Urban Color Expressing the Spirit of the City by Chinese Color System

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ABSTRACT

From Chinese philosophy point of view, Urban Color is the general color which value transcend the beauty of an external. As the general color, Urban Color is from the sky and the earth, and it is caring for feelings, too. The best example is Beijing of Ming and Qing Dynasty which had splendid urban color. It used Chinese color system. Expressing spirit is something which mainly distinguishes Chinese color system from the others. In the latest Beijing urban color planning, we applied Chinese color system of new version.

My paper will share something of Chinese color system such as the following issues.

In the macroscopic layer, Chinese color system will distinguish Yin and Yang, that is make sure the Urban Color Type. We got it by researching the color of Chinese sky, soil and vegetation, analyzing the samples of urban color within China and concluded some color rules of different urban color type.

In the middle scope layer, Chinese color system will check the Color Force which is the force on human from the color in the space. In city, different district, path, edge, node and landmark has different Color Force, and giving people different feeling, expressing different spirit of the city. My paper will analyze the color of the medial axis of the Forbidden City in Beijing.

KEYWORDS: urban color, Chinese traditional color system, spirit

GENERALIZED COLOR

Urban color is a kind of generalized color. Usually, we see the bright color when they think of color, this is the narrow sense of color. "Generalized color including the narrow sense of color, contains the sense of distance, light and shadow, texture, dry and wet etc., such like sense of perception and experience." Generalized color integrated visual and tactile, auditory, olfactory, gustatory perception, including not only what we see, but also what we feel. Therefore, based on the Chinese philosophy, the value of generalized color is beyond the outer beauty. Because it comes from heaven and earth, take care of the heart, it can express the spirit of the city.

CHINESE TRADITIONAL COLOR SYSTEM

The root of urban color lay in China. Because urban color has the same identity as Chinese traditional culture. It is the relationship and the whole that are the key points of Chinese culture. Based on this, Chinese traditional color system has relationship with heaven, earth and man closely. It have strong identity of conceptual, and is good at expressing spirit. So, it appeared the first city which did the urban color planning artificially in the world in China that is old Beijing city.

In China, people think that man is an integral part of nature. The relationship of man and nature are not opposed but mutual. That is, Chinese think subject-object unified. This comes from Yin Yang and Wu Xing. Yin Yang (the two opposing principles in nature, the former feminine and negative, the latter masculine and positive) and Wu Xing (five elements of wood, fire, earth, metal, water) are the law of thought for Chinese and the framework of Chinese culture. Chinese live in mainland which is length and breadth. They have farming culture. The ancient Chinese happiness depended on the relationship between man and nature, man and man. Because they couldn't have enough food when the weather was bad and they can't be welcome when they didn't obey the rules of big family lived in the place from generation to generation. Ancient Chinese summed up all elements in Yin Yang and Wu Xing. Almost everything in life was brought into this universe model.

However, western look at the world in the different way. They think subject-object dichotomy and the relationship of man & nature is external. Many westerns are seafaring nations. They are good at fighting with nature because of the life instinct. So, western developed positive science and are skilled in analytics. Modern science and technology owes to it.

The color systems most people used today such as Munsell, OSTWALD, and PCCS Practical Color-ordinate System) come from these positive sciences. But color can't be treat with subject-object dichotomy completely. When people connect Newton's spectrum to hue circle and point out the names of the hue, we put the subjective reasons in color. Because the spectrum is continuously. Furthermore, OSTWALD introduced psychology color to the color system. And PCCS combined lightness and purity into tone. They all add more subjective issues in color.

Chinese traditional color system begin with subject, and can be explained by modern science objectively. It was built based on Yin Yang and Wu Xing which is Chinese universe model. Color is one of the parts of this model. Five Color is matched with Wu Xing in the model. Therefore, Chinese traditional color system is conceptual and philosophical. It aims at meaning. It looks like a pagoda which stack-up vertically. Because the colors in the system have different hierarchy.

The first level of the system is Xuan which is very near the black. It means heaven. Tian Xuan Di Huang means that the heaven is black and the earth is yellow. Astronauts have seen the black outer space today is the real evidence. The earth is yellow comes from the soil where ancient Chinese lived.

The second level of the system is Five Formal Color which are Blue, Red, Yellow, White and Black. They are not exactly the same as blue, red, yellow, white and black. So I used capitals to express the difference. Confucius thought Five Formal Color are primary matters. So, they can be used in formal, political, important and ethical places only. And there are several strict rules when use them. Surprisingly, Five Formal Color are basic colors that are three-primary colors and black & white in western science color system we often used today. In Five Formal Color, Yellow is the most important color because it is the combination of the other four colors. It also can be explained by modern science. When we combine the green (Blue in Five Formal Color is green sometime), red, white and black (reduce the lightness) light, we get yellow light. Only we can say is all roads lead to Rome.

The third level and the below of Chinese traditional color system are Jian Color that means secondary color. According to the rules of Wu Xing Xiang Ke, matching Five Formal Color each other, we get Jian Color. They are Green, Red, Bi, Purple and Liu Yellow. Matching these Jian Color again, we get another group of Jian Color in the lower level. Layer upon layer, there is a huge color system appeared finally. These rich and multiple Jian Color are not limited in use. So they express poetic, subtle and uncertain matters in the normal life.

The old Beijing city is a wonderful example applying Chinese traditional color system in urban space. Firstly, we can find Five Normal Color completely in all of important space of the city. This means balance. And Five Normal Color marked the importance of the space where is the center of Urban Color. The old Beijing have many centers like this in the city. The district of Urban Color in the old Beijing is radiation and likes ripple. There are many ripples radiating from many centers of Urban Color overlapping and interweaving. The biggest one is from the center of the Forbidden City. The carriers of Urban Color are multiple in old Beijing. Mountains, rivers, trees, roads, bridges, buildings, pavilions, pagodas, etc. came into Urban Color system as hints and metaphors. They worked together to realize the goal of Integration of Nature and Human.

RULES OF MODERN PRACTICE

Combining Chinese traditional color system and modern spirit, we find out some rules which can be applied in the practice of modern Urban Color planning.

In the macro level, the city grows on the earth, which can be understand from the following four dimensions.

The first dimension is the sky light. According to the ideal color of the sky map, we divided the city into the bright city, the medium bright city and the shadow city. Some bright city can use the high purity color boldly, such as Lhasa. The medium bright city is good at expressing texture, such as Rome; the shadow city, one solution is drawing the outline to increase the clarity, such as Amsterdam.

The number of the medium bright city is the most, such as Beijing, they need to do color design. Analyzing by the tool from the western color system, colors of the medium bright city covers almost the entire color triangle. Usually, the main color will appear in the middle region of the color triangle. The secondary

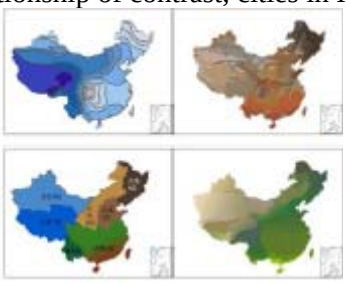
color located in relatively high and low lightness area. So, there appears black and white, grey level. In order to increase the sense of color, we can add a bit of high purity things. Of course, if not, at least there is a frame of brightness. As for hue, starting from the visual balance of psychological needs, a huge volume of city needs all of the hue in the color ring. Of course, in a city, there is always some color to appear with high frequency, or in large area, it has a relationship with the city spirit. Now, for a large number of medium bright city, most of the time we ignore the urban color planning and the architecture color design. It is a pity. We see that this kind of city have wide range of color.

After color planning and design, there will have an extremely diverse effect. This is a very broad world.

The second dimension is the soil. The last century 50's, the government organized the survey of the national geological soil and the soil samples were collected around. We drew the color of real samples in the distribution range of real soil located, then get a national soil color distribution map. We pleasantly surprised to find that it coincides with the Chinese Five Color Soil law. We see that in the middle of map is yellow, the South is red, the east is blue green. Why the soil is blue green tone? Because there is a long history of farming in this area and there are a lot of paddy soil. The paddy soil is the blue green tone. The west part of the soil color map is white, the north is black. This map leading us to analyzing the city from the angle of warm and cold hue because cities grow on the earth. Most of building materials come from the soil, and vegetation too.

The third dimension is vegetation. The southern vegetation is broadleaf, so it looks fresh, juicy, the purity and brightness of color are high. From Beijing to Chengde, we can find obviously that more coniferous vegetation appears, the color brightness reduced, and the purity lower. Put these things on the Chinese map we will find a clear rule, from south to North and northeast, the purity and brightness of color reduced very much.

So, we can study city from the angle of color purity. There are many different purity of cities. The cities have a low purity such as cities in Japan, Zhangjiakou in China. There is a great relationship between purity and dry and wet. For instant, Zhangjiakou's low purity because of dry. We can also study the city from the perspective of the purity relationship between the contrast. For example, Beijing is the city have purity strong contrast. The Forbidden City in Beijing during the Ming and Qing Dynasties is brilliant which has golden tile and red wall surrounding by grey quadrangles. At that time, the Beijing city belongs to the bright city. The nature has the law of purity strong contrast. When artificially constructed city in line with this law, it will become the earth art. Another example, Hunan in China has the red soil which color purity is high relatively. There is abundant rainfall in Hunan. After rains, all colors are bright, and the purity is elevated. So, from the relationship of contrast, cities in Hunan have purity weak contrast.



The fourth dimension and the most important dimension is humanity. The generalized color is composed of natural color and humanity color. Because the generalized color comes from heaven and earth, humanity color has a great relationship with the region. One of the words made up of 'humanity' in Chinese means "pattern" ,that is, 'humanity' means the diversity of people in different region have different ways of life. food, clothing, housing and transportation is the best way to reflect life. Housing in 'food, clothing, housing and transportation ' is architecture which decide the largest area of color saw by human eyes. So, housing plays the most important role in humanity color.

There are many kinds of folk housing in China such as Courtyard Dwellings in Beijing, the Huizhou-style folk dwelling houses, old villages in Guangdong, Guizhou and Yunnan, Tibet carved room, Kazakh yurt, Mongolia Mongolian yurt, Loess Plateau cave, etc. We put the ' food, clothing, housing and transportation' on the map, found that there is great regularity. The nature of nomadic region is vast, so the humanity color imitated nature. In the farming area, North and South have a clear demarcation, because of different language family. After we put the small areas of the color extracted from ' clothing, food and transportation ' on the 'housing' color background we can make the classification of the city from the angle of humanism color. Of course, there is a premise. We found a section to study. That is, our study is under the premise of the Ming and Qing Dynasties. Although the mode of production and the volume of the city today changed a lot, this study still has its value. It can help us to find the source of culture.

In the median level, people are immersed in the generalized color perceiving the city mainly through the five elements which are area, road, boundary, node and landmark. These elements affect people by means of generalized color, we call it 'color force'. Different color force give people different experience. These different color force formed the rhythm and intertwined, expressing different city spirit.

For the ideal road which give people good experience is very difficult to find, we try to let the central axis of the Forbidden City in Beijing as an example, studying the color force variation law of the road.

As shown in the figure, traveling along the central axis, we divides 13 nodes, and each node into color map. We can get from the color map that the area of artificial color is more than half of all, that is, all of the nodes have big color force. As a result, the space sequence of central axis has a great effect on people.

In the sequence, there are three levels of colors which are from building, sky and ground in each color map. The building color is the main melody, the sky and the ground colors are the bass accompaniment. Three levels of color woven together. Although the lightness, hue, purity of the main melody of building color do not change, but while people march forward in space, the three levels colors' area relationship, position relations are constantly changing, they cooperate with each other to form a sequence of rhythm and rhyme.

Node 1 is the 'thousand steps corridor', the color area relationship in the view is the main-auxiliary relations. The position relation is 'half contains', three edges contrast. They all belong to the medium contrast giving people the emotional experience of overture.

Node 2 is Tiananmen square, the color area of the sky, ground, building in the view are divided into three parts approximately. So, the color area relationship is the weak contrast. The position relation is the weak contrast, too. Because it is adjacent to each other, one edge contrast.

Node 3 is gone into the Tiananmen gate which is dark without light making people see the very small area of the building, the sky and the ground. The color area relationship is master-slave strong contrast. The position relation is four edges contrast, is strong contrast, too. There are another strong contrast exist at the same time, such as light and shade, vivid and grey contrast. From now on, the effect of color within the space sequence becomes strong.

Node 4 is Wu gate. The large area of building color oncoming determines the color area relationship in view is master-slave strong contrast. The position relation is medium contrast because of perspective deformation. The internal color force of space sequence continued to increase.

Node 5 is in the front court of Taihe gate. The color force reduced because the colors in view are almost equally divided the whole area and the position relation is one edge contrast. As a result, the color area relationship and position relation are weak contrast.

Node 6 is the hall of Taihe. It is the climax of this central axis space sequence. But we do not see a large area of the building color. On the contrary, the building color area is very small, the sky and the ground area is great. The hall was in the strong contrast between the sky and ground (The color area relationship is master-slave strong contrast. The position relation is strong contrast, too.) while it integrated with nature. These contrast implied the meaning of 'majestic and grand' which is beyond any artificial large scale building. The suggestibility of Chinese philosophy was expressed thoroughly in these contrast relationship. It is the color relationship in the space sequence embodies the spirit of philosophy Chinese rather than the buildings with different hue in the Forbidden City on behalf of the Chinese universe. If this methods is used in the design of contemporary architecture, it should be able to open up a new path of inheritance and innovation.

All kinds of color contrast relationship from node 7 to 10 is weakened gradually.

Node 11 is Imperial Garden. The natural color area increases and the building color area decreases. The color area relationship and the position relation turn into strong contrast again. Finally, through node 12 Shenwu gate, we enter the node 13, Jingshan Hill which is the end of central axis space sequence. The natural color influence reached the climax, the building color area is reduced to a minimum, showing a strong contrast. The position relation is strong contrast, too. The space sequence of the Forbidden City's central axis is full stopped here. The color force variation of whole sequence is from weak artificial color to the strong climax, then weakened gradually, and changes smoothly to natural color, ultimately end with strong natural color force. No matter how wonderful the man-made environment, the human home is still in nature. Chinese ancient emperors built such brilliant place for themselves, their last wish are still go back to nature. Here, the

spirit of 'harmony between man and nature' in Chinese philosophy is expressed very clearly by color relationship in material carrier.

CONCLUSION

In summary, urban color as a kind of generalized color, its root lay in China. It comes from heaven and earth, taking care of the heart, so as to express the spirit of the city.

With the recent progression of aging society and increasing proportion of elderly population, especially the ‘baby boomers’ born between 1955 and 1963 have emerged as ‘active seniors’ with considerable economic and purchasing power and the senior market is likely to expand in size as a result. In particular, various research projects have investigated information devices targeting seniors as an increasing percentage of seniors are using smartphones. The earliest signs of aging are found in vision as the lens that adjusts focus deteriorates with aging. As a result, seniors show different characteristics related to legibility and visual discrimination and, in this study, a subjective visual response test was conducted in order to provide basic data for color guidelines for smartphone contents. This study evaluated legibility of different combinations of background and character colors among seniors. The background and text colors can be combined in a numerous number of cases. However, an excessive number of stimuli presented during the test can increase fatigue of the subjects and, as a result, decrease the reliability of the test result. Therefore, in this study, the minimum number of colors was used for making optimal color combinations. The contents were divided according to the ratio of background and text on the smartphone display. To the background and text color combinations, typical achromatic and chromatic colors were applied and, based on the satisfaction survey among the senior subjects, this study proposed reference color values that are legible according to the color level as well as example for each screen used in the test.

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