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The Technical Principles and Development Path of Modern Mosaic Painting in China

Shi Yuejun

Abstract

The development of Chinese modern mosaic painting combines the inheritance of traditional crafts and the innovation of contemporary art. Its technological innovation and ideological methods reflect the characteristics of cultural consciousness, interdisciplinary integration, and is technology-driven. It is not only influenced by Western mosaic art, but also deeply integrated with Chinese traditional craft aesthetics, forming a unique creative thought and practical path. In the process of introducing Western technology concepts, Chinese modern mosaic painting has gradually cultivated an art form with both local characteristics and international vision. This paper reveals its unique value in Chinese modern and contemporary art by analyzing the process materials, development process and case analysis of Chinese modern mosaic painting.

Key Words

Material expansion, cultural connotation, mosaics

Mosaic art originated in the Uruk civilization of ancient Iraq in 3000 BC. In the Stone Cone Mosaic Temple at the Uruk site, the colonnade of the hall is arched by two rows of columns with a diameter of 2.62 m, and the walls are decorated with red, white and black conical mosaics. The inlaid turquoise animal-faced bronze medal ornaments unearthed in 1981 in Erlitou, Yanshi, can be regarded as the earliest inlaid handicrafts in China (figure 1),¹ and are closer to the mosaics of medieval Byzantine art in ancient Rome in terms of craftsmanship. However, whether it is the mosaic painting of ancient Roman and Byzantine art in Europe or the mosaic painting developed in China in the twentieth century, it was not developed based on the bronze decoration of the Erlitou site.

1. The Basic Principles of Mosaic Painting: Material Selection and the Production Process

As a mosaic painting process, there are many materials used in a mosaic painting, such as stone, glass, metal, etc., but what material is more suitable to reflect this mural needs to be considered and finally determined



Figure 1. Inlaid turquoise animal-faced bronze medal ornaments were unearthed in 1981 in Erlitou, Yanshi.

from many perspectives. The selection of materials and the use of techniques to transform the painting into a mural with material texture are restricted by time, region, materials, technology and other aspects; it is the key to the achievement of excellent artwork. It generally follows the following principles.

First, the principle of material selection and suitability, combined with traditional Chinese hard materials (jade, shell, ceramic sheet) and Western mosaic painting materials (glass, gold foil, sintered glass), according to the theme of the work and environmental needs of flexible choices. Outdoor works give priority to weathering-resistant and corrosion-resistant materials (such as Italian glass mosaics), and indoor works can try mixed media (such as metal, resin). Advocating the use of local renewable materials or industrial waste (such as ceramic factory waste) to reduce costs and environmental burden is also suitable.

Second, the principle of technology integration and innovation. It retains the fine craftsmanship of Chinese traditional wire inlay technique and gilded silver, and integrates the Western direct method (direct paste) or indirect method (pre-collage and transfer). Drawing on Western multi-layer substrate technology (such as a waterproof mortar layer plus a bonding layer) to enhance the structural stability of the work is especially suitable for large-scale public art. Using computer-aided design software (CAD) for pre-typesetting and laser cutting can achieve complex shapes, and retains the “temperature sense” of manual collage.

Third, composition and color performance principles. Inheriting the plane composition of traditional Chinese decorative arts (such as Dunhuang murals), and partially absorbing Western light and shadow techniques (such as the micro-pixel gradient of Italian mosaics) enhances the three-dimensional effect. Following the symbolic nature of the Oriental five-color system (such as green landscape tone), and using Western color science (such as color contrast) enhances visual impact. The collage gap (mortar line) is used as part of the composition, alluding to Gaudi’s curve gap or Chinese traditional white space aesthetics.

Fourth, cultural expression and thematic principles. The theme selection emphasizes Chinese history, philosophy or contemporary social issues (such as historical figures, the Silk Road, ecological protection), and avoids the simple imitation of Western themes. The traditional patterns (cloud pattern, key fret pattern) are reconstructed by the geometric language of mosaic painting, or the expression of Western constructivism. Focusing on the coordination of works with architecture and environment (e.g., subway station murals need to

consider the perspective of people flow), some works introduce touch interactive design.

In terms of material selection, Chinese modern mosaic painting not only inherits the wisdom of traditional crafts, but also integrates contemporary science and technology and ecological concepts, forming a set of multi-material systems that consider culture, technology and sustainability and trying to make the picture thicker and more durable through the combination of techniques and materials. The production of murals is not a simple representation, and the production method is not limited to the original manuscript.

The choice of the theme and content of Chinese modern mosaic painting is also different from that of the West. The basic principles are as follows.

First, cultural adaptation. Using traditional symbols for expression, where blue and white porcelain pieces correspond to literati landscapes such as the Hangzhou G20 Summit’s *Xihu lansheng* (*Scenic Views of West Lake*), inlays of mother-of-pearl are used to echo the patterns of the Tang and Song dynasties such as the *Dunhuang Feitian* (*Flying Apsaras of Dunhuang*) of Yangzhou Lacquerware Factory; and there are also some materials with regional characteristics to strengthen the local identity, such as the tile gray body of Fujian bodiless lacquerware and Suzhou Kesi gold thread. Ye Wulin’s *Xiao’ao Linquan* (*Recluse among Forests and Springs*) uses Guangdong Yunfu’s dolomite; the pattern is like freehand ink landscape painting, and its own black, white and gray can achieve eight or nine color gradient effects.

Second, technical feasibility and physical stability in considering the expansion coefficient (such as ceramic and metal bonding requiring flexible epoxy resin). The thickness of stone is different at different positions, and laser cutting is suitable for acrylic and metal in machining accuracy. CNC engraving is suitable for hardwood and stone. The thickness of the stone used in the mosaic painting is designed from the perspective of viewing, distance and the space of the picture itself. If the material of the mural is a reflective material, it is easy to form a mirror reflection, which affects the viewing effect. For example, some murals have installed glass mosaic murals on the long wall.

Third, the concept conveys the demand, and critical materials such as e-waste [Zhan Wang *Qianpin Shanshui* (*Composite Landscape in Inlay Technique*)] metaphor technology anxiety, and recycled concrete [Beijing *Zaisheng Fengjing* (*Regenerated Landscape*)] all point to urban changes, and the works break the flatness of the painting itself through the height difference, even having a bas-relief effect. Chinese modern mosaic

paintings must be selected according to the tone of the picture concept. Murals are inseparable from the wall of the building, therefore, the environment of the wall is also an important basis and concept carrier for material selection.

Fourth, ecologically sustainable, low-carbon materials such as low-temperature firing ceramics (energy consumption reduced by 40%), and mycelium biomaterials (biodegradable). There is also the reuse of construction waste and industrial residue (such as the transformation of the old site of Shougang inlaid with rust iron). From the size of the waste particles to distinguish the primary and secondary to the actual situation of the picture, the small particles are easy to describe in detail, and the large blocks are easy to express extensively.

2. Development Path of Chinese Modern Mosaic Painting

Traditional Chinese mosaics are mainly made of hard materials such as jade and shells, while Western mosaic painting techniques, especially Byzantine and Italian mosaic painting techniques, are known for materials such as stone, glass, ceramics and metals. Since the twentieth century, Chinese artists have introduced Western cutting and collage techniques through overseas study, investigation or literature research, and adopted industrialized inlaid materials (such as Venetian glass and sintered glass) to enrich the color and texture of their works. Chinese modern mosaic painting has developed under the influence of European Byzantine mosaic art. In the early twentieth century, the glass mosaic painting of Xujiahui Catholic Church in Shanghai systematically introduced the Byzantine mosaic into China for the first time, which was in contrast to the inlay of mother-of-pearl and jade in traditional Chinese temples. The Lingnan area has a “Cantonese mosaic,” which combines Western colored glass with traditional lacquer art, and representative works include the collage decoration of gray plastic porcelain in Chen’s Academy (Chen Family Temple). Lin Fengmian advocated “reconciling China and the West” at Hangzhou Art College; his student Li Youxing tried to use broken porcelain pieces to collage portraits and create an academic mosaic painting experiment. In 1941, Pang Xunqin first proposed the theory of “mosaic nationalization” in his *Gongyi Meishuji (Collection of Arts and Crafts)*, advocating the reconstruction of modern composition with the Dunhuang caisson pattern.

As a modern architectural decoration material and

technique, after the founding of the People’s Republic of China, the Chinese art circle has experienced the process of attention, exploration, creation and research. In 1960, the second art exhibition was held in the three northeastern provinces, and mosaic painting first appeared in the exhibits. This is also the earliest public mosaic painting in China.² At the same time, B. Spyridlova introduced the woodcut mosaics of the Soviet Republic of Lithuania to the Chinese academic community through *The Decoration*.³ The ten major buildings in Beijing (such as the Great Hall of the People) use inlaid colored glass to praise socialist construction. In 1962, the Department of Architecture of Harbin Institute of Technology developed the Cement-based Inlay Method, replacing expensive imported materials with broken ceramic tiles. The representative work *Gangtie Hongliu (Iron and Steel Torrent)* (now stored in Heilongjiang Art Museum) adopts the Soviet mosaic painting process, but the facial treatment of the characters is integrated into the Chinese New Year painting lines, which weakens the thick sense of Soviet inlay and is more in line with the oriental aesthetics. Yangzhou Lacquerware Factory has transformed the traditional mother-of-pearl inlay into revolutionary theme creation, such as the creation of *Jinggangshan Huishi (The Rendezvous at Jinggangshan)* in 1972, which used eggshells to collage snow scenes and created a new process of eggshell inlay. The production of Mao Zedong’s portraits gave birth to the stamping and inlaying technology of aluminum sheets. In 1979, the mural group of the capital airport opened a new chapter of mosaic painting. Yuan Yunfu’s *Bashan Shushui (Landscapes of Ba and Shu)* used ceramic high-temperature glaze collage to introduce abstract composition into official art for the first time. Artists try to combine traditional Chinese decorative arts, such as Dunhuang murals and Han Dynasty stone reliefs, with modern public art. After the 1980s, more Chinese academic circles paid attention to and studied the art of mosaics. For example, after Zhou Erfu visited Tunisia, he introduced the mosaic painting of Tunisia.⁴ Li Liankai introduced foreign colored stone mosaics.⁵ Mu Jiaqi introduced glass mosaic painting.⁶ Zhang Jing summarized and analyzed the techniques and development of Western mosaics.⁷

Using ceramic mosaic painting collage, the abstract symbol of the Great Wall symbolizes the continuity of Chinese civilization. The color draws on the green landscape, but the composition is influenced by constructivism. It breaks through the tradition of socialist realism and explores the possibility of “modernization of national forms.” Dunhuang Academy



Figure 2. Ye Wulin and Shi Yuejun's *Xiao'ao Linquan* mosaic painting.

experimented with mineral pigment mosaic to transform mural restoration techniques into creative language. What kind of materials and mosaic painting techniques are used to complete the painting, from the painting to the textured mosaic murals, has become the core issue of cooperation, and all work has been carried out. The painting is the soul. To use the mosaic painting technology to interpret the painting perfectly, we must understand the creative intention and taste the content of the painting.

In the twenty-first century, the development of Chinese mosaic painting has entered a new stage. New technologies, new materials and new ideas are applied more to the creation of mosaics. The PLA plastic module was used to simulate wood grain mosaic painting in the Vanke Pavilion of the Shanghai World Expo 2010 to realize zero waste construction. In 2015, Zhou Li's *Ciyi* (*Porcelain Memory*) used Jingdezhen broken porcelain as a medium to reflect on the impact of industrialization on the traditional handicraft industry. The combination of waste porcelain pieces and epoxy resin forms a visual metaphor of "fragmentation-reorganization," challenging the traditional pursuit of integrity in mosaics. After the traditional process was selected as an intangible cultural heritage, it nurtured the contemporary era. In 2020, Zhou Jianming, a Suzhou Kesi artist, transformed the *Zhiying* (*Weaving Shadow*) technique into a metal wire inlay. China Academy of Fine Arts set up a parallel course of traditional mosaic studio and digital mosaic laboratory. The painting and the process of converting the painting into murals have their limitations, but they complement each other. Mosaic painting plays the relationship between particles and particles, especially stone mosaics. The colors are natural, the types are not so rich, and it is difficult to achieve the natural transition of colors, so more attention is paid to the placement of particles. The dark gap between the particles is often

used as an important connection between the color and the shape transition, so the stone mosaic painting has certain limitations.

3. The Representative Work of Chinese Mosaic Painting in the Twenty-First Century—*Xiao'ao Linquan*

Ye Wulin was an important explorer who stood at the height of cultural exchanges between China and foreign countries at the turn of the twentieth century and had a connecting significance for the history of contemporary Chinese mosaic painting. Hunan Changde today is the place of Jin Tai Yuan (376-396), recorded in the *Taohuayuan ji* (*Peach Blossom Spring*) by Wu Liu of the Eastern Jin Dynasty. It is known as the metaphor of Taoyuan fairyland and a spiritual home. It is the ideal symbol of Ji Kang and Tao Qian's seclusion. With the passage of time and the evolution of culture and quality, today's public art career of city sculpture is based on the spirit of the world to cast the soul of the people. In 2018, Ye Wulin and Shi Yuejun cooperated to create a marble mosaic painting *Xiao'ao Linquan* for Changde, Hunan, which integrates Chinese and Western skills and promotes the essence of Chinese culture. It is a representative work of contemporary public sculpture art in the city. At present, art aesthetic education is in the ascendant, and building morality and casting a soul is the only way to enhance the national spirit. Ye Wulin's *Xiao'ao Linquan* is a large mosaic mural work with the theme of Jin Tao Yuanming's character and the mountain forest. This work perfectly presents the appropriate cooperation of ink painting manuscript, mosaic mural material selection and production process, which is not unrelated to the artist's personal experience, and can provide reference and application value for modern



mosaic painting production. Tao Yuanming can be regarded as a typical representative of the ideal artistic conception of the Chinese Taoist hermits. He integrates Chinese and Western influences and sets up his body, creating masterpieces or even models of mosaic art that can represent the current Chinese characteristics, Chinese spirit and Chinese style. The work is completed beyond the image with the technique of describing the spirit. The mosaic painting of *Xiao'ao Linquan* enlightens the modern aesthetic perception, spiritual rest and settlement under the high-intensity pressure of modern economic society, cross-cultural context and global perspective with hard materials and close skills. It carries, embodies and confirms the deep desire and vision of artists and Chinese people for the ideal of good and happiness in the new era, integrates the stones of other mountains to attack jade, and condenses and crystallizes the latest achievements in the dissemination and exchange of Chinese and foreign civilizations.

The creation of Ye Wulin and Shi Yuejun's *Xiao'ao Linquan* marble mosaic painting took two years and five months of continuous deepening, modification and improvement, finally realized the transformation of aesthetic art media from ink painting to textured murals, and achieved complementarity between the improvement of ink painting and the mosaic painting process of frescoes. Painters of modern Chinese mosaic paintings are tired of consulting information materials; on the other hand, they should consult historical data as much as possible, and integrate it into the painting as soon as possible. The main body of the whole picture of the *Xiao'ao Linquan* mosaic painting is a small number of characters, which are finely depicted by stone particles from a few millimeters to no more than 2.5 cm. Background stone, pine and bamboo are expressed in freehand style with large materials, and the blank part of the large block is cut

and inlaid by the new process of water knife (figure 2).

To show the process characteristics of mosaics, *Xiao'ao Linquan* has adopted many methods to solidify particles. The particles of the mosaic painting itself have a thickness, which determines the depth of the gap and the depth of the gap color. Usually, the effect before filling the gap is natural and comfortable, and to strengthen the "grid sense" of the gap the paste used to fill the gap is often filled too full, and this will affect the appearance. To weaken this feeling and make the effect more reflective of returning to nature, the author draws on the ancient dry powder sweeping method; that is, after the dry powder of the joint filling material is adjusted to color, it is directly swept into the gap with a brush, and then watered to let the dry powder naturally seep into the bottom of the gap, which finally fixes the particles and approaches the effect when there is no gap (figure 3-6).

Ye Wulin's *Xiao'ao Linquan* depicts the story of the characters in the Wei and Jin dynasties, with a certain sense of historical vicissitudes. The painting is expressed in ink and brush strokes, and when it is transformed into a mosaic painting the texture of the material itself is used for expression. The stone of this mural is treated with chemical agents. The visual and tactile effects of the texture on the surface of the stone are particularly obvious, which achieves an effect that painting cannot achieve. In the production, the ancient manual knocking and shearing methods are used to deal with the stone modeling. In the inlay process, the traditional Italian regular arrangement technique is combined with the contemporary free spell and inlay. In addition, the modern process of water knife cutting is equivalent to the combination of four processes, and the combination of various processes naturally enriches the content of the picture.

The painting of this mural is drawn by ink freehand



Figure 3. Partial view of *Xiao'ao Linquan* mosaic painting by Ye Wulin and Shi Yuejun, depicting Xiang Xiu.

Figure 4. Partial view of *Xiao'ao Linquan* mosaic painting by Ye Wulin and Shi Yuejun, depicting Liu Ling.



Figure 5. Partial view of *Xiao'ao Linquan* mosaic painting by Ye Wulin and Shi Yuejun, depicting Ruan Xian.

Figure 6. Partial view of *Xiao'ao Linquan* mosaic painting by Ye Wulin and Shi Yuejun, depicting Ruan Ji.

brushwork, and the final problem is not the color, but the conversion from ink characters to mosaics. Originally,

the structure and block relationship of freehand figure painting is not as clear as that of Western realistic oil

painting. To highlight the personality of each character, Ye Wulin deliberately exaggerated and deformed the characters of the picture in his early creation, so he was not satisfied with the continuous modification several times. At this time, the author can only solve this problem from the manuscript; based on the original freehand figure, to deepen the structure and the relationship between light and shade is a relatively clear sketch, and even for each character's head, hand and foot contour and internal structure trends have done a detailed decomposition. To facilitate the production of the assistant, some parts even outline the shape of the particles, which greatly improves the accuracy of the production and reduces the repetition. Finally, the effect does not lose the characteristics of ink figure modeling, but also reflects the characteristics of the mosaic painting process. Through the analysis of the details of the creation process of this mosaic painting, it can be reflected that in the process of integrating mosaic painting with Chinese local art, many of the problems were not experienced by predecessors.

4. Conclusion

The evolution of modern Chinese mosaics has gone from the colonial symbol of church mosaics to the collective will of revolutionary porcelain pieces, and then to the scientific and technological criticism of circuit board collage. Each technological innovation corresponds to the reactivation of culture, which reflects the following two characteristics: first, the blending of ideas, reconciling traditional literati aesthetics, socialist realism and contemporary conceptual art; second, the dialectic of technology: manual and digital, local and global, craft and experiment coexist. In particular,

the mosaic painting *Xiao'ao Linqun* created by Ye Wulin and others takes the traditional landscape artistic conception as the core, integrates modern mosaic painting technology and material innovation, and forms a strong visual tension and texture contrast through the collage and reconstruction of materials such as glass and ceramics. It not only inherits the reclusive spirit of Chinese literati painting but also reinterprets the dialogue between nature and humanity in contemporary art language. Its value lies in the realization of the cross-time and space integration of classical aesthetics and modern technology, and provides a creative expression example of Oriental philosophy for the field of public art.

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SHI YUEJUN (1978–). From 1997 to 2001, Shi Yuejun studied the discipline of oil painting in the Department of Fine Arts Education of Henan Normal University. In 2001, he entered the School of Fine Arts of Henan University and has been teaching ever since. In 2003, he was admitted to the assistant class and senior class of the mural department of the Central Academy of Fine Arts until the end of 2005. In 2010, he went to the Rome Academy of Fine Arts in Italy to study for a master's degree. At the same time, he studied mosaic mural art at the Lavina Academy of Fine Arts in Italy. After graduating from the two schools in 2014, he worked on mural restoration in Lavina, Italy. In 2016, he officially returned to China to continue teaching at Henan University. In 2022, he was hired as an associate professor at Henan University. He is a member of China Art Association, the China Mural Society, director of Henan Art Association, and is a high-level talent in Henan Province.

Editor: Wang Jing

ENDNOTES

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中國現代鑲嵌畫的工藝原則與發展理路

史躍軍

摘 要：中國現代鑲嵌畫的發展融合了傳統工藝的傳承與當代藝術的創新，其技術革新與思想方法體現了文化自覺、跨學科融合及科技驅動的特點，既受到西方馬賽克藝術的影響，又與中國傳統工藝美學深度融合，形成了獨特的創作思想和實踐路徑。中國現代鑲嵌畫在引進西方技術理念的過程中，逐步形成了兼具本土特色與國際視野的藝術形式。本文通過分析中國現代鑲嵌畫工藝材料、發展歷程、個案分析，揭示其在中國現當代藝術中的獨特價值。

關鍵詞：材料拓展；文化內涵；鑲嵌畫