

Social Dynamics: an Analytical Method of Drum Tower Design for Dong Nationality

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Abstract—Dong nationality culture is an ethnic minority culture with strong nationality characteristics, whose typical architecture represents the drum tower, which is the product of the essence and image of the material culture and spiritual culture of the Dong people, and has a very high status at home and abroad. In the process of formation and development of Dong nationality society, the design thought of Dong nationality is gradually formed and shaped. From the point of view of social dynamics, the essence of analyzing the design thought of drum tower of Dong nationality is also the process of analyzing the design thought of Dong nationality.

Keywords—drum tower; design thought; social dynamics; nationality culture

I. INTRODUCTION

Dong nationality is famous for its unique national culture, especially its architectural culture. Dong population is mainly distributed in the border areas of Guizhou, Hunan and Guangxi provinces, where mountains and forests are densely covered and water resources are abundant. This geographical environment makes Dong nationality form a unique mountain farming nationality group.

Drum Tower is the warm nest of the village,

There is no drum tower nowhere to enjoy.

Tall *Cunninghamia lanceolata* erect into drum tower,

There is a place to gather, and there is a song of joy.

“Dong nationality folk songs” [1]

The ancient folk songs of the Dong nationality recorded the drum tower as the unshakable position in the minds of the Dong people. Dong culture is also called "drum tower culture" by many nationality scholars. Drum tower of Dong nationality not only embodies the excellent architectural skills of Dong people in the field of architecture, but also, more importantly, bears all the material, spiritual and cultural elements of Dong nationality, which is also the most representative and interpretable cultural symbol in Dong culture.

II. THE DESIGN ELEMENTS OF DRUM TOWER IN DONG NATIONALITY

A. Architectural Form

The architectural forms of drum tower of Dong nationality are varied and have their own characteristics, but generally speaking, there are mainly the following types:

1) *Hall style*: The hall-type drum tower is the initial structural form of the drum tower, the plane is rectangular, when the drum tower is constructed, it is mainly used in the process of the combination of the penetrating bucket and the lifting beam, it takes the middle four columns as the fulcrum, with the Fangtiao-mao bearing weight, layer by layer high form. In terms of appearance, this kind of form has a kind of double eaves overlapping visual sense, although the scale of this kind of drum tower is not big, but the modelling is unique, the workmanship is light. Guangxi Sanjiang Linxi Township Pingyan Zhai drum tower belongs to this type.

2) *Dry-fence type*: This type of drum tower is constructed with the lower aerial method, and the drum tower hall is located on the second floor. The style of dry-fence architecture is also one of the important styles of the southern minority architecture. In ancient times, it was popular with the living area of the Baiyue nationality in the south, and the Baiyue nationality is considered to be one of the origins of the Dong nationality at present. The architecture form of the dry-fence drum tower can be said to confirm this statement from the other side. Guangxi Longsheng Longping Red Army drum tower and Pingdeng Township center of the street drum tower are representatives of this kind of drum tower (see “Fig. 1”).



Fig. 1. Guangxi Longsheng Longping Red Army

3) *Dense eaves type*: This is the most common form of drum tower. The bottom of this form of drum tower is relatively broad, the upper part has up to several layers of tight eaves, the number of dense eaves is odd, the common one is generally 7 - 15 layers, the drum tower with the largest number of dense eaves is the drum tower in Congjiang County Square, Guizhou Province, and the dense eaves are as many as 29 layers, it gives a solemn feeling, and each layer of flying cornice and raking angle design, which makes the drum tower itself show a different flavor, it appears to be dexterous and beautiful (see "Fig. 2"). Mapang drum tower in Sanjiang Dong Autonomous County of Guangxi was founded in the late Qing Dynasty, it is a national key cultural relic protection unit and it is also a typical representation of this type (see "Fig. 3").



Fig. 2. Plaza drum tower in Congjiang County of Guizhou.



Fig. 3. Mapang drum tower in Sanjiang Dong nationality Autonomous County, Guangxi.

B. Decorative Symbol

Drum tower is the Center of Dong people's Construction of villages, which is a huge cultural symbol and a unified object of Dong culture. For the Dong people, this symbol is even more sacred halo. Therefore, in the drum tower decoration elements, the Dong people will all the beautiful moral elements, not stingy decoration on the drum tower.

1) *Cedar*: There are many peoples in the world who regard "trees" and "pillars" as objects of totem worship. This is the religious view of the primitive people. The primitive peoples associate everything in their lives with the god tree or the main pillar, the pillar where it stands is the sacred space. Although there is no sufficient historical evidence for this totem worship, but in the lives of the Dong people, the sacred status of this kind of "tree" and "pillar" is self-evident, if the people of Dong nationality set up a village, they must build a drum tower first. If the financial and material resources can not be built a drum tower, then first set up a China fir as a stand-in. There are also strict screening criteria for cedar wood, which must have sacred rituals to cut down trees, the remaining wood and bark should not be discarded or build cattle, sheep and hog lots at will, can only be used to build houses and granaries. All these activities show that the "tree" and "pillar" are sacred to the Dong people, and this sense of holiness is fully reflected in the position of the drum tower. The four main pillars in the drum tower symbolize the four seasons and four directions, and the twelve eaves represent a year and twelve months. This shows that for the Dong people, Chinese fir is related to the religious cosmology of Dong's ancestors, and it comes from heaven and is the source of the sacred culture of the Dong nationality.

The appearance of the Dong drum tower looks like a huge China fir. The Dong people believe in the huge symbol of China fir to the end, bringing the unity of the family. Dong nationality is the name of a cluster, or living with the same surname, so this sense of national unity is inherent.

There is another symbol of cedar in Dong culture, that is, the meaning of "life never cease". Because after the fall of the cedar, its falling place will continue to send out new seedlings, until it grows into the forest, which also means that villages continue to multiply and pass on from generation to generation.

2) *Dragon*: Another important symbol of the drum tower is the image of the dragon. The ancient Yue people in southern China are a nationality with dragon and snake as totem, and the imprint of totem culture is also imprinted in Dong culture. Dragon to Dong people is another sacred image, implying that Dong people long for the blessing and protection of the dragon (as shown in "Fig. 4" and "Fig. 5").

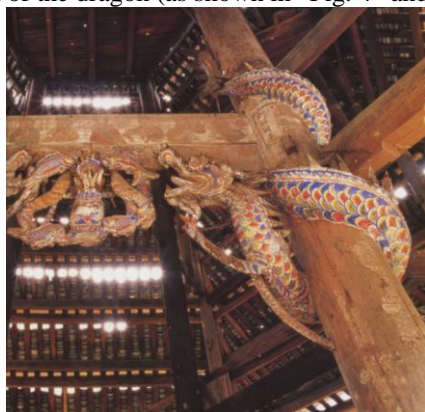


Fig. 4. The decorative symbol of Dragons inside drum Tower.

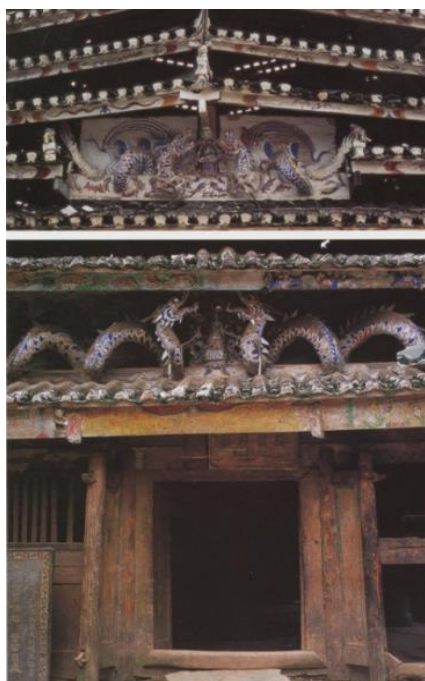


Fig. 5. The decorative symbol of dragons outside drum tower.

3) *Red-crowned crane*: Many Dong researchers believe that the drum tower decoration elements contain the image of the red-crowned crane, this statement also has some truth. Figuratively, the up-warped eaves of the drum tower make you feel like a group of wingspan red-crowned cranes. The red-crowned crane plays an ethical role in Dong culture. The ancient songs of the Dong nationality said: in ancient times, the ancestors of the Dong nationality were raised by the red-crowned crane sipping fish and shrimp every day and sucking the spring water. Therefore, the Dong nationality people for generations did not forget the kindness of the crane; the architects of the drum tower incorporated the image of the red-crowned crane as constructing a drum tower. From the aesthetic point of view, these rising elements make the whole drum tower rid of the heavy image, to reflect a light and elegant flavor, which is really ingenious and profound design (as can be see in "Fig. 6" and "Fig. 7").



Fig. 6. Part of the warped eaves of a drum tower (in group).



Fig. 7. Part of the warped eaves of a drum tower (in group).

4) *Gourd string*: A well-built drum tower is tower-shaped, its top uses a string of gourd image, straight to the sky, just like the tip of the tower. Gourd string represents the origin of human beings in Dong culture. The ancient legends of the Dong nationality are said to be flooded in ancient times, and the gods used the god gourd string to save the ancestors of human beings, so that human life could be continued (as can be see in “Fig. 8” and “Fig. 9”).

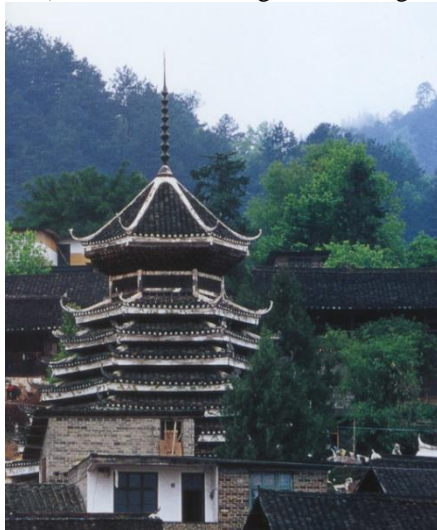


Fig. 8. The shape of gourd string at the top of drum tower (in group).

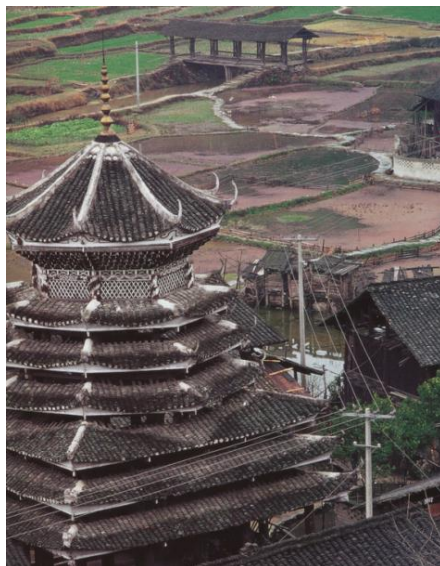


Fig. 9. The shape of gourd string at the top of drum tower (in group).

From the decoration symbols of these drum towers of the Dong nationality, we can deeply understand that the drum tower is the sacred image of the Dong culture highly concentrated and condensed, and studying the drum tower culture is to study the Dong culture.

C. Structure of Architecture

Dong people have superb architectural technology, drum towers in the Dong culture has a high status, among which

the highest level of architectural technology of the whole nation is condensed. The building of Dong nationality is famous for its Chinese fir mortise and tenon structure, whose structure is characterized by Chinese fir chisel and tenon connection, top beam and column plucking in the air, row Fang crisscross, consistent up and down, adopting lever principle, supporting layer by layer.

1) *The design of the large structure overlapping the small structure*: The technology of drum tower is very complex, but generally speaking, it is the design of large structure overlapping small structure, small structure overlapping smaller structure. This approach accords with the system theory in theory and is easier to realize in practice, which reflects the wisdom of the Dong people. The connections between the structures are made entirely by chisel and tenon connections (as can be see in “Fig. 10”).

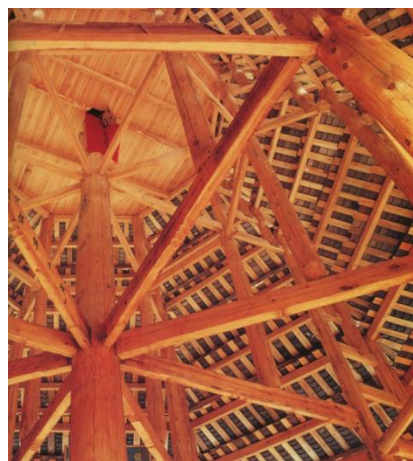


Fig. 10. Internal structure design of drum tower.

2) *Main column brace, making full use of mechanics principle*: Dong nationality drum tower is pure wooden structure, timber bearing gravity is limited, and easy to break, in order to build a stable drum tower, Dong nationality craftsmen pay great attention to the use of mechanical principles. The design of the main bearing column, eaves, Fangmu, Guazu, etc., makes the bearing gravity evenly distributed, and ensures that the drum tower can survive the test of time and last for a long time.

Another architectural feature of the drum tower is the use of pillar support, layer-by-layer technology. Generally four columns are the majority, there are also six columns, eight columns of the design, but more rare.

"Lift" is one of the drum tower construction techniques of Dong craftsmen. It has two kinds of construction condition: one is the construction craft that uses the main bearing column and the eaves column or the short column to share the whole drum tower weight together; The other is the melon column or short column which connects the main supporting column and the eaves, and also refers to the four pillars on the top floor of the drum tower lifting Leigong column. At the beginning of the construction of a drum

tower, the construction craftsmen took full account of the bearing capacity of the main bearing column and the gravity distribution between the Fang and the beam, all of which were in the absence of any drawings at all, thanks to craftsmen's skill and accumulated experience, people have to admire the wisdom of Dong people.

D. Morphological Characteristics

There are three main features of drum tower form of Dong nationality.

First of all, on the whole, the drum tower of Dong nationality is like a huge fir tree; taking this as the prototype, and the shape of the Han nationality Buddhist pagoda is fused to form the shape of the tower, which is big and small on the upper and lower sides.

Second, Dong nationality drum tower has a high-density cornice-superposed building. However, unlike Han nationality heavy-walled building, the cornice of the Dong nationality drum tower does not have a floor for people to live or use, so the distance between the cornices is shortened, and the density of the cornice is increased. This gives a sacred and solemn sense of image.

Third, the numbers of double eaves of Dong nationality drum tower must be odd. The number of double eaves is at least 1 layer, up to 29 layers, most of them are 7 - 15 layers, but all of them are odd. Dong people call odd numbers predestination, is the symbol of auspicious.

III. THE DESIGN IDEA OF DRUM TOWER OF DONG NATIONALITY

A. The Cultural Ecological Embodiment of the Spiritual Culture and Material Culture of Dong Nationality Society

Dong drum tower is the first thing that Dong people should do after they migrate to a region and decide to build a village. Therefore, the location of building a village is the location of a drum tower. The most important idea of location selection is based on the geomantic theory of Dong culture, which is also the system of Dong people's humanistic view of the universe. The small world of the building residence is harmonious with the big world of the mountains and rivers, so the site selection of Dong nationality depends mostly on the mountains and water. The mountains on which the stockaded village depends are called "dragon veins" by the Dong people, mountains and rivers intersection, Yin and Yang fusion, choose one of the most auspicious places where Dong nationality live, the ground is lower, Dong people call it "dragon cave", that's where the drum tower is built. Folk houses are built around drum towers. The Dong people are guided by the idea of "building the drum tower with the best wood, decorating the drum tower with the best handicraft, and displaying the highest honor in the drum tower." to build the direct drum tower, with the permission of financial and material resources. Dong nationality stockaded village drum towers will be built as magnificent as possible, decorative gorgeous moving. For a Dong nationality stockaded village, there is nothing more

enviable than the glory of the drum tower of their own stockaded village. Therefore, the construction of a drum tower is a symbol of the material and spiritual aspects of the Dong nationality stockaded village, a symbol of the wealth, popularity and spiritual appearance of this village, which is also an expression of the harmony and operation of the Dong nationality culture and ecology.

B. The Nationality View of Harmonious Development Between Man and Nature

Dong nationality people pay attention to fengshui theory, from another aspect also reflects Dong people's Nationality concept of promoting harmonious Development between Man and Nature. The Dong people believe that the Dongzhai depends on a "dragon vein", the drum tower built in the stockade is a "dragon head", and the other buildings are the dragon body and the dragon scale, all of which should be echoed by the surrounding environment. In addition to drum towers, Dong people have also built wind and rain bridges, pavilions, Dong folk houses and other buildings, making the whole stockaded village like a dragon hidden between the mountains and rivers.

The reason why Dong people's "system of rice, fish and duck symbiosis" has been included in the world agricultural cultural heritage list of United Nations, causing international concern, it is also the embodiment of the humanistic world outlook of the Dong nationality, which fully embodies the nationality and cosmological views of the Dong nationality, which advocates the unity of heaven and earth and harmonious development.

C. Reflecting the Inheritance of Social and Cultural Customs of Dong Nationality and Reflecting People's Yearning for a Better Life

Symbolism can be seen everywhere in drum towers and Dong buildings. The plane of the drum tower is even numbers, representing the number of ground, elevations are odd, representing predestination, they mean that the Dong people yearn for the unity of heaven and earth for a long time; The four main pillars and twelve eaves of the drum tower represent twelve months, four seasons of the year, peace all year round, and well-being all month round. This is the presentation of the social and cultural practices of the Dong nationality. In addition, there are also the final number of building dimensions, with "eight" or "six", because "eight" and "Fa" rhyme, adding to the meaning of wealth; The "six" stands for the "six and six great shun". "These fixed sizes correspond to 'the height of house meets eight, everything is accessible', 'deep into meet eight, family get rich, man get rich', 'staircase meets six, pick up the valley upstairs', 'stove meets six, the bright fire shines a thousand autumns', 'Pane meets six, separated ghost road' and other Dong folk proverbs." [2]

IV. THE ANALYSIS OF THE DESIGN CONCEPT OF DRUM TOWER OF DONG NATIONALITY FROM THE PERSPECTIVE OF SOCIAL DYNAMICS

In every society, we find some sort of family life, recognition of kinship, economic system, political system, social condition, religious worship, dispute resolution, ways of punishing criminals, organized entertainment, and so on, always accompanied by material culture, a great deal of natural knowledge, technical knowledge and traditional knowledge, etc. [4]^{P88}

A. The Social Function of Drum Tower of Dong Nationality

The role played by drum towers in the social activities and cultural operation of the Dong nationality is so great that Dong scholars also call the Dong nationality society the "Drum-tower society", referring to the fact that since ancient times, Within the Dong society there is a set of social structures centered on the "Drum House Assembly".

In order to realize the political and military functions of the drum tower, the cow skin drum is set up on the drum tower. Whenever there is a big event, the sound of the drum must be a big event in Dong nationality stockaded village, and the name of the drum tower will also get from it. Generally speaking, the main social functions of drum tower are as follows:

1) *Deciding important matters, the political and legal center of legal judgment:* A drum tower is a symbol of a social organizational unit, only when a major event affecting the entire family has taken place inside this unit, Zhai Lao will concentrate on the discussions and resolve these important events in the drum tower, from this point of view, it also illustrates the social authority of the drum tower.

The family is the most basic social unit in the Dong society, and on top of this, the Dong nationality has a higher level of non-governmental organizations, which are called "Kuan". Generally, "small Kuani" usually consists of several large natural stockaded villages in the region or several small stockaded villages near the joint of a main village, a number of "Small Kuan" form a "medium Kuan", and a number of "Medium Kuan" form a "Large Kuan". A number of "Large Kuan" makes up of the highest level of "United Dakuan". The laws and regulations of Dong society are "Contracts of Kuan" drawn up in the Drum tower Council, it is the criterion for Dong society to maintain public order, strengthen moral concept, and crack down on bad winds and evil spirits. "Kuan" is a non-governmental organization in Dong society. In the past few hundred years, it has played a great role in Dong society.

2) *A military command centre against foreign enemies:* In ancient times, if the Dong society was invaded by foreign enemies, it issued a number of commanders through the laws and regulations of the Kuan organization, and Kuan organizations at all levels and nearby, under Zailao's organization, through the drum tower signal, gathered their

own village team, and expressed solidarity with each other, helped each other.

There are soldiers in the Kuan organization, which is composed of young and adult men in the Dong nationality villages. They are not a permanent regular army, but a spontaneous, mass organization of the Dong people. During agricultural leisure, military training is organized to meet the needs of defending the homeland and safeguarding the security of the region, and these activities are centered on drum towers.

3) *An economic centre for exchange of productive experience and economic aid:* The economic function of drum tower, including the exchange of production experience and technology in drum tower on a regularly or irregularly scheduled, has promoted the improvement of the production level of the whole Dong nationality society. In addition, if meet people in need of help in Dong nationality villages, through this kind of rallies held in the drum tower, the people have also conducted treatment and curation in a unified and open manner, and ensure the unity and stability of Dong society.

4) *A cultural centre for sacrificial and cultural activities:* After the 1950s, with the disappearance of the Kuan organization, the political and military role of drum tower in Dong society has been gradually weakened, but the role of drum tower in social interaction, religious customs, cultural inheritance and other aspects has become more and more prominent. In Dong people's life, all major festivals, sacrificial activities, welcoming celebrations and other activities, are held in the drum tower. Including Dong nationality song and dance art exchange, sculpture and painting activities, they are all held in the drum tower. With the development and change of the society, more and more people understand the Dong society and culture through the drum tower activities of the Dong people, which promotes the inheritance and development of the Dong culture. It can be said that in the new historical period, the role of drum tower has a new expansion.

B. Analysis on the Design Concept of Drum Tower of Dong Nationality from the Perspective of Social Dynamics

French positivism philosopher Comte introduced the theory of biological organism into sociology, which led him to put forward the concepts of social dynamics and social statics. The theory of functionalism is very popular in sociology for a period of time. It should be said that functionalism has contributed a lot to the study of social origin in some respects. Social dynamics is the science of studying the dynamics, speed, direction and law of human social development. Here, we should pay more attention to the origin of the development of drum tower design thought for Dong nationality. The social dynamics introduces this design idea into the frame of "structure-function", which makes us understand the relationship between the design thought represented by drum tower and other factors in the society of Dong nationality, so as to grasp the law of development.

1) *Dong people's worship and awe of nature and religion*: Dong nationality is one of the typical minority nationality with cultural characteristics. Nature and religion account for the largest proportion of its ubiquitous design elements. For example: Design elements and modeling characteristics of drum tower of Dong nationality are taken from the natural religious elements that the Dong people yearn for and worship. This feeling of awe of the Dong people to nature and religious belief makes these elements gradually form the important elements of the design thought of their own nationality in the process of social development, and over time they form the norms of their design.

2) *The concept of social class promotes the development of the design thought of Dong nationality*: Dong nationality people have a strong sense of social class, which can be seen in the development and organization structure of its folk organization "Kuan". This concept is deeply rooted in the thought of the Dong people and is embodied in its design thought. The buildings in Dong stockaded village are well-arranged, only drum tower towering, this also illustrates the problem from a point of view.

3) *The congealing achievements of the "craftsman's spirit" of the Dong people*: The spirit of craftsman is rich in connotation. This paper mainly discusses the temporality and humanism of the craftsman spirit of the Dong people, which is an important factor to promote the development of their design thoughts. The core of crafts's spirit is a kind of human spirit, which actually refers to "labourers and labours of all creation"^[5]. From the perspective of social dynamics, the spirit of craftsman should be a concept with social time, which embodies the socialized time of objective time in the field of social structure^[6], which embodies a kind of law and rationality. It should be said that the formation of the design thought of the Dong people is the result of the condensation of the nationality "craftsman spirit", and the drum tower, the typical object of the Dong culture, is the crystallization of time and humanity of craftsman spirit of the people of Dong nationality.

V. CONCLUSION

Dong nationality in its formation and development process has created its rich and colorful, rich characteristics of nationality culture, its achievements to look at today, influence in the international and domestic cannot be underestimated. Analysis of the Design idea with Nationality imprint from the perspective of social dynamics development, it can be seen that the form of social development and design ideas can be traced. In today's reverence for traditional culture, it is one of the important ways to develop the national culture to study the path of the development of the nationality culture and the law of the formation of the design thought.

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