

## ANALYSIS OF THE WALL PAINTING OF THE DUNHUANG FRESCO AS A BASIS FOR ITS PRESERVATION AND RESTORATION

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### Abstract

*The article analyses the wall paintings of Dunhuang sanctuaries based on mathematical methods of defining features and system-structural analysis. This makes it possible to analyse the frescoes according to a certain common criterion and to identify common and different ones. The method of system-structural analysis made it possible to present the sanctuary as a certain integrity with components covered with decor and decorated with sculpture. The main thematic genres of frescoes by period were analysed and it was proved that, in general, the process of the genesis of plans, structural schemes and wall paintings from the early to middle and late periods had the same characteristics, that is, the features of archaism and simplicity characterized both the number and variety of plans and structural schemes, and the subjects of frescoes. The features of each genre at different periods are determined.*

**Keywords:** China; Dunhuang; cave paintings; analysis; preservation; restoration

### Introduction

The Dunhuang cave temple complex is the world's largest collection of Buddhist art, as it was built over a period of 1,000 years, from the 4<sup>th</sup> to the 14<sup>th</sup> centuries.

The Mogao Caves near Dunhuang have experienced a significant influx of tourists and overall tourism development since the beginning of the 21st century. Tourists are particularly attracted by the surviving relics of Buddhist art dating from the 4th to 14th centuries AD [1]. Thus, tangible cultural capital mainly combines aesthetic, symbolic, historical, and spiritual cultural values linked to economic values [2]. The cave paintings "in particular" are significant, but so are the surviving sculptures, together forming a major cultural capital whose development, economic, and social benefits also impact nearby Dunhuang and the whole surrounding area. Valuing, building, and developing this cultural capital for the benefit of its owners and the wider community is based primarily on a sustainable principle. The

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development of this tourist site is thus strongly influenced mainly by the quality and accessibility of the actual presentation [3-5] of the cave complex and the preserved artefacts, which, due to the nature and specificity of this presentation (in situ), also puts pressure on the quality of the guides, who can captivate the visitor with their explanations [6]. On the other hand, the protection of the cave complex and its “treasures” requires a particular compromise due to the cramped space in the caves and the number of visitors who visit the complex every year. This compromise is mainly aimed at ensuring a balance between maintaining visitor satisfaction and monitoring changes in the murals and the cave environment [1].

In terms of the presentation of cultural heritage, it is therefore a complex of in situ monuments [7], characterised by a rather cramped space, which not only impairs the visitor experience but is equally threatening to the preservation of the environment and the physical state of the cultural capital (temperature rise, carbon dioxide levels, etc.). The threat of mechanical damage (addressed in places using glass barriers) [1] is equally concerning. A compromise approach to presentation is also required by the lighting system chosen, which should, on the one hand, allow sufficient visibility of the artefact for visitors and, on the other hand, not cause damage to it [8]. The murals present are particularly sensitive in this respect.

The greatest value is precisely the frescoes, which cover all the internal surfaces of the caves and form one whole with structural schemes and sculptures. The style and content of the wall paintings in each sanctuary are subject to a clear compositional idea. The general compositional characteristics of the interiors are defined as integral since the murals cover four walls, the ceiling, and columns and are complemented by ritual sculpture. Often, frescoes are characterised as a kind of painting in the genre of easel painting, but this is not so, given their special sense of spaciousness. The compositional arrangement of wall paintings together with the techniques of performing frescoes contributed to the creation of a special psychological state of “ordered spiritual fullness”. This is characteristic of all cave sanctuaries, although each of them has its own compositional structure.

As a rule, in each sanctuary there is a main thematic mural around which other images are arranged. The compositions of the early, middle, and late stages differ in their characteristics: the early stage (“archaic”) is characterised by a planar composition without the expression of spatiality; in the middle stage (Sui and Tang periods) there is a flourishing of a complex three-dimensional composition with an expression of space and foreground and background; in the late period (Xi Xia and Yuan) again turn to a planar two-dimensional composition; this is confirmed by the fact that the landscape, which traditionally in the Sui and Tang eras took an active part in creating the effect of three-dimensionality frescoes, is replaced by planar ornament.

An important feature of the overall composition of the sanctuary is the rhythmic structure of the plots. The repeated repetition of the same elements and endless ornaments were supposed to symbolise the greatness of Buddhism and the infinity of the universe.

To generalise, the scenario approach in the location of the wall paintings involved a consistent visual presentation of the postulates of Buddhism to the viewer, where the main role was given to the wall painting of the western wall, and the wall paintings of the southern, northern, and eastern walls could be the same. Some images (such as the offering scene) were not placed on the west wall. If the size of the caves were small, they could not have large-scale Buddhist scenes.

Sources in the following areas were studied: general issues of monument preservation and museification, restoration aspects, and sources dedicated to the study of the Dunhuang complex. Since the Dunhuang complex (in the sources it is often called the Mogao Caves, after the name of the largest cave) is essentially a museum in a real environment, a kind of analogue of Pompeii, this led to the elaboration of the existing source base, which precisely highlights the aspect of preservation of authentic historical environment and museification [9-12], as well as problems of coexistence of historical objects and the modern structure of the city [13, 14]. The

block of processed sources of a general nature should include publications that highlight restoration aspects [15-17]. Sources devoted to the techniques and features of ancient Chinese wall painting were included [18-20].

Since the Dunhuang complex has no analogues in the world and is, firstly, the only such large-scale collection of Buddhist art over a millennium and in a real environment, and secondly, the only cave complex with so many wall paintings and sculptures, it is described and analysed in both foreign and Chinese editions [21-29].

The presented publication continues the cycle of articles devoted to the identification of national identity and external influences in the decorative decoration of Dunhuang during its thousand-year history.

Despite the sufficient coverage of the topic of Dunhuang, some aspects could be deepened.

The purpose of the article was to systematize information related to wall paintings in different periods, applying the method of defining features and system-structural analysis. The difference between this approach and the traditional methods of Dunhuang research is that the monument is investigated using mathematical methods with maximum generalization and structuring of information. Such approaches are not often used in art history but are common in urbanism and architectural theory.

## **Materials and methods**

As already mentioned, the presented study differs from the studies of its predecessors primarily using scientific methods of research that are not characteristic of art history (and Dunhuang's main research is conducted precisely in the field of art history). Although the basis remains the traditional methods - grapho-analytical, photo fixation, field surveys, but here they play the role of only the background, and the mathematical methods of defining features and system-structural analysis become the main ones for certain conclusions. Frescoes are grouped according to the method of defining features, of which there are several, and according to the method of system-structural analysis, the integrity of the interior of the cave is divided into structural components (ceiling, walls, floor, column).

## **Results and discussion**

### ***Stylistic origins of ancient Chinese wall painting***

It should be noted the influence that the traditions of ancient Chinese wall painting had on the art of China, including modern times. At the same time, this influence was not one-sided: in the same way, traditional painting techniques influenced the style and techniques of wall painting, which can be seen in the example of how under the influence of the artistic techniques of the Central Plains of China the style of the Buddhist canonical wall painting of Dunhuang cave sanctuaries was transformed.

It should also be noted that the Chinese version of the Dunhuang Buddhist wall painting was gradually formed through the interaction of several components: external (borrowed traditions and techniques of Indian Buddhism, and later Tibetan Buddhism during the Xi Xia and Yuan periods) and internal (local mythological representations, Taoism, traditions, and techniques of the Central Plains of China).

Here it should be noted that the local teachings of Taoism with its emphasis on the special role of the universe as an expression of ideal harmony, Confucianism with its system of moral and ethical norms of social life did not contradict the borrowed Buddhism, but instead "supplemented" it, which is clearly visible in the wall paintings Dunhuang of the late periods.

The tradition of arranging wall paintings in China is known even in the pre-Buddhist period, in particular, these are ritual burial wall paintings depicting certain symbols and mythological subjects. Often, this approach is seen as a unity with other ancient civilizations,

for example, with Ancient Egypt, because in the imagination of the ancients, life did not end with physical death and further existence was in another spatial dimension inhabited by deities and mythical creatures, so until we meet them the soul of the deceased had to be prepared.

Common to all ancient civilizations is the spread of so-called animistic beliefs, when the forces of nature were endowed with supernatural powers, or natural phenomena were depicted in the images of mythical creatures or deities. The same properties can be observed in an ancient Chinese wall painting with a series of symbolic images of a three-legged crow as an image of the sun, a frog as an image of the moon, the heavenly lord Fusi (the legendary first ruler of China), and his sister Nuiwa (one of the great goddesses of Taoism of the pantheon, the creator of mankind, the saviour of the world from the flood, the goddess of courtship and marriage) with human heads and snake bodies. Instead, with the advent of Buddhism, the emphasis shifts: instead of mythological supernatural beings, Buddha and bodhisattvas become exponents of greatness and supernatural abilities.

Therefore, the tradition of covering all surfaces of Dunhuang Buddhist sanctuaries with wall paintings did not become alien to the Chinese, where the first examples of wall paintings appeared in the Qin (221 BC - 206 BC) and Han (dynasty Western Han (206 BC - 25 AD), Eastern Han (Eastern Han) dynasty (25 - 220 (or 581)). The early stage of the appearance of wall painting took place against the background of the centralization of power in the hands of the emperor and the regulation of life by the postulates of Taoism and the moral and ethical norms of Confucianism.

It is worth analysing the figurative concept of the wall painting of the Dunhuang complex in the general process of the development of Chinese wall painting. In the Dunhuang mural painting, the development of the figurative concept took place from the direct borrowing of the Indian Buddhist figurative concept at an early stage to the gradual appearance of local layering and other external borrowings (such as the concepts of Tibetan Buddhism during the reign of the foreign dynasties Xi Xia and Yuan), resulting in the canonical mural painting gradually moved away from the Indian canons of Buddhist frescoes, elements of local Taoism and mythological subjects appeared in it.

The second result was the strengthening of the secular genre in the general Buddhist concept, which was related to the strengthening of the role of patrons in financing the creation and renovation of cave sanctuaries. This genesis of Dunhuang's wall painting corresponds to the general picture of the development of wall painting in China, from the conventionality and simplicity of canonical images of a simplified composition towards multi-figure, complexly detailed compositions, where the secular plot often dominates the purely canonical.

The evolution of murals in China continues from the Sui and Tang to the Ming era, and similarly, in the case of the Dunhuang wall paintings, the development process ends in the Yuan, and the complex declines. At the same time, in the last two periods - Xi Xia and Yuan, the artistic concept of Dunhuang is under the dominant influence of Tibetan Buddhism, which changes the character and coloristic solution of fresco images.

The Sui and Tang periods are generally considered to be the periods of maximum flourishing of Chinese fresco painting, when artists invested a lot of effort in the search for a new figurative concept and means of aesthetic expressiveness of the fresco, improving the existing compositional techniques and experimenting with new ones, introducing new, secular, subjects, and colouristic solutions.

According to the general concept of the development of Chinese mural painting, the genesis of Dunhuang's mural painting was to move away from convention and simplification to composition, from a limited number of figures to a lot of figurations. At the same time, although it is believed that the portrait, historical and landscape genres in frescoes became especially widespread during the Yuan period, however, it spread earlier in Dunhuang, such images are known since the early periods.

However, the tradition of the simultaneous presence of supernatural beings, deities, and people in the sacred wall paintings of China is quite old and has been known since the Han period (206 BC - 581 BC). This local tradition was based exclusively on local religious and mystical ideas about the structure of the universe and man's place in it. As is characteristic of all ancient religions, along with the deification of the forces of nature, there was also the deification of the ruler and endowment of him with the properties of a divine being.

On these local ideas, starting approximately from 65 AD influenced by Buddhism borrowed from India, the spread of which was facilitated by the favour of certain dynasties. Many postulates of Taoism and Confucianism did not contradict the postulates of Buddhism, in fact the three currents formed a harmonious religious syncretism.

Evidence of the merger of Taoism with Buddhism is evidenced by the appearance of scenes in the Dunhuang caves, where Indian asari take on the image of the local flying deities Fei Tian without wings, and along with the images of the Buddhist canon, Fusi and Nuiwa are depicted - in general, ancient mystical symbols of rulers sky, or the goddess Si-wang-mu, the Chinese goddess "Mistress of the West", one of the most revered in the Taoist pantheon, with sacred animals. The same images have been preserved in the frescoes of ancient tombs.

As we have already noted, common to Chinese wall painting is the departure from the strict canonicity of subjects with the regulation of images towards greater picturesqueness and realism by supplementing religious or mythological subjects with portraits not only of the emperor and his family, but also of famous monks, philosophers, poets, military leaders, and patrons who financed the creation of murals and sanctuaries.

Dunhuang's portrait mural corresponds to the established canons of Chinese art, common to both painting and mural painting. These canons were based on the identification of social hierarchy by artistic means, as there were certain canons of the image of dignitaries and ordinary people. In this, you can see the commonality between the canons of the image of the Buddha and bodhisattvas and representatives of the highest circles of China: both sacred persons and rulers were depicted in solemn poses and motionless.

#### ***The defining features are the components of cave interiors***

The cave sanctuaries of Dunhuang are a unique example of the synthesis of arts, a combination of wall painting with sculpture and artifacts.

According to the principle of system-structural analysis, the space of cave sanctuaries is divided into structural components: ceiling, walls, floor. Since the study is based on the principle of defining features, for plans and overlaps such a defining feature is the geometry of forms and its modifications. In a slightly different way, the principle of defining features is applied to the systematization and analysis of wall paintings, in particular, an extended system of possible defining features is selected, where the main feature is the plot of the fresco, and other features only clarify the classifications:

- 1) defined thematic genre (religious with varieties, portrait, landscape, decorative and ornamental);
- 2) a specific plot in different periods (Buddha on the throne, benefactor's portrait, landscape);
- 3) the presence or absence of a background on frescoes of different periods;
- 4) the degree of detailing of the fresco;
- 5) methods of depicting the human figure (with observance of anthropological characteristics or conditionally, how to depict the face, body parts, clothes, colours);
- 6) methods of depicting animals and birds (with observance of anthropological characteristics or conditionally, colours);
- 7) ways of depicting the landscape (detailed or conventional, colouristic);
- 8) ornaments and decor;
- 9) images of architectural objects;
- 10) images of mythical creatures;

11) the colour scheme of the wall painting from period to period.

As it was established, in the case of sanctuaries, the greatest difficulty was the classification of decorative decoration, since the types of plans are basically the same and are based on simple geometry of forms, as well as overlapping. Therefore, in the case of the systematization of plans and overlaps, it was easier to identify recurring types, and uncommon types and conclusions related primarily to the argumentation of the most widespread types and the characteristics of the degree of variety of plans and constructive schemes in the periods of different dynasties. It was also established what types of plans and overlaps there were in the early, middle, and late periods, in order to prove which of them were local property and which arose under external influences. It also made it possible to compare the processes of diversification of constructive schemes with the processes of diversification and improvement of the artistic system of sanctuaries.

The principle of defining features provides great opportunities in determining the characteristics of a mural in detail, however, since it is quite difficult to analyse frescoes in detail by all 11 defining features within the scope of the dissertation, we will conduct an analysis on some main features, and we will speak more generally about others.

The focus of the study is on the wall painting, as it carries the main artistic and stylistic load, and the sculpture is its complement.

The main object of research are the interiors of cave sanctuaries, the analysis of which is built on three hierarchical levels:

- the zero level - integral space;
- the first level - ceiling, walls, floor (general analysis of plots and their characteristics);
- the second level - the composition and details of the ceiling and wall frescoes.

So, first, a general description of the degree of decoration of the sanctuaries' premises as a whole is given, then the principles and methods of decorating different parts of the premises with a general description of the theme of the images (religious subject, secular subject, ornament) are analysed, the main attention is paid to the frescoes on the second level, which are already analysed in detail the specificity of the plot in different periods, visual and artistic level, style, polychromy, level of detailing, etc.

The importance of the method of defining features lies in the fact that it is quite difficult to argue stylistic and figurative changes and to trace the process of the genesis of a fresco, if you compare frescoes with different subjects so as not to go to the level of structuring the image, separately highlighting the ways of depicting deities, people, animals, landscapes, architectural objects. Similarly, an even smaller level of the hierarchy is the study of the way faces, body parts, clothes, etc. are depicted.

This allows, first, to determine the characteristic features of a fresco of a certain period at all levels - from the general concept to a detail and a fragment, and to identify the dominant features, noting at which level there is common and different, local, or borrowed.

Considering the huge number of areas of wall paintings and their variety, this is the only way to analyse them in general within the limits of one dissertation. It is worth noting that in most scientific sources such structuring is not observed, but factual descriptions of frescoes and their concepts in general prevail.

#### ***The synthesis of arts as the basis of the figurative concept of the Dunhuang Caves***

A separate research question concerned the transformation of the same canonical plots from period to period.

#### ***Buddha Image (Foxiang Hua)***

The subject of the image of the Buddha sitting on the throne is the main canonical subject in the Dunhuang Buddhist wall painting. It was analysed how this plot was interpreted in the periods of Northern Liang (401 - 439), Northern Wei (439 - 534), Western Wei (535 - 556), Northern Zhou (557 - 581), Sui (581 - 618), Tang (618 - 907), Five Dynasties (Five

Dynasties and Ten Kingdoms) (907 - 960), Northern Song (960 - 1127), Xi Xia (1038 - 1227) and Yuan (1271 - 1368).

Analysis of the means of artistic expressiveness of the same plot made it possible to determine four main periods of its figurative concept and the differences between them:

1) Northern Liang Dynasty (401-439), Northern Wei Dynasty (439-534), Western Wei Dynasty (535-556), Northern Zhou Dynasty (557-581) - primitivism of human figures' images without light-shadow gradations and modelling of faces, with conventional images of body parts, few figures in the plot, a limited number of open bright colours are used, the canons of Shiyu (西域) Buddhism (Fig. 1).

2) Sui dynasty (581-618), Tang dynasty (618-907) - complication of the image, conformity to human anatomy, fine facial features, drawing of figures and parts of the body, departure from primitivism towards detailing and aesthetic expression, attention to details (Fig. 2).

At the end of the Tang Dynasty and during the Five Dynasties, the territory of Dunhuang was under the control of the army of the Tang Dynasty (Guyijun - Military Governorate of the Shazhou Territory 848-1036) and was isolated from the influence of the interior territories of China and, accordingly, the local styles that caused a gradual decrease in the level of mural painting in subsequent periods.

Starting from the periods of the late Tang and the Five Dynasties, there is a change in style, a departure from large-figured compositions with a limited number of figures towards small-figured compositions.



**Fig. 1.** Offering to the Bodhisattva, Mogao, Cave 275, Northern Liang Dynasty.  
Gansu Provincial Institute of Cultural Relics and Archaeology

3) The era of Five Dynasties and Ten Kingdoms (907-960) and the Northern Song Dynasty (960-1127) is a complex political and economic situation that negatively affected on the development of artistic techniques. In the Five Dynasties, problems of a political and economic nature became a manifestation of the fragmentation and polymorphism of the compositions with the Buddha, where the figure of the Buddha is lost in the general space with many characters, the appearance of excessive detailing, the colour scheme changes, light pastel colours are used, attention to the details of the background (nature, architecture, etc.).

The Northern Song Dynasty (960-1127) - strengthening of the tendency to fragment the plot with the Buddha, multi-figure compositions with excessive detailing, including the background.



**Fig. 2.** “Guan-wu-liang-shou-Jing-bian”, Yulin ku, Cave 25, Tang Dynasty. Gansu Provincial Institute of Cultural Relics and Archaeology

4) Xi Xia Dynasty (1038-1227), Yuan Dynasty (1271-1368) - another change in style, interpretation in the version of Tibetan Buddhism due to the Mongolian roots of the rulers, colours become muted, darker, departure from multi-figure detailed compositions to conventionality of images, a limited number of figures without background detailing, the style of depicting figures is changing (Fig. 3). The mural painting is performed simultaneously by Mongolian artists and artists from the Central Plains of China.

Thus, without delving into the detailed changes in the interpretation of the image of the Buddha by period, we note that the general changes in the style of the Dunhuang fresco took place in three stages:

the 1st stage - the period of Xiyun techniques - primitivism and conventionality of images, large-scale figurative frescoes (Northern Liang Dynasty (401-439), Northern Wei Dynasty (439-534), Western Wei Dynasty (535-556), Northern Zhou dynasty (557-581).

The 2nd stage - the national style period- initially the national style development - at the end, the decline due to the difficult political and economic situation (Sui dynasty (581-618), Tang dynasty (618-907), the era of Five Dynasties and Ten Kingdoms (907-960), the Northern Song dynasty (960-1127)), while the periods of the late Tang dynasty (618-907), the era of Five Dynasties (907-960), the Northern Song dynasty (960-1127) are characterized by fragmentation and excessive detailing, frescoes with many details of figures;

The 3rd stage - the borrowing period - Tibetan influences combined with local techniques (Xi Xia dynasty 1038-1227; Yuan dynasty 1271-1368).





**Fig. 3.** Teachings of Buddhism. Siqianfodong, Cave 13, Xi Xia Dynasty.  
Gansu Provincial Institute of Cultural Relics and Archaeology.

### ***Portraits of Patrons***

It is worth noting that although the Dunhuang cave complex is a complex of Buddhist sanctuaries, along with the religious subjects of the wall paintings, secular subjects were also used, in particular the portraits of patrons. Traditionally, there were canons of conveying the strength, grace, and nobility of the depicted characters, but there are differences in the depiction of sacred persons and mythical creatures and real people. If sacred persons and mythical figures can be depicted naked or half-naked, human figures are always depicted in the clothes of their period. Similarly, different symbolism is embodied in the character of the images of the body, head, hands and feet of heavenly beings and earthly people.

In the early period, mythical characters are depicted with large round heads and defined bellies to emphasize the physical health and strength of the characters. At the end of the Northern Wei dynasty, with the development of the portrait genre, the figures become more realistic and there are attempts to give them volume. Male figures of mythical characters, in contrast to portraits of patrons, are usually naked to reveal their physical strength, in accordance with the Buddhist canon.

Images of portraits of patrons in the Northern Liang (401-439), Northern Wei (439-534), Western Wei (535-556), Northern Zhou (557-581), Sui (581-618), Tang (618-907), Five Dynasties and Ten Kingdoms (907-960), Northern Song (960-1127), Xi Xia (1038-1227) and Yuan (1271-1368). This made it possible to outline the main stages of the development of secular wall painting, their artistic characteristics, and differences between them.

1st stage - Northern Liang dynasty (401-439), Northern Wei dynasty (439-534), Western Wei (535-556), Northern Zhou (557-581) - archaism and convention of images without the expression of portrait likeness, the same features that characterize early scenes with the Buddha. At the same time, there are differences between the portraits of the Northern Liang and Northern Wei dynasties, on the one hand, and between the portraits of the Western Wei and Northern Zhou dynasties, on the other hand (Fig. 4).

2nd stage - the Sui dynasty (581-618) - the appearance of dynamism in the figures, the diversification of the poses of the figures, an attempt to convey the individuality of facial features, however, in a rather naive interpretation; the Tang dynasty (618-907) - the flowering of the portrait genre with the transmission individual features of the portraits, diversification of compositions, wealth of detailing, improvement of polychromy (Fig. 5). The era of Five

Dynasties and Ten Kingdoms (907-960), the Northern Song Dynasty (960-1127) - a decline in the artistic level of the portrait genre.



**Fig. 4.** Patrons (donors). Mogao, Cave 268, Northern Liang Dynasty.  
Gansu Provincial Institute of Cultural Relics and Archaeology



**Fig. 5.** Patrons (donors). Mogao, Caves 468 and 469. Tang Dynasty.  
Gansu Provincial Institute of Cultural Relics and Archaeology.

The 3rd stage - the Si Xia (1038-1227) and Yuan (1271-1368) dynasties - the revival of the portrait genre, but in a tangible Mongolian version with local influences, a return to the transfer of individual features of the portraits, diversification of compositions, richness of detail, improvement of polychromy (Fig. 6).

Thus, we can distinguish three stages of the development of the portrait genre, which according to chronology and artistic trends correspond to the stages of development of scenes with the Buddha:

1<sup>st</sup> stage - abstract conventional images of human figures without drawing faces, the poses of the figures are equally static, limitations of detailing and colour gamut (Northern Liang Dynasty (401-439), Northern Wei Dynasty (439-534), Western Wei Dynasty (535-556), Northern Zhou dynasty (557-581);

2<sup>nd</sup> stage - the period of the maximum flourishing of the artistic and figurative means of expression of people, which ended with the decline of the level of skill as a result of political and economic troubles; if in the depictions of the image of the Buddha it was expressed by

excessive fragmentation of the compositions, then in the portrait genre it manifested itself in the lower level of depictions of people (Sui dynasty (581-618), Tang dynasty (618-907), the era of Five Dynasties and Ten Kingdoms (907-960), Northern Song dynasty (960-1127));

3<sup>rd</sup> stage is a return to the high level of portrait wall painting, but already in the Mongolian interpretation with local influences (Xi Xia dynasty (1038-1227), Yuan dynasty (1271-1368)).



**Fig. 6.** Patrons (donors), Mogao, Cave 332. Yuan Dynasty.  
Gansu Provincial Institute of Cultural Relics and Archaeology.

Thus, it proves a direct connection between the economic and political situation in the country and the level of art. The art of Dunhuang reacted to the hidden and overt processes in the empire by a sharp decline in artistic excellence. The return of art to its previous level took place only during the Mongol dynasties, however, outer Mongolian and Tibetan artistic traditions dominate.

***Background detailing (landscapes, patterns, animals, and buildings)***

The presence of a detailed background on the frescoes of the periods Northern Liang (401-439), Northern Wei (439-534), Western Wei (535-556), Northern Zhou (557-581), Sui (581-618), Tang (618-907), Five Dynasties and Ten Kingdoms (907-960), Northern Song (960-1127), Xi Xia (1038-1227) and Yuan (1271-1368).

The Northern Liang Dynasty (401-439) - the conventionality of the images without drawing the background, the figures exist as if in an empty space, the absence of a landscape, but the presence of ornaments.

Northern Wei Dynasty (439-534) - there is no complete landscape, the story frescoes contain images of buildings, animals, and mountains.

Western Wei Dynasty (535-556) - there are some landscape paintings, but very few images of animals.

Northern Zhou Dynasty (557-581) - landscapes are used, in which figures are located in story frescoes.

Sui Dynasty (581-618) - landscapes and patterns in story frescoes.

Tang Dynasty (618-907) is the heyday of the traditions of detailing the background, including the landscape genre.

The era of Five Dynasties and Ten Kingdoms (907-960) is the preservation of the landscape traditions of the Tang Dynasty.

The Northern Song Dynasty (960-1127) is a gradual decline in the mastery of techniques of landscape paintings derived from the Tang Dynasty.

Xi Xia Dynasty (1038-1227) - a small number of landscape paintings.

Yuan Dynasty (1271-1368) - no landscapes, only patterns.

Now let's analyse these thematic plots in the corresponding periods.

In the Northern Wei period (439-534), we can speak of a "proto-landscape", that is, its individual elements in the most simplified form, as well as the depiction of animals essentially with a stencil, with solid filling of figures without modelling the body, the colour range is restrained, with in a small number of colours (ochre, malachite blue, malachite green, white), the same for all depicted figures.

The same "proto-landscape" is found in the Western Wei period (535-556), but we can talk about a certain genesis in the direction of a large drawing of animal figures and modelling of their images with a certain volume, the circular scale changes (ochre-red, white, cyan, ultramarine, black).

The Northern Zhou dynasty (557-581) - the landscape becomes part of a certain plot, figures are located in it, but the plan is expressed in primitive ways, it is also a "proto-landscape", since the same limited colour range is used for the elements of the fresco, white colour dominates, other colours - ochre-red, malachite-blue, malachite-green, ultramarine, black.

Similarly, the landscape of the Sui dynasty (581-618) becomes part of the story frescoes. It is also a "proto-landscape" without a clear outline and selection of conventional planes located at different distances from the viewer. As for the colours, the role of white is reduced here, and ultramarine in combination with malachite blue dominates.

The period of the Tang Dynasty (618-907) is considered the time of the maximum flowering of the landscape genre with the detection of depicted zones that are at different distances from the viewer, the landscape becomes part of complex multi-figure frescoes, the images of animals are detailed with volume transfer, the colours become pastel with accentuation of individual figures in black and brown.

The same traditions are still preserved in the era of the Five Dynasties and Ten Kingdoms (907-960) and in the period of the Northern Song dynasty (960-1127), but there is a gradual decline in performance techniques, a lower level of detail and limited colour scheme (white, green, ochre, accentuation of figures with black).

The Xi Xia dynasty (1038-1227) was marked by a decrease in the number of frescoes with a landscape background, and in those cases where it is present, it is interpreted in the style of Tibetan Buddhism, the planning is maintained, but in essence the landscape becomes monochrome in brown tones. During the Yuan period (1271-1368), landscapes disappear altogether.

Thus, the following stages can be distinguished:

1<sup>st</sup> stage - the so-called “proto-landscape” and simplified images of animals (Northern Wei Dynasty (439-534), Western Wei Dynasty (535-556), Northern Zhou Dynasty (557-581), Sui Dynasty (581-618), the changes concern only colours;

2<sup>nd</sup> stage is the flowering of the landscape genre and the detailing of animal images (Tang dynasty (618-907); then the preservation of the traditions of the Tang era with their gradual simplification and decrease in the level of skill (the Five Dynasties era (907-960), the Northern Song dynasty (960-1127);

3<sup>rd</sup> stage - the use of the landscape genre in a limited number and in the version of the Tibetan wall painting (Xi Xia dynasty 1038-1227).

Now let's compare the stages of different genres in order to match them.

In the plot with the Buddha, stage 1 - Northern Liang Dynasty (401-439), Northern Wei Dynasty (439-534), Western Wei Dynasty (535-556), Northern Zhou Dynasty (557-581), in the portrait genre, stage 1 - Northern Liang Dynasty (401-439), Northern Wei Dynasty (439-534), Western Wei Dynasty (535-556), Northern Zhou Dynasty (557-581); in the landscape genre, stage 1 - the Northern Wei Dynasty (439-534), the Western Wei Dynasty (535-556), the Northern Zhou Dynasty (557-581), the Sui Dynasty (581-618), therefore, the landscape genre begins later than the genre of Buddha images and the portrait genre, but also covers the period of the Sui dynasty. In images with the Buddha and in the portrait genre, this is the period of archaism, but it ends before the Sui period, in the landscape genre, archaism persists longer, even in the Sui period.

In images with the Buddha, the 2nd stage is the Sui dynasty (581-618), the Tang dynasty (618-907), the Five Dynasties and Ten Kingdoms (907-960), the Northern Song dynasty (960-1127); in the portrait genre, stage 2 - the Sui dynasty (581-618), the Tang dynasty (618-907), the era of the Five Dynasties (907-960), the Northern Song dynasty (960-1127) - the period of prosperity, which ended with the gradual decline of the artistic level of traditions, which were maximally improved in the Tang era, in the landscape genre, the 2nd stage is similar.

In images with Buddha and in the portrait genre, the 3rd stage is the Si Xia dynasty (1038-1227), the Yuan dynasty (1271-1368) with the revival of traditions under strong Tibetan and Mongolian influences, in the landscape genre, the 3rd stage is the Si Xia dynasty (1038-1227) with a minor role of landscape images with foreign influences. During the Yuan Dynasty (1271-1368), there were no landscapes.

In addition to the genres of mural painting, traditional Chinese elements related to the composition of the mural are important: dots, lines, planes (点线面). Lines (线描) in Dunhuang murals are used differently than in Western European painting, and the line is often more important than the painted background it outlines, or it is contours without colour filling. Such an important role of lines was determined by their variety - straight and curved, short and long, thin, and thick, broken, and continuous. It was believed that the combination of different types of lines gives the image expression and expressiveness. Frescoes were meaningfully separated from each other by lines of different types. However, not a line, but a dot is the main element of the composition of the planes.

Even though all the surfaces of the sanctuaries are covered with continuous wall paintings, they give the impression of thematically divided and ordered planes in such a way that the general plot is visually understandable. Large murals can also be meaningfully divided.

#### ***Systematization of varieties of ornamental compositions of Dunhuang frescoes***

Patterns were a characteristic feature of Dunhuang frescoes in all periods. These are abstract ornaments in the form of stripes, borders, planes, and decorative inserts, as well as ornaments on clothes and objects depicted in frescoes. From the frescoes of different periods, researchers study ethnic components, the presence of borrowings, etc., that is, Dunhuang frescoes are also a source of ethnographic research on the life of people in the periods of different dynasties. A characteristic feature of the ornaments is rich polychromy, where the line that outlines the form and the polychrome filling are one.

The following are the original types of decorative fresco compositions of the heyday of Dunhuang wall painting:

- “jingbian hua” (image of transformations in heaven and hell, Viparinatam 经变画) - a complex plot composition that was finally formed in the Tang era and was characterized by pronounced three-dimensionality, the division of figures into main and secondary, first and second plan;
- "huagai" - a canopy over the emperor's carriage (Fig.7);
- “border” - framing patterns (borders) in the form of long stripes);
- “jaojin” - complex ornamental compositions (artesonado);
- compositions with flying Fei tian (飞天) (Fig. 8);



Fig. 7. Examples of "huagai" patterns, Painted by Chang Shana. Chang Shana, Decorative Patterns of Dunhuang in China.



Fig. 8. Ornamental composition "Pair Fei Tian with Bead". Mogao, Cave 76. Song Dynasty. Gansu Provincial Institute of Cultural Relics and Archaeology.

- compositions with a combination of “jaojing” techniques and images of Fei tian, an example of such a hybrid composition formed from two separate types is “lotus-Feitian-jaojing” (Lianhua-Feitian-Jaojing), where in the centre of the composition is a lotus of fourteen smaller lotuses and fourteen wave-like patterns.

## Conclusions

Considering the involvement of an interdisciplinary research team from all aspects that should be considered: from painting techniques and technologies to material analysis, the present study highlight the importance of their preservation.

The inner space of the cave Buddhist sanctuaries of Dunhuang should be interpreted as a space of synthesis of arts, where wall painting and ritual sculpture form one whole, at the same time, unlike other similar Buddhist sanctuaries in China, the main artistic and meaningful load in the sanctuaries of Dunhuang is given to the wall painting, to which it is subordinated sculpture.

The Dunhuang mural is a complex phenomenon that can be analysed in different aspects:

- the influence of the economic and political situation on the development of wall paintings;
- list of plots;
- the genesis of the same plot from period to period;
- comparison of the genesis of different plots from period to period;
- analysis of composite construction;
- polychromy.

The analysis of Dunhuang's wall painting shows that its main feature, characteristic of Chinese art as a whole, is a departure from conventionality and primitiveness of images to improvement and artistic skill, however, this process was not continuous and during the periods of economic and political decline of the empire, the level of art decreased sharply.

The peculiarity of this process in Dunhuang is that the revival of the traditions of high-level wall paintings took place only after the Mongol dynasties Xi Xia and Yuan came to power - mainly on a Tibetan-Mongolian basis with the partial involvement of local techniques.

The study of the periodization of the Dunhuang wall paintings against the background of historical events showed how Buddhism, borrowed from India, gradually supplanted local animistic beliefs, but gradually it itself was influenced by Taoism and Confucianism with the formation of the so-called "religious syncretism", and these elements local beliefs penetrated into the composition of the Buddhist fresco - in a partially transformed form. This proves how resistant to change the local Taoist and Feng Shui (geomancy) traditions, along with local mythology, have proved to be.

At the same time, the development of the plot with the Buddha on the throne can be characterized as follows: a sequential development from primitive conventional imagery with a limited number of figures and colours to the complexity of the composition, the correctness of the image of a person, then there is an excessive fragmentation of the plot with excessive detailing, when the figure of the Buddha is lost in the general plot, and in the final stages, under foreign Mongolian and Tibetan influence, a fundamental change in style occurs, a return to the conventionality of images, and a rejection of fragmented compositions.

That is, the development of the plot with the Buddha went through a closed cycle and ended: from the primitivism and conventionality of the early periods under the influence of Indian traditions through the formation of the national style and its fragmentation and then a complete change to the Tibetan style partly with local influences, related to the early period in its conventionality, greater primitivism, and lack of fine detail.

In a similar way, the development of the portrait genre takes place in three stages - from abstraction and primitivism to high skill, then to the loss of skill and a partial revival of the portrait genre based on borrowed Mongolian traditions in combination with local influences.

The genesis of the landscape genre lasted from 439 to 1227 (788 years) and successively went through a long stage of "proto-landscape" (439-618) (179 years), then a period of prosperity (618-907) (289 years), then a gradual decline (907-1127) (220 years) and short-lived revival (1038-1227) (189 years) before the final disappearance. Thus, the duration of the stages was more or less the same in time. So, the landscape genre arose later than the Buddha genre and the portrait genre and disappeared earlier. In general, the stages of the genesis of the Buddha, portrait and landscape genres coincide, but there is a discrepancy in the periods after the beginning of the stages. This indicates a direct connection between the flourishing of craftsmanship and the level of development of the country, dependence on the political and economic situation in the state.

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