

# The Color and Artistic Features of Murals in Dunhuang Cave 465 in Mogao Grottoes

Zhangmin Yan<sup>1,\*</sup>

<sup>1</sup>College of Art and Design, Wuhan Textile University, Wuhan, Hubei 430073, China

\*Corresponding author. Email: 670138792@qq.com

## ABSTARCT

This paper makes status quo counter-draw of two Danapati Bodhisattvas at the ceiling of Dunhuang Cave 465 in Mogao Grottoes, investigates the murals in Dunhuang and Kizil grottoes on the spot, and analyzes the artistic features of murals in Dunhuang Cave 465 in Mogao Grottoes in combination with various documents. Based on the analysis of painting materials, the author compares the features of Tibetan Buddhist paintings in color application (generally warm red tone). The murals in Cave 465 are unique in the expression of color, especially the green color, which highlights its special research and artistic value. The local inheritance and historical uniqueness of the materials employed in murals are also analyzed. The effects of time, physics and geology prompts murals change color and peel off, presenting rich color layers and color changes, and finally leading to the current situation of murals with coldness.

**Keywords:** *Tibetan Buddhist paintings, mineral materials, color and artistic features*

## I. INTRODUCTION

After replacing the Western Xia regime (1038 – 1227), Mongolian in Yuan Dynasty ruled Gao and Sha for 145 years (1227 – 1372). The rulers of the Yuan Dynasty implemented the policy of "three religions and peace of heart" for political needs and vigorously advocated Buddhism. Therefore, the Buddhist culture in Dunhuang not only survived, but thrived. Especially in 1246, Kublai Khan, Yuanshizhu Emperor, appointed Phatpa the state teacher, and Buddhism the state religion. As a result, the reverence for Tibetan Buddhism was unprecedentedly high. Tibetan Esoteric Buddhism, which had been circulating in the Hexi region since the late Xixia period, further developed thanks to the Buddha worship never seen before by the rulers of the Yuan Dynasty. Buddhist art represented by Dunhuang Grottoes murals also grew, especially the expression of Tibetan Buddhist art has brought a new atmosphere to the murals.

Among them, Cave 465 of Mogao Grottoes, which was influenced by the popular East Indian Polo art style at the time, showed the unique artistic features of Tibetan Esoteric paintings in both the content and the form of expression. As for historical and cultural inheritance and development, it is not accidental that Cave 465 of pure Tibetan Buddhism was built in Dunhuang where Chinese and Western cultures meet. No counterparts are found among existing esoteric paintings in Tibet. The instances of main statues of different sects in the same cave are rare. Thus, the

unique artistic and research value of Cave 465 is highlighted.

## II. ANALYSIS AND APPLICATION OF DRAWING MATERIALS

The color art of wall paintings in Cave 465 of Mogao Grottoes is unique in the history of Dunhuang, showing the deepness, coldness and mystery that sets them apart from murals in other periods. Study on the unique color and artistic effect of Cave 465 must start with its drawing materials.<sup>1</sup> The cave is also a cave directly excavated in the granule. The base layer is finished before drawing murals. According to experts in Dunhuang Academy China, the clay in base layer is derived from the "soil" in front of the cave, which is the weathering and transporting product of the ancient metamorphic rocks in front of Mount Sanwei, mainly illite and chlorite, and also contains some unstable minerals. Clay, fragments of mineral and plant fibers make up the base layer, which is divided into two layers. The lower layer is coarse mud layer, mixed with thicker plant fibers, with low sediment content, and thickness ranging from 2 to 5 cm. The upper layer is thin layer of fine mud, generally 0.3-0.5 cm thick, mixed with fine fibers such as hemp or wool and has a large sand content. This high sediment concentration may be responsible for the large number of punctures in the murals of cave 465. The thickness of the pigment

<sup>1</sup> Yu Zongren. Study on Materials and Techniques of Yuan Dynasty Wall-painting in Dunhuang Grottoes. 2009:18.

layer varies 5 to 100  $\mu\text{m}$  due to the size of the pigment particles, among which blue and green particles are thicker, while red, black, and brown particles are thinner. Animal glue acts as a bond and is generally believed to be made from cowhide.

Most of the pigments used to paint Cave 465 are natural mineral pigments. The main paints are:

#### A. Blue

Blue comes from azurite (the name of the paint), which is made of blue malachite ( $2\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$ ).<sup>2</sup> In ancient China, based on texture and color, it was further divided into Kongqing, Bianqing, Shaqing, Zengqing, etc., among which Shaqing is also called Foqing or Tibetan blue as it's mainly produced in Tibet and Xinjiang with dark, deep and lustrous color. As for the overall tone of murals, the author holds that Tibetan blue is the main blue pigment used in Cave 465. Its wide application explains its uniqueness. Blue is mainly adopted in Dunhuang murals in the past dynasties to draw background mountains and rivers and decorative objects. However, Cave 465 took it to draw the bodies of gods, with differences in hue and lightness, and wide color span. In addition to being mixed with other pigments, there are signs of layers copying.

#### B. Green

Green comes from chlorocopperite ( $\text{Cu}_2(\text{OH})_3\text{Cl}$ ), which falls into two camps.<sup>3</sup> The first is the secondary mineral of copper, which is found in nature symbiotic with azurite (chessylite) and mineral green (malachite), but in very small quantities. The other is processed from aerugo with a stable color. The Cave 465 follows the tradition since mid Tang Dynasty, with green as the background of mural painting, which is used most and widely. As with blue, it was used not only for background and decoration but also for body painting of the gods. However, green shows little sign of being mixed with other paints or layers copying. The extensive use of green distinguishes it among the Tibetan Buddhist painting system, which enjoys significant research value.

#### C. Black

Black comes from  $\text{PbO}_2$ , the product of discoloration of carbon (C) and miniumite ( $\text{Pb}_3\text{O}_4$ ).<sup>4</sup> Black is generally used to draw hair, eyeballs and some decorations. Its particles are finer and thinner, but have strong coverage. The bodies of some of the gods in the

murals are also black, which can be explained by color change of original miniumite because of chemical reaction based on research results. Miniumite is made of lead, sulfur, saltpeter, etc. It is orange-red powder. Red lead was made and used as early as the Qin and Han Dynasties in China. However, it contains lead and is easily oxidized to black, which explains the black body of gods. The higher the content of red lead, the darker it becomes. When mixed with other pigments, it turns into various dark grays, and there are also colder and warmer ones. Some became very black, while others remained the same, creating a natural tint.

#### D. Red

Red comes from the mixture of cinnabar ( $\text{HgS}$ ) and iron oxide red ( $\text{Fe}_2\text{O}_3$ ) with cinnabar ( $\text{HgS}$ ).<sup>5</sup> Cinnabar, also known as vermilion, mainly consists of mercury sulfide. It can be found in China's Hunan, Guizhou, Sichuan, Yunnan and other places. It also serves as the most commonly used pigments in ancient Chinese paintings because of its bright and stable color. Iron oxide red, also known as earth red, is one of the more stable and dark reds, derived from hematite. Ancient painting theories often classified it as dai zhe in ochre, there are few records about iron oxide red. However, it has been widely used in artistic creation since a very early age. Iron oxide red is the reason why many murals in cave 465 are dark red. In addition to painting niches and arhats robes, it also paints the entire body of gods and their horses. At the same time, it is mixed with blue and white, producing purplish red, violet blue, pink with rich change.

#### E. White

White comes from the mixture of gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) and calcite ( $\text{CaCO}_3$ ).<sup>6</sup> As a pigment, gypsum was widely used in the murals of ancient Rome, Egypt, and India as early as the second half of the first century AD. The top of Cave 465 is mostly painted with light and lotus-shaped stands, but what is more eye-catching are the seven bodhisattvas painted with white, especially the one at the bottom, which is exquisite. The thick white color forms a strong contrast with the bodhisattva turned into a dark brown color, which is abrupt and mysterious and impresses people.

In addition to the light khaki of the exposed soil layer, no pure yellow pigment has been found, which is replaced by a large amount of gold foil. As a painting material, gold foil was applied as the as decoration of artworks. It was used as early as in ancient Egypt and

<sup>2</sup> Wu Rongjian. The Application of Colors in Dunhuang Murals and the Causes of Discoloration. *Dunhuang Research*. Issue 5, 2003:47.

<sup>3</sup> Li Zuixiong. Analysis and Research on Pigments in Mogao Grottoes Paintings. Dunhuang Academy China.

<sup>4</sup> Li Zuixiong. Analysis and Research on Pigments in Mogao Grottoes Paintings. Dunhuang Academy China.

<sup>5</sup> Wu Rongjian. The Application of Colors in Dunhuang Murals and the Causes of Discoloration. *Dunhuang Research*. Issue 5, 2003:45.

<sup>6</sup> Wu Rongjian. The Application of Colors in Dunhuang Murals and the Causes of Discoloration. *Dunhuang Research*. Issue 5, 2003:45.

was later widely employed in religious art. As in Cave 465, the ornaments on the gods and the Buddha's light trim are all decorated with gold foil, creating a resplendent effect, which reflects the ideal situation of the Buddhism.

The above lists the most common pigments seen in the cave, including minerals, earth and metal. The production and use of these materials directly determine the overall artistic effect of the mural, which will also be the focus of future study and research. However, Zhang Yanyuan of the Tang Dynasty recorded as early as in *Records of Famous Paintings in The Past Dynasties* 72 kinds of pigments. Therefore, the rich color of murals in Cave 465 is not limited to the traditional "five colors". Whether there are other colors and varieties of pigments involved requires further study and discussion.

### III. MYSTERIOUS AND DEEP GREEN

The wall paintings of Cave 465 are well-known for their mysterious color art, among which green is the most obvious as the tone and dominant color. It has inherited the tradition of Dunhuang since the Mid-Tang Dynasty. However, such a large area of flat-painting background is rare, and it is one of a kind in the whole Tibetan Buddhist painting system. The preference of the Dunhuang region for painting murals in cool colors dominated by green is probably down to its special climate of dry and long sunshine duration in the northwest. Such feeling is especially obvious when viewing the Kizil murals in Xinjiang. When people suddenly enter the cold grottoes from the scorching outdoors, such visual contrast can immediately calm down the impetuous heart, and a cool and cozy feeling fills the whole body, making people immersed in the ideal world of Buddhism. In addition, the green was cheaper and more readily available than lapis lazuli, it was favored by the Dunhuang painters and became an iconic color after the Song Dynasty. The green and deep blue that dominate murals in cave 465, together with brown and black after discoloration, creates a dark, mysterious and harmonious visual effect.

As for the overall artistic style of the murals, the murals in Cave 465 should be directly influenced by Nepalese Buddhist art, which is mainly reflected in its strong and calm tone. Among them, green stands out from the picture with its gorgeous purity, and at the same time is unified by a large area of gray and black. The old saying goes: "用色不以深淺为難，难于色彩相合 (Attention should be paid to the harmony of colors in artistic creation)". The green in the mural is conspicuous but not abrupt and isolated. Although gaudy, the spirit and charm are still there, greatly breaking through the literati view of color that takes the Han nationality as the center. Warm color and green match properly, bringing out the best in each other with

the surrounding environment, to avoid the conflict between warm and cold colors. Color distribution follows the principle of "gaudy but not common, shallow but not thin". The author also found that the overall color configuration of cave 465 is different from the previous one. The color harmony that mentions commonly refers to the matching in color, which is normally decided by adjacent colors. However, the author calls the special color structure of Cave 465 "color-surrounding method", which is different from the visual effect produced by color juxtaposition. Each mural is surrounded by a dark decorative frame that varies with its content and color. The east and west slopes of the zenith from outside to inside are a dark gray decorative pattern surrounded by black, a stone green, and a deep red (red and blue overlap, mainly red). The whole picture is surrounded by a dark blue background. As for the statue, golden ribbons surround the large backlight, head light, body light of different colors, and finally the body color of the character. The north and south slopes present white → green → dark gray decorative belt → white → dark blue (red and blue overlap, mainly blue) → green background → each statue. Zenith presents the purple red decorative pattern surrounded by a ring of green belt, which shows the shape of staircase divided into three levels. The same principle applies to the four walls below. This principle of color composition coincides with the work of Josef Albers, modern Western artists of the 20th century ("Fig. 1"). Additional, the color of each layer reveals superb use of contrasting color in murals. The color lightness of the mural from high to low is white, yellow, green, blue, red and black in turn. Here, green becomes an indispensable blending color, cleverly balancing the relationship between black, white and gray in the picture.

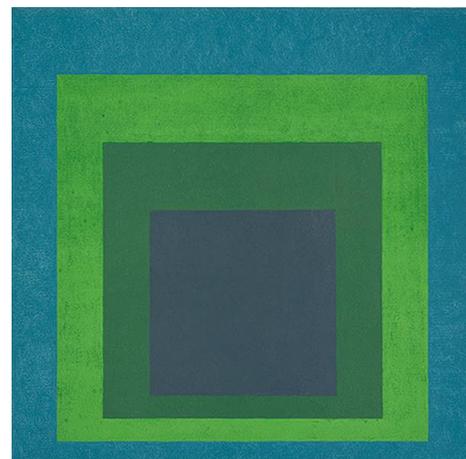


Fig. 1. Works by modern artist Josef Albers.

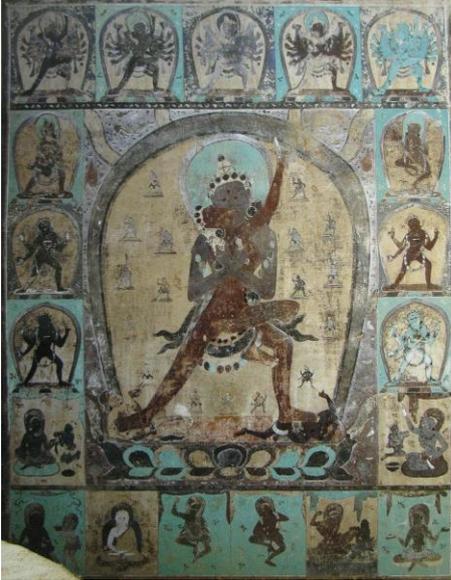


Fig. 2. Cakrasamvara and Vajravahni.

The statues of Buddhas with ferocious faces and great movements in the murals in cave 465 seem to be frozen in the walls without any sense of noise, which makes people feel a solemn and mysterious sense. Just as "all that is gorgeous will eventually be plain", leaving only the profound Buddhist doctrine and contemplative contemplations.

#### IV. THE TIME-HONORED CHARM OF COLOR

As the murals in cave 465 were completed more than a thousand years ago, so it is impossible to imagine their original situation. Over the millennia, however, natural and man-made influences have reshaped it and given it a different look. Good and bad are intrinsically relative. The present artistic appearance of the murals in cave 465 is so impressive that it is unnecessary to consider the question of whether the original or the present is more wonderful.

The influence of history on the murals in cave 465 is summarized as follows:

- The erosion of harmful substances such as salt and alkali on wall makes the adhesive liquid deteriorate and lose its gelatinability, thus leading to the large-scale peeling of color. These harmful substances react with unstable elements in the pigment to produce varying degrees of discoloration.
- Geological activity caused a large area of the northwest corner of the mural to collapse and flake off.
- In the process of production, the sand content in the surface base layer is relatively high, which leads to a lot of spot-like spalling.

- Cave 465, dug on the northern cliff of Mogao Grottoes, was a cave where Tibetan monks were engaged in meditation at that time. There were traces of lamps burning in the cave, and the large amount of carbon dioxide released by the burning materials also accelerated the discoloration of the pigments.
- The theft of murals, such as the head of Lord Voldemort at the foot of Mahamaya. What's more, the scratching of murals by tourists throughout the ages. ("Fig. 2")

The above factors have combined to form the unique artistic appearance of cave 465, whose color is fascinating to people. A close examination of the peeling marks of the murals reveals that the bodies of the gods were painted in more than two colours. In addition to color mixing techniques, the more important is the layer dyeing of color. This has been proved by Yu Zongren in his Study on Materials and Techniques of Yuan Dynasty Wall-painting in Dunhuang Grottoes. Here is an example of Nanpo Mañjuśrī ("Fig. 3") on the south slope from an iconological perspective. Four colors can be found on bodhisattva. The body is tan, with dark brown at the bottom, gray-blue in an oblique triangle from the shoulder and neck to the left elbow, and pink in the right chest and lower areas. The natural discoloration of the pigment and the trace of double layer dyeing are quite conspicuous. The dark blue and brown-red lotus petals on the Bodhisattva's bench are black and visible due to the underlying color discoloration, creating a gradual shading effect on the originally painted lotus petals. It is one of the important techniques of modern rock painting creation to enrich the picture by means of double layer dyeing. The mineral pigments, which are composed of different particles of different thickness, give off the underlying color in the case of repeated overlapping dyeing, thus producing a rich color effect. This technique highlights the unique artistic expression language and material beauty of rock painting. The discoloration and peeling of the murals in cave 465 have a very rich sense of depth, which is more in line with the modern western idea of color expression. At the same time, the observation of large-scale peeling marks of the background and backlight shows that the murals in cave 465 are not painted with white as previous one, but painted directly on the light grayish yellow ground layer. As white is the painting habit of the Han people, the painting consciousness of pure Tibetan Buddhism is highlighted here. However, the author is baffled by the question why such a large area of peeling occurs in the flat background and backlight. ("Fig. 4") Why is it that instead of flaking off in one piece? ("Fig. 5") Given its commonness and large size, man-made destruction can be directly excluded here. So the author concludes that: Such peeling marks are most likely related to the way painters painted and the composition of materials at that

time, which can be correctly interpreted through further research. It is of profound significance to both the study of painting techniques at that time and the creation of modern rock paintings.



Fig. 3. Nanpo Mañjuśrī.

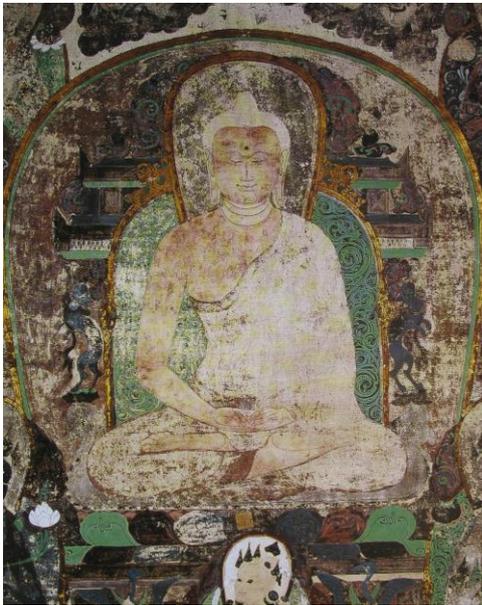


Fig. 4. The background of Amitabha Buddha in Xipo and the whole strip of cassock.



Fig. 5. Strong brushstroke-like peeling on the background of Tara.

## V. STRONG SENSE OF DECORATION AND SYMBOLISM

The reason why the murals in cave 465 can arouse the audience's emotions and play the role of religious influence lies in the strong decorative interest of its colors.<sup>7</sup> It does not excessively pursue the realism of colors, and carefully design contrast in complex colors, so that colors are harmonious and unified in rich changes. At the same time, its unconventional, bold change of color reflects its subjective intentionality, which has profound symbolic significance. In the murals in cave 465, the Buddha Vairocana with golden body (now discolored) represents all the wisdom of perfection. The Amitabha with white and yellow body (flayed color) represents the infinite life span and light of protecting all beings. The Aksobhya Buddha with blue body represents the removal of all physical and mental diseases and prolonging life. The Amoghasiddhi with green body represents personal and professional fulfillment. On the walls, the ferocious Buddha and Dhammapala are painted all over in blue, representing the enemies of the Buddha and the elimination of troubles. These highly symbolic colors decorate the entire Buddhist world in the caves. Duan Wenjie once pointed out when talking about the characteristics of the application of color in Dunhuang murals, "Instead of colorful appearance and realistic description, Chinese painting has always pursued spirit. Exaggeration and change in color help to express the inner spirit of the characters, thus giving people a special sense of beauty." These subjective intentional colors with

<sup>7</sup> Duan Wenjie. *Collected Works of Dunhuang Grotto Art*. Gansu People's Publishing House, 1988.

symbolic meanings make people unconsciously enter a sacred and detached Buddhist world when facing the murals.

## VI. CONCLUSION

Different from traditional Taoist color view in China, the color view of Buddhist art breaks through the boundary of five colors, that is, the profusion of colors dazzles. Nor does it advocate monochromatic aesthetic thought, or fall into the extreme gate of "subtle formlessness of Tao". It enjoys not only the detached color symbol, but also the imitation to the color in natural world. Its color concept is broad and inclusive, following the harmony and unity of "the way from what is beneath abstraction". Modern Chinese painting has always developed national characteristics on the basis of catching on, and strive to distance itself from other kinds of painting. The proposition that "the more national, the more of the world" is followed. As a result, color art should be based on the eastern color system, absorb the western color concepts and color matching techniques, break through the inherent aesthetic concepts and the special complex of ink, restore the systematicness and comprehensiveness of Chinese color art, and actively achieve "harmony in diversity" with the Western painting system.

As mentioned above, the green color of the murals in cave 465 not only shows the psychological implication brought by color, reflects the tradition of color use in Dunhuang area, and reflects the extensive performance of atacamite in production and application at that time, which also endows special aesthetic significance to the picture. As the saying goes, "It is necessary to have effective tools to do good work." Ink, watercolor, oil color, rock color and other materials are symbol of visual language, just like a variety of different languages in the world, reflecting the richness of human culture. *The Record of Craftsmanship* writes that the weather is limited by the season, the land by the climate, the craftsmen are divided into skilled and unskilled, and the materials into good and bad. The thing that combines these four is the best. Among them, "material beauty" is one of the indispensable and necessary conditions for a good product. Modern rock paintings (heavy-color paintings) with natural minerals as main materials have enriched the color charm and texture effect of traditional paintings with rich colors and fine particles, and the material beauty reflected has been fully recognized in painting community in recent years. *The Record of Craftsmanship* records that men of great wisdom have created beautiful objects conducive to human activity, and skillful men have recorded the process of making them. Material is the most basic carrier in artistic creation. The creator gifted it with noble quality, while the artistic creator intelligently combined materials to fully show their own aesthetic feeling. Modern rock paintings (heavy-color paintings)

creates a new painting form language based on material ontology, and fully embodies the unique charm of this material language different from other painting types. At the same time, since ancient times, China has paid attention to "审曲面势 (A craftsman judges the curvature of materials when making objects)". Creation begins by examining the hard, soft, color, texture, and shape of the material. It's needed to look at the material before start, and then decide what to do with it. The Chinese value instruments and not limited them. However, the comment that "重道轻器 (Valuing human ethics over scientific and technological inventions and creation)" is not proper. "It is impossible for an artist to communicate with materials without thoughts, opinions and attitudes, which will inevitably give new interpretations to materials and transform it." <sup>8</sup> Any kind of material itself has a kind of "character", and material is also emotional, spiritual. What the artist has to do is to discover and express the "character" of various materials. The "character" of the material will inevitably lead to a new aesthetic concept. "The artist's scrutiny and emotion activates the material language, which in turn awakens the artist's inspiration." <sup>9</sup> Nowadays, the focus of rock color (heavy color) artists is to transform the ancient mineral materials into contemporary art language, to properly express the real feeling of the current existence, which carries forward the original art of national tradition, and accepts the artistic innovation of modern art concept.

A glance at art history reveals that classical art in the system of figural art is "tangible and colorless", while Impressionism liberates it in color, leaving it in an awkward position of "colorful but invisible". How to juggle "entity and color" has been a puzzle to the author. However, after studying the murals in cave 465, the author found that the concrete image is dealt with flatly on the modelling, such factors as discoloration and peeling because of drawing material and drawing method, endow its color with rich level and harmony. Such move not only conforms to the Oriental modeling aesthetic, but also satisfies the aesthetic demand of modern art, ingeniously combining the realistic modeling and expressive color properly. With its unique artistic style, the murals in cave 465 show "contrast" from the previous Dunhuang art tradition. It also reflects the third erotic culture which is often neglected by people except spiritual and material culture. The combination of multi-ethnic culture and belief is in sharp contrast to the Han culture which ruled the central plains for a long time, which can be

<sup>8</sup> Xu Hong. Human and Things: Chinese Rock Color Painting Invitation Exhibition. *Oriental Rock Color Magazine*, 2008:79.

<sup>9</sup> Xu Hong. Human and Things: Chinese Rock Color Painting Invitation Exhibition. *Oriental Rock Color Magazine*, 2008:79.

described as a gorgeous sunset in the history of Dunhuang Mogao Grottoes.

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