

JAPANESE URBAN STRUCTURE AND CULTURAL CHARACTERISTICS

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Abstract

1. Introduction

Our principal object is Art and Science. At Kyoto Institute of Technology we are now making a bridge over Art and Science through education or research field as well. Along this line, we would like to show you the charming points of Japanese cities. Especially we are looking at the three factors in urban spaces, namely beauty, intelligence and technique.

Next main subject, west meets east. SSS9 will be held in Seoul. This means western culture meets eastern culture at Seoul. This is very good chance for us to consider the similarity and difference between west and east. We Japanese have been looking at west these 200 years, but today, after the modernization west and east have many points in common. Our urban appearances resemble each other. In facts, we would like to get out the similarity of modern cities in common by using scientific technique.

Third subject is to show the characteristics and charm points of Japanese cities. Of course Japanese cultures reflect in its urban spaces, and during the last 2000 years,

Japan has been influenced from Chinese culture and Korean culture, for instance Kyoto or Nara, such a kind of old capital cities were built by Chinese concept. But recently after the Second World War, Tokyo design conference was held at 1960, which is very epoch making conference because from here metabolism group was born and many projects were made for our future society. At the same time, we were very interested in our own urban space and historical studies. We began to study about design survey on many old villages on country side or seaside.

We will start the analysis of traditional culture and urban space by mathematical approach and then try to classify the traditional urban spaces by Japanese cultures.

2. Japanese traditional design

We introduce Japanese design pattern and also making recipe for design. Japanese famous design patterns are Seigaiha (blue sea wave), Yagasaki (arrow head) ,

Kohsi (grid type), Kaminarimon (thunder) , Kikkoh (turtle) etc. Japanese traditional design patterns are used in wearing dress and flower vase or tea cups as well. We call it repeating pattern. This is very easy recipe since basic pattern will be moved or rotated so that first basic pattern will be expanded into all over the plane. Triangle, quadrilateral or hexagonal shape are used for the basic unit and you can put your design in it. On the other hand, knot pattern can be seen in garden design or ceremonial situation.

More interestingly, we can find a similar design pattern in traditional urban space. Tokyo was political capital because of living place of tycoon and Osaka was a second largest city and economical capital called a national Kitchen. Kyoto was a cultural capital of Japan because of the Emperor palace. Another cities were under the umbrella of tycoon system, and they were called Johkamati (town under the castle) whose space structure often used a spiral pattern from the center of castle for military protection code. Kyoto and Nara and Osaka have a grid system because they are older than tycoon centralizing system. But Tokyo has a spiral structure as a whole.

3 Scientific analysis of urban structure

Levy Strauss was called a father of structuralism since he translated human relationship or marital relationship into mathematical algebraic structure. From here we can get the similarity between the social structures of western society and eastern society. First of all we had better to get the structure of complex phenomena and then we get the similarity and common information from the comparison of the different social systems. This is very modern and transparent technique to get the equality.

More concretely, we are going to go to the network analysis. We would like to discuss the similarity and differences between theoretical network and real urban network.

We imagine the set of cities and also set of networks on urban structure. We would like to do some operation on the networks, for instance additive operation or subtraction operation by the networks. We compare the real city network with a model network, for instance, minimum spanning tree which is the minimum network or Delauney diagram which is maximal network. If you pick up Paris and compare the road network with minimum spanning tree, we can see that almost 90% of minimum spanning tree links are embedded in real Paris road networks.

And then, we construct the maximal network among the crossing points of Paris. We can see that real Paris links are embedded in Delauney network at high ratio.

4 Culture characteristics and urban spaces in Japan

Since 1960 when design conference was held in Tokyo, metabolism group was born. At the same time, we Japanese were interested in our own traditional townscape that had been destroyed during Second World War and also by modernization or economical development pressure. Since then, we have two ways of urbanization, future-oriented way and historical-oriented way.

From this points of view, Japanese city image can be described by the Image of the City, published by Kevin Lynch, famous 5 elements (path, edges, districts, nodes, landmarks). But that is not enough, we require another 4 factors to describe the Japanese historical town, namely (orientation, hierarchical accessibility, placement due to circumstances, esthetic triangle), that were presented in a famous book titled Japanese urban space, published by Prof. Tange- group Tokyo Univ.

Japanese urban space cannot be described only by the logical analysis. To the contrary, Japanese urban characteristics may be irrational or illogical intrinsically. From this point of view, Absent, Ambiguous, Anonymous, Absurd, Animate are important factors for traditional town planning in Japan. Furthermore, we need to think about psychoanalysis for urban analysis of Japanese city. In facts, we introduce XY-axis in Kyoto and compute the future of Kyoto by the power game of emperor-culture system and tycoon-real power.