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A STUDY ON THE CURRENT STATUS OF ALZHAI GROTTOES MURAL ART

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ABSTRACT

The Alzhai Grottoes murals are an important grotto art heritage in northern China, carrying rich cultural information. However, due to the influence of natural environment and human factors, their protection and research face many challenges. This paper systematically reviews the current status of the Alzhai Grottoes murals, combines field surveys and analysis, photographic data and literature analysis to summarize the current status and progress of relevant research; and formulates the future development direction of Alzhai Grottoes mural art based on government policy support for mural protection. It is hoped that this will provide new ideas for the protection and dissemination of murals in the future, and provide theoretical support for the sustainable development of Alzhai Grottoes murals.

KEYWORDS: research status; practical research; optimization and development

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1. INTRODUCTION

The Alzhai Grottoes are a cultural heritage integrating temples, grotto architecture, murals, sculptures and inscriptions. Its historical, cultural and academic value is irreplaceable, and it is a unique grassland cultural treasure. In March 2003, it was specially approved by the State Council to be added to the fifth batch of national key cultural relics protection units, and a series of protection measures were adopted, opening the track for more effective protection. In the important article published in the 8th issue of Qiushi magazine on April 16, 2024, General Secretary emphasized that we should promote the excellent traditional Chinese culture and enhance the country's cultural soft power and international influence by protecting and inheriting cultural heritage. Based on this, this article explores new paths for the dissemination of Alzhai Grottoes murals through literature analysis, field investigation and interviews

A. Current Status of Research on Alzhai Grottoes Murals

1.1. Theoretical Research

Currently, research on the murals of the Alzhai Grottoes is relatively limited, especially in the context of cultural integration and artistic innovation, where aspects such as mural replication, derivative works, and cultural dissemination remain largely unexplored. Existing research mainly focuses on the protection and restoration techniques of the grotto murals, analysis of artistic styles, and discussions of individual religious themes. Current research on the Alzhai Grottoes murals involves multiple disciplines, with researchers including art scholars, archaeologists, historians, and cultural relic protection experts. They employ methods such as document analysis, field investigation, image analysis, scientific testing, material analysis, and digital restoration. Some studies have also investigated the historical background, artistic style, craftsmanship, pigment composition, and cultural integration characteristics of the murals. For example, Fu Peng (2022) and Zhang Wu (2024) analyzed some material components and restoration techniques of the murals through scientific testing. Through on-site investigation and laboratory analysis using the MICP technology, they studied the materials and damage of the murals in Cave 28 of the Alzhai Grottoes, confirming the restoration effect of this technology. However, they mainly offered suggestions for protection and restoration. Li Yumeng (2020) and Qian Rui (2021) explored the diverse cultural elements in the murals, studied the historical and cultural changes reflected in the Alzhai Grottoes murals, and revealed the spread of Tibetan Buddhism in Mongolia and its integration with Mongolian customs through historical documents and mural content analysis. However, the research also has limitations such as insufficient data and insufficient depth of multidisciplinary integration. Urigachoru (2023) studied the protection and restoration methods of the murals and proposed some possibilities for the application of modern technologies. Dong Xiaorong (2015) and Pan Chunli (2017) studied the thematic characteristics and artistic features of the Alzhai Grottoes murals. Through art history analysis, they pointed out the aesthetic tastes and cultural characteristics of the Mongolian people in the murals, and also explored their artistic style and painting period. In addition, some studies also involve digital protection and cultural dissemination strategies for the murals, providing new perspectives for the long-term protection and value exploration of the murals.

1.2. Practical Research

As an important cultural and artistic heritage in Inner Mongolia, the murals in the Alzhai Grottoes have suffered varying degrees of damage and erosion due to the lack of comprehensive protection in the early stages of excavation. But the government actively promotes the protection and inheritance. Since 2018, the Etuoke Banner government has commissioned the Dunhuang Academy to organize and implement the Alzhai Grottoes mural protection project, with more than 20 cultural relic restoration experts from the Dunhuang Academy participating in the restoration. In December 2021, with the active participation of Dunhuang Cultural Relics Protection Center, the Alzhai Grottoes carried out the reinforcement of dangerous rock formations and the protection of murals. In October 2023, the mural restoration work for all 13 caves in the first phase of the Alzhai Grottoes Temple has been completed. The cave roof, which has undergone secondary reinforcement, has stabilized, ensuring the quality of the restored murals to the maximum extent possible. Starting from 2024, the Alzhai Grottoes Temple has entered the second phase of mural restoration work, but it is currently not open to the public.

According to research and analysis, the Dunhuang Art Research Institute has proposed protection and restoration techniques such as injection bonding and grouting reinforcement for natural and man-made diseases (such as cracking, hollowing, smoking, etc.) of the murals in the Alzhai Grottoes, and strengthened monitoring and management to delay the decay of the murals. But research has found that

protection and restoration work will intervene in the mural itself, inevitably causing more or less damage to the mural itself. This is also the driving force for future artists to consider more comprehensive and innovative methods.



Figure 1: Comparison of the protection of the mural with damaged armor before and after repair. The left image is before repair, and the right image is after repair

In summary, the Alzhai Grottoes Site, as a nonrenewable cultural and artistic resource, is a treasure of grassland culture. We must delve into its rich cultural connotations and fully utilize its cultural value. The current literature research presents a diversified trend, from which we can discover theoretical fields that have not yet been studied, laying the foundation for subsequent conceptual research. At the same time, the existing mural restoration work has not yet fully restored the original appearance of the murals, and it will take many years to witness whether this restoration is effective, and even after restoration, it still cannot be opened. Therefore, we need to find a way to protect murals from damage and promote wider communication, truly achieving effective dissemination and innovation of murals. To this end, we should adopt new technological means and high-precision replication of cave murals to comprehensively display the true appearance of the Alzhai Grottoes, achieving the dual goals of protection and utilization.



Figure 2: Field investigation and research

B. Field investigation and research

1. Interview and communication

Practice is an effective way to test theory. The internal connection between the cultural and artistic dissemination of the Alzhai Grottoes needs to be studied through practical comparison. To further determine the status and role of the mural art in the Alzhai Grottoes in the dissemination of Chinese grotto art. After two in-depth visits to the Alzhai Grottoes and communication with the research director of the Alzhai Grottoes and the Etuoke Banner Cultural Relics Bureau, as well as in-depth interviews with the director of the Inner Mongolia Autonomous Region Cultural Relics Bureau, the specific development direction and basic status of the Alzhai Grottoes have been clarified, and the pain points of the development of cave murals have been

understood. The historical and cultural elements that affect the formation and development of the Alzhai Grottoes have been clarified, and the transformation goals for the next specific strategy have been sought.



Figure 3: On-site observation and measurement research

2. On-site observation and measurement research

According to research needs, on-site analysis was conducted on some murals, and the restored mural patterns and colors were compared with historical image data to evaluate the restoration effect. In addition, the research also involves the investigation of mural substrates, pigments, tools, techniques, and painting skills, providing a foundation for future replication experiments and teaching. And based on market analysis, design and promote mural works for popularization.

Due to the influence of natural environment and human factors, the murals in the Alzhai Grottoes face serious risks of damage, and the grottoes are no longer open to the public, greatly limiting on-site research. At the same time, the murals themselves are greatly affected by natural environment and human factors, facing serious risks of damage. Therefore, researchers often rely on historical image data, digital restoration, and copying and replicating methods to deeply study the content of murals. So, the next step urgently needs to use high fidelity copying and replication technology to reproduce the mural art of the Alzhai Grottoes. By reproducing the details and techniques of the murals, researchers and viewers can conduct material analysis, craft exploration, and artistic style research on the basis of approaching the original work, so as to more systematically understand the artistic value and cultural significance of the Alzhai Grottoes murals.

3. How Will the Mural Paintings in the Alzhai Grottoes Develop in the Future

Based on literature research and practical investigation and research. It has been found that there are valuable legacies to learn from in current research, as well as pain points in the development of mural art that urgently need to be further explored. It can change the continuous impact of environmental degradation, human destruction, and natural aging on the murals in the Alzhai Grottoes, and form a solution to the core issues of protection and inheritance faced by academia and industry in the Alzhai Grottoes murals.

1. Explore innovative replication techniques and expand the development and application of mural art

From ancient times to the present, people at different historical stages have adopted various methods of mural protection and replication to address its fragility and non renewability. Traditional mural copying methods include paper rubbings and clay models, but each of these methods has its own shortcomings. Although paper copies are convenient for recording details, due to material limitations, they are difficult to fully present the three-dimensional and authentic texture of murals; The clay tablet model is replicated by making molds on the original mural, but the production process is cumbersome and the finished product is bulky, making it difficult to widely spread or preserve. In recent years, the development of digital technology has brought new hope for the protection of murals. Digital mural replication utilizes high-precision scanning and

digital modeling techniques to achieve comprehensive preservation and dissemination of mural information. However, digital replication technology has the problem of "lack of physical sensation", which cannot fully meet the real tactile and visual effects requirements of murals. This deficiency limits its application in education, research, and exhibitions. Therefore, in the future, a combination of traditional and modern replication techniques should be adopted to accurately restore murals. Copying can be used for exhibitions and teaching, breaking geographical limitations and allowing more people to experience the charm of murals up close.

2. Establish diversified inheritance methods and form channels for the dissemination of mural art

The future development of the Alzhai Grottoes murals should seek a balance between protection and inheritance. By adopting a combination of traditional and modern copying techniques, improving the dissemination system, enhancing educational dissemination and public participation, and striving for policy support and financial guarantees, the protection level and dissemination effect of the murals can be effectively improved. The research results of this paper not only provide theoretical support for the protection and inheritance of the Alzhai Grottoes murals, but also provide reference for the protection and dissemination of other cultural heritages. We believe that through continuous efforts and innovation, this precious cultural heritage of the Alzhai Grottoes murals will be better protected and inherited, and will continue to contribute to the cultural development of mankind.

The historical, cultural, and academic value of the Alzhai Grottoes murals is irreplaceable, and they are a unique treasure of grassland culture. Both national policies and local protection have put them on the agenda, and a series of protection measures have been taken, opening a more effective protection track. However, based on the current research status, it is found that the current research status is not perfect and more diversified research on inheritance and innovation is needed. In order to protect and inherit the mural art, promote the cultural heritage passed down from ancient times, enhance the influence of mural art, and lay the groundwork for the next step of research on the mural art of Alzhai Grottoes based on this article.

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