

Research on Restoration of Architectural Images in Yongle Palace Murals and Structure of Yuan Dynasty Residences

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Abstract

This study takes the architectural images in the Yongle Palace murals as the research object and systematically examines their correspondence with the structural features of Yuan Dynasty residential buildings. The research finds that the architectural images in the murals are highly consistent with the physical remains of the Yuan Dynasty in terms of overall layout and spatial sequence, especially in the characteristics of courtyard-style layout and "front hall, rear bedroom" spatial organization. Although the representation of architectural components is simplified, the key structural features accurately convey the technical characteristics of Yuan Dynasty architecture. The study confirms the significant value of the Yongle Palace murals as research materials for the architectural history of the Yuan Dynasty, while also pointing out the need to be cautious about the influence of artistic processing when using image materials. This achievement not only provides new visual evidence for the study of Yuan Dynasty residential buildings but also establishes a reference framework for evaluating the historical value of architectural images.

Keywords

Yongle Palace murals; Yuan Dynasty dwellings; architectural images; iconographic analysis; architectural history research

1. Introduction

As an outstanding representative of the Taoist mural art of the Yuan Dynasty, the murals of Yongle Palace have a rich architectural image system that records the social life scenes and architectural forms of the Yuan Dynasty. This study takes the architectural images in the murals of Yongle Palace as the entry point to explore the correlation between the architectural features presented in the murals and the actual residential structures of the Yuan Dynasty. Existing research mostly focuses on the artistic value of the murals or individual architectural history investigations (Xu Yanhong, 2004; Zhang Jingshuang, 2021), but lacks systematic comparisons be-

tween the architectural images in the murals and the physical buildings. This paper aims to fill this research gap by analyzing the architectural elements in the murals and providing new visual evidence for the study of residential architecture in the Yuan Dynasty.

2. Literature Review

2.1. Research on Architectural Images in Mural of the Yongle Palace

Regarding the architectural images in the murals of Yongle Palace, there have been abundant academic research results. In the field of architectural image recognition, researchers have established a systematic classification system (Song Hui et al., 2023), and conducted detailed identification of various architectural elements presented in the murals. These studies particularly focused on the spatial characteristics and structural details of the buildings (Wang Yansong, 2024), providing a foundation for understanding the architectural representation in the murals.

The technical research has revealed the drawing characteristics of the mural architectural images (Xu Yanhong, 2004), including the used perspective techniques and proportional relationships. These studies indicate that the architectural representations in the murals not only follow certain technical norms but also exhibit the unique handling methods of folk art. In terms of artistic expression, scholars have analyzed the composition relationship between architectural elements and other picture elements (Hua Siyu, 2021), and explored their visual features and decorative characteristics (Ren Chaoge, 2023).

2.2. Research on Architectural Structure of Yuan Dynasty Residential Buildings

The research on Yuan Dynasty residential architecture is relatively weak, mainly due to the scarcity of physical remains. Current studies mostly rely on limited archaeological discoveries and historical records for speculation (Song Hui et al., 2023). In recent years, scholars have begun to attempt to restore the characteristics of Yuan Dynasty residences through various materials, among which mural images are regarded as important reference materials (Song Hui et al., 2024).

Some studies focused on the detailed features of building components (Zhang Jingshuang, 2021), and through comparative analysis, explored the correspondence between images and the actual objects. These studies provided a new perspective for understanding the architectural characteristics of Yuan Dynasty dwellings, but there are still many unresolved issues.

2.3. Summary of Literature Review

Most current studies have regarded the mural architectural images of Yongle Palace and the residential structures of the Yuan Dynasty as two separate research fields. On one hand, the research on mural architectural images mainly focuses on their ar-

tistic expression and technical features (Wang Yansong, 2024; Xu Yanhong, 2004); on the other hand, the discussion of the Yuan Dynasty residences mostly concentrates on the limited physical evidence verification (Song Hui et al., 2023). Few studies have systematically combined the two to explore the reference value of mural images for restoring the residential structures of the Yuan Dynasty. This paper aims to fill this research gap by analyzing the architectural image features in the mural paintings of Yongle Palace and comparing them with the known information on Yuan Dynasty residential structures, to discuss the reliability and reference value of mural images as historical architectural research materials.

3. Analysis of Architectural Image Characteristics in Paintings of Yongle Palace

3.1. Image Representation of Architectural Types

The murals of Yongle Palace vividly depict various architectural forms of the Yuan Dynasty. Residential buildings occupy a significant position in the murals, with their courtyard-style layout features clearly visible. The roofs are mostly of the hip or gable style. Commercial buildings are usually distributed along the street, with open facades facilitating business operations. Government office buildings are larger in scale, and their special status is demonstrated through tall bases and complex roofs. The spatial treatment techniques of these architectural images are quite distinctive. The architectural complexes often appear in a combined form, creating a sense of depth through the arrangement of buildings in front and back. The individual buildings focus on presenting all three facades completely, facilitating the audience's understanding of the architectural form. It is worth noting that some architectural details, such as the dougong structure, have been simplified, which might be due to artistic considerations.

3.2. Image Characteristics of Architectural Components

The murals have distinct characteristics in depicting the architectural components. The base of the columns adopts a simplified urn-like style, and the column bodies are straight with few variations. The beams and eaves are distinguished by different color bands, making the structural relationship clearly identifiable. The parts of the doors and windows are finely depicted, with rich and colorful patterns in the grooves. The roof focuses on showing the tilework and ridge decorations, with the ridge grooves arranged neatly and the ridge decorations elaborate.

In terms of detailed design, heavy colors are often used to highlight the shadow effect under the eaves. The base is mostly made of a single-layered lotus pedestal, with simple moldings. The style of the railings varies depending on the architectural grade. Important buildings use staff-supported railings, while ordinary buildings are simplified. These design techniques not only reflect the actual construction techniques but also embody the artistic characteristics.

3.3. Image Organization of Architectural Space

The spatial layout in the murals has narrative characteristics. The architectural complexes are mostly arranged around the central courtyard, forming an inward-oriented spatial sequence. The foreground buildings are depicted in detail, while the background buildings gradually become simpler, creating a visually distinct hierarchy.

The relationship between the building and the environment is handled very skillfully. The courtyards are adorned with trees and rocks, adding a touch of liveliness to the space. The buildings transition naturally through elements such as corridors and platforms. The indoor and outdoor boundaries are blurred, and the penetration of spaces is often hinted at by curtains and lattice screens. This approach not only meets practical needs but also fulfills the requirements of visual expression.

Overall, the architectural images in the mural of Yongle Palace combine both realism and artistry. Their types are clearly distinguished, the components are presented in a standardized manner, and the spatial organization is reasonable, providing valuable materials for the study of Yuan Dynasty architecture. At the same time, it should be noted that the simplification of some details may affect the accuracy of the image data. By conducting in-depth analysis of these features, it is helpful to better understand the characteristics of Yuan Dynasty architecture.

4. Comparative Analysis of Wall Painting Architectural Images and Structures of Yuan Dynasty Residential Buildings

4.1. Correspondence of Spatial Layout

Through comparative analysis, it can be observed that the architectural spatial layout depicted in the wall paintings has many similarities with the known features of Yuan Dynasty residential buildings. The courtyard layout is fully reflected in both the wall paintings and the physical remains, and this spatial organization centered around the courtyard reflects the common characteristics of Yuan Dynasty residential culture. The common "front hall and rear bedroom" spatial sequence in the wall paintings is highly consistent with the plan configuration of the Yuan Dynasty residential sites discovered through archaeology, confirming the credibility of the image materials. The organizational style of the architectural group also shows similarities. The enclosed form of the architectural group in the wall paintings is consistent with the layout principles of the existing Yuan Dynasty architectural complexes, emphasizing the inward-oriented spatial characteristics. In terms of courtyard scale, the proportion of the courtyard depicted in the wall paintings is close to the physical measurement data, and this corresponding relationship provides an important basis for the utilization of image materials. It is worth noting that the combination of buildings and the environment in the wall paintings, such as the configuration positions of trees and water bodies, is quite similar to the handling methods of Yuan

Dynasty gardens recorded in the literature.

4.2. Comparison of Architectural Components

In terms of the representation of architectural components, the wall painting images and the physical remains have both similarities and differences. Regarding the form of the column base, the simplified treatment in the wall paintings contrasts with the exquisite approach in the physical remains, which may be due to the need for artistic expression. The representation of the beam frame structure is relatively accurate, and the raised beam structure shown in the wall paintings is consistent with the physical remains of Yuan Dynasty buildings, reflecting the painter's understanding of the architectural structure. The treatment of the roof shows an interesting correspondence. The arrangement of the tile work in the wall paintings is the same as that in the physical remains, but the design of the tile caps is simplified. The representation of the ridge decorations is more realistic, with the forms of the swan's beak and hanging beasts being highly similar to the physical remains. The details of the doors and windows are another aspect that deserves attention. The lattice patterns of the grilles in the wall paintings are consistent with the decorative patterns in the physical remains, showing a clear style consistency.

4.3. Evaluation of Historical Value of Image Materials

Comprehensive comparison indicates that the architectural images in the Yongle Palace wall paintings have significant historical value. In terms of overall layout and spatial relationships, the image materials provide complete information that is difficult to preserve in physical remains. Although the representation of architectural details is somewhat simplified, the key features are accurately conveyed. This "overall realistic, local simplification" characteristic makes the wall paintings an important supplementary material for studying Yuan Dynasty architecture. The limitations of the image materials also need to be acknowledged. Artistic considerations led to the omission or alteration of certain structural details, and the blurring of regional characteristics also affected the universality of the materials. However, through cross-validation with other historical materials, reliable architectural information can still be extracted from the wall paintings. Especially in the field of residential studies, the wall painting images fill the gap left by the insufficiency of physical materials and provide intuitive references for understanding Yuan Dynasty residential buildings.

Overall, the architectural images in the Yongle Palace wall paintings have a significant correspondence with the structures of Yuan Dynasty residential buildings. This correspondence is reflected both in the overall layout and in the details of the components. Although there are elements of artistic processing, the image materials still preserve a large amount of valuable architectural information. Through careful analysis and comparison, these images can provide a unique perspective and im-

portant supplementation for the study of Yuan Dynasty architecture. The limitations of the image materials also need to be acknowledged. Artistic considerations led to the omission or alteration of certain structural details, and the blurring of regional characteristics also affected the universality of the materials. However, through cross-validation with other historical materials, reliable architectural information can still be extracted from the wall paintings. Especially in the field of residential studies, the wall painting images fill the gap left by the insufficiency of physical materials and provide intuitive references for understanding Yuan Dynasty residential buildings.

5. Conclusion

This study conducted a systematic comparison between the mural architectural images of Yongle Palace and the structural features of the Yuan Dynasty dwellings, revealing the corresponding relationships and differences between the two. The research found that the mural images have a high degree of credibility in terms of overall layout and spatial organization, and can provide important references for the study of the Yuan Dynasty dwellings. Although there is a phenomenon of simplification in the representation of building components, the key features are still accurately conveyed. The limitation of this study lies in the failure to cover a wider regional comparison. Future research can expand to other regions' mural materials. Additionally, an in-depth exploration of the image representation techniques will also help to more accurately assess their historical value. Overall, this study provides methodological references for using image materials to study ancient architecture and opens up new avenues for the study of the Yuan Dynasty dwellings.

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