components and semantic elements of the modern *yurt* [6]. Thus, the Chakra Samvara is the most relevant embodiment of the principles of *arga* and *bilig*, which means the dialectic worldview, pertained to Mongolian nomads. According to this worldview, all the phenomena in the world are divided into two polar categories. "*Arga*" means "method" and "*bilig*" means "*wisdom*", so in other words, arga corresponds with external, upper sides, action, male principle, and bilig is connected with internal and lower sides, female principle, and idea.

Moreover, it was the *yurt* that became the basis for a special architectural style, a specific form of the Mongolian *yurt* temple. But, on the other hand, back in the Middle Ages, the *yurt* became a visible embodiment of the principles of *arga bilig*. The design, the division of the interior space of the *yurt*, the colour scheme - all these elements had a special symbolism, corresponding to the principles of struggle and unity of the opposing principles. Thus, the *yurt* is that part of the culture that organically united the new and old worldviews.

The analysis is carried out in stages to consistently reveal the concept of using the *mandala* as a design module. At the first stage, the basic module of the *mandala* is identified, where the scheme is colored yellow to facilitate the perception of the structure when analysing the scheme.

At the second stage, the modular structure of the *mandala* is compared with the architectural features of the Mongolian temple. Particular attention is paid to the key intersection points, which serve for a detailed analysis of the temple structure. This method helps to understand how the *mandala*, being an ideal geometric model, can be embodied in physical space. It is worth noting that the initial data for the analysis are taken from the *Dictionary of Buddhist Iconography* by Lokesh Chandra, but they contain some geometric distortions and irregularities. In this regard, for a more structured and readable scheme of the *mandala*, we made adjustments that align the elements and eliminate perspective distortions. At the same time, all the basic principles of composition and the structure of the *mandala* were preserved, which, in our opinion, allows us to fully apply them for analysis.

The presented scheme №1 (Fig. 1) shows twenty-five gods, structured in circles or levels, which form the basis of the composition. The simplified diagram, in which each god is marked with a yellow dot or square, allows

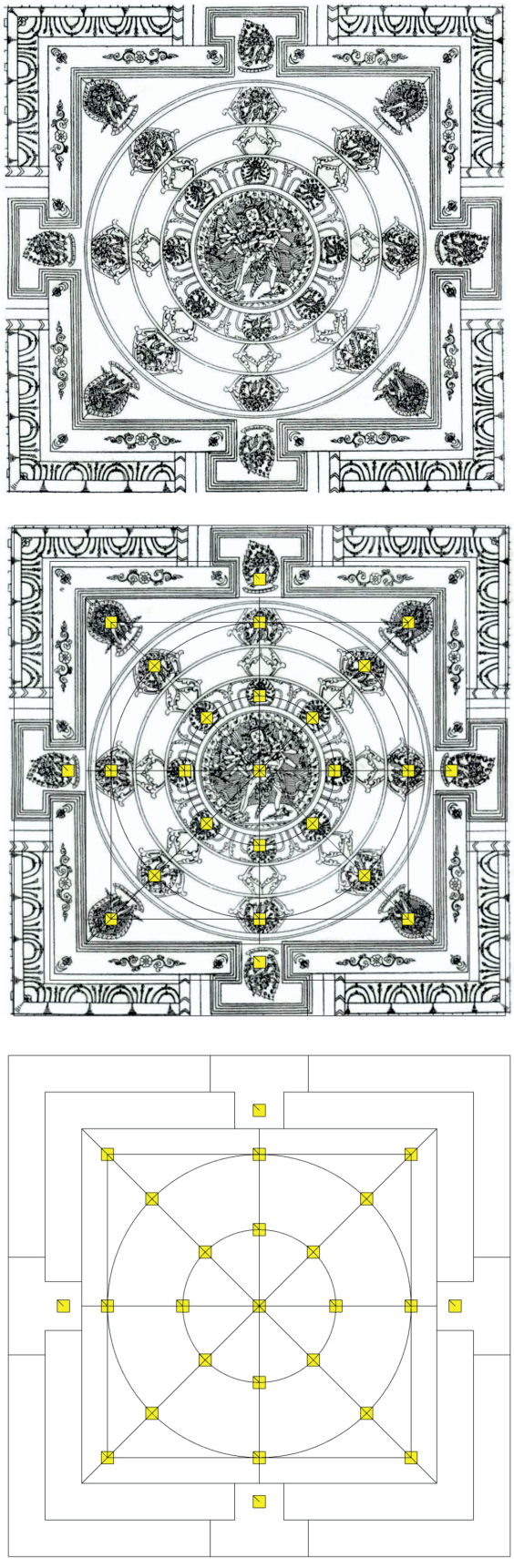

Fig. 1

us to highlight the geometry and interrelationship of the elements. When this module is arranged in a three-dimensional coordinate system along three main axes, a volumetric structure is formed reflecting the same basic diagram, but with additional layers and an increased number of elements. In a three-dimensional composition, the number of gods increases to forty-three, which creates a more complex level of interactions, allowing us to understand the principles underlying this *mandala* differently. (Fig. 2)

Here we can conclude that the main elements of the *mandala* are structured and organised by the levels, forming a complex geometric composition with a centre and a symmetrical distribution along the axes from it. The three-dimensional symmetry of the entire model emphasises that the structure of the *mandala* is preserved regardless of the viewing angle, and the central elements always remain the main focus of attention. The multi-layered distribution of points and their interrelation in space allow us to study not only symmetry, but also spatial relationships between the elements of the *mandala*. Such a model provides extensive opportunities for analyzing the principles of symmetry and hierarchy inherent in the *mandala*, and opens up prospects for its use in architectural design. All these point to the significant potential of using the *mandala* as a design module, which can serve both as a basis for designing symmetrical

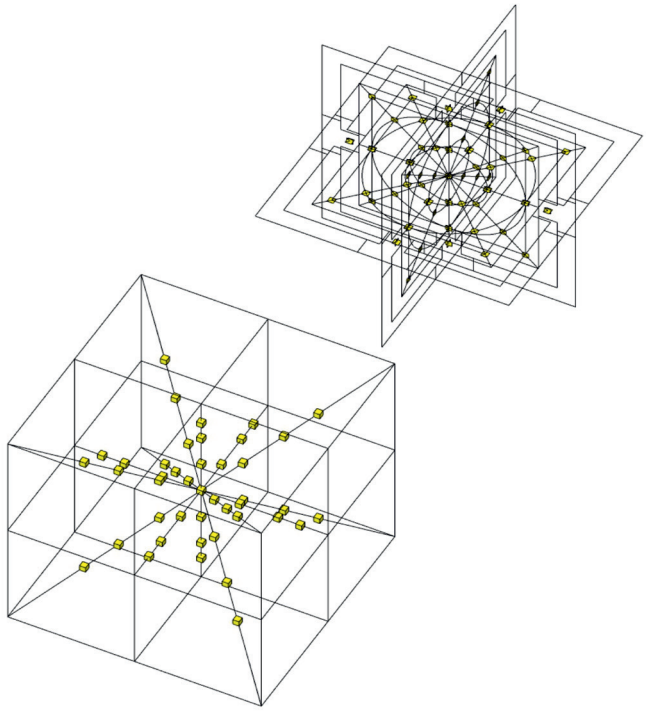

Fig. 2

spaces and as a tool for analyzing architectural solutions that require a harmonious and orderly composition.

For the analysis, we will consider the architectural forms of Buddhist temples proposed by Shchepetilnikov N. M. [1, p. 111]. In his work, he demonstrates the evolution of Buddhist temple architecture, starting from the simple form of a *yurt* and ending with the complex structure of square temples. This process illustrates the gradual development of an architectural form, where the round base of a *yurt* is transformed into a square base of a temple, reflecting changes not only in the spatial arrangement but also in the symbolic meaning of Buddhist architecture (Fig. 3).

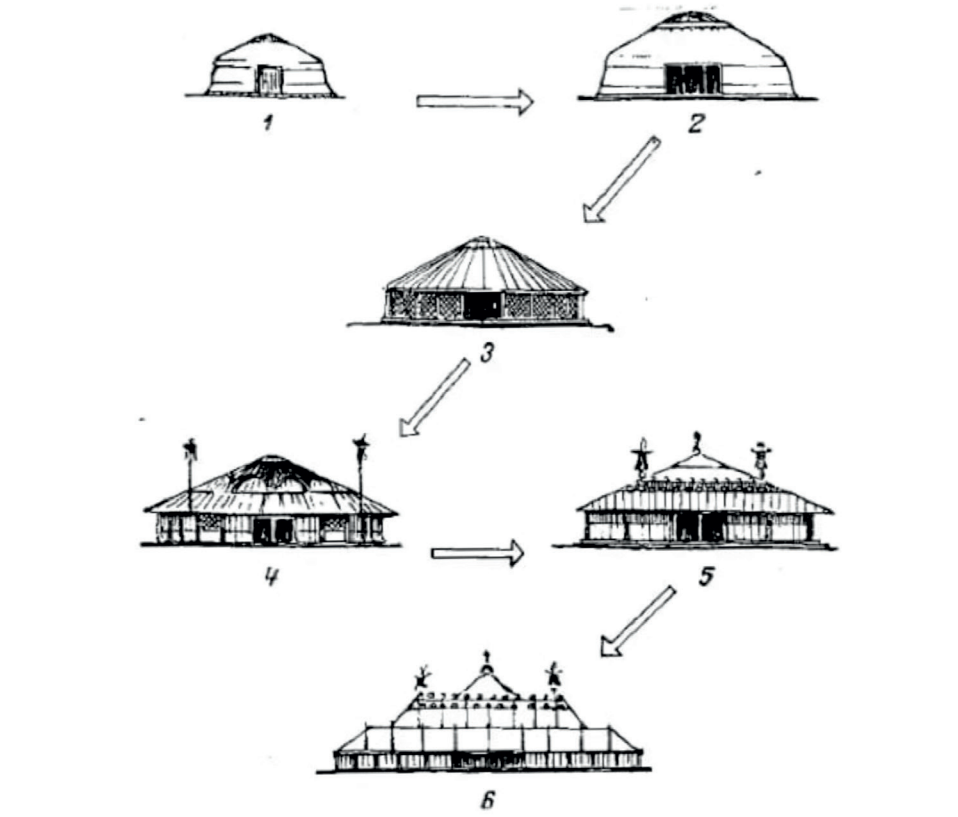

Fig. 3

We are interested in the last stage of architectural evolution -- the square temple-- therefore, the Mongolian form of the Buddhist temple was chosen for analysis. This choice is because Mongolian temples represent a unique adaptation of Buddhist architecture to the cultural and climatic conditions of Mongolia. Their forms demonstrate a creative reworking of Tibetan traditions and a deep connection with the traditional Mongolian dwelling – the *yurt*, which is reflected in the combination of round and square forms. Such architecture not only preserves the symbolism of the central axis and symmetry characteristic of Buddhist temples but also introduces features of stability, order, and harmony with the surrounding landscape, which is especially important in the context of Mongolia's nomadic heritage.

Mongolian temples are distinguished by their strict geometry and clarity of form, which makes them particularly interesting for analysis. Their architecture not only highlights the unique elements of the Buddhist temple tradition but also illustrates important cultural aspects, such as the connection with cosmology and adaptation to the harsh natural conditions of the region. The square temple in question, with its elongated rectangular facades and well-thought-out volumetric composition, is an example of Mongolian Buddhist architecture and is an ideal object for further study. (Fig. 4)

This article focuses on the structural analysis and study of the relationship between the *mandala* with the

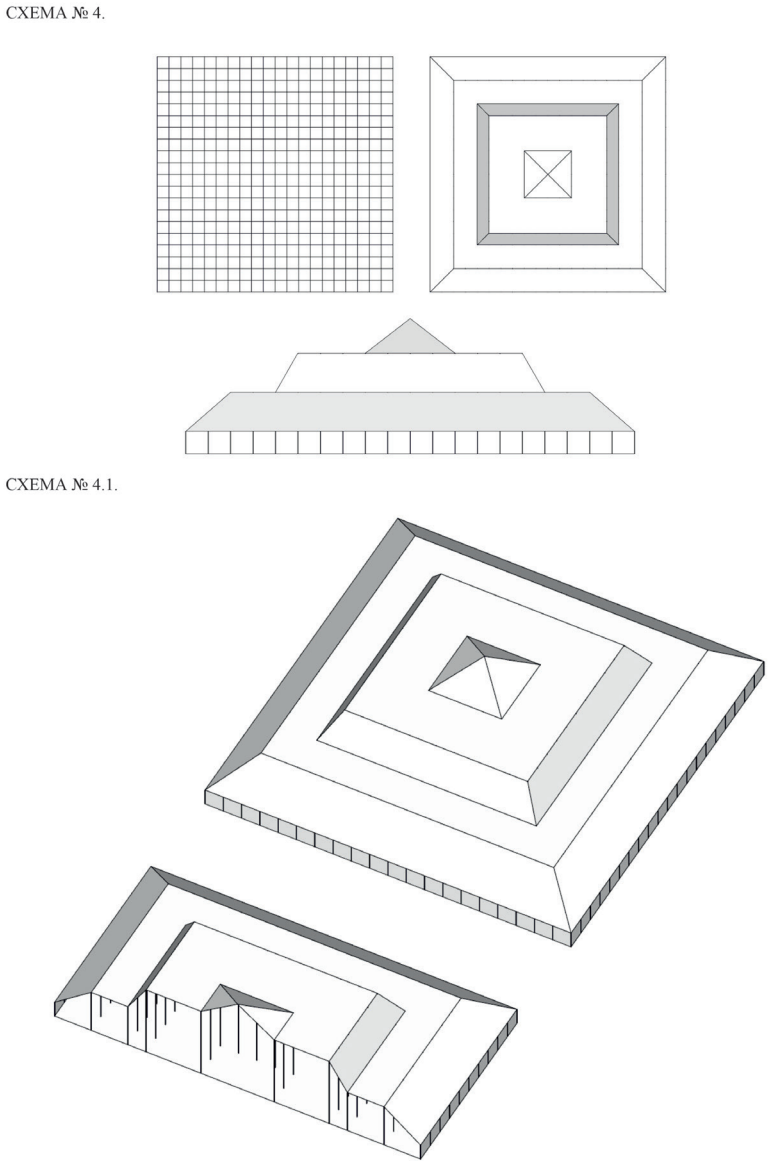

Fig. 4

architecture of the temple. We do not aim to achieve an exact match in scale or size of elements due to the lack of accurate data, but focus on the schematic structure and interdependence of the architectural and symbolic elements of the *mandala* in the design. The application of the *mandala* design module to the architectural volume of the temple is presented in two variants. In the first variant, scheme No.5, the boundaries of the design and composition are defined by the lines of the entire *mandala*, representing its structure as a closed contour, which allows us to display the complete limitation of the space of the temple structure by the *mandala,* (Fig. 5). In the second variant, scheme No. 5.1, the approach is based on the use of extreme points, namely the figures of the guardian gods placed on the outer boundaries of the central composition of the *mandala*, which makes this method more logical for analyzing the connection (Fig. 5).

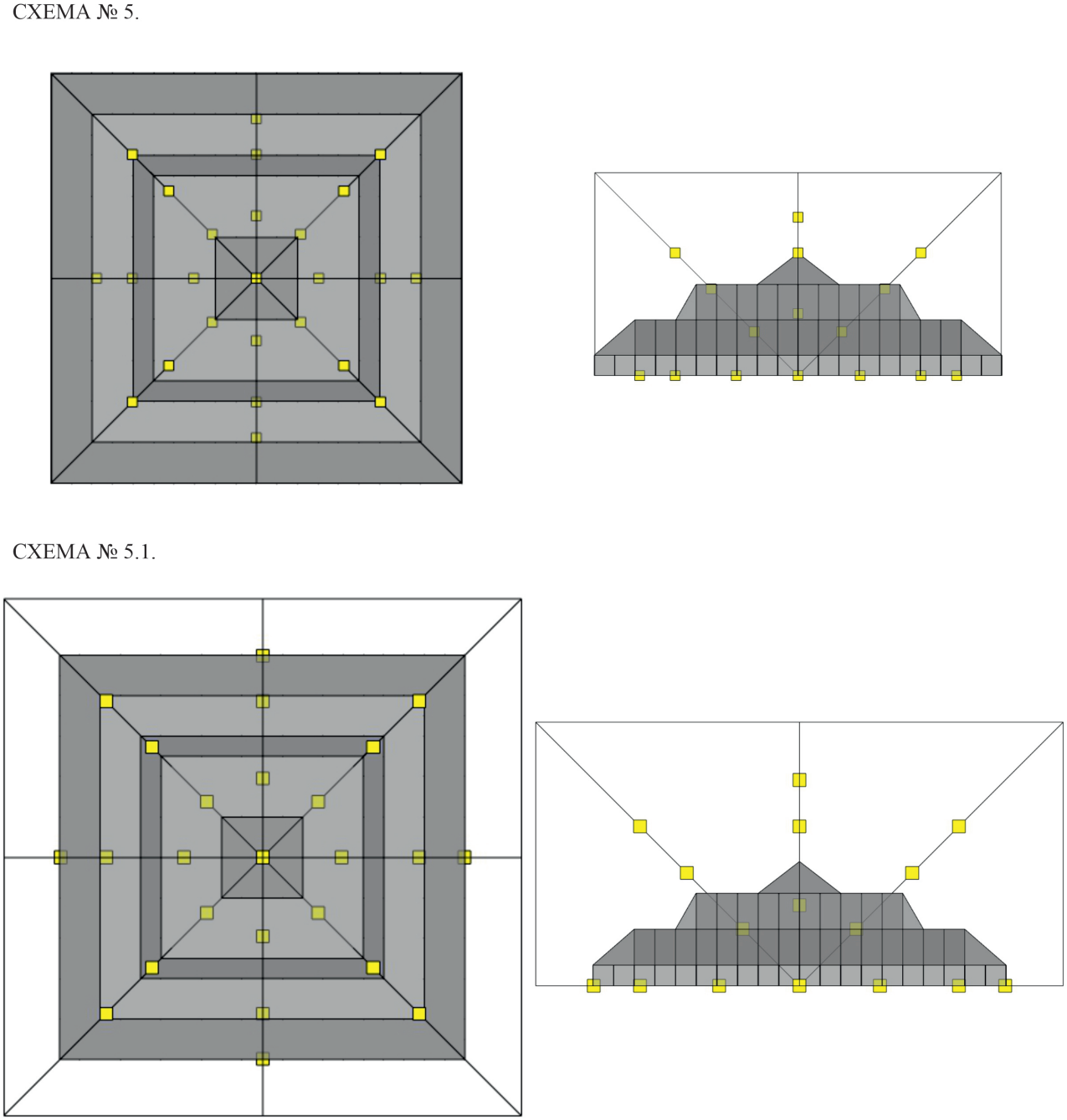

Fig. 5

In both schemes, we can see yellow dots that match the squares that form the architectural framework of the temple, demonstrating the structural connection between the elements of the *mandala* and the geometry of the building. In schemes 6 and 6.1, the main matches are shown at key points, which show the entire complexity of the *mandala* composition, which does not go beyond the boundaries of the building. This demonstrates not only the symmetry but also the interrelationship of the composition. (Fig. 6)

СХЕМА № 6.

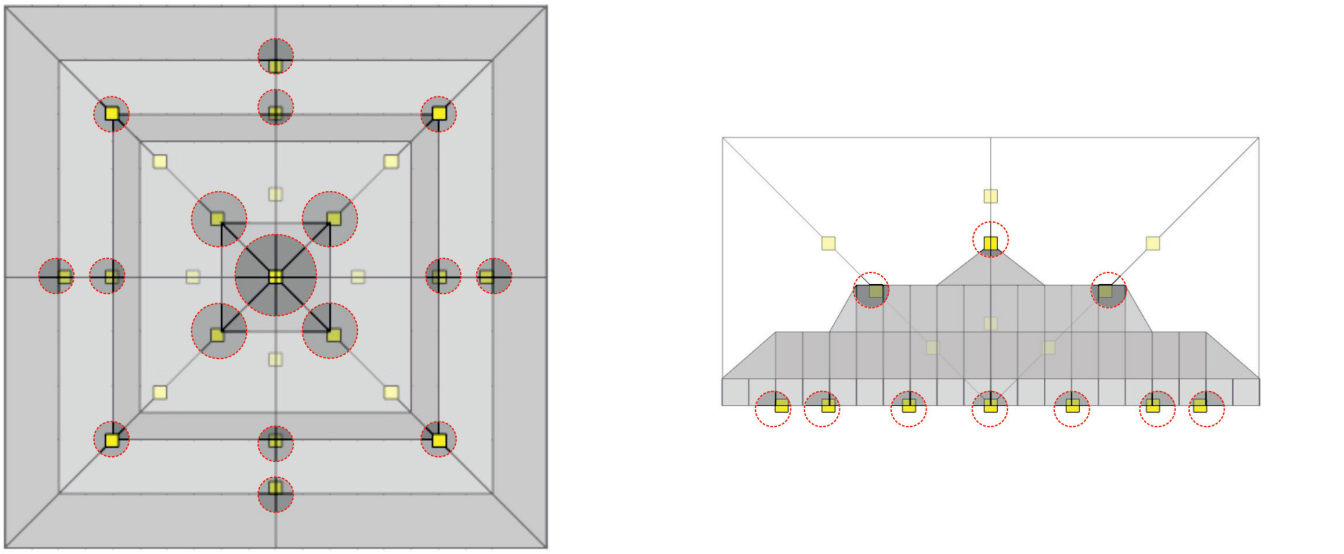

СХЕМА № 6.1.

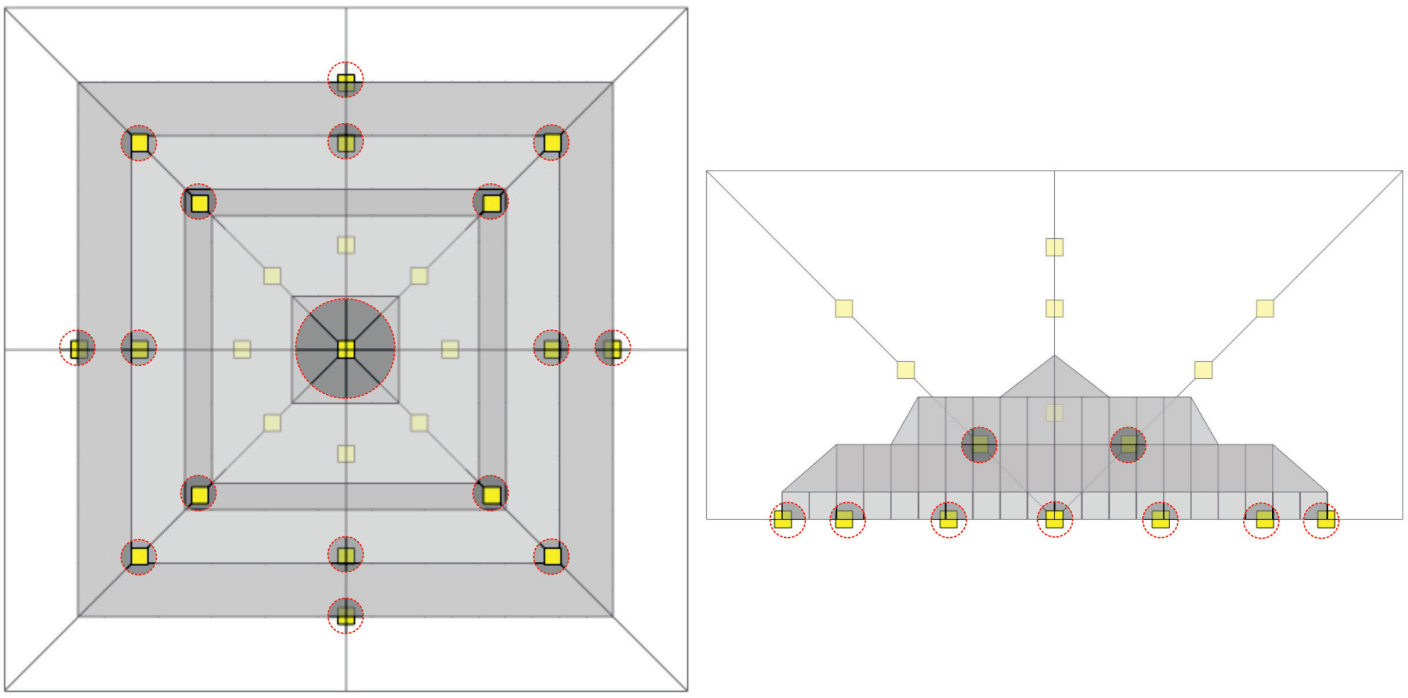

Fig. 6

For a more detailed analysis of the connection between the *mandala* and the architectural structure of the temple, the entire volume (Fig. 7), a longitudinal section and a quarter of the building in section (Fig. 8) are presented. These diagrams clearly show the axial direction and the semicircle formed, which forms the sacred centre of the composition -- the location of the main deities and the main action. Schemes 9 and 9.1 (Fig. 9) highlight the main constructive, axial and compositional coincidences that demonstrate a close relationship between the *mandala* and the structure of the temple, emphasising the unity and harmony inherent in their overall composition.

СХЕМА № 7.

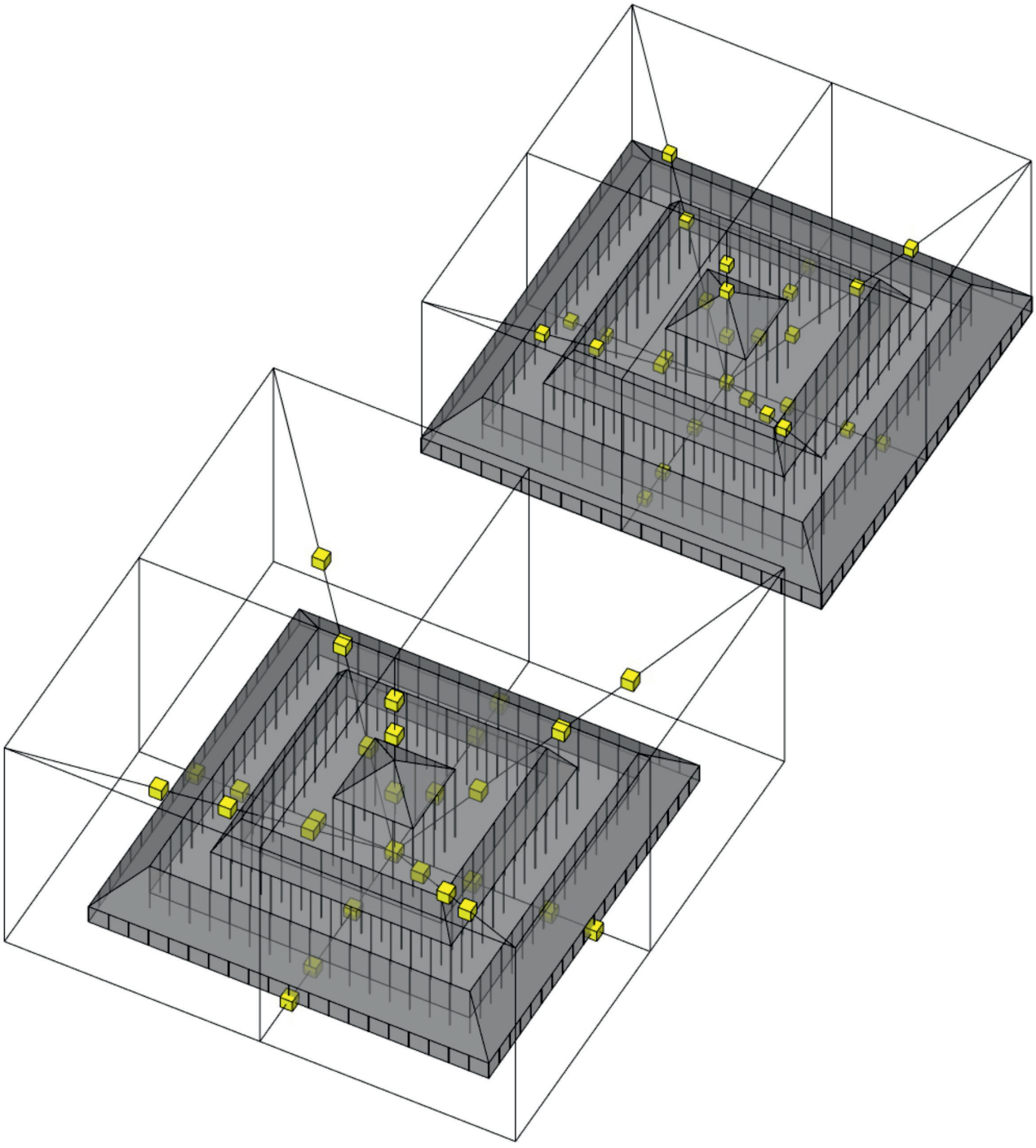

Fig. 7

Conclusion

The analysis of the *mandala* as an architectural module of the Buddhist temples of Mongolia confirms its importance as a basic element for creating the structure of the architectural composition. The use of *mandala* in the analysis of temples allows not only the expressing of the symbolism of Buddhist cosmology, but also to show the spatial organisation, where each element works in a single compositional hierarchy. The main stages of the analysis - from the identification of the basic geometric structure to application in three-dimensional models -- emphasise the universality of the method.

The use of the *mandala* as a module demonstrated the possibility of creating volumetric compositions, where the spatial structure preserves symmetry and the interrelation of elements, which is especially important in the architecture of Buddhist temples. The use of *mandala* helps to connect the internal sacredness and external physical form, which makes it an ideal basis for design, showing harmony and cyclicity. Thus, the *mandala* not only becomes an element of decorative design in the form of *thangka*, i.e., scroll painting, but it also plays the role of a constructive and symbolic framework, determining the spatial logic of Buddhist temples in Mongolia. This study opens up prospects for the further use of the *mandala* in architectural design, especially in the context of creating harmonious spaces, and in the analysis of small and large Buddhist architectural forms.

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