The Spreading of Christianity and the introduction of Modern Architecture in Shannxi, China (1840-1949)

Christian churches and traditional Chinese architecture

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EL PRESIDENTE                              LOS VOCALES

EL SECRETARIO
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Abstract

The Chinese architecture has gone through great changes during the long process of history. The tremendous changing period was the named Modern Times of China when, for the very first time, the western architecture was introduced into China and became to influence majorly on the traditional Chinese architecture. Before that, the traditional Chinese architecture which has its own, yet totally different system from the occidental architecture system was the only architectural style could be found in China.

Although, due to many historical, conceptual and architectural characteristic reasons, large amount of the ancient Chinese architecture built in the feudal China was not preserved, there are a lot of buildings of semi-feudal China that was well constructed and conserved. The most important architectural type of the semi-feudal China is the Christian Churches. It was not only the first western architectural form that was brought into and well developed in China, but also was the beginner of the modernization process of Chinese architecture. Because of the deep root of the 2000-year traditional Chinese architecture, all the Christian Churches built in China during the semi-colonial society has a combined style of both the traditional Chinese architecture and the classic western churches. They are a priceless asset of the Chinese architectural history. Recently, more and more attention had been paid on the Chinese Modern Times architecture, however, the Christian Churches in Shaanxi Province, the province which has a unique history with the Christian, but less economically developed have never been researched yet. The
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Christian Churches of Shaanxi Province reflect the general feature of developing history of the Christian Churches of common inner-land regions in China. The research opens the door to further study on other Christian Churches and related buildings, and also for the further study on the Chinese-western architectural and culture communication.

On the base of document research, field survey and mapping, in this thesis, an in-depth study had been done on the general history of the features and roots of the traditional Chinese architecture, the developing history of the Christian Churches of Shaanxi Province and the architectural types, examples, characteristics, present situation and conservation status. By comparing the Christian Churches of the cities in Shaanxi province to the Christian Churches in other more developed cities, and by comparing the Christian Churches in China to the classic western churches, the architectural combination feature of the Christian Churches in China are highlighted.

The thesis is a fundamental research on which many further studies about the architectural developing history, characteristics and conservation of the Christian Churches in China could be done. It is considered essential to add to the work, as an appendix, an elaborate conceptual illustrated glossary of architectural and construction terms in Chinese, English and Spanish.

Madrid, October 2014
Resumen

La arquitectura china ha experimentado grandes cambios a lo largo de un extenso proceso histórico. El hito de mayor importancia es el que da paso al denominado Tiempo Moderno, periodo en el cual irrumpe por vez primera en China la arquitectura occidental, que comienza a tener una influencia muy activa y significativa sobre los rasgos y la identidad de la arquitectura tradicional china, hasta ese momento el único estilo o forma de hacer –muy diferente, en cuanto a su concepción y fisonomía, de los planteamientos occidentales- que había sobrevivido sin desvíos significativos, configurando un panorama milenario bastante homogéneo en los aspectos técnicos y artísticos en el desarrollo de esa arquitectura.

Por un cúmulo de complejas razones, la mayor parte de la arquitectura china del periodo feudal –es decir el que forman todos los años anteriores a 1849- ha desaparecido. Sin embargo, desde la fecha indicada hasta la Revolución de 1949 (el denominado periodo semicolonial o semifeudal), sí se conservan muchas edificaciones, que fueron mejor construidas y mantenidas luego, destacando por su importancia en ese sentido las iglesias cristianas.

Dichos templos representan cronológicamente, no sólo la primera irrupción de la arquitectura clásica occidental en China, sino el inicio de un proceso de modernización de la profundamente enraizada y, en buena medida, estancada arquitectura vernácula, combinando técnicas y estilos de ambos planteamientos, para dar como resultado originales edificaciones de un singular eclecticismo que caracterizarían buena parte de la arquitectura de dicha etapa semicolonial.
Resumen

En términos generales, últimamente se ha ido prestando cada vez más atención a esta arquitectura de los tiempos modernos, aunque las iglesias cristianas de la provincia de Shaanxi no han sido objeto de estudio específico, a pesar de que su tipología es muy representativa de las construcciones de esta clase en otras regiones del interior de China. La investigación que desarrolla la presente tesis doctoral sale al paso de esa deficiencia, abriendo puertas a la continuación del trabajo referido, extendido a otras zonas o arquitecturas, y, por extensión, a la profundización analítica de la hibridación arquitectónica y cultural entre China y Occidente.

Sobre las bases de investigación documental, estudios de campo y dibujo, la tesis plantea un estudio aclaratorio de los rasgos y raíces de la arquitectura tradicional china, al que sigue otro histórico y tipológico de los templos cristianos en la provincia de Shaanxi, deteniéndose en sus características fundamentales, situación (uso) actual y estado de conservación.

Se ha considerado imprescindible añadir al trabajo, como apéndice, un elaborado glosario conceptual ilustrado de términos básicos arquitectónicos y constructivos, en chino, inglés y español.

Madrid, Octubre de 2014
Introduction
General Background

The feudal society have had lasted for more than 2000 years in China since 475 BC. During such a long period of time, the traditional Chinese architectural have shaped up their unique formation. Although the formations were changing and evolving according to the developing of the culture, the technique and the economy, the most common appearance of the traditional Chinese architecture are constituted by the steps as the base on the ground, the beams and columns as the main supporting part in the middle and the large slope roofs on top. The abundant types of architectural formations, from palaces, government mansions, living residences to religion constructions and public buildings, even the urban planning are strict to the hierarchy. Besides, as China occupies a large area of almost 9600000 km², it contains various natural, geographic and climate conditions. The climate, topography, accessible materials and culture are quite different from one region to another. Therefore the traditional Chinese architecture formed diverse local formations to adapt to the different local constructive conditions.

However, the traditional Chinese architecture formation had never been interrupted until 1840 when out broke the first Opium War. The gate of ancient feudal China was knocked open by the gun boats of the western powers. Since then, China had turned into the semi-colonial society and started the modernization process. Along with China was defeated by the western powers, the Christianity was brought back to China for the fourth time, but was preaching in the position of the strong culture for the very first time relying on the series of unequal treaties signed with numbers of western countries. Inevitably, the Christian
Church buildings were constructed in all over China as the demand and a result of the preaching. It was the very first formation of western traditional architecture which was introduced into China. It is the beginning of the communication and connection of western and Chinese architecture and started the modernization process of Chinese architecture. So the Christian Church buildings built in China in between 1840 and 1949 it occupies a special and very important position of Chinese architectural history.

As the traditional Chinese architectural formations are quite deep-rooted in China, all the Christian Church buildings built in China between 1840 and 1949 are more or less influenced, so they are not of typical western classic church formations but a combination of both the traditional Chinese architecture and the western classic churches. The typical western churches features have been gradually blended in with the traditional Chinese architectural characteristics. Therefore, the Christian Church buildings built in China in 1840-1949 are combinations of traditional western-Chinese architectural formations. Furthermore, because the different regions of China have their own unique local constructional formations, the Christian Church buildings built in China were mostly designed by foreign missionaries but constructed by local craftsmen; the Christian Church buildings built in each and every regions of China have have diversity as they have taken advantage of the local architectural technique and become the integrate building units of western church and local formation. Also, the wars and various events had made the period of 1840-1949 an age of turbulence, so there were only small scale of other constructive activities. The Christian Church buildings built in each regions of China in 1840-1949 were the

1 1949, is the year when the People's Republic of China was founded on the 1st of October.
crucial part of architecture in China of that period of time. The large serial research on the Christian Church buildings of each region of China composes the major part of the study of Chinese modern architectural history.

A) Definition of the Concepts

a) The definition of the time.

As China turned into semi-colonial society in 1840 along with the invasion of western powers and became a socialist country in 1949 when the People’s Republic of China was founded, this special period of time---1840-1949 is named as the modern times in China. The architecture built in that period in China is modern time architecture which connects the traditional Chinese architecture of feudal society (before 1840) and the contemporary architecture of P.R. China. This is identical with the social developing and all the architectural research on Chinese architecture follows this time definition.

b) The definition of space

Among the 23 province, 5 autonomous regions and four direct-controlled municipalities of mainland China, Shaanxi province is locating in the relative center. The north part of Shaanxi province is on the loess plateau, the central part is on the Central Plain, the south part is on Qin Mountains. It covers an area of 205,800 km². The provincial capital city is Xi’an which was the city of Chang’an in ancient China and had been the capital of the ancient China for 13 dynasties.

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2 Qin Mountains (秦岭) are a major east-west mountain range in southern Shaanxi province, China. The mountains provide a natural boundary between the North and South of the country. They support a huge variety of plant and wildlife, some of which cannot be found anywhere else on Earth.
B) Research Background

There are a lot of works and researches including different kinds of books and published articles about the traditional Chinese architecture, but very few of them were done for occidental people. A famous book could be found in the western world is the *A Pictorial History of Chinese Architecture* which was written in English to briefly explain the traditional Chinese architecture by the Chinese architect, Liang Sicheng and published after his death in the version of English-Chinese in 1984.

The architecture of the Modern Times has gradually gained more and more attention as the architecture is always the material carrier of the culture which reflects the social background and the cultural features of the certain era. The architecture the Modern Times not only shows the characteristic of the transition period, but also is the important link chain of architectural developing. So, the United Nations Educational Scientific and Cultural Organization’s World Heritage Center has paid close attention to the conservation on the architecture of 19th and 20th century. They are mentioned as a specialized type of culture heritage and are discussed in exclusive documents. Until July 2009, twenty-nine architectural heritages of 19th and 20th century have been listed as the world culture heritage. The conservation on the architecture of modern times has become the new domain and issue of the

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4 Liang Sicheng; (20 April 1901-9 January 1972) was a Chinese architect who is recognized as the “Father of Modern Chinese Architecture”.
architectural heritage restoration.

In Asia, Japan is the first country started the research on the conservation of the modern times architecture. Since the 1980s, Japan mobilized the force of whole people to do the general survey on the modern times architecture, and finished the Japanese Modern Architecture Overview which registered 15000 buildings. Then they paid attention to all the modern times architecture in Asia which promoted the research on the modern times architecture in some Asian countries, including China. The Japanese finally organized their international organization--- mAAn (Modern Asia Architecture Network).

In China, the research on the modern times architecture began in the late 1950s. Until May 1959, nineteen regions have redacted the regional history of the modern times architecture. On this base, the first draft of Brief History of Chinese Modern Architecture and the Picture Set of Chinese Modern Architectural History were published in 1961 and 1989 respectively. Later in the 1970s, due to several reasons, all the research work stopped. The recovery of the research work happed in the mid-1980s. In the following twenty years, the research and conservation on the modern times architecture in China have continuously been deepening and extending.

The research on the Christian architecture in China has not been very deep, or systematical due to some historical reasons. Especially the study on the Christian architecture of 1840-1949 is still in the preliminary stage. As the Boxer Rebellion in the early 20th century and the ten-year Culture Revolution in the 1970s have done destructive damages on the Christian Church buildings, the Christianity and Christian architecture
related document literature has also been majorly lost. Due to this reason, the research results about the Christian Church buildings in China of 1840-1949 are few, there are works: The Developing History of Christian Art in China, Architectural History of Macau, Brief History of the Four Major Christian Church Buildings in Beijing, The History and Present Statue of Main Christian Church Buildings in Shanghai and so on.

Most of the record and narrate of the Christian Church Buildings built in China in 1840-1949 are in the local chronicles; the records are simply about the year of build and the important events of the church buildings along the history. As far as I can find, there is no research did by occidental researchers on the Chinese Christian Church buildings of 1840-1949.

As the importance of modern time architecture has been realized, there are more conservation researches and related studies have been done by Chinese scholars. Being one of the most valuable parts of the Chinese modern time architecture, the Christian Church buildings are digging into region by region.

C) Significance and Objects of the Study

Among the serial of researches on the Christian Church buildings built in each region of China between 1840 and 1949, the church buildings in Shaanxi province has somehow been left. It may be the reason that Shaanxi province is locating in the inner land of China which has never been colonized during 1840-1949; and the economy was relatively less developing than the coastal cities after 1949. However, Shaanxi is the first place in record where the Christianity was introduced into China for the first time in year 635 of Tang Dynasty; it participated in each and
every developing climax of Christianity in China. Many church and facilities were built up along with the spreading of Christianity. The Christian Church buildings in Shaanxi province, is also a type of architecture that carries a culture and a period of history, they deserve more attention and protection. The research of this thesis will not only fill in the blank of the large serial research on the Christian Church buildings of each region of China, but also provide a basic yet comprehensive study material from aspects as history, developing, architecture related and present statue of the Christian church buildings in Shaanxi province built in 1840-1949 for the future conservation.

In this study, the following objects will be achieved:

a) Build a brief history of the traditional Chinese architecture as the general introduction of traditional Chinese architecture.

b) Sum up a word list of traditional Chinese architectural words in Chinese- English- Spanish.

c) Reveal the process of how the Christianity began to be introduced into China from the very first time in Tang Dynasty and the several spreading peak time along history until the modern times (1840-1949).

d) Analysis on the history of Christian architecture being introduced and developing in China, the architectural features, constructive structures and materials, and decorations of the Christian Churches built up in Shaanxi province during that period.

f) Make clear the present status of existing Christian Church buildings in
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Shaanxi province for further conservation researches and projects.

e) Compare the Christian Church buildings in cities of Shaanxi province and Beijing as example of inner land un-colonized cities, to the Christian Church buildings in Shanghai, Qingdao and Macau as example of trading ports colonized cities, in order to emphasize the characteristic of the Chinese Christian Churches of that period.

D) Research Methodology

a) Literature study: study on all the related specialized documents, works and books, internet information resources. It helps to understand the research object comprehensively and historically. The existing research results will be used as the starting point of the further study.

I looked into the urban developing and formations of seven historical cities in ancient China; the five basic traditional roof types and its practice; eleven representative types of traditional Chinese residences; and six typical Buddhist temples of traditional Chinese architectural formation by studying all the traditional Chinese architecture related books and papers that I could find to build the brief yet sufficient background of traditional Chinese architecture which would help understand the Christian Church building, as the most important architectural formation of the Chinese Modern-time architecture.

By searching the informations of religion architectures from the chorography of 92 Counties and cities, I found out that, a large number of Christian Church buildings built in between 1840-1949 in Shaanxi province were destroyed along the history; only the existing examples could not reflect the overall statue. Many historical materials have been
obtained through lots of literature studies including historical files, records, photography, local chronicles, religion related books and articles. Also, the internet information was taken full advantage of.

For more information and research materials, I also looked into the research works and articles of 72 Christian Churches in other cities of China built in 1840-1949.

b) Field survey and mapping: because there are few researches on the Christian Church buildings of Shaanxi province built in 1840-1949, we are short of the relative record or material; so in order to achieve the basic information and exact materials of the Christian Church buildings in Shaanxi, the deep field survey and mapping are necessary. I did a three-month field survey and several shorter field surveys in the three parts of Shaanxi province to visit the Christian Churches built in 1840-1949, the church staffs, and the local residents. After finding out which Christian Church buildings from 1840-1949 of Shaanxi are still existing by all the document research works, during the field surveys, I visit all the 16 existing Christian Churches in Shaanxi province built in 1840-1949 to take exterior and interior photos, the detailed measurements for drawing the plans, façades, sections and sketches. By visiting the priests and church staffs, there have unrecorded stories and valuable photos been found out.

c) Comparisons: the comparison defines differences. The horizontal comparison is made, on one hand, between the Christian Church buildings in the cities of Shaanxi province and in other four more developed or colonized coastal cities in which the Christian Churches from 1840-1949 have already been deeply researched. The cities of
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Shaanxi province and the other cities are two types of cities with different backgrounds of history, politic, economy, culture and constructional technology so the modern-time architectures in these cities which were influenced by the western architectural culture show obvious difference. On the other hand, it is made between the general features of Christian Church buildings in China and in the oriental countries. As being affected by the traditional Chinese architecture, the Christian Churches built in China are different from the western classic churches in many noticeable ways, that is to say, the Christian Churches built in China do not have the real western church formations.

The vertical comparison is made between the modern architecture of China and the traditional Chinese architecture to highlight the difference after the influence of western architectural culture. The multiple comparisons could reveal for the first time the characteristics which help us to understand more comprehensively and clearly the Christian Church buildings in Shaanxi province built in 1840-1949.
CHAPTER 1

Introduction to Chinese traditional architecture
1.1 The concept of traditional Chinese architecture

To speak from the aspect of time, the traditional Chinese architecture refers to an architectural style of distinctive feature in ancient Chinese society (before year 1840), which was formed by the constant practice and experience accumulated of working people with the influence of geographical factors, the natural environment and the social conditions. Ever since the First Opium War\(^8\) occurred in 1840, China entered the period of semi-colonial and semi-feudal society, while the Chinese architecture turned into the modern times (1840-1949) and began the process of modernization. Because China had the obvious dual socio-economic structure in its modern times, it caused the imbalance of construction development so that two architecture systems---the old and the new appeared. The old building system has been a continuation of traditional architecture. Chinese ancient architecture experienced the primitive society, slave society and feudal society these three periods before 1840 with the development in building technology, architectural art, building materials and other aspects, gradually formed a unique and mature system ultimately. Feudal society is the main stage of the formation of Chinese traditional architecture.

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\(^8\) First Opium War: It happened in June 28, 1840 - 1842 in August (Qing Dynasty). It was a war between British and China which triggered by British smuggling opium into China which was in Qing Dynasty ruled by Manchu. The fuse of the war was that the British businessmen were smuggling opium more than twenty years in the sea area of Guangdong without stop or decrease. In 1839 Lin Zexu(林则徐) enforced the implement of melt down the opium in Guangdong Province. The contradictions between China and British successively upgraded. The war ended with the failure, reparations and ceding territory of China. Therefore, the Treaty of Nanking(《南京条约》) was signed which was the first unequal treaty in the modern times of China. It claimed that besides the indemnity pay, the Hong Kong Island was permanently ceded to the United Kingdom, and the United Kingdom has the consular jurisdiction.
As for the characteristics, the architectural features always formed under the certain influence and domination of the natural environment and social conditions. China is a vast country which has multi-ethnic, the conditions of geology, topography, climate and hydrological change considerably from north to south and from east to west. In addition, the cultural traditions and living habits among ethnic groups are various and different, therefore, many distinctive architectural styles were formed. However, the traditional Chinese architecture still has several main general features.

1.2 Main characteristics of the traditional Chinese architecture

1.2.1 Wood was used as the main construction materials

In most part of China the load-bearing wooden frame architecture has been used. This kind of architecture has been widely distributed in Han Ethnic Group (汉族), Manchu (滿族), Korea Ethnic Group (朝鲜族), Hui Ethnic Group (回族), Dong Ethnic Group (侗族), Bai Ethnic Group (白族) and other areas of the Ethnic Groups. It was the type of construction which was most widely distributed and had the largest number and also was the main representative of the architectural achievements of ancient China. For thousands of years, in the imperial palaces, temples for sacrifice and royal tombs, as well as government offices, Buddhist and Taoist temples, the wooden frame architecture were so commonly used. Its wide coverage and the various geography, climate, habits in different places caused many changes and the variety, showing
colorful prosperous scene in the plane composition, appearance, and so on.

Wooden frame architecture was used as a mainstream type of construction in such a long-term and so broadly, its inherent advantages were:

(1) Easily obtained

In ancient times, a large number of dense forests distributed all over the vast land of China, including the Yellow River Basin, where had been a moist climate region covered with forests. Besides, the processing of wood is much easier, with just the use of stone tools can complete the felling, smoothing and the tenon joint (although very rough machining) processes. Then along long with the use of bronze tools and later the iron ax, saw, chisel, drill were applied, the technical level of the wooden structure was quickly improved, that helped the formation of the unique and mature architectural technology and art system.

(2) High adaptability

In a wooden frame architecture, the load of the roof and floor was bore by the frame built of columns, beams, Fāng, purlins, and other components, so as to the wind and seismic force. The walls were not load-bearing but only for the enclosure, space separation and column stabilizing. As the saying among people says, “when the walls collapsed, the house stands still”. The interiors can be freely separated into small spaces, as well as windows and doors can also be opened at will. In a word, it has high flexibility and adaptability.

(3) The relatively good seismic performance
The composition of the wood frame uses the tenon joint (see Figure 1-3-1) combination, with the inherently flexible of wood and the certain degree of activities that the tenon joint nodes may have, the entire wooden structure have great potential for the abatement of the destruction from seismic forces. There are some famous wooden frame architecture survived from major earthquake, such as The Guanyin Pavlion (观音阁) in Temple of Solitary Joy (独乐寺) in Ji District (蓟县) and The pagoda of Fogong Temple in Ying District, Shanxi Province (山西应县佛宫寺释迦塔) (both from Liao Dynasty (907-1125), standing for about thousand years since built) can be well preserved, provided a strong proof.

(4) The high speed of construction

The wood processing is faster than the stone machining, besides ever since Tang and Song Dynasties a system similar to today's building modulus method has been used, the types of the wooden frame has been finalized, so various wood components could be processed at the same time then made combination and assembled after. Some ancient churches of Europe took over than a hundred years to build, while the construction of massive palaces of the Beijing Forbidden City, from preparation to completion took only a few more than ten years.

(5) The facility of repair and relocation

The tenon joint node is detachable, so the replace of some components or the disassembly and relocate of the whole house are relatively easy to be realized.

Due to these advantages of the wooden frame architecture, the needs
of architecture of ancient society had no qualitative leap so that the wood supply could still meet the needs, besides the shackle of traditional ideas and no strong external shocks, the wooden frame architecture have had been firmly occupy the mainstream of Chinese architecture until the end of the 19th century to the beginning of the 20th century.

However, wooden frame architecture also has some fundamental flaws:

First, the wood is getting scarce. Ever since the Song Dynasty, it became short of the large amount of wood for the palace construction. That was why that in Yingzao Fashi⁹ (Treatise on Architectural Methods 营造法式), a series of provision to economize was made, like a piece of wood in large or long size is not allowed to be cut into small or short pieces. The columns can be combined up by small and short piece of wood. In Ming Dynasty, when the construction of the Forbidden City in Beijing was processing, the wood had to be transported from the far-away provinces in southwest and southern as Sichuan, Hunan, Hubei, Jiangxi and other places. The large scale of cut off forests made the ecological environment in China deteriorating, as well as losing the prerequisite for the development of the wooden frame architecture.

Second, the wooden frame architecture prone to fire. Such as the three main halls of the Forbidden City in Beijing which were built in Ming Dynasty, was struck by lightning and burned down on the second year of use. In all parts of the country, the records of burned down houses due to fire disaster never stopped. In the south, there are serious threats

⁹ Yingzao Fashi (Treatise on Architectural Methods 营造法式) was the most complete ancient architectural technical book, written by Li Jie(李诫).
on a wooden frame building caused by termites. When the wood gets moisture, its easy corruptible is also a big disadvantage.

Again, no matter it is the Chuan Dou System (穿斗式) or the Tai Liang System (抬梁式), they were both difficult to meet the larger and more complex space requirements. Besides the huge timber consumption limited the prospects of its continuous development.

Therefore, after the beginning of the 20th century, when appeared the new construction needs, building materials and new structure theory, traditional wooden frame construction has finally become a gradually replaced architecture system.

1.2.2 Maintain the framework principles and the spatial arrangement is flexible

The structural system of Chinese wood frame architecture has two main systems: Chuan Dou System (穿斗式) and Tai Liang System (抬梁式). In addition, there are many variant practices.

(1) the characteristic of Chuan Dou System (穿斗式) is: columns are connected together by Chuān Fǎng (穿枋) into series of frames. The purlins (檩 Lǐn) are situated on the column caps directly. On the horizontal direction of purlins, again, the columns are combined by Dǒu Fǎng (斗枋), in this way, forming up an overall framework. This type of wooden frame was widely used in Jiangxi, Hunan, Sichuan and other southern regions. (Figure 1-2-1)
(2) the characteristic of Tai Liang System (抬梁式) is that to place the beams on the columns and then the shorter beams are supported by shorter columns over the bottom beams, and stacked-up on like this. When dǒu gǒng (斗拱, bracket set) is used on top of columns, the beam is situated on dǒu gǒng (斗拱, bracket set). This kind of wooden frame was mostly used in the northern region and for palaces, temples, and other larger constructions. (Figure 1-2-2)

Comparatively, Chuan Dou System (穿斗式) requires smaller piece of wood and forms strong integrity. But the columns are arranged closely
so it only can be used when the indoor spatial scales are relatively small. The large span beam can be used in Tai Liang System (抬梁式), to reduce the quantity of columns and obtain a larger indoor space, so it is more suitable for palaces, temples and other larger buildings. Therefore, in some of the temples and halls in the south, these two main types of wooden frames were usually mixed for using. In either of these structural systems, the loads roofs, floors, winds, and seismic forces are bore by columns, beams, Fāng (枋), purlins, and other component. The walls are not load-bearing, only play the role of enclosing, separating and stabilizing columns. The internal space could be separated freely; windows and doors can also be arbitrarily set up. It has high flexibility and adaptability, the saying like “when the walls collapsed, the house stands still” was so well known.

The northern China has cold climate, in order to keep warm, the walls of the building are relatively thicker. The insulation layer is set on the roof (generally the insulation layer constitutes by soil and lime), and with the considerations of snow load, so the wooden materials used for the rafter, purlin and Fāng (枋) are large. The exterior of the building also appears vigorous and dignified. Conversely, due to the hot climate and abundant rainfall in southern China, the issues of ventilation, sun-shading and rain-proof are more important, so thin walls (or using only wood board or bamboo fence); light roofs and large eaves are mostly used. The architectural appearance is also lightweight.

1.2.3 Use of bracket set (斗栱 dǒu gōng)

The bracket set (斗栱 dǒu gōng) is a specific structural member of Chinese wooden frame construction, whose function is outstretching
cantilever from columns to support weight of the hanging eaves. The hanging eaves of ancient palaces could be up to 3 meters, the stability of the eaves would be difficult to maintain if there was no support from bracket set (斗栱 dòu gōng). Until Tang and Song Dynasty, the structure role of bracket set had been very obvious which built up by large pieces of wood and not in dense arranged. Since Ming Dynasty the decorative role of bracket set was strengthened. The wooden materials became smaller and they were arranged in dense. To see from distance, the bracket sets looked like a row of carved jewelry under the eaves. But its structural role has not yet lost.

The bracket set was also called Pū Zuò(铺作) in Song Dynasty, which means it was formed stacked layers. In Qing Dynasty it was called Dōu Gōng (斗栱 bracket set) and it was named Pái Kē(牌科) in the south. The bracket sets under the eaves have different specific names because of their different positions, meanwhile they played different roles. The bracket sets placed on top of columns are the main bodies for supporting the weight of eaves; the ones placed between two columns on the Fǎng (枋), play a secondary supporting role. The bracket set on the columns which stand on four angles are supporting the angles of the roof, and are also main structural components. The indoor bracket sets usually only support the weight of the ceiling or as the connection of the beams. Its structural role is clearly not as obvious as the bracket sets under eaves. (Figure 1-2-3)
The main components of a bracket set (Dou Gong 斗拱) are: Gong(拱), Qiao(翘), Ang(昂), and Dou (斗). This way:
Gǒng(栱): The component which shaped like a bow, and parallel to the surfaces of a building is called Gǒng(栱). There are mortise in the middle of Gǒng(栱) to undertake Qiào(翘) and Áng(昂) which goes intersect with it. Gǒng(栱) has both ends bent up like a bow (Figure 1-2-4).

Qiào(翘): It is arched wood which is vertical to the building surface, and therefore is vertical to Gǒng(栱). Qiào(翘) has the same form and function as Gǒng(栱), only in the perpendicular direction to Gǒng(栱). The Qiào(翘) in the bottom stretches out least, but increases layer by layer as stack-up. In Yingzao Fashi (Treatise on Architectural Methods 营造法式), Qiào(翘) was named as Huá Gǒng(华栱) regardless of the length.

Áng(昂): the bracket set stretch out forward and backward from the center line, the ramp wooden component with sharp in front is called Áng(昂). It has the same function as Qiào(翘) but in a different form.

Dōu (斗): The load-bearing square pieces of wood in a bracket set which supporting the weight from in both directions, is the supporting seat of Gǒng(栱), Qiào(翘), and Áng(昂). They have mortises in cross shape. The one in the bottom of the whole bracket set, supporting the whole weight is called Zuò Dōu (坐斗) (Figure 1-2-5).

10 Gǒng(栱): the name of Gǒng(栱) differs as the position changes.
11 Zuò: sit.
1.2.4 Roof

The roofs of ancient Chinese architecture are ever-changing, magnificent and beautiful. They not only increase a lot of charm for Chinese ancient buildings in the aesthetic aspect, but also play a very important role in the style of the building. In feudal society, there were many hierarchical establishments of roof shape and its decoration. The form and the height of the roof, the size, number, color of the ridge decoration should all be constructed based on the level of the building, no exceed allowed. As the most important part of the ancient architectural modeling, the roof generally showed a curve and was composed by beams of different structure forms. Important architecture outstretches the eaves by bracket sets and formed raising in the eave corners. There are five basic forms of roof: hipped roof (庑殿顶), gable-and-hipped roof (歇山顶), overhanging-gable roof (悬山顶), flush-gable roof (硬山顶) and pyramidal roof (攒尖顶). According to their individual shape characters, they are used in different occasions. Such as the hipped roof (庑殿顶) has very grand style and is used for main hall on the central axis of high level buildings. The gable and hipped roof (歇山顶) has gorgeous and vivacious personality so it is generally used for side hall; pyramidal roof (攒尖顶) is mostly used for kiosks and tower; flush gable roof (硬山顶) is often used for residential.
Roof types

a) hipped roof (庑殿顶)

The hipped roof has four slopes; one top ridge and four side ridges, besides, the four slopes are curved, so it is also called Si’a roof (四阿顶) in Song Dynasty and the building with hipped roof is named five-ridge hall (五脊殿) as well. The hipped roof is the highest level of roof style in the ancient architecture. Normally it was used in royal palace, in the most important hall in temples. In very grand occasion, the double-eave hipped roof would be used (Figure 1-2-6, 1-2-7, 1-2-8).

Figure 1-2-6 hipped roof and double-eave hipped roof (Drawn by HuangShan)

Figure 1-2-7, 1-2-8 photos of hipped roof and double-eave hipped roof (taken by Huangshan)
b) gable-and-hipped roof (歇山顶)

The gable-and-hipped roof is just under the level of hipped roof (Figure 1-2-9, 1-2-10). It is composed by the top ridge, four side ridges and four Qiang ridges (戗脊). So sometimes the building with gable-and-hipped roof is called nine-ridge hall (九脊殿). The gable-and-hipped roof is commonly used in the second important buildings in the palace and residence or garden. There are double-eave gable-and-hipped roof too (Figure 1-2-11). Also, the gable-and-hipped roof without the top ridge is frequently used and called round-ridge gable-and-hipped roof (卷棚歇山)(Figure 1-2-12, 1-2-13).

Figure 1-2-9 gable-and-hipped roof (Drawn by HuangShan)
Figure 1-2-10 photo of gable-and-hipped roof (Taken by HuangShan)

Figure 1-2-11 photo of double-eave gable-and-hipped roof, Tiananmen (From http://bbs.zhulong.com/101010_group_676/detail7586181)
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Figure 1-2-12 round-ridge gable-and-hipped roof (Drawn by HuangShan)
Figure 1-2-13 photo of round-ridge gable-and-hipped roof
(From:http://hugng1217.blog.163.com/blog/static/12251476201011311516801)

c) **overhanging-gable roof** (悬山顶)

The overhanging-gable roof belongs to two-slope roof (Figure 1-2-14, 1-2-15). It is leveled second only under the gable-and-hipped roof and is the most common roof style appears in the ordinary buildings like residences. Its characteristic is that the eave is overhanging out of the gable. There is one top ridge and four side ridges. The type without the top ridge could also be seen (Figure 1-2-16). The pillar, beam and Fāng are usually showed off at the edge of gable.

Figure 1-2-14 overhanging-gable roof (Drawn by HuangShan)
Figure 1-2-15 photo of overhanging-gable roof
(From:http://mooc.chaoxing.com/nodedetailcontroller/visitnodet...knowledgeId=354066)
Figure 1-2-16 photo of overhanging-gable roof without the top ridge
(From:http://zh.wikipedia.org/wiki/xuanshanding)
d) flush-gable roof (硬山顶)

The flush-gable roof (Figure 1-2-17, 1-2-18) belongs to two-slope roof, too, but without overhanging the eaves out of the gable. The gable is mostly built by bricks and is higher than the roofing. It appeared as early as in the Song Dynasty (960-1279), and its appearance maybe because of mass-produce of bricks. Since Ming and Qing Dynasty (1368-1642, 1644-1911) when bricks became large produced in both the southern and the northern part of China, this type of roof has been widely used.

![Figure 1-2-17 flush-gable roof (Drawn by HuangShan)](http://mrspai.pixnet.net/blog/post/37709110-no.18)

e) pyramidal roof (攒尖顶)

The pyramidal roof could be used in the buildings which are not very large, such as towers, kiosks and pavilions. The characteristic is that the roofing is that the slope roofing is steeper. There is no top ridge but the vertical ridges combined in the top point. There are plan of rectangular, triangular, round, pentagon, hexangular, octagon and dodecagon (Figure 1-2-19). Normally it is single-eave except the towers and in royal architectures (Figure 1-2-20).
Figure 1-2-19 round, triangular, rectangular and hexangular pyramidal roof (Drawn by HuangShan)

Figure 1-2-20 photos of round, triangular, rectangular, octagon and dodecagon pyramidal roofs (From: http://zh.wikipedia.org/wiki/攒尖顶)

The Practices of Roof

a. The curve of the roof

It includes the curve of roof eave, the curve of roof ridge and the roof curve of the architecture.
1) The curve of the roof eave

The curved roof eave and upturned roof corner cannot be seen in the stone buildings and funerary objects of Han Dynasty (202BC-220). But as no wooden building from Han Dynasty was preserved until today, it is hard say if the roof eave was totally flat or not in Han Dynasty. The architecture in Northern Wei Dynasty (386-534) had the upturned roof corner, but the roof eave was still straight. (for example, the Ning Mao Room (宁懋室, year 529). The roof eave of main hall of Mount Wutai Temple of Buddhist Light (五台山佛光寺大殿, year 857) of Tang Dynasty (618-907) has very obvious curve. In Song Dynasty, the eave columns were lifted from the middle bay to the ends, so the eave showed lenitive curve. It was precisely explained in Yingzao Fashi (Treatise on Architectural Methods 营造法式) of Song Dynasty (960-1279). Since Yuan Dynasty the roof eave became flat again, even the roof corner was not upturned until the end of Yuan Dynasty and this formation was remained in Ming and Qing Dynasty (1368-1644, 1644-1911).

The curve of the roof eave is formed by the gradually raising of eave columns from the ones in the middle to the ones on both sides. In order to upturn the eave corners, a certain type of wooden block is put under the purlins on the eave corners.

2) The roof curve

It includes the vertical curves and horizontal curves. The earliest literal records of the roof curve appeared in Han Dynasty, which indicates that the roof of Chinese building had shown a horizontal curve in very early time. The curved roof was first seen in the main hall of Nanchan Temple (南禅寺大殿) which is a wooden architecture of Tang Dynasty.
However, as the raising of roof truss is relatively low, the curve is gentle. Since Song Dynasty the height of the roof truss was raised increased and became higher in the Ming and Qing Dynasties, so the curve became steeper along the depth direction of the architecture. (Figure 1-2-21).

The curve of the roof along the depth direction of the architecture is caused by Ju (举 jǔ, the raising of ridge purlin) and Zhe (折 Zhé, the falling of the rafter). The elevated height is called the JuGao (JuGao=H, 举高 jǔgāo, the raising height). The curve of the roof is formed like this: draw a straight line (line 1) between the ridge purlin (P0) and the eave purlin (撩檐枋), the first purlin (P1) under the ridge purlin (P0) should be 1/10H below this straight line (line 1). We draw another line (line 2) from this purlin (P1) to the eave purlin, the position of the second purlin (P2) under the ridge purlin should be 1/20H below the line 2. Just like this, the height reduces of each purlin decreases by half, and these points of purlins are joined by straight lines to form the roof curve. This method was called “bend the roof”.

![Diagram of roof curve formation](image-url)
In the Song Dynasty architecture, because the purlin at the both ends of the façade would be blocked up, so the roof also tilted up at the ends in accordance with the width direction. It combined the roof curve formed by Ju in the depth direction and made the roof slightly in shape of hyperboloid. This practice was rarely seen in the construction of the Ming and Qing Dynasties.

The formation of the roof curve not only good for the rain drain, but also gained more sunshine for the interior, in addition, the appearance of the roof become more gentle and beautiful.

3) The curve of the roof ridge

In stone building and the funerary objects of Han Dynasty, the roof ridge had slightly unturned. The roof ridge purlin of would be blocked up at the both ends in Tang, Song and Yuan Dynasties, so the main ridge was upturned more vividly. However, in Ming and Qing Dynasties, the roof ridge returned to be straight.

b. The corner of the roof

The architecture of Han Dynasty had no warped roof corner image. The stone relief of North Wei (386-534) unearthed in Luoyang, Henan Province showed that the roof corner of stone tower have been significantly warped. The roof corner would be warped had become an established role in Tang and Song buildings which was well kept until the end of feudal society.

In general, the architecture in northern China had relatively flat warped
roof corner, which has the sedate appearance. While in the south the roof corner was warped steeply, so it showed a more lively appearance. However, the warped roof corner has different practices, such as just in the region of Suzhou (苏州), there are Shuiqiang warped (水戗发戗) and the Nenqiang warped (嫩戗发戗) two practices(Figure 1-2-22). The Shuiqiang warped (水戗发戗) is characterized by flat cornice with hardly warped corner, only the hip is warped up towards near the roof corner. The characteristics of Nenqiang warped (嫩戗发戗) is the eave would be significantly upturned at the roof corner, the cornice is very warped at the corner of the building.

![Figure 1-2-22: elevation of Shuiqiang warped and the Nenqiang warped (From Chinese Architecture History)](image)

**c. The roofing materials**

The non-governmental architecture commonly used thatch, mud, tables of stone and small clay tile for roofing materials. The official architecture used pottery tile, plain tile or glazed tile. In Tang Dynasty, there were roofs built by two materials, which was also showed in Song Dynasty painting. Generally higher ranking materials were used for ridges, eaves and side edges; the lower level materials were set in the middle. A few architectures used copper or iron as tile, or oil-soaked and paint the pottery tile.
Wood used in roof structures

1) Material selection

Most of Chinese ancient buildings had wood as the load-bearing structure which is the wooden structure. The roof structure is composed all by wooden components except the tiles and roof ridge decoration. The types of wood used for various constructions in different areas were distinct; although in the same construction, there would be more than one type of wood used for the variety parts. The feature of decay and attack of insects of wood are closely related to the type of the wood. The different woods have their own natural durability, so the useful life (durable life) will not be the same. Therefore, to understand the type of wood and its durability is very important in selection.

The major wood species used in Chinese ancient buildings, are Phoebe zhennan (楠木)\textsuperscript{12}, pine wood, Chinese fir (杉木), poplar wood and teakwood; Some individual building components take use of cedar and sandalwood. The columns, large beams mostly were built by Phoebe zhennan, pine wood, spruce; the rafters and purlins were mostly constructed by spruce, and some carved wood components (like flying rafters\textsuperscript{13}) make use of hardwood pine. Take the construction of the Imperial Palace of Ming and Qing Dynasties in Beijing---the forbidden city as example, the wood craftsman had very careful consideration in choosing the wood species, such as the Phoebe zhennan, Northeast pine, teak were apply for columns, beams structures were built up by Phoebe zhengnan, yew and yellow pine; The rafters and the roof boarding were mostly built by Chinese fir, corner

\textsuperscript{12} Phoebe zhennan (楠木) is a large species of tree up to 30 meters (98 ft) tall in the Lauracea family. Zhennan was originally a Chinese word that related to its Chinese name 楠(Nan).

\textsuperscript{13} Flying rafter is the rafter under the eave edge.
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beams and windowsills were mostly camphor wood, the wood pile under the ridge decoration and the easy-moist components always used cedar.

2) Tools and methods

The woods that were commonly used in ancient buildings typically were logs, sawn piece of board and square lumber (板方材) and other shape components. The ancient architecture construction paid particular attention on the economically rational use of wood, that the long wood mast not be used in short and the excellent timber should not be used in less important parts.

Ever since Sui and Tang dynasties, the wood practice in construction has formed a clear lumber system in China, the method of "sawing lumber" had already been used which was similar with the log frame saw in the modern principal wood breaking solution. However, the invention of log frame saw was relatively late in China; it happened about in the late Northern and Southern dynasties and lasted until the end of Sui Dynasty. Before Northern and Southern Dynasties, from the Iron Age to the Neolithic such a long early time, the Chinese major wood breaking tools was stone wedge in primitive society, which was similar with the wedge tools to breaking masonry used today, and known as the "鈎". The other differentiation as "Juan" was accommodated for processing different sizes of wood to associate with it. The operating techniques also rely on splitting.

To break the wood by stone wedges which is also called “splitting

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14 board and square lumber (板方材) is the common name of pieces of board and squared shaped limber sawn longitudinally from original wood.
technique" is roughly like this: drawn a to-be-cut line along the vertical wood fiber on the original wood, beat paralleled in the blade of a number of stone wedge separated a certain distance along the vertical to-be-cut line; because the stone wedges have thin blades and thick tops, there will be a short split on both sides of the stone wedge along the vertical wood fiber direction. The splits made by each wedge will be connect up with the wedges being beat deeper and expanded in depth; Then do the same procedure in the opposite, so that the split on diameter gradually connected up, which eventually will break a log in to two (Figure 1-2-23). The most fundamental principle is taking the use of laminate law of wood itself and the feature of weak connection of fibers on vertical and radial direction. It also is the difference from sawing wood.

![Diagram](image)

Figure 1-2-23: diagrammatic sketch of split an original log by stone wedge (Drawn by Huangshan)

The purpose of breaking the logs is to create board and square lumber. But it should be emphasized that, not all logs are required split. Produce the square lumber from small round log is special, directly chop into the maximum inscribed quadrilateral of the cross-sectional circle, or cut chop according to the design requirements will be enough; no split process is needed. The larger original log, if the required square lumber is relatively close to the section of the log, then the amount of chopping
is not a lot, so it will be processed by this method. However, when the required square or board lumbers are different distantly from the original logs, the split process must be taken. The medium logs can be chopped into lumber that has nearly square cross-section, and then split it along the midline with stone wedges; or first split the original log into two, and then chop the semicircular wood into largest inscribed rectangle. The lumbers made by the methods have the cross section of height-thickness ratio close to 2:1, and were only split once (Figure 1-2-24). But the large logs must go through several times of split before getting ready to be used.

![Diagram of splitting and chopping processes](image)

Figure 1-2-24: diagrammatic sketch of split and chop processes. (Drawn by HuangShan)

The “split and chop technique” which was used since late Neolithic has been used in a long time until the new tools for breaking the wood was invented. About in the late Northern and Southern Dynasties, saw became to have a certain amount of wood breaking function. Although there is no Tang architectural instance is remained, but the
unearthed coffin board of Tang Dynasty and later, the thickness was significantly thinned compared with the Han era and before. The height-to-thickness ratio had thoroughly broken the approximately 1:1 and 2:1 limits of the early lumbers, which proved to be made with a saw. Thus the large frame saw was asserted to be used no later than the early Tang Dynasty (mid-7th century) in China. The use of large frame saws, not only ensured the rational usage of logs, but also ensured a certain flatness of the machined surface.

After the invention of the large frame saws, a revolutionary change occurred in the wood breaking technology --- from “split and chop” to “saw”, which affects all aspects of ancient wood processing technology, and even affect the constructive technology as well as the architectural art, such as the lumber size of ancient constructions, the cross section ratio and processing fine degree.

Therefore most of the early construction lumber were large, should be the result of less developed technology. In the initial time of frame saw’s invention, the sizes of the components were mostly processed following the old traditions. But with the use of frame saws, lumber making technology has also undergone a corresponding revolution, and its role has become more significant. It significantly increased the processing capacity of large amount of the same sized and the variable lumbers, which not only improved the processing efficiency, but also improved the utilization of original logs. We can say that in a certain extent, the large frame saw provided the technical premise of this change.

In short, the advance of wood processing technology and the existing era are corresponding to each other, and show different values at different times. From the stone axes and wedges used by people in
Neolithic to cut logs and obtain lumber, using stone axes, adzes, chisels to process tenon-mortise; and stone flat shovel smooth timber, through the Bronze Age, when people made the, adzes, axes, shovels, Cha, chisels, drills, saws, knives and other tools by bronze which made the lumber processing like cutting, smoothing, perforation, carving improved, the quality of lumbers became more delicate. Until in the Iron Age, the appearance of iron has greatly improved the wood processing technology and quality, accelerated the processing speed, so the size became more accurate, and the carving became more exquisite.

3) Tenon-mortise

Chinese classical wooden architecture commonly used tenon-mortise (榫卯) joins among the various components. For example, the roof construction process is first fix the purlins onto short columns on the beam or directly on the lintel which is always sitting on the beam; and then placed rafters and roof boarding on purlins, followed by painting guard grout to smooth the rough leveling of the roof boarding, then coated the waterproof layer made by the mixing of gray lime and lime. (Figure 1-2-25) The final process is sequentially stacked the tiles. In this procedure, except the roof boarding are nailed on rafters as well as the rafters are nailed on purlins , the purlins and beams, the two roof-boarding\(^\text{15}\) are connected by tenon-mortise.

\(^{15}\) The roof boarding is generally spread between every two rafters and the width should be the distance from the middle of two rafters, and are connected by the Qikou tenon-mortise (tongue and groove joints).
While these several connections by nails are almost the only non-tenon-mortise connections in the entire building. Between beams, between roof structure and the lower support structure, and the components inside of the bracket sets are all connected by tenon-mortise. This combination approach achieved the complementary of gentle and firm on each node of the architecture and has better effect on offset the horizontal thrust. There are a variety of ingenious and reasonable structure tenon-mortise styles developed by ancient working people in long-term practice. The tenon-mortise of Warring States period (476BC-221BC) has been found, although was used for coffin boarding connection, they can prove that the tenon-mortise structure had been very mature at that time (Figure 1-2-26).
In the Tang and Song Dynasties, the tenon-mortise used in construction became more skillful and exquisite. This period is the peak stage of technological developing on wooden tenon-mortise. In the architecture of Ming and Qing Dynasties, the tenon-mortise was greatly simplified in construction compared to the former eras, but the inherent function has been retained.

There are many different types and shapes of wooden tenon-mortise. These formations were formed not only directly related to the function, but also related to the location of the components; the angle and mode of combination; as well as the sequence and method of installation. According to the function of tenon-mortise, it can be roughly divided into several categories (Figure 1-2-27): A) pin tenon-mortise to fix vertical member; B) bread tenon-mortise for connecting the columns with the beams horizontally; C) Dovetail tenon-mortise for several components joint in one point, which cannot be pull out or install from lateral direction; D) Hasp tenon-mortis which is used for connecting horizontal components in two directions. Each of these has various modes and there are still other types of tenon-mortise in practice.
Among a series of wooden construction technology invented by ancient Chinese people, the more prominent is the prefabricated building technology and lifting techniques. However, the modulus system created the premise for prefabricated wood components. Accordingly, people can pre-male the cell components (columns, beams, purlins, etc.) and composite members (bracket sets (斗栱), beam frams, etc.), and mount orderly in construction. The wooden prefabrication favored the quality assurance and short the construction period, also is beneficial to diving and remodeling and reducing waste. The ancient Chinese modulus system --- Cai Fen system (材分制度), has been explained detailed and systematically in the Song Dynasty architecture book " Yingzao Fashi (Treatise on Architectural Methods 营造法式). In the book Engineering Detail Practices of Qing Dynasty also explained a modulus system based on Cai Fen system and it was rather
similar except slight differences.

In Yingzao Fashi, the Cai Fen system of the components such as bracket sets, beams and columns had been set. Cai is divided into 8 specifications. Which level of Cai fen system would be used in a building depends on the type of the building and what level it has. Once the level of Cai fen system for the construction is determined, the size of all the components would be complied with it.

The height of each Cai is divided into 15 equal parts, each one is called Fen (Figure 1-2-28). The width of the each Cai is 10 Fen. When one component is placed upon another component, it is custom to fill the gap with a block 6 Fen in height, called Qi (契). The component measures 1 Cai and 1 Qi is called 1 Full Cai (足材). The building’s height, depth, the dimensions of every components used in the building, the rise and curve of the roof line, in short, all measurements in the building is to be measured in Fen of the specification of Cai is used.

![Figure 1-2-28: the Cai Fen System from Yingzao Fashi (Drawn by HuangShan)](image)

For example, In Yingzao Fashi, the components of bracket set is divided into 8 levels according to the level of the construction:
First Cai: 9-inch (1 inch=3.1cm) high, 6-inch wide, for 11 bay palace;  
Second Cai: 8.25 inches high, 5.5 inches wide, for five or seven bay palace;  
Third Cai: 7.5-inch high, 5-inch wide, for 3 or 5 bay palace or 7 bay hall...

5) Decay and insect proof

In addition to the flammability, wood is a kind of perishable and easy attacked insects building material. In order to make the building lasts longer and be stronger, the ancient people mainly took preservative measures like: 1, Material control. (a) Select the appropriate types of trees, such as fir, which will not go bad when it was buried and can avoid insects; the old cedar wood can last for really a long time. Just like the Forbidden City in Beijing, used Chinese fir as purlins, rafters and roof boarding and used cedar in the moist part. (b) Select the appropriate harvesting seasons. It was recorded in Book of Etiquette in Spring and Autumn Period that in midwinter when the days are short is good for lumbering. And there are old saying that the lumber should not be obtain from January to the end of summer, or silverfish must live alive. 2, Humidity control. (a) Ventilation and dehumidification. Earlier than Han Dynasty there were practice of setting the gable ventilation holes, eaves vents, wood floor vents and exposed the wooden columns in the earth and brick walls, to facilitate ventilation. (b) Obstruct the moisture. For the wooden components that direct contact with the atmosphere, generally applied a layer of tung oil for blocking; for wood members in contact with soil, there were approaches using lime and charcoal as partition. 3, Bacterial control. (a) Pharmacy Act. Such as recorded from North Wei Dynasty that drilled a big hole at the root of pine, poured pounds of tung oil into the hole, let it penetrate, and the
wood would not be bored through. (b) Dipping method. Since Jin Dynasty, there were practices of dipping the lumber into tung oil, or lime, salt water, alum water for antisepsis. (3) Smoking method. Some of the ancients would place the building timber in a pit and smoked with bran and sawdust. All these can inhibit the bacteria growth.

For the insect prevention treatment, the ancient people seal the exposed wood with a layer of mortar or lacquer coating which formed the tight protective layer on the surface, so that termites cannot seam into. Or tung oil soaking and cooking methods such as green vitriol solution, impregnation of wood to prevent termite infestation.

After the wood components has been built up, for further antisepsis and moisture proof, usually a layer of coating mixed with fermented animal blood, tung oil, flour and brick dust will be spread over the surface of wood components. This layer of coating is called Dizhang (地仗), mostly in black or vermeil. Later, people began to pay attention to the color arrange of the coating, and then the color became complex and rich with gradual evolution. Furthermore, a clear division of labor appeared between the coating layer and the painting layer, and then the coating and decorative painting have had strait classification as Chinese architecture.

6) Protection and restoration

About the restoration of ancient buildings, as the beam frames are the main structural elements of the ancient buildings, if the building framework has the basic integrity, only individual beams or columns were rotten and lost the carrying capacity, when replacing a new component, it can be processed in this way: if swap columns, first
reduce the load on the beams. Then prop up the beams, bracket sets and other components on the column with a jack and prop rods. Finally, slowly lifted the beam and other components and remove the bad column, and then put on the new pre-made column and placed back the beams and other components while making the tenon-mortise fit.

About the flying rafter, roof boarding, eave edging and tiles of roof structure, if the flying rafters have tiny cracks and decay, they can be continued to use. But if the rafter is too decayed to support the tiles on eave or the decay depth is deeper than $2/5$ of diameter or the crack depth is deeper than $1/2$ of diameter, it should be replaced. Each flying rafter on the corner has different length and oblique angle, so it should be re-made according to the location individually when replacement is needed. As the eave edging and tiles is placed on the end of the flying rafters, they decay easily, so they need to be replaced completely often. The style and section size should always be according to the original system. The roof boarding usually has the thickness of $0.2$ to $0.3$ cm and is tend to decay; the replacement could be done after taking off the tiles in order. The tiles would be placed back as they were when the replacement of roof boarding is finished.

**Tiles**

a. Pottery tile

The archaeological data showed that the pottery tile of West Zhou Dynasty (11th century BC-771 BC) unearthed from Feng Chu Village, Qishan District, Shaanxi Province (陕西岐山县风雏村), was the earliest pottery tile. However, it was large shaped and few in number, so maybe it was used only for the thatched roof ridges and gutters. In addition, the
tiles of late West Zhou Dynasty were also founded in Luoyang (洛阳) and Xi’an (西安). There were already tilings, look-up tiles and ridge tiles three formations, and tile rings or tile nails. The imbrex already had semicircle eave tile and had ornamentation. By the time of the Warring States period, the tile ornamentation became more exquisite.

Probably from Qin Dynasty (221BC-207BC), the eave tiles evolved from semicircle into circle which not only improved the water restrict function, but also provided the conditions for further abundant of decorative patterns of the eave tiles. The eave tiles of Qin and Han Dynasties had an extremely wide variety of patterns, geometric patterns, animals and plants, four deities, texts (auspicious words, palace or official signature). Since Northern and Southern Dynasty (420-589), China was influenced by Buddhism, a lot of lotus and bestial heads were used, so as in Tang Dynasty. The literal eave tile had been rarely used at that time. By the time of Song Dynasty, it increased the pattern of dragon and phoenix, other flowers and plants.

The cornice dripping tiles placed at cornice were not existed until the Warring States Period. There were several shapes of cornice dripping tile like banding pattern, tooth shaped and pointed dripping. These types are still in use today. The surface of the pointed dripping was decorated with a variety of animal and plant patterns or geometry.

The tile of early West Zhou Dynasty has tile columns and tile ring on the surface and bottom of the tile, probably these were used to tie the rope or fix into the mud cushion in the roof. Some of the tiles had small holes to be inserted tile nails. This practice has become a custom in the imbrex roofs.
b. Glazed tile

Coated the clay with a layer of glaze, which could form a solid and bright cover layer on the surface of the tile after being firing, both improved the water resistance and increased the aesthetics. It was generally used in higher level buildings.

The funerary objects from Han Dynasty had already been painted yellow-green glaze. The glazed tile was formally used in roofing since Southern and Northern Dynasties, but there were only a few. The glazed tile was widely used in Song Dynasty and had a climax in Ming Dynasty.

From the glazed tower in Youguo temple (佑国寺琉璃塔) of Song Dynasty and the famous Tang Sancai (唐三彩) we can tell that the glazed tile in Tang and Song had more than , Kaifeng Temple yellow and green these tow colors. In Yuan Dynasty, the palace applied white and blue glazed tiles. In Ming and Qing Dynasty there were pink, black, dark reddish brown and other colors.
The roof ridge and roof decoration

In the construction of early Zhou Dynasty, the grass roof ridge was only covered by clay tiles, which was mainly for the waterproof function, while the decoration was of secondary importance. The portrait stone and funerary objects of Han Dynasty show some the roof ridge of that time was straight and others were two-terminal uplifted. Multiple pieces of simple tiles were often piled up on the two terminal of the roof ridge. There was vermillion bird or phoenix in the middle of the roof ridge as decoration. Some patterns were engraved on the side of the ridge.

The official records of Chī Wěi (鸱尾) on the two terminals of roof ridge was first seen West Han Dynasty (202BC-9). The Chī Wěi (鸱尾) we founded from the tomb of Emperor Li Shiming (李世民 who was on the throne from 627 to 649) of Tang Dynasty is about 1.5 meters in height, 0.76 meter in thick and the maximum width is of 1 meter. And it was coated with green glaze.

The early Chī Wěi (鸱尾) had relatively simple shape and decoration. The tip of the tail extended inward tilt, there were fin-like ornamentation on the outside (Figure). From the middle of Tang Dynasty, open mouth bestial head appeared under Chī Wěi (鸱尾) and the tail gradually transferred to fishtail. In Song Dynasty, it was divided into several forms of Chī Wěi (鸱尾), dragon tail and bestial head. Yuan Dynasty Chī Wěi (鸱尾) gradually curled outward, and some have been renamed as Chī Wěn (鸱吻). In Ming and Qing Dynasty, Chī Wěi (鸱尾) has been completely curled outward, the tail became curled from bifurcation, and there were small dragons carved.
1.2.5 Single building’s standardization

The single building of traditional Chinese architecture is simple, real and organic; By simple, it mainly refers to the plan being constituted by “Jian” (间) which is the space between two frames (房架, each frame is formed by two pillars and the beam), so the plan-outline and the structure arrangement of the whole architecture is quite simple and obvious. The most common plan type of a single building is a rectangular composed by 3, 5, 7, 9 “Jian” (间 bay). By real, it means the display of the real wooden structure. Normally the beam system, pillars, bracket sets and all other wooden structure are totally exposed. By organic, it means that the inner space could be divided and arranged flexibly to meet the different requirements of functions. The other characteristic of the Chinese ancient single building is that the plan, the structure and the appearance could not be separated. Again, when deciding on the depth of a house, the length of the beam and the number of the purlins would be used on the roof frame must also be considered in the same time. That is to say, the appearance of the building should be taken into account together with and the plane and structure. Only by observing the column net arrangement can we know the interior space of the
building and the basic situation of its superstructure.

1.2.6 **Attach importance to the layout of the architecture group**

China ancient architecture was good at the combination of building groups. Palaces, tombs, temples, government offices, pavilion, are combined of many single buildings. Especially was good at using of the courtyard as a combination techniques to achieve the different requirements of all types of building and spiritual goals. The life experience and artistic feel of one building group can only be obtained when entered every courtyard. The courtyard is the soul of ancient Chinese architectural groups' layout.

The courtyard is closed space enclosed together by houses, enclosures, corridors; it can create a quiet, safe and clean living environment. This enclosed courtyard is one of the most suitable layouts of the building layout in the vulnerable society by natural disasters and social unrest. The courtyard not only is necessary for houses lighting, ventilation and the rainwater excretion but also an ideal solution for outdoor activities and planting flowers to beautify the living.

Due to the different conditions of climate and terrain, the size and the form of the courtyard vary. For example, the residence in northern China has open front yard in order to receive plenty sunlight in winter; In Southern China, in order to reduce the exposure of sunshine, the courtyard are often small, called "patio". The effects of indoor ventilation can also be enhanced by this way. However, the buildings in mountain area are limited to the narrow base, so the neat open
courtyard layout usually cannot use. A liberal courtyard is required for public building due to large-scale scenes and activities.

Based on the development and changes of Chinese history, I am dividing the Chinese architectural conservation into three major historical stages.

### 1.3 Historical stages

#### 1.3.1 Feudal Society

The Chinese ancient architecture had experienced three historical stages of the primitive society, the slave society and the feudal society; among that, the feudal society is the main stage of the formation of Chinese classical architecture. Along the long period of feudal society, Chinese ancient architecture gradually formed a mature system; not only in urban planning, buildings, gardens, residential areas; but also in the architectural space processing, architectural art, material and structure; as well as the harmony unified, design methodology and constructive technology. There have been excellent creativity and contribution. Until today, many aspects still can provide useful reference in architectural creation.

Before the feudal society, China had experienced two periods which were the primitive society and the slave society. In primitive society (six to seven thousand years ago --- 21th century BC), the development of the building was extremely slow. Our ancestors gradually mastered the technology of ground housing construction from the tough burrowing and nesting construction, they created the original wooden frame construction which met the most basic requirements of residential and
public activities. In slave society (2070 BC --- 476BC), the abundant use of slave labor and bronze tools made a huge development of architecture emerged the magnificent capital city, palaces, temples, tombs and other type of buildings. At that time, the building using the rammed earth walls and wooden frame as the principal part has been initially formed. However, the technical and artistic not yet went out of the original state in the early period, but luxury palace with tile roofs and color painting appeared in the late period.

1.3.1.1 The early-days of Feudal Society

The early days of feudal society refers to the year 475 BC --- 589 AD, during which experienced the Warring States(战国), Qin Dynasty(秦), Han Dynasty(汉), the Three Kingdoms(三国), Wei Jin(魏晋) and Southern and Northern Dynasties(南北朝).

a) In the Warring States (战国) period(475BC---221BC), handicraft industry and commerce developed, the cities were prosperous, the urban scale was growing up and appeared an upsurge of urban construction. The capital cities of every state were large commercial and industrial cities and the stronghold of the feudatory ruling. At that time, high-platform palace and high-platform construction were prevalent. The brick-making technology had reached a very high level back then, but the ruling class still took wood as the material for tombs and wood coffins (棺椁 Guānguǒ) in general. The tenon-and-mortises of those coffins were produced accurately in various forms (Figure 1-3-1).
b) The Qin Dynasty (秦朝 BC 221 --- 206 BC), after the first emperor of Qin Dynasty--- Qin Shi Huang (秦始皇) whose personal name was commonly known as Ying Zheng (赢政) unified the country, he vigorously reformed the political, economic, cultural; consolidated laws, currencies, weights and measures, as well as characters; repaired road net covered around all the country and built the Great Wall to resist Huns (匈奴) on one hand. On the other hand, he put together human and material resources from all over the country and centralized the technical achievements of the six former states, to construct the capital city, royal palace and tombs in Xianyang (咸阳 in Xi’an 西安 now). Now still exist the ancient ruins of the famous Epang Palace (阿房宫) and Mausoleum of Qin Shi Huang (秦始皇陵) in the history. The Epang Palace and the Mausoleum of Qin Shi Huang has not been explored yet, but the scale of their ancient ruins is unprecedented in the history and ranks the first of all other emperors in Chinese history (Figure 1-3-2, 1-3-3). In recent years, the large-scale buried pits of terracotta warriors and horses queue were found in the eastern side of the Mausoleum of Qin Shi Huang. The rammed earth station(夯土台) left over from Epang Palace is 1270 meters long from east to west, and 426 meters long from north to south, as recorded in the latest archeology data (Figure 1-3-4, 1-3-5).
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Figure 1-3-2 plan of Mausoleum of Qin Shi Huang (Drawn by Huang Shan)
Figure 1-3-3 photos of terra cotta of horses and warriors (Taken by Huang Shan)

Figure 1-3-4, 1-3-5 Archaeological site of Mausoleum of Qin Shi Huang and Epang Palace

"Records of the Grand Historian" records: "the Front Hall of Epang Palace, five hundred steps (693 meters) from east to west, 50 ten feet (116.5 meters) from north to south, could hold about ten thousand people at one time." The front hall of Epang Palace had a total area of 80,700 square meters, accounting for about one-seventh of the Epang Palace’s whole area. The city wall was 1200 m long, 450 m wide, with a total area of more than 600,000 square meters. At the northeast of the Front Hall, there was a rammed earth station; traces of the stairs, column bases and sewer had been found.

Great Wall originated in the Warring States when vassals and states battled each other and needed self-defense. The original Great Wall was expanded after Qin Shi Huang (秦始皇) unified the country, and was put together into a 3,000-kilometer line of defense. So far there still exist
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a part of the ruins of the Great Wall built in Qin Dynasty. Later, after the construction of Han Dynasty (汉), Northern Wei (北魏), Northern Qi (北齐), Sui Dynasty (隋), Jin (金) and other era, the brick-building Great Wall left over is the Ming Dynasty relics. (Figure 1-3-6, 1-3-7)

Figure 1-3-6 the Great Walls in Qin Dynasty
(From: http://gdwxs.fudan.edu.cn/gdwxs/tupian/143.htm, noted by Huangshan)

Figure 1-3-7 Great Walls in Ming Dynasty
(From: http://military.china.com/zh_cn/history2/06/11027560/20050526/12348438.html, noted by Huangshan)
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c) The Han Dynasty (汉朝 206 BC --- 220 AD) was a prosperous period of the ancient Chinese architectural history. Its outstanding performance is the wooden frame construction became mature gradually; as well as the masonry architecture and the arch structure(拱券) has been developed significantly. Wooden frame construction although has no relic left, according to the indirect information like paint and masonry of that time, the two main wooden structure systems--- Chuan Dou System (穿斗式) and Tai Liang System (抬梁式), which are seen commonly in later time has been formed.

However, the heritage of the hall and ancestral temple in southern suburbs of Chang'an (长安 a district of Xi'an now) shows that in the last few year of the first half of Han Dynasty (around year 5 AD), the high-platform construction method of the Warring States period was still used. The small space wooden frame buildings were built around the rammed earth station (夯土台) to form the large size. This may reflect the technical problem of the large space building was still not resolved. The bracket set(斗栱 dǒu gǒng), as a significant characteristic of Chinese ancient wooden frame has been commonly used in the Han Dynasty. But the forms of bracket set(斗栱 dǒu gǒng) at that time were not uniformed at all, far from the stereotype in the Tang and Song dynasties. Its structure played a more obvious role which was using the outward singled bracket set(斗栱 dǒu gǒng) supporting the eaves to a sufficient extent in order to protect the walls, wooden frame and housing base.

In the field of brick-making technology and arch structure, it has achieved tremendous progress in Han Dynasty. In addition to a large number of big hollow brick, appeared wedge shaped brick and tenon bricks (Figure 1-3-8).
Chinese stone architecture has been rapidly developed in Han Dynasty. First, the sarcophagus, to make the underground burial goods preserved everlasting, the aristocratic bureaucrat excavated tomb on rock or built beam-slab tomb and arch tomb by stone in addition to build huge tomb by brick arches. As for the ground stone building, most of them were still the small architecture around the tomb like Mu Que, Mu Biao and stone tablet (Figure 1-3-9, 1-3-10).
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**Dynasties** (南北朝) (220 --- 589) from the late years of Han Dynasty, through the Three Kingdoms, Two Jin to the Southern and Northern Dynasties\(^{16}\), was a stage of political instability, war destruction and long-term disunited in the history of China. In those 300 years, the development of social productivity was relatively slow. There were less creativity and innovation in architecture compared to Han Dynasty. However, due to the introduction of Buddhism which caused the development of Buddhist architecture, the high-leveled pagoda appeared. Also sculpture, art painting were brought in from the vicinity of India and Central Asia, which not only led a huge development of Chinese grottoes (石窟), Buddhist statues and murals; but also impacted to the art of architecture--- the simple and unadorned architectural style of Han Dynasty became more mature and bountiful.

The most prominent types of architecture during that period were Buddhist temples, pagodas, and grottoes (石窟). Buddhism was introduced to China in the middle of Han Dynasty. From Three Kingdoms, Two Jin to the Northern and Southern Dynasties, because the strong advocates of the ruling class, a large number of temples, pagodas, and grottoes was constructed. Buddhism was introduced into Mainland China from India, so at the beginning, the layout of Buddhist temple was similar with it was in India which took the pagoda as the main object of worship. The pagoda was placed in the central of the temple, the Buddhist hall was placed behind as supplemented building. Then in the Three Kingdoms period in the capital city, Luoyang (洛阳), there were many Buddhist temples were converted from residence of

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\(^{16}\) The Southern and Northern Dynasties (南北朝) (420-589) which include the Southern Dynasty (南朝 420-589) and the Northern Dynasty (北朝 386-581) two parts existed in the same time in southern and northern China respectively. The Southern Dynasty had Song (宋 420-479), Qi (齐 479-502), Liang (梁 502-557), Chen (陈 557-589) four periods while the Northern Dynasty had North Wei (北魏 386-534), West Wei (西魏 535-557), East Wei (东魏 534-550), North Zhou (北周 557-581), North Qi (北齐 550-577) five parts.
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aristocratic bureaucrats, the so-called "give up the house for temple". As the front hall was changed to the Buddhist main hall and the back hall was changed to the Buddhist auditorium, the Buddhist temples showed more and further Chinese architectural style in China.

The pagoda buried the relic (Sakyamuni remains), and used for the Buddhist doing worship which has the Holy Sepulchre nature. After it was introduced into China, it was minified; combined with the existing Chinese multi-storey timber-framed pavilion in Han Dynasty, the Chinese-style pagoda was formed. The pagoda in Yongning Temple (永宁寺) was the most ambitious wooden pagoda at that time. It was in square shape and had 9 floors. Although wooden pagodas were prevalent for a while, none of them was retained. Apart from the wooden pagoda, the brick pagoda and stone pagoda were also developed. The brick pagoda of Dengfeng Songyue Temple in Henan(河南登封嵩岳寺砖塔) which was built in the late period of Three Kingdoms, was the earliest stupa existing in China (Figure 1-3-11, 1-3-12, 1-3-13).
Grotto Temple (石窟寺) is the cave-type Buddhist temple carved out of the cliff. There are Longmen Grottoes temple in Luoyang, Henan Province (河南洛阳龙门石窟), Yungang Grottoes temple in Datong (山西大同云冈石窟) and Taiyuan Tianlong Grottoes temple in Taiyuan, Shanxi Province (山西太原天龙山石窟). The construction of the largest Buddha statues in these grottos was paid by royal or aristocratic bureaucracy. The grottos were often protected by the wooden building built up outside of it. The carving and painting retained in the grotto temples from each dynasty were the valuable ancient art treasures.
1.3.1.2 The middle-times of Feudal Society

The middle-time of feudal society refers to the period from Sui Dynasty to Song Dynasty in China, which was from year 581 to 1279. Sui and Tang until Song Dynasty were the heyday of Chinese feudal society, and also the maturity period of the ancient Chinese architecture. There was a huge development in urban construction, wood architecture and masonry, building decoration, as well as design and construct technology.

a) Sui Dynasty (581 --- 618) As Sui Dynasty was funded, china was again unified, the long period of war and the North-South disputes situation were ended. It created the conditions for the further development of the feudal socio-economic and culture. But due to the extravagance and aggressive of Emperor Yang Guang (隋炀帝), Sui dynasty was soon completed collapsed. The architectural achievements of Sui Dynasty were the construction of the capital city --- the Daxing City (大兴城) and the east capital, Luoyang City (洛阳城), as well as large-scale palace and gardens. Also canalized the north and south Grand Canal, repaired the Great Wall, and so on. Both the Daxing City and the Luoyang city were used continuously in Tang Dynasty and became the examples of block (Li Fang 里坊) in neat formation, network road system and magnificent urban planning by further development. The Daxing City was the largest city in ancient China. The architecture left from Sui Dynasty is Anji Bridge in Zhao district, Hebei Province (河北赵县安济桥) (Figure 1-3-14).
It is the oldest open shoulder arch bridge in the world. The large arch was built by 28 pieces of arched stone (石券) and it has a span of 37 meters. This kind of bridge not only can reduce the weight of the bridge itself, but also can reduce the impact of flash floods on the bridge which reached a very high level both technically and in modeling. In addition to the stone bridge, another heritage from Sui Dynasty is the Four Gates Pagoda of Shen Tong Temple in Licheng, Shandong Province (山东历城神通寺四门塔) which was built in year 612 (Figure 1-3-15, 1-3-16).

Figure 1-3-14 photo of Anji Bridge in Zhao district, Hebei Province (http://www.baike.com/ipadwiki/anjiqiao)

Figure 1-3-15 the plan (Drawn by Huang Shan)
Figure 1-3-16 appearance of the Four Gates Pagoda of Shen Tong Temple in Licheng, Shandong Province (http://amuseum.cdstm.cn/AMuseum/jianzhu/content/suitangwudai/text/shandonglichengshentongsisimenta.html)
b) Tang Dynasty (618 --- 907) is the climax of the economical and cultural development of Chinese feudal society. Architectural technology and art has a huge developing and improvement. The architecture of Tang Dynasty has the following characteristics:

The first, it had large-scale and rigorous planning. The capital city of Tang Dynasty--- Chang'an City inherited the planning and construction of the original Daxing city and expanded on its basis, and then became the most ambitious and prosperous city in the world at that time. The planning of Chang'an City was of the most neat formation throughout all China's ancient capitals (Figure 1-3-17), and had the impact on the Tokyo City of Bohai State (渤海国东京城), Heijo in Japan (日本平城京 710 --- 794, now in Nara) and Heian-kyo (平安京 794 --- now, in Kyoto City). The layout of these cities was basically the same with Chang'an City, only smaller, such as Heijo (平城京) only was one forth of Chang'an City. The scale of the Daming Palace (大明宫) in Chang'an City was also huge. The area of the ruin site, without the inner part in the north of Taiye Pool (太液池), was more than three times to the total area of the Imperial Palace of Ming and Qing Dynasties---the Forbidden City (Figure 1-3-18). The architecture in other province, the government office buildings were also large enough that there was no other dynasty’s architecture could be compared with.
Figure 1-3-17 the restored map of ancient capital city of Tang Dynasty, Chang’an City
(By Liudunzhen, from Chinese Ancient Architectural History, noted by Huangshan)
Figure 1-3-18 the plan of Imperial Palace of Ming and Qing Dynasties—the Forbidden City (By Liudunzhen, from Chinese Ancient Architectural History, noted by Huangshan)
The second, the processing on architectural complex was becoming more mature. Before the Sui and Tang dynasties, there was only a simple arrangement in several buildings and hardly any organic combination was done among the group of buildings. In the Sui and Tang dynasties, not only the overall urban planning was strengthened, but also the space combination of highlighting the main building was strengthened in palaces, tombs, and other buildings.

The third, wooden architecture solved the technical problems of large area and size, besides it had been finalized. From the point of view of the existing main hall of Mount Wutai South-Zen Temple (五台山南禅寺正殿) and the main hall of Mount Wutai Temple of Buddhist Light (五台山佛光寺大殿) (Figure 1-6-1), the wooden structure has been, especially the bracket set (斗栱 dòu gōng) part, normalized both the component form and materials.

The fourth, the design and construct standards had been improved. Technical personnel among people who mastered the design and construction appeared, they were called Duliao (都料 material supervise), were specializing in the design and on-site construction command of public and private buildings. Their name would be recorded on the beam after the building was constructed.

The fifth, masonry had been further developed. It was mainly because the increasing number of pagodas supported by masonry construction. During the Sui and Tang dynasties, although wooden Multi-storeyed Pavilion Pagoda (楼阁式塔) was the major pagoda type, dominating quantitatively, the wooden pagoda was flammable, suffered fire disaster frequently and not durable. It was proved that masonry pagoda stood the trial of time, as at present all the pagodas saved in
China from Tang Dynasty are masonry pagoda. The masonry pagoda in Tang Dynasty had the Multi-storeyed Pavilion Pagoda (多层楼阁式塔), the Tight-tile Pagoda (密檐式塔), and single-floor pagoda (单层式塔) these three types. The masonry Multi-storeyed Pavilion Pagoda, which was evolved from the wooden Multi-storeyed Pavilion Pagoda, not only met the traditional demand of climbing up and overlooking, but also was relatively durable. The Big Wild Goose Pagoda in Xi’an is one of the instances (Figure 1-3-19). The plane of the Tight-tile Pagoda was mostly in square shape. It always had the soft outer contour, such as Small Wild Goose Pagoda in Xi’an (Figure 1-3-20, 1-3-21).

![Image of Big Wild Goose Pagoda and Small Wild Goose Pagoda in Xi'an]

The sixth, architectural art processing became more real and mature. The architectural style of Tang Dynasty was characterized as magnificent, in neat formation but open and clear. The existing wooden architecture relic reflects the unity of architectural art processing and structure in Tang Dynasty. There is neither added component just for decoration, nor the phenomenon that distort the performance of building materials to meet the decorative requirements.
Undoubtedly, this is the traditional characteristics of classical architecture in China, but was expressed more thoroughly in the architecture of Tang Dynasty. In addition, the simple and bright colors, large smooth-out roof, unpretentious doors and windows which gave a solemn and generous impression, were the features could not be easily found in the architecture of Song, Yuan, Ming and Qing Dynasties.

c) **Five Dynasties** (907 --- 960), is also known as Five Dynasties and Ten Kingdoms, in which China entered into the split period. In that split period of more than 50 years, the Yellow River Basin experienced Later Liang, Later Tang, Later Jin, Later Han and Later Zhou dynasties; there had been 10 local separatist regimes in other areas. There were frequently wars between separatist regimes and caused great damage. On the area of architecture, the tradition of the Tang Dynasty was mostly inherited in the Five Dynasties period and there was very little new creation.

d) **Song Dynasty** (960 --- 1279) During Song Dynasty\(^\text{17}\), handicraft and commercial had been well developed so that the architecture level had reached a new height, specifically in the following aspects:

The first, fundamental changes happened to the structure and layout of cities. The feudal capital city in and before Tang Dynasty all implied the curfew and the block(里坊 Lǐ Fāng) system. In the night, the residents was closed and guarded inside of the block(里坊 Lǐ Fāng), to ensure the safety of the rulers. However, the increasing development of

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\(^{17}\) The Song Dynasty (960-1279) is relatively a most prosperous period of culture and economy in the history which was divided into two distinct periods: the Northern Song(960-1126) and the Southern Song(1127-1279) as the change of capital and territory. During the Northern Song (北宋), the Song capital was in the northern city of Bianliang (now Kaifeng) and the dynasty controlled most of inner China. The Southern Song (南宋) refers to the period after the Song lost control of northern China to the Jin Dynasty. During this time, the Song court retreated south of the Chang Jiang (Yangtze River) and established their capital at Lin'an (now Hangzhou).
handicrafts and Business inevitably required breaking through the shackles of this feudal rule. In the Song Dynasty, the capital city Bianliang (汴梁) was no longer able to retain the curfew and the block (里坊 Lǐ Fāng) system. Although the name block (里坊 Lǐ Fāng) was kept, but the actual content had changed. New developments had been achieved in areas like, city fire control, transportation, shops, bridges and so on.

The second, a classical modular system was taken in wooden frame architecture. In Song Dynasty, it was formulated in the architectural budget norm enacted by the government --- Yingzao Fashi (Treatise on Architectural Methods 营造法式), that Cai (材) was used as the measure standard to construct the buildings. It means the material measurements of wooden frame architecture are divided into eight levels, each level is one Cai (材). Cai (材) will be chosen in accordance with the size and the class of the building, once Cai (材) has been selected, the size of all the timber frame components would be decided as full set according to the regulations. In this way, not only saved a part of design time, as there were the uniform standards for quantity estimation, but also the construction became more convenient. This approach may have been used in the practical application of Tang Dynasty, but finalized in text and be enacted as government regulations was the first time. From then on, every dynasty used the modulus equal to Cai (材) in wooden structure architecture until Qing Dynasty.

The third, in the building combination area, the space level had been strengthened in the vertical direction, in order to bring out the main building.
The fourth, there was great development in the architectural decoration and color. This was inseparable from the level of handicrafts was raised and the ruling class's pursuit of luxury and gorgeous in Song Dynasty. In Tang Dynasty windows were unpretentious, while in Song Dynasty a large number of lattice doors windows were used, which improved lighting conditions and reinforced the decorative effect. The door and window styles of the Ming and Qing Dynasties were basically inherited from the Song Dynasty practice but experienced a big change after the application of glass in the middle of the Qing Dynasty. The architectural color in Tang Dynasty was mainly white and vermilion. A part of the green, gold leaf angle and gold nails embellished the windows and doors. The roof was built up by gray and black tiles, so the color of architecture in Tang Dynasty was bright and dignified. In Song Dynasty, flowery color was used in the wooden structure part and the extensive use of glazed tiles on the roof, made the building looked gorgeous and colorful from outside. In the interior layout, before and in Tang Dynasty, the indoor space was separated mainly by plants, however, wooded decoration have been mainly used in Song Dynasty.

The fifth, the masonry reached a new level. The main masonry was still pagoda at that time, followed by bridges. Now there are a relatively large number of pagodas preserved from Song Dynasty. The majority of them located in the provinces on south of the Yellow River. The characteristics of pagodas in Song dynasty are: Wooden pagoda has been less used, the majority was masonry pagoda.

From the late period of Song Dynasty to the year 1279, existed Liao Dynasty (907-1125), Jin Dynasty (1115-1234) and the Western Xia Dynasty (1032-1227), three regimes ruled by the Khitan( 契丹族 ).
Jurchen and Qiang. The pagoda of Fogong Temple in Ying District, Shanxi Province (山西应县佛宫寺释迦塔) from Liao Dynasty is the only preserved ancient wood pagoda and an example of the ancient timber-framed high-rise building (Figure 1-3-22, 1-3-23).

Figure 1-3-22, 1-3-23 the plan (Drawn by Huang Shan) and the section of the pagoda of Fogong Temple in Ying District, Shanxi Province (From the Chinese Ancient Architecture History)

1.3.1.3 The late-times of Feudal Society

The late-time of feudal society refers to Yuan, Ming and Qing Dynasties (1271 --- 1911), it was the late period of feudal society in China when the development of political, economic and cultural were all in a sluggish stage, sometimes appeared backwards phenomenon. So the development of architecture was also slow, especially in Yuan Dynasty and late Qing Dynasty.

a) Yuan Dynasty (1271 --- 1368) Mongolian rulers had occupied the
territory of Jin, Western Xia and Song, and established a military empire of vast territory. They came from backward nomads, except the large-scale killing and robbing during the war, they turned arable land into pasture and plundered in large number from the agricultural population and handicraft population, which caused serious damage to agriculture, trade and industry so that the highly developed feudal economy and culture since Song Dynasty had been extremely ruined. It had obvious obstructive impact on the development of Chinese society. The architecture development was in a standstill stage. Until the emperor Kublai took the encourage-farming policy, the social productive forces had gradually been restored in some level.

As rulers believed in religions, Buddhism, Taoism, Islam, and Christianity had been developed in certain levels and the religious architecture was also abnormally flourished. Especially the Tibetan Buddhism (Lamaism) not only developed in the region of Tibet, but also appeared Lamaism monasteries in Mainland China as being advocated in Yuan Dynasty, such as the White Pagoda of Miao Ying Temple in Beijing (Figure 1-3-24).

Figure 1-3-24 photo of White Pagoda of Miao Ying Temple in Beijing (http://baike.baidu.com/view/174096.htm)
The wooden frame architecture still inherited the tradition from Song Dynasty, but the size and quality were much inferior compared to those of Song Dynasty. Especially in the northern region, typical temple had rough architectural processing with hasty materials and many construction and component were simplified. Certain pillars in temples or palaces were removed boldly, some indoor bracket set（斗栱 dǒu gōng）was cancel, all these practices reflected the socio-economic withered and timber shortages so that they had to take those cost-saving measures. Minus column method failed because there was no scientific basis supporting, however, the consequences were not entirely negative. Since the architecture in Song Dynasty had already went towards fine and ornate with large varieties of decoration, the simplification in Yuan Dynasty strengthened the integrity and stability of the wooden frame itself except for saving wood. An representative of the preserved GuangShengXia Temple in HongDong, Shanxi Province (山西洪洞广胜下寺) (Figure 1-3-25, 1-3-26, 1-3-27), the column layout in the main hall took the minus column method and got rid of six columns, only with four frames staying above the indoor beams. But as the big bay between the two indoor beams, two columns had to be added under the beam later to support, which also proved the failure of the minus column method.
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Figure 1-3-25 the elevation of GuangShengXia Temple in HongDong, Shanxi Province
(From Chinese Ancient Architecture History)

Figure 1-3-26 the section of GuangShengXia Temple in HongDong, Shanxi Province
(From Chinese Ancient Architecture History)
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Figure 1-3-27 the plan of GuangShengXia Temple in HongDong, Shanxi Province (Drawn by HuangShan)

**b) Ming Dynasty** (1368 --- 1644) Ming Dynasty was the regime of the Han landlord class that established on the basis of the peasant uprising in late Yuan Dynasty. In order to consolidate its rule in early period of Ming Dynasty, various measures to develop the production were adopted, so the social economy had a rapid recovery and development. In Late Ming, capitalism already sprouted inside of feudal society, handicraft industry, foreign trade had been greatly developed. Because the north part of China had suffered long term severely damage in Jin and Yuan Dynasties while the economic development was relatively stable in the south part of China since late Song, economic and cultural development of Ming society presented the North-South imbalance.

With the development of the economy, architecture had also been improved, mainly as follows:

The first, brick had been widely used for walls of residential buildings. Before Yuan Dynasty, although there were brick pagodas, but the wooden frame buildings mainly had the walls built by earth and mud. Bricks were only used for floor-paving and the bases. The brick wall was not commonly used until Ming Dynasty. With the development of the
brick, appeared the building built all by bricks--- the beamless hall. It was mostly used as a fireproof building, such as Sutra House in Buddhist temples and the royal file store.

The second, the quality of glass tiles and glazed tiles was improved and had a more extensive application. The early glazed tile was made of clay, but in Ming Dynasty it was made of white mud, so it had fine texture, high strength and it was not easy to absorb water. As the Pagoda of Bao’en Temple in Nanjing saved from Emperor Zhu Di (朱棣 on throne from 1402-1424) up to 80 meters, is a 9-storey Multi-storeyed Pavilion Pagoda (楼阁式塔). It was paved all the appearance with glazed, using colors of white, light yellow, dark yellow, dark red, brown, green, blue and black (Figure 1-3-28).

Figure 1-3-28 the Bao’en Temple in Nanjing (Taken by Huangshan)

The third, the wooden structure, after the simplification of Yuan Dynasty, in Ming Dynasty it formed a new standardized wooden frame: the structural role of bracket set (斗栱 dòu gōng) was reduced, the integral of beam-column frame was strengthened. As the walls of palace and
temple in Ming Dynasty was built by bricks, eaves of roof could be less stretched out led to a corresponding reduction in the role of bracket set（斗栱 dòu gōng). In this way, the bracket set（斗栱 dòu gōng）on the column no longer had to play as important structural role as in Song Dynasty. But as the requirements of rich and luxury appearance from palaces and temples, the bracket set（斗栱 dòu gōng）who had lost the original meaning became more dense instead of disappear.

The fourth, the arrangement of buildings became more mature. The Temple of Heaven in Beijing which was built up in Ming Dynasty is an excellent example of building complex processing by the end of the feudal society in China. It successfully formed a very sacred and sublime atmosphere when the highest feudal class offered a sacrifice to Heaven. The layout of the Ming and Qing Imperial Palace--- Forbidden City in Beijing, was formed in Ming Dynasty. Only a few reparation and additions were done in Qing Dynasty. Its strictly symmetrical layout, the layers of courtyard space and palaces linked to a huge building complex, lifting the feudal "monarchical" to supreme. This extremely serious layout is a typical product of autocratic monarchy in the end of the feudal society in China (Figure 1-3-29).

Figure 1-3-29 the streamline of the architectures in the central axis of the Forbidden City (From Chinese Ancient Architecture Histroy, noted by Huangshan)
The fifth, the private garden of bureaucratic and landlord was well developed. Especially in the southern area, where bureaucratic and landlord gathered due to the higher level of economic and cultural, the garden was also particularly flourished. The increasing of buildings and stones used in the garden was an apparent trend of the garden style.

The sixth, the decoration and painting of official architecture was gradually finalized the design. Such as doors, windows, ceilings had been basically formed styles so as the patterns. The stone sculpture had become more skillful and mature.

The furniture of Ming Dynasty was world famous and feng shui (风水) had reached its heyday in Ming Dynasty.

c) Qing Dynasty (1636-1911). Qing Dynasty was ruled by Manchuria aristocracy, feudal despotism became more serious. The control and oppress were extremely brutal on economic and political. However, in order to consolidate its rule, in the early Qing Dynasty, some measures had also been taken to stable the social and to recover the production. After 100 years the social economic was finally restored, which was two to three times longer than the recovery period after the founding of other dynasties. In the period of Emperor Aisin Giorro Hongli (爱新觉罗弘历 on the throne in 1735---1795), agriculture, handicrafts and commerce reached the heyday, but meanwhile in the plunder of the rulers grew as well. Another feature of the Qing Dynasty was, it adopted a high-pressure policy on the ideological and cultural which obstructed the academic progress and limited the development of Chinese ancient science. It was when the situation of behind the European countries appeared.
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The architecture in Qing Dynasty largely kept the tradition from Ming Dynasty, but it still had been developed in the following aspects:

The first, garden reached a zenith period. The scale and number of the imperial garden in Qing Dynasty was so large that any other dynasty could not be compared with.

The second, the Tibetan Buddhist architecture became flourished. A large number of Tibetan Buddhist architecture was constructed because of the belief of Mongolian and Tibetan nationalities and the advocate of the Qing government. Such as the Potala Palace in Tibet which was began to construct in year 1645, is both Dalai Lama¹⁸’s palace and a huge Buddhist temple (Figure 1-6-6).

The third, residential construction was flourishing and became colorful. As the big territory of Qing dynasty (Figure 1-3-31, 1-3-32), there were more minorities inside of its territory, the residential building was particularly rich in type, also had most relics left. Due to the different habits, cultural background, building materials and geographic conditions in every ethnic group and region, the formation of the residential building was ever-changing. Inside the same region and ethnic, the economic status of various classes also produced significant differences in residential buildings.

¹⁸ Dalai Lama is the high priest of Tibet
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The fourth, the design of a single building was simplified while the design level of building groups and decoration was improved. The official buildings of Qing Dynasty were regularized on the basis of the standards in Ming Dynasty with official specification. In the book "Engineering Practice", which was published in 1734, gave out examples of 27 single building wooden practice, Ðà ìû zuò(大木作) and did the provisions of bracket set(斗栱 dòu gòng), decoration, practices and materials of stone, tile, copper, paintings.

The fifth, there was still building technology innovation. For example the method of wet-bend, that makes the wood bend into a curved purlin, so it could be used in small dome building. The glass was introduced from abroad in Qing Dynasty, causing the big change on the pattern of windows and doors. The dense lattice on the windows and doors in the past became variety of bright window types.

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19 Ðà ìû zuò 大木作, see attached vocabulary.
1.4 Urban construction

In ancient times, the city is the stronghold where the slave owners and feudal lords rule, also intensively represented the achievements of economy, culture, science, technology and other aspects in the ancient times. Due to the hard work and bloody price of the laboring people, along the Chinese history, there have been many magnificent cities as well as excellent urban construction achievements and experiences.

The ancient Chinese city has three basic elements: the governing institutions (palace, government offices), the handicraft and business districts, and the residential area. The urban form of each period was changing constantly along with the development of these three essential elements. The whole ancient period can be roughly divided into four stages:

The first stage was the urban newborn period, equivalent to the late primitive society and Xia (夏 21 century B.C. ---16 century B.C.), Shang (商 17 century B.C. ---11 century B.C.) and Zhou20 (周 1046 B.C. ---221 B.C.) three dynasties. The productivity improvements in the late primitive society exacerbated the social divide between rich and poor, where appeared the class opposition. The violent struggle between the clans prompted the flourish of fortification activities on the purpose of group defense. At present, more than 30 city sites of the primitive society have already been found within the territory of China. These city walls had been built by rammed earth and the technology was relatively primitive.

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20 Zhou Dynasty (1046 B.C. -221 B.C.): the earlier half, from 1046 B.C. to 771 B.C. was called West Zhou (西周), while the later half, from 770 B.C. to 221 B.C was East Zhou (东周). The East Zhou was again divided into the Spring and Autumn Period(春秋时期 770 B.C.-476 B.C.) and the Warring States Period(战国 475 B.C.-221 B.C.)
This practice was later used continuously as the basic method to build the city walls in the whole feudal society of China.

Their specific technique mostly was: dug foundation trench on the ground first, and then starting tamp from the foundation trench to build a base for the city walls. About the part above the ground: the templates were set up along the direction of the city wall, been supported from the outside with earth, and the inside part between a couple of template was the main part of the city wall. When constructing, the earth was tamped in both inside and outside at the same time. The rammed earth inside of the templates was in horizontal rammed layer, and the rammed earth outside of both sides of the templates, was sloping. Once a set of templates was covered by rammed earth, they lifted the templates and continued the building. Sometimes, the templates were kept in rammed earth, and the construction would be continued with new set of templates. The filling earth was pure loess with very few impurities. The punner was a kind of small pestle. The thickness every rammed layer was of 5 to 10 cm. When the city wall was built, the gentle sloping earth on both sides would be shaped to become steep. The rammed earth of ancient cities, had quite hard texture, so although it went through three or four thousand years, there are still two or three meters of rammed earth station stayed above the ground. (Figure 1-4-1)
Figure 1-4-1 how the city walls were built up (Drawn by Huang Shan)

The second stage is the period when Lǐ Fāng (里坊 block) System was established, equivalent to the Spring and Autumn Period to Han Dynasty (汉朝 202B.C.-220A.D.). The arrival of the Iron Age, the establishment of the feudal system and the rise of local forces, led to the first high tide of urban development in Chinese history. New cities have sprung up, while with the expansion of the city, the prosperity of handicraft industry and commercial, the rapid population growth and the increasing complexity of urban life, the requirement of taking effective measures to ensure the orderly functioning of the city and the safety of the ruling clique became inevitable, so emerged the new urban management and layout mode: the city was divided into a number of closed Lǐ (里 block) as residential areas, the commercial and handicraft industry were restricted in some of the Shì (市 market area) which have set time for opening and closing. The palaces and YáShǔ

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21 The Spring and Autumn Period(春秋时期 770B.C.-476B.C.): the earlier half of East Zhou (东周) which was the later half of Zhou Dynasty.
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衙署 (the government office in feudal China) of the rulers, occupied the most advantageous position in the city, and was protected by the walls. Each Lǐ (里 block) and Shì (市 market area) were enclosed by high walls, and there were gates for every Lǐ (里 block) and Shì (市 market area), guarding and managing by the minor officials\textsuperscript{22}, the curfew was imposed in all the city. Until the Han Dynasty, the vassal\textsuperscript{23} whose principality reached ten thousand families would be allowed to open the individual gate to the street, free from the constraints of the gate of the Lǐ (里 block). This is the outstanding performance of feudal despotism in the urban form. However, during this period, the overall urban layouts were relatively more freely with diverse forms: some of them were outer city (郭 guō) encircled small city (palace city), such as the ancient capital---Qufu (Figure 1-4-2); Some of them were two city stood side by side.

Figure 1-4-2 plane of the site of ancient capital---Qufu in West Zhou to West Han Dynasties (Drawn by Huang Shan)

\textsuperscript{22} In Chinese, they were called Lìzhú (吏卒) who and Shílìng (市令) who was in charge of the market zone management.

\textsuperscript{23} The vassal in China mostly refers to the ruler of the territory which was subinfeudated by the emperor.
The third stage is the heyday of Lǐ Fāng (里坊 block) System, equivalent to the Three Kingdoms (三国 220-280) to Tang Dynasty (618-907). The capital city—Yè (邺 Figure 1-4-3) of Wei Kingdom in the Three Kingdoms period, created a clearly function-distinct, rigorous ruled urban layout for Lǐ Fāng (里坊 block) System cites which was, rectangular plan with palace located in the center of the north of the city, the whole city was divided like a checkerboard, residents and market was arranged into these checkerboard section composing every Lǐ²⁴ (里 block). This is further optimized results on the basis of the previous phase of relatively free Lǐ Fāng (里坊 block) System urban layout. Therefore, not only the various functional elements were clearly divided, the traffic was convenient, but also the appearance of the city became more spectacular. The Chang’an City of Tang Dynasty was such a model of these cities. At that time the Lǐ (里 block) and Shì (市 market area) were still surrounded by high walls, opened and closed on schedule, without essential difference from the Han Dynasty, but the controls have been relaxed in the latter period. Such as in the Chang’an city, the residence of officials over certain level could open individual gate to the street as well as Buddhist and Taoist temples. In some Lǐ Fāng (里坊 block) residents liven up all night. Night market could be stopped in spite of repeated prohibitions.

²⁴ Lǐ (里 block) was also called Fāng(坊) after the Northern Wei Period (386-534) of Northern and Southern Dynasties(420-589), then the name Lǐ Fāng (里坊 block) became more popular used.
The fourth stage is the open downtown-street period that was the city mode after the Song Dynasty. Based on some cities started to break the Lǐ Fāng (里坊 block) System from late Tang Dynasty, the capital of the Northern Song Dynasty—Bianliang (汴梁, now in KaiFeng, Henan Province) also canceled the curfew and Lǐ Fāng (里坊 block) System. Bianliang was originally an economic prosperous waterway transportation hub, since the Five Dynasties and the Song Dynasty founded the capital there and then expanded it. The developed transportation and gathered commercial made the capital called off the Lǐ Fāng (里坊 block) System which obstructed the development of urban life and economic. Therefore, the city mode continued to be used for more than 1500 years in Chinese history formally announced its perish and was replaced by the open urban layout. Although some of the neighborhoods in the city were still using the old name with Lǐ (里) or Fāng (坊) System, but in fact, there was a fundamental difference from the city mode of the previous period.
Throughout the long-term practice, the ancient Chinese urban construction has accumulated a wealth of experience on site choosing, defense, planning, flood control and drainage:

Every dynasty attached great importance to the location choosing of the capital. Royal relatives or ministers were often sent to survey the topographical and hydrological conditions, as well as presided over the construction. The municipal water use is extremely important for a capital city with the population of several hundred thousand to more than a million, so each dynasty pay a lot attention to solve the water source problem when choosing the site. First, the quality of drinking water must be ensured, the Emperor Yangjian (杨坚 who was on the throne from 581-604) of Sui Dynasty built a new capital in another place---Daxing because the groundwater was too salty to be suitable for drinking. Moreover, there must be sufficient water for gardens and water transport\(^\text{25}\). The so-called water transport was the supply line of food, goods and materials for the capital, and was considered as the lifeline of every dynasty. For example, in Han Dynasty, the capital Chang'an opened Zheng Channel (郑渠 West from Kunming Lake Shanglin Park\(^\text{26}\), east to the Yellow River\(^\text{27}\)); In Sui and Tang Dynasties Yun Channel (which run onto the south part of china\(^\text{28}\) via Yellow river) was built, all these were in order to solve the water transport.

In the ancient capital, in order to protect the safety of the rulers, there was a setting of inner city walls and outer city walls from the Spring and Autumn Period until the Ming and Qing dynasties in every capital. The

\(^{25}\) water transport (漕运): transport of grain by water to the capital in former times

\(^{26}\) Shanglin Park: Imperial palace park with all kinds of palaces and entertaining function in southwest of capital Chang'an of Han Dynasty.

\(^{27}\) Yellow river: the second longest river in china. The length is about 5464 km.

\(^{28}\) South part of China: normally refers to the south of the Yangtze River which is the longest river in China.
functions of the two were pretty clear: the inner city walls were to protect the monarch while the outer city walls, were to look after and take charge of the people. For slave owners and feudal rulers, it was safer surrounding the inner city walls by outer city walls, so since Han Dynasty, this was the only way being developed. Although, there were various names of the inner and outer city walls in different dynasties, the essence was always the same.

In general there were three walls of the capital city: Imperial City (like the Forbidden City); the inner city (royal city); and the outer city. This is the way that the ancient ruling class layered up barriers to protect themselves. Talking to the method of building up the city walls, in Xia and Shang Dynasties, the walls were built up by rammed earth, but the rammed earth wall was vulnerable to rainfall; after the Tang Dynasty, gradually appeared the method of using bricks to package up the rammed earth walls, however, this method did not gain popularity until Ming Dynasty when the brick production increased. The structure of gate arch in the city walls used wood lintel in early times, the brick arches gradually started widely used since Song Dynasty. In order to strengthen the defense capability of the gate in the city walls, many city walls had barbican entrance to the city 29(Figure 1-4-4).

29 More explanations about the design and construction of the city walls are developed in my unpublished article “The city walls in Xi'an” (Madrid, 2012).
Figure 1-4-4 diagrammatic sketch of the barbican entrance to the city (Drawn by Huang Shan)

About the urban road system, the majority took the square grid layout with the main roads on north-south direction which was extended from the layout that almost all buildings were facing the south. Due to the geographical location and climatic conditions of China, this architectural layout experience which met the actual situation in China, was summarized and established since the Xia and Shang Dynasties, and has been used until today. The square grid road system was set to suit local circumstance in order to adapt to the various conditions of different places. The arrange mode as strait squared as in Daxing City of Sui Dynasty, was only used for the flat terrain and entirely new cities, other altered cities or cities contained hills or rivers took appropriate modifications in accordance with the practical conditions, not rigidly adhered to the square contours and the uniformity of the road network. Just like the Chang’an City of Han Dynasty, which was gradually expanded on base of detached palace\textsuperscript{30} from Qin Dynasty, so the

\textsuperscript{30}Detached palace: the palace built for the emperor in addition to the palace in the imperial city in the capital where the emperor would go and spend a certain amount of time every year. The detached palace was normally
road system and the contours was less regular; In the Nanjing City (南京) of Ming Dynasty, there were a lot of water surfaces and hills, and the old city from the South Tang Kingdom\(^{31}\) was continuously used, so the layout was more liberal.

With the increasing density of building, the city fireproof issues became prominent. For example, the capital City of North Song Dynasty---Bianliang (汴梁) was built up based on the commercial city of late Tang Dynasty---Bianzhou (汴州), which was located in the transportation hub between the south of Yangtze River and the Central Plains. After the Five Dynasties (907-979) and Northern Song Dynasty (960-1127) founded their capital there, the urban development went very fast, the houses became more and more dense that the buildings and roof eaves were almost connect together. There was frequent hidden trouble of fires. So in the city, the army patrol spots were set up about every Chinese mile\(^{32}\) who was responsible for night patrols, and there were fire tower built by bricks to lookout fire dangers at high altitude with more than a hundred soldiers stationed and fire-fighting appliances prepared. Since the Northern and Southern Dynasties, the drum towers and bell towers were located for both fire alarm and giving the correct time use.

About the urban drainage treatment, since Han Dynasty, in Chang'an City, clay pipes and brick sewer had been used. In Tang Dynasty, the ditches for drainage were dig on both sides of the streets in Chang'an City. But because of the ditch system drew out poorly, when there was heavy rain, the Lǐ Fāng (里坊 blocks) in low-lying areas of the city often

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\(^{31}\) The South Tang Kingdom(937-975): a kingdom of Five Dynasties and Ten Kingdoms (907 --- 960), founded their capital in Nanjing which was called Jinling (金陵) back then.

\(^{32}\) Chinese mile: the length measurement used in ancient China. It was not exactly same about how long was one Chinese mile in different dynasties. But it was around 500 meters.
faced the flooded disaster. In the Song Dynasty, the BianLiang city had four rivers crossing through, which has great benefits for water for living, water transport and drainage. In Ming Dynasty, Beijing has set up ditches for rain water drainage, and the Street Hall was exclusively in charge of dredging.

About the entertainment places of the city residents, from the Southern and Northern Dynasties to Tang Dynasty it mostly relied on the Buddhist temples and suburban scenery. The statues, murals and operas in Buddhist temples were the visit point for the citizens. In Tang Dynasty, even the princess had to go to the theatrical building in the Buddhist temple to watch a theater. The Qujing in the south of Chang'an city in Tang Dynasty, the famous site and some private gardens in suburban of Bianliang city in Song Dynasty, were great places for spring outing. In Song Dynasty, the theatres was set up separately as Wa Shi (瓦肆 tile market), then it was used as a building type that has been widely adopted around the country since Yuan Dynasty.

The Chinese ancient capitals had grand scale, area and population ranked in the highest level in the world. The Chang'an City of Tang Dynasty covered an area of 84 square kilometers, which ranked the first at that time. The city Luo Yang of Northern Wei Dynasty was about 73 square kilometers. The capital of Yuan Dynasty, Dadu, was about 50 square kilometers and the city Beijing in Ming and Qing Dynasties was about 60 square kilometers.

In terms of population, due to ancient history books normally just recorded the number of families, while the huge population of royals and army was not included. What’s more the aristocracy had a lot of persons per family. The general population underreported or
concealed the numbers a lot in order to evade the taxes. So it was very
difficult to obtain an accurate population data. However, when Qin Shi
Huang (秦始皇) moved all the rich progenies across the country to
capital Xianyang, 120,000 families was relocated. In the late times of
Southern Song Dynasty, there were about 300,000 families in capital
Lin’an (临安), take four to five person in one family, the population of
these cities could reach or more than one million.

1.4.1 The capital cities from Han (202 B.C.—220) to
Ming (1386-1644) and Qing Dynasties (1644-1911)

The geographical choose of Chinese ancient capital cities had a trend
of moving from west to east which was developing from the
Guanzhong Plain and the Central Plains to the coastal area, the reason
was the economic gravity center eastward. The Guanzhong Plain
whose centre was Chang’an and the Central Plain whose centre was
Luoyang, as both of them had suitable geographic location and were
convenient for dominating the country, had always been regarded as
the ideal region of capital. However, due to the political center located
in these two regions for long-term which made them suffered the
frequent destruction of war and severe deterioration of the ecological
environment, water loss and soil erosion, agricultural recession brought
by deforestation. The capital city established relying on the former
fertile town had become increasingly dependent on the supply from
the south of Yangtze River region so that the operation of the regime
could be maintained. This form became an irreversible finality in
Northern Song Dynasty, and then the whole eastward shift process was

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33 Qin Shi Huang (秦始皇): The very first monarch who took the autocratic monarchy and the founder the
centralized unified country, and also who used the title of “emperor” in Chinese history.
completed in Yuan and Ming Dynasties.

There are three types of Chinese ancient capital modes in general:

The first category is the brand new city. That is to say, there was no foundation; the whole city was basically built up from the ground. This kind of situation mainly appeared in the early stage, such as the Xianyang (咸阳) City and many other vassal states in Qin Dynasty (221 B.C.-206 B.C.).

The second category is to build up the new city standing by an old city. Since Han Dynasty most of the capital cities took use of this approach, such as in early Han Dynasty, capital Chang’an was found up standing by the Old Xianyang City of Qin Dynasty, and relying on part of the Old Detached Palace. The capital city, Daxing, of Sui Dynasty (581-619) was constructed on the southeast of the Chang’an city from Han Dynasty. Dadu (大都), the capital of Yuan Dynasty (1271-1386), was built up on the north of old town from the period of Song Dynasty. Among these capitals there were two situations: the first, when the new capital was completed, the old city was abandoned, such as Daxing City of Sui Dynasty; the other, old city continue to be used, both the new and the old city coexisted for a long time, such as the capital Dadu of Yuan Dynasty.

The third category is the constructive expansion on the basis of the old city. The city Nanjing and Beijing in the early Ming Dynasty are of this type. The advantage is making full use of the foundation of the old city to service for the new capital, so there would be less investment but yielding quicker.
As the national center of politics and culture, the capital city had a population of more than several hundreds of thousands to a million, covered an large area and run complex functions, while was constrained to the terrain, climate, water and land transportation as well as socio-economic, political and other conditions, therefore it was not possible to regulate the capitals within a fixed pattern. That is to say, each of the capital cities must determine the construction mode based on their specific needs and objective conditions, which is why different capital types were produced throughout the history.

In ancient time, the feature of capital construction was all for servicing the feudal rule, expanded all around the emperor and imperial power. The constructive order was also first, imperial palace, royal city, then the capital city and the outer city. About the layout, the imperial palace was located in the most important and central place followed by the various the organization of regime functions and the residence of princes and ministers as well as the appropriate municipal construction, and then finally the living area for common people, and handicraft, commercial lots. Every capital city from Han to Qing dynasty was just like this.

The following cities themselves have different features and important historical significant of Chinese urban development, also, the urban developing the local architectural formation interaction effect on each others. Especially the City of Chang’an (city of Daxing in Sui Dynasty) in Han and Tang Dynasty and the city of Beijing (Dadu in Yuan Dynasty) in Ming and Ding Dynasty both have long history with Christianity. The explanation of the will help understand only only the urban construction, but also the local architectural fromations which also had a strong
influence on the Christian Church buildings built there in 1840-1949.

1.4.1.1 The Chang’an city in Han Dynasty\textsuperscript{34}

Before Qin Dynasty (220B.C. ---207B.C.), the early Zhou Dynasty had established the capital in this area. Every since in year 350B.C. when the monarch Ying QuLiang (嬴渠梁) was on throne of Qin State, the capital was moved from Yueyang (栎阳 in Yanliang district of Xi’an, Shaanxi Province today) to here. Xianyang (咸阳 15km east to today’s Xianyang city) had always been the capital of Qin state. In the year 221 B.C. when Qin Shi Huang unified the country, a major event of constructive expansion took place here. The Chang’an city of West Han (202B.C.-9) was set up on the basis of the original Detached Palace--- Xingyue Palace (兴乐宫) of city Xianyang. The emperor Liu Bang (刘邦 in Han Dynasty who was on throne from 202B.C. to 194B.C.) subsequently built Weiyang Palace (未央宫) as the main palace of capital Chang’an in West Han (202B.C.-9)Han Dynasty. However, the city walls of Chang’an City were not built up until year 190B.C. When the emperor Liu Che (刘彻) was on throne (from 141B.C. to 87B.C.) massive construction projects were taken in Chang’an, the Jiangui Palace (建桂宫), the Mingguang Palace (明光宫), the Jianzhang Palace (建章宫) as well as gardens, halls for sacrificing events, temples and other buildings was built up, which made the construction of Chang’an reached the climax (Figure 1-4-5).

\textsuperscript{34} The Han Dynasty had two parts; the earlier half was named West Han (西汉 202B.C.-9) and the later half named East Han (东汉 23-220). There was a interim authority between these two halve called New Dynasty (9-23 新朝).
Because Chang'an city was gradually expanded on original basis and had Wei River near on the north, so the urban layout was irregular. The main palace, Weiyang Palace (未央宫) was on the southwest of the city facing the north and directed straightly to the Heng Gate (横门) which formed an axis. Jia District (甲第区) of Ministers and Government Offices were on the North of Weiyang Palace (未央宫). There were nine markets distributed on the east and west sides of the Avenue (大街). In the east of Weiyang Palace located the Arsenal (weapons possession) and
another palace Changle Palace (长乐宫). These two palaces are located the Longshou highland, which was the highest place of Chang’an city and the terrain gradually lowered down in the north near Wei River where the North Palace (北宫), Gui Palace (桂宫), Mingguang Palace (明光宫) and area for markets and common residents were arranged. Because these palaces were built one after another, they were more dispersed. Each palace was surrounded by palace walls with groups of halls and pavilions as well as small lakes and gardens inside of it. Archaeological excavations and the literature records show that the majority of Han Chang’an city site was occupied by those five palaces. However, there were 160 living area according to the records, which was too many to be arranged in the rest palaces inside of the Chang’an city, so most of the living area should be in the outer city.

According to records, outside of Heng Gate (横门), on east of the other three gates, and also Duling (the mausoleum town)\(^{35}\) of Emperor Liu Xun who was on throne from 74B.C. to 49B.C. down to the southeast, these areas were likely to be the gathered residential places. There were three gates on each direction of Chang’an City, in which Xuanping Gate, the one on the northeast, was the gateway that must be passed through to city Luoyang, so this area had been densely populated. The Heng Gate (横门) was the throat to the cites in the north and directly opposite to the main entrance of Weiyang Palace, so there was a particularly lively downtown area.

Another feature of the Chang’an City in West Han (202B.C.-9) was that

\(^{35}\) Mausoleum town (陵城): In Han Dynasty, the town located at the tomb of the emperor in the vicinity of the Chang’an City in order to strengthen the centralization and manage the wealthy elite. In fact, it was a consumer city.
seven towns were set up in the southeast and the north suburbs, they were all mausoleum towns called Changling, Anling, Baling, Yangling, Maoling, Pingling and Duling. The very rich families were forced to move and live in these towns so the local tyrannical forces could be weakened while the control of the central government strengthened. The scale mausoleum town was quite large, such as Changling had 50 thousands of families and the Maoling has 60 thousands. Chang’an city had a population of 80 thousand during year 1 B.C. to year 6.

The Jianzhang Palace (建章宫) on the west side of Chang’an city had a pretty amount of houses, halls and pavilions according to records, in which there were pool opened and mountains heaped. Outside of the An Gate (安门) located etiquette buildings (礼制建筑) like Sacrificed Hall and Alter of Land and Grain. Again on the South and west of the Jianzhang Palace (建章宫) there was the broad range Shanglinyuan (上林苑), which was originally built by Qin Shi Huang, and restored by emperor Liu Che (刘彻 was on throne from 141B.C. to 87B.C.). More than 30 detached places were located in there. In year 137B.C. Kunming Lake which girth was about 40 Chinese miles in was excavated in Shanglinyuan, in order to storage the mountain water for the urban water supply and water transport, and the ship warfare of water military could also be trained in the lake. On one hand, the water run

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36 Etiquette buildings (礼制建筑) are not religious buildings, but closely linked with the religious buildings. The etiquette is one of the Confucian concepts, which means there are differences between upper and lower, and order of superiority and inferiority. The purpose of the etiquette system was by the provisions of the person-to-person relationship and ritual ritual, to maintain a stable social ruling order; the ultimate aim was to maintain the domination of the ruler.

37 Shanglinyuan (上林苑): was a palatial garden built up by emperor Liu Che (刘彻) (was on throne from 141B.C. to 87B.C.) in year 138 B.C., by constructive expansion on the old site of the palatial garden from Qin Dynasty, which had grand scale and many palaces, with a variety of functions and amusement content. Unfortunately none of them is preserved. It had both beautiful natural scenery, and also the gorgeous palace group distribution. It was the total garden included a wide variety of life content, which was also a typical example of the palatial garden of the Qin and Han dynasties. In addition, there stationed the Royal Army.

38 Water transport (漕运) which refers to the system of transporting grains through inland rivers and sea of to the imperial family and delivery rations to the military in Chinese history, including the development of the canal, the production of ships, and the collection of the grains for official and military use.
into the city from the southwest, went through the Cang pool in Weiyang Palace and flew out of the city towards east. On the other hand, the branch interlinked with the Yellow River, which was not only convenient for the water transport, but also for the agricultural irrigation. This was a kill two bird with stone project of city water impoundment and diversion (Figure 1-4-6).

Figure 1-4-6 diagrammatic sketch of capital Chang’an and its surrounding area in Han Dynasty (Drawn by Huangshan)

The eight avenues towards the gate of Chang’an city were the main road. These avenues were separated into three roads by the drains, the middle one was dedicated to the emperor. On both sides of the avenues trees like locust, elm, pine and cypress were planted. All avenues were dust roads without pavement. The drainage communicated to the gates and there were masonry culverts to draw out rain water.
1.4.1.2 The Luoyang city of North Wei (386-534) in the Southern and Northern Dynasties (420-589)

As the city Luoyang (洛阳) is located geographically suitable, it had an important position in both economic and military, therefore, since East Zhou (东周 770B.C. to 221B.C), East Han (东汉), Wei kingdom (魏 220-266 of Three Kingdoms), West Jin (西晋 266-316 of Two Jin), North Wei (北魏 386-534) all established it as capitals. Luoyang was originally set up as a city in the early time of West Zhou (西周 1046B.C. to 771B.C.), when the new governing class built up the Chengzhou city (成周) here to resident the people from the last Dynasty---Shang Dynasty (商朝 17th century B.C. ---11th century B.C.), also called Yin Dynasty from where the earliest literal records---oracle bone script was found out. And then the Wang City (王城) was built up as the east capital on the west of the Chengzhou city (成周) to guard those people. Ever since then, this system of establishing two capitals has been followed by the Qin, Han, Sui and Tang Dynasties. The capital was moved eastwards from Chang’an to Wang City (王城) at the beginning of East Zhou (东周 770B.C. to 221B.C). To the late Spring and Autumn Period (春秋时期 770B.C.-476B.C.), in order to seek refuge from war, the capital was moved from Wang City (王城) to Chengzhou city (成周), and was extended which laid the foundation of being a capital in the following dynasties.

The city Luoyang of North Wei was rebuilt on the ruins of the capital Luoyang from West Jin (西晋 266-316 of Two Jin). The North Wei first set up their capital at Ping city (平城 now in Datong, Shanxi

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39 North Wei (北魏 386-534) was an authority in Northern Dynasty (北朝 386-581) of the Southern and Northern Dynasties (南北朝 420-589).
40 Shan Dynasty (17th century B.C. ---11th century B.C.), also called Yin Dynasty from where the earliest literal records---oracle bone script was found out.
Province), by the time of Emperor Yuan Hong (孝文帝 who was on throne from 471-499), in order to facilitate the governing of the northern part of China, as well as acquisition of economic support from more developed regions, in year 494 moved the capital in the more suitable location ---Luoyang. 183 years had passed since when Luoyang was abandoned in the West Jin. The city has long been fallen in to disuse. The construction projects implemented more than a year according to the palace ruins from the West Jin, so it had the basic scale. Seven years later, Lǐ Fǎng (里坊 blocks) for residents and the outer city was gradually be built up.

According to the records, the Luoyang city in North Wei was 20 Chinese mile from east to west, 15 Chinese miles from north to south, had 320 Lǐ Fǎng (里坊 blocks) and there were the outer city walls, the inner city walls (for royal families) and the imperial city. The Mang mountain (邙山) was on its north while the Luo river (洛水) run throw the south. The terrain is relatively flat, but slightly sloping down from north to south. The imperial city was on the north of the city, and the inner city was on the north-south central axis of whole city. Government Offices (官署), the Imperial Ancestral Temple (太庙), Alter of the Land and Grain (社稷坛) and the nine-floor wooden pagoda of Yongning Temple (永宁寺九层木塔) were arranged on both sides of the main road leads to the imperial city. On the south of the city, there were Ling Tai (灵台)\(^{41}\), Ming Tang (明堂)\(^{42}\) and Tai Xue (太学)\(^{43}\). The markets gathered in the small markets and the big markets respectively on the east and west of Luoyang city. The foreign businessmen gathered in Sitong Quarter (四通市) where

\(^{41}\) Ling Tai (灵台): The building dedicated to astronomy, meteorology in ancient China.
\(^{42}\) Ming Tang (明堂): It belongs to etiquette buildings where was used by the emperor to declare the politics and education.
\(^{43}\) Tai Xue(太学) equivalent to the university in ancient China
there was an area specially for receiving the foreigners. According to the
Monasteries of Luoyang⁴⁴ (《洛阳伽蓝记》) records that the inhabitants of
Luoyang in North Wei was more than 109,000 families, besides there
were about 10000 families of the Southern Dynasty and foreigners on
the south of the outer city walls, and again, together with the
populations of royal family, the army and the Buddhist temples, the total
population should be more than sixty to seventy thousands. Inside of the
outer city walls, on the west, gathered residences of nobilities. The area
closed to the west of the outer city walls was the residential area for
princes, known as the Prince Square. Near the big markets inhabited
the craftsmen and traders. The Taicang (太仓) on the east of the city
was the royal granary, the rent field (租场) was where levied over the
tribute and tax. As the small markets were nearby, this area was very
lively and densely populated, some Lǐ Fāng (里坊 blocks) hosted two or
three thousands inhabitants. The gate on the outer city walls which was
outside and on the east of the Jianchun Gate (建春门) on the inner city
walls was the gateway to the other places in the east, where also was
the place for seeing and receiving friends. The Lǐ Fāng (里坊 blocks) had
the scale of one Chinese mile in square, but from the archaeological
survey and the results showed that it may not be very uniform. Each Lǐ
Fāng (里坊 blocks) opened four doors, and had 6 junior officers,
managing the residents. It is obvious that the residents were controlled
very strictly (Figure 1-4-7).

⁴⁴ The Monasteries of Luoyang⁴⁴ (《洛阳伽蓝记》) is a master piece of history, geography, Buddhism and arts
written by Yang Xuanzhi (杨炫之) in North Wei which recorded all the history and development, stories,
architectures of all the Buddhist temples in city Luoyang.
In city Luoyang, the water for palace, moats, water transport mainly relied on Gu Shui (谷水  a small river on northwest of Luoyang). Because Gu Shui (谷水) was in higher ground, it went through the outer city walls from northwest to the Tianyuan lake (天渊池) in Huanlin Garden (华林园) then run out of the city towards east supporting the water transport. There were plenty of trees in Luoyang city of North Wei Luoyang, a scene of magnificent palaces surrounded by column-lined trees could be seen when climbing high. The road layout was irregular grid, which may be caused by a lot part of the old city was continuously used when city Luoyang was reconstructed in North Wei.
1.4.1.3 The Daxing city in Sui Dynasty (581-619) and city Chang'an in Tang Dynasty (618-907)

After the Emperor Yang Jian (杨坚 who was on throne from 581-604) won the regime from the North Zhou\(^45\), the old site of the former capital Chang’an of Han Dynasty was still used. However, the capital Chang’an in Han Dynasty had been record the battlefield for various times, and was withering as time gone by, everything was broken and disserted, the palace very narrow palace, coupled with the salinity of groundwater which made it unsuitable for drinking, so in the second year of Sui Dynasty (year 582) a place with beautiful river and mountains on the southeast of the former Chang’an city was chosen for the construction of the new capital. The imperial city was built up first, then the royal city, and the outer city was the last part was constructed (Figure 1-4-8).

\(^45\) North Zhou (北周) the last regime in the Northern Dynasty (北朝 386-581) in northern China of the Southern and Northern Dynasties (南北朝 420-589). See more in notation 1.
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The new capital was called as Daxing City, Gao Ying (高颖) and Yuwen Kai(宇文恺) was responsible for its construction. The Emperor Yang Jian summarized previous experience from the former capitals, and thought that, since Han Dynasty (202 B.C.–220) until the Southern and Northern Dynasties (南北朝420-589), common residency, palace, local officials and other facilities were spread randomly inside of the inner city (royal city) which was inconvenient. Thus, in Daxing City the local authorities were concentrated inside of the inner city and separated with the common residents and markets. The functional area was separated clearly was the innovation of Daxing city construction.

The urban planning of city Daxing largely modeled on the old Luoyang city from Han, Jin to the North Wei Dynasties, so the scale, the city

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46 Gao Ying (高颖?–607) famous prime minister in Sui Dynasty, and Yuwen Kai(宇文恺555–612), the specialist of urban planning and architecture construction in Sui dynasty.
outline, the formation of layout, the arrangement of Lǐ Fāng (里坊 blocks) and markets were all similar with the city Luoyang. But the octy Daxing was a new built up city, so it was more regularized and more idealistic. However, the actual situation was not in line with the planning intention, for example, the four rows of Lǐ Fāng (里坊 blocks) in the south of the city, was always desolated with few residents even after 300 years of the Sui and Tang dynasties. In Tang Dynasty, the residential density differed in large number from the east to the west of the city. Normally the ministers lived in the east of the city, especially in northeast corner which was the liveliest part of the city. That was because it neared the Daming Palace, so it was more convenient to go to court. While in the west of the city where more remote, mostly lived lower residents.

According to records, the Daxing City was 18 Chinese miles and 115 steps\textsuperscript{47} from east to west, 15 Chinese miles and 175 steps from north to south (actually measured 9721 meters from east to west, 8651 meters from north and south), except for the imperial city and the royal city in the northern end of the central axis, the city was divided into 109 Lǐ Fāng (里坊 blocks) and two markets. The markets on the east and west were called Duhui Market (都会市) and Liren Market (利人市) in Sui Dynasty respectively, also each Lǐ Fāng (里坊 blocks) had a name. The streets were wide and straight, the horizontal street between the imperial city and the royal city was 200 meters wide, while the street in front of the royal city was 150 meters wide, and about the other streets, the narrowest had 25 meters in wide. The city formed a regular checkerboard layout (Figure 1-4-9).

\textsuperscript{47} Step (步) Chinese ancient length measurement. It was different in each dynasty, and 1 step was about 1.5 meters in Sui and tang Dynasties.
The Emperor Yang Jian vigorously promoted Buddhism and encouraged the construction of Buddhist temples in order to receive the popularity and decorate the capital, so there were a lot of Buddhist temples in Daxing city. Originally on the southeast corner of city there were Qujiang Pond (曲江池), which made the terrain complex. Yuwen Kai (宇文恺) considered that it is better to be turned into a Garden, the Lotus Garden (芙蓉园), and be enclosed inside of the city. In addition the water from the Yellow River was led into Qujiang pond (Figure 1-4-10).

This Daxing city in Sui Dynasty was the basis for the development of Chang'an City in Tang Dynasty. Although in Tang Dynasty, it basically
followed the urban layout of the Sui capital city, but because the main palace moved to the Daming Palace (大明宫) on the northeast, the courtiers, dignitaries all concentrated in the east side of the city, so the gravity of the city biased towards one side. This was the feature of capital Chang’an of Tang Dynasty.

The Emperor Li Shimin (李世民 who was on throne from 627-649) built up the Yong’an Palace which was renamed as Daming Palace later in year 635 for his father, the former Emperor Li Yuan as the summer palace. To the year 650, when the Emperor Li Zhi (李治) was on throne (649-683), the large scale construction was taken in Daming Palace, and the imperial family was moved in the next year. From then on, the political center of the Tang Dynasty was relocated here.

Since Sui Dynasty to early Tang Dynasty, the general buildings in Chang’an City were relatively simple. However, from the era of Emperor Li Shimin (李世民 who was on throne from 627-649), it was becoming more and more extravagant, especially when the Emperor Li Longji (李隆基) was on throne from 712-756, a large number of luxury construction was taken. In addition to the Taiji Palace (太极宫 the former imperial palace of Sui Dynasty) and the Daming Palace (大明宫), he extended Xingqing Fang (兴庆坊) which hosted his residency into Xingqing Palace (兴庆宫) with many halls and pavilions. There was a period of time that Xingqing Palace (兴庆宫) became the political center of the Tang Dynasty. Besides, the Emperor Li Longji (李隆基) constructed the Qujiang excursion district (曲江名胜游览区), and excavated the drain through West Markets (former Liren Market). Since the An Lushan Rebellion (安史之乱) 48, the ministers pursued for luxury too much. But until the end of

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48 An Lushan Rebellion (安史之乱) was a rebellion occurred between 16 of Dec, 755 and 17 of Feb, 763, which
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In Tang Dynasty, the layout of the city Chang'an had no major changes.

Figure 1-4-10: the restored plane of capital Chang'an in Tang Dynasty. (From the Urban Planning Survey of China, noted by Huangshan)

In Tang Dynasty, the markets of Chang'an City were gathered in the East and the West Markets. There were foreign businessmen outside of the West Markets, where was the central point of international trade. On the other side in the East Markets located 120 rows of shops and workshops. When the Emperor Li Zhi was on throne from 649-683, once was the turning point from prosperous to decline of Tang Dynasty.
established the South Markets, but was disestablished soon by the Emperor after him, Wu Zetian\(^4\). In such a big city, the markets were all concentrated in two places was inconvenient for people’s lives, so there spread many other shops in each Lǐ Fāng (里坊 blocks). In the evening, although the gate of each Lǐ Fāng (里坊 blocks) was closed, some Lǐ Fāng (里坊 blocks) was still very lively. In Chang’an city, not every Lǐ Fāng (里坊 blocks) was in the same size, the small one was about a Chinese mile square, just like the traditional scale, while the large one would be times larger than the small ones. The thick walls were built around each Lǐ Fāng (里坊 blocks), some of them had 2 gates while others had four. Inside of each Lǐ Fāng (里坊 blocks) there was east-west street or cross streets of 15 meters in wide, and then, the entire Lǐ Fāng (里坊 blocks) was divided into 16 small plots by cross alleys about two meters wide and leading to various residences (Figure 1-4-11).

![Figure 1-4-11 the sketch of the gates, streets and alleys in Lǐ Fāng (里坊 blocks) (Drawn by Huangshan)](image)

There were many temples in Chang'an City, as well as the famous murals, but the theater field could rarely be found. The theater field in the Ci’en temple was the most famous. Moreover, Qujiang was the only

\(^4\) Wu Zetian (武则天) the only female emperor in Chinese history, on her throne from 690 to 705.
natural scenic, so public entertainment life is extremely limited.

Although the streets were wide in Chang'an City, they were all dirt road which became so muddy after heavy rain that the daily court meet had to stop. The road from the residence of prime minister to the Daming Palace was the only road paved by sands and was called sands dike (沙堤). On the roadside planted acacia trees and opened drains, and then there were thick walls of Lǐ Fāng (里坊 blocks) outside of the drains. As the result that all the street of Chang'an city had endless ranks of acacia trees and rammed earth walls on both sides, although there were gates of the minister mansion's and temples embellished, the streetscape was still very monotonous. The Lǐ Fāng (里坊 blocks) and markets system also bound the development of life and economic of the city residents. In respect of solving urban drainage and transportation, it was not good, either, so after a heavy rainstorm residents drowning accident and collapse of walls happened a lot. Then maybe because of transport barrier and the lack of food, the price of rice was soaring rapidly, even appeared the serious phenomenon that the Imperial Palaces only had 10 days of food stocks, which finally led to the abandonment of Chang'an city and move the capital eastwards.

Luoyang, as the east capital of Sui and Tang Dynasties was built in the first year of the Emperor Yang Guang (杨广) was on throne (605-618). In Early Tang Dynasty, the East Capital was abolished for a while, but soon it was reestablished. Then Shangyang Palace (上阳宫) was constructed, markets were moved, the others were basically as usual. In Sui Dynasty, the city Luoyang was in about 8 kilometers west of the city Luoyang from Han Dynasty, and was the new constructed city, so it had very
neat layout. Since the city Luoyang was the east capital, the scale was slightly smaller than the city Chang’an, the imperial city, the royal city, the Lǐ Fāng (里坊 blocks) and the streets were correspondingly reduced. The imperial city was not in the center but in the northwest area, to be distinct from the regulation of the capital Chang’an (Figure 1-4-12).

![Figure 1-4-12](1).4.1.4. The BianLiang city in North Song Dynasty (960-1127)

The region on the south of the Yangtze River had their economy been growing gradually and steadily in Sui and Tang Dynasties, and suffered less from war destruction during the Five Dynasties period, so each regime must rely on food and supplies from southern China. The city Bianliang (汴梁), which located in the water and land transportation network
hub between region on the south of the Yangtze River and Luoyang, gradually became a flourishing commercial city in Tang Dynasty. During Five Dynasties period, four of the five regimes had established their capitals here, which made the commercial more prosperous. When it came to the last regime of Five Dynasties period, the city Bianliang had become so crowded that the buildings were so closed to each other and there was no room for new buildings. In addition, people here suffered the pain of hot and humidity, often in fear of fire disasters. Obviously, to accommodate the regime power and the huge army, as well as the handicraft business and commercial caused by them in a medium sized city, was indeed impossible. Therefore, in year 956 the outward expansion for a few Chinese miles around the original Bianliang city was taken and the outer city walls was added. Meanwhile broaden the streets in the original city to 50 steps, under 30 steps and under 25 steps three kinds. On both sides of the streets within five steps can plant trees, dug wells and build pergola. When ZhaoKuangying (赵匡胤) captured the regime and established Song Dynasty, the city Bianliang was still used as the capital. During the Emperor Zhao Zhongzhen was on throne from 1067 to 1085, the outer city walls were rebuilt, and added the barbican city and watchtowers. In year 1116, the outer city walls were expanded southward for miles, in order to build up government offices and military barracks.

As the city Bianliang was expanded from a medium sized city, the imperial palaces and the royal city were all be altered from the old municipal government and the old city, although the expanded construction of the imperial city was taken at the beginning of Song Dynasty, it still had small scale, equal to 1/10 of the imperial city of

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50 Step (步) one step was about 1.3 meters in ancient China.
Chang’an. The area of the outer city was half as the city Chang’an. Because it was gradually expanded based on the actual situation of the various developing stages of the city, it was densely built, land was fully utilized, and the fire problems were particularly prominent. In North Song Dynasty, fire brigade and watch towers were established. The streets were not as straight as in Chang’an City which also reflected the features of reconstructed city. However, the imperial street in front of the Imperial city was very wide, with imperial corridor on the both sides. The imperial street was separated into three roads; the one in the middle was for the emperor. There were drainage ditches on each side. Due to the developed commercial, the city was full of stores, restaurants, hotels, bathrooms, medical shops, especially the areas of Zhouqiao Street (州桥大街), the Xiangguo Temple (相国寺), outside of the Cao Gate (曹门) and around Fengqiu Gate (封丘门) were most prosperous with thriving night markets. The supply of all kinds of food never stopped despite of the snowy and rainy days. There was the temple bazaar which opening up five times per month in Xiangguo Temple (相国寺).

Wu Zhang River (五丈河), Jinshui River (金水河), Cai River (蔡河) passed through the city, the Bian River (汴河) was the water transportation channel to the region on south of the Yangtze River. The rented and merchant ships could direct city parked in the city, the waterways were smoother than Luoyang. Inside the outer city along the Bian river located warehouse district, inside the royal city along the Bian river there was the inn district for southern officials and merchants’ accommodation. The traditional Lǐ Fǎng (里坊 block) System had been abolished completely and stead by a sleepless city filled with bustling markets everywhere, this was a big step forward in the history of urban
development in China.

The official government offices were partly located in the royal city and partly arranged outside of it mixed with residents, which was not as focus as in Chang'an City. More than 50 barracks and warehouses were scattered in the royal city (Figure 1-4-13).

![Diagram of capital Bianliang in North Song](image)

Figure 1-4-13 the diagrammatic sketch of capital Bianliang in North Song (From the Urban Planning Survey of Chinese Cities, noted by Huangshan)

The official government offices were partly located in the royal city and partly arranged outside of it mixed with residents, which was not as focus as in Chang'an City. More than 50 barracks and warehouses were scattered in the royal city.
The population of Bianliang city in Song had no accurate records, however, it was said "Today, gathered one hundred thousand soldiers and horses, all the people from the former dynasties in the capital Bianliang, which was ten times of the population of Chang’an city in Tang Dynasty". The annual consumption of grain was about 38 million kilograms. Thus, it can be estimated that the population was about more than a million.

The site of Bianliang city has been flooded by Yellow River; fortunately there are relative rich literature materials so we can still understand the general picture. In recent years, the exploration outer city walls clarified its contour and range further.

1.4.1.5 The Dadu city in Yuan Dynasty (1271-1368) and city of Beijing in Ming (1368-1644) and Qing (1644-1911) Dynasties

The city Beijing is located in the northern end of the north china plain, in the hub zone connecting to the northeast plain, and has formed the city here in the Warring States period. In Jin Dynasty (1115-1234)\textsuperscript{51}, the capital called Zhongdu (中都) was established on base of the former capital of Liao Dynasty (947-1125)\textsuperscript{52} but expanded towards east and south. According to records, the palace construction of Jin Dynasty imitated from capital Bianliang, and was more luxury than the palace in BianLiang. All the main door of the palaces were wholly covered with green glazed tiles, using white marble for Chinese tables and bridges, many windows and doors decoration were dismantled and shipped

\textsuperscript{51} Jin Dynasty (1115-1234) was the regime ruled by Jurchen (女真族) existed in almost the same time with South Song Dynasty in the northeast part of China.

\textsuperscript{52} Liao Dynasty (947-1125), was the regime ruled by the Khitan (契丹族) existed in almost the same time with North Song Dynasty in the very north part of China.
from BianLiang after captured the city. The first emperor of Yuan Dynasty used the Qionghua Island in the northeast of Zhongdu (中都) from Jin Dynasty as the core and constructed the new palace, and then subsequently built up the capital Dadu (大都) of Yuan Dynasty.

After the old city of Jin Dynasty was abandoned and the new capital was moved northward in Yuan Dynasty, officers and rich people moved into the new built city and the old city (Zhongdu 中都 from Jin Dynasty) became the residential areas for the general people, this pattern of two cities existing together had remained to the end of Yuan Dynasty. For the construction of the new city, the first emperor of Yuan Dynasty, Emperor Hubilie (忽必烈 was on the throne from 1271-1294) took the way of guarding the imperial city and royal city by outer city walls. The abundant springs from West Mountain\(^{53}\) and Changping\(^{54}\) areas was conducted into water canal --- Tonghui River (通惠河) which connected Tongzhou\(^{55}\) and city Dadu, so the food and supplies brought in by the Grand Canal and the sea could arrive directly at Haizi \(^{56}\)(海子 now Jishuitan) which was on north of Qionghua Island (琼华岛) via Tongzhou. Therefore, in Yuan Dynasty, the royal city was established next to Haizi which made the water transport very handy.

The capital Dadu (大都) was arranged imperial and royal city centered. As the terrain was flat, as well as the city was new built, so the road system was structured straight into square grids, the contours of the city close to a square. The central axis of the city was the central axis of the imperial city. The geometric center of the plane was at the

\(^{53}\) West Mountain: on the west of Beijing today.

\(^{54}\) Changping (昌平): A district belongs to Beijing which located on the northwest of Beijing today.

\(^{55}\) Tongzhou (通州): Another district belongs to Beijing which located on the southeast of Beijing today.

\(^{56}\) Haizi (海子 now jishuitan): the water from Tonghui River gathered together and formed a large lake in the city named Haizi (海子). It's called Jishui Pond which means stagnant water pond.
central station (中心台 now on the west of Beijing Drum Tower and on the east of the Jishuitan). There were two kinds of road types, the major roads and alleys whose width were 25 meters and 6-7 meters respectively. All the alleys had east-west direction; the distance from one to the other was about 50 steps, the lots between two alleys were divided into residential base. The regular streets arrangement formed two different ways of arranging residential areas from Lǐ Fāng (里坊 block) System before Song Dynasty. The restaurants and markets were scattered in the city, with the most lively point in the northeast of Haizi (海子) which was the endpoint of canal, followed by the intersection on the east and west sides of the imperial city. The northern part of the city was relatively desolate. The north-south major road of City Dadu had been set up with stone ditches draw out rain water. The Bell Tower and Drum Tower were established in the heart of the City.

The royal city biased towards the south of city Dadu (大都), including the imperial city, the Longfu Palace the Xingsheng Palace and the Imperial garden arranged on the west coast of Taiye Pool (太液池) surrounded an open water, which was different from a traditional palace layout and was an innovation of Yuan Dynasty. This may be related to the traditional concept, living by chasing the water and grassland, of nomadic Mongols. Due to the royal city location was close to the south of the former city, the most of the new city was built in the north of the royal city. This layout was determined by the specific conditions at that time.

In front of the royal city the Imperial Ancestral Temple (太庙) was located on the east, while the Alter of the Land and Grain (社稷坛) was arranged on the southwest. There were imperial city walls, the royal city
walls and the outer city walls with eleven gates in total. By the end of the Yuan Dynasty, in order to resist the farmers' rebel army, barbican city was added outside of the outer city walls. The openings of barbican city were built by bricks to prevent fire attacks (Figure 1-4-14).

Figure 1-4-14: the restored plane sketch of capital Dadu in Yuan Dynasty (From Chinese Ancient Architecture History, noted by Huangshan)
When Ming Dynasty ended totally Yuan Dynasty and set up the new regime, the city Dadu (大都) was renamed as Beijing (北京). The Emperor Zhu Di (朱棣, the fourth emperor of Ming Dynasty who was on the throne from 1402-1424) began to reconstruct the palace in Beijing from year 1407 in order to move the capital from Nanjing to Beijing. The construction was completed in year 1420, and the capital was formally moved, since then, Nanjing had become the provisional capital of Ming Dynasty.

The city Beijing of Ming Dynasty was reconstructed by taking use of the original city Dadu. The Ming regime captured city Dadu, although the Mongolia aristocracy had receded to Mobei (漠北), they were still looking for opportunity to invade southward. Therefore, in order to facilitate defense, the garrison of Ming dynasty abandoned the desolate area about 5 Chinese miles in wide on north of the city Dadu (Figure 1-4-15).

57 Nanjing (南京) was the capital of Ming Dynasty regime from when it first set up in the southern part of china in 1368 to it finally ended the ruling on the Center Plain of China by Yuan Dynasty of Mongols in 1388.
58 Mobei (漠北) the region in People's Republic of Mongolia and lake Baikal in Russia today.
The area of outer city was decreased. When the Emperor Zhu Di (朱棣) established the capital Beijing, he built up Wufu (五府) and Liubu (六部) in front of the royal city and moved the outer city walls southward for more than 1 Chinese miles. To the middle of Ming Dynasty, the Mongol horsemen repeatedly southward even approaching at city Beijing, so the outer city walls was added in year 1554, but because of

59 Wufu (五府), the highest military institutions command of the national army.

60 Liubu (六部), the highest government office in charge of each aspect of the country, like Central Organization Department, Ministry of Finance, The Central Propaganda Department, the Ministry of Education, Department of National Defense, the Ministry of Justice, the Ministry of Environmental Protection, the Ministry of Housing and Urban-Rural Development, the Ministry of Transport and so on.
insufficient financial resources, just south edge of the city where located
dense residential area was surrounded, the other three sides, West,
North, East did not continue to be built. Therefore, the plane of Beijing's
city wall became a shape as △. The scale of the city Beijing was not
expand any more in Qing Dynasty, the outline of the plane of the city
was no longer changed, the main construction was on imperial
palaces and gardens.

The added city walls in the south of city Beijing in Ming dynasty was 7950
meters from east to west and 3100 meters from north to south. There
were three gates on the south and another two gates on both east and
west. Five gates were opened on the north in which the tree in the
middle was the three south gates on the original city wall. The other two
gates connected to the outside of the city. The original city things was
6650 meters from east to west and 5350 meters from north to south, with
every two gates on east, north and west as well as the three south gate
(that were the three north gate of the added city). All these gates had
barbican city and tower. On the southeast and southwest corner of the
original city had turret built. The layout of city Beijing took the royal city
as the centre. The plane of the royal city was an irregular square,
located on the north-south axis of the city, and had gate opened on
four directions. The main entrance to the south is the Tiananmen (天安
门). On the south of Tiananmen, there is another front gate to the royal
city which was called Grate Ming Gate (大明门) in Ming dynasty and
renamed as Grate Qing Gate (大清门). Inside of the royal city there
were a large number of different types of construction, including of
palaces, gardens, Altars, government offices, temples, workshops,
warehouses and so on (Figure 1-4-16).
Figure 1-4-16 the imperial city as the core and axis of city Beijing (by Liudunzhen, from Chinese Ancient Architectural History, noted by Huangshan)
The imperial city (Forbidden City 紫禁城) as the core of the royal city located in the center part of city Beijing, surrounded by high walls and gates with four turrets in four ornate corners of the city, and moat. From the Grate Ming Gate (大明门), through the imperial city (Forbidden City 紫禁城) until Di’an gate, this axis was completely occupied by imperial palatine buildings. According to the traditional the ritual system thinking, the Imperial Ancestral Temple (太庙) was built on the left front of the imperial city (East), while the Alter of the Land and Grain (社稷坛) on the right (West), and the Temple of Heaven(天坛)(South) the Temple of Earth (地坛) (North), the Temple of the Sun (日坛)(East) and the Temple of the Moon (月坛)(West) were constructed outside of the city. Wufu (五府)61 and Liubu (六部) was set up on each sides in front of Tiananmen (天安门). In Ming Dynasty, the Forbidden City was rebuilt on the former site of the imperial city of the city Dadu (slightly southward), but the layout model was imitated from the palaces in Nanjing, just with more grand scale.

In the entire city Beijing, there was axis with total length of about 7.5 km run through the north to south. The axis started from the South Gate (Yongding Gate 永定门) of the added city, went by the South Gate (Zhengyang Gate) of the original city, the Tiananmen (天安门) and Duan Gate (端门) of the royal city, the Wu gate (午门) of the Forbidden City, then passed through the other three gates and seven halls and palaces, went out from Shenwu Gate (神武门), crossed Di’an Gate (地安门) and ending at Drum and Bell Tower on the northern end. Along this axis, on both sides, arranged, Temple of Heaven(天坛), Temple of Agriculture(先农坛), Alter of the Land and Grain (社稷坛), and other magnificent building groups in great size with vivid colors, which formed

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61 Wufu (五府), the highest military institutions command of the national army.
sharp contrast with the general public grey-tile-roof housing. It stressed the feudal emperors' authority and supreme position in urban planning and architectural design (Figure 1-4-17).

![Figure 1-4-17: The plane sketch of Beijing in the middle of Qing Dynasty](image)

The planning system of streets in the city from city Dadu was still in use. As the imperial city stood in the middle of the city with the long axis from north to south, the main roads mostly parallel to the two avenues on both side of the axis of the city. One of the avenue starts from Chongwen Gate (崇文门) and the other starts from Xuanwu Gate (宣武门).
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[门]), both of them went directly to the north wall, all the streets of Beijing are linked with these two avenues. But the transport connection from east to west was inconvenient, which also reflected the characteristics of empire service in a feudal capital. The alleys perpendicular to the two avenues and leading to the living area, had space of about 55 - 57 meters from one to the other. This was the scale left from city Dadu of Yuan dynasty. However, residences of high-brow, high-level officers were often built crossing the alleys, and free from this limitation. The official storehouse and offices which always occupied a large area often hindered the alley traffic. A considerable number of temples scattered all over the city, while the residences of urban civilians and housing for craftsmen who shifted into service in Beijing were squeezed in the streets behind the big house where were unoccupied.

The markets and restaurants of city Beijing relatively gathered on the four sides of the royal city, and formed four commercial centers. Each business or profession usually concentrated in the alley named by the profession. Such as sheep market, horse market, fruit market, towel and cap alley, pot alley, bowls alley, and so on, many of which are totally serving for ruling class living, such as jewelry market, silver bowl alley, ivory alley, and goldfish alley.

### 1.4.2 The construction of local cities

In Zhou Dynasty subinfeudated various vassal states (诸侯国)⁶², the number of cities was also equivalent. Ever since Spring and Autumn Period (春秋时期 770B.C.-476B.C.) and Warring States (战国 476B.C.-221B.C) the number of the cities was increasing rapidly. Form

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⁶² Vassal stats (诸侯国) refers to the appellation of the manor by the supreme ruler of the Central Plains, before Chinese Qin Dynasty (221B.C-202), while the supreme ruler of the manor is called vassal (诸侯).
Qin Dynasty (221 B.C.-202), every dynasty implemented the system of prefectures and counties. The counties and prefectures were the ruling stronghold of the court stationed political and military, and also are often the economic and cultural center. Some of them were the transportation hub, handicraft center; others were foreign trade port, or both. Some counties were set on the basis of the original naturally formed cities. As can be seen from the following table, although cities, countries and prefectures have been changing a lot, the number of the cities leveled above the county has always been more than a hundred.

**Numbers of provinces, prefectures and countries form Han to Qing Dynasties (List 1)**

<table>
<thead>
<tr>
<th></th>
<th>Han</th>
<th>Sui</th>
<th>Tang</th>
<th>Song</th>
<th>Yuan</th>
<th>Ming</th>
<th>Qing</th>
</tr>
</thead>
<tbody>
<tr>
<td>prefectures</td>
<td>103</td>
<td>190</td>
<td>30</td>
<td>33</td>
<td>140</td>
<td>309</td>
<td></td>
</tr>
<tr>
<td>provinces</td>
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<td>154</td>
<td>359</td>
<td>193</td>
<td>205</td>
<td></td>
<td></td>
</tr>
<tr>
<td>countries</td>
<td>1314</td>
<td>1255</td>
<td>1557</td>
<td>1234</td>
<td>1127</td>
<td>1138</td>
<td>1353</td>
</tr>
</tbody>
</table>

Each local central city which hosted the local government had a set of related institutions and facilities to ensure the effective operation of the regime. For example, in the Ming Dynasty, these facilities included: prefectural Yashu (府县衙署 head of the executive institutions), Chaiyuan (察院 prosecution agencies), Tax department/bureau (税课司/局), Inspection Division (巡检司 police agencies), Warehousing (仓贮 reserve the official grain), Confucianism (儒学 government-run schools), Dualistic policy and Medicine (阴阳学与医学 in charge of astronomy, meteorology, disaster reports and medical institutions), Pharmacy (惠民药局 in charge of medicine), Yangji hospital (养济院 adopt the orphans lonely old), Louze Park (漏泽园 buried ownerless corpse), the mountains
and river altar (山川坛 sacrificed to the god of thunder, cloud, wind and rain), Alter of the Land and Grain (社稷坛 sacrificed to god of soil and grains), Li Alter (厉坛 to worship the ghosts and spirits), the Chenghuang Temple (城惶庙 sacrificed to the local protection God), Bala Temple (八蜡庙 sacrificed to eight agricultural gods), and Sages Temple (sacrificed to Confucius and other sages of the past).

Other infrastructure of the local cities includes the following four aspects:

a) Defense project

It refers to moats, city walls and its ancillary facilities. This related to the major event of the city residents' safety and the survival of the regime, so every dynasty paid a lot attention on. In early times, the city walls were built up by earth. They dug trench and used the earth from the digging to construct the wall, which was logical and made balance the earth. In Ming dynasty, the majority the prefectures and countries built up city walls covered by bricks. In order to make it convenient to patrol and guard the city, watchtowers, turrets, and related buildings were built on the city walls. In some of the southern cities where rains frequently, the corridor was built on the entire city walls, known as the String Building (串楼), in order to avoid the burning sun and the invasion of wind and rain, the longest String Building had about 1400 Jiān (间 bays).

b) Water conservancy project

This plays an important role in urban transport, water supply, drainage and so on. The embankment outside the city to shutoff water and
formed the reservoir lakes, could not only guarantee the water for city life, but also increased suburban scenic and tourist places. Therefore, West Lake, East Lake, South Lake could easily be found across the country, and most of them were related to water conservancy construction. The city walls were both the defense project and the flood control projects. By shutting down the gates in the critical moment can resist floods outside of the city.

c) The road and sewer system

It rains less in the northern China, so they only had dust roads while in the south where rains plentifully, mostly roads were paved with brick. Before Tang Dynasty, most city bridges had wooden structure, but were gradually being replaced by the stone bridge since Song Dynasty. Sewer was located in the roadside. Some cities had a complete sewer system earlier, such as in Ganzhou City (赣州城 in Jiangxi Province today), it had been formed the city drainage system consisted by two subsystems name as Fu Ditch (福沟 blessing ditch) and Shou ditch (寿沟 longevity ditch) in North Song Dynasty. Fu Ditch (福沟 blessing ditch) collected the water from the south of the city, while the Shou ditch (寿沟 longevity ditch) collected the water from the north of the city, then led the water Gong River (贡江) on the east of the city and the Zhang River (章江) on the West of the city through 12 drains. Until now, there are 12.6 kilometers of ditches have been reserved with about 2 meters in deep and 0.6 to 1 m of width, and still plays important role in the drainage of Ganzhou old city area (Figure 1-4-18).
d) Post station facilities

In China, ever since the Han Dynasty, a national unified postal system had been established. Until the rise of the modern communications and traffic, the postal system still played an important role in the connecting communication and decrees passes between the central and local governments. The master post office was always set up in front of the prefectural Yashu (府县衙署) head of the executive institutions.

As for the layout of the city, it varied due to the different geographical conditions. City in the plains always had a squared shaped layout, mostly in rectangular with spacious straight roads in cross or T-shaped. Usually the Drum Tower and Bell Tower were setup in the city center. These characteristics can be seen from the city Xi'an in the Ming and
Qing Dynasties (Figure 1-4-19). The area of city Xi’an in Ming Dynasty was approximately equal to the royal city of capital Chang’an in Tang Dynasty. The cross-shaped street of the city was centered by the Bell Tower, and leading to the four gates. There were four small cities outside of each gate. This layout is typical in the northern cities. The existing Bell and Drum Tower of city Xi’an are the Ming Dynasty relics. Another example is the city of Guidefu 归德府城 (in shangqiu, Henan Province today). The original city was destroyed by Yellow River flood, so it was relocated on the high ground on the north of the original site in year 1512 (Figure 1-4-20). The plane of the city was a rectangle with the perimeter of 4.36 km, covering an area of 1.14 square kilometers. It had four gates, and 16 lookout towers on the city walls. The city streets was arranged relatively neat, with prefectural Yashu (府县衙署 head of the executive institutions), Chaiyuan (察院 prosecution agencies), and other organs of political power, occupied the central position. In order to defense the Yellow River flood, a dike built up by earth was added about 500 meters outside the city.

Figure 1-4-19 plane sketch of city Xi’an in Ming Dynasty (From the Urban Planning Survey of Chinese Cities, noted by Huangshan)
Figure 1-4-20 plane sketch of city Guidefu in Ming Dynasty (From the Urban Planning Survey of Chinese Cities, noted by Huangshan)

In the area of many rivers and hills, the terrain was complicated and changeable, so there were diverse urban layouts; the road system was often in irregular shape. If the city was established along the mountain, the main street was along the contour line. If the city was built up along the river, often it formed a ribbon shaped city. Such as the mountain city of Chongqing (重庆), which located in the on the hill connected the Yangtze River (长江) and Jialing River (嘉陵江), had formed the city which against the mountain and facing the water in the Warring States. Then it developed continuously towards the mountain, but the city extension remained essentially unchanged since Song to Qing Dynasty (Figure 1-4-21).
In the region on the south of the Yangtze River (长江), it was an area of water nets, and waterway-based, so the streets and houses were arranged on both sides of the banks. Therefore, the small cities often expanded along the river into a ribbon, while big cites formed the lump shape because of the cruciform, well-shaped cross-channel. Just like the Songjiang city (松江府城) in Ming Dynasty, in addition to the street system, there were river-way system. These two systems together formed the urban transport network. (Figure 1-4-22, 1-4-23) The famous ancient city of Suzhou (苏州), the city has numerous rivers that can be called as the typical of the urban layout in river region. The city was originally founded in the late Spring and Autumn period (514 B.C), according to the archaeological excavations and literature, we know that the
location of the city walls and the river system was formed before Tang Dynasty. In Tang Dynasty there was a particularly large number of bridges because of the city was fulfilled with river-way. The number of the bridges was between 390 and 370. In South Song Dynasty, Suzhou (苏州) was called Pingjiang (平江), was a very important city in both the economic and the military. At that time, the major rivers led to the gates, and ceded many branches leading to various living areas. Street, restaurants and houses were located on the banks. There were two moats surrounding both the inside and the outside of the city walls, which was not only the traffic ring road, but also a double moat to protect the city. All the river-way of the city formed a transportation network and drainage system. On the central south of the city located the small city of city government and army. The northern part of the city arranged the markets and residential areas.
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Figure 1-4-22 Plane of city Songjiang in Ming Dynasty (from Songjiang City Annals)

Figure 1-4-23 Plane of city Pingjiang in South Song Dynasty (From the Urban Planning...
1.5 Residential construction

Residential is one of the earliest human building types. The natural caves which were used more in winter and the nests set up by woods which were often lived in summer of the Paleolithic period, were the residential ways of the very ancient people. But back then, there was no fixed living places as the natural caves were not widely available and some of the individual units often needed movements and decompositions in case of the lack of production capacity from natural collection and hunting. In the area with absence of natural caves, the nest building constructed by woods to avoid the damages was developed; the sheltered rough shacks were built with branches, leaves, barks in the summer, while in the winter they covered the crypt with dirt, branches and thatches. This era was about 10,000 to 6,000 years ago. It was during this period when the human beings received more adequate and stable food supply for the first time by fishing and planting. The fishing and planning on one hand, met the basic food requirements, on the other hand, planting grain and fruits need to take a long time, which in itself shows that people have had the relatively stable living areas, this was the premier settlement.

To the Neolithic period, people in the most parts of China had been engaged in farming. The countryside ruins of village Jiang Zhai in Lintong, Shaanxi (陕西临潼姜寨村落遗址), is the reflection of the settled life of clan dominated by agriculture in this period (about 5000B.C to 3000B.C) The residential area of the village ruins was divided into five groups. Each set has a big house as the core, the other smaller houses standing around the open space in the middle and formed the circular
layout with the big house. It reflects the living situation of clan community (Figure 1-5-1).

![Plan of the countryside ruins of village Jiang Zhai in Lintong, Shaanxi](image)

Figure 1-5-1 Plan of the countryside ruins of village Jiang Zhai in Lintong, Shaanxi (Drawn by Huangshan)

The first human labor division, which emerged agriculture and formed stable living areas --- settlements; the second human labor division, which split off the commercial and handicraft from agriculture, the settlements differentiate into villages which were dominated by agriculture, and cities which were based on non-agricultural commercial and handicraft. It happened in the transition period from primitive society to slave society. Along with it, due to the different lifestyles and living environments, the residences of dignitaries in the city and the residence of plebeians in the villages had their own tracks in the long development of history. In general, the urban residence had relatively obvious shape changing along with the development of society while the rural residence was evolving constantly more on the suitable technology. Meanwhile, because of the population migration and cultural dissemination, there were mutual influential and exchange
between both. Settlements had different looks because the distinction between urban and rural. The city was self-contained, but the village, on the other hand, because of the continuity of the development of Chinese ancient agricultural society, has kept the two major characteristics of the early settlement: the first, expand lifestyle in order to adapt to local situation (such as local geography, climate, customs, etc.), the main activities of Han ethnic was agricultural; second, the kinship of family (clan in primitive social) was the ties of survive.

1.5.1 The evolution of the residential formation

According to Etiquette and Ceremonial’s records, in the Spring and Autumn Period (770BC-221BC), the residences of scholar-officials were composed of courtyard (Figure 1-5-2). There are three houses at the entrance, the central bay (明间) was used as the gate, the side bay on the right and left were used as private tutorage (塾). The courtyard was found when enter the gate, the building on the north was the main hall which was not only used for the activities of daily living, but also for meeting with the guests and hold ceremonies. On the right and left of the main hall, there was east and west wing room and the bedroom is in the back.

The residential formations in Han Dynasty, one of them inherited the traditional courtyard, which we can see according to the tomb stone reliefs, bricks and funerary objects. The smaller-scale residences were Sanheyuan (三合院), the "口" shaped courtyard formed by L-shaped

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63 Etiquette and Ceremonial (仪礼) is one of the thirteen Confucian scriptures, which recorded every kind of social behavior and ceremonial ritual as it was practiced and understood during the Spring and Autumn Period (or generally before Qin Dynasty 221BC-207BC).
64 Scholar-official (士大夫) is the common name of the ancient officials and the intellectuals who has community reputation and high position.
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house and walls, and the "日" shaped courtyard formed by dooryard and the backyard. (Figure 1-5-3, 1-5-4, 1-5-5)

![Sketch plan of residences for scholar-officials](image)

Figure 1-5-2 Sketch plan of residence for scholar-officials
(By Liu dunzhen, from Chinese Ancient Architecture History, noted by Huangshan)

![Sanheyuan (三合院) and L-shaped house](image)

Figure 1-5-3 diagrammatic sketch of Sanheyuan (三合院) (From Chinese Architectural History)

Figure 1-5-4 image of L-shaped house (by Liudunzhen, from Chinese Ancient Architectural History)
Figure 1-5-5 diagrammatic sketch of "日" shaped courtyard. (From Chinese Architectural History)
Figure 1-5-6 the portrait brick unearthed from Chengdu, Sichuan (From Chinese Architectural History)

The medium-scale residence, such as recorded in portrait brick unearthed from Chengdu, Sichuan (Figure 1-5-6), there were door, hall, and twofold of courtyard on the right side, which was the main part of the residential, the subsidiary buildings were on the left side, and also had twofold of courtyard. There was a tall building in square shape in the backyard. This type was developed on the basis of the courtyard, some of them expanded and increased courtyards forwards and backwards, and the others extended the courtyard to both sides, and set up the tall building with the intent of developing towards higher.

Another is to create a new system --- dock wall (坞壁), which was built up dock as surround fence; Doors were opened in front and at back. There was a watchtower built up inside of the dock wall and four turrets stood in each corner, similar with the defense system of the city (Figure 1-5-7, 1-5-8). Normally the owner of the dock wall was despotic landlord, who strengthened the defense with the dock wall, and organized private arms. By the time of Yellow Turban Rebellion\(^6\), there were

\(^6\) Yellow Turban Rebellion, is the popular uprisings occurred in the late East Han Dynasty (25-220) in China, and
famous dock walls like Xuchu wall (许褚壁), Zichao Dock (自超坞), Heshui Dock (合水坞), Tanshan Dock (檀山坞) and so on.

Figure 1-5-7 plan of the dock wall (Drawn by Huangshan)

Figure 1-5-8 the plan view and the diagrammatic sketch of the dock wall and the houses in it of the funerary objects from Han Dynasty, Guangdong, Guangzhou Province (Drawn by Huangshan)

also is the largest insurrection organized by religious forms in Chinese history. It began in year 184 (when the emperor Liu Hong was on the throne), led by ZhangJiao (张角). At that time, the court was corrupt, endless fighting happened in border; the national power was becoming increasingly weak. There was few grain harvest because of the nationwide drought, however the taxes was not diminished at all. So the desperate poor farmers rise in rebellion under Zhang Jiao's order, launched fierce attack to bureaucracy and landowners, and had a huge impact on the reign of the East Han Dynasty court. Although the uprising ended in failure, but the separatist warlord regimes and the situation that the Eastern Han Dynasty only existed in name was irreparable, eventually leading to the formation of the Three Kingdoms period (220-280).
In Southern and Northern Dynasties (南北朝 420-589), the gate of aristocratic residence was built up in hipped roof and Chī Wěn (鸱吻). There were mullioned windows in a row on the enclosure, and corridor surrounded the courtyard was built inside of the enclosure. Back then, many aristocratic bureaucrats left their residence to be a Buddhist temple. We could know from Monasteries of Luoyang (《洛阳伽蓝记》) that the residence were composed by a number of large halls, courtyards and corridors for different purposes.

Figure 1-5-9 the residence described in Dunhuang mural (敦煌壁画) (By Liudunzhen, from Chinese Ancient Architectural History)

In Sui and Tang Dynasties, the residence still commonly used mullioned window corridors formed the courtyard, which can be verified from the Dunhuang mural (敦煌壁画) (Figure 1-5-9). Some of the residential gates used Wutou gate form (乌头门), some of the gates still had hipped roof. There were both symmetric and asymmetric courtyards. However, from

66 the Monasteries of Luoyang (《洛阳伽蓝记》) is a master piece of history, geography, Buddhism and arts written by Yang Xuanzhi (杨炫之) in North Wei which recorded all the history and development, stories, architectures of all the Buddhist temples in city Luoyang.
the slave society to Tang Dynasty which was the mid-period of the feudal society, the evolution of the urban housing formation was relatively clear. It was closely related to detail practice, the increase and change of courtyard (in the palace the buildings in front were for the court and the buildings in the back were for sleeping and rest, while in a residence, the rooms for rest and sleeping was also located in the back of the living hall), and the gate system of the imperial palaces. Although the regulation was not as strict and specific as a palace, the interoperability between palace and residence more or less had something to do with their basic functional requirements and the city layout in the Lǐ Fāng (里坊 block) System.

The Lǐ Fāng (里坊 block) System disintegrated in Song Dynasty, the urban structure and layout had a fundamental change so that the urban residential formation was also diversified. Take the capital Bianliang (汴梁) of North Song Dynasty described in the painting Along the River During the Qingming Festival (清明上河图) for example, the plane figure was very free, some of the residences was closed by courtyard with gate set in front of the courtyard; Some of them opened the shop down to the street, and the house at back was used for living (Figure 1-5-10). There was a kind of “工” shaped residence in which two or three houses were connected by a hallways. The residence in Song Dynasty in order to increase the living space, the solo corridors were instead by rooms added on them. There was a screen wall standing right after the gate to separate the outside and the inside which formed a standard Siheyuan (四合院). Generally the residence of titled official

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67 Along the River During the Qingming Festival (清明上河图): The original painting of "Along the River during the Qingming Festival" has the length of 528 cm, and 24.8 cm of height, the first version was made by painter Zhang Zeduan (张择端) of the North Song Dynasty, now in the possession of the Palace Museum in Beijing (北京故宫博物院). The Painting depicted in North Song Dynasty the bustling and lively scene and beautiful natural scenery in the capital BianLiang and on both sides of the Bian River.
built up a row of room and used the one in the middle as gate. “The residence of the officials above level six was allowed to used Wutou gate (乌头门)...ordinary people were forbidden to use double eaves and colorful painting as decoration...they were not allowed to built the eaves outstretched on four directions...” («History of Song Dynasty»). In South Song Dynasty, in the area on the south of the Yangtze River, the residence was more like a courtyard garden, which had a bit impact on the later construction of urban residence and private garden in this area.

Figure 1-5-10 the residences of capital Bianliang of North Song Dynasty described in the painting Along the River during the Qingming Festival (from http://zh.wikipedia.org/wiki/qinmingshanghetu)

The archaeological discoveries on the ruins of the residences in Beijing Houyingfang Hutong (北京后英房胡同) proved that there still existed the residence with the main house in “工” shaped plan (Figure 1-5-11). In Ming and Qing dynasties, the residence in northern China represented by Siheyua, arranged the houses and courtyards symmetrically along the north-south longitudinal axis; the residence in the south region of Yangtze River, had enclosed courtyard units arranged along the longitudinal axis, but the direction was not always towards due North-South. Large-scale residence had three longitudinal groups of courtyards on left, right and in the middle. The garden was built up on
the left or right at the back of the houses, which created a beautiful and suitable for living urban residential living environment.

Figure 1-5-11 the diagrammatic sketch of partial plan of the residences in Beijing houyingfang Hutong (Drawn by Huangshan)

### 1.5.2 The residential building types

China has many ethnics and a large territory. The ancients created different living environments in different environments, climates, customs and cultures. Meanwhile, the residence provided us a series of appropriate technology due to the necessary of adjusting to the local conditions, the various materials and the reasonable structure. The slow development and blocking traffic in ancient social allowed these architecture characteristics to be kept in long-term. For example, in the southern mountain where the climate is hot and humid, there is overhead construction built by bamboo or wood --- GanLan(干阑 more information in following paragraph); The northern nomad has yurt residence which is light wooden frame covered with felt blankets and can be migrated easily; The area that lives Uyghur (維吾尔族) in Xinjiang (新疆) is dry and rarely rains, so they have residence of earth walls with
flat-topped or dome; the people in the middle and upper reaches of the Yellow River dig the horizontal hole in the loess cliff to be the residence, and it was called the cave-house (窑洞); The residences in the forest of northeast and southwest use crude wood field up as walls, this building type is called well-frame System (井干式). The build types of residences are most representative, both of the historical development and across the regional limitation. Take the existing residences of Ming and Qing dynasties as examples described below:

**a) wooden framed the Chuan Dou System (穿斗式), the Tai Liang System (抬梁式) and the mixed system**

Mainly distributed in Beijing (北京), Jiangsu (江苏) and Zhejiang (浙江), southern Anhui (皖南), Jiangxi (江西), Hubei (湖北), Yunnan (云南), Sichuan (四川), Hunan (湖南), and Guizhou (贵州).

The techniques of Chuan Dou System (穿斗式) and Tai Liang System (抬梁式) had already matured in the Han Dynasty, then these two structure systems were used commonly in residences among a wide range thereafter. The Tai Liang System (抬梁式) (Figure 1-5-12) was more popular in northern China, which was represented by the main house of Siheyuan (四合院) in Beijing. In southern China, the Tai Liang System was more often applied, such as the main part of the Bai ethnic’s residence in Yunnan (云南), the residence of Yi ethnic was built of Chuan Dou System (穿斗式) without landing which forms a wooden arch frame.
The side frontons of the residences in area of southern Anhui, Jiangsu, Zhejiang and Jiangxi take use of Chuan Dou System (穿斗式) (Figure 1-5-13) with relatively intensive columns and beams horizontally combined, and supplemented by the walls to enhance the wind-resistant performance; in order to make the center bay more spatial and solemn, although the column and beam was combined by horizontal tenon joint which has the characteristics of Chuan Dou System (穿斗式), the large beam was used to connect the front and back columns together, eliminating the need for so many columns, and then the large beam carried up the upper beam frames, which makes it a mixed system (Figure 1-5-14).
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Figure 1-5-13 wooden structure of Chuan Dou System (穿斗式) system of Ethnic Yi’s residence in Sichuan (From Chinese Residential Architecture Brief History)

Figure 1-5-14 diagrammatic sketch of mixed system of residence in southern Anhui (皖南) (From Chinese Residential Architecture Brief History)

b) bamboo or wood structured --- GanLan(干阑) system\(^\text{68}\).

Mainly distributed in Guangxi (广西), Hainan (海南), Guizhou (贵州), Sichuan (四川) and other ethnic minorities regions.

In popular residences, the GanLan(干阑) system has the main

\(^{68}\) GanLan(干阑) style, it is a popular primitive form of residence in the area of the Yangtze River and further south in ancient China, which is using erected wooden or bamboo as under frame to support the house above ground.
characteristics of supporting the housing by beams and columns made of bamboo and wood. It was widely distributed, mainly used in the wet mountain area or the region nearby water. The GanLan(干阑) system (Figure 1-5-15) architecture in Yuyao Hemudu of Zhejiang province (浙江余姚河姆渡), which has the components of the tenon-and-mortises, was the first discovery in the area south of the Yangtze River of Neolithic period. Then there was from Shang Dynasty (17centryBC-11centryBC) unearthed in dry twelve bridge in Chengdu, Sichuan (四川成都十二桥), large scale of GanLan(干阑) system residence from West Zhou (11centryBC-771BC) was discovered in Qichun Hubei (湖北蕲春), and also there was sites of GanLan(干阑) system architecture in Jianchuan hanmenou, Yunnan (云南剑川海门口). But, in this sites of GanLan(干阑) system architecture in Yunnan, the housing had one end resting on the shore, and most of the rest part was supported over the water. It belongs to the era of Chalcolithic (金石并用时代)69. The funerary objects from Han Dynasty (202BC-220) unearthed in Guangzhou proved that has been very popular in Han Dynasty. In Ming and Qing dynasties (1368-1911, a lot of the GanLan(干阑) system architecture has been used in the southern minority areas. In the north, this system became rarely used since Han Dynasty, except there was a kind of GanLan(干阑) system architecture used as warehouse dry in northeast which was not tall from the ground just for moisture proof.

69 Chalcolithic (金石并用时代), following after the Neolithic period, before the Bronze Age, which was the transition period.
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Figure 1-5-15 the GanLan(干阑) system residence of Ethnic Chuang
(From Chinese Residential Architecture Brief History, by Liu zhiping and Wang qiming)

c) The wooden Well-frame system (井干式).

It mainly distributed in forested areas of Northeast and Yunnan Province.

Field up crude wood as load-bearing structural walls, it was used in our primitive society. The Emperor Liu Che (刘彻 who was on the throne from 1401BC to 87BC) of Han Dynasty had built up well-frame system building, the Xijing Fu (西京赋) had description that “the well frame field up for hundred layers”, which both proved that the use range of well-frame system should not only be the later-seen forest areas in northeast and Yunnan. The well-frame system residence in northeast and Yunnan forest areas, have a common practice among the people which has tenon- and-mortised on the ends for field up. However, due to the length limitation of the woods, usually the house has smaller bay (Figure 1-5-16).

Xijing Fu (西京赋) which was written by Zhang heng (张衡), describes the bustling in capital Chang’an, satirizes the extravagant atmosphere of the society, has both literary value and historical research value.
d) The load-bearing brick-wall system (砖墙承重式).

Distribution: Shanxi (山西), Hebei (河北), Henan (河南), Shaanxi (陕西).

The warehouse of Han Dynasty unearthed in Luoyang, Henan, had many square shaped brick-wall rooms, which demonstrated the technology has quite developed, but bricks were not popularized in over-ground residential buildings. It was in Ming Dynasty when bricks became commonly used in residential walls and for load-bearing, and therefore it formed and widespread the flush-gable roof (硬山顶) residence in north China. Generally in northern Siheyuan (四合院), there are three bays of rooms in each direction. Sometimes, there would be a wall built up in the middle of the middle bay of each direction in order to support the purline, transfer load and in this case fire pit position could also be reasonably arranged which forms a one bay and half room (Figure 1-5-17).
e) The bastion building (碉楼).

Mainly founded in Xikang (西康 now in Sichuan Province), Qinghai-Tibet Plateau (青藏高原), Inner Mongolia (内蒙古).

Along the southwestern border, there existed the bastion building since Han Dynasty or even earlier. The ethnic Ran Mang (冉駩) in Han Dynasty, which was called Jia Liang Yi (嘉良夷) in Sui and Tang dynasties, which is modern Jiarong (嘉戎), move out from Qiongdu of Tibet was one branch of Tibetan. The residence they lived in, was first called as bastion (碉) in the book “Wide records of Middle Shu (《蜀中广记》, shu 蜀: Sichuan Province today ) written by Cao Xuequan (曹学全) from Ming Dynasty. It can be known that this bastion residence had related to the special geographical environment in mountain area. This area was mountainous and the stones were slate or have gneiss structure, which could be easily flaked for processing, so the stones were obtained.
conveniently. The exterior walls of the bastion building were thick Shoufen\textsuperscript{71} stone walls (ground floor is up to 40 cm thick and the total height is up 10 meters). There were storied building inside. The floor slabs were earth surface which was made by displaying wood batten densely on wooden beams and cover a layer of twigs, then cover a 20 cm-thick layer of tamped earth (the finer practice would had wooden slab on the tamped earth). There also was tamped earth of 30 cm thick on the roof. This kind of particular practice was related to the local dry windy plateau climate (Figure 1-5-18).

\textsuperscript{71} Shoufen (收分): The Chinese ancient cylinder have different diameters from up to down ends, except for some really short columns, the others are all not the cylinders which have the same upper and lower diameter, but the down side is a little thicker while the upper side is a little thinner. This practice is known as Shoufen.
f) The earthen building (土楼)

Mainly distributed in: Fujian (福建), Guangdong (广东), southern Jiangxi (江西).

The earthen building is the residence of ethnic Hakka who moved to south China from Central Plains in order to escape the war happened in the north since the Three Kingdoms period, until Tang, Song, Ming and Qing several main dynastie. The types and distribution of the earth building, is consistent with the distribution pattern of the Hakka.

The ethnic Hakka is mostly living in the bordering area of Guangzhou, Fujian, and Jiangxi these three provinces and in Guangxi, Taiwan, Hainan and other provinces. The soil of these areas are mostly red soil or lateritic soil, which have heavy clay texture and good toughness, unlike loose sandy soil of the Central Plains, it could be tamped for tall walls with minor processing. In the mountains of the region abounded hardwood and bamboo. The hardwood was used for building houses and the bamboo provided the equivalent of the building skeleton’s connection. At the same time, due to the geographical and climatic reasons, the Hakka people changed from wheat culture to the culture of rice, so glutinous rice, brown sugar, became the best coagulant. These three building materials, together with gravel and lime together, composed variety kinds of earthen building (Figure 1-5-19).
(g) Yaodong (窑洞 Cave dwelling or House cave)

Main distribution: western Henan (豫西), norte of Shaanxi (陕北), Turpan area in Xinjiang (新疆吐鲁番).

The predecessor of Yaodong (窑洞 Cave dwelling) cave dwelling was the horizontal cave of the primitive society. The underground grain cave group discovered in Luoyang proves that the house cave having at least 4,000 years of history. The 19 house cave sites excavated in Luliang area, Shanxi (晋西吕梁地区) was house cave with “凸” shaped plan and dome roof, were in the era of about 4500-4300 years ago. The house cave residence characterized on rising of arch in natural soil, and was mainly popular in the Loess Plateau and Turpan vicinity where the climate is drought and hot. In the city sites of Jiaohe (交河) and Gaochang (高昌) from the Han and Tang Dynasties the semi-underground house cave with dome roof still could be founded.
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The house cave which still can be seen in eastern Gansu (陇东), northern Shaanxi (陕北) has arch line in almost parabolic shape, the span is of 3-4 meters. The western Henan (豫西) house cave are mostly semi-arched (Figure 1-5-20).

![Diagrammatic sketch of Yaodong (house cave)](image)

Figure 1-5-20 diagrammatic sketch of Yaodong (house cave) (Drawn by Huangshan)

**h) Ayi Wang (阿以旺)**

Distribution: southern Xinjiang Province (新疆南部).

Ayi Wang (阿以旺) (Figure 1-5-21) is the common residence of ethnic Uygur in Xinjiang and has three or four hundred years of history. It has wood and earth structure, flat roof and side corridor. The so-called Ayi Wang (阿以旺) is a kind of summer room (big hall) with a patio in the middle for lighting, the skylight was above the roof about 40-80 cm. It is used for living, receiving visitors, the part behind is used as bedroom which is also known as winter room and each room also has patio hole for lighting. The roof of Ayi Wang (阿以旺) placed wooden purlins the top of the wooden beams. There are earth stations of 40-50 cm height set
up against the wall inside of the room for the daily living. The Indoor space has many alcoves decorated with plaster pattern, which can be used for storing the bedding or debris. The walls are likely to be decorated by fabric and its texture, size, and the number identify the status and wealth of the owner. There is courtyard on the house side, and can be used for daily life in summer under the grape trellis\textsuperscript{72}.

![Diagrammatic sketch of Ayi Wang (阿以旺) in Xinjiang](From Chinese Traditional Residential Architecture)

i) Yurt (毡包).

Mainly found in: Inner Mongolia (内蒙古), Xinjiang (新疆).

The yurt is mainly the residential building system of nomad who mostly lives the nomadic life. The Qin Dynasty (221BC-207BC) had such kind of construction; it can be commonly seen in the records of Han Dynasty; the herdsman in Tang Dynasty also liked to use it, because the convenience of living by the water and being moved every easily. In Yuan and Qing Dynasties, it was extensively used as the country was dominated by minority (Mongolian and Manchu respectively), and

\textsuperscript{72} Grapes are abounded in Xinjiang and almost every Uygur family plant grapes in their courtyards.
formed the yurt of settlers system. The users are mainly Mongolian herders, besides Kazak, Uygur, Tajik and other ethnics (Figure 1-5-22).

![Figure 1-5-22 diagrammatic sketch of Yurt (毡包) in Inner Mongolia (From Chinese Traditional Residential Architecture)](image)

The yurt has a simple structure and can be built up easily. When erecting, the ground turf need to be shoveled and slightly made flat. Dig shallow through-line on the ground in accordance with the size of the yurt, then erected skeletons of branches lashing by thongs enclosed into a wall, then placed an umbrella arched net brace on it and fastened by sheepskin on the junction with the vertical skeletons. Finally, covered the sheepskin or felt on the outside and roped tightly. In order to be damp proof, a layer of sands or sheep manure were paved in the inner ground, the covered by leather packing and blankets. There is a round hole on top of the umbrella shaped skeleton center, at daytime the sheepskin or felt can be ripped off for lighting. The entrance of the yurt is generally short and small; normally people need to stoop to get in.

From the constructive system which is supporting the main body of the residence, these are several main different types above. But in reality, a
complete residence is often finished by multiple constructive systems together. The One Seal residence in Yunnan (云南一颗印住宅) (Figure 1-5-23) is characterized that the site and appearance are squared such as a seal, distributed in the area around Kunming (昆明), west until Dali (大理), south to Pu’er (普洱), Mojiang (墨江), Jianshui (建水), east to Zhaotong (昭通), Zhanyi (沾益). Due to the windy weather in plateau area, the walls are built thick and the tiles were heavy. The outer enclosure of the residence are built by thick adobe brick or rammed earth, or with bricks outside packed rammed earth inside, known as the "Gold Packing Silver". The houses inside of the “seal” are mainly in Chuan Dou System (穿斗式) (Figure 1-5-13). Another example is the residences in Huizhou (Anhui 安徽) are mainly Chuan Dou System (穿斗式) or the mixed system, however, because the buildings are arranged densely and in the mountain area, the fireproof and wind proof are very important. So except the beams are wooden-framed, the gable is of brickwork and connected to columns and beams by Ironwork links, so the wet climate will not affected the wooden structure. The bastion building (碉楼), the earthen building (土楼) and Ayi Wang (阿以旺) are all built by wood and earth together.
bricks, the inner structure is of Chuan Dou System.
(From Chinese Traditional Residential Architecture, by Wang zhili and Zhang zugang)

1.5.3 Examples

a) Beijing Siheyuan (北京四合院)

Beijing Siheyuan (北京四合院) is the typical representation of the courtyard-style residence in the northern China. The plan layout is characterized by courtyard, and has two, three, four or five courtyards connected according to the status of the owner and the situation of the base (the unoccupied area between two alleys) (Figure 1-5-24). The large residence in addition to the vertical courtyards, also increased parallel courtyards in horizontal direction, and has garden in the back.

Figure 1-5-24 the typical neighborhood and the layout of siheyuan in Qing Dynasty in Beijing (By Liu dunzhen, from Chinese Ancient Architecture History)

Take the most common three-courtyard Siheyuan as example (Figure 1-5-25, 1-5-26, 1-5-27). The front yard has small depth and mainly
located the back-seat houses, which are used primarily as concierge and guests room. The gate is located in the east of the back-seat houses, the southeast corner of the whole residence. The room next to the gate is more likely being used for concierge or the bedroom of butlers. The small yard on the east of the gate is for private school. The bathroom is located in the small yard on the west of the back-seat houses. The front yard is more like a reception area, guest and visitors cannot enter the main yard until they are invited.

The inner yard (main yard) is the place for family's main activities. The front yard and the inner yard is separated by Hanging-Flower Door (垂花门) on the central axis, which also is the boundary of the inside and outside. The house on north of the inner yard is the main house, also known as upper house, north house, or main house, is the largest sized and highest positioned house in the entire residence, used for the living of the seniorities. The houses on both sides of the inner court are called the east wing room (东厢房) and the west wing room (西厢房), which are used for the living of the younger generation. The lower and smaller houses at on both sides of the main house are called the ear-house (耳房 as it looks like two ears of the main house). The narrow space enclosed by ear-house, gable of the wing room and wall of the yard is called open field (露地), which is often used as small yard for odds and ends. Sometimes the rockery, or flowers and trees are arranged here in some residence. There are Chao Shou veranda (抄手游廊) connect the Hanging-Flower Door (垂花门), the wing rooms and the main house which makes it more convenient for walking in the rainy and snowing days. Inner courtyard has large area, with flowers and trees planted

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Hanging-Flower Door (垂花门): The secondary gate in a traditional Chinese courtyard with characteristically inverted carved poles hanging from the top of the gate and decorated with flowers.
and furnished aquarium and bonsai, which provide a quiet and comfortable living environment for enjoying the cool air or other activities of the family.

Figure 1-5-25 air view of typical three-yard Siheyuan in Beijing
(By Ma bingjian, from Architecture of Siheyuan in Beijing, noted by Huangshan)

Figure 1-5-26 plan of typical three-yard Siheyuan in Beijing
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(By Ma bingjian, from Architecture of Siheyuan in Beijing, noted by Huangshan)

The back houses stand in the most northern part of the whole residence which forms the back yard of the residence. The back houses host kitchen, bathrooms, storage, and the rooms for servants, etc. If there is a back door of the yard, it would be located in the northwest bay of the back houses. There is well in the back yard. The backyard is the area for family service.

![Figure 1-5-27 the elevation of main house and section of the wing rooms of typical Siheyuan in Beijing (By Ma bingjian, from Architecture of Siheyuan in Beijing)](image)

The entire Siheyuan is axial symmetrical, hierarchical and in order, just like a microcosm of the capital regulation. The gates are the boundaries of inside and outside, the lead of the order and the manifestation of the status. Such as the gate, the screen wall is set up on the wall directly facing the street throughout the gate; people need to turn left to go into the front yard. This group of doors and wall become a good conversion between the outer and the inner part. The gate has edifice-style and wall-style two kinds. The former one has higher level, in which have the gate of princely residence and the gate of the residence of other ordinary lords, like Guanglaing Gate (广亮大门 Figure 1-5-28, 1-5-29, 1-5-30). The lower level gate, like Ruyi Gate (如意门 Figure 1-5-31, 1-5-32, 1-5-33), which is the most common gate of
Siheyuan in Beijing. The Hanging-Flower Door (垂花门 Figure 1-5-34, 1-5-35) is the door of the inner yard, its height and gorgeous depends on the social status of the owner.

Figure 1-5-28 photo of Guanglaing Gate (From internet)
Figure 1-5-29, 1-5-30 elevation and plan of Guanglaing Gate (Drawn by Huangshan)

Figure 1-5-31 photo of Ruyi Gate (如意门) (From internet)
Figure 1-5-32, 1-5-33 elevation and plan of Ruyi Gate (Drawn by Huangshan)
Beijing Siheyuan, after long-term regulatory constraints and the development of construction technology, has a more standardized and mature way of construction. The main building is Tai Laing System (抬梁式) and of flush-gable roof (硬山顶), secondary houses, such as the ear-house (耳房) sometimes use flat roof. The houses have thick walls, and do not open towards outside, the lighting rely on the window opening towards the inner courtyard, so there is less noise and less dusty.

The Kang (炕 Bed-stove) is ofteh set up in the rooms for heating. There are several kinds of partition to separate the space, like partition wall (nailed board on wooden-framing, and paste paper on the outer), Bi Sha Zhao (碧纱罩 lightweight partition board, decorated with calligraphy and painting which can be taken off), and a variety of ground partition (落地罩). The roof is composed by frame and the surface. The fancy frame is made by wooden grid, while the general ones are tied by straw. The surface is mounted by paper. The floor is always paved by bricks; there are squared brick and small brick two
kinds. In higher level residence, the bricks for paving the floor have large size. After the bricks have been paved, a few later of tung oil (桐油) would be spread and it would be waxed. The outdoor ground is paved with ordinary bar brick, but the axis of the road is commonly paved by squared bricks.

The Beijing Siheyuan is naïve and practical whose color is also mainly in gray (roof) and blue (bricks). However, the regulation still reflects the pecking distinct, orderliness and generous temperament connected to the capital city.

b) The patio residence in Dongshan, Wu District, Jiangsu Province (江苏吴县东山天井式住宅)

The residence of southern Jiangsu Province in lower reaches of the Yangtze River roughly has the following levels: First, the residence of officials in the city. It often has a deep depth with two or three transversal parallel axis. Starting from the main entrance, the door way, sedan-chair hall gatehouse, main hall and main house are arranged on the central axis. The buildings are apart and connected by small yards between them. The floral hall, study, bedroom, small garden and stage are arranged on the two side axis. The second is the patio residence in village and towns. It has symmetric plan, but with only one axis. The gate house, sedan-chair hall, main hall and houses are arranged on the axis. Some others have the storehouse. In the area of water network, in addition to the sedan-chair hall, the boat hall is set up. The third is the small residence among the people, which has mostly irregular plan; the main building is still enclosed of patio style. However, the gate conforms to the streets, so it appears oblique and side entrance and the case of
using the surrounding irregular terrain as garden. Also there is some buildings erected near the water, and have access doorways both on the street and the water. Zunrang Tang in Dongshan, Wu District, Jiangsu Province (江苏吴县东山秋官第尊让堂天井式住宅) belongs to the second type.

![Diagram](image)

**Figure 1-5-36** the plan of first floor of Zunrang Tang in Dongshan, Wu District, Jiangsu Province (Drawn by Huangshan)

The Zunrang Tang in Dongshan, Wu District, Jiangsu Province (江苏吴县东山秋官第尊让堂天井式住宅) is Ming Dynasty architecture whose plane was inverted "凸" shape (Figure 1-5-36). The first small "口" is a yard enclosed by buildings with the stairs standing on the right side. The building facing the yard has three-bay. The central bay is a hall (equivalent to the sedan-chair hall); the two side bay is used as bedroom. The big "口" of the inverted "凸" shaped plan is a patio enclosed by a five-bay storied building and two wing rooms. This
building has the deep depth and wide bay, the central bay is the main hall for living and the rest bays are bedrooms. There are horizontal yard and veranda connecting between the two "口", which have both patrol and fire proof functions. The inner door is located in the middle of the horizontal yard and veranda, as the boundary of the inside and outside. There is a long horizontal strip yard behind the main building. The two groups of buildings are both storied buildings, so the patio is profound, with big volume of ventilation. The yard and veranda in the middle of the two yard and the yard at the back of the building are both formed by storied buildings and tall walls which are efficient for both ventilation and lighting. This kind of patio residence reduces the solar radiation to make it cool and pleasant for living. In addition it takes less area, so it is typical residential form in the region of southern Yangtze River where has economic prosperity and large population in Ming and Qing Dynasties.

Figure 1-5-37 sections of Zunrang Tang in Dongshan, Wu District, Jiangsu Province
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(From Chinese Ancient Architecture History)

This storied building also has very regional characteristics (Figure 1-5-37). Its beam frame on the front of the central bay is of Tai Liang System (抬梁式), but the other beam frames on the side bay are of Chuan Dou System (穿斗式). In this case the central bay which is used as the main hall is very spatial, while the other beam frames has interweaved with many columns standing on the floor so the stories building is high but of stable structure. Another characteristic is upstairs column and downstairs column are not aligned. The upper columns stand on the beam, so the underlying has larger beam. Talking about the beam member, the beam is of moon shaped, which is cutting the ends of the beam flat, supporting the purlin and sitting on the Zuò Dǒu (坐斗)\footnote{Zuò Dǒu (坐斗): See Figure2-2-5.}. The weight of the ridge purlin is passed on the beam directly by the Zuò Dǒu (坐斗) of two layers of dǒu gǒng (斗栱 bracket set). The wing room has shallow depth.

The wooden structure of windows and doors are thin and fine in simple flowing lines. In order to break the over straight of the 5 bay storied building, the main ridge is divided into 3 sections with ends lightly up warped, combined with gray tiles and white walls, the refined residential style of southern Yangtze River is totally filling.

c) The Yaodong (Cave Dwelling or House cave) of Gong District in Henan Province (河南巩县窑洞)

Loess Plateau is the hometown of Yaodong (House cave 窑洞). The Gong District locates in the southern edge of the Loess Plateau, where has a large area of eolian loess facing, accounted for 60% of whole
area of the district. The thickness is from ten to one hundred meters. Again because of the dry climate, it is suitable to excavate house cave for living. In year 1978, niche tomb and circular foundations were founded in the Peligang Culture Sites (裴李岗文化遗址) which was earlier than the Yangshao Culture (仰韶文化)75 in Tiesheng Village of Gong District (巩县铁生沟村). The niche tomb is a horizontal cave. There is another iron smelting sites with 180 meters long from east to west and 120 meters wide from north to south from Han Dynasty in Tiesheng Village. The arched tunnel construction is founded in iron smelting furnace, which is inside lining of the horizontal cave. A lot of horizontal caves from Han Dynasty tomb were founded out from the loess facing in the villages near Tiesheng Village. In Sui Dynasty, the horizontal caves used for living have had literal records. The great poet Dufu (杜甫) of Tang Dynasty was born in the house cave. In Song Dynasty, the house cave has become popular. In the later process of development, there are three main types of house cave: (1) open cave by cliff; (2) sinking-mode cave yard; (3) brick-built cave.

Figure 1-5-38 plan of the Kang Million Manor (康百万庄园) house cave group
(By Liu jinzong and Han yaowu, from the Historical and Cultural Work of Residence)

75 Yangshao Culture (仰韶文化) (5000BC-3000BC) was a Neolithic culture that existed extensively along the Yellow River in China.
The Kang Million Manor (康百万庄园) house cave group (窑群) from Ming and Qing Dynasties in the Kangdian Village of Gong District (巩县康店村) is the largest scale open-cave-by-cliff residential group in the area of Loess Plateau in China. (Figure 1-5-38). The Kang Million Manor (康百万庄园) covers an area of 64,300 square meters, in addition to the 73 brick-built caves, it has 16 brick-arched open caves by cliff in the main house zone. The whole group was arranged along the loess cliff and laid out in fold line, composing of the five parallel courtyards. When Eight Nation Allied Forces\textsuperscript{76} invaded China (year 1900), the Empress Dowager (慈禧太后) and Emperor Guangxu (光绪皇帝) run away to the west and on their way back to Beijing via Gong Distric, The family Kang used million of teals to welcome and host the emperor. Empress Dowager (慈禧太后) said the Kang family was a millionaire, then the family became famous on this.

The sinking-mode cave yard, is dug the earthen under the ground level into a yard in the case of no natural cliff, then excavated the house caves on the walls of the yard (Figure 1-5-39). The first problem need to be solved is the traffic connecting the cave yard to the ground. The common way of the solutions are ramps, stairs, straight-through or combined ramps and stairs together (Figure 1-5-39, 1-5-40). Then the yard needs drainage, there are two ways to solve the problem, dig culverts outwards or dig seepage wells in the yard. Furthermore, there must be enough height of soil to above the cave to meet the structural and functional requirements. Normally it is three meters. This kind of house cave yard can be seen in West Village (西村乡), Kang Dian Village (康店乡) and Xiaoyi Town (孝义镇) of Gong District.

\textsuperscript{76} Eight Nation Allied Forces (八国联军) was an alliance of Austria-Hungary, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States, whose military forces intervened in China in the summer of 1900.
The example of brick-built cave is the Zhang Gao Manor (张诰庄园) of Xin Zhong Village in Gong District (巩县新中乡). It was built up in the late Qing Dynasty and the Republic of China, arranged in three stepped area depending on the mountain. Each house cave is of 4 meters wide, 12 meters deep and 3.5 meters high. There are wing rooms with gable-and-hipped roof (歇山顶) and verandahs on both sides of the house cave, which enclosed a individual yard with the house cave. The stairs were set up to connect the house caves on each step, which formed the manor with rich stereo vision.

However, no matter which kind of the house cave, they all take obtaining the space towards loess and occupying less ground as the principle, characterized of arched structure. When more than one room
is needed, several caves in parallel could be connected or it could be developed in depth (up to more than 20 meters), and forms the house cave sets. Some of them dig a small cave on one end of the big cave and formed a turned house cave (拐窑), the others has a small cave perpendicular to the big cave and it is called Mother and Child house cave (母子窑) (Figure 1-5-41). Generally the kitchen, bed stove and all day living activities are arranged near the mouth of the house cave where the air is sufficient. The area in depth is for storage. The façade of the house cave is decorated with bricks or built into a circular arch, or built like a wooded structure Hanging-Flower Door (垂花门).

![Figure 1-5-41 ways of organizing more than one house caves (Drawn by Huangshan)](image)

The house cave has the advantages like warm in winter and cool in summer, fireproof, soundproof, affordable and practical, and less occupation of farmland, etc., however, there are also disadvantages such as wet, dark, poorly ventilated and long construction period. On one hand, in recent decades, the local residents are trying to overcome the disadvantages by adding exhaust vent in the cave, setting up wind-core outside of the cave, increasing side windows, digging front and back yards. On the other hand, the architect also helped warm up the cold house cave by designing the solar ventilation, stove ventilation, ceiling ventilation and vertical duct ventilation.
according to the principle of the hot pressing and air pressure promoting air circulation. At the same time, also the ecological rationality of house cave is widely used in the design of the public building.

1.6 Religion architectures

1.6.1 Introduction

In ancient China, there have appeared a variety of religions. The most important ones are Buddhism, Taoism and Islam. Among these three, the one has a long continuation of time and the most widely geographical spread, should be the Buddhism from India came through the Western Regions (西域). It not only left us with a wealth of architectural and artistic heritage (such as pavilions, pagodas, sutra pillar (经幢), stone caves, carvings, statues, murals, etc.), but it also brought far-reaching impact on the development and ideas of Chinese ancient socialization.

Another religion which was introduced and spread in China on and off for several times along the history in Christianity. However, as the first two times of preaching were totally relying on the Buddhism, the Christian Church, which was also named “temple” at that time, had the same formation with the Buddhist temples.

Buddhism formally came into China approximately in the early East Han Dynasty (25-220). The Buddhist architecture which was first seen in the

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77 The Western Regions: (西域; Xīyù) was a historical name specified in the Chinese chronicles between the 3rd century BC to 8th century AD, which referred to the regions west of Jade Gate (玉门关), most often Central Asia or sometimes more specifically the easternmost portion of it. However, it was sometimes used more generally to refer to other regions to the West of China as well, such as the Indian subcontinent.
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oduction to Chine
se Traditional Architecture

historical records of China was the White Horse Temple in Luoyang which was built when the Emperor Liu Zhuang was on the throne (57-75). Although none of its structure was remained, the in the Volume 114 of Book of Wei recorded that the temple layout was based upon design of Indian and Western Regions which is place the pagoda as the center of the square courtyard plane. This kind of layout could still be found in the Stupa Temple (浮屠寺) in Xuzhou (徐州) until the late Han Dynasty. However, the pagoda in this temple had the wooden pavilion-style structure, along with the surrounding corridors and pavilions; they were gradually changed to the traditional style of Chinese architecture. Overall, the Han Dynasty Buddhist architecture is rare known.

Buddhism had been greatly developed in Two Jin(两晋 266-420), Southern and Northern Dynasties(南北朝 420-589), in that period a large number of temples, stone caves and pagodas were built. According to historical records, only around the capital Luoyang of North Wei there were more than 1,200 temples been built up, and more than 500 temples in city Jiankang (建康) in Southern Dynasty. The famous grottoes in China that still existing today like, Yungang (云岗), Longmen (龙门), Tianlongshan (天龙山), Dunhuang Temple (敦煌寺), were all began to be constructed in this period; Its architectural and artistic accomplishes have reached a very high level. As the number of objects and documents of this period improved a lot, we can have more understanding of the Buddhist architecture of that time. Such as the Yongning Temple in Luoyang of North Wei (北魏洛阳的永宁寺), was a very famous temple built by the royal family.

According to Monasteries of Luoyang(《洛阳伽蓝记》) and other relevant records as well as the archaeological excavations on the site, it is
known that the main part of this temple is composed by a pagoda, a hall and the courtyard enclosed by corridor. In addition, it had the axial symmetry plan layout. Its core is a 9th floor square pagoda located on the three-tier pedestal. The Buddhist palace (佛殿) is built on the north of the pagoda, and is surrounded by walls, forming a broad rectangular courtyard area. The walls on the east, south and west of the courtyard, there is a gate opened in the central with gate tower built on top; there is a Wutou gate of relatively simple form (乌头门) set on the north of the courtyard. There are about one thousand bedrooms for monks and other annexes, respectively disposed on the west side and behind the main courtyard. There are four turrets built up on the corners of the courtyard. The walls are covered with short rafters and tiling, as the system of the palatial walls. The outside of the walls are surrounded by dig trenches and the pagoda trees are planted along the ditch. It can be seen that the main part of the temple still is the courtyard of the pagoda, it has the same principle with the aforementioned Stupa Temple of late Han Dynasty in Xuzhou (徐州). Although it used the layout of “pagoda in front, palace behind”, it’s still highlighted the theme of stupa. A number of genetic cases of such layout can also be found in Korea and Japan where have been impacted greatly by Chinese Buddhism.

Another kind of temple which takes the Buddhist palace (佛殿) as the theme also numbered a lot, especially the certain temple converted from residence. In order to take advantage of the original residence, the temple always use the front hall as the Buddhist palace and the back hall as the Lecture hall (讲堂), such as the Jianzhong Temple in Luoyang of North Wei.
About the grotto temple, the ones built in the early time have tower column set up besides the carved statues which suggested that it still has not get rid of the set pattern of the Western and Indian temples. In terms of its sectional decoration, such as flame-shaped arches, bind lotus columns and whorl capital have retained a number of influences from outside. But from the overall point of view, such as the colonnade of eave columns and the bracket set performed in the grotto and the courtyard-style layout of temple, wooden beamed roof frame, the hipped roof or gable-and-hipped roof, Chiwei (鸱尾), and imbrex reflected in sculptures and mural, all basically have inherent Chinese architectural forms. It indicates that the Buddhist architecture at that time has been largely localized in China.

From the Sui, Tang, and the Five Dynasties to Song Dynasty, is another highly developing period of Chinese Buddhism. Although there had been twice suppressions of Buddhism during year 845 of Tang Dynasty and year 955 of the Five Dynasty, they lasted too short, and were recovered soon. However, the old Buddhist monastery, temple, pagoda have been greatly damaged, causing irreparable damage. In the Buddhist doctrines, from the West Jin Dynasty, Mahayana Buddhism has gradually prevailed, followed by the emergence of many denominations. The research on Buddhist Thought achieved an unprecedented prosperity, but they did not bring a decisive impact on the Chinese Buddhist architecture.

Indirectly indicated by the murals of Dunhuang (敦煌壁画) and other data that the main part of the larger temple in Sui and Tang Dynasties, still used the symmetrical arrangement, which is arranging the gate, the lotus pond, platform, pavilion, side hall and main palace along the
central axis; The palace has gradually become the center of the temple while the pagoda has been moved to the back or side and formed another area of courtyard itself. Or it was built as twin pagodas (the earliest cases has been seen in the South Dynasty), standing in front of the palace or the gate. The larger temples would be divided into several courtyards due to the different worshiping purposes or functions addition to the group of main buildings in the central. Each courtyard has its own name. The courtyards belong to the large temple are often up to as many as dozens. Vajrayana (密宗)[78] became prevalent in late Tang Dynasty, so the eleven faced Guanyin and Thousand hands Guanyi has appeared in the Buddhist temple and appeared the stone sutra pillar engraved with Sutra scripture. In addition, the set of bell tower has become the custom at least in the late Tang Dynasty. Generally the bell tower is located in the east of the north-south axis of the temple. This system had been in effect until the early Ming Dynasty, probably in mid-Ming Dynasty, the drum tower began to be established in the west, and the two towers were moved to near the front of the temple gate.

In Ming and Qing Dynasties, the Buddhist temples became more regularized, most of the buildings like gate, bell and drum tower, King Palace (天王殿), Main Palace (大雄宝殿), side hall and Sutra House (藏经楼) were arranged symmetrically by the central axis of buildings. The pagoda has been rarely seen. The other belonging buildings were arranged in the temple side. The general plane of the temple seems to have stalled towards.

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[78] Vajrayana (密宗) is a branch of Mahayana Buddhism which is influenced by Tantric (特罗密教). It first appeared in the fourth centuries in India. There is a lot of cultivate way are teaching privately, and characteristics of the mystery contents, so is also known as Tantra;
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The Buddhism that is popular in most areas of China which is dominated of Han ethnic is known as Chinese Buddhism. The small building is called An (庵, it may just for nun), Tang (堂, hall), Yuan (院, courtyard); the large temple is called Si (寺, temple), while the largest temple will be re-crowned a word Da (大 Large) on the front, such as Da Xiantong Si (大显通寺, Large Xiantong Temple). The Tibetan Lamaism is distributed in Tibet, Gansu, Qinghai and Inner Mongolia, and centered in Lhasa and Xigaze. The temple of Tibetan Lamaism mostly used the castle design with thick walls and flat roofs. In the large temple of Tibetan Lamaism, there is Zhacang which provide the place for the monks to study in addition to the palace, hall and Lama residences. These are Mahayana Buddhist architecture. The Theravada Buddhism has very small distribution, only in Xishuangbanna, Yunnan (云南西双版纳). They have temples with very different plane and architectural style.

Chinese Taoism is generally believed to have started from the "Moral" of Laozi (老子《道德经》), however, the actual earliest origin should be the ancient witch, and not became a religion officially until the East Han Dynasty. Taoism ranks the second in China. The thoughts that have been advocated by Taoism like the yin & yang and five element theory\(^{79}\) (阴阳五行学说) and smelting immortality medicine have played a considerable impact on Chinese ancient society and culture. But in terms of Taoist buildings, there isn’t a separate system and style formed. Taoist buildings are generally referred as Guan (观, Taoist temple) or Gong (宫, as Palace), its layout and format generally still follow the traditional Chinese system of palaces which takes the palace, hall as

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\(^{79}\) Yin & yang and five element theory (阴阳五行学说) is the Chinese ancient naïve thoughts of materialism and spontaneous dialectic, it believed that the world is material, the material world is breeding, developing and changing under the promoting of yin and yang; And it believes that wood, fire, earth, metal and water are five kinds of the basic substance which are indispensable elements in constituting the world. These five basic substances grow and restraint mutually and are in constant motions and changes.
the main buildings and arranged symmetrically along the central axis. Compared to the Buddhist temple, the scale is relatively small, and no pagoda or sutra pillar is built. The relatively intact Taoist temples that have been preserved until today can be represented by the Yongle Palace in Xirui County of Shanxi Province (山西芮城县永乐宫) from mid-Yuan Dynasty.

The Islam which was founded in the 7th century had been introduced into China from the West about in the Tang Dynasty. Since the requirements of Islamic teachings and ritual, the mosque has been furnished differently from the Buddhist and Taoist which have the longer history in China. The minaret is often built in the mosque for calling the faithful believer to worship, as well as the bathroom for the believer to clean. There is no set idol sculpture set up in the mosque, only located a shrine facing the holy place Mecca for prayer. The buildings are commonly constructed by bricks or stones forming arch or vault; the unique decoration is the Koranic word or patterns of plants and geometric. The mosque of early period (such as the Huaisheng Mosque in Guangzhou(广州怀圣寺), built in Tang Dynasty, and the Qingjing Mosque in Quanzhou (泉州清净寺) rebuilt in Yuan Dynasty), remained more exotic effects in the architectural aspect: Tall and erect minaret, onion-shaped pointed arch doors and the hemispheric dome structured prayer hall and so on. The mosques which were constructed later (such as the Huajuexiang Mosque in Xi’an (西安化觉巷清真寺) and the Niujie Mosque in Beijing (北京牛街清真寺) of Ming Dynasty), in addition to shrines and decorative themes, all the structure and appearance of the building have been completely built in Chinese traditional wooden architecture form. But in some other ethnic inhabited regions, such as the Muslim mosques in Uygur Autonomous
Region of Xinjiang Province, it basically maintained the inherent features in their region.

1.6.2 Buddhist temples

According to the known historical documents, archaeological excavations and physical data, the Buddhist temples which are popular in most part of our China could be roughly divided into Pagoda centered and palace centered two main types.

The Buddhist temple centered by pagoda first appeared in China, it was the "Tianzhu" (天竺) standard introduced to China along with the western monks. Simply put, this kind of temple take the pagoda the main part of the temple, which is surrounded by a square courtyard, cloister and gate hall, for example, the first Buddhist temple in China, the White Horse Temple (白马寺) which was built in the East Han Dynasty in Luoyang, the Buddhist Temple (浮屠祠) built in Xuzhou in Han Dynasty and the Luoyang Yongning Temple (洛阳永宁寺) build in the North Wei Dynasty and so on. The appearance and formation of this type of the temple was from the ritual needs of worship around the pagoda of ancient Indian Buddhist. Although it was followed by Chinese earliest Buddhist temples, as the winters are quite cold, especially in the north China, it is quite inconvenient to hold the Buddhist ceremony at outdoors, so the appearance of palace and hall which can accommodate many people to worship was very logical, and they gradually developed into the main building of the temple instead of pagodas (this phenomenon is first widespread in the mid-period of the North and South Dynasty which was the about the first big developing climax of Buddhism in China). At that point, the pagoda had no longer
been the major worship object in the temple and the position was also moved from the center to the lateral of the temple, and later, it even became the dispensable architecture in the temple.

The Buddhist temples which take the Buddhist palace as the main building basically used the Chinese traditional courtyard-style layout. It first appearance may be from the abandoning residence for temple of the imperials and nobles in North and South Dynasty. To take advantage of the existing building, the temples mostly take the form of using the front hall as the Buddhist palace, the back hall as Buddhist hall. This type of Buddhist temples, not only solved the inconvenience in practical of aforementioned Buddhist temple which had pagoda as the main building, but also consistent with people's daily life habits and ideas; what's more importantly, the consumption of materials and time in the construction can be greatly reduced, thus it became the widespread from of the Buddhist temple since Sui and Tang Dynasties.

Depending on the different scales and factions of the Buddhist temples, there may be altar, Arhats Hall (罗汉堂), Sutra House (藏经楼), Bell Tower, Drum Tower, Free Live Pond (放生池) and many other buildings and constructions. The plans and elevations have their own characteristics, and enriched the temple a lot.

a) The main palace of the Buddhist Light Temple in the Mount Wutai (五台山佛光寺大殿)

The Mountain Wutai has already been one of the centers of Buddhism since Tang Dynasty; many temples were built up then. The Buddhist Light Temple is located in the waist of the Mount Wutai which is 5
kilometers away from the northeast of the Weitai District, in Shanxi Province. It was built along the mountain feature from bottom to top and arranged along the east-west axis. The existing main buildings in the temple are the main palace built up in the late Tang Dynasty, the Manjusri Hall (文殊殿) of Jin Dynasty, the tomb tower of Jingguang monk (无垢净光禅师墓塔) of Tang Dynasty and two stone sutra pillars. The main palace was built in the year 857 when the Emperor Li Chen was on the throne. It has 7 bays in width, 8 bays in depth and the hipped roof (Figure 1-6-1). Although it went through many times of restoration, it has generally remained the original appearance from Tang Dynasty.
Figure 1-6-1 the Façade plan and section of the main palace of the Buddhist Light Temple in the Mount Wutai (Drawn by Huangshan)

The main palace was built on the low brick platform; the column grid of the plane was composed by two rings of columns, one inside and the
outside. (Figure 1-6-1) The inner and outer columns have the equal height but the column diameters are slightly different. The columns are round and straight with pillar slight entasis at the top. The eave columns tilted inward a bit and the height increased from the one in the middle of the facade to the ones in the ends (Figure 1-6-1).

The ṍōu gōng (斗栱 bracket sets) on the columns are very different from the ones on the beams of the main palace. The ṍōu gōng (斗栱 bracket sets) on the columns have four tiers of rising and extending outwards in steps with double jutting arms (华栱) and double long cantilever arms (昂 áng). The ṍōu gōng (斗栱 bracket sets) on the beams are quite simple. They used the short columns standing on top of the column instead of the large block at the bottom of the bracket set, and had double jutting arms rising and extending both outwards and inwards. There is only one set of ṍōu gōng (斗) in each bay.

The roof slope is relatively gentle, the ratio of roof height and depth of the building is about is approximately 1/4.77. Both the roof ridge and eaves are tilted up curve. The column height and bay width forms like a square. The height ṍōu gōng (斗栱 bracket sets) is about the half of the column height. The strong columns, grand ṍōu gōng (斗) plus overhanging eaves, all show out the vigorous powerful feeling. The wooden doors, brick pedestal of Buddha statues and the Buddha statues themselves are all original from Tang Dynasty.

b) The Longxing Temple in Zhengding, Hebei Provence. (河北正定隆兴寺)
Figure 1-6-2 the General plan of Longxing Temple in Zhengding, Hebei Provence (From The illustration Chinese Buddhist Architecture, noted by Huangshan)

This temple which was built in Sui Dynasty and formerly known as Longcang temple (龙藏寺 which means the dragon is hiding here) was converted to use its present name in Song Dynasty. The general plane still largely preserved the style of Song Dynasty, which shows a narrow rectangular with a north-south axis (Figure 1-6-2). There is a screen wall (照壁) standing opposite the gate, and there are stone bridge and
memorial arch (牌坊) in front of the gate. Enter the gate, inside of the temple, the bell tower and the drum tower on both side of the axis and the main palace (Dajue Liushi Palace 大觉六师殿) on the axis line had already been ruined. Further to the north, stand the east and west side hall and the Moni Hall (摩尼殿 Hall of the Heavenly Kings). There is an alter, the Cishi Pavilion (慈氏阁) and the Zhuanluncang Hall (转轮藏殿) arranged following the Moni Hall. Then it came along the east and west pavilion of stone tables (东、西碑亭) and the Pavilion of the Fragrance of Buddha (佛香阁). The Amita Hall was at the end of the main axis. The room of the Buddhist abbot and the bedrooms of the Buddha are in the east of the Pavilion of the Fragrance of Buddha (佛香阁) and are attached with kitchen and stables, etc. Because of taking the advantage of the building volume sizes and courtyard space changes, the axis may be long yet not feel stiff.

The Moni Hall was built in the year 1052 of the North Song Dynasty. It is of 7-bay both in width (about 35 meters) and depth (28 meters), and has the double-eave gable-and-hipped roof (which is rebuilt later). There are Baosha (抱厦) in the middle of the four directions of the Moni Hall (Figure 1-6-3). The eave columns are connected by the brick walls, the interior column grid is composed by two circles of inner columns. The bays between the end bay and central bay in both the width and depth directions are narrower than the end bays; this is very different from the common bay arrange.
c) The Dule Temple in Ji County town, Tianjin (天津蓟县独乐寺)

The temple is built inside of the Ji County town. According to legend, it was originally built up in Tang Dynasty, and then it went through the reconstruction in year 984 of Liao Dynasty. The constructions of Liao Dynasty that have been preserved are the Gate and the Guanyin Pavilion. The Gate is of 3-bay in width (16.63 meters) and 2-bay in depth (8.76 meters). It has the hipped roof, which the raising height (JuGao, 举高) of the roof ridge is about 1/4 of the depth of the building. It was built on the stone platform. There is a row of columns in the middle of the plane (Figure 1-6-4).
Guanyin Pavilion which was built in year 984 is located in the north of the gate. It is 5-bay in width (20.23 meters) and 4-bay in depth (14.26 meter). It is seen to have two floors from the outside with waist eave. There are three floors inside (another floor is between the other two). The roof is of gable-and-hipped style.

It is built on the stone platform which is short and has Moon Platform (月台)\textsuperscript{80} attach in front. The upper and lower columns were connected by the constructive method of intersect-column-make (叉柱造)\textsuperscript{81}. Because the columns of the two upper floors are located a radius more interior than the column of the bottom floor, it appeared more steady. There are columns oblique supported the mezzanine between the bracket sets of the bottom floor and the slab of the upper floor which enforced the structural rigidity. This practice is as same as the pagoda in Buddhist Palace temple in Ying County if Shanxi Province (山西应县佛宫寺释迦塔).
It has withstood many earthquakes through thousand years, so the structure is tested and proven to be reasonable.

d) The Shanhua Temple in Datong, Shanxi Province (山西大同善化寺)

The Shanhua temple is located inside the South Gate of Datong city, which has the Main Palace (大雄宝殿) preserved from Liao Dynasty (916-1125), the Gate, Three Buddha Palace (三圣殿) and the Puxian Pavilion (普贤阁) rebuilt in Jin Dynasty (1115-1234).

Figure 1-6-5 photo of the Shanhua Temple in Datong, Shanxi Province (http://www.sxgongmei.cn/html/newslist_1811.html)

The axis of the general plane is on the north-south direction, along which arranged the Gate, Three Buddha Palace and the Main Palace with side halls on the east and west, the corridor (already destroyed), Wenshu Pavilion (文殊阁 already destroyed), Puxian Pavilion (普贤阁), Earth Possession Hall (地藏殿 already destroyed), Guanyin Hall (观音殿 already destroyed) and so on (Figure 1-6-5).

The Main Palace (大雄宝殿) is of 7 bays (40.48 m) in wide and 5 bays
(24.24 m) in depth with hipped roof. There is a brick built Moon Platform (月台) in front which is 31.42 m wide and 18.77 m deep.

The reduce-column-make (减柱造)\(^{82}\) was taken in the plane. About the two inner column circles in the center, the front inner columns of the outer circle and the back inner columns of the inner circle were all reduced. The eave columns have been lifted (升起)\(^{83}\) very high. It was enclosed by thick walls between two eave columns except the gate and windows have been opened on the central bay and the tip bays of the façade. Only one bracket set was set up between each bay, but there are eight types of bracket sets in the palace and were all structured and constructed complex.

The Puxian Pavilion (普贤阁) is located on the southwest of the Main Palace, it was rebuilt in year 1154 of Jin Dynasty. It is square planed with 10.40 m of each side. The bottom floor has 3 bays in the east and west face but 2 bays in the north and south face. The upper floor has 3 hays in each face. It shows two floors from the appearance with the waist eave in the middle. The roof is of gable-and-hipped roof style. The pavilion was built up on the brick platform. It has no inner column. Mansion built in brick platform. No inner column was set on the plane. The bottom floor is enclosed by brick walls except the gate opened in the central bay of the east face.

Three Buddha Palace (三圣殿) stands between the Gate and the Main Palace which is 5 bays (32.68 m) in wide and 4 bays (19.30 m) in depth. It was built in year 1128 and has hipped roof.

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\(^{82}\) reduce-column-make (减柱造): See the attached vocabulary.
\(^{83}\) lift (升起): See the attached vocabulary.
It has brick Moon Platform in front. A lot of inner columns were reduced from the plane, only four of them were kept. There are another four auxiliary inner columns which may be added in later dynasty.

There are gates opened on central bays of both front and back, and the windows are opened on the side bays. Then all the other parts are enclosed by brick walls. A screen wall is set up along the inner columns of the 3 bay in the middle on the back eave. The Buddhist altar is built in front of the screen wall.

There are two bracket sets setting up in the central bay while only one in the other bays. The eave columns have a relatively high lift.

e) the Potala Palace in Lhasa, Tibet (西藏拉萨布达拉宫)

The Potala Palace is located in the Potala Mountain which is about 2.5 km west of Lhasa. It is the administrative and residential palace for Dalai Lama (达赖喇嘛)\textsuperscript{84}, and also the largest building group of the Tibetan Lamaism temple which can accommodate about 20 thousands monks. According to legend, it began to be built in the 8th century, the era of King Songtsen (松赞干布)\textsuperscript{85}, but was destroyed by war later. From years 1645 of Qing Dynasty, it began to be reconstructed by the fifth Dalai. The major project took about 50 years, then the enlarge work was taken one after another which in total lasted more than 300 years.

The Potala Palace has been built nestling the mountain. To reach the entrance of the palace, it takes a long trip of rock steps to the mountain waist. Around the entrance, most of the bastion- buildings with arrow

\textsuperscript{84} Dalai Lama (达赖喇嘛), the high priest of Tibet.

\textsuperscript{85} King Songtsen (松赞干布): He was the founder of the Tibetan Empire, by tradition held to be the thirty-third ruler in his dynasty.
windows have been built by white stones, and only have the redden-white-grass in the eave sides and fence wall as decoration, so it has simple and neat appearance. The Red Palace Upper on the upper center is the main building of the whole building group, and also is the place of Dalai lama’s administrative body where he accept the formal visit. It includes the Sutra Halls, Buddha Halls, Libraries, warehouses, the Ancestor Hall of Dalai Lama, the Ancestor Pagoda, platform, courtyards, and so on. The largest Sutra hall can accommodate up to 500 monks by the reciting. The white palace in the east of the Red Palace is the residence of the Dalai Lama, whose location is slightly lower than the Red Palace and is decorated gorgeously. Near the Red Palace, there are places for Buddhist statue and Buddhist appliance manufacture, sutra printing house, stables, guardhouse, prisons and Lamas’ residence. (Figure 1-6-6)

![Potala Palace in Lhasa, Tibet](http://lhasa.cncn.com/jingdian/budalagong/info_22409.htm)

The main body of the Potala Palace is of 117.2 m in height but it is in the height of 200 meters above the earth. It seemed to have 13 floors from the appearance, but actually, there are only nine floors. Since it was
built on the mountain waist and large areas of stone walls are standing as cliff, the building seems to be an entirety with the mountain and the momentum is very majestic. There is neither central axis nor the symmetrical layout is use in the general plane, but the sharp contrast of the Red Palace and other buildings is emphasized from the scale, the position and the color, so it still showed up the results of emphasis and prioritize.

There are three golden palaces and five golden pagodas are built on top of the Red Palace and glittering in the sun which highlighted the importance of this group of buildings.

The Potala Palace uses both a number of Han Ethnic architectural forms (roofs of the golden palaces, the decoration of Dalai Lama's residence) and preserved a lot of traditional Tibetan architectural practices (doors, windows, bone ornaments...). It reflects the close combination of various architectural forms of different ethnics, and performed the level of Tibetan architectural arts. In addition, there are murals painted in the palace which are valuable for the study of Tibet's history and arts.

f) Shiretu Juu (席力图召) in Hohhot of Inner Mongolia (内蒙呼和浩特)

The Shiretu Juu is located in the old city of Hohhot, the Chinese name is Yanshou Temple (延寿寺) ("Juu" is temple in ). It was built in Ming Dynasty during year 1573 to 1619, and was rebuilt in year 1696 of Qing Dynasty, after the reconstruction, it went through several reparations and alterations. Now, it is Han-Tibetan mixed lamasery.
Figure 1-6-7 General plan of Shiretu Juu in Huhhot of Inner Mongolia
(From Chinese Ancient Architecture History, noted by Huangshan)
The general plan still use the general layout of the Han ethnic temple (Figure 1-6-7), multiple courtyards are arranged along the central longitudinal axis. The memorial arch, Gate (King Palace 天王殿), the Great Sutra Hall (大经堂), the Great Buddha Palace (大佛殿) are all located on this axis. The other hall, residence for the monks are arranged on both sides of the axis, although they are symmetrically arranged, they face the same direction with the main palace, which is a special way. Most of the buildings in the temple are of by Han ethnic form, only the main building --- the Great Sutra Hall (大经堂) is the Han-Tibetan mixed style.
CHAPTER 2

Christianity and Shaanxi Province
2.1 Introduction

This chapter generally states the spreading history of Christianity in China, especially the preaching and developing process in Shaanxi province.

It is in two major parts, the first part is about the introduction and spreading of Christianity in China according to the era of Tang, Yuan, Ming-Qing dynasties and in the modern times. The second part is on the preaching of Christianity in the north, central and south parts of Shaanxi province.

2.2 Christianity in China

2.2.1 Tang Dynasty

China underwent 2000 years of feudal society, as well as the outbreak of the Opium War in 1840; it turned into a semi-colonial, semi-feudal society when Chinese society and architecture both began the modernization process. However, prior to that, there had already been three appearances of Christianity. The first appearance of a Christian mission occurred during the Tang Dynasty (618-907AD). According to the detailed inscription recorded on the Nestorian Stele (Figure 2-2-1), the Christian scripture was first brought into Chang'an (Shaanxi province) in 635 by Alopenzz. The Emperor Li Shimin (李世民), who was on the throne from 626 to 649, encouraged the missions and ordered the building of a church at the northwest corner of Chang'an city. This church, known as Daqin Temple, was the very first Christian Church built in China to be indicated in historical records. Its shape and structure are
now not known. Christianity was once so highly developed that during the 680s, churches were built in hundreds of cities. However, in the Tang Dynasty, the spread of Christianity in China mainly relied on the deeper rooted Buddhism, leading up to the end of the first peak period of the Christian mission when the Buddhism-Prohibit Movement was initiated during the late Tang Dynasty.

Figure 2-2-1 Nestorian Stele (大秦景教流行中国碑)
(From http://www.catholic.org.tw/shilin/CatholicChurchinChina.html)
2.2.2 Yuan Dynasty

The second spread of the Christianity in China happened in Yuan Dynasty, when the Mongolian dominated China and the Emperor Kublai supported the missions. Therefore, the revival of the Christianity that had disappeared from the major part of China in Tang Dynasty but also existing and spreading among the northwest frontier, as Inner Mongolia, plus the first landed of Roman Catholic, constituted the Christianity spreading in Yuan Dynasty, which was called Arcoun\textsuperscript{86} that time. The spread of the Christianity in China mostly depended on the support and generous treat from the Mongolia noble and high society of Yuan Dynasty, so by the end of Yuan Dynasty, as the Mongolian was expelled from China, the second spread peak of Christianity was also ended.

2.2.3 Ming and Qing Dynasties

The Christianity came to China for the third time in the 17\textsuperscript{th} century, when China was at about to turn into Qing Dynasty (1644-1911) from Ming Dynasty (1368-1644). The Catholicism became the main preached religion.

It worth to mention that the Spanish missionary Francisco Javier, the co-founder of the Society of Jesus, who had led an extensive mission into Asia, tried to extend his missionary preaching to China in 1552. He first settled at Shangchuan Island in August of 1552 (near the coastline along the city of Taishan, Guangdong province, China) and planed to enter into China. However, the Chinese businessmen who had promised to help him never showed up. Then he died because of Malaria in

\textsuperscript{86} Arcoun is the transliteration of Mongolian, Arkaun Erkeun At, which means people believe in gospel.
Shangchuan Island in 3rd of December, 1552.

In 1601, a group of missionaries arrived in Beijing following the famous Italian missionary Matteo Ricci. At first, they preached Catholicism by imparting the advanced science knowledge and technology to the upper class people. Later, they continuously built up new churches in all over China in order to expand the influence of Christianity. In 1605, Matteo Ricci designed and arranged to build church in his living area, Xuanwu Gate. But this church has the traditional Chinese architectural style because it was located in the north, inner landed city. Until 1712, after being used for over a hundred years, it was turned into western style when reconstructed.

As the incessant spreading and developing of Christianity, by the year of 1664, there formed 11 main mission regions, with about 150,000 believers. Among them, 40% were from Shaanxi Province, which is more than any other regions. Ever since 1706, the Chinese Rites Controversy, problem concerned about Chinese believers do ancestor and Confucius worship, had upgraded the contradiction between Roman Curia and Chinese Qing Government. The Qing Government began to implement strict Christianity Prohibition Policy, so the Christianity declined again in China.

2.2.4 End of Qing, since 1840 to 1949

In year 1840, China had turned into the semi-colonial semi-feudal society, as the outbreak of the First Opium War. When China was defeated in 1842, the Qing Government had to sign up a series of unequal treaties with the western powers. As well as cede territory and pay indemnities, there were a lot of specific clauses protecting the
freedom of Christianity mission in China. The Qing Government had to relieve the Christianity Prohibition Policy which had already implemented for over a hundred years under the extreme stress from the western powers. In this way, the Christianity had been spread in China in the posture as a strong culture for the first time. During the early time of the modernization process of China, the missionaries not only imparted a large amount of western advanced technologies and cultures to Chinese, but also built up many Christian Churches to expand the influence of Christianity and do the missionary work, which inevitably had the western architectural culture introduced into China. The church architecture had become the most important carrier and field that brought the western traditional architectural culture into China and occupied a special and important position in the history of Chinese architecture in Modern times (1840-1949).

2.3 Christianity in Shaanxi Province

Shaanxi province is locating in the relative center of China. The north part of Shaanxi province is on the loess plateau, the central part is on the Central Plain, the south part is on Qin Mountains (Figure 2-3-1).
The Catholicism became mainly preached in the country when the Christianity came to China for the third time. As the capital city---Chang’an (Today’s city of Xi’an) is located in Shaanxi province in Tang Dynasty, Shaanxi province participated a lot during the first two times of Christian missions in China. After that, the Catholicism was brought into Shaanxi Province at the late time of Ming Dynasty (1368-1644). The more precise sign was Wang Zheng, who was the first believer of Catholicism from Shaanxi Province invited the missionary Nicolas Trigault (金尼閣) to Shaanxi in 1622. They set up a church in Tangfang Street to do the missionary work in Wang Hui’s home. In 1627, the church was rebuilt by

87 Nicolas Trigault was born in Douai (part of the Spanish Netherlands at then, now part of France); he became a Jesuit in 1594. Trigault left Europe to do missionary work in Asia around 1610, eventually arriving at Nanjing, China in 1611. He eventually died in 1629.
German missionary Johann Adam Schall von Bell (汤若望), and named Chongyi Church. This church was abandoned during the Qing Government implemented Christianity Prohibition Policy, and rebuilt again in 1881. Then it was destroyed in the Cultural Revolution (1966-1976).

As the well developing of Catholicism and the increasing number of believers in Shaanxi, in 1696 when Roma Curia re-divided the Chinese mission district, Shaanxi Province had become a diocese and one of the most important region of Catholicism mission in China.

After the Opium War, the western powers opened the door of ancient China with the help of its gunboats, as the protect Christianity preach clauses in the unequal treaties were signed, plenty of Christian missionaries had entered into the mainland China. The Christianity had the great opportunity to be developed again. The Shaanxi apostolic vicariate was set up again in 1844, and divided into the north and south apostolic vicariate in 1887. Later in 1911, the north Shaanxi apostolic vicariate was developed into two parts: Central Shaanxi and North Shaanxi apostolic vicariate. In 1924, the Central Shaanxi apostolic vicariate was renamed as Xi’an apostolic vicariate. Then 1946, it was promoted as Xi’an Archdiocese, and the North Shaanxi apostolic vicariate became Yan’an diocese. By 1949, there were about 116000 Catholic believers and 372 Catholic Churches in Shaanxi province.

2.3.1 the preach of Catholicism in central part of Shaanxi Province

In Xi’an which is the capital city of Shaanxi Province and located in the
central part of Shaanxi, the most characteristic architecture from 1840-1949 is the Christian Churches and the hospitals and schools built up by the churches. The Christian Churches in China was the first architecture formation been brought in from the western counties and was the most important carrier of classic western architecture culture developing in China and influencing the Chinese traditional architecture. Also the development of the Christianity buildings has been highly related to the spreading of Christianity in China. However, the Christianity was brought in China as early as in Tang Dynasty (year 618-907), Xi’an as the capital of China for thirteen dynasties in the feudal society (Xi’an was named Chang’an in feudal society) and Shaanxi province, have participated a lot and maintained in a very important position during the history of the introducing of Christianity into China (Figure 2-3-2, 2-3-3).

Figure 2-3-2 the regionalism of the north, south and central part of Shaanxi province (Drawn by Huangshan)
a) The Christian architecture in central Shaanxi before year 1840

The Christianity had been introduced into Shaanxi, as well as into China, three times into China during the feudal society (476BC-1840).

In the 16th century, when China was at the changing period from the Ming Dynasty to Qing Dynasty, the Catholicism was introduced into China. The missionaries led by Matteo Ricci gathered in Beijing to promote the development of Catholicism around China. They complied with the Chinese etiquette and custom, introduced the advanced natural science and technology to the upper level people as scholars and promoted the Catholicism by those ways. Then the Catholicism was gradually spreading all over China and many churches were built up in different places.
In 1620, the Italian missionary Giulio Alenio (爱儒略 1582- 1649) came to Xi’an to do the missionary work. In 1622, a Shaanxi people, Wang Zheng (王徵), embraced Catholicism in Beijing and he invited Nicolas Trigault (金尼阁 Flemish Jesuit, 1577- 1628) to Xi’an to do the missionary work. During the same period, the discovery of the Nestorian Stele in Shaanxi astonished the whole country and the world. It attracted worldwide attention. Many prominent missionaries, including Ferdinand Verbiest (南怀仁 Flemish Jesuit, 1623- 1688), Johann Adam Schall von Bell (汤若望 German Jesuit and astronomer, 1592- 1666), Stephanus Faber (方德望 French, 1598- 1659), and Alvaro de Semedo (曾德照 Portuguese Jesuit, 1585- 1658) came to Shaanxi.

After Nicolas Trigault came to Shannxi, in 1627, he and Wang Zheng bought the land in Tangfang Street and built up the church for the missionary work. This church was called Chongyi Catholic Church. The church was abandoned during the Christianity Prohibition happened later (around 1706-1840). Then in 1881, it was rebuilt with about 100 attached rooms. Unfortunately, it was totally destroyed during the Cultural Revolution (1966-1976). The site have been protected since 1982 and signed as the site of Shaanxi Major Seminary. There is a church rebuilt up in 1989 and opened to public since 1991.

After years of hard working by the missionaries, Catholicism had been rooted deeply in Shaanxi Province. According to the data provided by annals of Xi’an, there were ten churches and over 20000 pilgrims in the early period of the Qing Dynasty in Xi’an, 40000 pilgrims and 6 churches in Hanzhong. At that time, there are about 150000 pilgrims in China and distributed in 11 main Catholic areas. As we can see, the pilgrim population of Shaanxi province accounted nearly 40% of the pilgrim
population of China and exceeded all the other provinces which showed the prosperous of the Catholicism in Shaanxi province at that time.

In 1696, when Roman Curia re-divided the Chinese Catholic dioceses, Shaanxi became the individual Apostolic Vicariate. By then, Shaanxi had become a very important and an irreplaceable catholic area in China. In the same year, the Italian Franciscan priest Basilius Brollo was appointed as the first bishop of Shaanxi Apostolic Vicariate.

In 1716 a church was constructed in the Earth Temple Cross by the second bishop in Shanxi& Shaanxi Diocese, Antonio Laghi (梅书升). The church became the Catholic Cathedral of the Shaanxi Parish when constructed and was named as the Wuxingjie Catholic Church. The church was extended during 1765 and 1785 by the third bishop Franc. Saraceni (方启升) of Italian Franciscan when the Christianity Prohibition was not implemented very strictly in Shaanxi. Then years later, the Christianity prohibition became more and more strict and deep-going, so that the Wuxingjie Catholic Church was kept under sequestration around 1790.

Later in the early 18th century, since 1706, a dispute about if the Chinese folk rituals such as their offering to the emperor and the worship for ancestor and Confucius constituted paganism or idolatry arose up. It led to the well known Chinese Rites Controversy, which had upgraded the contradiction between Roman Curia and Chinese Qing Government. The Qing Government began to implement strict Christianity Prohibition Policy. Christianity declined again in China. But this time, it did not vanish in total, though so many Chinese Christians and missionaries were put to death and the congregations suffered to
scatter and during the same period all churches were kept under sequestration and many European missionaries were banished from China. The church continued to grow secretly and slowly.

See the Christian Church buildings in Xi’an of this period in List 2
List 2 the the Christian Church buildings in Xi’an of the period of 1627-1711

<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Founder</th>
<th>Name of the church</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Began to be built from 1627 (Ming Dynasty)</td>
<td>Tangfang Street in Xi’an</td>
<td>Jesuit Nicolas Trigault &amp; Wang Zheng</td>
<td>Chongyi Catholic Church</td>
<td></td>
</tr>
<tr>
<td>1711 (Qing Dynasty)</td>
<td>TONG YUAN FANG in Gaoling County</td>
<td>Italian Franciscan</td>
<td>TONG YUAN FANG Catholic Church</td>
<td>First built in 1711, but no record could be found on that now. The Italian priest Alfonso Donato rebuilt it in 1845.</td>
</tr>
<tr>
<td>1716-1727</td>
<td>Earth Temple Cross in Xi’an</td>
<td>Italian Franciscan</td>
<td>Wuxingjie Catholic Church</td>
<td>An extension was done in 1765-1785 and it had been rebuilt in 1884.</td>
</tr>
</tbody>
</table>
Although the Christianity had been introduced into feudal China three times, it was never really developed successively or deeply. It had been through many times of severe setbacks and long term standstill and the reason was that China had strong local culture and religion so it is difficult for the foreign culture and religion to take root in. Therefore as long as the regime changed or the religion prohibition happened, the preaching of Christianity had to be stopped. No detailed record of the church buildings or the formations of them had been preserved. However, the Christian Church buildings been destroyed during the Christianity Prohibition (around 1706-1840) were strongly related to the Christian Churches in the Modern Times (1840-1949).

b) The Christian Church buildings in central Shaanxi from 1840 to 1949

In 1840, along with the broke out of the Opium War, China had entered the Semi-feudal Semi colonial society, the modern times (1840-1949). When China was defeated in the Opium War, the Qing Government was forced to sign up a series of unequal treaties. A lot of clauses that protect the freedom and profit of Christianity spreading in China and their church properties were included in these unequal treaties. This means that under the intense pressure of the western powers, the Qing government had to finish the Christianity Prohibition which had been implemented for over a hundred years and open up the door for preach the Christianity legally. Relying on the protection of the western powers and unequal treaties, for the first time, Christianity began to be spread as a strong culture and gained the unprecedented developing opportunity.
In 1844, when Shaanxi & Shanxi was separated into two individual dioceses, the Italian Priest Alfonso Donato was appointed as the first bishop. At that time, there were about 15000 believers in Shaanxi diocese (which included the 2000 believers in Gansu Province under the Shaanxi Diocese’s supervision). Then the Catholicism turned into the period when developing in high speed. As the former cathedral was kept sequestration since 1790 and the property was not returned to the church until 1884, in year 1845, Alfonso Donato came to Shaanxi and built up the bishop’s house in TONG YUAN FANG of Gaoling County which locates in the middle of central Shaanxi and was 50 km away from city Xi’an. He built up a seminary besides the cathedral for training the local clergies. In 1849, Ephisius Chiais (高一志) took over the bishop of Shaanxi. As the second bishop of Shaanxi diocese, he dedicated a lot to extend the cathedral area and made TONG YUAN FANG rapidly developed. Also he built up the magnificent cathedral which was about 17m high, 14m wide and 50 m long. Then the third bishop Amatus Pagnucc continued to the construction of TONG YUAN FANG and enlarged its scale and effect, he made TONG YUAN FANG the famous catholic base in Shaanxi and the northwest of China.

In 1860, when China was defeated in the Second Opium War, the Qing government had to sign up another series of unequal treaties. In one of those unequal treaties, the Convention of Peking ruled that “the French missionaries have the freedom to buy and rent land in every province and construct as their wishes”. Since then, the activities of Catholicism became public. A huge wave of foreign missionaries came to the inner land cities of China for doing the missionary work. The Catholic force expanded tremendously. In addition, it also ruled in the Convention of Peking ruled that “return the Christianity property to the churches”, so
from 1861 to 1868, the return church wave almost happened in every place that had ever exist a church.

In 1862, the bishop of Shaanxi requested the Shaanxi Governor to return the Wuxingjie Catholic Church property to the church. By then, the Wuxingjie Catholic Church had been occupied by local people and the owners changed several times during the long period. However, under the inference of French minister in China, the property of Wuxingjie Catholic Church was finally returned to the church. In 1884, the bishop Amatus Pagnucc (林奇爱) organized to build a new church building on the original site of the Earth Temple Cross where the old Wuxingjie Catholic Church was located. It became the cathedral and the bishop’s house of Shaanxi diocese.

There had 182 Catholic Church buildings ever existed in the central part of Shaanxi province during the period of 1840 to 1949. These Catholic Churches were mainly distributed in city of Xi’an, Counties of Gaolin, Fengxiang, Zhouzhi, Sanyuan and Dali.

2.3.2 the preach of Catholicism in northern part of Shaanxi Province

a) The three main paths of Catholicism spreading in northern Shaanxi from the late time of Qing Dynasty (1644-1840) to the early Republic China (1911-1949)

The first path: coming in from the north.
In 1872, the Belgian missionary Ye Maozhi\textsuperscript{88} of CICM Missionaries came to Ningxiaoliang Town, Jingbian County in northern Shaanxi Province. It did not take the missionaries long to build a church at the side of a bridge. They also bought the land nearby and rented it out to the local people in order to get the chance to preach Catholicism. The arrival of Catholic missionaries in Jingbian County and the building of the church was the sign that Catholicism had officially landed in northern Shaanxi and the missionary work began. From then on, Catholicism was spread into Dingbian, Suide, Huanyuan and other counties of northern Shaanxi.

The second path: coming in from the east.

Following the outbreak of the Boxer Rebellion, the Catholic activities of northern Shaanxi did not decline or slow down, but the region of missionary activity expanded. While Catholicism was developing well among the northern counties mentioned above, in 1900, the Italian priest Sun and friar Ma Liupin came to Tanjapin village in Jia County from Shanxi Province to avoid pursuit by the Boxer Rebellion. Then Catholicism directed by a Franciscan was brought into northern Shaanxi and had a strong influence in Jia, Wubao and Shenmu counties.

The third path: coming in from the south

Until 1905, Catholicism spread from central Shaanxi to Ganquan County. Later, when Yan’an parish was set up (1911), the Catholicism of the Franciscans spread among the counties of Yanchang, Anding, Ansai. It continued towards the south to Fu, Huangling, Yijun and Hengshan.

\textsuperscript{88} Ye Maozhi (叶茂枝), the Chinese name translated according to the original pronunciation. Only this kind of Chinese name has been recorded in the historical material. The original cannot now be known.
After the North Shaanxi apostolic vicariate re-divided as Central Shaanxi apostolic vicariate and North Shaanxi apostolic vicariate in 1911, in 1924, the North Shaanxi apostolic vicariate was renamed as Yan’an apostolic vicariate and the missionary work was managed by Spanish Franciscans. The bishop was stationed in Yan’an city. The first bishop was Spanish, Caesar Ibañez y Aparicio, who was stationed in Yan’an as bishop for more than 30 years. During that period, the Catholicism was well spread over northern Shaanxi. At the peak time, there were about 30 priests, more than 50 churches and 10000
believers.

b) The distribution of Catholic Churches in Northern Shaanxi Province

When the Catholicism was brought in northern Shaanxi, the missionaries would build up churches at many countries to hold the religion activities and be as the centre of preach area. The church building was not only an important symbol that the Catholicism existed in local place, but also the stronghold for further spreading the religion doctrine. So, the church place is the Catholic force centre of a county as well as the base for its outspreading. The number of churches buildings directly reflected the development degree of the local Catholic force. The distribution situation is a visual mirror on the spreading feature of Catholicism among countries.

In the 25th year of Republic China (1936), Shaanxi Provincial government ordered to check and register the Christian Churches and the Muslin mosque without delay. The list for investigation of Catholic churches in northern Shaanxi Province has been recorded in Shaanxi Provincial Archives, according to the data, the Catholic Churches stood in northern Shaanxi before 1936 have been summed in the following form.
List 3 Catholic Churches stood in northern Shaanxi before 1936

<table>
<thead>
<tr>
<th>Location</th>
<th>Name of the church</th>
<th>Direction</th>
<th>Year of construction</th>
<th>Priest in charge</th>
<th>Actual situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yan’an (Fushi County)</td>
<td>Qiao’ergou Catholic Church</td>
<td>Northeast of Yan’an city</td>
<td>1931-1934</td>
<td>Cae.Ibanezy Aparicio (Spanish)</td>
<td>it was occupied by the Lu xun art academy since 1939</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guanguyi Catholic Church</td>
<td>Ganguyi twon of Baota District, Yan’an city</td>
<td>1933</td>
<td>Spanish Missionaries of Franciscans</td>
<td>Occupied by local grain supply centre</td>
<td></td>
</tr>
<tr>
<td>Suide county</td>
<td>Baihuali Catholic Church</td>
<td>Baihuali of Suide County</td>
<td>1922</td>
<td>Lei zhenhua (Spanish)</td>
<td>No exist. No recorded data.</td>
</tr>
<tr>
<td></td>
<td>Xindian village Catholic Church</td>
<td>Xindian Vallage of Suide County</td>
<td>1928</td>
<td>Lei Zhenhua (Spanish)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------</td>
<td>--------------------------------------------------------</td>
<td>----</td>
<td>--------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td><strong>Hengshan County</strong></td>
<td><strong>Huanyuanbao Catholic Church</strong></td>
<td><strong>Xijitan of Huanyanbao, Hengshan County</strong></td>
<td>1915</td>
<td>Mei Jiding (Belgian)</td>
<td>Moved to Jingbian County in 1935</td>
</tr>
<tr>
<td><strong>Jia County</strong></td>
<td><strong>Tanjiaping Catholic Church</strong></td>
<td><strong>Tianjiapin of Jia County</strong></td>
<td>1909</td>
<td>Spanish priest Nicolas Nieto</td>
<td>still in use</td>
</tr>
<tr>
<td></td>
<td><strong>Tongzhen Catholic Church</strong></td>
<td><strong>Ben street of Tong Town, Jia County</strong></td>
<td>1911</td>
<td>Priest Wei and Priest Yueyin</td>
<td></td>
</tr>
<tr>
<td><strong>Yulin County</strong></td>
<td><strong>Yulin Catholic Church</strong></td>
<td>the old government office in feudal society</td>
<td>1914</td>
<td>Yin Jiabo (Spanish)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>North Mountain Temple Catholic Church</strong></td>
<td><strong>Outside of the north gate of Yulin</strong></td>
<td>1932</td>
<td>Zhao Jinrong (Chinese)</td>
<td></td>
</tr>
<tr>
<td><strong>Jiangbian County</strong></td>
<td><strong>Bridge-side Catholic Church</strong></td>
<td><strong>Ningtiaoliang Town, Jingbian County</strong></td>
<td>1874</td>
<td>Steenackers Jan-Bapist (Belgian)</td>
<td>Tore down in 1968</td>
</tr>
</tbody>
</table>
According to the Local Chronicles of Northern Shaanxi region, there were 67 churches ever existed before 1949. (Figure 2-3-5)

List 3 The distribution of the 67 churches ever existed before 1949.

<table>
<thead>
<tr>
<th>region</th>
<th>county</th>
<th>number of churches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yulin includes 5 countries</td>
<td>Fugu, Shenmu</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Yulin</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Jia</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Hengshan</td>
<td>7</td>
</tr>
<tr>
<td>Yan’an includes 11 countries</td>
<td>Jingbian</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Dingbian</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Zichang</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Fushi(Yan’an)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Yanchuan</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Yanchang</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Ansai</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Wuqi, Zhidan, Ganquan, Yichuan</td>
<td>none</td>
</tr>
<tr>
<td>Suide includes 5 countries</td>
<td>Suide</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Mizhi, Zizhou, Wubao,</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Qingjian</td>
<td></td>
</tr>
<tr>
<td>Fu includes 4 countries</td>
<td>Fu</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Luochuan</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Huangling</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Huanglong</td>
<td>none</td>
</tr>
<tr>
<td>Total</td>
<td>25 countries</td>
<td>67</td>
</tr>
</tbody>
</table>
Figure 2-3-5 the distribution map of the Catholic Churches in north Shaanxi (Drawn by Huangshan).

From the list above we can see that the Catholic Churches were built and distributed in 60% of the counties in northern Shaanxi. The distribution was not balanced as half of the churches were gathered in the northwest countries where the Catholicism was brought in relatively earlier. This area hosted the core of Catholic force in Northern Shaanxi. The north and northeast countries next to Inner Mongolia and Shanxi Province had several churches, while the each county in the central and south mostly had only one Catholic Church. The churches
distributed in the north were obviously more than the south.

Furthermore, in north Shaanxi, except for several churches was built in the counties, most of the churches were built in the towns and villages. This actually shows that in northern Shaanxi, the main object of preaching the Catholicism is village people. The churches being built in the towns and villages is the expression of targeting at the village people.

### 2.3.3 the preach of Catholicism in southern part of Shaanxi Province

The Christianity was introduced into China since Tang Dynasty and had been through twice of spreading climax in feudal China before Ming Dynasty, but the materials of the impact on the early spreading of Christianity in the south of Shaanxi could not be found now. However, by the end of Ming Dynasty, the Christianity was brought into the south of Shaanxi. The spreading scale was pretty small at first so it did not have strong impact on the traditional Chinese architectural culture. The church buildings built in Hanzhong region was destroyed or occupied for other uses as the Christianity Prohibition Policy implemented later in Qing Dynasty. The affection on the architecture domain had disappeared.

After the relieving of Christianity Prohibition Policy, a lot of foreign missionary came to China to do the missionary work which had influenced the Chinese traditional culture and architecture greatly. Many Christian Churches were the product of the communication and the mixing of western and Chinese architectural culture.
Ever since the Christianity was brought into Hanzhong region, most of the churches were headed by foreign missionaries as well as being supported by foreign churches financially. They not only built up church buildings for religion activities, but also set up schools and hospitals for helping the local people in multiple ways.

Although, at that time, the Christianity was brought in along with the western invasion, the western culture it brought in had objectively influenced many aspects of Chinese society. And it introduced new architectural type, technique and formation.

Figure 2-2-6 map of the regions in the south part of Shaanxi province (Drawn by Huangshan)

a) Hanzhong region

The Hanzhong region has always been an important stronghold of the preaching of Christianity, it was the centre of Christianity of the south Shaanxi. In 1635 of late Ming Dynasty, the French missionary Stephen LeFevre (方德旺) who was born in 1579 in Avignon, south of France, came to Shaanxi for doing the missionary works. In 1630, he was sent to
Christianity and Shaanxi Province

China to preach the Catholicism by Jesuit headquarters. After he arrived in China, he spent one year learning Chinese in Macau and then began to do the missionary work in Beijing and Taiyuan, the capital city of Shanxi province. When he was in Taiyuan, he met the leader of the Chenggu County. The county leader accepted the Catholicism during his contacting with Stephen LeFevre and was baptized. He invited Stephen LeFevre to preach Catholicism in Shaanxi province. Therefore, in 1635, Stephen LeFevre was introduced into the south of Shaanxi province for doing the missionary work.

At first, he came to Yang County, but there were few believers. Then he moved to Chenggu County. After he helped the locals to remove the locusts, he gained the trust from the local people, so more and more people became baptized. Stephen LeFevre built up the first Catholic Church of south Shaanxi in Chenggu County for further missionary work. He died in Chenggu County and was buried there in 1659. As been recorded in Hanzhong chorography, there were about 4000 catholic believers in 1664 of Qing Dynasty. Hanzhong was subordinate to Shaanxi Apostolic Vicariate, when Roman Curia re-divided the Chinese Catholic diocese in 1696.

During the Christianity Prohibition happened around 1706-1840, there was no much activities of Christianity in south Shaanxi, but it did not disappear or stopped either. All the missionary work was kept in minimum and secretly.

In 1862, the Italian missionary Xinzena built a Catholic Church in Yang County and then from 1862 to 1875 the Catholicism was introduced into Lueyang County and there were churches built up.
The Catholicism was brought in Mian County and Ningqiang County since 1871, there were four and five churches were built up there respectively.

In 1885, approved by Roman Curia, Hanzhong Apostolic Vicariate was divided form Shaanxi Apostolic Vicariate, the bishop’s house was set up in Guluba (ancient road dam) of Chenggu County.

In 1888, the Italian priest Gregorius Antoniucci (安廷相) arranged to construct the bishop’s house in Guluba of Chenggu County. After 30 years’ construction, an area of about 67000 m² with cathedral, bell tower, the bishop’s residence, monastery, orphanage, nursing home for aged people were finished.

In 1895, the Italian priest Kangyueyao (康乐尧) introduced Catholicism in Xixiang County but the church was not built up until 1901.

In 1900, a catholic area with church, residence and orphanage began to be built in Nanzheng County and was completed in five years.

In 1915, another Italian missionary went to Zhenba County to do the missionary work and built up a church in two years.

The Catholicism was most developed in Chenggu County. There were 47 Catholic Churches by the year of 1949 as recorded in the Chenggu Coungry Annals. During 1911 to 1949, there were 76 foreign missionaries and 35 local clergies worked in Hanzhong region. Until the end of 1949, almost 100 churches were built in Hanzhong region; there were 7000 believers and 70 clergies.

When People’s Republic of China was founded, all the foreign clergies
left the mainland China. Since 1958, the Catholic activities paused because of the Great Leap Forward[^9]. During the Culture Revolution, all the religion activities were stopped. The churches and temples were destroyed or occupied.

**b) Ankang Region**

As recorded in Ankang chorography, the spreading of Catholicism of Ankang region began in 1890 when the German missionary Kang lile (康礼乐) was sent from Hanzhong Apostolic Vicariate. He bought local residences in Jinyinxiang (gold silver alley) for setting up the Catholic Church. Then there were monastery, Latin school, hospital, orphanage for infants and old people and primary school built up in bishop’s house and clinics in every county belongs to Ankang region. Since then, the missionaries from British, Germany, Italia and Poland had came to Ankang region to do the missionary work successively in Shiquan County, Hanyin County, Pingli County, Langao County and Ziyang County. They also built up Catholic Churches in every County. In 1925 Ankang became an apostolic prefecture. In 1928 the priest Joannes M. Soggiu (苏辑武) was sent by Roman Curia to head in Ankang apostolic prefecture.

All the foreign missionaries left Ankang in 1952. Most of the church buildings were torn down during the Culture Revolution.

[^9]: The Great Leap Forward (大跃进) of China was an economic and social campaign by the Communist Party of China from 1958 to 1961. The campaign was led by Mao Zedong and aimed to rapidly transform the country from an agrarian economy into a communist society through rapid industrialization and collectivization. The campaign caused the Great Chinese Famine.
c) Shangluo region

According to the Shangluo Chorography, after the Opium war, the Italian priest came to Danfeng County to do the missionary work. In 1918, the Spanish and Italian missionaires began to do missionary work in Shangluo County and built up a Catholic Church. There were 499 believers. In 1922, the Catholic Church was built in Shangnan County and the number of believers was about 2500. The Catholic Church in Shanyang was built up in 1925, until 1948, there were 1066 believers. The Shangluo parish was under the jurisdiction of Xi’an diocese.

Until 1949, there were 94 churches, 9000 believers in Hanzhong region, 19 churches and 4000 believers in Ankang region and about 10 Catholic Churches, 4000 believers in Shangluo region. However, during the Culture Revolution, almost all the church buildings were demolished, only the bishop’s residence of Guluba Catholic church in Chenggu County of Hanzhong region, the Shiquan Catholic Church in Shiquan County of Ankang region and a small building of Yanzibian Catholic bishop’s house in Ningqing County of Hanzhong region were conserved and stand until today.

Speaking of the distribution status, the Catholicism in south Shaanxi province was mainly distributed in Hanzhong and Ankang regions. However, not all the countries of these two regions had Catholicism been introduced during the period of 1840-1949. The Catholicism in Shangluo region was the less developed and there is no church buildings been preserved until now. In general, the Catholicism in the south of Shaanxi province was less developed than it in the central and north part of Shaanxi. Relatively the Catholicism was most flourished in
the central part of Shaanxi but the north Shaanxi had the most characteristic church buildings.

2.3.4 the preach of Protestant in Shaanxi Province

The protestant was introduced into the central part of Shaanxi province relatively late. From 1885, the missionaries Moir Dunkan (敦崇礼), Evan Morgan (莫安仁), Arthur Gostick Shorrock (邵涤源) of Baptist Missionary Society World Mission (BMS World Mission) came to Shaanxi and built up the first Protestant Church in Fuyin village of Sanyuan County which locates to the north of city Xi’an. It was the first strong hold of the protestant activities in Shaanxi. From 1901 to 1903, they bought an area in Dongxinxiang (East New Alley) of Changle Fang in the east of Xi’an, and established the first Protestant Church in Xi’an which became the leading office of protestant in Shaanxi.

Since then, many other Protestant Church and mission group came to Shaanxi in succession. Until 1949, there had been about 20 protestant groups that were founded up in Xi’an. They all processed various constructions of different scales and characters. In additions to the constructions of many church buildings, they also preached the protestant by founding the schools and hospitals as well as the charity. These buildings became the representative of the Modern Times architecture which was influenced by western architectural culture in Shaanxi province.

The Protestant had been once preached in northern Shaanxi. According to several countries annuals, the Belgian missionaries had brought protestant in the northwest part of northern Shaanxi before 1900, and there had Protestant Churches been set up. The relatively
large scale development of protestant in northern Shaanxi happened since 1917 when the Congregational Church of America sent missionaries to do the missionary work in the area of Suide and Yulin countries. However, the protestant had never been well developed in north Shaanxi. As the Red Army entered north Shaanxi (1935), all the churches became abandoned and prohibited, the protestant faded away from northern Shaanxi quickly. In accordance with the all county annuals of northern Shaanxi, a very few Protestant Churches had been built. But no more specific literate material could be found about the Protestant Churches built in north Shaanxi with this period of time; also we didn’t find any site old building.

During 1840 to 1949, the protestant was introduced into the south of Shaanxi province from Wuhan.

The protestant in Hanzhong region

In November of 1879, the foreign priest George King (金辅仁) came to Hanzhong from Wuhan. He rented a bungalow and set up the first Protestant Church of Shaanxi there. The doctor Wilson who was a believer did the missionary work there through healing the sickness of local people then he set up the church of China Inland Mission\(^{90}\) in town. The first Protestant Church in Yang County was set up in 1884 while three years later the first Protestant Church was set up in Chenggu County. In 1890, an American pastor became to do the missionary work in Mian County. The protestant was brought into Xixiang County by a British female missionary; she set up a missionary school there too. Then protestant was introduced to the neighbor county---Zhenba in 1904 and

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\(^{90}\) China Inland Mission (基督教内地会) is a protestant church; The predecessor is the China Inland Mission which was founded by British missionary Hudson Taylor in 1865. It was renamed as The Overseas Missionary Fellowship or OMF International in 1964.
a church was built up. By the end of Qing Dynasty, there were about 9 Protestant Churches and 400 believers in Hanzhong region. In 1933, a British pastor went to Ningqin and began his missionary work. There were about 18 Protestant Churches and 2000 believers at the end of 1949.

**The protestant in Ankang region**

The protestant was first brought into Ankang region from 1898 by the British missionary Chebuyun who was sent by China Inland Mission. He bought a local residence and turned it into a Protestant Church. In 1917, a Norway pastor of Lutheranism was sent to Ankang County. He bought a local residence to set up the church there.

Since then, the Protestant Churches were also set up in Hanyin and Baihe countries. By the year of 1949, there were about 300 believers of protestant in Ankang region.

**The protestant in Shangluo region**

In 1900 the protestant was brought into Shangluo by another Norway missionary. His intended to set up a church in Shangluo County but it was rejected by the local people, so he moved to Danfeng County and set up the first Protestant Church of Shangluo region in a residence he bought. In the following ten years, there were churches set up in countries of Shangluo, Luonan, Shangnan and Shanyang. Also four missionary school, two clinics and one orphanage were organized during the same time.

Relatively, the Protestant was mainly developed in Hanzhong and Ankang regions. The Protestant was more of minority in the south
Shaanxi. It has less number of churches and believers compared to the Catholicism. Also most of the protestant churches were not newly constructed. They were turned from the local residences.
CHAPTER 3

Analysis of Christian Churches in Shaanxi Province
3.1 Catholic Churches

3.1.1 The Catholic Churches in central Shaanxi

a) The St. Francis Cathedral of Xi’an (The Wuxingjie Catholic Church)

1 The history

The Wuxingjie Catholic Church was originally built in 1716 when China was in the Qing Dynasty. It was constructed in an area of land called the Earth Temple Cross bought by Italian missionary Madaidi (马戴弟) who was sent by the second bishop in Shanxi& Shaanxi Diocese--- Lanxi (兰溪) to host the missionary works in Xi’an during 1716 to 1727. They were both Italian Franciscan missionaries. The church became the Catholic Cathedral of the Shaanxi Parish when constructed. Ever since 1706, the Qing Government gradually began to prohibit the missionary work of Christianity in China. It was at first not hit in Shaanxi Province that much, so the Wuxingjie Catholic Church was extended during 1765 and 1785 by the third bishop Fangqisheng (方启升) of Italian Franciscan. Then years later, the Christianity prohibition became more and more strict and deep-going, so that the Wuxingjie Catholic Church was kept under sequestration around 1790. After 1844, when the Shanxi and Shaanxi became individual diocese, the second and third bishop, Gaoyizhi(高一志) and Linaiqi(林奇爱) went through a long term negotiation with the Qing Government since 1862 and finally reclaimed the church and property in 1884. Then the church was expanded again to 700m², the façade is 17.45m tall. The total area is 14746.7 m² and has a seating capacity of 350. In 1906-1908, when German priest
Hudingbang (胡定邦) became the fifth bishop of Shaanxi diocese, the church had been repaired. From the 20th century, several schools and hospitals--- Rose Girls Middle and Primary School, Joseph Boys School, Ando Hospital and Mary Clinic, had been hosted here. The Wuxingjie Catholic Church had not only achieved outstandingly in missionary works and development, but also dedicated a lot to the social service and education (Figure 3-1-1, 3-1-2).

Figure 3-1-1, 3-1-2 photos of the Wuxingjie Catholic Church (Taken by Huangshan)

The Wuxingjie Catholic Church and the annexes had been occupied by government during the 10 years of Culture Revolution, only the main church survived form the destroy. After the new religion policy been practicable in the 1970’s, the Wuxingjie Catholic Chuch was returned to the chuch in 1980. However, due to the years of disrepair, it was in terrible status. The State Council of P.R.China and Xi’an government allocated funds to restore the church in 1990. It has been listed in the important cultural relics protection units of Xi’an.

2 The architectural feature of present status

The actual formation has been mostly reserved from church which was extended and repaired in 1884.
There is a spacious platform at the entrance of the church. The overall formation is single floor, three bays in wide and eleven bays in deep. It used the similar formation of basilica from western church that the depth is divided by columniation; however, the orientation is sitting-north facing south of traditional Chinese architecture. Counting from the south of the depth axis, there are one-bay extensions to east and west in the first, fourth and sixth bay, which formed six cells outward the main body.

The first bay on depth axis from the south is the porch. The outward cells on the sides are the staircases which lead to the second floor of the porch. The pray hall is from the second to the sixth bay, which central bay on the east-west direction is 4.5 m wide and the two side bay are 4.4 m wide each. The depth of those bays is 3.9 m. The four cells are used as small prayer rooms. Then the seventh and eighth bays are for the choir stalls. To obtain an open and none blocking space, the two columns in the middle were removed. The ninth and tenth bays are the altar, and the last bay is service quarter (Figure 3-1-3).
Figure 3-1-3 plan of the Wuxingjie Catholic Church (Drawn by Huangshan)

The south face of the church is the façade, although displaying some traditional Chinese details, is similar to early Jesuit Baroque style flanked by two wings with Chinese motifs of carved brickwork spirit screen, as shown in Figure 3-1-4. The façade is divided into three bays. It is 20 m wide in total and 17.45 m in height. It is in Baroque-like composition with double Corinthian columns in double layer, the volute curve on the top and the cross standing above. The architrave decorated base, the folding entablature and pediment are common Baroque elements and stress the three dimensional. The walls of cyan bricks are laid on plinths of bluish-grey granite and decorated with carvings and moldings. The door openings are of arched heads and there is horizontal inscribed board hanging over the main entrance. The moldings are diverse; the engraving pattern is exquisite with Chinese traditional architectural patterns mixed in.
Figure 3-1-4 the façade and section of the Wuxingjie Catholic Church (Drawn by Huangshan)

The east and west elevations are different from western style façade, they are primarily of typical Chinese architectural style: load-bearing brick wall, wooden roof truss and tile roof covering. The roof structure is of traditional Chinese Tai Liang System (抬梁式), the south eight bays is of round-ridge flush-gable roof while the north three bays is of flush-gable roof. But the windows and door openings have semicircular arch heads (Figure 3-1-5), which never appeared in traditional Chinese architecture.
The indoor decoration is relatively magnificent. The ceiling of the central hall is of semicircular barrel vault; the aisles are connected to the central hall by arcades. The ceiling are jointed to the under part structure by Chinese beam color-painting and the chapiter is in Composite order with decoration of Chinese color-painting. In a word, it is all quite a combination of Chinese and Western elements (Figure 3-1-6).

3 Restoration

After the church building was returned to the church in 1983, it was restored in 1990. A lot of repair work was done:

All the weathered or damaged places were repaired, the embossments were polished, and the surfaces were cleaned and plastered. The destroyed tiles and wooden structure of the roof were
replaces by component of the same material as the original ones. The
three crosses on top of the church roof which were destroyed during
the Culture revolution were replaced by new aluminium alloy crosses.
The wainscot was added in the indoor space.

After the church was listed as one of the important cultural relic
protection units of Xi’an in April 2001, another restore project on the
moist alkalified wall, the weathered and dropping bricks, the damages
on the brick carvings, and the falling off of the aged mural inside was
taken in 2004 on the funds supported by the church itself.

During this restore project, the roof was cleaned and the broken parts
was replaces by using the same method: treated felt laying on the roof
boarding, hosting the grass-mud counter battens then supporting the
lime-mortar tiles. In this case the roof keeps as neat as possible.

For the outer walls, the incomplete brick carving was repaired. The
weathered bricks were replaced. Twelve 300x300mm square holes with
steel corners and nest were opened on the east and west elevation to
be used as exhaust vents to solve the problem of moist walls.

For the inner door parts, large area of peeling and cavity appeared on
the murals due to the long-term lacking of reparation. They take photos
of the old picture, removed the damaged mural and repainted
according to the photos. The inner walls were repainted on oil color.

Another important thing which was done during this restore was that the
workshops built up in Culture revolution when the church building was
occupied by the factory, was demolished. This left the open space in
front and around to the church building.
b) TONG YUAN FANG Catholic Church

1 The History

The TONG YUAN FANG Catholic Church was originally built in 1711 of Qing Dynasty. It was arranged by the missionaries sent by the first Italian bishop of Shaanxi & Shanxi Diocese, Basilius Brollo (叶宗贤). It was three-bay wide and seven-bay deep when first built but there is no more record could be found.

In 1844, when Shaanxi and Shanxi diocese was separated as two individual dioceses, the Italian priest Alfonso Donato (冯尚仁) was appointed as the first bishop of Shaanxi Diocese. Then the Catholic of Shaanxi province entered into a rapidly developing period. In the next year, the Bishop Alfonso Donato came to a Gaolin County which is about 50 km to the northeast of Xi’an. He built up the cathedral in an area of Gaolin County where he named TONG YUAN FANG. TONG (lead, connect) YUAN (far away) means lead to the heaven and lead to the far away Roman Curia. The reason why Alfonso Donato chose to build up the cathedral here is that it is not quite connected to the major road, so it could be relatively hidden as the prohibition of Christianity had not been relieved yet. Also it is an area quite near the town and Xi’an, the development could be optimistic. A Bishop’s House was built and a seminary was established during the time when the Bishop Alfonso Donato was there.

After Ephesus Chiais (高一志) was ordained as the Bishop of Shaanxi province in 1848, he planned and constructed a much larger church building, with about 15.5 m high, 46.6 m long and 12.4 m wide. This made TONG YUAN FANG develop unprecedentedly. It became the
missionary base for Shaanxi and Shanxi province and promoted the development of the Catholicism in the northwest of China.

Amatus Pagnucc (林奇爱) took over as the Bishop of Shaanxi province after the death of Ephisius Chiais (高一志). During his tenure, Amatus Pagnucc continued the construction of TONG YUAN FANG. His projects were the followings: 1) the refurbishment and extension of the existing Church in 1857. 2) He built up the Bishop’s House, which was a three-storey building with basement. 3) Walls were put up to protect the territory. 4) In order to make convenience for the missionary works promoted among women, in 1886, he invited a group of Franciscan nuns from Europe to TONG YUAN FANG. They were all wearing white cloth, so were called white-cloth nuns by the locals. Amatus Pagnucc arranged to construct a building for the nuns in TONG YUAN FANG, and had the white-cloth nuns in charge of the charity including orphanages for babies and aged people and a hospital. Also there were a long building with up to 50 rooms and a two-floor corner building built up for these facilities.

The TONG YUAN FANG back to that time was protected by high walls, while inside of the “city”, there were a cathedral, a Seminary which includes a small church and occupied over 13333m², a building for nuns, a school for the Bible study of the outlanders, a hospital, and orphanages for infants, orphans and aged people. After the endless effort of several bishops, TONG YUAN FANG had become a densely populated town and the true famous Catholic center of the northwest area of China (Figure 3-1-7).
During the Culture Revolution (1966-1976), all religious activities were suppressed, and church properties were confiscated. The cathedral was destroyed extremely; the narthex, the transepts, and the central section were demolished. With the gradual implementation of a new religious policy in 1984, church properties were returned. The actual formation of the TONG YUAN FANG Catholic Church has been preserved from the restored church in 1984.

2 The architectural feature of present status

It is shown in the pictures (Figure 3-1-8) that the old façade of the narthex was demolished during the Chinese Cultural Revolution. The facade of the old narthex, although displaying some traditional Chinese details, was similar to Jesuit Baroque style. The façade which
was flanked by sculptured lions had three deeply recessed portals and the central doorway is divided by a pillar. The entrance, in the form of a two-story triumphal arch surmounted by a pediment, has four attached giant Corinthian columns flanked by pilasters (Figure 3-1-9).

Figure 3-1-8, 3-1-9 photos of the old façade of the narthex (From the priests of the TONG YUAN FANG Church)

The cathedral was of timber and brick in typical Chinese traditional style, with a rectangular plan that highlights a holy shrine (Figure 3-1-10). The nave, together with aisles, has three bays and was about 42m long, 12m wide. Originally there were six transepts on each side, but these were demolished during the Chinese Cultural Revolution.
The current narthex was rebuilt in 1984 (Figure 3-1-10). The church has the typical Chinese architecture orientation, sitting in north while facing south. The main body is of rectangular plan. It is three bays wide and the space is divided into three lengthwise parts by two rows of wooden columns. The middle part is wider than the side parts. The church has sixteen bays in depth, the first bay from the north is the porch, the second to the thirteenth bay are the pray hall, the fourteenth and fifteenth bay are used as altar. The sixteenth bay had only one bay in wide and is the changing room for priest. There is one cell extended to the west on the thirteenth bay. The porch and the cell were added in 1984 when the church was restored. The TONG YUAN FANG Catholic Church has the capacity of 2000 people and was the largest Catholic Church in the northwest of China.
The present façade (the south elevation) (Figure 3-1-11) was also restored in 1984. The composition of the façade is simple; it is basically having Baroque-like feeling. There are curve pediment decorated by the Baroque-like moldings on the upper part and a cross on the top. A horizontal inscribed board written by Chinese character of Catholic Church is hanging in the middle. The bottom part is the overhang eave supported by four couple of individual columns. Three gates were opened on the façade; the middle one is higher than the side ones. The side elevation has been built up by grey bricks with imbrex roof, eave tiles and cornice dropping tiles. The double pitch roof is decorated by beautiful tile carving ridge. The windows are not in the unified form because the original main body of the church had high arched window, but after the six cells on the side were plugged, the added windows are normal flat windows.
The church is of the brick-wood mix structure. The roof is traditional Chinese wooden Tai Lian System (抬梁式). The wooden pillars and beams are very thin; the diameter is just 350mm. The load is bearing by walls which are grey bricks outside and adobe bricks inside. The thickness is about 960mm.

The inner space (Figure 3-1-12) of the church is more than 5m in height. It is special with few decorations. The pray hall had simple flat wooden ceiling. The central part of it is a bit higher than the side parts. The altar and the cell had arch ceilings for the definition of changing space. The wooden columns are painted in red and standing on the stone stylobates. There are windows on the walls on two sides for natural lighting. Twelve tombstones of Chinese and western priest who were buried here are inset into the walls.

3 Restoration

During the Culture Revolution, the TONG YUAN FANG Catholic Church was occupied by the local people and used as the storage. Some damage had been done on the church building: the iron cross on top
of the roof was demolished, so as the façade. The stones and the carvings that were taken down were buried under ground. The altar and six cells of the church were also demolished.

Parts of the windows and doors were broken. The church building was not returned to the church until 1983, and then the church was repaired in 1984. The façade was rebuilt and was different from the original one. The old inner space and the structure were maintained during the restore project. All the stones and the carvings that were taken down and buried under ground were used in the restore.

c) Sanyuan Catholic Church

The Roman Curia ministry divided the Roman Catholic Archdiocese of Xi’an into five dioceses in the November of 1931. Sanyuan Diocese became under the supervision of Italian Franciscan. The first bishop was the Italian priest, Fulgentius Passini. Since 1934, he bought a land area at Yuanmen Alley of Sanyuan County and built up the Sanyuan Catholic Church. Later, because the broke out of Anti Japanese War (1937-1945) and the lack of funds, the construction stopped in year 1938. However, the main body of the church had been basically done, only left the bell tower and inner space decoration. The main body of the church is about 45 m long, 183 m wide and 33m high. It occupies 666 m² with appearance similar to Romanesque style.

During the Cultural Revolution (1966-1976), the church was occupied by the cotton mill of Sanyuan County and used as workshop and residences. In that case, the inner space of the church was separated by walls. The cross and mural painted by foreign priests at the altar were eradicated so as the altar. In 1979, a fire happened at the church, so
the roof, gates and windows were burned away. The church property was returned back to the church, but the residents lived in church had not moved out completely until 1990. From the march of 1990, the church began to be restored on the funds of the State Council. The restoring construction was finished in the end of that year.

The current church has the façade of about 90m high facing east. The bell tower is in the opposite direction from the façade. (Figure 3-1-14, 3-1-15) No picture information of the original church could be found by now.

![Sanyuan Catholic Church](image)

Figure 3-1-14, 3-1-15 photo of the Sanyuan Catholic Church (Taken by Huangshan)

### 3.1.2 The Catholic Churches in northern Shaanxi

#### a) The Tanjiaping Catholic Church

In Jia County, the catholic was first being brought in from Shanxi Province which is located next to the east Shaanxi Province. In year 1900, when the Boxer Rebellion\(^9\) was taking places, the Italian priest

\(^9\) Boxer Rebellion (义和团 Yihetuan), Boxer Uprising or Yihetuan Movement was a violent anti-foreign and
Sun and friar Ma(liupin) went across the Yellow river from Shanxi Province to Tanjiaping to escape the pursuit and capture of the Boxer rebellion. In this way, the Catholicism was first brought into Jia County. Ever since 1900, the Spanish Franciscans began to preach in the north of Shaanxi Province. In February of 1909, the Spanish priest Nicolas Nieto (聂长春) came to Tanjiaping and began to build up the church. But he died the 5th, July of 1910 because of typhoid. Then the church was continued to be constructed by priest Wei Xiangque and finished in the early 1912. (Figure 3-1-16, 3-1-17)

Figure 3-1-16 the Tanjiaping Catholic Church along the Yellow river (Taken by Huangshan)
Figure 3-1-17 Façade of the Tanjiaping Catholic Church (Taken by Huangshan)

This is the earliest Catholic Church in Jia County. After the Tanjiaping Catholic Church was built, the ordinance and activities were governed by 8 missionaries one after another and the precinct covered to the area along the Yellow River in Shanxi Province. Besides, there were eight other churches were built up---Tong Town Church, Songjiashan Church, Shizichuan Church, Xiliangmao Church, Zaopin Church, Qinliang

anti-Christian movement which took place in China towards the end of the Qing dynasty between 1899 and 1901. It was initiated by the Righteous Harmony Society (Yihetuan), known in English as “Boxers,” and was motivated by proto-nationalist sentiments and opposition to foreign imperialism and Christianity.

All the priest did missionary work in China had a Chinese name very related to the original name pronunciation. But a major part of them had only been recorded in Chinese, we can hardly find out what were their original names now.
Church and Hanhongdao Church. According to the statistical of 1937, there were more than 1000 follower belonged to the Tanjiaping Catholic Church. Since the liberation of P.R.China, the Tanjiaping Catholic Church was occupied by production team and used as warehouse until the Christian regained the freedom to preach again. In year 1966, the rebel group of the Culture Revolution dug out the remains of priest Nieto and a gravestone with epitaph on it. The remains of priest Nieto was threw into the Yellow River, but the gravestone was kept by church members and preserved in Tanjiaping Church until now. (Figure 3-1-18)

![Gravestone](image)

Figure 3-1-18 photo of the gravestone (Taken by Huangshan)

The gravestone is in steel-grey color, with 154.4cm high, 80.5 cm wide and 11 cm thick. There is a cross on top, 10 lines of Latin in the middle:
Analysis of Christian Churches in Shaanxi Province

“AQUÍ ESPERA
LA RESURRECCIÓN FUTURA
(DE) NICOLÁS NIETO
DE LA PROVINCIA DE SANTIAGO EN España
NACIDO EL AÑO DE 1881
LLEGADO A CHINA EL DÍA 10 SEPT 1906
Murió in tanjiapín diá 5 Jul. 1910
DESCANSE EN PAZ”

About 190 Chinese characters in 13 lines were engraved at the bottom part. The gravestone was set up in May, 1912. It recorded the process from when priest Nieto arrived in Tanjiaping and bought this ground to how he began to set up the base and build the church. During the construction, he frequently missed the meals and slept quiet little. He dedicated so much to it that he got sick very badly and died because of typhoid on the 5th of July, 1910 when the construction project was not finished. Then the church was continuously built up by the priest Wei. The Priest Nieto was very nice and kindly helped a lot of people; the grave stone was set up to memory him. The epitaph was engraved by Qin Hao (秦好).

In year 1989, the priest Song was sent from Yanan Parish to Jia County to take charge of the ordinance and activities. He repaired the Tanjiaping Catholic Church which was very important for the revival of the church and the church members. Now the Tanjiaping Catholic Church has become a tourist place as it is the longest history in Yulin Parish.

The whole building is 15.8 m long and 15.2 m wide. (Figure 3-1-19) The
main body of the church in the middle is of double pitched roof, while the flat roof buildings on both sides of the main church is the residence for abbot. The one on the east has two floors and is a little lower than the main church, but the one on the west has just one floor by the reason that it was unfinished because the abbot returned to his County.

Figure 3-1-19 Plan the Tanjiaping Catholic Church (Drawn by Huangshan)

The whole construction has stone-arch structure, in style of the combination of the typical residence--- cave dwelling\(^{93}\) of the north Shaanxi, and Gothic-like appearence. (Figure 3-1-20, 3-1-21) The

\(^{93}\) The cave dwelling is a special kind of house found in the loess area the Yellow River in the northwestern part of China, where rainfall is scanty and timber scarce. The caves were dug into a loess cliff providing a dwelling with narrow façade and extending into the cliff. The vaulted ceiling was sometimes strengthened by inner brick vaulting.

Where there were no cliffs, a sunken courtyard was dug and caves were dug in from the “walls” of the sunken courtyard. A ramp was built to allow carts and residents down into the four-closed sunken courtyard. Since the cave dwelling had one side facing outside, there was insufficient daylight and poor ventilation. Some of the later cave dwellings have “courtyards” at both ends of the cave to provide cross-ventilation. Some of the cave dwellings were integrated with regular houses built on the land in front, thus forming a combination of houses and caves.

The cave had the advantage of being easy to heat in cold weather and cool in warm weather. A recent survey shows that people living in the caves have enjoyed a longer life-span than those living in traditional courtyard houses.
longitudinal axis is along the east-west direction with the façade facing the east. The cave in the middle has been used as the church and is connected with the caves on the south and north. The church has rectangular plan with 15.8 m long and 6.6 m wide. It has been covered with the double pitched roof. The inner part of the church is the pointed arch cave dwelling in height of 10 m. The main entrance is on the east while the altar is located on the west. There is a second entrance on the south connecting to the cave used as sacerdotal residence. Two towers have been set up on both sides of the main entrance, the taller one is about 14m and the other one is about 10m. The gate and windows on the façade are of gothic-like pointed arches. The cave dwellings on the south contain six caves arranged in two floors and have the flat roof. The L shaped stairs on the east of the caves leads to the ground. The cave dwellings on the north have three caves in one row covered by flat roof. The total occupation is 1360m² including storehouse and stable.

Figure 3-1-20, 3-1-21 Sketch of Tanjiaping Catholic Church’s cave Dwelling Structure (Drawn by Huangshan)

The traditional horizontal inscribed board, doves and plants patterns have been used as detailed decoration. The church is a little similar to Gothic style, but the cave dwelling and the decoration increased the local characteristic of itself.
b) The Qiao’ergou Catholic Church

The Qiao’ergou Catholic Church is located in Qiao’ergou village, Baota district, Yan’an city. In 1911, when Yan’an parish was set up, it was just a small village with four families. The Spanish bishop Caesar Ibañez y Aparicio (易兴化) went back to Europe three years for raising funds to build the church. In 1914, he bought about 46667 m² here and built up 52 stone caves, 17 bungalows, and 80 loess caves in succession. One large cave was used as the church, and then schools, orphanage and medical clinic were set up continuously. The Catholic Church was started to be built in 1931 and the main project was finished in 1934. In year 1935, during the movement of agrarian revolution, the priest and relative people evacuated and the schools closed before the built up church was used for the first time. In 1936, when the Central Committee of the Communist Party of China arrived and garrisoned in Yan’an, the Qiao’ergou Catholic Church became used as the auditorium of central committee of the communist party school. From 1939 to 1945, it was occupied by the Lu xun art academy which belongs to the communist party of china. Since 1949, the Qiao’ergou Catholic Church has been protected as the very important historical site in Shaanxi Province. (Figure 3-1-22, 3-1-23)

![Figure 3-1-22 photo of the Façade of Qiao’ergou Catholic Church (Taken by]
The main body of the church has the rectangular plan, which is 36.28 m long and 15.86 m wide. The gross area is 575.4 m².

The bell house, which includes the hall in the middle and two towers on each sides, the central hall and the altar are located from the south to north. The height of the central hall of the bell house and the bell tower is 18 m and 25 m respectively while the depth is 3.83 m.

The façade of the middle hall has three parts. There is a concave semicircular arch gate at the bottom, as the main entrance. Two pilasters were arranged on both side of the main entrance arch. The waist part has three paratactic windows with semicircular arch. The top part is triangle pediment with two pilasters symmetrically on each side and a traditional Chinese horizontal inscribed board carried the word Catholic Church in Chinese. There is a concave round window which is similar in form with the rose window above the inscribed board.

The two bell towers are totally symmetric, each of them includes four parts: the concave arch gate as the second entrance at the bottom, two arch windows at the midway down with an arch above, then the rose shape like window in the upper part, the concave arch window decorated by European colonnade was on the top. The overall modeling is very tall and straight. (Figure 3-1-24, 3-1-25, 3-1-26).
The central hall of the church is 27.35m long, 15.8m wide. The twelve Corinthian columns with 4.5 m in height in two rows have divided the hall into three parts, the central nave and two aisles. Each column has plum blossom, peony and other different plant patterns engraved on the column head and body. The central nave is 11 m high, 7.2 m wide, the ceiling is of semicircular rib arch structure built up by stone, and separated from the aisles by arcades. The aisle is 6.3 m high and 7.2 m wide. It’s of successive arches with windows opened on the east and west, 7 set of windows on each side. Every set of window contains three small arch windows; the middle one is higher than the other two. The altar is on the north with 5.1 m in length. The detailed stone carving used traditional plant and animal patterns as plum blossom, orchid, chrysanthemum, lotus and dragon. There are well-decorated pilasters
and brick carved niches on the north wall of the altar. A second-entrance is set up on the west. (Figure 3-1-27)

![Figure 3-1-27 Inner space of the Qiao’ergou Catholic Church](image1)
![Figure 3-1-28 Outer walls of the Qiao’ergou Catholic Church](image2)

All the bottom part of the church is built by stone; the other part is of grey bricks. (Figure 3-1-28) It is of brick-wood structure. The indoor decoration is a combination of Chinese and western style, while the outdoor decoration is more of Romanesque-style.

**c) The Guanguyi Catholic Church**

The Guanguyi Catholic Church is located Baota District of Yan’an city. The Catholic was brought here in 1911, then years later, a Spanish priest whose Chinese name was Pingjing An bought up an area about 33000 m². He first built up three stone cave dwellings used as the church. There was a stone horizontal inscribed board with the sign of the Cross and 1926 on it. Meanwhile the other six cave dwellings were built up as the primary school. In 1927, eight cave dwellings were built up and the minor seminary of the parish was set up, while another five cave dwellings were built and used as the Orphanage and medico clinic.

The existing Ganguyi Catholic Church had begun to be constructed from 1931 and it lasted three years. However, after the liberation of
Yan’an city in 1935, the minor seminary was closed down, the church evacuated. The Catholic Church was set up as the First Complete Primary School of Yan’an. In 1939, the church began to be used as the hospital, and then in 1944, it was changed into a textile factory, both for the Red Army. From 1951, the church was occupied by the government as grain storage, and then altered again into a sale station of grain and oil in 1953. The windows of the church were blocked in 1967 and the church was turned back to grain storage. Part of the cave dwellings were tore down in the same year.

Since 1984, the Catholic Church has been listed as one of the Municipality Protected Historic Site. It was repaired and reinforced in 1988. Now the appearance of the church is in good condition, but the indoor facility does not exist. There are 22 cave dwellings and a 77 m enclosure wall on the south with the main entrance gate. The Chinese words of Catholic Church were engraved on it. The church is conserved without occupation, yet all the other buildings are used as the grain storage of Ganguyi town.

The church is facing south, 16 m wide, 31m long. It has the rectangular plan with outward arch shape altar on the north end. The façade is composed by three vertical parts: the two aisles on the side and the bell tower in the middle. The elevation of the aisles were completely symmetrical and each one was divided into two parts, pointed arch underneath, triangle pediment above with rose shaped blank window engraved on traditional Chinese plants decoration. Two spires were located on each side of the pediment. (Figure 3-1-29)

94 Red Army the army led by Chairman Mao and achieved the revolution of People’s Republic of China at Oct. 1st, 1949.
The elevation of the bell tower is the center of the composition, which has been divided into three roughly equal parts. The bottom part is the main entrance of the church; it is a three layer concave pointed arch gate. The middle part has three concave pointed windows and the horizontal inscribed board. The upper part is a hexagonal bell tower, which has pointed arch windows and decorated cornice. (Figure 3-1-30, 3-1-31)
The indoor space of the church is made up by the central hall, two aisles and the bell tower. The semicircular altar is at the north end of the central hall. The bell tower is on the middle of the main entrance. The roof truss of the central hall and aisles is of arch, while the altar has vault. There were oil paintings about Bible stories on the wall. The portrayal of Virgin Mary, the father and Jesus were hanged on the altar.

The whole construction was of brick-wood structure and stones were the main constructional material. All the chapiters have the same detailed decoration. There are spires on the roof, all the windows and gates is of pointed arches and have fine engrave. It shows a similar appearance to typical gothic style with traditional Chinese decorations. (Figure 3-1-32)

Figure 3-1-32 photo of Side elevation of Ganguyi Catholic Church (Taken by Huangshan)

d) The Xiaosuangou Catholic Church

The Xiaosuangou Catholic Church was built in 1932 on the hillside of Qinghuabian Town, Baota District, Yan’an City. It is of Chinese-western combined style, with cave dwellings inside and Romanesque-like
façade facing south.

The northern part of Shaanxi province is located in Loess plateau, the region of Yan’an is in the gully region of the Loess plateau. No matter in the countryside or the cities and towns, the cave dwelling is the most common residential type in all ages. The urban residents mostly live in the stone or brick cave dwelling, while in the county the major type is the mountain cave dwelling. Actually, the mountain cave dwellings are most typical in northern Shaanxi. It is the horizontal cave dug into the mountain, sometimes with several caves connected. In order to avoid the loess collapse, there would be stone or brick arch added inside the cave and brick wall would be built up to protect the cliff face. The soil texture is very important for choosing the location to build the cave dwelling, it has to be clay. The cave must face the south and open area while against the mountain.

The building process of the cave dwelling is first, dig out the cave and move away the soil with. This should be done slowly because the water content of the clay is relatively high and it would be easier to collapse if the digging is too fast. Second, shape it out by getting the arch of the roof and neat the walls. Then, after the cave is dry, facing the cave with the mud mixed by loess and crushed straw until it become neat and smooth. For the last, build the façade of the cave dwelling with bricks.

The Xiaosuangou Catholic Church is of typical mountain cave dwelling with façade of Catholic Church build by bricks. It’s 12 m high, the appearance shows two floors. The upper part is brick-built bell tower, while the bottom part is five loess cave dwellings covered by gray brick elevation. (Figure 3-1-33, 3-1-34, 3-1-35, 3-1-36) The total wide is 26m. The cave in the middle which the inside width is 6m, was used as the church.
The church cave is about 9m in depth and 7m high from inside, altar is on the north. The indoor measurements of the other four caves on the two sides are 3m wide, 3.5 m high and 6.4m deep.

![Sketchs of the cave dwelling structure of the Xiaosuangou Catholic Church](image1)

Figure 3-1-33, 3-1-34 Sketchs of the cave dwelling structure of the Xiaosuangou Catholic Church (Drawn by Huangshan)
Figure 3-1-35 Cross section of the cave dwelling structure and the façade (Drawn by Huangshan)
Figure 3-1-36 Façade of the Xiaosuangou Catholic Church (Taken by Huangshan)

**e) The Tianshen Temple Catholic Church**

The Tianshen Temple Catholic Church has the same name as the street on which it stands in Yuyang District, Yulin City. The building site was a compensation for the church by the government of Shaanxi province because the priest Wei Xiangque was killed in the Qinmajian Village of Jia County. The priest Yin Jiabo came here in the same year and set up the church on the old house property to do missionary work. The old
house property includes two courtyards; the orphanage and minor seminary were set up in the north courtyard in 1916. In addition, there were 5 cave dwellings and 5 bungalows.

In 1922, the Catholic Church was built up in the north courtyard. It was constructed by brick and covered by brown glazed tiles. Besides, another 7 bungalows were built up on the north, and seven cave dwellings were built up in the south courtyards used as guest rooms and storages. Five year later, Spanish priest Piao Jinfu came here and established a western medical clinic. By then, there were 57 rooms and 7 cave dwellings in total, which occupied an area of 40000m².

In year 1935, Yan’an was liberated, the church was evacuated, so the Spanish Bishop came here and turned the Tianshen Temple Catholic Church as the Cathedral.

In 1948, the priest Yin Jiabo and Piao Jinfu went back to Spain, but another Spanish priest Zeng desheng succeeded. However, the medical clinic was shut down for one year. After the priest Zeng desheng left Yulin in April of 1953, the clinic was took over by the government. The clinic and the Yulin Chinese hospital were merged, and the church was occupied in 1960. Then in 1966 it was combined with the Yulin health center and merged into the Yulin People’s Hospital with the pharmacy company. The south courtyard was occupied by the gauze and medical material companies as storage. Both courtyards have belonged to the government while the church was turned into a refectory.

In 1982, all the constructions in the north courtyard had been tore down by the government except the church, but the church had not been
preserved until now. It was dismantled by the Land Bureau of Yuyang District. There are only 7 cave dwellings in the south courtyard been remained until now, but was still being occupied by government. (Figure 3-1-37)

Figure 3-1-37 Façade of the reserved part of the Tianshen Temple Catholic Church (Taken by Huangshan)

f) The Songchuan Catholic Church

The Songchuan Catholic Church is founded in Songchuan Village, Baota District of Yan’an City. It was built in 1933 and of cave dwelling style. There were three caves, the middle one which was used as the church and the east one were facing north, the one on the west is facing east. The church cave is 5 m in wide and 10m deep. There is a stone horizontal inscribed board engraved the sign of the cross and 1933 inlaid over the entrance. These three caves were connected inside. The side cave was 4m wide, 3.5m tall and 8 m deep inside. Since the church evacuated in 1935, it have been occupied by the villagers until now. (Figure 3-1-38)
g) The Youfangtou Catholic Church

The Youfangtou Catholic Church is Gao Town, Hengshan County of Yulin city. The Spanish priest, Priest Hang came to do missionary work here in 1897. He used several cave dwellings as the church at first, then built the new church in 1909. The new church is Siheyuan (四合院)\(^95\). 7 caves and 10 caves were on the south and north respectively. The middle cave on the south was the main entrance, while the middle and larger cave on the north was used as the church. It has two gates and a semicircular window above. Also a stone horizontal inscribed board engraved 1909 was on the church elevation. The depth of the church cave is 20m and the width is 8m. Additionally there were 6 caves on the west and 3 caves on the east. As all the other churches in this area, it was closed in 1935 when the priest was taken away by the Red Army. After 1949, the church courtyard was used by the production team until the 1980s; the caves were distributed to the villagers. Now a large part of the courtyard collapsed. (Figure 3-1-39)

\(^95\) Siheyuan (四合院) is the typical representation of the courtyard-style residence in the northern China. The plan layout is characterized by courtyard, and has two, three, four or five courtyards connected according to the status of the owner and the situation of the base (the unoccupied area between two alleys)
3.1.3 The Catholic Churches in south Shaanxi

a) Shiquan County Catholic Church

The Catholicism was first introduced into Shiquan County in 1891. The Shiquan County Catholic Church is located in Hujiaxiang (Hu family Alley) of Shiquan County of Ankang region. It was constructed in 1931. It contained 20 rooms for two schools (one for boys and the other for girls), an orphanage and a clinic. The church was partly destroyed during the Culture Revolution. It is still occupied by government and no religion activities are held here.

The church is of rectangular plan with 8.5 m wide and 15.4 m long and it covered an area of 130 m². It is 3 bay in wide and 5 bay in depth. The height is about 7 m. The construction is of brick-wood structure, the walls and columns were built by grey bricks while the roof truss is of wood. For the indoor space, in longitudinal, the columns were connected by arches; in horizontal, the columns are supporting the roof truss. The outer wall on two sides and back was blocked by added residence. The façade is built by stones with simple delineating divisions to gain the modeling effects. There is a rose shaped window opened in the central of the façade, but only the window hole exists. It is suppose that it had wooden window frame. The side bays of the façade were blocked by added buildings. It is notable that the roof structure of the two side bay is traditional Chinese Tai Liang System (抬梁式) while the roof structure of the central bay is triangular truss which is obviously from the western architecture (Figure 3-1-40, 3-1-41).
The church has western-Chinese mixed roof truss structure with western-like façade and Chinese roof tiles. It used all the local construction materials to satisfy the Christianity function and features. In short, it is a harmony example of church mixed both foreign construction method and traditional Chinese practices.

Although, there had been more than 100 Christian Churches built during the period of 1840 to 1949 in south part of Shaanxi province, it is the only one that survived the culture revolution and other large scale demolishes. The church itself has very important value as a culture and architecture relic. However, it is not in very good condition now.

Because the Shiquan County Catholic Church was used as public residence, it was extended from the external and the separating ceiling was placed inside the church building. Due to the Wenchuan
earthquake\textsuperscript{96} and urban renewal demolition, most of the residents had moved out. The majority of the additional rooms were demolished except the rooms against the exterior wall of the church. They blocked the appearance of the church but it’s harmless to the structure of the church. The façade, grey brick built walls, arches, wooden truss are basically well preserved. If we demolished the additional rooms against the exterior walls, remove the separating walls and ceiling inside the church, change the broken components, the church could be recover to its original appearance.

However, the district holds the church is going to be demolished and move out, it is difficult to tell if the church would be conserved.

\textbf{b) Yanzibian Catholic Church}

Yanzibian is a town of Ningqiang County in Hanzhong region. The Catholic Church was rebuilt on a large resident courtyard bought from the local people.

The Catholicism was brought in Ningqiang County since 1871; the Yanzibian Catholic Church was located in a small village where the Jialing River and Yanzi River join. In 1900, the foreign priest was killed because the church snatched food and grain from the local people. However, the Eight-Nation Alliance\textsuperscript{97} attacked Beijing at the same time. The Qing government was so nervous that they imposed a felony to the murder and fine heavily from the county government to pay back to

\textsuperscript{96} The 2008 Sichuan earthquake or the Great Wenchuan Earthquake, measured at 8.0 Ms and 7.9 Mw, and occurred at 02:28:01 PM China Standard Time at epicenter on Monday, May 12 in Sichuan province, killed 69,195 people and left 18,392 missing.

\textsuperscript{97} The Eight-Nation Alliance was an alliance of Austria-Hungary, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States, whose military forces intervened in China during the Boxer Rebellion and relieved the siege of diplomatic legations in Peking (Beijing) in the summer of 1900.
the church. The church was occupied an area of 26700 m², but only 14% of the area was left to the church after 1951. Then the church was used as a grain supply centre, and turned into a factory for medical materials. Now it is used as a wood factory (Figure 3-1-42, 3-1-43).

There had been about 30 rooms with titled roofs arranged in the two-courtyard Siheyuan formation which occupied 4500 m². Now only a two-floor building left and there is no record about what it was used for. This building has L shape plan with 13.4 m long and 13.16 m wide, it is 6.9 high. The stair case is placed in the join part of the two rectangular. It is of brick wood structure and gable-and-hipped roof. The wooden columns in the second floor are confused. It seems like there had been an extended contribution. The whole building is in dangerous condition.

The building is abandoned for just storing stuffs now. The arched windows and doors show the influence of western architectural culture.

There no more literature records about this church in architectural

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98 Siheyuan: See examples in 2.5.3
aspect. The only building survived from destroy is in very unstable status and surrounded by other residences.

c) The bishop's residence of Guluba Catholic Church

The French missionary Stephen LeFevre brought the Catholicism into south Shaanxi since 1638. He first arrived in Yang County but the missionary work was not well developed. There were few followers. Then he moved to Chengu County and continued his work.

Then after the Christianity Prohibition was relieved, in 1889 the Guluba Catholic Church began to be built in Chengu County under the design of Italian priest and the construction was completed in 1895. There was cathedral, bell tower, bishop’s residence, small residence, monastery, orphanage, Latin school, college, grain and oil storage, factory and basements. All the buildings were connected to each other by corridors and there are four turrets on the corners of the wall of the church area. Later, the cathedral was moved to Hanzhong County so the Guluba Catholic Church was gradually left unused.

When the Anti-Japanese War occurred 1937-1945, most the college moved into the inner land cities. The Guluba Catholic Church had hosted the Industry School of Northwest United University. After 1949, all the foreign missionaries went back to their countries; the church area was used by local people for non-religion uses. Then a large part of the church area was destroyed in Culture Revolution except the bishop’s house.

The bishop’s residence is sitting in south-north direction with □ shaped plan (Figure 3-1-44). It occupied an area of 68.4X50 m². The gate room is
of double-eave hipped roof. The main hall had five bays in wide with mix roof style which is double-eave gable-and-hipped roof seeing from the façade but single slope from the back. There were 13 rooms on the east and west directions.
Figure 3-1-44 plan of the bishop’s residence of Guluba Catholic Church (Drawn by Huangshan)
The building is of brick-wood structure. The wooden columns were buried in the brick walls. The brick wall itself is not bearing any load. The rood truss was of Tai Liang System (抬梁式) supporting by the wooden columns buried in the walls and the brick columns against the exterior of the walls. There were paintings of Catholic stories on the beams which is a typical Chinese way to express Catholicism. The main hall was turned to a church since this residence was the only building of Guluba Catholic Church area survived from the Culture Revolution.

The bishop’s residence in conserved in good condition and it is still used for Catholic activities now. It has already been listed as one of the provincial key cultural relic protection units.

### 3.2 Protestant Churches

Compared to Catholicism, the Protestant was introduced into Shaanxi province relatively late. Also a lot of the churches chose to build up their church buildings in the local residents or existing buildings. Or they built churches buildings in the total local formation. After the long history filled with wars, culture revolution and other events, almost all of the buildings used as Protestant Churches was destroyed or demolished or turned into other buildings, especially in the northern part of Shaanxi province. In south part of Shaanxi, although there had been 18 Protestant Churches in Hanzhong region; about 10 Protestant Churches in Ankang region and 17 churches in Shangluo region in addition with several schools and hospitals, the existing examples of Protestant Church buildings could hardly be found now. There only are several Protestant Church buildings left and conserved in the central part of Shaanxi province.
3.2.1 Protestant Churches in central Shaanxi

a) The Church of BMS World Mission, Xi’an City Dongxinxiang Church

1 The history

In 1890s, Timothy Richard (1845-1919) who was doing the missionary work of BMS (Baptist Missionary Society) World Mission in Shanxi Province of China, sent the missionaries A. G. Shorrock, Moir Duncan, and Evan Morgan to Shaanxi Province during 1890 to 1895. They came to Fuyin Village of Sanyuan County which is about 50,000 m away from Xi’an City, and built the first church of BMS World Mission in Shaanxi Province.

In 1900, when Boxer Rebellion was spring up, the English missionaries were compelled to leave Shaanxi. In 1901, having survived the sieges of the Boxer Rebellion, the missionaries of BMS World Mission returned temporarily to Shanghai. After the “Boxer Protocol” of 1901, they came back to Xi’an City of Shaanxi Province. From 1901 to 1903, after several times of trying to buy the land by very high prices and rejected by the local people, BMS World Mission finally acquired a roughly 8 acres of land in Dongxinxiang (East New Alley) of Changle Fang in the east of Xi’an, and established the Shaanxi Office of BMS World Mission. In 1909 Dong Xinxiang Church was completed on the foundation of BMS World Mission.

The church occupied about 10667m², and of timber frame arch.

99 The Boxer Protocol was signed on September 7, 1901, between the Qing Empire of China and the Eight-Nation Alliance (Austria-Hungary, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States) that had provided military forces plus Belgium, Spain and the Netherlands after China’s defeat in the intervention to put down the Boxer Rebellion at the hands of the Eight-Power Expeditionary Force. It is often regarded as one of the Unequal Treaties.
structure. It was taken away during the Culture Revolution, and not returned until 1984. After being restored, the church has been listed as one of the City Protected Historic Sites (Figure 3-2-1).

Figure 3-2-1 photo of the Xi’an City Dongxinxiang Church (Taken by Huangshan)

2 The present status

The church is sitting west while facing east. It is 25 m long, 11 m wide and 15 m high with the collar braced roof (Figure 3-2-3). It has rectangular plan, single flat, one bay in wide and seven bays in depth. The first bay from the west is the altar, then the second to the seventh bay is the pray hall. The church was extended in 2004 as opened the back door on the north of the back wall of the altar, set up an inner corridor for the clergy and added two cells in front of the altar at the north and south which made the plan into a cross. An entrance gate was set up on the east elevation with an outward cell as the anteroom. There are doors opened on the north and the south walls of the cell connecting to the pray hall (Figure 3-2-2).
The façade (east elevation) of the church, which does not display any traditional Chinese details, is similar to Early English Gothic style. It shows off roughly in the triangle shape, the north and south ends go in towards the middle in step which makes the contour line variegated. The top of the façade is semi-circulated with a cross standing on. There are
arched windows on both sides of the bottom parts, and a semicircular lattice window in the middle of the upper part of the façade. The anteroom’s form echoes the formation of the east elevation. The exterior of the church had been built up by grey ganged bricks. Four sets of arched high windows are opened on both the north and south elevation (Figure 3-2-4, 3-2-5).

The most different part of the church is the roof structure of the hall (Figure 4-2-3). The whole weight of the roof is supported by a row of wooden arches which are on the bottom of the roof structure. The span of the wooden arches is about 10 m. The practice is quite special: the semicircular arches are located the lowest; each arch is tangent to four wooden beams which supported the triangle roof truss. The feet of the wooden arches stand on the chapiters of the pilasters on two sides. The pilasters were built by sand-gravel and each row has six of them. Half of each pilaster is embedded in to the wall; the brick wall outside of the pilaster could help offset the side thrust from the wooden arches which likes the practice of western Gothic churches. The roof truss has two pitches in north and south, each pitch supported three purlins and the rafters upon. The wooden roof boarding was placed over the rafters and cover by tiles.
There is no decoration in the inner space of the church (Figure 3-2-6). The whole roof structure is totally exposed as there is no ceiling which makes the most characteristic point of the interior. There is a big red cross on the back wall of the altar and four Chinese characters which are the transliteration of Immanuel. Two wooden stairs are set up at the north and south ends of the altar for the priests when baptize.

![Figure 3-2-6 photo of inner space of Xi’an City Dongxinxiang Church (Taken by Huangshan)](image)

b) Sanyuan Dongguan Church

1 History

The missionaries, Mo anren (莫安仁), Guochongli (敦崇礼), A·G·Shorroek(邵涤源), of BMS World Mission came to shaanxi province continuously from city Taiyuan of Shanxi province from 1885 to 1887, they brought an area in Youfang alley which was in the east of Sanyuan County to build up church for the missionary work. The Sanyuan Dongguan Church has been built up since 1915 by British missionary Rev. J. Watson’s design and arrangement. (Figure 3-2-7, 3-2-8)
2 Current statuses

The church is of brick-wood structure, with double brick walls bearing the loads. It has the wooden roof truss in shape of “人” with overhanging gable roofs. It is 11m high and the rectangular plan is about 23m long, 12m wide and 300 m². As the church was built by BMS World Mission, there is a baptismal font of 3.4 m long and 1.4 m wide set in front of the altar. The façade of the church has gothic-like style and traditional Chinese eaves and outlines. The church is in typical Chinese traditional style, though has imitated the setup of classic gothic church. The east façade, flanked by twin towers with hipped and gabled roof is two-story high and taller than the nave. The portal is under each of towers. The bell towers were built by grey bricks with traditional Chinese patterns engraved. The church, in total, is simple and special with mix styles.

c) Xi’an City Nanxin Street Church

1 The history

Xi’an City Nanxin Street Church is located in Jixianxiang (gathering wise
man alley) of Nanxin Street (Figure 3-2-9). In 1919, with the help of the priest of BMS World Mission, Rev. J. Watson, Chinese priest Zhang Ziyi, and several personage of protestant from Xi’an, Nanxin Street Church and its attached buildings have been built up. It occupies about 6667 m².

The church is sitting in west while facing east. It is a single layer planned in rectangular and occupied about 400 m². The church is about 20m long, 15m wide and 8.8 m high. There are two towers outward from the east elevation with portals opened under. The altar is set at the west with gateways of Chinese style on sides connecting to the corridors leading to the restroom for priests (Figure 3-2-10).

The east elevation is the most characteristic elevation of the church. It
combined Chinese and western architectural style harmoniously. The composition of the east elevation is effected by the gothic style, which divided into three bays and flanked by symmetric towers in height of 8.8 m. the portal is on the north and south elevation of the towers because of the site limitation. The towers have Chinese square pyramidal roof with delicate brick carvings on the eave edges. The body of the towers have been built up by gray ganged bricks with two arched window opened on each direction of the tower. The east elevation has four arched window on it while the north and south elevation have seven arched windows each and being divided into five bays by piled bricks.

![Figure 3-2-10 plan of Xi'an City Nanxin Street Church (Drawn by Huangshan)](image)

The inner space hardly has decorations. No ceiling is covering the roof structure. Two rows of pillars separated the whole space into three parts. The pillar has circle section without chapiter and standing on the bluestone stylobate (Figure 3-2-11).
Figure 3-2-11 roof of Nanxin Street Church (Taken by Huangshan)
Analysis of Christian Churches in Shaanxi Province
CHAPTER 4

Christian Churches in Other Cities of China
Along with the gate of the feudal China was forced open by the western powers after the Opium War in 1840, the Christianity was spreading in China as one of the major culture for the first time. The western classic church architecture was introduced in China as the first and only western architectural formation and had a strong influence on the future development of Chinese architecture. However, as the economy of China at that time was felt behind, the constructive technique didn’t reach the high level needed to build the grand western classic churches and the traditional Chinese architectural technology and art had rootedness in all over China, in this case, all the Christian Church buildings built in China during 1840 and 1949 have had not only the basic characteristics of western classic churches, but also the traditional Chinese architectural feature. In addition, almost of all the churches built in China in 1840-1949 have been constructed with local constructive technique by using the local constructive materials. Therefore, on the expanse land of China, the Christian churches built in 1840-1949 in different regions and cities have various local architectural features.

We take four other cities, represented the inner land or coastal cities, once colonized or not, locate in the north or south part of China, in which the Christian Churches built in 1840-1949 are also very important constituent parts of Chinese Modern-time architecture. And because several reasons, such as more economically developed, better location and the colonization, the Christian Church buildings in these cities have been both better constructed and better preserved. With these examples more aspect of Christian Churches in China and the features of the Christian Churches of different regions will be showed. (Figure 4-0-1).
Christian Churches in Other Cities of China

Figure 4-0-1 the locations of the five cities. (Drawn by Huangshan)

4.1 Christian Churches in Macau before 1949

In 1557, the Portugueses were approved to live in Macau. Since then, the society of Macau had gone through the rapid change. Along with the disintegration of feudal society and the invasion and development of capitalism, some new architectural activities began in here.

As the Portuguese settled down in Macau, they went in to business, they plundered, they married to the local people, and they gradually formed an ethnic group of European and Asia. This group has different living habit and cultural quality from both Portuguese and local Macanese. When they could stay and have a long life there, they began to construct the necessity for life such as the churches, the hospitals, the orphanages and the schools. All these buildings have the formation of western architecture. The church is the most common western architectural formation in Macau which was brought in the
earliest. As soon as the Portuguese businessmen came to Macau, the missionaries also arrived there. Until 1566, Macau had become the missionary base of Catholicism for preaching it to the countries of the Far East. A lot of exquisite Catholic Church building was built up in Macau. From 1558 to 1588, the St. Lazarus' Church (first construction in 1569, then reconstructed in 1618, final reconstruction in 1954), the San Antonio Church (first construction in 1560, then reconstructed in 1638, 1810 and 1874, final reconstruction in 1930) and the St. Paul Church (first constructed in 1582, then reconstructed in 1602-1644, final reconstruction in 1835) was built in Macau. Since then the missionaries of other churches like San Austin, San Franciscan and San Dominicans began to build church buildings in Macau, too. The San Dominic’s Church which was built in 1588 (reconstruction in 1829) and the St. Augustine’s Church which was built in 1586 (reconstruction in 1874) was first conducted by Spanish and then by Portuguese. At that time, there were thousands of Catholic believers in Macau. These church buildings had played an important role in the formation and development of city Macau. The Portuguese who had the unification of the state and the church always formed their communities centered the churches. The markets first appeared around the different churches then developed into communities. These divisions of communities are remained until today. It is said that Macau was formed on the administrative structure which had strong religion characteristic. Therefore, there are more than ten church buildings are preserved perfectly on the Macau peninsula of 6605 km² which is very rare in Asia.
4.1.1 St. Paul’s Church

Of all the church buildings in Macau, St. Paul’s Church had the largest scale (Figure 4-1-1). It is said that it had the scale only smaller than the San Peter’s Basilica in Rome.

The church was locating in the heartland of Macau peninsula, on the northwest of Fortaleza do Monte. The Portuguese settled down around the Fortaleza do Monte there when they first came to Macau and formed the Portuguese residential living area. In 1563, the three founders of the church, Francisco Perez, Manuel Teixeira and Carlos Pinola arrived in Macau. They constructed a small church there which was burned down in 1595. The church was rebuilt immediately but burned down again in 1601. They began to rebuild the church in 1602 and finished in 1644. But unfortunately, this church which took more than 40 years to build was burned down in the big fire hazard in 1835. Only the façade of the church was luckily conserved.
The conserved façade is standing there on its own which is seemed like the traditional Chinese architectural formation—Paifang\textsuperscript{100} (memorial archway). It is called as Dàsānbā Páifāng (大三巴牌坊) in Chinese. It is 27 m high, 23.5 m wide and 2.7 m in thickness. It stands on the platform of 68 step-high which shows it original scale.

The façade have no tower. There are 40 stone columns composing its main structure. The compositional columns divided the façade into three vertical parts. The façade is of four-layer superimposed orders.

The bottom layer has Ionic Orders, the second layer has Corinthian Orders, and the upper two layers have the Composite Orders. All the Orders have integrated figure, but are separated from the wall, only being as the decoration. There are images of Bible Stories on each layer. The bottom layer has three gates. The Latin word “MATERDEL” was engraved on the lintel of central gate and the sign of the Society of Jesus “IHS” was engraved on the symmetrical side gates. The second layer has three arches and four statues in niches surrounded by the embossments and some Chinese words like “念死者无罪” and “鬼怪诱人为恶”\textsuperscript{101}. The third layer has the statue of Maria standing in the niche surrounded by roses and wide lilies which symbolized pure. Six angels are arranged on two sides. Further to the left, there is the Tree of Life. The dragon with seven heads is tread under foot by Maria. There is a set of human skeleton and a sword symbolizing the death. On the opposite, behind the three angles on the right, there is the Life Stream, a boat sailing under the shelter of the God of Fortune and a head of a conquered devil and a figure of woman. The top layer has the gods

\textsuperscript{100} Paifang: (牌坊), see the attached vocabulary.

\textsuperscript{101} “念死者无罪” and “鬼怪诱人为恶” which means the one has died wished is innocent, and ghosts and monsters attracts to be evil.
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with crosses one the two sides and the bronze statue of Jesus in the middle. The figure of western lilies and Chinese chrysanthemum are engraved around the bronze statue of Jesus. The triangle pediment on the top has a steel pigeon symbolized the Holy Spirit, surrounded by four stars with the son on the right and the moon on the left. There are traditional Chinese stone lions on the two ends of the third and the top layers.

The façade has strong Baroque characteristic and some traditional Chinese feature perfectly combined together. The whole proportion is harmonious, the decoration is exquisite. It is magnificent and feeling joyful.

4.1.2 St. Dominic’s Church

St. Dominic’s Church (Figure 4-1-2) (Portuguese: Igreja de São Domingos; Chinese: 玫瑰堂) is a church in style similar to the late 16th century Baroque-style that serves within the Cathedral Parish of the Roman Catholic Diocese of Macau. It is locating in the peninsular part of the
city at the Largo de São Domingos, situated near the Leal Senado Building. The construction of the church was finished in 1587 and was overseen by three Spanish Dominican priests. Due to renovations and reconstruction, the current structure dates back to 1829. The reconstruction was helped by a priest who knew well about the Spanish architecture. The church is the oldest in Macau and is listed as one of the 29 sites that form the Historic Centre of Macau, a UNESCO World Heritage Site.

The inner space of the church is divided into three parts. The columns supported the vault. The main beam has the span of 31.5 m and is 13.2 m high. The hollow out wooden ceiling is artfully connected to the ventilation system of the church. The church has porcelain mosaic block floor.

The façade of the St. Dominic’s Church, similar with the St. Paul’s Church, has Superimposed Orders arranged in three layers. Three widows are locating above tree gates which also reflect the three parts of the inner spaces. The emblem of the church occupies the middle part of the top layer. The bottle shaped statues on top of the double columns on two end of the façade enhance the definition of the elevation curve. The church building is perfectly combined with its front plaza and the wavy pavements.

Most of the churches in Macau are locating in high ground of the peninsula and became the landmark of the area. Due to the limitation of local climate and construction materials, the church buildings are not of pure western architectural style, but absorbed some local traditional constructive methods, such as the tile roofs, the decoration patterns and the consideration on space layout of ventilation and
damp proof. The Catholic Church buildings and the missionaries helped to bring about the communication of two different cultural systems.

The plans of Catholic Church buildings in Macau are mostly similar to Latin cross. The façades are always facing important streets or the front plazas. Before the 17th century, most of the church buildings were constructed by wood and straw. The material was developed into bricks and wood (18th century), then stones (19th century). Some of the church buildings in Macau has Baroque decoration elements with exquisite and various murals and engraves. A lot of niches, statues, columns, architraves and volute curves are used in the façades which show both wealthy and stressful mystery.

4.2 The Christian Churches in Beijing built between 1840 and 1949

Since Yuan Dynasty (1271-1368), Beijing had become the capital of China instead of Xi’an. From the late Ming Dynasty (1368-1644) when Christianity was spreading in China for the third time, Catholicism had become the most preached foreign religion until the end of 1949.

Along with the Opium war knocked open the gate of old China, Catholicism began its really spreading in China in large scale. Also, the spreading of Catholicism in Beijing during the period of 1840-1949 started.

After the Opium War I and II in 1840 and 1856, the Qing government was forced to sign up a series of unequal treaties and released the Christianity Prohibition Police which had already been carried out for more than 100 years. The missionaries from many different western
countries arrived in Beijing to do the missionary work. The influence of Catholicism kept increasing in Beijing.

Around 1900, the Boxer Rebellion took place. During that time, 20 church buildings, 24 church schools, 4 monasteries and 20 hospitals were burned down. Almost all the Catholic Church buildings, except the North Catholic Church, were destroyed by Boxer Rebellion. The Catholicism in Beijing went through a heavy blow. In 1901, the incapable corrupt Qing government had to sign the Boxer Protocol under the powerful imperialist stress. Since then, the Catholicism recovered its activity in Beijing again. Each Catholic Church made use of the big amount of reparations from Qing government, and built many church buildings in Beijing. Until the end of Qing Dynasty (around 1911), there were 67 church buildings in Beijing.

The invasion from the imperialist had aroused the enthusiasm of Chinese people on saving the country.

During the Anti-Japanese War, Chinese people had gone through huge disaster from foreign invasion. Since 1937 the Japanese occupied Beijing, Beijing was burned, killed, robbed and plundered. The Catholic Churches were also badly destroyed. The war made the Chinese Christian believers realize that they had to connect together to expel the Japanese and save China. Under this situation, the numbers of Catholic believers kept increasing. Until 1949, there were about 3500000 Catholic believers and 45 Catholic Church buildings in Beijing.

102 Boxer Protocol （《辛丑条约》）, in Western countries, it was also known as the Treaty of 1901, Peace Agreement between the Great Powers and China. The full name of the protocol is Austria-Hungary, Belgium, France, Germany, Great Britain, Italy, Japan, The Netherlands, Russia, Spain, United States and China—Final Protocol for the Settlement of the Disturbances of 1900, reflecting its nature as a diplomatic protocol rather than a peace treaty at the time of signature. In China, it was known as the Xinchou Treaty. It was later regarded as one of the "Unequal Treaties".
Although Beijing locates near the port city--Tianjin, it is an inland city. Therefore, the group layouts and the annexes of the Christian Churches in Beijing built between 1840 and 1949 showed the traditional Chinese characters. The main church buildings have been constructed according to the architectural principle of classic western churches, but also appeared the traditional Chinese features such as constructional materials and decorations.

Figure 4-2-1 The Siheyuan plan layout of the Northern Catholic Church of Beijing (From: The history institute of Chinese Architectural Design and Research Academy, Beijing Modern Architecture. Chinese Construction Publishing House)
Christian Churches in Other Cities of China

The classic western church buildings mainly appear in open layout, not far away from the residential area and have intimate connection with the plazas, streets and the city. However, the Christian Church buildings in Beijing are mostly arranged in traditional Chinese courtyard layout, especially the most common and local residential formation--- Siheyuan (Figure 4-2-1). The whole Christian Churches in Beijing built during 1840 and 1949 were mostly composed by the church building, the residence, the cafeteria and the hospital. The church buildings followed the architectural formation of western churches and were arranged in the most important location in the integrated layout. There are 17 Catholic Churches preserved from 1840-1949. Only one Catholic Church was altered to open layout, others are keeping the courtyard layout.

The western church buildings are mostly sitting east and facing west according to the Catholic rule that the believers should be facing the direction of Jerusalem. So the altars are always being located at the east end of the plan and the entrances are on the west. However, the Catholic Churches in Beijing have two kinds of facing directions. The church is seating east while facing west, such as the East Catholic Church. The other church buildings have the traditional Chinese orientation--- seating in north while facing the south such as the South Catholic Church, the North Catholic Church, the West Catholic Church, the East Ming Alley Catholic Church, Nangang Catholic Church, Yongning Catholic Church, Longzhuang Catholic Church and so on.

The plans of the Catholic Church buildings in Beijing built during 1840-1949 mostly use the plan similar to Basilica and Latin cross. Although these kind of lengthways plan formation meet the requirements of Catholic activities, they also are ready to combine the
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traditional Chinese timber frame to form the rational structural system. The church buildings were constructed by local craftsmen and used Chinese traditional architectural materials. The façades show some traditional Chinese architectural elements which made the building had both the features of local architecture and some of the Gothic or Romanesque characteristics.

4.2.1 The Xuanwu Gate Catholic Church

The Xuanwu Gate Catholic Church is also known as the South Catholic Church of Beijing. It is one the four mayor Catholic Churches in Beijing and the oldest Catholic Church in Beijing.

It has been listed as the important cultural relic protection units in Beijing in 1979 and then listed as one of the national key cultural relic protection units in 1996.

In 1605, the Italian missionary Matteo Ricci bought a residence inside the Yuanwu Gate for living. Later, he altered it in to a small church. This is the predecessor of the Xuanwu Gate Catholic Church. In 1610, the church was expanded. The project was small and only took about 20 days, but it had a real church building. In 1652, the German missionary Johann Adam Schall von Bell built up the larger church on the base of the original church building. This was the first generation of the South Catholic Church. It appeared the Chinese architectural style.

The church building was destroyed during earthquake in 1703, and the reparation finished in 1712. It became a high western style building. This was the second generation of the South Catholic Church. In 1720, the church building was damaged again in earthquake, but rebuilt up in
1721. This was the third generation of the South Catholic Church. It is similar to Baroque Style with Latin-cross-like plan, about 15 m wide, 27 m long covered by vault roof.

In 1730, the church went through another earthquake, the church building after the reparation became the fourth generation of the South Catholic Church. It kept the Baroque-like style with vault roof. Arch windows and doors were used which made the building seemed more spacious. In 1775, a fire disaster occurred in the church. Then the church after reparation, which remained its previous Baroque-like style, became the fifth generation of the South Catholic Church.

In 1900 the church was total burn down by the Boxer Rebellion. The rebuild in 1904 had not totally recovered the church building to the previous appearance. The façade was reduced to three bays from five bays. Only one front yard which was also the entering plaza of the church was remained. The façade kept the Baroque-like style. The semicircular vault roof was similar to Romanesque style. The use of grey bricks and tiles was an agreement of the local architectural tradition. It is the formation of the preserved South Catholic Church.
Architectural characteristics

a) Group layout

![Figure 4-2-2 image of the Xuanwu Gate Catholic Church](http://www.bjguoxue.com/bjgx/gudusj/1843.jhtml)

The Xuanwu Gate Catholic Church (the South Catholic Church) of Beijing locates in the intersection of Xuanwu Gate Street and Xuanwu East Gate Street. It occupies an area of 1300 m² with about 400 m² of annexe. The church building and its annexe are of local Beijing courtyard layout, which is commonly known as Siheyuan. There are three courtyards connected together (Figure 4-2-2, 4-2-3). The gate is of Chinese architectural style which is locating in the first courtyard. The first courtyard mainly is used for reception, office work and medical. Each room of this courtyard is built by grey bricks with white plastered walls and is covered by traditional Chinese gable-and-hipped roof. The courtyard has a quiet, simple but elegant atmosphere. The gate is relatively higher than the other buildings which broke the invariable skyline. There is an arch door on the west enclosure of this courtyard connecting to the arch door of the east courtyard. A tall and aged tree is preserved in this courtyard. The Santa Maria hill is locating one the

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103 gable-and-hipped roof (歇山顶): see 2.2.5
northeast corner of this yard with statue of Santa Maria standing in green covered cave and surrounded by purl water in the pond.

Figure 4-2-3 Plan layout of the Xuanwu Gate Catholic Church (From: The history institute of Chinese Architectural Design and Research Academy, Beijin Modern Architecture. Chinese Construction Publishing House)

The second courtyard is on the north of the first courtyard, it is used as the residence of the clergy. These two courtyards are connected by an arch door with a statue of Matteo Ricci standing in front. The second courtyard is enclosed by two rows of brick built rooms of traditional Chinese style separately on the north and west and the enclosure on the east. It has a nice view inside the courtyard and it is quite residential friendly. The outward roof eaves form the corridors.
The third courtyard is locating on the east which hosts the main building of the South Catholic Church. This courtyard has a gate on the south as the secondary entrance of the whole Xuanwu Gate Catholic Church. The gate is built by bricks and in Chinese and Western mix style--- a cross as the sign of the Catholicism is standing on the rectangular pyramidal roof. The zigzag complicated architraves are placed under the eaves. Two simplified Ionic order in white color are set up on the two sides of the gate. Chinese red lacquered double doors are set up under the arched gate opening. There are two stone tablets on east and west of the yard, which records the constructional history of the church in 1650 are, preserved since 1650s. But it is illegible now. There is a statue of San Francisco Javier. There old trees are conserved in the courtyard which also shows the long history of this Catholic Church building. The general layout Xuanwu Gate Catholic Church is of typical Beijing architectural style. The annexe and the enclosure were built in Chinese traditional methods by local material. It is the agreement and usage of the local tradition.

b) The plan

The plan of the church has the feature of western Basilica. The main hall is arranged lengthways and separated as spacious central hall and narrow side hall by two rows of columns. The altar covered by semicircular vault is locating at the end of the central hall. There are several differences between the Xuanwu Gate Catholic Church and the typical western Basilica church which are: 1) there are two small rooms connected on two sides of the altar which makes the semicircular altar not outward the rectangular plan. 2) The main entrance of the church is arranged on the south of the plan; two side
doors are set up on the east and west. This is traditional Chinese architecture orientation. 3) The church was built upon multiple steps (Figure 4-2-3).

c) Façade

The church building is built by bricks. The façade is a screen-like gable much higher than the roof. A lot of volute curve and complicated moldings show the characteristic similar to Baroque style. The façade is divided into three parts by four groups of full height Corinthian superimposed square columns. The middle part is the centre of the composing while the side parts are symmetrical.

The centre of the composing is made up of the under part---main entrance and the upper part---triangle arc-shaped pediment separating by cornice architrave with volute figures on the ends. There is round brick engrave hanging over the arch window which is above the arch door. The upper and under columns of the Corinthian superimposed square columns have their own eaves, chapiters, bodies and plinths. The upper columns are shorter than the under columns. There are Chinese stylobate sat the bottoms of the under columns. The window and door are decorated by rich moldings.

The sign of the Catholicism---brick cross is locating at the top of the pediment. The volute curve connected the cross, the pediment and the columns together in the composition of façade. The entrance has double red lacquer wooden door and semicircular painted glass window on top. The arch window also used the painted glass and dark red wooden window frame. The round brick engrave is of traditional Chinese decoration pattern. The triangle pediment on the top has
several layers of curve architrave as the edge definition which shows the feature of Baroque.

The two side parts of the façade are symmetrically arranged. They are composed of contractible arch windows and doors compared to the central part to highlight the entrance. There are giant volute in the tops of these two parts which made the natural transition of the height difference between the central and side parts. It also enhances the Baroque characteristic and echo to the other elements on the façade (Figure 4-2-4, 4-2-5).

![Figure 4-2-4, 4-2-5 façade and section of Xuanwu Gate Catholic Church](From Jinying, Research on the Catholic Churches in Beijing Region)

**d) East and west elevation**

The east and west elevation of the church have the same composition. Square pilasters are arranged under the multiple layers of architrave at the eaves. Round and arch windows with painted glass and dark red wooden window frames are set up between pilasters.
e) The north elevation

The north elevation is not like the façade (Figure 4-2-6). The two small rooms are arranged symmetrically centered the bell tower. The bell tower with the vault is the highest point of the whole building. It has polygon plan. Arch windows of different size are set up around the tower body. There are pilasters on the corners.

The church has traditional Chinese double pitch roof paved with tiles.

![Figure 4-2-6 photo of the north elevation of the Xuanwu Gate Catholic Church (From Jinying, Research on the Catholic Churches in Beijing Region)](image)

f) Inner space

The Xuanwu Gate Catholic Church has wide and spacious inner space. Sixteen columns are arranged symmetrically. The central hall have arch ceiling. The altar is locating on the north end of the central hall and constructed on three broad steps. It has semicircular plan and is cover by vault. (Figure 4-2-7) There are eight pilasters on the altar. Three murals of Santa Maria are set up between the four pilasters in the middle. The side halls are relatively lower than the central hall. There are niches for St
Joseph and Jesus on the end of the side hall. The ceiling of the side hall is similar with the pendentive upon the rectangular plan of western churches. The painting glasses for the windows are of portrait and plant patterns.

Figure 4-2-7 photo of the altar space of the Xuanwu Gate Catholic Church (From Jinying, Research on the Catholic Churches in Beijing Region)

4.3 The Christian Churches in Qingdao in the period of 1840-1949

4.3.1 The development of city Qingdao during 1840 and 1949

There are two islands along the Kiaochow Bay\(^\text{104}\), one is green, and the other is earthy yellow. The local fishermen call them Qingdao (green island) and Huangdao (yellow island). This is today’s Qingdao; the bay in front is called Qingdao Bay. Qingdao was once a small fishing village, in 1891, the Qing government set up maritime defense in Kiaochow Bay, the general government was contributed in Qingdao village. This was

\(\text{Kiaochow Bay} (\text{胶州湾}, \text{German: Kiautschou-Bucht}, 36°7′24.44″N 120°14′44.3″E)\) is a sea gulf located in Qingdao City, China. It was a German colonial concession from 1898 until 1914.

\(^{104}\)
when Qingdao became developing.

In 1897, by the excuse of Juye Incident\textsuperscript{105}, Germen sent Far East Fleet to forcibly occupy the Kiaochow bay. In 1898, the Qing government signed the Kiaochow Bay Concession Treaties with Germany, so that Qingdao had officially become the colony of Germany. Since then, the city construction of Qingdao entered the modernization. Until the beginning of the 20\textsuperscript{th} century, Qingdao had become a compelling city in Asia. The buildings in Qingdao had foreign appearances. This architecture recorded the developing track of Qingdao and remained the deep culture mark.

Before 1949, the development of Qingdao could be divided into six periods according to the evolution of society: 1) Before 1897--- feudal period; 2) 1897-1914--- colony of Germany; 3) 1914-1922--- colony of Japan; 4) 1922-1937 governed by Beiyang Government\textsuperscript{106} and Nationalist Government\textsuperscript{107}; 5) 1938-1945 colony of Japan again; 6) 1945-1949 governed by Nationalist Government.

Among these period, the city was formed during 1879-1914 when Qingdao was the colony of Germany, the first developing peak of urban architecture appeared. The second developing peak of the urban construction was during 1922-1937. Although Qingdao has short

\textsuperscript{105} Juye Incident: (曹州教案 or 巨野教案) refers to the killing of two German Catholic missionaries, Richard Henle (b. 21 July 1863 at Stetten near Haigerloch) and Franz-Xavier Nies (b. 11 June 1859 at Rehringhausen, Olpe, Roman Catholic Archdiocese of Paderborn), of the Society of the Divine Word, in Juye County, Shandong Province, China on 1 November 1897.

\textsuperscript{106} Beiyang Government: (北洋政府) or warlord government collectively refers to a series of military regimes that ruled from Beijing from 1912 to 1928 at Zhongnanhai. It was internationally recognized as the legitimate Government of the Republic of China. The name comes from the Beiyang Army which dominated its politics with the rise of Yuan Shikai who was a general of the Qing government.

\textsuperscript{107} Nationalist Government: The Nationalist Government of the Republic of China (中華民國國民政府) was the ruling governmental authority of China between 1927 to 1948 led by the Kuomintang (also known as the Chinese Nationalist Party, KMT), until the Government of the Republic of China under the newly promulgated Constitution of the Republic of China was established in its place.
Christian Churches in Other Cities of China

history compared to the ancient cities, it occupies an important position in the Chinese modern history (1840-1949) as it is the example of colonial city in China.

During 1840-1949, as the first colonist is the German, where Catholicism and Protestant is prevalent, the foreigners and missionaries arrived in Qingdao later were also from the Christianity counties, the most churches built in 1840-1949 in Qingdao are Catholic and Protestant Churches.

The Catholicism was gradually developing in Qingdao along with the invasion of the Imperialism. After Qingdao became the colony of Germany in 1897, the German missionary Bai Mingde\textsuperscript{108} came to Qingdao and built up a wooden building in Taiping Street as a simple church. This was the first Catholic activity place in Qingdao.

There are a lot of churches of Protestant in mainland China. They have different scale and were introduced into Qingdao continuously. The main churches such as Presbyterian had been brought into Qingdao in 1837 before the German invaded.

Now there are seven Christian Church buildings from the period of 1840-1949 preserved in Qingdao, two of them are Catholic Churches, the other five are Protestant Churches.

\textsuperscript{108} Bai Mingde, Chinese name of foreign missionary.
4.3.2 Jiangsu Street Protestant Church (Evangelische Kirche für Tsingtau)

Figure 4-3-1 photo of the Jiangsu Street Protestant Church
(From http://www.panoramio.com/photo/28564301)

It is locating in the south part of city Qingdao (Figure 4-3-1). The construction of the church, financially supported by German colonial government was started from April, 19\textsuperscript{th}, 1908, and lasted about two years. It was finally built up on October, 23\textsuperscript{th}, 1910 used exclusively for German protestant believers who are staying Qingdao. The official name of the church is Evangelische Kirche für Tsingtau. As all the money for building up the church was paid by the German colonial government, the church was also commonly called “German Church”. There are two other buildings with two floors in the church area, one is attached church, and the other is the residence for the clergy.

The church was conducted by Berlin Missionary Society. After Qingdao was occupied by Japanese in 1914, the church was taken over by local people. When the World War I ended (1918 Nov), all the German missionaries returned to their country, the church was taken over by American church and still used by the foreign believers in Qingdao. It was called as International Church at that time. During the World War II,
before 1941, the church was conducted by German missionary again. During 1942-1945 the church was managed by Anglican. The German believers and American believers gathered there separately in the morning and in the afternoon. This situation lasted until 1949.

The Jiangsu Street Protestant Church was the first Christian Church that was reopened for public after the Culture Revolution (1980). In 1992, the church was listed as the provincial culture relic protection units.

**a) History**

![Old photo of the Jiangsu Street Protestant Church](From Dengqiang, Research on the Christian Churches in modern times in Qingdao)

The Jiangsu Street Protestant Church was one of the earliest Christian Churches of Qingdao. It was constructed according to the urban developing planning need which was revised by German colonists from 1900 to 1901. As the most attracting architectural program in Qingdao at that time, the German colonial government began to collect the design from the western architects, who were in East Asia from June, 1\textsuperscript{st}, 1907. It was the only bidding project in Qingdao before 1914. Finally the design of German architect, Curt Rothkegel, was chosen because he successfully combined the architectural requirements and the topographic condition together. The construction of the church started
in April, 19\textsuperscript{th}, 1908 and finished in October, 23\textsuperscript{th}, 1910.

The church was also called as The Bell Building as there is a time clock tower which was 36 m high. In Germany, there was a church that was constructed according the same design with this church in Qingdao, but that church in Germany was destroyed by the World War II fire.

b) Location

The church is locating in the middle of the Governor General Office and the Governor’s palace of German colonial time. The urban planning of 1898 left the two piece of highland on both sides of the city central axis for church buildings. Although the city central axis did not form in the end, the location of the church was remained. The church is the centre and the controlling landscape node of the surrounding area and it is the view point building of the several streets around there. It was obvious influenced by the concept of garden city which was quite popular in German at that time.

c) The plan

The church has the capability of 1000 people. The plan of the church is composed by the main church, the bell tower and the subsidiary rooms. Because the base could not meet the requirement of the length of the church plan and the plaza in front of it, the designer finally decided to display the length direction of the church from south to north. The main entrance of the church with the plaza was arranged in the south. There are also another two small plazas on the east and the west of the church. The east elevation of the church was against the street. There are a one meter natural level difference between the church and the
street. Steps were arranged at the crossroads which made the church seemed much taller.

The church has irregular L shaped plan (Figure 4-3-3). The main hall is similar to basilica formation which is separated into three parts by two rows of columns. The central hall is taller and more spacious while the side halls are long and narrow. There are interlayer by the north half of the side halls. The whole building in 36.7 m long, 33.35 m wide. The main church is 28.7 m long, 18.5 m wide and 11.3m high. The bell tower has rectangular plan in height of 36.472 m.

Figure 4-3-3 plan of Jiangsu Street Protestant Church (From Dengqiang, Research on the Christian Churches in modern times in Qingdao)

There are four entrances set up on the south elevation, the northwest and northeast of the building. The entrances are connected to the main hall by the entrance halls and connecting hall. The entrance on the east of the south elevation is connected to the interlayer by stairs.

The office space is arranged on the northwest of the church and is connected to the altar by the preparing room. The staircase leading to
the bell tower and basement is set up on the southeast of the office space. The basement is used as the office for the manage staff of the church and the boiler room.

The entrance on the northeast of the church is used as the evacuation exit. There is also a small entrance hall next to it. It is said that this entrance was designed to be an exclusive entrance for the Governor General when he came. The bell tower is arranged on the northwest of the church plan.

d) The elevations

The whole elevation appearance enhances the green (cooper sheet) broken line curved tower top and made it the center of the composition. The main building is about 16.7 m high. The eave is on the height of 9.36 m. It is 36.473 m from the top of the bell tower to the earth. The bottom part of the wall used the local un-burnished mushroom stone with big embossments. The heavy granite built wall footing made the church seemed more dignified. Influenced by Art Nouveau, the wall is large arch gable in yellow corrugated scratch cement plaster.

The cornice is inlayed by rough granite. The irregular structural formation is very impress. The church has typical red clay imbrex slope roof which is not only quite romantic, but also solemn and elegant. The bell tower has green curve roof. There are clocks under the top of the tower on the south and north side of the tower. The clock on the west side of the tower is locating in the middle of the brick wall. There are three German church bells inside of the top of the bell tower which was set up in 1909 and still in function.
The south elevation which is facing the Qingdao Bay has un-symmetrical composition. The main body of the church building had rich layers and various height differences, in addition to the bell tower is on one side of the church, so the church has very active appearance. There is a relatively big height and body type gap between the bell tower and the main church hall, but it won’t fell uncertain or abrupt because the un-burnished mushroom stone used for the under part of the church walls are also used for the bottom of the tower. The hefty granite increased the sense of stability of the bell tower. Also the architrave of the main church hall and the tower are connected together, which made the church as an entirety. The curve gable, the un-burnished granite cornice and the wall are in style of German Jugendstil which has the feature of naturalis and against the traditional symmetrical composition.

To sum up, the church has appropriate proportion and rigorous composition. The red ombrex roof, the green top of bell tower, the black iron sheet covered wood doors, the yellow wall and un-burnished mushroom stones formed vivid contrast, which created the special sense of beauty of religion buildings. The body of the church is formed by different height and various levels, but has unified style. It appeared to be a German countryside church of German Jugendstil and have a deep mark of European architectural culture.

e) Architectural Technology

The church used the brick, stone, steel and concrete mix system with steel truss roof structure and steel wire gauze cement ceiling in the main hall, which is quite in advance compared to the traditional Chinese
architectural structure.

At that time, all the other German architecture in Qingdao have brick and wooden load bearing wall with \( \mathcal{I} \) shaped steel beam and concrete arches. The roofs are always of wooden truss structure. Usually the buildings were paved by wood floor. However, the church used some other new technique and materials such as, the steel roof truss replaced the wood roof truss, the steel wire gauze cement ceiling which is simultaneously used in European countries then, the \( \mathcal{I} \) shaped steel beams and concrete floors. In a word, the constructional technique used in this church is on the same level with the simultaneous European constructional technique which was quiet in advance in China.

4.4 The Christian Churches in Shanghai built since 1840 to 1949

Right before the outburst of the Opium War, the Shanghai County had became a metropolitan with prosper business. At that time, Shanghai had already become the open seaport and the business center of the eastern Asia, which made it the breakout of opening the gate of China for the western colonist.

However, at that time, the city center was limited in the Shanghai County, which was the old city area locates in the southern part of today’s Shanghai. That is to say, except the Shanghai County, most part of the Shanghai city of today was farmlands or small villages and towns by then. The Bund, as the name card of today’s Shanghai, was a low-lying land of dampness, and covered by wild reeds in the summer.
The real development of Shanghai city began from the year 1843. Until then, Shanghai, which not only was first treated as a boundary city by the Christian churches but also the loosest spot of Chinese feudal society, had become truly influenced by the Christianity.

The Christianity was brought into Shanghai in 1608 during the third time when the Christianity was spreading in China.

In the last 50 years of the twentieth century, after 1843, the Christianity was spreading over Shanghai quickly relying on the colonial aggression from the western countries to China. Different churches from various countries built church buildings all over Shanghai successively to do the missionary work. The cathedral, the churches, the chapels distributed among the big streets and small alleys and the church buildings in the villages made Shanghai had a Christian atmosphere just like a European city. By the end of the nineteenth century, there were about 300 church buildings of different scales.

Meanwhile, Shanghai had become the most prosper port in the Far East, the economic and financial centre of East Asia, and the only international city in Asia during the period of 1840-1949.

The fast development of economy had direct affect on the developing of the city Shanghai. The architecture in Shanghai built during 1840-1949, which was largely influenced by the western culture, became the representative elements of the special era and the social difference. The church buildings in Shanghai built during that period intensively shows the time spirit, the blend of different cultures, the impact of the various regional features. The relationship of time and space that reflected by the church buildings, the deepness and extent of them
were incomparable by other types of architecture. The church buildings reflected the Westernization process of Shanghai in the period of 1840-1949.

However, before 1840, there was only one Catholic Church in the economic well developed, all religions gathered Shanghai.

Along with the Nanjing Treaty was signed in the August of 1842, Shanghai had become one of the five treaty ports of China during 1840-1949. The Humen Treaty, which was signed in the October of 1843, had express stipulated that British businessmen could rent lands for constructions. Then the treaties of China-America and China-France had made sure that American and French businessmen had the same right as the British.

As the foreigner had encountered a lot of difficulties at their beginning of renting the lands, the first British Consul General in Shanghai, George Balfour, request the Qing Government to line out the special area for British residency and separated the Chinese and foreigners. In November, 29th of 1845, the Shanghai Land Regulations was issued which defined the range of the first concession in Shanghai. It occupied 553333 m², and was protected to be developing according to the pattern of western cities.

The first Protestant church, Holy Trinity Cathedral, was built there. After that, Protestant churches, such as, the First Baptist Church, the Shanghai Moore Memorial Church, Union Church and Catholic churches like Saint Joseph's Church, Dongjiadu Catholic Church were built up one after another. It is particularly mentioning that the Union Church was built in the intersection of Huangpu River and Wusong River, which was
the throat of Shanghai and had the most convenient water and land transportation. The high-standing Union Church could be seen from the Huangpu River. It clearly became the first boundary tablet of British Concession.

In 1893, the British and American Concession joined in together, the area reached 7110000 m². In 1899, the concession of British and America was renamed as International settlement of Shanghai, and expanded up to 22330000 m² which was three times as large as the old area. In the same year, the French Concession also expanded to 1420000 m². The increase looked like the inevitable results of the growth of population, but actually it was the ambition expansion of the western colonists to build an independent country inside China. The giant potential support had enhanced the confidence of those missionaries who wanted to spread Christianity all over China. The missionaries in Shanghai were busier than the missionaries in the other places of China, also, the number of the church buildings were keep growing. Meanwhile, because the spreading of Christianity was going on with the rapidly capitalized of Shanghai, the Protestant which contains more capitalistic factors was developing much faster than the Catholicism in Shanghai. The number of the Protestant Church buildings was much more than the number of the Catholic Church buildings, and became the core of the research on the Christian Church buildings in Shanghai during 1840-1949.

4.4.1 Holy Trinity Church

The Holy Trinity Church was constructed in 1847, is the earliest Christian Church in Shanghai that has been preserved until today, is the first
Protestant Church built after 1840 in Shanghai. The church building is locating in the intersection of three roads, Hankou Road, Jiangxi Mid Road and Jiujiang Road. The tower is facing the Jiujiang Road, which made the church could be seen from the Jiujiang Road since very far. Other than that, during 1840-1949, the tall Gothic-like tower could be seen standing out of many mediocre gallery type buildings from the ships entering the bund port. It was an important constitutes part of the skyline of the bund (Figure 4-4-1, 4-4-2).

Figure 4-4-1, 4-4-2 old photos of the Holy Trinity Church (From Zhoujin, Research on the Christian Churches in Shanghai in 1843-1949)

The Holy Trinity Church belongs to British Anglican Communion. As soon as the Opium war ended, the Anglican Communion sent missionaries to do missionary work in the coastal cities in China, riding on the Nanjing Treaties. In 1845, after the Shanghai Land Regulations was issued and the concession gradually formed, more and more foreigners came to Shanghai, most of them were British. As the British businessmen and governor needed to go to church, in 1847, Bell, from the British Telephone Company offer the land in the intersection of Jiangxi Road and Jiujiang Road and donate money to build the church for the believers of British Anglican Communion.
This church building was very simple and crude and was in bad quality. It required frequently repair, and was repaired in large amount in 1851. But it still collapsed during the typhoon in 1862. They had to build up a temporary building in the old site and began to construct a new church at the same time. They invited the British church architect George Scott to design, but his design was too exquisite and cost so much money that he was altered by another architect. Four years later, the church began to be constructed on May, 24th, 1866. The project cost 3500kg silver and was completed in August, 1st, 1869. That is the main body of today’s Holy Trinity Church (Figure 4-4-3).

Figure 4-4-3 photo of the Holy Trinity Church
(http://blog.sina.com.cn/s/blog_b9cc87bc0101fh3q.html)

As the church was built up all by red bricks, so it was also called as Red Church. There are Rome style colonnades outside of the church building on three elevations. The middle of the main hall is of wooden structure covered by stone paved roof. The altar is on the west. The floor was very fancy marble with multiple level of pattern stitching imported from British. There is chapel and small altar on the southwest. The Baptist gallery is locating inside of the entrance on the northeast. The altar, Baptist pool and platform are decorated with beautiful embossments (Figure 4-4-4). The whole church was in the quiet environment of large
green land with flourish plants.

Figure 4-4-4 plan of the Holy Trinity Church (From Zhoujin, Research on the Christian Churches in Shanghai in 1843-1949)

Figure 4-4-5 elevation of the Holy Trinity Church (From Zhoujin, Research on the Christian Churches in Shanghai in 1843-1949)

The stone columns and buttress are bearing all the loads. The main hall has scissor shaped wooden roof truss and covered by paving stone. It is said that there are about 8000 wooden stakes for base enhancement including 3400 stakes of 4.75m long, 2470 stakes of 3.66 m long and 1660
stakes of 1.52 m long. In addition, there are 625 wooden stakes of 4.75 m long used for the base of the tower. And the wooden stakes are paved with a very thick layer of granite.

The church is of brick-stone structure. It has plan layout similar to Latin cross surrounded by stone colonnade verandas. The plan is about 153 feet long; 58.5 feet wide (51mx19.5m). And it’s about 19 m high (Figure 4-4-5). The windows on the two sides of the church are inlayed with holy paintings composed by colorful glasses. People’s name and Madonna were engraved on each of them. The seats are of cane back long chairs. The nameplates of the donors were nailed on the back of the chairs and the window frames.

Short after the church was constructed, in 1874, proposed by Queen Victoria, agreed by Bishop Canterbury, the Holy Trinity Church was promoted as the cathedral of Anglican in the north china parish, also known as The Anglican Cathedral. It used to be the church of the highest level in the Far East, and one the most beautiful architecture in Shanghai.

In 1893, a bell tower similar to Gothic with rectangular plan and sharp taper roof was added in the northeast of the main church building. The bell tower has one big pointed roof in the middle surrounded by four small pointed roofs on four corners. It was so tall that seems like it could reach the clouds. The appearance of the bell tower was quite similar with the tower on the southwest corner of Chartres Cathedral.

Since 1941 when out broke the Pacific War, the Holy Trinity Church became lack of maintenance and preserve. It had never been repaired in large scale, so the wood and the stone were badly
weathered; the roof and the walls were all in bad conditions. Until the early 1950s, the church building went into worse condition and the owner could not afford the great number of land tax. The British had no way to keep the church, so they gave the church to the local government. The church went through a large scale of repair in 1955 and continued to be used by Chinese believers until 1966.

During the Culture Revolution, the church building was damaged badly; the bell tower was torn down. Since the 1980s, the church building had been used by the local government. Now it is the headquarters of China Christian Council and Three-Self Patriotic Movement and opened for public as the church.

The Holy Trinity Church has a mixed style similar to Romanesque and early Gothic, or to be specifically it is similar to early Gothic with some Romanesque style. The church building is sitting west and facing east with one main hall and two side halls. There are stone colonnades on outside and front. Another portico is locating at the entrance. The asymmetric plan layout is quite similar as some British Gothic churches. The façade of the church is similar to Romanesque style which the middle is taller than the two sides. However, the Gothic-like bell tower is arranged individually, which confirms to the Romanesque, not the late Gothic. The successive semicircular colonnade is the common motif on the elevation composition of Romanesque-like churches. Speaking to the inner space, the Romanesque-like technique is used more than the Gothic-like technique.

The main hall is relatively high, the buttress, not the flying-buttress was used. The pointed arch wooden roof truss is showing on the top. There are only single short columns standing in between the main hall and the
side halls. Successive pointed arcades are on the top of the column caps. The partial design also shows the mix of the two styles. Most of the windows and arcades used obtuse-angle pointed arch. There are buttress between arches but the semicircular arch was used in the entrance portico. There are grey bricks used in the points where the stands on. The rose shaped window and successive arches are decorated on the facade.

**4.4.2 Dongjiadu Catholic Church**

The Dongjiadu Catholic Church has an original name--- Francisco Javier Church because it is the first cathedral of the Society of Jesus. It is locating in the cross road of Dongjiadu Street and Wanyu Street which was the boundary of the old city of Shanghai in the late Qing Dynasty (1644-1840). The church began to be built in 1847 and the constructive project took six years. The church building seems quite silence due to the surrounding of the large area of flat roof buildings in grey color. However, this wooden-brick structure church in simple Baroque-like style was once the Cathedral of the Roman Catholic Diocese of Shanghai. Also it was the first large scale church building with the capacity of more than 2000 people in China. It occupies an area of 20000m², have more than 200 rooms which made it the church of the largest scale in China at that time. It also was the resident cathedral for the Bishop of Far East. The important position was not replaced until 1910 when Xujiahui Catholic Church was constructed.

In 1847, the Italian missionary Lodovico Maria (dei Conti) Besi decided to built a church in Dongjiadu Street. The revolt of Small Swords
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Society \(^{109}\) erupted shortly after the church was constructed, so it became the temporary hospital and refugee camp for a while.

The church is similar to Spanish Baroque Style with obvious traditional Chinese architectural elements as it was designed by Spanish architect, Ferrand Jean.

The normal Baroque architecture pursues the dynamic, the sculptural, and the strong shadow and color changes. The lines are full of twists and turn which formed the beauty of bizarre and motley. However the Dongjiadu Catholic Church appears in surprisingly succinct decoration style This is because the original design of Dongjiadu Catholic Church which is a imitation of the Sant'Ignazio Church, Rome (The Church of St. Ignatius of Loyola at Campus Martius (Italian: Chiesa di Sant'Ignazio di Loyola in Campo Marzio) (Figure 4-4-6) had to be changed because the missionary Lodovico Maria (dei Conti) Besi returned to Rome and not coming back to China, the new missionary had to go to Europe to collect the money for the construction, but the funds were still not enough and the church used a part of it to help the people as there was pestilence happened. Therefore, a row of glass windows on the upper layer and the large dome in the centre was canceled from the original plan. The Height of the façade was reduced to the 2/3 with a Baroque-like gable for sealing. The planed Latin Cross plan has been simplified to a T-shape plan.

\(^{109}\) Small Swords Society: 小刀会 was a political and military organisation active in Shanghai, China and neighbouring areas during the Taiping Rebellion.
The church is locating along the Huangpu River with the façade and main entrance facing south. There arranged a small plaza between the street and the church. The church is of wooden-brick structure in two floors and the gross floor area is 1835m². The façade has been divided into three parts by two relatively deep horizontal architraves. The bottom part of the façade is divided into three bays by four pairs of simplified Ionic columns. There entrance gate on each bay, while the main gate in the middle directly connected to the central hall.

There are brick carving Chinese couplet on both sides of the main entrance. Shrines with sculptures inside are placed between the pairs of Ionic columns. A big round clock is locating on the centre of the middle part of the façade flanked by couplets on the grooves of the brick pilasters. The Spanish curved volute gables are on the side of the middle part. Two small baroque-like bell towers are standing on the ends with obvious Spanish style curves and ball shaped roofs. The top part is the

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110 Huangpu River (黄浦江) is a 113 kilometres (70 mi)-long river flowing through Shanghai, China that was first excavated and created by Lord Chunshen, one of the Four Lords of the Warring States during the Warring States Period (475 BC - 221 BC). It is the last significant tributary of the Yangtze before it empties into the East China Sea. The Bund and Lujiazui are located along the river.
Spanish style curved triangle pediment with a vertical board inscribed the Chinese characters of Catholic Church (天主堂). The iron cross on top is about 4m long and weighted one ton.

The inner space has more of the Roman style combined with some Renaissance. The plan is T-shape and of three-bay basilica-like formation (Figure 4-4-8). The basic elements for composition are the semicircular arches. The roof is composed by semicircular arches and cross arches. The ceiling of the central formed the barrel vault by semicircular arches. The half round cross vault is covering the aisles and the altar. All the windows, doors and corridors used semicircular arches. These arches are not made of stone but have wooden structure wrapped by plaster. There are two cells on each side of the altar. The altar is separated from the central hall by short handrails.

Figure 4-4-8 plan of The Dongjiadu Catholic Church (From Zhoujin, Research on the Christian Churches in Shanghai in 1843-1949)

The columns in the church are big; they have the section in square of 1mx1m. There are small altars set up by the columns. A lot of traditional Chinese architectural elements can be found in the inner door decoration such as the embossment of Chinese lotus, crane, calabash.
and treasured sword.
CHAPTER 5

Comparisons
Xi’an, as the capital of Shaanxi Province, is locating in the very center of China. Before 1911, when China was in the long process of feudal society, the city Chang’an (ancient name of Xi’an) had been the capital of China for 13 dynasties. The Christianity was first introduced into China in year 635 when China was in the beginning of the powerful and prosperous Tang Dynasty (618-907). By the support of twelve Emperors who were on their throne from 626-840 and the preaching strategy of relying on the Buddhism, the Christianity was once well developed and widely spread in China during the Tang Dynasty. According to the literary inscription, there were a lot of Christian Churches built in the formation of Buddhist temple in and around city Chang’an. Until the late days of the Tang Dynasty, when Emperor Wuzong (Li Chan 李瀍) was on the throne from 840 to 846, he carried out the restrict Great Anti-Buddhist Persecution, the first time of the Christianity spreading in China was ended. All the Christian Churches in form of Buddhist temple were also destroyed. Then more than four hundred years later, the Christianity was brought back in China again along with the Mongolian entered and hosted the Central Plains and established the Yuan Dynasty (1271-1368). But the Christianity disappeared in China again at the end of Yuan Dynasty when the Mongolian was expelled as the preaching of Christianity in Yuan Dynasty was totally relied on the Mongolian nobility.

In the 16th century, the Christianity was brought back to China for the third time during the exchanging period from the Ming Dynasty (1368-1644) to Qing Dynasty (1644-1911). For this time, the Catholicism became more spread. The missionaries came to Beijing, complied with Chinese etiquette and custom and tried to preach the Catholicism by introducing and teaching the advance natural science and technology to the upper class Chinese. By the continuous working of the missionaries, the Catholicism was gradually spreading all over China. Since 1620 when the Italian missionary Giulio Alenio (爱儒略 1582- 1649)
came to Xi’an to do the missionary work, the Catholicism was developed quite well in Shaanxi province and became the province with the largest number of Catholic believers in China by the beginning of Qing Dynasty. Since 1702, the Chinese Rites Controversy which concerned ancestor and Confucius worship for Chinese believers had upgraded the contradiction between Roman Curia and Chinese Qing Government. The Qing Government began to implement a strict Christianity Prohibition Policy, so Christianity again declined in China.

Along with the outburst of the Opium War in 1840, China ended the feudal society which lasted for more than two thousand years and entered the semi-colonial society. The western powers forced open the door of ancient China and released Christianity Prohibition Policy. The Christianity became spreading as the strong culture in China for the first time under the protection of series of unequal treaties. From then on, the Christianity was well developed all over China. The Catholicism started to develop in high speed in city Xi’an.

In 1845, Alfonso Donato built up the bishop’s house in TONG YUAN FANG of Gaoling County which locates in the middle of central Shaanxi and was 50 km away from the central of city Xi’an. After that, the church buildings built before 1840 which was occupied by the local government during the Christianity Prohibition Policy was returned to the church, such as the Wuxingjie Catholic Church.

The Protestant was brought into Xi’an after 1885 first by the missionaries of Baptist Missionary Society World Mission (BMS World Mission). Then during the sixty years before 1949, many Protestant Churches had built church buildings in Xi’an and surrounding counties.
5.1 The historical development and the locations of the five cities

The city Xi’an as the old capital city of ancient China, is locating in the very centre of mainland China. It is a typical inner land city and is divided as in the northern China since always. Beijing is also an inner land city, but it is locating in the northeast and quite near one of the port city Tianjin, and has been the capital of China since Yuan Dynasty (1271-1368). Qingdao, locating on the east of China along the sea, is quite young but with a history of being colonized. Shanghai, the most international city in mainland China, was once one of the five port cities and an international settlement in the Chinese semi-colonial society. It is locating in the southeast of mainland China. Macau is in the south end of mainland China. It was colonized in Ming Dynasty (1368-1644) by Portuguese and not returned to Chinese government until December, 20th, 1999. After more than four-hundred years’ governing and organization by the Portuguese, the architectural style on that peninsula had been largely westernized.

Among these five cities, except for Xi’an, there are two cities belongs to the northern part of mainland China which are Beijing and Qingdao just like Xi’an, the other two (Shanghai and Macau) are in the southern part of mainland China. Beijing and Xi’an are inner land cities and never been colonized, the other three were all port cities locating along the sea and had been colonized for different period of time. The Christian Church buildings in these cities represent the features of the church buildings in their region. The church buildings in each city in China have some of the characteristics which could be commonly found from Chinese traditional architecture, the others are with local marks so they are distinct from one to another. The comparison will help to understand the Christian Church buildings not only in Shaanxi Province, but also in
other places of China.

5.2 The time when the Christianity was first introduced in to the five cities

Compared to the other cities, Xi’an is the very first city that the Christianity was brought into before 1840. It participated in every period which the Christianity was preached in China in the history. Beijing, as the capital city of China from Yuan Dynasty (1271-1368), had Christianity spreading since 1294 in Yuan Dynasty for the first time, but the religion disappeared when Yuan Dynasty died out. The Christianity became spreading again in Beijing by the late Ming Dynasty (1368-1644) when the Italian missionary Matteo Ricci built a church next to the Xuanwu Gate in 1605. The Christianity was brought into Macau since 1557 when the Portuguese settled in. Macau was the first colony of China. On the other hand, the city Shanghai was rarely developed before 1840, although the Christianity was brought in here 1608 but the real blossom happened since 1843 when Shanghai became the international settlement. Qingdao was a small fishing village until 1891 when Qing government set up a general government there. In 1898, Qingdao became the German colony and then the Christianity was introduced here for the first time.

![Time shaft of when the Christianity was first introduced in every city](image)

Figure 5-2-1 time line of when the Christianity was introduced into these cities (Drawn by Huangshan)
During the third time that Christianity was brought in China, the Catholicism was the one been spreading. Therefore, in the cities which had Christianity preached in the 16th century, the Catholicism was their first mark of foreign religion and was more developed in these cities during the semi-colonial society. Generally speaking, the protestant was brought in relatively late and was not quite well developed at the beginning in some cities. The Protestant was not introduced until 1885 in city Xi’an and 1861 in Beijing. However, in Shanghai, although Catholicism was once brought in before 1840, the Protestant was better developed after 1843. Macau was spreading with Catholicism since the Portuguese settled in. However, Qingdao as another colony city, although it has shorter history, the Catholicism and Protestant were both been well developed between 1898 when the Christianity was brought in and 1949.

5.3 The architectural characteristics

5.3.1 Location and general layout

Most of the Western Classic Churches appear in the open layout near the residential area and are connecting closely to the plazas, streets and the city. However, the Christian Churches built in China during 1840 and 1949 have chosen their location according to the different geography conditions and various features of residential building in each city. For instance, the city Beijing was constituted by countless Siheyuan in distinct scales which formed the alleyways (Hu Tong 胡同) layout outside of the Imperial City (the Forbidden City), so the Christian Church buildings in Beijing built in 1840-1949 are mostly arranged in the courtyard. The open plazas which can normally be found in front of a western church in the European country were instead by the open

111 Hu Tong: (胡同) are a type of narrow streets or alleys, commonly associated with northern Chinese cities, most prominently Beijing.
Comparisons

space in front of the main building of the courtyard which hosts the church. In addition to the local layout of the Christian Church buildings in Beijing, some of the Christian Churches in the cities of northern Shaanxi, such as Yan’an and Yulin have also been layout in the typical local building formation--- cave dwellings.

There are more ups and downs of terrain in the cities like Qingdao, Shanghai and Macau, the Christian Churches in these cities built in between 1840 and 1949 have always been located not only on the highland of a region, but also around the cross road of several roads. Therefore with the pretty tall bell tower, the Christian Church became the highest spot of the skyline in the region; it occupied a commanding position and could be seen since far way. The city Xi’an and Beijing, as the ancient and current capital city of China, are locating in plains and has no ups and downs.

About the orientations of the Christian Church building in China built between 1840 and 1949, they did not totally follow the doctrine which plans the altar in the east and the façade facing west. The Christian Church buildings of Beijing and Shaanxi province built in 1840-1949, are mostly sitting in the north and facing south. It is because the traditional Chinese architecture in the northern China par particular attention to the sitting north and facing south orientation, as in this way the building will be easily receiving enough sunlight to be cool in summer and warm in winter. But, in the southern part of China, as there is no such special attention paid on the orientations of the buildings, the Christian Churches in Macau, Qingdao and Shanghai would consider more about the actual site, so the churches may be arranged in sitting in the east and facing west.
5.3.2 The Plan

The Basilica, the Latin Cross and the Greek Cross are the main plan formations of western classic churches, which cannot be found in any of the Traditional Chinese Architecture. Even the basilica plan is different from the normal Traditional Chinese Architecture plan as the Traditional Chinese Architecture plans are mostly horizontal rectangular, but the Basilica plan are of vertical rectangular. About the Christian Church buildings in China built in between 1840-1949, from the examples of those five regions we can see that all of them have the plan formation similar to western classic churches except some of the Catholic Churches in the north of Shaanxi Province which was arranged in the typical local building form--- cave dwelling. The Christian Churches in Beijing are always built in the Siheyuan, with the main churches buildings are constructed in western formation while the annexes are mostly in Traditional Siheyuan form. The Basilica and Latin cross are vertical plans, however, all the traditional architectures in Siheyuan of Beijing have horizontal plans, so the eclectic method to solve the problem is that the main church building used the one of the classic western church forms but all the other buildings stay in their traditional way.

According to these examples of the Christian Churches from the five regions, the church buildings in the cities that locate near the sea, have more convenient transportation and more developed economy, used the Latin cross-like plan more relatively speaking, such as in Shanghai and Macau. The inner land cities are more often having Christian Churches in plan similar to Basilica, as in city Xi’an, Yan’an and Yulin, a Christian Church building with cross plan can rarely be seen. The city Beijing, although it is an inner land city in northern China, it have been the capital of China for more than 500 years until 1840, so it was more developed than the other inner land cities in China, and it locates quite
near the port city Tianjing, so both the Basilica-like plan and the Latin Cross-like plan can both be found in the Christian Church buildings built in 1840-1949 in Beijing. Some of the churches have irregular plans but with Basilica-like formatted main halls, such as the Jiangsu Street Protestant Church in Qingdao.

5.3.3 The façade and roofs

The majority of the Christian Church buildings in these cities of China built in between 1840 and 1949 have façades similar to Romanesque, Gothic and Baroque style. In Macau, besides the Baroque-like style, Catholic Churches similar to Classicism can also be seen there. The main styles of Christian Church in Shanghai are similar to Baroque and Gothic. Beijing is more mixed where the Romanesque-like, Gothic-like, Romanesque-Gothic-like, and Romanesque-Baroque like can all been found in the Catholic Church buildings of 1840-1949. The Catholic Churches in the north of Shaanxi province have Gothic-like and Romanesque-like as the main style, while the churches in Xi’an are more similar to Baroque. The only exist Catholic Church in Qingdao is similar to Romanesque style, the other protestant churches are mostly not belonging to any of the mentioned westerns classic church styles, such as the Jiangsu Street Protestant Church in style similar to German Jugendstil or a total traditional Chinese architecture was turned into a Christian Church, but only the inside space.

However, no matter how many of them, the traditional Chinese architectural elements are added into all these façades. For instants, the horizontal inscribed board with Chinese characters on it, the brick carvings of typical Chinese plants and patterns and the building formation like brick spirit screen. Even in Macau, as the earliest colony in China, locating in quite sea-transportation developed peninsula and with a large number of Portuguese residences, all the Christian
Comparisons

Church buildings built there have been influenced by the traditional Chinese architecture. The strong evidence is the stone loin carvings on the façade of the St. Paul’s Church in Macau.

The other elevations of the Christian Churches in China built in 1840-1949 are simplified than the Western Classic Churches.

Speaking to the towers, the Christian Church buildings in the cities of Shaanxi province all have towers if they are of Gothic-like style. The Romanesque-like churches also have double towers except the one which only have a Romanesque-like façade on the cave dwelling in the mountain. For example the Qiaoergou Catholic Church in city Yan’an has towers but the Xiaosuangou Catholic Church has not. The churches with façade similar to Baroque style have no towers. All the Christian Church buildings in other cities of China built in between 1840-1949 have followed this rule.

Among all the Christian Church buildings in these cities, lots of them have traditional Chinese double pitch tile roofs. However, in some of the churches the foreign roof truss structure are used, such as the herringbone wooden roof truss in the Sanyuan Dongguan Church, the triangle wooden roof truss in the Shiquan County Catholic church, the scissor shaped wooden roof truss in Holy Trinity Church in Shanghai and the wooden arches in Xi’an City Dongxinxiang Church.

5.3.4 Constructive materials and structures

In Shaanxi province, the Catholic Church buildings built in 1840-1949 in the north are mostly of stone-brick structure, but the church buildings in Xi’an and the south are mainly of wooden-brick structure. It is the result that when the western missionaries were building the churches in China, they adopt the local and traditional Chinese architectural materials. Almost all of the Christian Churches in Macau and Qingdao are of
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stone-brick structure. It is quite closely related to the fact that these two cities have been more developed, have better economy and transportation and the churches are expected highly by the large number of colonists. However, the Christian Church buildings built in 1840-1949 in city Beijing and Shanghai have both stone-brick and wooden-brick structures. It is because that Beijing is the capital of China; Shanghai is the most developed city in the Far East, so the exquisite stone-brick structure church buildings are inevitable. However, these two cities occupy large area with big amount of people or have relatively long history and the deep influence of traditional Chinese architecture, so the wooden-brick structure Christian Church buildings also exist.

In total, compared to the western classic church in the European cities, most of the Christian Churches in China built in between 1840 and 1949 are simpler in formation and combined with the traditional Chinese architectural elements and used the local materials and constructive technique in certain amount.

5.4 The conservation condition

The church buildings of wood-brick structure are as inflammable as all the other traditional Chinese architecture. So the Christian Church building built in China during 1840-1949 of wood-brick structure had gone through several times of fire damage in their early times, such as the Christian Church buildings in Macau, Beijing and in some cities of Shaanxi province. Normally they were repaired on the support of the believer right after the fire damages. Then in the 1900, a lot of Christian Church buildings were destroyed in Boxer Rebellion, especially the churches in Beijing. However, along with the Boxer Protocol was signed in 1901, the Christianity revived in China. Not only the church buildings that were destroyed during the Boxer Rebellion were rebuilt or restored
using the large amount of compensations from the Qing Government, but also new Christian Church buildings were constructed.

Then later, many Christian Church buildings suffered severely in the Anti-Japanese War broke out in 1937, especially those churches in Shanghai and Qingdao. The churches kept staying in the bad condition until 1949 when the People’s Republic of China established. Before they had a chance to be repaired, each and every Christian Church buildings in China were occupied and used in other purpose during the Culture Revolution (1966-1976), they went through another time of change and damage. Luckily, some of the church buildings in more developed cities were restored after the Culture Revolution ended and the implement of the Religion Free Policy in the 1980s. Some of the church buildings were returned to the churches, but as the lack of financial support and attention, they are not well restored. By the time of 2000s, as more attention has been paid on the conservation and restoration of the historical buildings and the better economy situation in China, more and more Christian Church buildings built in between 1840 and 1949 in China became taken better care of than before. However, there still are large numbers of Christian church buildings did not survived from the long suffering history and disappeared; some of them still stay in poor condition in relatively backward region.

**List**

List 6, list of the main churches mentioned in the thesis
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<tr>
<td>Catholic Church</td>
<td>facing south with front plaza</td>
<td></td>
<td>appearance</td>
<td>Spanish</td>
<td>Double-pitch</td>
<td>arches and cross arches</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical rectangular</td>
<td>Influenced Baroque</td>
<td>style</td>
<td>tower with plate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>shaped</td>
<td></td>
<td>towers</td>
<td>tiles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Xuanwu Gate Catholic Church</td>
<td>In Siheyuan, the entrance of church building is facing south</td>
<td>Vertical rectangular shaped</td>
<td>With appearance similar to Baroque</td>
<td>One tower in the middle of the north elevation</td>
<td>Double-pitch roof with plate tiles</td>
<td>arches</td>
<td>Bricks</td>
</tr>
<tr>
<td>Jiangsu Street Protestant Church</td>
<td>Entrance facing south, altar sitting in north</td>
<td>Irregular L-shape</td>
<td>With appearance similar to German Jugendstil</td>
<td>More than 30 meters</td>
<td></td>
<td></td>
<td>Stone-brick</td>
</tr>
<tr>
<td>St Paul’s Church in Macau</td>
<td>On the high platform</td>
<td>Shaped like Latin Cross</td>
<td>appearance similar to Baroque</td>
<td></td>
<td></td>
<td></td>
<td>Stone-brick</td>
</tr>
</tbody>
</table>
Conclusions
1. The traditional Chinese architecture has completely different but integrated system from the traditional western architecture. The system is based on special constructive features.

a. The most important and common constructive material they use is wood.

b. The wooden beams and columns form the supporting frame structure enclosed by brick walls and covered by various types of large sloping roofs.

c. 矗 (斗栱 bracket set) is used as connections and supporting elements in every joints between the horizontal and vertical structures.

d. As China occupies a relatively large area, each region have had formed their own traditional architecture formation according to the local natural, geographic and climate conditions, as well as the most convenient local constructive materials.

e. Although the traditional Chinese architecture has vividly different local characteristics, the generality still exists: in general plan, there is no single building in so giant scale like some traditional western architecture, but buildings of smaller scales are always gathered together to form a group.

f. The courtyard conception is always devoted particular care to. The traditional Chinese buildings in the north part of China are mostly sitting in north and facing south to gain the better sunlight in winter. However, the traditional Chinese buildings in the south part of China do not pay much attention to this.

g. There is very strict hierarchy of traditional Chinese architecture. From the urban planning of the capital, the provincial capitals, the common cities to the imperial palace, governor residences, ordinary residences, they were all constructed according to the strict architectural hierarchy.
2. Before 1840, in the feudal China, the architecture of prevail religions in China have had their own style. As the main religions prevailed in China were Buddhism and Taoism back then, the Buddhist and Taoist temples of traditional Chinese architecture formation could be commonly saw all over China. However, most of the temples were not located in the city centers but on the mountains surround the cities. The few ones inside the cities were constructed in a quiet individual courtyard far away from the downtown area. This is quite different from the site selection of sitting on the cross roads or nearing the plaza of Christian Church buildings. Although the Christianity was brought into feudal China three times when all the architecture here was of traditional Chinese architecture style, it was spread relying on the Buddhism or the royals and nobles, so the Christian Church buildings were built up in formation of Buddhist temple. The western architectural style had not been introduced then.

3. However, since 1840, along with the outbreak of the Opium War, China was forced to enter the semi-colonial society from the feudal society which last for more than 2000 years. As the gate of ancient China was knocked open by the gunboats of western powers, China had to start the modernization process under the severe stress. Meanwhile, the Christianity was well spreading in China as a strong culture for the first time by the protection of series of unequal treaties. The Christian Church building became the first western architectural formation being introduced into China as large amount of them were built up in all over China during that time. Therefore, the Christian Church buildings occupy a special and important position in the architectural history of China. It is the beginning of the modernization of Chinese architecture. Because the Christian Church buildings built in China between 1840 and 1949 not only were the brand new foreign architectural formation in all the regions of China, but also combined certain amount of traditional Chinese architectural elements when
constructed, the research on them is a crucial part of the research on the architecture of China in semi-colonial period.

4. Among the provinces and cities of China, Shaanxi province have participated in each peak time when the Christianity was highly spreading in China as the provincial capital—Chang’an (today’s Xi’an) was the capital city of feudal China for many dynasties. We could say that before 1949, the spreading history of Christianity in Shaanxi province is an epitome of the developing history of Christianity in China. As Shaanxi province is locating in the Central Plains of China, the Christian Church buildings built in here during 1840 and 1949 are quite a representative of the Christian Church buildings in the inner land cities of China.

5. As the topography and climate are different from the north to the south part of Shaanxi province, the Christian Church buildings of the three regions in Shaanxi province have distinct characteristic.

1). Catholic prevailed in the northern part of Shaanxi province during 1840 and 1949. The developing history, the construction and distribution of Catholic Church buildings built in northern Shaanxi during 1840 and 1949 is clarified and summed up. Most of the Catholic Churches in northern Shaanxi built in 1840-1949 were designed and constructed under the management of the Spanish missionaries from Franciscans.

The construction of Catholic Church buildings in the north part of Shaanxi province had strong influence on the local architecture. The construction of Catholic Church buildings had brought the unprecedented new architectural formation to the local architecture, they combined together and show following features.

   a. The plan layout of the existing Catholic Churches in northern Shaanxi built between 1840-1949 is slightly similar to basilica plan. The
plans are just rectangular without the altar protruding outwards, such as Tanjiaping Catholic Church and Qiao’ergou Catholic Church.

b. Because normally the Catholic Churches in northern Shaanxi from 1840-1949 are not of large scale and the indoor space arrangement is relatively simple, the indoor space would hardly make people feel small insignificant as European churches may do. All the churches there have a wide open indoor space, and a sweeping view would be seen the moment we enter the church. The reason for this is probably that the Chinese traditional architecture is quite practical; and at that time, neither the economic condition nor the construction technology in China could achieve the same standards.

c. The chapter appears for the first time in the architectural history of Northern Shaanxi.

d. Some of the Catholic Churches in northern Shaanxi built in 1840-1949 have used the masonry arch structure, such as Qiao’ergou Catholic Church and Ganguyi Catholic Church, which was the brand new architectural structure in this area at that time. It is a result of the first introduction of western architecture formation. Also, there are also some churches which use the local characteristic cave dwelling structure.

e. The elevations of the Catholic Churches in northern Shaanxi built in 1840-1949 are relatively faithfully following the basic composition of the elevation in western churches. However, the local constructors had conceived a new elevation formation by combining the local architectural form and the foreign composition elements such as the statues of portrait and sculptures were replaced by the Chinese horizontal inscribed board and engravings of Chinese plants and animals such as plum blossom and peony are found in many places.
2) Speak to the uniqueness of architectural style, the Christianity architectures in central Shaanxi which were built between 1840 to 1949 have less typicality in the artistic architectural expression and advanced structural technique. The consideration and discus of its value and significant should be done on aware of the limitation of inner land cities and regions. So, from this point of view, the value and significant are the followings.

The value and significant of Christianity architectures built between 1840 and 1949 in central Shaanxi:

a. The technical and artistic value of architecture: Just like all the other regions, the church buildings were the building types appeared earliest in Modern Times (since 1840 to 1949), meanwhile, it was the earliest building type which brought the western architectural culture into central Shaanxi. It had placed a lead role in the architectural modernization process in central Shaanxi. The research on the Christianity architecture in Shaanxi will help understand the development and changes from traditional Chinese architecture to modern architecture on aspects of structural technique, artistic style, constructive materials and so on.

b. The social, historical and cultural value: the Christianity architecture in central Shaanxi of Modern times is a record of the Christianity spreading in central Shaanxi process and their deep impacts.

The characteristic of the Christianity architectures in central Shaanxi of Modern times (1840-1949):

Because Shaanxi is a inner land province, besides the Chinese-western mix style, the Christianity architectures of Modern times show more localize characteristic compared to the Christian Churches in the
Conclusions

coastal port cities. In specific:

a. The plan formation: the plan formations of the existing church are commonly simple. Most of them are of lengthwise rectangular, which apparently was affected by the western churches. The plans are mostly divided by two rows of columns. Some of the churches are sitting north facing south as the orientation of traditional Chinese architecture while others are sitting west facing east.

b. The modeling: the western architectural practice was mixed in to traditional Chinese architectural practice naturally. For instance, the Wuxingjie Catholic Church has façade with elements of Baroque style, the Xi’an City Nanxin Street Church has façade proportioned with a little of Gothic-feeling, but they both have more Chinese traditional architectural features showing in detailed parts. The doors and windows normally used the arched form, but the arches are usually simple without decoration. Therefore the mix of western arches, classical orders, volute curves, moldings and Chinese roofs, ridge decorations, Spirit screens, brick carves existing in the same building.

c. The structural technique: the Christianity Church buildings in central Shaanxi built in 1840-1949 mostly used the brick wall with wooden roof truss structure. The practice of the roof could be divided into two kinds, one is the traditional Chinese Tai Liang System (抬梁式) as in TONG YUAN FANG Catholic Church and Wuxingjie Catholic Church; The other is the western triangle roof truss as in Xi’an City Nanxin Street Church or wooden arched truss as in Xi’an City Dongxinxiang Church. The churches were constructed on the economic brick bar-type foundations.

d. The materials: due to the inconvenience and difficulties of material transportation, the Christian Church built in Shaanxi during 1840-1949 used all the local materials like bricks, wood, stones, adobe.
The roofs of the church are usually built by wood; the walls are of bricks or adobe inside covered by grey bricks. The roof surfaces are of traditional grey ceramic tiles.

   e. The churches were contributed by Christianity groups, designed by foreign missionaries but constructed by local craftsmen. This also is a reason why the churches have such a mixed style.

3) The spreading of Christianity in the southern part of Shaanxi province is mainly centered on Hanzhong and Ankang. Until 1949, there were more than one hundred Christian church buildings, schools and hospitals built in the southern part of Shaanxi province. However, after the Culture Revolution and the wave of demolishing and construction happened since the late 1980s, all of the Christian church buildings suffered so much that they were already torn down or in very poor condition.

5. Being as the first western architecture formation that was brought into China, Christian Church building built in China between 1840 and 1949 was designed by foreign missionaries but constructed combining the traditional Chinese architectural technique and local architectural formation by the local craftsmen using the local materials. So, all the Christian Church buildings in China have more or less some traditional Chinese architectural features. The architectural formations are different from traditional formation of the western classic churches. For instance:

a) The site selection of the Christian Church buildings of 1840-1949 in China mostly followed the convention of western classic church which is locating on the intersection of streets, or on the higher ground and try the best to construct the front plaza. But there still appear Christian Church buildings in traditional Chinese architectural layout, such as the Church in Siheyuan and cave dwellings.
Conclusions

b) A lot of Christian Church buildings in China have used the traditional Chinese architectural orientation which is sitting in the north while facing the south.

c) The plans similar to Basilica or Latin Cross could never been seen in Chinese architecture before the Christian Church buildings were built.

d) The façades appear in formations similar to western classic churches, some of the elements from Romanesque, Gothic and Baroque are used on the façade of the Christian Church buildings from 1840 to 1949 in China. Large amount of elements from western classic church were used to enhance the characteristic of Christianity, but the traditional Chinese architectural decorations, carvings and horizontal inscribed board could also be found.

e) The elevation modeling, especially the other three elevations except the façade, is simplified compares to the western classic churches.

f) Roofs are mostly of traditional Chinese sloping formation, but the arch roof truss was introduced for the very first time. Other forms of western roof truss could be seen in a lot of the Christian Church buildings built in between 1840 and 1949 in China.

g) These church buildings are also the first architectures of ground architecture besides the pagodas and bridges which use stones and bricks as the main constructive materials in most part China.

6. However, in China, the architectures in different regions have formed their own local characteristics according to the local geography, climate and materials. It also makes the Christian Church buildings have various features due to the region they were constructed.

First, the inner land cities have inconvenient transportation and less developed economy compares to the coastal cities, the un-colonized
cities have hosted much less foreigners than the colonized cities, so the demand of churches is few, too. Therefore, the Christian Church buildings in the coastal and colonized cities are larger in scale and more advanced in the constructive materials, the technique and the modeling than the church buildings in the inner land and un-colonized cities. The Christian Church buildings in the inner land cities built in 1840-1949 have combined more traditional Chinese architectural elements and local architectural formations.

Second, the inner land cities have never get rid of the situation of relatively inconvenient transportation, less developed economy and low demand of churches, so suffering from many wars and events happened after the churches were built, the major part of the Christian Church buildings were totally destroyed. The small number of existing Christian Church buildings are in the bad situation because the lack of conservation awareness and necessary financial and technique conditions. This situation was not improved until the 21st century. On the other hand, the Christian Church buildings in the coastal and colonized cities are relatively better preserved. There are more church buildings survived from the series of wars and events. However, Beijing is both inner land and un-colonized city, but it has been the capital of China since Christianity was spreading in China as the strong culture until now, so it stays in the forefront of Chinese economy and culture development. Therefore, there are more Christian Church buildings have been preserved and remained better condition in Beijing than other inner land cities.

Third, the Christianity is a foreign religion which was introduced in China relatively late compares to the Buddhism. The spreading of Christianity in China was relying on the invasion of western powers, but the Christian Church buildings were frequently damaged because of the unceasing conflicts between Qing government and western powers, and the
Conclusions

Chinese people’s continuous resistance against the foreign invaders. Then a lot of the Christian Church buildings were destroyed during the following wars and special historical period like the culture revolution. The survived Christian Church buildings are most in poor conditions. After 1949 when the People’s Republic of China was founded, at first the architectures as Christian Church buildings in China which have very important historical signification remained in the bad, restore-needed condition because of the poor economy, backward repair technique and weak awareness of the preservation on the historical architectures. This condition was gradually improved after the 2000s.

However, the Christian Church buildings in Shaanxi province and other palces of China, as an important part of the historical architectures built in 1849-1949, have not been paid enough attention to. The thesis has provided a basic foundation both in the historical and architectural version for their further conservation research.
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http://en.wikisource.org/wiki/Nestorian_Stele
Appendix
<table>
<thead>
<tr>
<th>Chinese</th>
<th>English</th>
<th>Español</th>
<th>Explanation</th>
<th>Observation</th>
<th>Imagines</th>
</tr>
</thead>
<tbody>
<tr>
<td>干阑</td>
<td>Pile supported building</td>
<td>Edificación sobre pilares</td>
<td>The Pile supported building’s bottom floor is supported overhead by pillars, the upper floors are for residential use. The minorities in the mountain areas of southwest are still using this kind of building a lot. Some people think that this kind of building is evolved from nest building of primitive society.</td>
<td>It mostly appears in the moist and hot mountain area in the southern China, and it is always built by bamboo or wood.</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>井干式</td>
<td>Well-frame building</td>
<td>Construcción de entramado lleno o blocao (de &quot;pozo&quot; = 井)</td>
<td>A kind of housing structure does not use columns and beams. In this kind of structure, the logs or rectangular timber or hexagonal timber would be parallel stacked upwards layer by layer and cross-bitted in the corner of the ends, forming the walls of the house. Then set up short columns on the left and</td>
<td>This structure takes use of a lot of timbers, and has limitation on both the scale of the house and the opening flexibility, so it is not popular applied. In China, mostly it just can be found in the forest area in northeast and southwest.</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
</tbody>
</table>
In the region of Shaanxi, Gansu, Ningxia Provinces (northwest of China), the loess formations are very deep, some of them are of dozens of kilometers depth. Chinese people take advantage of this terrain and dig caves for residing. It formed the ancient and traditional residential way of the residents living in the loess plateau in the northwest of China. This house cave residence dates back to 4000 years ago.

<table>
<thead>
<tr>
<th>Chinese</th>
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</tr>
</thead>
<tbody>
<tr>
<td>窑洞 Yao dong</td>
<td>House cave</td>
<td>Cuevas</td>
<td>right side walls of the house to support the ridge purlin.</td>
<td>There are open cave by cliff; Sinking-mode cave yard and brick-built cave three types of house cave. The type of open cave by cliff is more often seen.</td>
<td>![Image of a cave house]</td>
</tr>
<tr>
<td>Chinese</td>
<td>English</td>
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<td>Explanation</td>
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<td>----------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>間 Jían</td>
<td>Space in</td>
<td>Crujía</td>
<td>1 the space formed by four pillars. 2 the space formed by two rows of frames. It usually means the second meaning in ancient Chinese architecture.</td>
<td>In ancient Chinese architecture, Jían (間, bay) is unit of measurement for the building.</td>
<td><img src="image1.png" alt="Diagram 1" /></td>
</tr>
<tr>
<td>明間 Míng Jían</td>
<td>Central bay</td>
<td>Vano central (en fachadas)</td>
<td>The bay in the centre of the architecture façade.</td>
<td>It was call differently in dynasties.</td>
<td><img src="image2.png" alt="Diagram 2" /></td>
</tr>
<tr>
<td>面闊 Miàn kuò</td>
<td>Building</td>
<td>Anchura</td>
<td>The distance along the direction of entering the building is the depth; while the building width is the sum of the distances between every two eave-columns.</td>
<td>Bay (interje del pórtico) is the unit (módulo) for both the width and depth.</td>
<td><img src="image3.png" alt="Diagram 3" /></td>
</tr>
<tr>
<td>进深 Jin shēn</td>
<td>depth</td>
<td>Fondo</td>
<td></td>
<td></td>
<td><img src="image4.png" alt="Diagram 4" /></td>
</tr>
<tr>
<td>Chinese</td>
<td>English</td>
<td>Español</td>
<td>Explanation</td>
<td>Observation</td>
<td>Imagines</td>
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<td>----------------------------------------------------------------------------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>梁 Liáng</td>
<td>beam</td>
<td>Viga</td>
<td>The beam is the load-bearing component in the horizontal direction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>枋 Fǎng</td>
<td>Small beam or lintel</td>
<td>Viga corta, dintel</td>
<td>It is beam of smaller size which has both the function of connection and load-bearing. In Qing Dynasty, the component situated in the vertical direction of the façade was called beam (梁 Liáng) while the component situated in the horizontal direction of the façade is called 枋 Fǎng. But sometimes it’s not divided so strict.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In Chuan Dou System, normally there is no beam or 枋 Fǎng (枋). The pillars are connected by Chuān (穿). But the Chuān (穿) situated in the vertical direction of the façade could be called Chuān Fǎng (穿枋) while the ones situated in the horizontal direction of the façade are

![Diagram of Chinese traditional architecture showing the beam and枋](image)
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>穿 Chuǎn</td>
<td>lintel</td>
<td>Carrera, solera</td>
<td>The horizontal component to connect the pillars besides beams and Fāng (枋)，it only plays a supporting role of beams and Fāng (枋).</td>
<td>In Chuan Dou System, it is the only horizontal component which crosses through a row of pillars.</td>
<td><img src="image1.png" alt="Diagram" /></td>
</tr>
<tr>
<td>一榀房架</td>
<td>frame</td>
<td>Pórtico, vano de pórtico.</td>
<td>The structure unit constituted by two pillars and the beam or Fāng (枋).</td>
<td></td>
<td><img src="image2.png" alt="Diagram" /></td>
</tr>
<tr>
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<tr>
<td>檩 Lin</td>
<td>purlin</td>
<td>Correa</td>
<td>Horizontal timber supporting the rafters of a roof. It is located upon the beam and枋 (枋), the round shaped component being parallel with the horizontal direction of façade.</td>
<td>There are more than one purlins arranged equally spaced from the eave to the ridge along with the height of the beams.</td>
<td><img src="image1.png" alt="Diagram of purlin" /></td>
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<tr>
<td>檐子 Chuán</td>
<td>rafter</td>
<td>Cabio</td>
<td>On top of the purlin and in the vertical direction of the purlin. The section could be round or rectangular. It is for the paving of tiles.</td>
<td>Because each piece of tile is not large, so the rafters are arranged concentrated mostly.</td>
<td><img src="image2.png" alt="Diagram of rafter" /></td>
</tr>
<tr>
<td>斗栱 dōu gōng</td>
<td>bracket set</td>
<td>Ancón, ménsula</td>
<td>A unique structure of Chinese building stays in the join point of the columns and beams. The arciform load-bearing structure runs out layers by layers from the top of the column is called the arch (栱, gōng), the square</td>
<td>The bracket set could be easily found in royal palace, common residential, temple, etc. It has different types. Before the Tang and Song Dynasties (618-907,</td>
<td><img src="image3.png" alt="Diagram of bracket set" /></td>
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<td>piece of wood between the arches pad is called dou (斗, dōu). The two of them are collectively named bracket set (斗栱, dōu gōng) in china. Its function is outstretching the cantilever on the pillar to support the weight of the eaves.</td>
<td>960-1279), its structural function was main and obvious for supporting the large eave and roof, but from the Ming and Qing Dynasties (1368-1662, 1664-1911) its decorative function became stronger. The bracket sets under the eaves were like a row of sculpture decoration seen from far away.</td>
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<tr>
<td>高台建筑</td>
<td>High-platform building</td>
<td>Edificación de plataforma alta o berma central</td>
<td>High-platform building was popular used from Warring States Period (475BC---221BC) to West Han Dynasty (202 BC-9), was the architectural style which was commonly used in important palaces. The high-platform building take the high rammed earth station as the core, then built up houses upwards. The wooden structure adhered on the rammed earth station very closely and formed the structural system mixed with earth and wood.</td>
<td>Gaining the larger-scale, varied-form architecture by collecting and organizing several smaller single buildings on a rammed earth station, this kind of architecture was formed due to the large-scale structure could not be realized at that time.</td>
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<tr>
<td>棺椁 Guān guǒ</td>
<td>Inner and outer coffin</td>
<td>Doble artesa</td>
<td>Inner coffin is called (棺 guā) and (椁 guǒ) is the bigger coffin outside of the inner coffin (棺 guā).</td>
<td>The wood and stone were used as the material for the coffins</td>
<td>tech.sina.com.cn</td>
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<tr>
<td>大木作 Dà mù zuò</td>
<td>Load-bearing elements</td>
<td>Entramado clásico (madera)</td>
<td>Chinese traditional architecture terminology refers to the main structural part of Chinese wood-framed structure, which is composed of columns, beams, Fǎng, purlin. It is the load-bearing part of the wood-framed building, which is also an important determinant of the proportion scale and appearance of wooden building.</td>
<td>Because the ancient architecture has wood-structure as the main frame, the design of the house also belongs to Dà mù zuò.</td>
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<tr>
<td>小木作</td>
<td>Non-load-bearing components</td>
<td>Conjunto de elementos constructivos no estructurales (ventanas, puertas, tabiques, ornamentaciones, etc..)</td>
<td>It refers to the production and installation of non-load-bearing wood components in Chinese ancient architecture. Such as doors, windows, partitions, railings, the eave decoration and protective components, floor, ceiling, stairs, niches cupboard, fences, and so on.</td>
<td>It was called as Zhuāng Xiū Zuò (装修作Decoration) in Qing Dynasty.</td>
<td><a href="http://baike.baidu.com/view/732380.htm">http://baike.baidu.com/view/732380.htm</a></td>
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<tr>
<td>墓阙</td>
<td>gravestone</td>
<td>Pilonos, monolitos</td>
<td>The stone architecture in front of the tomb in ancient times, normally there are two standing separately and symmetrically on the left and right side. Què (阙) is a special type of architecture of ancient Chinese, firstly appeared as the watchtower on</td>
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<tr>
<td>Mù què</td>
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<td>It is also called as Mùbiāo (墓表). Què (阙) normally has base, body and roof three parts and had the function of decoration and look-out. It also appears in front of tomb, temple and city wall.</td>
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<td>石窟</td>
<td><strong>Grotto;</strong> Grotto temple</td>
<td><strong>Gruta, cripta (templos)</strong></td>
<td>Grotto is the cave excavated on cliff used for religion purpose. There are murals, stone inscription and other art works inside. It originally was a Buddhist architectural type in India.</td>
<td>In a grotto temple, there are religious statues or murals of religious stories.</td>
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<tr>
<td>里坊 Lǐ Fāng</td>
<td>block</td>
<td>En la ciudad: sector (residencial, comercial, etc...)</td>
<td>Divided the whole city into many closed Lǐ (里) as residential areas, the commerce and handcraft industry were limited into markets which opens and closes strictly on timetable. The Lǐ (里) and markets were all enclosed by high walls and guarded by special office.</td>
<td>It was called Fāng (坊) since the North Wei Dynasty (386-534). The later generation always mention it as Lǐ Fāng (里坊) system.</td>
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<tr>
<td>券 Quàn</td>
<td>arch</td>
<td>Arco (varios tipos)</td>
<td>Quàn (券), in ancient Chinese architecture there are four types: flat (平券), wooden comb back (木梳背), semicircle (半圆券) and carport (车棚券). The last three can be called as Gǒngquàn (拱券) which means arch, but there is no arch of the flat Quàn (券).</td>
<td>Chinese arch techniques for ground floor architecture began to be used in the brick pagoda of Wei and Jin Dynasty (220-589). In the Eastern Han Dynasty (25-220), the barrel arch bridge has</td>
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<tr>
<td>鳲尾  Chī Wěi  鳲吻  Chī Wěn</td>
<td>ornament on roof ridge  鳲尾 It was first called Chī (鸱) Wěi (尾) then changed into Chī</td>
<td>Crestería</td>
<td>It is the decoration component on the ridge end of the ancient palace. Chī (鸱) was passed on as the ninth son of dragon. It is water based, so it was built on the roof ridge for its symbolic meaning of avoiding fires.</td>
<td>In Han Dynasty when palaces were built, in order to prevent the fire the components of Chī (鸱) Wěi (尾) shape would be installed on both ends of the roof ridge. After the Tang Dynasty these</td>
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http://baike.baidu.com/subview/148021/8226431.htm
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<tr>
<td>(鸱) 吻</td>
<td>(lips 吻), but they always refer to the same thing.</td>
<td></td>
<td>components gradually became called Chī (鸱) Wěn (lips 吻) because of their shape. To the Ming and Qing Dynasties, Chī (鸱) Wěn (lips 吻) in large scale were used for construction of the palace were also known as &quot;Central Wěn (lips 吻)&quot; &quot;Dragon Wěn (lips 吻).&quot;</td>
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<td>乌头门</td>
<td>Wutou gate</td>
<td>Puerta Wutou</td>
<td>It is normally built up in palace, sacrificial altar, and tomb. The formation is: set up a lintel between two columns, color the top of the columns in black. Set up doors between the columns; install windows on the upper half of the door so it could be looked through. There are decorative carve on the top of the columns.</td>
<td>It was called Lingxing Gate (棂星门) in Qing Dynasty and it was said as the heaven gate.</td>
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<tr>
<td>照壁</td>
<td>Screen wall, also called spirit screen, or spirit wall</td>
<td>Pantalla</td>
<td>The screen wall is used to shield an entrance gate in traditional Chinese architecture.</td>
<td>Spirit screens can be positioned either on the outside or the inside of the gate they are protecting.</td>
<td><img src="http://tupian.baike.com/a0_85_49_01300000167882121843494480001.jpg.html" alt="Image" /></td>
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<tr>
<td>月台</td>
<td>Moon Platform</td>
<td>Antezócalo</td>
<td>A part of pedestal in traditional Chinese architecture, which connect the main body of the pedestal and the steps.</td>
<td>It is no appearing in any pedestal, but only appears in the large scale pedestal.</td>
<td><img src="image" alt="Diagram" /></td>
</tr>
<tr>
<td>斗</td>
<td>square pieces</td>
<td>Ancón, ménsula (de esquina)</td>
<td>The load-bearing square pieces of wood in a bracket set which</td>
<td>They have mortises in cross shape. The one in the bottom of the</td>
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<tr>
<td>拱 Gǒng</td>
<td>Bow-shape element</td>
<td>Piezas que van formando estructuralmente la curvatura hacia arriba del vuelo de los faldones (ver figura)</td>
<td>supporting the weight from in both directions, is the supporting seat of Gǒng(qī), Qiào(qiào), and Áng(áng).</td>
<td>whole bracket set, supporting the whole weight is called Zuò₁¹² Dǒu(坐斗).</td>
<td>![Diagram]</td>
</tr>
<tr>
<td>翘 Qiào</td>
<td>Element in the perpendicular direction to Gǒng(拱).</td>
<td>Piezas que van formando estructuralmente la curvatura hacia arriba del vuelo de los faldones (ver figura)</td>
<td>It is arched wood which is vertical to the building surface, and therefore is vertical to Gǒng(拱). Qiào(翘) has the same form and function as Gǒng(拱), only in the perpendicular direction to Gǒng(拱).</td>
<td>The Qiào(翘) in the bottom stretches out least, but increases layer by layer as stack-up. In Yingzao Fashi (Treatise on Architectural Methods 营造法式), Qiào(翘) was named</td>
<td>![Diagram]</td>
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1¹² Zuò: sit.
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<tr>
<td>昂 Áng</td>
<td>Stretch out element</td>
<td>Piezas que van formando estructuralmente la curvatura hacia arriba del vuelo de los faldones (ver figura)</td>
<td>the bracket set stretch out forward and backward from the center line, the ramp wooden component with sharp in front is called Áng (昂).</td>
<td>It has the same function as Qiào (翘) but in a different form, not appeared until Tang Dynasty.</td>
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<tr>
<td>叉柱造 Chā zhǔzào</td>
<td>intersect-column make</td>
<td>Nudo de ménsula (ver figura)</td>
<td>叉柱造 (Chā zhǔzào) is the terminology of 大木作 (Dà mù zuò). Simply speaking, it is in the Pavilion-style buildings of two or more floors, the foot of the eave column of upper floor have 十 or 一 shaped tenon and insert in the 斗 (Dòu) of on the eave column of the lower floor, but going toward inside for a radius of the cross section of the</td>
<td>It can enhance the contact between the upper and lower floors, and enhance the stability of the entire architecture.</td>
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<td>减柱造</td>
<td>reduce-column</td>
<td>Supresión de soportes en el interior</td>
<td>Reduce the columns in the inner side of the eave columns. It is proved to be a bad way, as it reduces the stability of the whole buildings.</td>
<td>It is mostly seen in the buildings of Yuan Dynasty because the backward economy and technique and the</td>
<td><a href="http://www.manda8.com/Item/264.aspx">http://www.manda8.com/Item/264.aspx</a></td>
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<td>升起</td>
<td>lift</td>
<td>Alargamiento de los pilares en los aleros</td>
<td>The height of the eave columns are gradually increased from the ones in the middle to the ones on both ends. The middle columns do not lift, the height of the others is increased 6.7cm in each bay.</td>
<td>The corners of large out toward eaves are lifted by the lift so the inner space could get enough sunlight.</td>
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<td>牌坊</td>
<td>memorial</td>
<td>Edificio-puerta votivo</td>
<td>In feudal society it is the building in recognition of meritorious service. There are also some temples used it as the gate, or indicate the names. Also it could be the monuments of the doorway style to promote feudal ethics.</td>
<td>It is very important in traditional Chinese architecture as a building type. It has even been a symbol of Chinese culture abroad and is used as a symbol of Chinatown in the West countries.</td>
<td><img src="http://www.gdtravel.com/jqjd/gdqy/gdjd/201109/11546.html" alt="牌坊" /></td>
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