CONTEMPORARY REGIONALISM IN CHINESE ARCHITECTURE: A PERSPECTIVE INSPIRED BY K. FRAMPTON'S CRITICAL REGIONALISM (FROM 1980 TO THE PRESENT)

By

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Abstract

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Rapid urban development in China threatens the urban fabric of Chinese cities. Development has attempted to balance strong Western influences with traditional Chinese forms and has met mixed results. Although there already exists a new current of Chinese regionalism in architecture, this trend could be improved by careful applications of the principles of 'Critical Regionalism' as described by Kenneth Frampton. This thesis presents six case studies of current Chinese regionalist architecture taken from two distinct urban settings—Beijing and Shanghai—and examine them through the lens of Frampton's critical regionalism. Each case study is examined in each of the basic dimensions used by Frampton to define critical regionalism. These case studies are then used as the foundation for specific recommendations for future development of contemporary Chinese architectural regionalism, in particular focusing on ways to integrate traditional or vernacular techniques, devices and forms with modern needs, modern technologies, and foreign influences in order to enhance the regional culture and built environment. Distinction is made between Beijing as a historic city emphasizing

Chinese government, while Shanghai is more of a “pluralist” city emphasizing international business. Both of these traditional lines of development lead to legitimate---but---expressions of what critical regionalism can mean for China.

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1.0 INTRODUCTION.

Today China is faced with both great opportunity and many problems that have arisen with policies of reform that have fostered tremendous economic development. One of the great problems architecturally has been the damage done to the urban fabric of China's cities by development based on the Modernist model developed in the western industrialized countries during the twentieth century. This thesis proposes some directions for a Chinese critical regionalist architecture, an architecture that can help maintain important positive aspects of the traditional Chinese urban fabric while still gaining the benefits of economic growth and new technologies. Kenneth Frampton's critical regionalism (Frampton, 1992) is taken as the starting point; case studies from China are examined to better understand the ideas of critical regionalism in the Chinese context, and finally, suggestions for the direction of Chinese architecture are presented.

1.1 STATEMENT OF PROBLEM/CONTEXT FOR THESIS

Rapid urban development in China presents many new opportunities for urban and architectural design. Starting in the late 1970's, when China adopted its policy of "reform and openness to the outside world," urban development has been pushed along by extremely fast economic growth. Backed by the economic boom that started in the early 1990's, this rapid modernization of urban centers has led to fundamental changes of the urban environment.

In the past two decades, this rapid urban renewal has changed the urban shape and skyline of Chinese cities. The boundaries of cities are expanding; for example Beijing's

ring road system has now been extended to a sixth ring. The growth of the ring road system spurs the growth of new communities and facilities that extend the limits of the city **(fig. 1).** In addition to the change of the cities' boundaries, urban skylines keep changing. The most striking example is the Pudong area of Shanghai, which was vacant land a dozen years ago, but now has become the site of hundreds of new skyscrapers that have radically changed the skyline of the city. **(fig. 2,3)** (Zhang, 2004, p3-4).

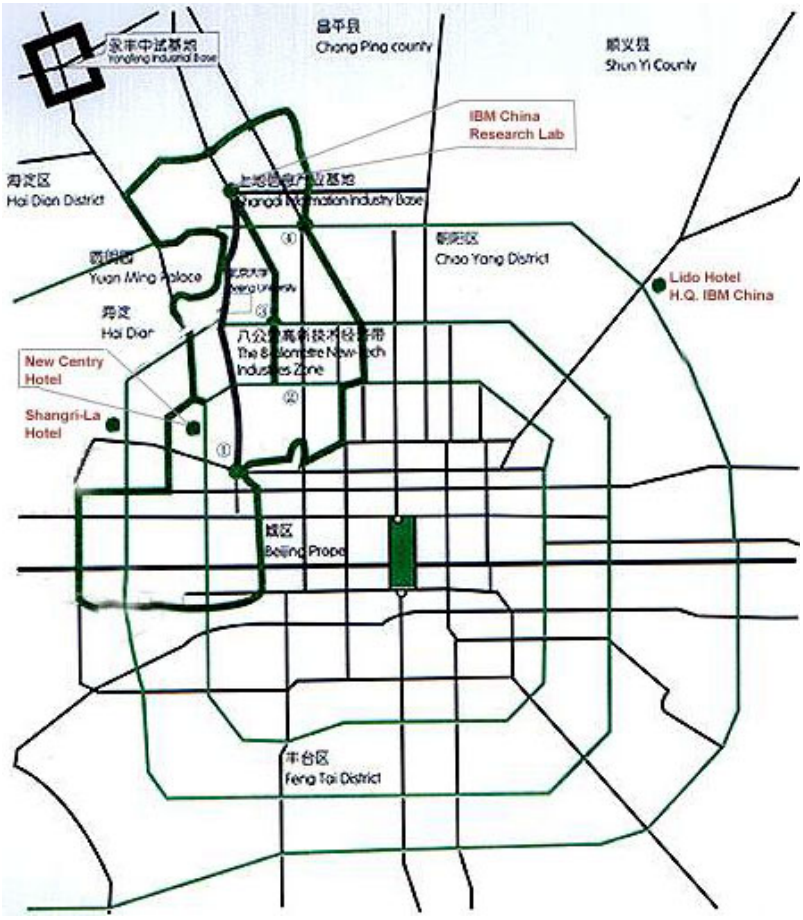


Figure.1. *The most current city's limits of Beijing, defined by the ring road system, shows the rapid expansion of urbanization.*

Figure.2. *A bird's-eye view of Shanghai in 1990 shows the vacant landscape of the Pudong area.*

Figure.3. *The same view of Shanghai in 2002 shows the new skyline of the Pudong area.*

But it is evident that in China today, while the speed of urban growth is fast, the development of cities has been guided by poor urban and architectural design. There are two major problems challenging the contemporary Chinese urban environment. The first problem is the misuse of traditional forms. There are attempts to 'sinofy' Modernist box-

forms through formal imitation of traditional Chinese architecture and the application of traditional forms taken from the Chinese vernacular vocabulary. For example, the Beijing West Railway Station is a typical example of this direction, applying the form of an ancient rooftop to a structure that is basically a typical Modern structure **(fig.4)**. In this railway station design, several traditional pagodas, used as ornaments, are stiffly put above this building, hiding the authentic characteristic of concrete used to build these pagodas beneath traditional Chinese forms created for wood construction. The pagoda form is not an expression of authentic feature of material employed in this project (Shen, 1998, p7). By the end of the 1970s, I. M. Pei addressed this problem, warning that "you can put on a traditional Chinese gown. But it becomes almost a caricature in making it 'Chinese'." (Pei, 1997, p3) The forms are a pastiche of foreign influences and misappropriated traditional forms rather than a natural outgrowth of the place and culture they are built to serve.

Figure.4. *The Beijing West Railway Station is a typical example of misuse of traditional forms.*

The second problem is the disruption of the urban fabric. The rapid urban development disrupts the urban fabric while attempting to renew the urban environment. Today China is facing the challenge of globalization. Globalization is viewed as a phenomenon that destroys “great civilizations and great culture” (Ricoeur, 1965, p281). Today, globalization influences almost every economic, social and cultural field through use of globalized technology or widely disseminated media, like radio, TV and the Internet. This trend reaches every part of the world and tends to make all countries follow the same pattern in their everyday life. For example, Coca-Cola and jeans, which were first American products, have become a part of global culture and now influence everyday life all over the world. As for the built environment, the phenomenon of homogenization and uniformity is the most obvious effect of globalization. Such cultural assimilation can be easily seen around the world in the forms of individual buildings and the urban profile. Hans Ibelings argues that “cities and agglomerations around the world have undergone comparable developments and assumed similar shapes. Wherever one looks there seems to be high-rise downtowns, low-rise suburbs, urban peripheries with motorway cultures and business parks and so on” (Ibelings, 1998, p67). Under globalization, indigenous cultures are fading away while universal models come to dominate urban and architectural developments. Buildings of great similarity are accepted worldwide as the norm, with, perhaps, a few adjustments made to respond to the specific site. In every country can be found cities that share a nearly identical appearance characterized by globalized architecture. The urban environment is filled with high-rise office blocks and curtain-wall commercial buildings that quickly occupy urban space and greatly influence the urban context and environment, especially for those cities full of traditional or

regional characteristics. Thus the city becomes the product of industrial age instead of a demonstration of regional culture. This situation challenges urban fabric and built environment. As demonstrated in figure 4-7, cities like Chicago, Singapore, Hong Kong, and Shanghai have a similar shape, characterized by a high-rise downtown **(fig.5-8)**. Chinese scholar Zeng Jian points out that globalization is "a great challenge to the survival of regional and national cultures. If we take no effective measures, it will bring about serious consequences" (Zeng, Zhou & Zhang, 1999, p2) In particular, there is the fear that globalization will eliminate the regional culture that created the traditional urban fabric. But Chinese cities such as Beijing have a strong connection with traditional culture. For example, Beijing has a clear, symmetrical and hierarchical traditional urban pattern. A north-south urban central axis dominated the whole urban plan. The street system was parallel to the central axis and divided the city into many blocks. The grand and eye-catching Forbidden City (the Palace) was set within the gridiron framework of plain and grey-coloured courtyard housing neighborhoods. As a whole, the Old City of Beijing is characterized by its horizontal skyline. This horizontal skyline is covered with trees and low-rise gold and grey curving pitched-roofs. This unique urban characteristic gives Beijing a strong connection with tradition (Wu, 1999, p10-14). But, when the forces of globalization create a modern, international city, such as the new development in Beijing, there is little concern for the traditional urban pattern and architectural tissue, instead the vision of the new city is to build a universal city's skyline and streetscape. For example, new high-rise apartments and office buildings erected in Beijing are destroying the horizontal skyline that is a major feature of traditional Beijing. And many traditional street blocks are demolished and replaced by new and large-scale developments.

Figs. 5-8 *The similar shape of the downtowns of different cities all over the world.*

Figure 5. *Chicago*

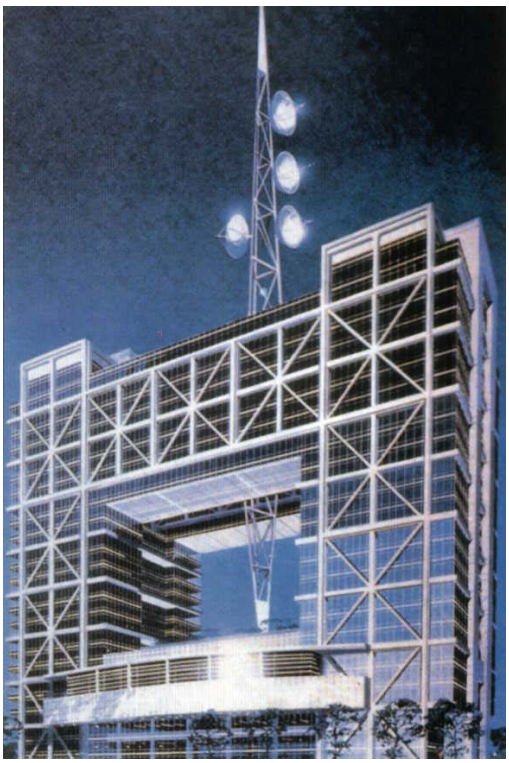
Figure 6. *Singapore*

Figure 7. *Hong Kong*

Figure 8. *Shanghai*

Today China takes western urban development as a successful model for its own development. In the evolution of Chinese openness and reform, various architectural schools poured into China and the western design model was accepted by the public and the professional sector. Viewed as an ideal blueprint for modernizing China, the western planning model was applied to urban development without appropriate accommodation for traditional culture. As a result, the traditional urban fabric fades away and regional identity is replaced by a universal appearance. But this architecture without regional identity can stand anywhere and makes no contribution to the urban fabric. An urban fabric is formed gradually and influenced by many factors include regional physical features such as climate and topography, and cultural characteristics such as tradition and lifestyle. A placeless architecture ignores regional characteristics, seeking an abstract efficiency or beauty, or both, by following universalized norms. It doesn't enter into a proper dialogue with nature and the built environment. As a result, it loses contact with place. For example, the Shanghai Stock Exchange is a typical case of technological expressionism **(fig.9)**. In this case, the structural frame dominates the architectural form. Technological expressionism boasts of the technologies used in construction. The architectural form is no more than a technological and structural presentation (Chen, 1997, p6). This tendency is not suitable for today's China where historical and regional factors dominate urban built environment in many cities such as Shanghai and Beijing. The technological expressionism, ignoring the local to brag of its universal technology, conflicts with the urban context.

Figure.9. *Shanghai Stock Exchange Center is a typical case of technological expressionism.*



Furthermore, the presence of western classical fragments is often evidence of the disruption of the urban environment. For some cities, such as Shanghai, Tianjin and Qingdao, which were once western colonial cities and consequently have many western-style buildings, responses to these existing alien cultural contexts can be seen as a valuable effort to respect and preserve the urban history and context. But for most Chinese cities, the value of these westernized forms in a traditional urban context is questionable. The Hongji Commercial Center is a typical example of this direction **(fig.10)**. Western classical fragments of Baroque style form the ornament of the tower's top and distinguish itself from its surroundings (Zheng, 1995, p29). This phenomenon only can be seen as a superficial understanding of the western design idea. Since for any

region, architecture has its own existing context, the introduction of purely alien facades is tending towards the disruption of the urban fabric. The feeling of a traditional neighborhood and street pattern will be greatly influenced by the involvement of alien cultures. In today's China, traditional urban structure and fabric still dominate the urban built environment. Therefore, currently the cities need proper assimilation of alien and modern influences rather than direct importation and imitation from the west. Due to differences in the histories of various cities, it may sometimes be appropriate to use more European sources in the architecture, but for those cities whose history is generally free from European sources so far, great care should be used in importing the architectural forms of the West. In a word, the improper involvement of the forces of globalization hurts urban cultural values.

Figure.10. *Beijing Hengji Tower is a typical case of the misuse of western classical fragments.*

1.2 STATEMENT OF APPROACH TO PROBLEM

This thesis is interested in developing ideas for contemporary Chinese architectural regionalism, a term created in this thesis, and which is intended as a strategy to respond

to the forces of globalization and preserve the culture of China and the Chinese urban fabric while still responding to the needs of a growing economy and the opportunities presented by technological advance. It attempts to preserve the traditional urban structure and fabric while renewing the built environment. It seeks an integration between ancient culture and modern technology, built form and regional factors, which including physical features such as climate, topography and light, and cultural characteristics such as traditional urban pattern and architectural prototype. The idea of Chinese regionalism is based on Kenneth Frampton's "critical regionalism" and, by examining examples of recent architecture in China, seeks to focus Frampton's points for use in China.

Seeing the disruption of urban fabric of Chinese cities as they develop, regionalist architects such as Wu Liangyong have called for regionalist strategies to preserve urban fabric while meeting contemporary use. Wu argues that "the contradiction between preservation and development has become more and more serious…urban design and architectural design should respect Beijing's historical context" (Wu, 1999, p16). He seeks an architecture that uses suitable regional principles that will help renew rather than destroy the traditional urban environment.

In today's China, some Chinese regionalist architecture is already being built. Besides the prevailing architectural directions influenced by the forces of globalization, there is a marginal practice of contemporary Chinese architectural regionalism, which searches for a hybrid strategy to meet the challenge of modernization and urbanization. On the one hand, it emphasizes the regional culture. On the other hand, it assimilates ideas from

western culture. This strategy argues that a critical perspective is necessary to balance modern and ancient issues as well as national culture and alien influence under architectural globalization, thus the starting point is the idea Frampton presented as Critical Regionalism.

The thesis introduces Frampton's idea of critical regionalism and uses it as a foundation for the examination of case studies of contemporary Chinese architectural. His theory is used as an analytical perspective on current projects and then guides the conclusion which presents some recommendations for architects.

1.3 DESCRIPRION OF THE REST OF THE PAPER

In chapter two, Frampton's critical regionalism is presented in depth. The seven points of critical regionalism as he defined it are discussed and distilled into five categories that are used to guide the analysis of the case studies. In chapter three, the six case studies in two typical urban environments are examined by the five categories derived from Frampton's critical regionalism. These case studies are not necessarily meant to be paragons of critical regionalist architecture. While some of these projects, like the Ju'er Hutong neighborhood are excellent examples of what architecture inspired by a critical regionalism could be, others, like the Jinmao tower, appear less successful in the lens of critical regionalism. In chapter four, conclusions for contemporary Chinese architectural regionalism are made. Furthermore, recommendations for future development are proposed.

2.0 KENNETH FRAMPTON'S CRITICAL REGIONALISM AND THE THEORETICAL BASIS FOR CONTEMPORARY CHINESE ARCHITECTURAL REGIONALISM

As discussed in the previous chapter, this thesis uses Kenneth Frampton's theory of Critical Regionalism to guide both the analysis and the recommendations for future development of Chinese urban areas. Frampton first presented his theory of critical regionalism in the early 1980s. This thesis is based on this theory as presented in his book *Modern Architecture: A Critical History* (Frampton, 1985). The term 'critical regionalism' was borrowed from Alexander Tzonis and Liane Lefaivre to identify region-oriented practices "whose primary aim has been to reflect and serve the limited constituencies in which they are grounded" (Frampton, 1992, p314). He argues that "we have to regard regional culture not as something given and relatively immutable but rather as something which has, at least today, to be self-consciously cultivated" (Frampton, 1992, p315). Because of the influence of globalization, contemporary environments no longer support the development of regional culture spontaneously, and yet this culture is precisely what is needed to combat the ills of globalization. It is in response to this situation that Frampton promotes his critical regionalism.

Vernacular architecture, viewed as architecture without architects, represents the logic of construction in a specific region. Vernacular architecture is a literal expression of the materials used and the method of construction employed. In Europe, prior to the Renaissance, the academic mode of architecture could be seen as the professional manifestation of the vernacular. The academic mode deliberately enhanced and

elaborated the vocabulary of forms associated with the traditional vernacular, while retaining the same basic functionality as the vernacular, because the academic mode and the vernacular mode were both authentic manifestations of the relationship developed in the culture between available, mostly local, materials and local craftwork traditions. From the Renaissance onward, there was a conscious effort in architectural theory to seek sources outside the immediate local tradition. In the Renaissance this was most obviously shown in the utilization of (Greek and Roman) classical sources, thus denying centuries of local development and expression of these traditions. But it could also be seen in the shift in construction techniques from relying on the craft artisans to relying on construction techniques of greater technological sophistication. In China, this close connection with lasted until the late 19th century when China accepted western cultural influences (Pan, 2001, p297). A gap between the traditional architecture and the architecture shaped by foreign influences became larger with the introduction of new technologies and ideas which created new physical and cultural environments. The commonly built architecture now no longer expresses the same meaning as the vernacular does—the vernacular having been largely suppressed by the foreign. On the one hand, in rural areas in China, where the traditional craftwork and local material are available, vernacular architecture is still the major form of building construction. On the other hand, in the cities, architecture that utilizes both the technological means derived from the most highly industrialized societies and the formal language of the West, dominates the built environment.

The new theories and new cultures, and the new needs and possibilities created by the new environments, provide new directions for architecture. The vernacular is no longer the only source for new architectural ideas. An architectural pluralism becomes possible. Further, as contacts between cultures become more common, this pluralism is further widened by the introduction of western cultural influences into previously isolated areas. For example, the Bund **(fig. 11)**, a one-mile strip of embankment facing the Huang-po River built in a style that combined Chinese and Western influences, is one of the most significant architectural symbols of Shanghai. In the early 20th century, the Bund was a major financial and political center; Shanghai's financial market was, for a time, the third largest in the world (behind London and New York). Beginning in the 1920s, multistoried buildings such as banks, clubs, hotels, apartment houses and department stores were built on this strip. The tallest one, the Park Hotel, was twenty-four stories high. These middle and high rises were inspired by western styles such as classical, Gothic, renaissance, eclectic and modern, and built using modern construction materials and techniques developed in the Western industrialized nations (Zhou, 1991, p13). These Chinese-western combined buildings inscribed the Shanghai's history of the early 20th century in their built forms. Thus, the Bund became one part of the truly regional culture of Shanghai.

Figure.11. *The Bund with buildings built in a style that combined Chinese and Western influences.*

Today, across the Huang-po River, the high-tech district of Pudong is emerging with the economic boom in Shanghai and the influence of globalization. Described in Wired magazine as “the site of the wildest and most ambitious construction boom of the 1990s” (Gluckmon, 1999, p8), this area has become a new focus where different cultures meet in Shanghai. This Manhattan-like district of gleaming skyscrapers sprouted across the Huang-po River from the old city on what was vacant land just a dozen years ago **(refer to fig.2 & 3)**. The Jin Mao Tower, one of the case studies examined in this thesis, is located in this district. The Pudong district is example of something is not positive-a wholescale importation of styles and architectural traditions derived in a completely different culture (and somewhat different climate).

Frampton cites Paul Ricouer as suggesting “that sustaining any kind of authentic culture in the future will depend ultimately on our capacity to generate vital forms of regional culture while appropriating alien influences at the level of both culture and civilization” (Frampton, 1992, p315). It is this need for vital regional culture that drives Frampton to propose critical regionalism.

Frampton defines seven main points that guide critical regionalism; this thesis will use five points to structure the analysis of the case studies. For reasons to be described, one of Frampton’s points is dropped from the analysis, and two of the other points are brought together as one. First, the reasons for dropping one point—Frampton’s seventh—from the analysis, are discussed. Second, Frampton’s six original points will be briefly listed.

Then the reasons for combining two points—Frampton's third and sixth—will be discussed. Finally, each of the five points used for the analysis will be described in detail.

Frampton's seventh point is a description of the environment in which critical regionalism arises. Frampton argues "critical regionalism tends to flourish in those cultural interstices which in one way or another are able to escape the optimizing thrust of universal civilization. Its appearance suggests that the received notion of the dominant cultural centre. . . is ultimately an inadequate model" (Frampton, 1992, p. 327). This point is not part of the analysis for two reasons. Firstly, this point focuses on an environment appropriate for the creation of critical regionalist architecture. By contrast, the first six points focus on specific aspects of architecture which can be seen as potential choices for the designer; they focus on such issues as normative optimization, or sentimental simulation of the local vernacular. The seventh point is not concerned with design choices in the same way; it is difficult to look at a building and understand how the architect might have made the environment more conducive to the creation of the building. Therefore, the seventh point does not make as good a point for analysis as the others. Secondly, since Frampton originally introduced his idea of critical regionalism at the beginning of the 1980s, the very idea of relying on a single dominant cultural ideal, such as that which motivated the Modernists and their search for universal forms, has weakened significantly. Thus the environment in which critical regionalism can flourish already exists. This thesis is evidence of that environment, as are the case studies examined in the thesis. Projects that express sentiments like those of Frampton's critical regionalism have already been built in China, even if the architects themselves were not

directly influenced by Frampton. But having the appropriate environment is not equivalent to being able to use that environment advantageously. The West Beijing Railway station shows a willingness to use forms outside the universal forms of the Modernists, but this willingness does not guarantee success. The examination and interpretation of Frampton's critical regionalism presented in this thesis are intended to help guide the development of rich regional architecture instead of an impoverished Sinofied repetition of the worst that can be found in global culture.

This thesis uses the first six points of Frampton's critical regionalism to structure its analysis, but two of the points—Frampton's third and sixth points—are merged into one, for reasons that will be explained after introducing the original points Frampton made. Aside from his point about requiring the proper environment for critical regionalism, Frampton lists six points:

1. A critical but open approach to Modernist attitudes and technologies where technical and technological aims like normative optimization.
2. A consciously bounded architecture concerned with the territory to be established by the building.
3. An interest in creating an integrated whole—what Frampton calls a 'tectonic fact'—rather than a series of scenographic episodes.
4. A stress on local conditions and responsiveness to local climate.
5. An emphasis on the tactile as well as the visual—architecture that is not only for the sight but for a complete human experience.

6. An opposition to sentimental simulation of the local vernacular combined with a willingness to re-interpret and use these local formal motifs and a willingness to also introduce foreign sources as well.

In turning these points into a guideline for a Chinese critical regionalist architecture, some overlap was noticed between points 3 and 6, the two points that are concerned with visual aesthetics and formal issues. Frampton's first point is concerned with questions of the scope of the project and the technologies used; the second, with interaction with the site; the fourth with environmental issues; the fifth with the perceptions of the inhabitants and occupants, but the third and sixth points are both primarily concerned with formal aesthetics. The idea that the whole should not be scenographic episodes is an aesthetic concern, just as is the idea that there should not be sentimental imitation of traditional forms. Further, these points overlap because when forms are authentically related to the architecture, they are not sentimental imitation but reinterpretation. For example the pagoda roofs of the Beijing West Railway Station are both a sentimental imitation and a scenographic episode. In contrast, the roof of the Shanghai museum is a reinterpretation of traditional forms that appears part of a whole rather than merely applied ornamentation, like the roofs of the Beijing West Railway Station. Because of this overlap between points 3 and 6, they will be combined into one point that is concerned with the formal aesthetic issues (the third in the list below). Having combined two of Frampton's six remaining points , there are going to be five points that guide the case studies and the future recommendations for Chinese critical regionalism. The five points used in this thesis are:

1. a preference for regional intentions over normative optimization,
2. a consciously bounded architecture,
3. more than scenographic episodes or sentimental historicism,
4. a responsiveness to local conditions and climate,
5. an emphasis on the tactile

Each of those five points, and examples, will now be discussed in greater detail.

1. A preference for regional intentions over normative optimization.

Frampton views critical regionalism as a marginal practice with respect to the dominant trend of modernization, which he views as dominated by "naive utopianism" and a focus on normative optimization. Normative optimization seeks to maximize building performance with respect to some standard or norm. Typical standards used for optimization are efficiency and utility in building construction and performance. The search for normative optimization, as Frampton describes it, utilizes the universal technologies developed by the industrialized countries and thus accepts and is limited to the forms derived from the application of these industrialized technologies. Frampton argues that "modern building is now so universally conditioned by optimized technology that the possibility of creating significant urban form has become extremely limited". Nonetheless he does not wish that critical regionalism "abandon the emancipatory and progressive aspects of the modern architectural legacy" (Frampton, 1992, p327). Critical regionalism, rather than being dominated by the needs of optimization, is free to use desirable tools to serve its specific ends. What Frampton has in mind here is that critical regionalism is less a response to normative optimization and more concerned with the associative attributes of a specific region such as local architectural fabric and cultural

values. Examples of this can be seen in the Shanghai Museum and in work on Yaodong dwellings in North-Central China by the GARC.

At the Shanghai Museum, traditional Chinese symbolism in architectural form led to a structure, which is far from the most efficient but is culturally significant. The architect self-consciously links this museum design with traditional Chinese culture. The architectural form of this museum is inspired by the ancient Chinese philosophy that the sky was round and the earth was square and the tradition of capturing this idea in buildings **(refer to fig.66)** and Neolithic bronze containers **(refer to fig.68, 69)** (Zhang, 1996, p37). Following this tradition, the Shanghai Museum uses a square plan at the ground and a circular plan at the roof or for upper floors. A second level of meaning is generated because this museum is famous for its collection of ancient Chinese bronze work. The architect consciously highlights this second association by adding four handle-like arches in the entrances on every side that rise from the circular roof so that the architectural form resembles the Neolithic bronze artifacts displayed in this museum. The architect Xing Tonghe argues that "Neolithic bronze culture is one of most representative evidences of old traditional culture. The built form highlights the characteristic of this museum where hundreds of the Neolithic bronze artifacts are displayed" (Xing, 1999, p11). Obviously, the symbolism of the architectural form is more important than structural efficiency or economic optimization. Freed from the demands of optimization, the architect can use modern technologies to realize the culturally evocative form, a huge overhung circular volume above a square base. Thus this museum illustrates the primary intent of critical regionalism, the self-conscious cultivation of regional culture.

Another example of the distancing from normative optimization is the new "Yaodong" dwellings in north-central China by GARC. Although one of their primary aims is to apply the principles of green architecture, in working with their clients at the Yaodong dwellings, GARC decided not to use greenhouse fronts, despite the improvements in thermal performance that these fronts would have brought (the architects did implement other measures to improve thermal performance, but those measures were not met with the same resistance from the clients). The clients were concerned that the Yaodong no longer looked like a cave once the green house was added (Liu, Wang & Yang, 2002). As with the Shanghai Museum, normative optimization, in this case thermal efficiency, was viewed to be less important than cultural symbolism. Here the significance of the arched front lies in the maintenance of vernacular values.

2. A consciously bounded architecture.

Frampton says that "Critical Regionalism manifests itself as a consciously bounded architecture, one which rather than emphasizing the building as a free-standing object places the stress on the territory to be established by the structure" (Frampton, 1992, p327). He cites Heidegger's critical point of boundedness which says "a boundary is not that at which something stops, but the boundary is that from which something begins its presencing" (Heidegger, 1954, p24) First, a bounded architecture should have a capability to create a spatial boundary, a territory defined by the structure. Second, more than the physical boundary, a bounded architecture seeks the integration between built form and cultural values. For Frampton, the characteristic of boundedness is a way against "this phenomenon of universal placelessness". Architecture of critical regionalism should be

grounded in local fabric and regional culture. Creating a bounded architecture depends on the architect's capacity to generate an architectural form with a sense of place.

The design of the Fragrant Hill Hotel generates this awareness of bounded space. Frampton emphasizes a "place-form", an architectural form that is firmly bound to the place, both in the dimensions of a physical boundary and a regional cultural identity. At the Fragrant Hill Hotel, the architect I. M. Pei interpreted the boundedness by learning from traditional Chinese garden architecture. He said "you can find parts of the design that are reminiscent of some of the buildings (garden architecture) I saw in Yangzhou and Suzhou" (Pei, 1997, p4) In this hotel design, he "wanted to find a new vernacular for China" (Pei, 1997, p4) . He developed a horizontal and rambling plan layout surrounded by a series of courtyards (refer to fig.28). The buildings and the courtyards are totally integrated, forming an intimate and particular territory between architecture and nature, as often found in traditional Chinese architecture. His intention was to create a proper built form bound to the place and vernacular culture rather than offer a freestanding building. He attempted to reinterpret "the Chinese perception of the relationship between nature and building" which was still valid at that time (Pei, 1997, p6). Furthermore, the architect highlighted a very famous historical landmark already on the built site called Liushuiyin (a water maze). Pei preserved the unique historical site and took Liushuiyin as one of the focal elements in architectural composition. (refer to fig.29). Therefore, the identity of the place was enhanced through a proper integration of the new building with the traditional cultural identity of the site.

3. More than simply scenographic episodes or sentimental historicism.

In his third point, Frampton sees the need for architecture that is understood as a "*tectonic* fact" rather than simply a series of scenographic episodes. He argues that the tectonic "is more than the simple revelation of stereotomy or the expression of skeletal framework." He recalls Stanford Anderson's definition of the tectonic which "referred not just to the activity of making the materially requisite construction…but rather to the activity that rises this construction to an art form." Frampton views the tectonic as "the presentation of a structural poetic." He opposes the scenographic episodes which is "the re-presentation of a façade" (Frampton, 1983, p32).

In his sixth point, Frampton argues use of sentimental imitations of local vernacular, seeking instead a reinterpretation of those forms and a blending of those forms with outside influences. As in the first point, he argues for an openness to western influences, but he sees this openness as requiring a focus on the local; critical regionalism "will endeavour to cultivate a contemporary place-oriented culture without becoming unduly hermetic, either at the level of formal reference or at the level of technology" (Frampton, 1992, p327).

Together these two points are the aspects of critical regionalism concerned with forms and aesthetics. Because the avoidance of sentimental simulation and the avoidance of creating scenographic episodes poorly associated with the architecture as a whole are closely related, these two points to seem to indicate a desire for architectural and formal

authenticity and responsiveness to the special characters of place and time that are more than an attempt to aptly ill-chosen ornament.

To some degree, the scenographic episode is just a skin-deep treatment such as the kitsch of vernacular details. The Beijing West Railway Station **(refer to fig.4)** is a typical example of the scenographic episode. The forms are not an expression of the tectonic but mere ornamentation. Adolf Loos once argued that "as ornament is no longer organically linked with our culture, it is also no longer an expression of our culture…it would have been the artist's task to find a new formal language for new materials. Everything else is imitation" (Loos, 1898, p13). The Beijing West Railway Station is this sort of imitation and not an expression of the culture that created it.

Frampton reckons that "the primary principle of architectural autonomy resides in the *tectonic* rather than the *scenographic*" (Frampton, 1983, p35). It is not simply nostalgic historicism but rather architecture that is treated as a whole. This argument can be illustrated by Ken Yeang's Roof Roof house **(fig.12)**. In traditional Malay architecture, the overlapping roof has the function of cooling the heated roof and keeping the interior environment from the sun's radiation. The design of the Roof Roof house draws on local traditions in the generation of its forms. The house has two roofs, a filter roof and a structural roof. The overhung filter roof, like a large single louvered umbrella, provides a buffer zone and shades the living spaces, achieving a favorable internal environment for the residents (Yeang, 1987, p47). Without degenerating into a literal imitation of traditional form, the creative modern version of traditional overlapping roofs are the

product of an attempt to build an integrated structure which responds well to its climate and to the regional culture. The importance of responding to climate is the next major point.

Figure.12. *Roof Roof House, Malaysia. The house has filter and structural roofs.*

Another example of this might be the Jean-Marie Tjibaou Cultural Center designed by Renzo Piano, whose forms, built with modern technology, echo the forms of local vernacular huts **(fig.13, 14 &15)**. The center is composed by many huge case-like buildings, evoking the Melanesian culture of the Kanaks (Mcinstry, 1998). Although using timber construction, the architect employs modern technology to support these huge volumes, which are quite different from the small-scale vernacular ribbed hut structure. In this example, modern technology is used to enhance traditional construction techniques, thus the ribs are made of laminated iroko instead of vernacular palm saplings, and are linked by horizontal tubes and diagonal tie-rods of stainless steel. The particular forms are achieved by integrating regional culture and alien influence.

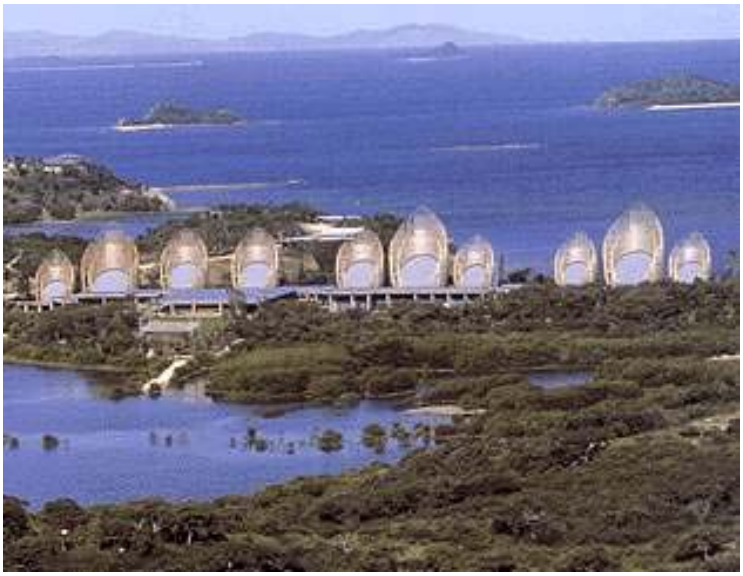
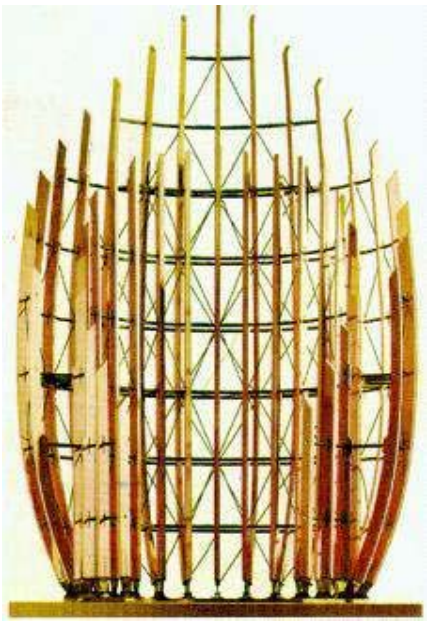


Figure.13. *The Jean-Marie Tjibaou Cultural Center. whose forms, built with modern technology, echo the forms of local vernacular huts.*

Figure.14. *The vernacular hut of traditional Kanak***.**

Figure.15. *The structural model of Jean-Marie Tjibaou Cultural Center shows that modern technology is used to enhance traditional construction techniques.*



4. A responsiveness to local conditions and climate.

Critical regionalist architecture "tends to treat all openings as delicate transitional zones with a capacity to respond to the specific conditions imposed by the site, the climate and the light." It reckons that architecture should naturally dialogue with the place and respond to the physical features of a region, the "site-specific factors, ranging from the topography. . . to the varying play of local light" (Frampton, 1992, p327). It opposes the indifference to such factors shown by the tendency to use air-conditioning systems. Again, Ken Yeang's Roof Roof house shows such an attempt to dialogue with climactic issues **(fig.16).** Yeang's concern for climactic issues can also be clearly seen in his Bio-climactic skyscraper **(fig.17, 18).** His approach is to use new building techniques, energy concepts and façade systems in high-rise buildings to adapt to tropical climate of Southeast Asia. Specifically, the bio-climatic idea is achieved through creating variable

deep air zones, employing layered exterior cooling and filtering systems, making use of vertical vegetation for shading, all of which integrate the building's environment with the world outside instead of creating a hermetically sealed environment inside the building.

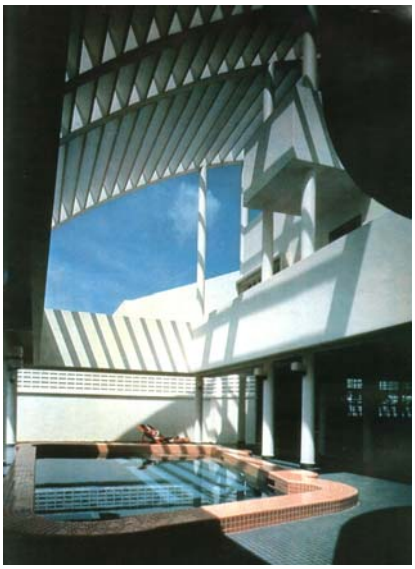
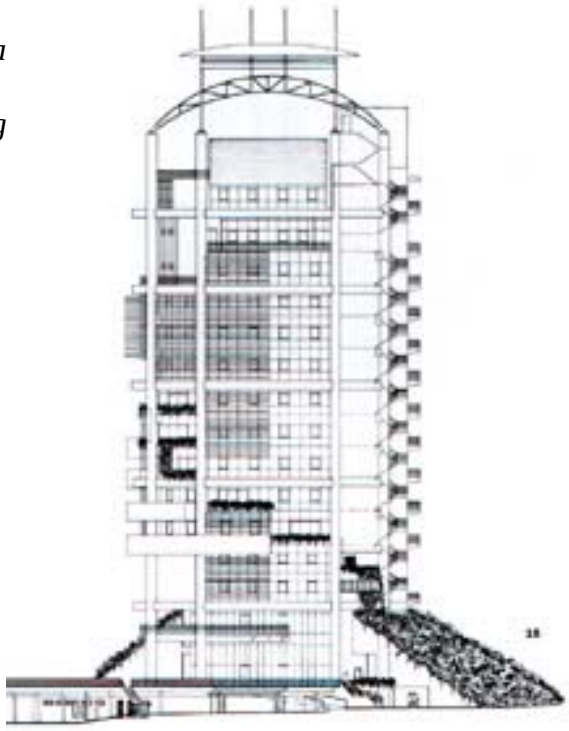


Figure.16. *Roof Roof House. The filter roof shades the living spaces.*

Figure.17. *Menara Mesiniaga, IBM head office in Malaysia, is a Bio-climactic skyscraper which adapts to tropical climate of Southeast Asia.*

Figure.18. *Section of the Menara Mesiniaga, reflecting the idea of making use of vertical vegetation for shading.*



Another example of this awareness might be found in the Ju'er Hutong Neighborhood which responds to Beijing's cold and windy climate by adapting traditional courtyard housing into their new design **(fig.19).** Inspired by traditional courtyard housing, this new low-rise courtyard housing is characterized by an enclosed transitional and communal space, creating a residential environment with an energy-efficient microclimate. The climate of Beijing is hot in summer and cold and windy in winter. The courtyard housing, combined with unique lane-street system, provides shadowed areas for indoor residents and outdoor pedestrians during the heat of summer. On the other hand, compared to row housing and high-rise apartments with open rather than enclosed transitional space, this small-scale built environment is more adaptable to the windy and cold climate of winter in Beijing. Furthermore, the Ju'er Hutong Neighborhood abandons

the orientation hierarchy among bedrooms in traditional courtyard housing and improves sunlight and ventilation conditions for all family units through the flexible plan layout. Having east- and west- orientation units is a shortcoming of traditional courtyard housing. In traditional housing, insufficient sunlight and ventilation conditions of some bedrooms in the east and west wings are significant problems. In the new courtyard housing, sunlight and ventilation conditions are greatly improved by appropriate set-back layout and the decrease of building story in the east and west wings **(Fig.20, 21).** In a word, the qualities of sunlight and ventilation of the new courtyard housing have been greatly improved compared to the traditional housing of Beijing (Wu, 1999).

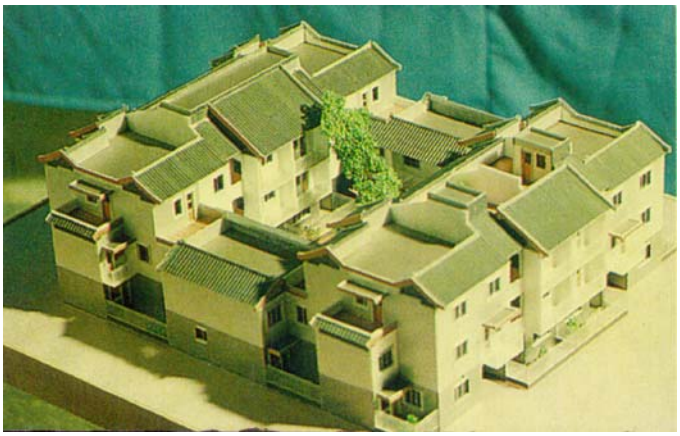


Figure.19. *The model of new "Siheyuan". It is characterized by an enclosed transitional and communal space, creating a residential environment with an energy-efficient microclimate.*

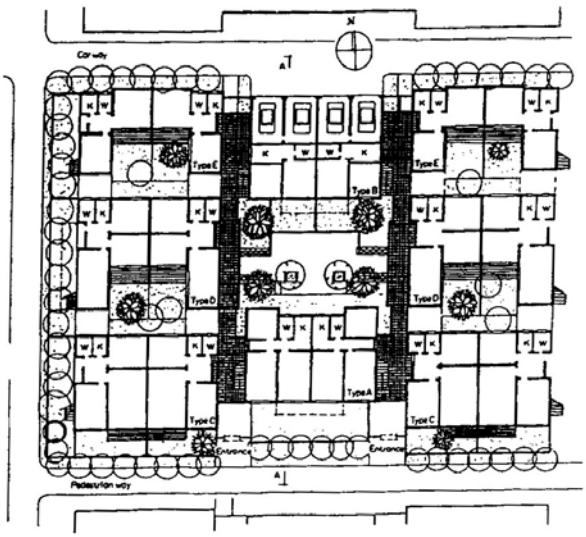


Figure.20. *Ground level floor plan.*

Figure.20&21. *show a design consideration for sunlight and ventilation conditions by appropriate setbacks.*

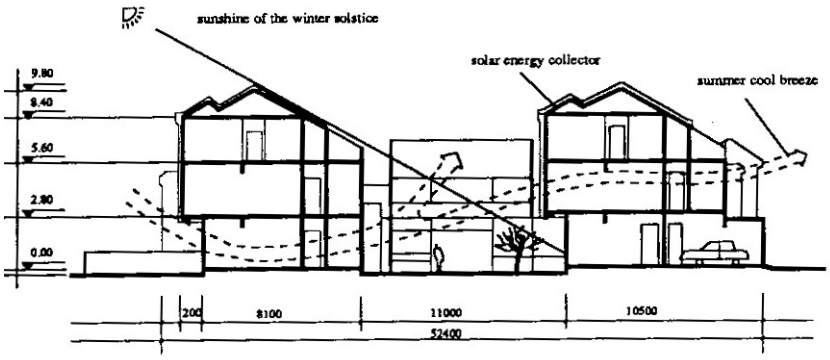


Figure.21. *Building section demonstrates sunlight analysis.*

5. An emphasis on the tactile.

In the previous point, Frampton focused on light and on light's role as "the primary agent by which the volume and the tectonic value of the work are revealed," but he also says it is important to be "aware that the environment can be experienced in terms other than sight alone" (Frampton, 1992, p327). Other experiences, like heat and cold, humidity, air movement, aromas, and sounds are important aspects of the environment. Frampton argues that "the tactile is an important dimension in the perception of built form." Critical regionalism recognizes that these other sense perceptions need to be recognized alongside the visual. Further, this aspect of the design can be seen as a strategy to oppose the domination of abstract information in the media age. For example, people can "experience" a scene recorded or created by the media such as movie and computer without engaging with the real environment. In this case, the engagement is only visual (or limited to the visual and auditory). Therefore, critical regionalism reckons that "the capacity of the body to read the environment" by means of tactile experience "suggest[s]

a potential strategy for resisting the domination of universal technology." Critical regionalism emphasizes that the concrete significance of the sensuous environment cannot be replaced by media experience.

This aspect of the critical regionalist program was of great significance to the designers of GARC. They comment with satisfaction "it is remarkable how the new *Yaodong* units preserve many of the sensual-tactile attributes of the original dwellings" (Liu, Wang & Yang, 2002, p7). This sensual environment was preserved through use of appropriate materials, construction technology and design, despite significant differences-particularly that the new units are freestanding and two stories high as opposed to traditional Yaodong dwellings that are built against cliffs.

Together these five points: 1. a preference for regional intentions over normative optimization, 2. a consciously bounded architecture, 3. more than scenographic episodes or sentimental simulation, 4. a responsiveness to local conditions and climate, and 5. an emphasis on the tactile, form the basis for the development of a Critical Chinese Regionalism. Already architects in China are developing projects which are not dominated by the modern tradition; these five points are intended to help understand and evaluate what has been built, and to help what is yet to be built.

The ideas of critical regionalism are intended to be used as a guidebook, not a blueprint. Critical regionalism provides suggestions rather than strict instructions; it presents possibilities rather than necessities. Frampton highlights the idea that these points

"attitudes" as opposed to "features", suggesting that they guide the designer's process rather than constituting a list of specific characteristics that must be found in critical regionalism. The idea that they are attitudes suggests the role he sees them playing: they are ways of looking at design problems; they are perspectives. For example, he is not suggesting that designers should not look for normative optimization or opportunities to build more efficiently, he is suggesting that there are other things of importance as well as normative optimization, and that designers should be open to the possibility that normative optimization is not the most important thing. Because they are attitudes, not necessary characteristics, a designer guided by critical regionalism might choose to ignore any of the points if the project demanded it. For example, it is only to be expected that a museum displaying ancient artifacts attempt to isolate its interior environment from external environmental conditions, in contradiction to the critical regionalist interaction with nature. This does not proscribe the possibility that the same museum could very successfully apply other aspects of the critical regionalist project.

In the case studies, these features are not always of equal relevance. Not all the case studies are equally good examples of critical regionalism. Some of the case studies do not reveal any strong evidence of the designer cultivating one of the attitudes suggested by Frampton. For example, the Jin Mao tower project reveals little interaction with the local climate and environment which Frampton emphasizes, especially if compared to a building like Ken Yeang's bio-climactic Skyscraper. Nonetheless, these cases all can show something interesting about the possibilities and limitations of a critical regionalist architecture. In the case of the Jin Mao tower, critical regionalism might find some

inspiration in how to make forms that are sensitive to cultural influences, even if the project is one, a giant skyscraper, that does not readily adapt to most of the ideas of critical regionalism.

This thesis will now examine six projects already built in China which represent the trend of creating a contemporary Chinese regionalism. Like the Yaodong project of GARC, these projects were not specifically inspired by the theory of critical regionalism, but nonetheless reveal the ideas of Frampton's critical regionalism. The five points of critical regionalism will be used to analyze these projects in hopes of better understanding how to apply the theory of critical regionalism to the culture of China. This understanding will provide the foundation for a theory of Critical Chinese Regionalism.

3.0 CASE STUDIES OF CONTEMPORARY REGIONALISM IN CHINESE ARCHITECTURE

A critical regionalist architecture emphasizes the integration between built form and regional and cultural values. The urban built environment is the production of regional features such as climate and topography and cultural values such as lifestyle. Therefore the built environment is a basic factor used to understand and evaluate contemporary architectural regionalism. In this thesis, Beijing and Shanghai, as exemplars of the most representative traditional and modern cities, respectively, in China, are chosen as urban contexts for case studies. Major characteristics of each urban context will be discussed before presenting the case studies from that context, in order to describe the basic urban background for the case studies. From both of the urban contexts are taken a group of three case studies. Specifically, the Fragrant Hill Hotel, Ju'er Hutong Neighborhood and Yanhuang Art Museum are selected to illustrate current level of contemporary regionalism in traditional Beijing. The other three cases, the Shanghai Museum, Shanghai Library and Jinmao Tower are evaluated in detail to uncover various strategies for modern urban context of Shanghai. It is worth mentioning that these projects are not the products of architects consciously following Frampton's programme and that therefore not all six points will be of equal relevance to all six cases.

3.1 CASE STUDIES IN A TRADITIONAL CONTEXT—BEIJING

Beijing, the capital of contemporary China, was also the political center from 1271 AD to 1911 AD when it served as the capital of the last three imperial dynasties of the Yuan, Ming and Qing. It was one of the earliest walled cities in China, and its history could be dated back to the Zhou Dynasty of the 11th century BC. On the one hand, as the only well conserved ancient capital city, Beijing is the finest example of classic Chinese city planning and design among traditional cities such as Xi'an (ancient Chang'an), Luoyang, Kaifeng and Nanjing, which were also once capital cities in ancient times. Beijing has more cultural relics and traditional values than those cities (Wu, 1999, p4-8). On the other hand, as one of the most developed metropolises in China, rapid modernization and urbanization are greatly threatening the traditional urban environment. Therefore, the contradiction between preservation and development became more serious than for other traditional cities. Today Beijing has become the most typical and controversial urban environment for contemporary developments within a very traditional urban context.

As a historical capital city, Beijing has a unique urban structure and fabric. First, Beijing has a clear, symmetrical and hierarchical urban pattern, which inherited the traditional Royal City prototype of its predecessors such as Chang'an City (today's Xi'an), the capital of Tang Dynasty. The Old Beijing was composed of the Inner City and the Outer City **(fig.22)**. The square Palace City, called the Forbidden City, was in the center of the inner city **(fig.23)**. A 7.9-kilometre-long north-south urban central axis dominated the whole urban plan. All the magnificent monumental buildings such as the Drum Tower,

the Bell Tower and the Forbidden City were erected along this central axis. The street system was parallel to the central axis and divided the city into many blocks. Although physical changes of the city have taken place several times since the Yuan Dynasty, all the urban elements, whether old or new, were organized by this original and significant axis. Thus, a sense of order was created by the unique treatment in the urban plan (Pan, 2001, p35-39).

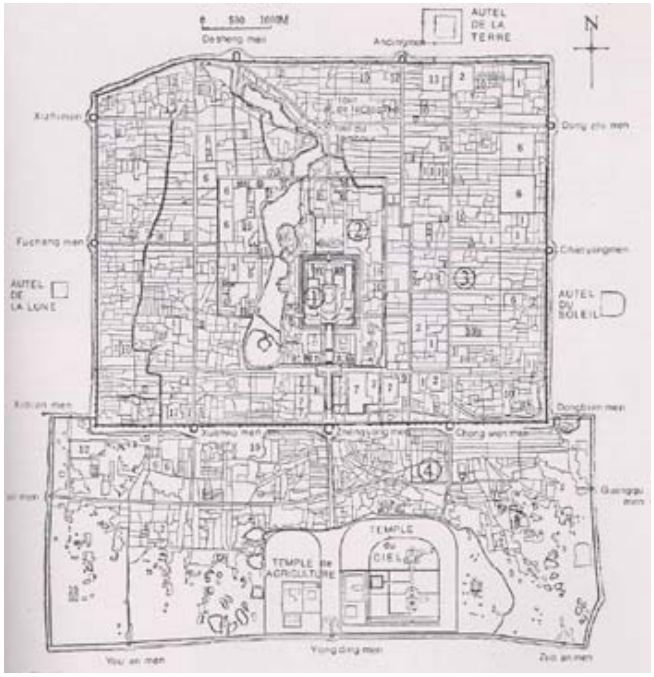


Figure.22. *Plan of Old City of Beijing. It was composed of the Inner City and the Outer City.*

Figure.23. *Birdseye's view of Forbidden City. It was in the center of the inner city.*

Second, The ancient urban pattern of Beijing expressed a strong sense of hierarchy. The Forbidden City, composed of the varying forms of palaces and temples and decorated with bright colors such as red walls, crimson columns, white pedestals and green eaves, was in the central position of the city. By contrast, simple, low-lying and grey-coloured courtyard houses were used by the common citizens. Therefore, the grand and eye-catching Forbidden City setting within the gridiron framework of plain and grey-coloured courtyard housing communities generated a coherent built form, the most important feature of Beijing's urban pattern (Pan, 2001, p38-42). The famous scholar Liang Sicheng argued that "Beijing is a planned entity...Therefore we must first of all realize the value of the wonderful structure which gives the city its intrinsic character. This should be the point of departure for any attempt to understand the city. The majority of monuments in fact are not freestanding buildings; rather they are often architectural complexes, each of which consists of quite a few buildings interrelated in a particular manner. This feature in itself is the city's most valuable contribution to art and architecture" (Liang, 1987). In a word, the traditional urban structure, the pattern and fabric of interrelated buildings and spaces, has lasting value. As a critical component of the fabric and texture of Beijing, traditional courtyard neighborhoods play important influence on maintaining the urban structure. The neighborhoods show urban physical order and tissue. Wu argues that "the formation of the residential neighborhoods of Beijing generally follow a hierarchical fish-bone-shaped structure of access, from major street to small lane (hutong) to courtyard house, that extends in a systematic way from the most public spaces to the most private. This urban layout, combined with the characteristics low, dulating, and tree-dominated roofscape, is what most amazing characteristic of Beijing" (Wu, 1999, p66).

As a modern metropolis, the process of urban renewal is proceeding at an accelerating pace in the Old City of Beijing. From the beginning of 1980s, with the rapid development of national and regional economy, the government intended to modernize Beijing quickly. China yearned to develop their cities based upon the western urban development model at the beginning of its openness to reform. The government intended to reconstruct Beijing based upon the models of Hong Kong or Singapore, a typical urban pattern influenced by western metropolises, where the urban landscapes were characterized and dominated by high-rise apartments and curtain-wall office blocks in the downtown area. But for Beijing, the downtown area, the Old City of Beijing, maintains a traditional urban structure and is characterized by its horizontal skyline. It is dominated by the centrally located Jingshan and the White Pagoda in Beihai. The horizontal Beijing is covered with trees and low-rise gold and and grey curving pitched-roofs. If the blueprint for a high-rise downtown area were carried out, the Old Beijing as an entire built form would have been fundamentally damaged. It is no doubt that with the increase of tall skyscrapers, the traditional roofscape would be altered and the city’s traditional beauty would be threatened or destroyed. Fortunately, this plan was given up due to I. M. Pei's effort. An American-Chinese architect, Pei was invited to design a modern high-rise hotel in the center area of Beijing in the late 1970s. But he refused and selected a different site for the proposed hotel, the Fragrant Hill Hotel. At the same time, he convinced the Chinese government to give up a series of plans for high-rise buildings in the Old City of Beijing in order to preserve the Forbidden City from skyscraper intrusion. Driven by Pei's suggestion, Beijing almost canceled all contracts of skyscraper structures; as Pei said later: "Since then no tall buildings have been allowed within the vicinity of the Forbidden

City. I consider this my most important contribution" (Pei, 2002, p6). In recognition of the need to preserve it, the State Council listed Beijing as an important historical city in 1982. A Building Height Zoning Act was finally passed by the municipal government in 1987 and this was followed by the High-Rise Building Act in 1989 which controlled high-rise blocks in the city (Wu, 1999, p35).

Although Pei's effort helped to preserve the horizontal skyline, new developments still challenge the traditional urban built environment. Currently the conservation of Beijing as a whole has not been given sufficient consideration. The traditional urban structure is suffering from an over-heated boom in real estate development. To meet the pressing demand for housing within the Old City, many traditional courtyard houses had to be demolished to make way for multi-storey apartments. Lu Xiaoxiang lamented that "the horizontal and open spaces of the Old City and their leafy environment are disappearing amidst the apartment blocks" (Lu, 1991). Conservation has become a difficult problem in the traditional areas. The Beijing Municipal Government's policy is to allocate the lots designated for rehabilitation within the city to different development corporations in the hope of renewing the Old City by means of large-scale real estate development (Liu, 1997). Unfortunately, more and more large-scale office buildings and department stores are springing up under the stimulation of profit. As a result, more and more traditional neighborhoods, historical gardens and buildings are being destroyed. This situation calls for an appropriate strategy in urban plan and architectural design that requires new development should respect this particular urban structure and fabric.

Besides the urban built environment, the climate is another important issue influencing regionalism architecture. The four seasons are very distinct in Beijing with a temperate spring, rainy summer, clear autumn, and a cold, snowy winter. In the winter and spring, the climate is typically dry and windy. Thus, it requires an appropriate treatment in architectural form. Traditionally a transitional space between outdoor and indoor environment is a response to this feature. The enclosed courtyard of courtyard housing is a typical example to illustrate this point. Moreover, related to this climatic feature, the color of building should be carefully considered. Light colors, such as white, are easy discolored and are difficult to maintain for years. Traditionally, off-white stucco and grey roof tiles were often used for residential buildings in the south of China. In the northern regions such as Beijing, white color is seldom applied to buildings. The grey color is major tone for courtyard housing. These issues, related to the climatic factors, need to be considered in regionalist architecture.

In this thesis, three case studies are examined in contemporary Beijing. Although not all of them are entirely successful examples of a Chinese regionalist architecture, they show a continuous exploration of the ideas central to regionalism in architecture. The Fragrant Hill Hotel is an example of rediscovering traditional and cultural values. It might be viewed as the first case of Chinese architectural regionalism. The Ju'er Hutong Neighborhood is an example of the renewal of a traditional neighborhood prototype. It focuses on small-scale projects in neighborhood redevelopment. Aimed at the large-scale new development in the Old City of Beijing, the architect Wu Liangyong argues that “the rehabilitation of a historical city must not be driven entirely by profit, and such an

approach is ultimately fruitless." He reckons that the Old City should be rehabilitated through small-scale improvements that are carried out with great care rather than large-scale clearance and rebuilding (Wu, 1992). The third case study, the Yanhuang Art Museum, is used to discuss how to make new types of building dialogue with the traditional structure and tissue. Although the museum is not a traditional building type, this case benefits from the concept of regionalism. It is worth mentioning that idea of critical regionalism includes dynamic development and use of new ideas. The application of an architecture based on critical regionalism is not just limited to use of historical building types. In today's China, more and more building types such as museums and libraries are created to meet contemporary needs. They should become important parts of a new urban fabric that adapts to new needs without rejecting or devaluing important regional culture and features.

CASE STUDY ONE: FRAGRANT HILL HOTEL

The Fragrant Hill Hotel, built outside of Beijing, is a good example of architecture responding to regional and cultural considerations. The Fragrant Hill Hotel uses both the advantages of modern technology and a conscious attempt to link to cultural traditions to create a building that fits into its site aesthetically and culturally. From the use of ancient landmarks on the site and the work of local craftsmen, to use of modern technology, Pei's building inspires a vision of an architecture that is sensitive to both the past and the future.

The Fragrant Hill hotel was built in 1982. The architect I. M. Pei started to design the hotel in 1979 when the Chinese government began the early stages of economic reform. At first, the Chinese government wanted him to design a number of high-rise hotels on Changanjie to accommodate what they thought would be increased travel in China. The Changanjie is a main street of Beijing, part of the Changanjie divides the Forbidden City from Tiananmen Square. At that time, China's infrastructure was extremely limited and the Chinese authorities were especially eager to erect high-rises as proof of their emerging role in the international community. But Pei refused this commission, arguing "I refuse – and shall always refuse – to build a skyscraper in the center of Beijing. In order to modernize it is not necessary to destroy the past: China can create an image and a modern architecture for itself through a renewal of its own tradition without chasing after the mirages of the West" (Hoving, 1983, p68-81). Pei reckoned that any inappropriate construction would intrude on the traditional harmony of existing urban built environment.

Then the government offered Pei several sites to choose from for the hotel. Pei selected Fragrant Hill, located in twenty miles northwest of Beijing, which was once part of an imperial hunting reserve. Twenty years ago, it was just in the suburbs of Beijing. But with the rapid urban development and the construction of the urban ring road system, the city limits of Beijing have expanded and Fragrant Hill is now a part of metropolitan Beijing. The site is just right off the fifth ring road which has a convenient access to the downtown Beijing via the ring road system (**refer to figure.1**).

Compared to those projects located on the center Beijing such as Ju'er Hutong Neighborhood, Fragrant Hill Hotel has more favorable landscape and the surrounding environment. The Fragrant Hill has steep slopes rising up all around and they were thick with a rich variety of trees including cypress, chestnut, cedar, pine, willow, and gingko. As Pei said, he wanted to find a site where he could do a building that was more traditional. And the Fragrant Hill is a perfect site for the hotel (Pei, 2002).

Although the Fragrant Hill Hotel was originally designed that was outside the urban limits of Beijing, it is a project worth considering with respect to the development of urban critical regionalism for a number of reasons. Firstly, Pei's initial design choice—the refusal to build a skyscraper in the center of Beijing—was a choice about the nature of Beijing's urban environment, and was a choice that has had a significant impact on further development in Beijing. Secondly, Pei wished to revitalize an idea of architecture that drew from the living traditions of China. Wiseman argues that "the design of Fragrant Hill was based on a rigorous distillation of what Pei felt were the best elements

of a continuing tradition in Chinese architecture. ” He continues to argue that “Pei’s real aim in the design was to pick up that lost thread of continuity and use it in the weaving of an architectural aesthetic for contemporary China” (Wiseman, 2001, 201). Thirdly, Pei’s design was inspired by two different urban sources: the traditional courtyard dwellings of Beijing and the traditional urban gardens of southern China. For these reasons, an urban Chinese critical regionalism, a regionalism suited to Beijing, can learn a great deal by studying the Fragrant Hill Hotel even though it was not originally set into an urban environment.

What Pei has in mind about the hotel is “a third way, an alternative to the architecture of Hong Kong and Singapore, to find a new vernacular for China.” Since Pei left China for almost 40 years, to refresh himself, he visited many cities in China and widely investigated traditional private gardens of southern China such as Suzhou and Wuxi, the residential architecture of ancient literati. Pei found that there was a possibility of a new vernacular because he realized that the source what he was seeking was in the design of traditional private garden and the principle of Chinese housing was still applicable. He reckoned that “this is where the architectural tradition resides. It reaffirmed my belief in the importance of residential design as the best source-it was there one had to search” (Pei, 2002, p4) Based upon the realities of that time, Pei decided that the traditional private garden would be the major inspiration for the hotel.

Traditionally, the private garden is a very personal construction using both natural and manmade elements such as trees, ponds, rockeries, zigzag paths, corridors and bridge

blended together to form a living space. Generally it is composed of courtyard dwellings and gardens. A garden is often attached to the family's living quarters. Most of the buildings are hidden behind walls, forming an enclosed living space. Courtyards and garden are designed to create the illusion of nature in the smallest of spaces by blending water, plants and rocks with the manmade beauty of poetry, bridges and pavilions. A maze of hidden courtyards, secret turnoffs and twisting mosaic pathways enlarge the space, while open-air windows between walls leak glimpses of what lies beyond. Skillful use of perspective makes small spaces appear larger. Undulating, serpentine walls suggest mountains in the distance and provide a surface for the interplay of light and shadow. Thus, there are plentiful and unpredictable visual perceptions in the enclosed built environment **(fig.24 & 25)** (Pan, 2001, p312-317).

Figure.24. *Unique visual perception by proper arrangement of water areas in traditional Chinese garden.*

Figure.25. *The metaphor of mountains by proper arrangement of rocks in traditional Chinese garden.*

In a word, buildings, courtyards and garden are merged organically to form comfortable and vigorous living spaces in the traditional garden. It greatly highlighted the organic combination of the living part and the recreation area.

In the traditional literati's garden, Pei rediscovered the essence of vernacular, the intimate relationship between nature and building. As he described, "Chinese gardens are very unusual in the sense that you can create a microcosm of the world in such a tiny space… In a Chinese garden, you make a turn, and then you pause, you see something, and you turn again, and you see something different" (Pei, 2002, p4) Moreover, he found that the traditional living pattern, living spaces centering on the courtyard, remained suitable for contemporary life. Because at that time most people in Beijing lived in the traditional courtyard housing, where the courtyard and the buildings are mixed together as an organic living environment. Even today, courtyard housing is still one of main residential types in Beijing.

One may argue that the Fragrant Hill Hotel improperly responds to regional conditions since the hotel makes use of southern gardens rather than a local architectural prototype from Beijing, such as the imperial palaces and temples, the most typical and enduring Chinese forms in the capital city. However "these traditional examples seemed inappropriate as a source for a building that was serve a China so remote from their traditions" (Wiseman, 1990, p192). Moreover, although the hotel is located in the north of China, Pei reckoned that it is appropriate to learn from the private gardens of the south of China. He argues that "it was quite true that the climate of Beijing was different. But

the courtyard plan of houses in Beijing was not that different from that of the south. Life still centered around the courtyard. They were all low buildings. In some ways, the differences were not as great as one would think, despite the climate" (Pei, 2002, p7).

An more important issue, which drives Pei to wide investigation and to distill the best elements from traditional architecture, is his intention to provide a design guideline for contemporary Chinese architecture. For Pei, the hotel is not just a regionalist architecture but a project of root-finding for China. Jing Shuping, an old friend of Pei, recalled the conversation with Pei that "When I. M. Pei told me about Fragrant Hill, I knew it was more than just a hotel fro him. Every Chinese is very proud of our ancestry, and he (Pei) said that he wanted to develop some kind of architectural language to leave to our descendents" (Wiseman, 1990, p192).

When looking at the Fragrant Hill Hotel through the lens of critical regionalism, we can see many places in which Pei's design succeeds in creating a regionalist architecture, from the sensitive use of varying means of construction and craftwork, to placement on the site that takes advantage of local conditions, to the creation of a bounded architecture and the use of elements that engage senses other than sight.

1. A preference for regional intentions over normative optimization.

Two factors determined obviously regional intentions on the selection of construction technology and materials in this hotel project. First, at the time of construction, modern construction technology was more expensive in China than in the West. Although it is a

mid-size project, most of the construction of this hotel was based upon available light vernacular techniques and materials, since they were more available and cheaper than modern construction technology. In addition, most of the work on the job site relied on cheap manpower (labor) rather than machinery. There were 3,000 workers working on the hotel. It is estimated that a job on the scale of Fragrant Hill would just have required 200 workers in the United States (Wiseman, 2001, p204). The skylight of the entrance atrium is the only part using contemporary materials and technology **(fig.26)**, where metal rods are used to diffuse the light coming through the glass roof, a similar structure employed in the East Wing of National Gallery, Washington D.C.

Second, vernacular materials and the work of craftsmen were used in this project, to serve I.M. Pei's intention to develop a new vernacular language. For example, the rock is an important architectural element of traditional garden. Pei looked for a high quality rock for the garden of the hotel. Although contemporary designers still use such rocks, but Pei was not satisfied with the available selection. He requested 230 tons of spectacular rocks from a remote region of southwest China, 1,500 miles away from Fragrant Hill, to meet his design purposes. It is obvious that getting traditional materials beyond the region is not preferred by critical regionalism, which emphasizes the use of local available sources. The selection of rocks, instead of being driven by a regionalist consideration, was motivated by a dedication to design excellence that is always can be seen in his design. A similar willingness to go to great lengths to find the precise materials to suit his vision is evident in the selection of glass in his project of Le Grand Louvre, Paris. In order to acquire totally clear glass which makes the glass pyramid as nearly transparent as

possible, Pei rejected all glass on the market as it had small amounts of iron oxide and thus a slightly greenish tint. He turned to a centuries-old French firm to resuscitate their old craft for the project (Wiseman, 1990, p255-256). As for vernacular craftwork, Pei wanted a traditional variety of dark gray brick for the hotel, but discovered it was no longer manufactured. Pei found a craftsman who knew the technique for making the brick and who could provide enough for the hotel (Wiseman, 2001).

In a word, Pei emphasizes available regional solutions in the Fragrant Hill hotel in order to create a building that was a natural outgrowth of the culture of China, rather than an attempt to show China's ability to build Western Style buildings.

Figure.26. *Entrance lobby with skylight is the only part using contemporary materials and technology.*

2. A consciously bounded architecture.

Inspired by the relationship between gardens and buildings in traditional architecture, Pei developed a horizontal and rambling plan layout surrounded by a series of courtyards **(fig.27)**, which create a physical boundary around the buildings. Each guest room has

direct visual linkage to a courtyard within the boundary. The buildings and the courtyard spaces are totally integrated. Therefore, the intimate relationship between architecture and nature becomes the most important characteristic in this modern hotel.

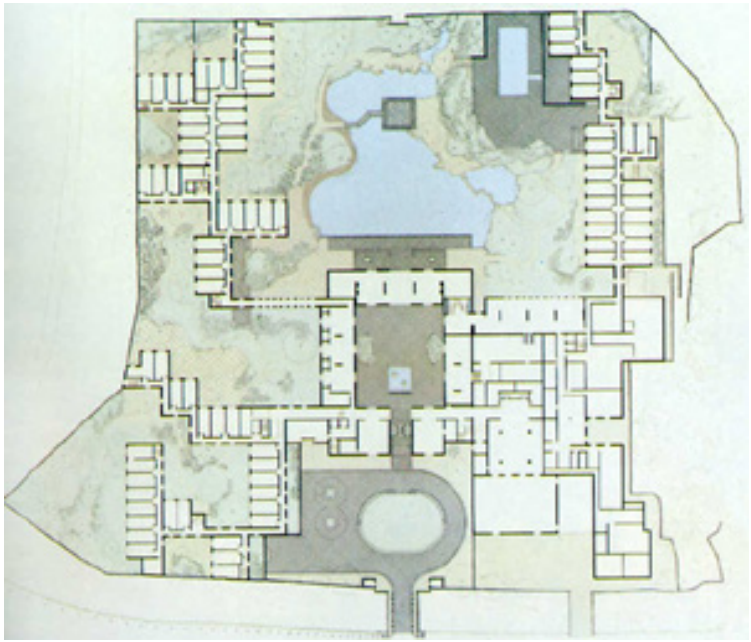


Figure.27. *A horizontal and rambling plan layout surrounded by a series of courtyard, Fragrant Hill Hotel.*

In addition, Pei attempted to link the built form with the living culture. As noted above, this hotel design learns from Chinese traditional garden. Moreover, a dialogue was established between the hotel and the site by highlighting a local historical landmark. On the built site there is a water maze called Liushuiyin in Chinese, a very famous historical relic from ancient China. There are only five such mazes remaining in China (one is in the Forbidden City). After discussion with Chen Cong-Zhou, a famous expert of traditional Chinese gardens, Pei reckoned that this one should be reserved to hint at the

site's link to history through the emphasis of Liushuiyin, a symbol that would speak of the past. (Wiseman, 2001, p201) "According to legend, poets floated wineglasses down the water maze in the moonlight. They were permitted to drink only if they could compose a poem in the seven or so minutes it took the slow-moving current to carry a glass to the end of the 165-foot passage." (Cannell, 1995, p316) Pei preserved this landmark and used it as a compositional element of his design, which is at the end point of the central axis of the buildings. The main garden of this hotel centers on the Liushuiyin **(fig.28)**.

Figure.28. *The water maze Liushuiyin is the garden focal point.*

The reinterpretation of traditional garden pattern and the link to the unique relic of the past contribute to this hotel's creation of a bounded architecture.

3. More than simply scenographic episodes or sentimental historicism.

The hotel is a realistic response to both contemporary life and the traditions of Chinese culture. Although of great age, the principles of the traditional Chinese private garden are

still valid. Pei argues that “I found several things that encouraged me that there was the possibility of a new vernacular. In some ways it was already there. There were built fifty, a hundred years ago, and there were still valid. Architecture is closely related to life. The life of the people had not changed. In 1978, the life of the people was no different from when I was there. The architecture did not change. Some of them could still be used. The relationship between nature and building is still valid” (Pei, 2002, p6-7) Based upon his understanding of traditional Chinese gardens, Pei creates a favorable living environment centering around the natural elements in the hotel design. The buildings and the semi-enclosed courts have an intimate relationship. Guestrooms open to the courts, which guarantees every room has a view of some sort of greenery.

Furthermore, Pei reinterprets the principle of traditional private gardens to cater to contemporary needs. For example, traditional private gardens were intended for the private use of individuals and small groups, which determined their compact layout. But in the hotel design, the architect’s alters the original model in order to accommodate more people. A four-story, 11,000 sq ft. skylit atrium, the interior court, provides a central orientation space for intimate guest rooms surrounding it. While making it available to large numbers of people, it creates an experience of viewing art in intimate spaces similar to traditional gardens (Wiseman, 2001).

One of the important characteristics of critical regionalism is to avoid using the scenographic episodes of traditional architecture. But in this case, the architect Pei used a lot of specific historical references rather than going completely against the nostalgic historicism. His remark of “what I did at Fragrant Hill was partly out of nostalgia and

partly time" provides a clear indication of Pei's philosophy in the hotel design (Pei, 2002, p8).

On the one hand, the Fragrant Hill Hotel directly demonstrated many major features of Chinese vernacular architecture. For example, although the plan is rambling, there is still a strong axial delineation from north to south, dominating the overall layout, which is a major characteristic of Chinese traditional architectural plan. The off-white stucco walls and grey-tile roofs **(fig.29)** reflect the typical feature of vernacular architecture **(fig.30)**. Moreover, the subtle arrangement of windows and doors, a typical technique of traditional Chinese garden, was used extensively in this hotel design. Specifically, the technique called "borrowing views" is fulfilled by making picture frames of all openings, including windows and doors. For example, each opening of the hotel is arranged at a strategic viewpoint to frame a natural picture, borrowing views from another space **(fig.31, 32)**. Thus, the motifs of traditional gardens such as the Chinese screens and diamond-shaped windows not only serve as a sort of decoration but also create unique spatial and visual experiences through windows.

Figure.29. *Off-white stucco walls and grey-tile roofs of Fragrant Hill Hotel.*

Figure.30. *Typical characteristics of vernacular architecture of South China.*

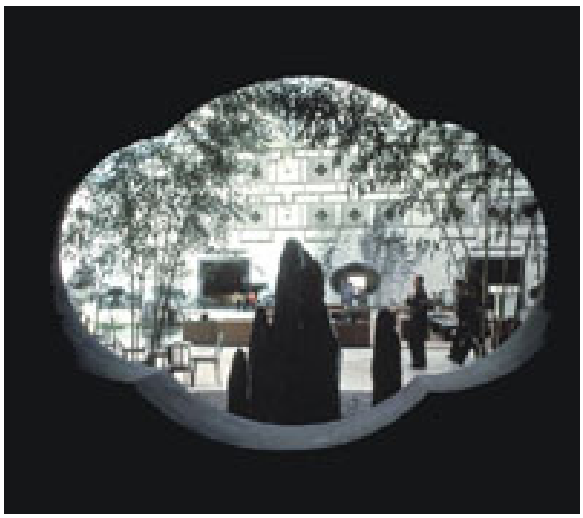


Figure.31. *Window picture of atrium.*

Figure.32. *Window picture of the main garden.*

On the other hand, Pei made great efforts to refine and reinterpret traditional elements to adapt to new situations. First of all, he simplified traditional timber form to reflect the real characteristics of modern concrete technology, while he used the vernacular as a historical reference. The succinct stuccoed concrete wall with the linear-sloping grey tile roof is different than the traditional timber profile, which was characterized by ornamental brackets, curved roof, and buttress slabs. Also, his refinements of the Chinese vernacular can be seen in specific gestures. For example, a screen was normally used as a solid device in traditional architecture. But in this hotel case, Pei changed this strategy and put a traditional ornamental screen with a round opening at the entrance. The visitors can see through it and get a look all the way through the garden **(fig.33)**.

All of these different techniques noted above show how the hotel is the product of Pei's attempts to combine traditional forms with novel forms.

Figure.33. *Ornamental screen with a round opening at the entrance lobby.*

4. A responsiveness to local conditions and climate.

Since the hotel is located at a beautiful mountain environment, one of Pei's main goals in the design was to preserve the natural beauty of the site. Pei argues that "nature has always been part of my sensibility" (Wiseman, 2001, p.201). In this hotel project, as noted in the discussion of point 2, a consciously bounded architecture, the buildings are only half of the design. The rest of the design is a series of gardens around the buildings. These semi-enclosed gardens are transitional spaces between interior and the mountainous site. Every guest room has a courtyard view by a subtle integration of architecture and landscape. Also, it is worth mentioning that many existing trees on the site, some as old as 800 years, are preserved and taken as compositional elements for small gardens. As an architectural frame, Pei gave these trees, the off-white stark stucco walls **(fig.34)**.

Some might argue that white is a poor color for the climate of Bejing, where the white will rapidly become dirty, but the white contrasts with the natural colors, and thus the natural scene becomes an important part of the spatial and visual experiences. He created a poetic picture, which can be seen in Chinese traditional paintings that emphasize the integration of nature and the built environment **(fig.35)**. Moreover, respecting the topography of the site, Pei created a dexterous layout of a series of interior courtyards that fit well into the mountainous setting and create interesting spatial and visual experiences.

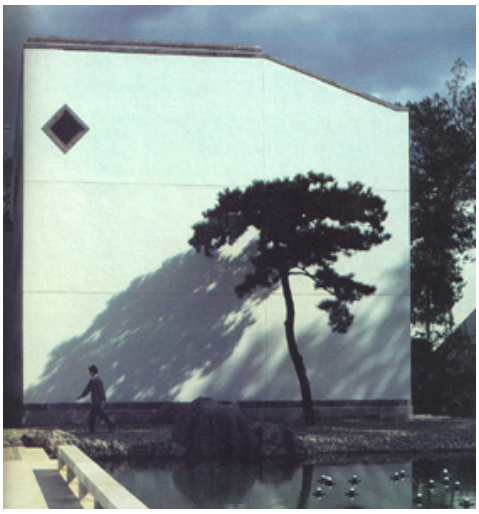


Figure.34. *The off-white stark stucco wall is an architectural frame for a tree.*

Figure.35. *Fragrant Hill Hotel in the form of traditional Chinese Painting.*

5. An emphasis on the tactile.

Critical Regionalism stresses perceptions that complement visual experience as a strategy. Pei learns from traditional Chinese gardens and introduces traditional paving materials and landscape plantings into the hotel. Different paving materials are used in transitional spaces, which continually alter the tactile sensation of walking from one space to the other. In some places such as patio paving stones are smooth, in others such as the courtyard path the paving stone and bricks are rough. The plantings are selected not only for their shape, seasonal character and symbolic meaning but also for different aromas. In

brief, the expeience of walking in this hotel is full of pleasing surprises for senses other than sight, like varying aromas of different trees, all the sensations caused by the paving finishes **(fig.36)**.

Figure.36. *Full of complementary perceptions in gardens of Fragrant Hill Hotel.*

In conclusion, Pei attempts to set an example and provide guidance for contemporary Chinese architecture. The design of the Fragrant Hill Hotel provides a good reference that the later architects can make use of. For example, the stuccoed concrete and masonry walls decorated with simplified traditional patterns became a new vernacular language, which was followed by many young architects later in China. Examples of this can be seen in Xian's Garden Hotel and Suzhou's Bamboo Grove Hotel.

In conclusion, when using the ideas of Critical Regionalism to guide the understanding of the Fragrant Hill Hotel, we can see many examples to learn from. As discussed, Pei creates a bounded hotel building and reinterprets the living tradition. At the same time, the hotel shows Pei's deference to nature by grounding this hotel in the configuration of

the mountain topography and maintaining the trees of the site as much as possible. The sensitivity to tactile perceptions is fulfilled through the application of vernacular materials. The regionalist intention to develop a new vernacular, indicates an effort to cultivate a contemporary regional culture for Beijing.

CASE STUDY TWO: JU'ER HUTONG NEIGHBORHOOD

In Beijing, the pressure of urbanization has put a great deal of traditional courtyard housing in danger of demolition. New urban construction has developed rapidly within traditional street blocks, roughly mixed with traditional courtyard neighborhood. Many new buildings are characterized by freestanding architectural forms which that threaten the traditional urban fabric. This situation threat becomes more and more urgent with the increasing rate of urbanization. Facing these challenges, the Ju'er Hutong Neighborhood project is dedicated to the continuity of traditional courtyard housing and the preservation of the existing urban context. It is located at the 8.2-hectare Nanluoguxiang historical preservation area within the old city of Beijing **(fig.37)**. In this project, the architect Wu Liangyong attempts to renew the traditional neighborhood. At the same time, he develops a new courtyard prototype, which is a combination of the form of western row housing form with the Chinese traditional Chinese courtyard conception (Wu, 1999).

Figure.37. *Historical Quarter in which the Ju'er Hutong Neighborhood is located.*

On the one hand, the architect Wu learns from the traditional courtyard housing. In his opinion, the traditional residential style, providing an enclosed transitional space, is still

valid for contemporary modes of living. Traditionally, Siheyuan, the one-storey courtyard house known as the 'Hutong' house, was the model for Beijing's housing. **(fig.38, 39)**. Generally the courtyard is located in the middle of the house and buildings are placed along the edge of the courtyard. Thus an interior space, which opens to nature and closes against the outside, is formed. Similar to plan of the Old City of Beijing, Siheyuan housing also reflects a strict hierarchical pattern. First of all, the size and the style of the courtyard house are varied according to the social rank of the master of a family. Second, spaces with different living conditions such as location, orientation, sunlight, and ventilation in a courtyard house are distributed based upon the importance of people within the family. There are specially defined living spaces for different people within the house. "The inner court was intended as accommodation for the women and girls of the family as well as the servants. The second inner court was the living area of the master of the house and was oriented to the south. The buildings on the east and west were meant for his married sons" (Blaser, 1979). Consequently, this housing pattern was designed to serve the traditional family. There are several problems with the traditional courtyard housing, such as overcrowding and the poor ventilation and sanitary conditions. For example, each person has 50sq.ft. of space and the nearest w.c. is 300ft away (Wu, 1999, p113). The architect of the Ju'er Hutong neighborhood has to attempt to deal with these problems while reinterpreting the traditional courtyard house. It is no longer commonly acceptable to have only 50 sq.ft. of space per person nor to have the w.c. 300 ft. away, but increasing space per person and placing a w.c. in every unit, creates challenges in the attempt to retain both the form of the traditional courtyard house and the necessary population density for the urban environment.

Figure.38. *Traditional Shiheyuan. This one-storey courtyard house known as the 'Hutong' house, was the model*

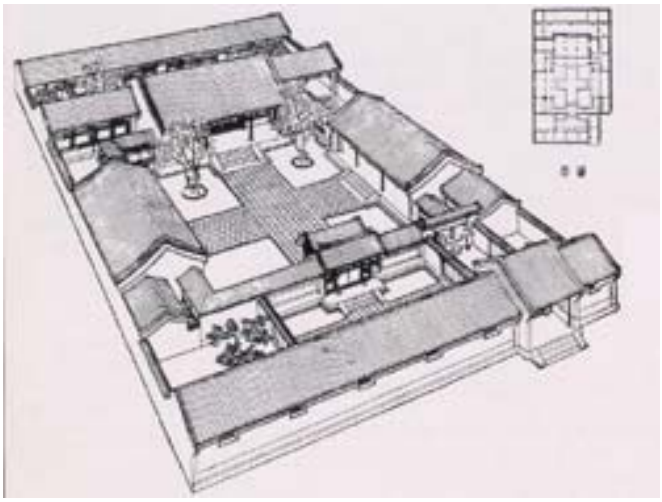
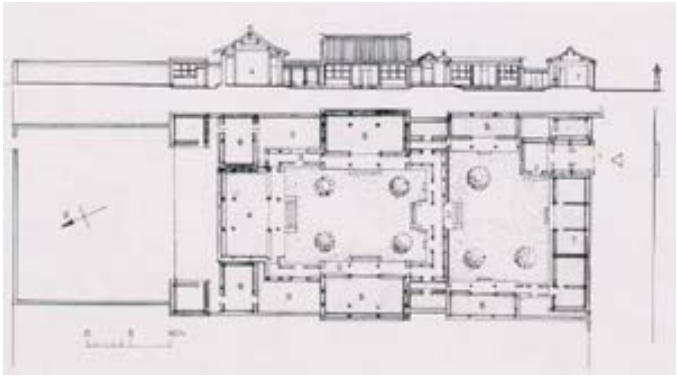


Figure.39. *Typical plan and elevation of Shiheyuan housing.*



On the other hand, Wu reckons that modern Chinese residential buildings can usefully be influenced by western row housing and tower blocks. There are several factors that create this situation. First, the traditional Chinese residential architecture was based upon a large family that emphasized sharing instead of independence. This creates a certain composition and layout of living spaces. But the traditional large family does not exist any more in contemporary urban life. The modern Chinese family unit is much smaller

than the traditional extended family. Therefore, for a modern family unit, the idea of sharing of the traditional residential type becomes the biggest barrier to renewing or reusing the traditional mode. Modern western family housing is based upon the integration of private or semi-private and semi-public spaces within a single dwelling. Every major living space is furnished with convenient sanitary equipment and other basic facilities. This principle provides separate living spaces for small units even in a large residential complex or cluster. Second, traditional Chinese housing is composed of one-storey buildings and its land-use intensity was much lower than today's land-use intensity. A higher density can be easily achieved in multi-storey and high-rise apartment blocks which can raise the floor-area ratio efficiently. In a word, the western residential style can meet the private, independent, convenient and economic requirements of modern life, which can make up for the shortcomings of the strictly hierarchical mode of traditional Chinese housing.

In the new type of courtyard house, the architect Wu reinterprets the courtyard as the communal center for residents in every cluster. At the same time, he creates excellent living conditions of sunshine, ventilation and lighting for the new courtyard cluster by remodeling the traditional courtyard housing. The new courtyard cluster has the following characteristics: two- to three-storey courtyard buildings that create a high floor-area ratio; a courtyard as a communal center; more private outdoor space than apartment blocks which lie in a line; more useable space in the attics under the pitched roofs.

1. A preference for regional intentions over normative optimization.

Frampton argues that today the architectural form is greatly limited by a focus on the idea of normative optimization, which emphasizes the efficiency and utility in building construction and performance, and by the idea of using modern industrial technologies-the technologies favored by the Modernist movement, such as reinforced concrete, pre-fabricated construction elements and high-rise construction, with its great reliance on mechanical devices to lift people and materials into the air. But in developing countries such as China, the same industrial techniques that provide technological normative optimization are not always efficiency and utility. Highly industrialized countries are not always the most efficient or useful. The Ju'er Hutong Neighborhood is an affordable housing project. The two- and three-storey courtyard units require only light construction techniques, which reduces construction costs and makes flexible construction procedures available. At the same time, a lot of manual labor, which is viewed as an uneconomic mode of construction in western countries, is involved because, in China, available manpower is cheaper compared to mechanical construction than in the west. At the same time, vernacular brick and roof tiles are major materials used in this project. The construction techniques applied are efficient with respect to the available resources. These factors make this project quite different from similar western affordable residential projects which emphasize the use of the industrialized technologies like those mentioned earlier, which all have low manpower costs and high energy and infrastructure costs, that are relatively cheap in the west.

Also, Frampton's argument that "critical regionalism favors the small rather than the big plan" is fulfilled in the new courtyard housing. The architect Wu argues that "in many

industrialized cities, large-scale development has led to serious environmental deterioration. Beijing is facing a similar situation. In the past forty years, many historical gardens and buildings have been destroyed, and new construction, especially of high-rise buildings, has threatened many important historic sites" (Wu, 1999, p56). The new courtyard housing is composed by several family units. The Ju'er Hutong neighborhood, though a large project as a community renewal, is based on many small cluster projects being brought together.

In a word, the architect uses available local resources to make sure the project is efficient and economical with respect to local issues rather than with respect to ideals of normative optimization developed in industrialized countries.

2. A consciously bounded architecture.

Frampton's concern with the boundedness of architecture in both time and place is a desire to create a place rather than an object in a place. The bounded architecture should have physical boundary and integrates built form into a place that serves a living culture. In the Ju'er Hutong Neighborhood, architect Wu illustrates similar concerns as Frampton's bounded architecture. On the one hand, he creates an enclosed courtyard and defines the physical boundary. On the other hand, the project shows a respect to for both the traditional urban fabric and the need for urban expansion; the expansion attempts to integrate and interpret the traditional models rather than attempting to replace them wholesale, and, as mentioned in the previous section, rather than being one large intervention, the Ju'er Hutong neighborhood is the product of several smaller projects,

thus what has been created is not the completion of the plan but, as Frampton suggests “a kind of temporal limit-the point at which the present act of building stops” (Frampton, 1992, p327).

The Ju’er Hutong Neighborhood project is to draws spatial boundaries by creating an enclosed courtyard space in every unit group. Seeing a lot of housing towers that directly facing to the main street and lacking of any privacy and open space in the metropolitan environment of Beijing, the architect Wu argues that “the Ju'er Hutong project attempts to create an environment in which the inhabitants can enjoy a new kind of privacy as well as have access to their neighbors in natural surroundings...[the project] explored the meaning of ‘a sense of place’ in the context of Beijing's modernization” (Wu, 1999, p191).

The new courtyard housing is composed by several family units that have different orientations. **(refer to fig.20)**. These family units are organized around central courtyard. The enclosed courtyard space creates a common enclosed quiet and comfortable place against the outside. As for the residents, there is an appealing private space for each single cluster, providing fresh air, enough sunlight, favorable landscape and available outdoor space for communication and activities. The architect reinterprets the traditional courtyard as an enjoyable and private space for modern residents.

Another major characteristic of the Ju’er Hutong Neighborhood project, showing itself as a bounded architecture, is its respect to traditional urban residential fabric of Beijing. The

biggest issue challenging this project is how to figure out a proper integration between the new courtyard housing and traditional urban fabric in the Old City of Beijing. The architect Wu argues that " certain aspects of the Old City's urban structure have lasting value" and he seeks to "establish a new organic order based on adaptation rather than on complete replacement" called "organic renewal" (Wu, 1999, p56). What Wu has in mind about the organic renewal is "the city is a living organism. Its components and tissues are always undergoing a metabolic process. The regeneration of urban tissues evolves with the survival of those elements that continues to be useful and relevant, and the elimination of those that are no longer suitable" (Wu, 1999, p61). He further argues that "organic renewal is part of the sustainable development strategy. It recommends a suitable scale of development, humane design, and coordination of present and future needs" (Wu, 1999, p65). In a word, the rehabilitation should be a process involving metabolic change rather than total clearance and rebuilding.

The starting point of the Ju'er Hutong neighborhood is to preserve and renew traditional urban residential fabric and environment. At the macro level, the project is a large-scale renewal in planning **(fig.40)**. Considering both the preservation and renewal intentions, the architect takes different strategies according to current situations of existing courtyard clusters. "Better quality dwelling clusters are retained and restored and the worst are replaced with new dwellings" (Wu, 1999, p61). This dynamic renewal with conservation and redevelopment strategies maintains the traditional urban residential fabric. It is a critical attitude to current Chinese urban renewal policy carrying out in other traditional city such as Fuzhou, a way of total replacement of new clusters and buildings in

traditional urban districts. At the micro level, for those new clusters, developing a suitable residential prototype to match the existing urban fabric is the major architectural goal in this project rather than using well-known residential types such as apartments, row housing and residential high-rise towers. The architect argues that “modern apartment buildings gain privacy and density, but they lose identity, adaptability, and neighborliness” (Wu, 1999, p98). He further argues that “in modern life, the significance of neighborhood may no longer be as important as it was, but that does not mean that it is no longer needed” (Wu, 1999, p98). In this project, respecting the traditional urban fabric by vernacular techniques and materials, the architect Wu attempts to prove that “conservation of the physical order does not imply a negative attitude towards development in the present” (Wu, 1999, p137). In the Ju’er Hutong Neighborhood, Wu interprets the sense of place by seeking the relationship between built form and physical boundaries and cultural values.

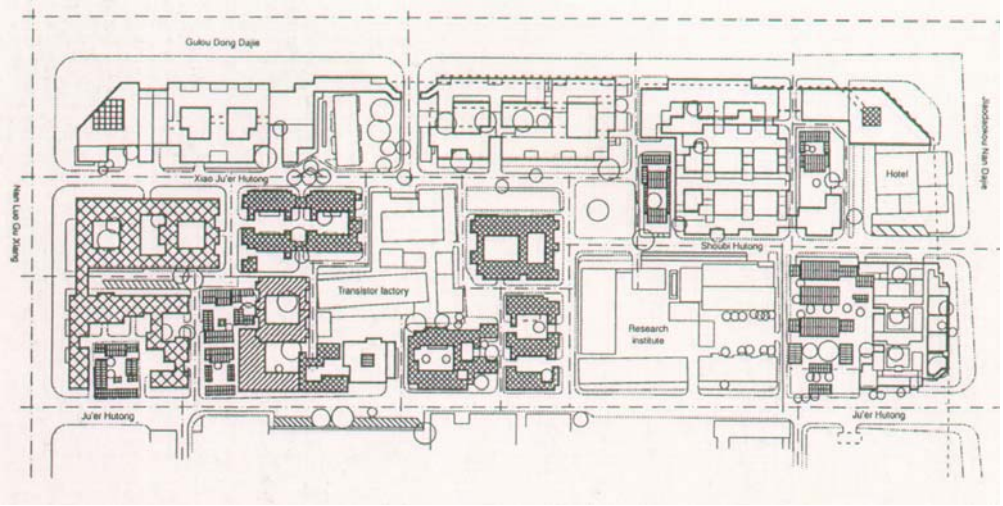


Figure .40. *Plan for the renewal of the entire 8.2-hectare Ju’er Hutong Neighborhood.*

Further, the new courtyard is a legitimate tie to traditional courtyard. In traditional courtyard housing, the courtyard is an outdoor living room for the big family while it functions as circulation and ventilation. Today the life around the courtyard is still valid in Beijing. Wu argues that "in the Old City of Beijing, a special kind of community life has evolved in conjunction with the city's characteristic physical neighborhood form. Neighborhoods are an important locus of social life… such spaces are not only physically suited to neighborhood social life, they are also reminiscent of how that life has been portrayed in literature and art…" (Wu, 1999, p94). In the new courtyard housing, the cluster is composed by many units. As the central public space, courtyard is shared by the whole community which is composed by several family units with equal living conditions. The courtyard becomes the new communal space that encourages the communication between neighbors. The height of the surrounding buildings are controlled to avoid treating the central courtyard as a well-like opening. Thus the "open living space" mode of traditional courtyard is kept and functioning. Wu argues that "the traditional courtyard form continues to have relevance in the contemporary city…The intimate scale and the close relation between indoor and outdoor spaces have an enduring attraction" (Wu, 1999, p96). The post-occupancy evaluation of the Ju'er Hutong Neighborhood shows that 83 percent of the respondents approve of the atmosphere created by the courtyard space. After returning from work, more residents felt that had "reached home" when they entered the courtyard cluster than when they entered their own apartments-another strong indicator that the original sense of neighborhood spatial community has persisted (Wu, 1999, p170). In brief, more than just a design convenience, the courtyard in the new model plays a significant role in supporting neighborliness.

3. More than simply scenographic episodes or sentimental historicism.

The new courtyard is a realistic response to the in situ cultural realities of the day. Although inspired by traditional courtyard housing, the new prototype Siheyuan has fundamental improvements in meeting the needs of modern life instead of a nostalgic imitation of traditional model, which has one-storey buildings placed along three or four sides of the property site, forming a courtyard in the middle and provides different living conditions for family members based upon their social status. First, a new spatial mode comes into being in this new courtyard prototype through the renewal of spatial configuration and improvement of living conditions. Traditionally, the big courtyard house serves for a big single family and the available space for family members is determined by their societal positions. But the new courtyard housing is shared by several families and the hierarchical system in space distribution have to be changed according to new situations. In contemporary China, taking the social equality of every family unit into account, living spaces and facilities should be redistributed based upon various needs of different families. Like other modern housing driven by equality of the family unit, the new courtyard housing guarantees different family units having equal living conditions. The new courtyard houses provide private outdoor spaces, and enough sunlight, ventilation conditions for each family through the renewal of the prototype. The hierarchy in the family reserved from the traditional courtyard illustrates in the orientations of spaces since the hierarchical system is still an active factor today. In every unit, major rooms such as the living room or master bedroom has southern exposure and good ventilation conditions and the rest has inferior living conditions (Wu, 1999).

Furthermore, there is a great revision of traditional residential form. New two- and three-storey type dwellings replace traditional one-storey models in order to suit the needs of high density, an important characteristic of modern urban housing under the intense pressure to use urban land efficiently. Wu argues that "without a floor-area ratio comparable to that of conventional multi-storey buildings, the new housing type would not be viable under the intense pressure to use land efficiently" (Wu, 1999, p191). In this project, the new courtyard cluster can reach a comparable density to the multi-storey apartments which are spread throughout Beijing today. **(fig.41)**. Furthermore, compared to traditional housing, much more indoor and outdoor spaces such as lofts and roof garden terraces are available in the new courtyard housing, which form a richer roofline than traditional one-storey courtyard housing **(fig.42)**. In traditional courtyard housing, no additional outdoor space is available even for the head of a household except the only open courtyard which functions as the only outdoor living space for the whole family. Furthermore, richer visual image are achieved in the new prototype through different composition of multi-storey buildings.

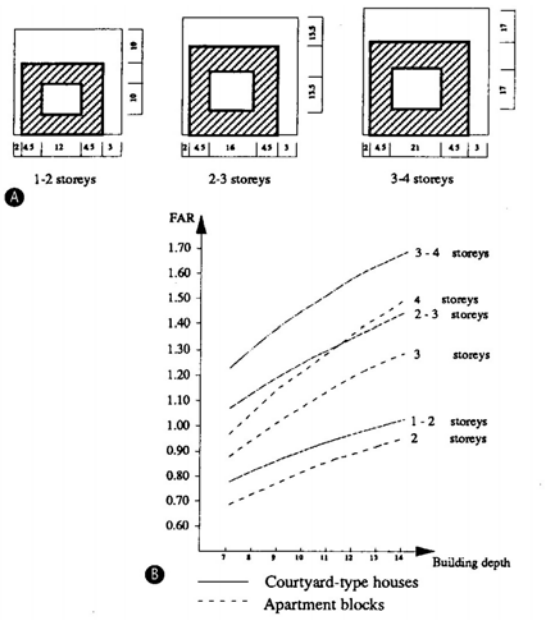


Figure.41. *Efficient use of space to improve floor-area ratio. A is the calculation of floor-area ratio. B is the floor-area ratio analysis by number of storeys.*

Figure.42. *Rich roofline of new Siheyuan house.*

In a word, Wu attempts to treat the built form of the new courtyard cluster as a whole rather than simply nostalgic historicism. His renewal strategies used in the Ju'er Hutong Neighborhood reflect contemporary needs, but also attempt to integrate with the formal characteristics of the neighborhood it is intended to renew. This project demonstrates a mutually beneficial interaction between regional culture and universal civilization which, in this case, means the modern western residential principles and models; the new courtyard cluster demonstrates a combination between traditional Chinese courtyard housing and western row housing.

4. A responsiveness to local conditions and climate.

Inspired by traditional courtyard housing, this new low-rise courtyard housing is characterized by an enclosed transitional and communal space, creating a residential environment with an energy-efficient microclimate **(fig.43)**. The climate of Beijing is hot in summer and cold and windy in winter. The courtyard housing, combined with unique lane-street system, provides shadowed areas for indoor residents and outdoor pedestrians

during the heat of summer. On the other hand, compared to row housing and high-rise apartments with open rather than enclosed transitional space, this small-scale built environment is more adaptable to the windy winter in Beijing. The courtyard creates an enclosed microclimate in the built environment. It prevents protects the communal space of the cluster from the wind. Therefore, it provides a favorable space for communal activities in the harsh winter. Furthermore, the Ju'er Hutong Neighborhood abandons the orientation hierarchy among bedrooms in traditional courtyard housing and improves sunlight and ventilation conditions for all family units through the flexible plan layout. Having east- and west- orientation units is a shortcoming of traditional courtyard housing. In traditional housing, insufficient sunlight and ventilation conditions of some bedrooms in the east and west wings are significant problems. In the new courtyard housing, sunlight and ventilation conditions are greatly improved by an appropriate setback layout and the decrease of building stories in the east and west wings **(refer to fig.20, 21)**. The architect's intention is to "work out a standard courtyard unit that achieves an ideal balance of sunshine, ventilation, lighting, and other environmental conditions" (Wu, 1999, p104). In a word, the qualities of sunlight and ventilation of the new courtyard housing have been greatly improved compared to the traditional housing of Beijing. Moreover, this project shows its deference to existing physical and cultural features of the site. Courtyard locations and sizes are variable in order to preserve existing trees and other irregular features of the site such as traditional alleyways, and archways of historical significance.

Figure.43. *The enclosed courtyard of new "Siheyuan" creates a residential environment with an energy-efficient microclimate.*

More generally, we can see this project's concern with the environment in the words of the architect. Using the idea of organic renewal taken from the sustainable conception which was put forward by Madame Brundtland of the United Nations in 1987, the architect Wu argues that "sustainable development, in this context, means that the built environment achieves harmony with nature, that people's living standards are improving gradually but continuously, that urban infrastructure and land use are regulated according to the local ecological context, and that solutions to current problems do not create greater future problems…Organic renewal is part of the sustainable development strategy" (Wu, 1999, p64, 65). His practice is the one of the first to use sustainable perspective in urban planning and architectural design in China. It is worth mentioning that many community projects all over the nation, such as Tongfang residential quarter project in Suzhou, have learned from this successful practice, showing that the strategies

used in the Ju'er Hutong Neighborhood are becoming a major direction in contemporary Chinese architectural regionalism.

5. An emphasis on the tactile.

In the Ju'er Hutong Neighborhood project, the wide use of local materials and the assimilation of traditional architectural elements demonstrate a close attention paid to the tactile perceptions. For example, vernacular stone pavement is used for transitional space such as courtyard, creating a special sensation experience. As already mentions, the distinctive lane-street pattern with archways and alleyways combined among different setback courtyard units creates rich and various shades. Walking through the community, residents can experience interesting changes of shade. These pools of sun and shade create pools of warmth or coolness, and they heat some surfaces, leaving other cool, thus creating an environment with spaces and surfaces that contribute to a rich non-visual experience of the space.

In conclusion, using the five points of critical regionalism to interpret the project, we can see that the architect has created the sort of work that Frampton wants to encourage. First, this example is an affordable housing project, which, in the Chinese context, means using the local light construction techniques and vernacular materials as much as possible instead of normative optimization related to universal technology and constructional methods depending on heavy machinery and highly industrialized support, to meet the requirement of low constructional cost. This characteristic makes it possible to escape the optimizing thrust of universal civilization. Second, this example shows the bounded

characteristic through its deference to unique urban fabric of traditional residential environment. Third, the critical reinterpretation of traditional courtyard housing, meeting new requirements of contemporary urban land use and improving the living environment, never remains at the level of nostalgic historicism, instead, the combination of the western residential model with traditional courtyard space creates a hybrid contemporary regional culture. Fourth, it assimilates a traditional vernacular tactic by creating an enclosed courtyard space to respond to local climate. Fifth, similar to the Fragrant Hill Hotel, the use of vernacular materials extends architectural experience to various tactile perceptions.

But more than that, it brings a high level of privacy and a quiet environment to the heart of Beijing. In brief, this project is an interesting case to show how a regional culture may benefit from the assimilation of global civilization and provide a good resource reference for similar situations beyond the region.

CASE STUDY THREE: YANHUANG ART MUSEUM

The Yanhuang Art Museum, built in 1991, is a large-scale modern gallery, in which the architect tries to find a way to reinterpret the traditional form and adapt to the local climate.

The museum is used for the display and study of traditional Chinese arts. Mainly it focuses on medieval China, particularly the Tang and Song Dynasties, which were viewed as the Golden Age of Chinese art and architecture. During those periods various styles of well-developed Chinese painting emerged. As for architecture, palatial architecture was the highlight of that period. The palatial architecture, whose form expressed the power and grandeur, became the most representative architectural style of medieval China **(fig.44).** For example, the Daming Palace, the summer resort palace of Emperor Li Shimin, was built in 634 for his father Li Yuan, the founder of Tang Dynasty. It was built in the northeast outside Chang'an City (Xi'an) during the Tang Dynasty. The Palace consists of the Hanyuan Hall and a dozen other halls. The main hall, Hanyuan Hall, is very imposing and magnificent, giving full reflection to the architectural artistic level of the prosperous Tang Dynasty **(fig.45).** It addresses the grandeur of that time. All buildings occupied high and spacious in terrain, making these structures look more magnificent (Pan, 2001, p156-168).

In the project of Yanhuang Art Museum, the architect consciously seeks a cultural dialogue between architectural form and the contents of display. The architect Liu Li argues that "The starting point of the museum is to evoke ancient culture of Tang

Dynasty when the traditional Chinese art styles became mature" (Liu, 1993, p68). The metaphorical approach to historical reference in form reflects architect's effort to evoke specific traditional culture.

Figure.44. *A typical composition of palatial architecture, Tang Dynasty.*

Figure.45. *The model of the reconstructed Hanyuan Hall, Tang Dynasty.*

This museum derives inspiration from traditional palatial architecture. Specifically, the architectural form draws on the traditional palatial style dating back to Tang Dynasty, the architectural prototype of the existing imperial palace in Beijing, the Forbidden City. In this museum, three roof-like volumes dominate the building group **(fig.46)**. The unadorned but powerful form creates a monumental profile evoking the typical imperial architecture of medieval China. The purple, glazed tiles recall the distinctive color of the

traditional official architecture of Beijing. The different colors of tile reflect the hierarchical pattern in ancient China. For example, the yellow glazed tiles were only used in palatial buildings. The general official buildings employed the purple glazed tiles. As for residential buildings of the common people, the grey flat tiles were the only choice (Pan, 2001, p324).

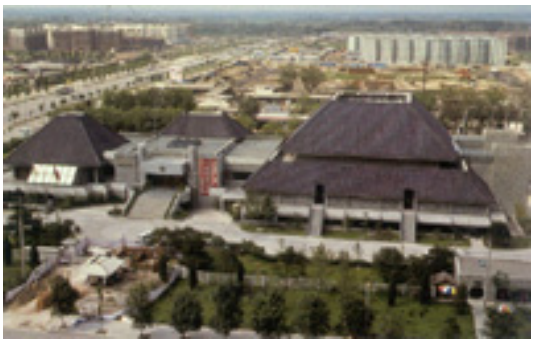


Figure.46. *Three roof-like volumes dominate the building group.*

A similar idea to modernize traditional form can be seen in I. M. Pei's Luce Memorial Chapel **(fig.47, 48)** of Tunghai University, Taiwan, built in 1963. In this case, the tent-like structure can be viewed as a modern reinterpretation of the traditional roof form. But other than the traditional timber construction technology, it employs complex modern technology and advanced engineering. The profile of concrete curve wall signifies a traditional pagoda roof (Pei, 1989).

The Henan Museum is another example to interpret the meaning of boundedness in Chinese architecture. The unusual form of the Henan Museum, which combines two pyramids, one inverted atop the other, is inspired by an ancient observatory in Zhenzhou, another former imperial capital of China **(fig. 49, 50)**.

Figure.47. *Luce Memorial Chapel. The profile of the concrete curve wall signifies a traditional pagoda roof.*

Figure.48. *Interior of Luce Memorial Chapel reflects the structural form.*

Figure.49. *The Henan Museum. The unique architectural form recalls an ancient architectural culture.*

Figure.50. *An ancient observatory of the Zhengzhou region.*

These examples show different efforts to interpret a bounded architecture. Moreover, other meanings of boundedness can be distilled from traditional Chinese architecture. Frampton emphasizes “the territory to be established by the structure” (Frampton, 1992, p327). Chinese architecture, from the grand imperial architecture such as palaces and temples to generic residential buildings such as courtyard housing and private garden architecture, is skillful to create different built environments to meet various needs, by arranging spaces in sequence and different plan layouts. For example, the imperial palaces, all grand and imposing major buildings are symmetrically arranged along a north-south axis, where a series of increasing courtyard spaces are located. The design presents the grand and magnificent architectural characteristics, indicating the majesty of the emperor's power. But at the private garden, the same element courtyard space creates a favorable built environment by the emphasis of the small scale and intimate relationship between nature and architecture. These ideas can provide good references for today’s China.

Furthermore, a bounded architecture can get inspiration from traditional Chinese philosophy, which reflects ancient cultural values and plays an important role in architecture. Critical regionalism prefers the integration between built form and cultural values. Traditional Chinese philosophy emphasizes the harmony of nature and people, in Chinese called Tianrenheyi. The idea is widely used in traditional architecture. For example, both imperial and private gardens, which highlight ecology-friendly layout and natural forms, are evident of the philosophical idea. In vernacular architecture such as stone residential architecture in Tibet and bamboo housing in southwest China present the harmony of traditional philosophy by responding natural landscape and local climate.

Compared to the earlier exploration in vernacular at the Fragrant Hill Hotel, the Yanhuang Art Museum shows increased sophistication of the reinterpretation and use of formal precedents. In the Fragrant Hill Hotel, some of the formal references degenerate into the sentimental reinterpretation of vernacular architectural elements although they are simplified to some degree. In the Yanhuang Art Museum, the highly abstract simplification of traditional architectural elements reflects the confidence of the formal reference and the increasing maturity of regionalist architecture. Actually the tactic of abstract simplification of traditional forms becomes a general design strategy to reinterpret traditional form, which can be seen in Shanghai Museum and Jin Mao Tower.

The museum addresses some important issues preferred by critical regionalism such as the creation of bounded building, the appropriate assimilation and reinterpretation of tradition, active response to climate and the deference to traditional urban context.

1. A preference for regional intentions over normative optimization.

As a large-scale modern museum, the technological requirements of the Yanhuang Art Museum are complex. Compared to the other two cases in Beijing (The Fragrant Hill Hotel and the Ju'er Hutong Neighborhood), modern technologies dominate the construction. For example, the museum space is characterized by a modern long-span structure which is composed of concrete columns and beams. This structural form makes large and open interior space for art exhibition possible **(fig.51)**. But, as opposed to the common prefabricated, modular-assembly building, the Yanhuang Art Museum's unusual architectural form, with an inclined roof-wall that goes all the way down to the ground, is a 'one-off', symbolic structure built into a traditional urban context **(fig.52)**. This uneconomic form shows a deliberate selection for its metaphor, a reinterpretation of traditional Chinese timber roof form through the concrete technology. This form requires adjustments of structural system at the upper floor where columns don't align with the lower floor. At the mean time, it requires higher standard materials and more complex structural design and construction. In brief, the unique built form is a sign that the architect rejects normative optimization as the dominating principle in the interplay between form and efficiency.

Figure.51. *Interior of Yanhuang Art Museum shows the application of modern technology.*

Figure.52. *An unusual architectural form that is a reinterpretation of traditional Chinese timber roof form.*

2. A consciously bounded architecture.

Creating a physical boundary and linking the built form with the living culture are central aspects of a bounded architecture. First, three large-scale volume buildings enclosing a main entry courtyard **(fig.53)**. Similar to the composition of the palatial architecture of Tang Dynasty, The buildings are connected by one-story base, underneath is the exhibition and research spaces. But break the symmetrical composition, the design works out a favorable physical boundary of the entry courtyard that includes the territory it is sited in **(fig.55)**.

Second, the bounded characteristic is also presented in the design by its attention to the cultural linkage. This museum derives inspiration from traditional palatial architecture. The museum complex is composed by three monumental volumes with pyramid-shaped inclined walls, a metaphor of magnificence, characteristic of Tang Dynasty architecture. The composition of the complex takes its inspiration from a tradition that uses groups of buildings that work together to create spaces **(fig.55).**

Figure.53. *The main entry courtyard creates a physical boundary for the museum.*

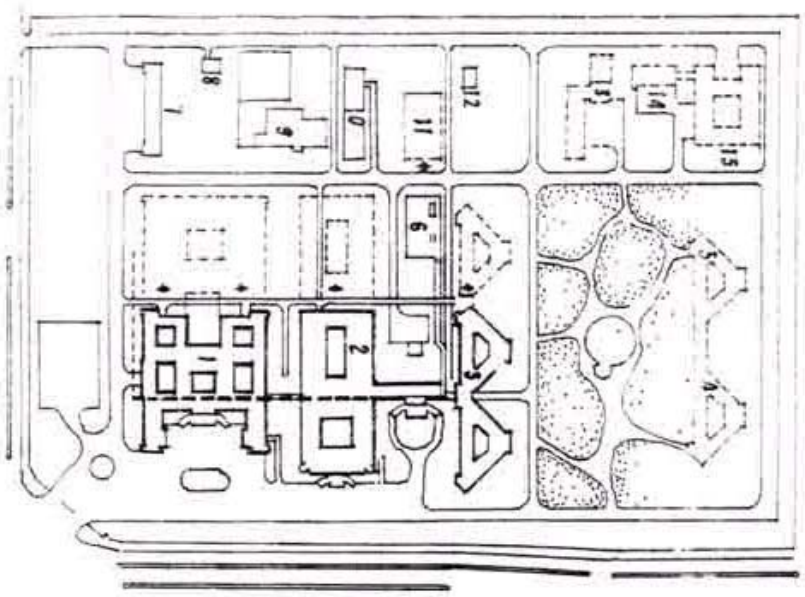


Figure.54. *The site plan shows the relationship between buildings and built environment.*

Figure.55. *Unique interior decoration of exhibition hall emphases the linkage of tradition.*

3. More than simply scenographic episodes or sentimental historicism.

The Yanhuang Art Museum provides an example of how contemporary Chinese regionalism can reinterpret the traditional built form. First, the reinterpretation of traditional formal characteristics is based upon simplification and metaphor of historical reference. The form of this museum was inspired by the palatial architecture of the ancient Tang dynasty such example as Daming Palace, which presents the typical characteristics of palatial architecture. The architect makes some revisions of traditional official buildings to accommodate the museum. First, the building is composed by three similar but different size volumes connected by the central lobby. Traditional palatial architecture is characterized by the clear central axis and symmetrical composition. The composition of the museum breaks the strict and symmetrical composition of traditional palatial architecture. It guarantees the flexibility of plan layout. In addition, the monumental, large-scale volume is an efficient built form for a museum. It encloses centralized exhibition and research spaces, which provide convenient and efficient services for visitors and researchers **(fig 56).**

Figure.56. *The interior shows convenient and efficient traffic function.*

Second, the reinterpretation of traditional form is presented in its roof-wall form. The roof-shaped wall is a metaphor of palatial architectural style of the Tang Dynasty. To some degree the appearance of the museum likes a large-scale modern sculpture, avoiding a literal imitation of historical reference.

In a word, the museum demonstrates that an appropriate revision of traditional built form is a good recall of tradition while meeting the functional requirements of the museum.

4. A responsiveness to local conditions and climate.

There are two aspects of the Yanhuang Art Museum's response to climate. On one hand, the form and color—the visual appearance of the museum—both suit the climate, on the other hand, it is also noted that, by not attempting to use natural light, the museum misses an opportunity that critical regionalism would suggest.

The three large-scale Pyramid-shaped volumes shape an enclosed environment, which adapts to the windy climate of Bejing. Besides the windy climate, dust is a very obvious characteristic of Beijing in autumn and spring. In view of this environmental feature, the architect chose the gray and dark tones as the dominant colors of this museum. These colors build up their resistance to the serious pollution of the windy and dusty seasonal climate. Compared to the use of white stucco walls of the Fragrant Hill hotel, this improvement in tone respecting to specific environmental condition ensures better and easier maintenance while in harmony with the traditional urban context of Beijing. As

noted before, two major tones dominate the urban color scheme: the bright, eye-catching colors of the imperial palace and temples and the grey of common housing.

For a museum, maintaining a stable internal environment is very important to protect the artifacts that the museum holds. Advanced lighting systems employed in this museum guarantee the quality of exhibition environments. But building a museum doesn't necessarily mean rejecting natural light, although natural light is totally ignored in this museum. One may argue that an appropriate emphasis on natural light will bring the regional characteristic to interior spaces of a museum. Such examples can often be seen in the museum designs of Louis Kahn. For instance, the Kimbell Museum (1967-72), also constructed of concrete in an urban park setting, has introduced in its interior spaces vaulted ceilings with integrated daylighting **(fig.57).** Paul Heyer described such space as follows: "Its interior form, bathed in a diffused natural light that enters the space via continuous interior suspended screen and reflected downward off the curve of the vault" (Heyer, 1993, p278-279). In museum design, the use of daylight not only helps save energy but also enriches the spatial experience of the visitors through the dialogue the light and the shadows, but in the Yanhuang Art Museum those factors have been ignored. In fact, the ignorance of natural factors especially light is a common feature of modern large-scale museums in China.

Figure.57. *The Kimbell Museum is a good example of the use of natural light in a museum.*

In summary, while the visual appearance of the museum is well-suited to its environment, it does not use natural lighting very well.

5. An emphasis on the tactile.

Critical Regionalism stresses complementary perceptions to visual experience as a strategy against treating buildings as information experiences. The architect employs a lot of local materials in this museum but don't contribute to tactile experience. For example, the out walls are decorated with slab stones that were used in traditional dwelling houses of Beijing region. Mushroom-shaped stones coming from the Macro Polo Bridge (Lu Gou Bridge) are used to decorate the gate wall. But an important highlight of traditional architecture, the tactile sensation, is ignored by the architect. The concrete block paving is used elsewhere outside of the museum. It fails to alter the tactile sensations as one moves from one space to another.

In conclusion, the Yuanhuang Art Museum demonstrates several characteristics preferred by critical regionalism. First, the constructional mode of this museum is based upon modern technology and materials. But its unique architectural form is not an economic structural form, which distances it from the demands normative optimization in order to favor the interpretation of cultural forms. Second, the formal reinterpretation of traditional official architecture addresses the metaphor of traditional urban fabric. Third, the enclosed built environment and the tone of building's color are good responses to the windy weather of Beijing region. But the failure to address tactile perceptions is a shortcoming with respect to the suggestions of critical regionalism.

3.2 CASE STUDIES IN A MODERN CONTEXT – SHANGHAI

Shanghai, once known as “Paris of the East”, is a fast-growing metropolis located at the mouth of the Yangtze River. The city is exposed to the East China Sea in the east. It is one of the most crowded urban areas in the world with 13 millions residents (Shun, 2002).

The most developed city of mainland China, Shanghai has quite a different urban context from Beijing, due to its shorter history and the great influence of western cultures. The case studies from Shanghai help reveal how sensitive the ideas of critical regionalism are to local history and local culture. The built legacy of European influences in Shanghai during the nineteenth and early twentieth centuries creates an environment that suggests different directions for critical regionalist architecture than found in Beijing.

Initially a small town supported by fishing and weaving, Shanghai has a much shorter history than Beijing, which dates back to the 11th century BC Shanghai, which means “by the sea” in Chinese, was founded in the late of the 13th century AD. Most of eastern modern Shanghai didn't exist until the 17th century AD, when a complex web of canals was built to drain the region. In the 17th century AD, Shanghai became a thriving port **(fig.58)** due to its favorable geographical position, the intersection of Yangtze River and the East China Sea. After the British opened their first concession in 1842 AD, after the first Opium War, change was rapid. The French turned up in 1847 AD and it wasn't long

before an International Settlement was established. By the early 20th century AD, Shanghai had become the biggest city in China (Pan, 2001).

Unlike ancient Beijing, whose structure was directed and formed by the ancient social estate system and the strict urban planning model that dated back to the ancient Zhou Dynasty, Shanghai developed without any preoccupied urban planning for a long time. The structure of Shanghai Metropolis was formed in the middle of 19th century AD when Shanghai was a stronghold for imperialist aggression in China. At that time, Shanghai mainly included three parts: the International settlement, the French Concession and the Chinese district. Each part had its own administrative system, cultural background and urban development policy. In this period, western powers imported many aspects of their culture into this region, and a pluralistic cultural environment that was partly Chinese and partly Western was formed and has persisted from then on. The inconsistencies among urban styles and development levels made Shanghai a city of fragments, which became the most attractive feature of the metropolis (Pan, 2001).

Figure.58. *This drawing shows the prosperous scene in Shanghai (Shiliu) Port.*

Not serving as a capital or a chief city of ancient dynasties, Shanghai doesn't have as many traditional burdens as Beijing. Furthermore, the modern colonial history made Shanghai a pluralistic cultural region—which will ultimately suggest more pluralism in the critical regionalism of Shanghai than in a city like Beijing, where there are fewer foreign influences.

On the one hand, different cultures co-existed and showed their own characteristics. First, Chinese tradition was preserved and continued as the basic tissue of this city, although not many traditional buildings are left in contemporary Shanghai. An example like the Yuyuan Garden **(fig.59)**, inside the Old City **(fig.60)**, built in 1557 AD, expresses the essence of classical garden architecture during the period of Ming and Qing Dynasties. Considered as one of the most famous gardens in South China, this garden maintained its classic beauty over the centuries and formed a sharp contrast with its contemporary surrounding. The top of its rocky hill was once the highest points in the city before the rise of skyscrapers. Other examples, like Shanghai City God Temple, also help give the city its roots in traditional Chinese culture.

Figure.59. *Traditional Chinese private garden Yuyuan, Shanghai.*

Figure.60. *View of the Old City, Shanghai.*

Second, colonialist architecture, built at the turn of last century, became a significant part of today's urban context. The Bund (**refer to fig.11**), the city's famous waterfront boulevard, is lined with buildings of western styles. On the Bund is group of buildings known as "a Gallery of world architecture." These buildings were built during 1920s-1940s AD respectively with different architectural styles included Classical Modernism, Art Deco and Expressionism. These historical buildings are characterized by varying European traditions such as English, French, Spanish, German, Italian, Norwegian and Russian, as well as revealing influences of other countries such as Japan, India, and the Arab world. Most of the buildings were owned by banks, as the Bund was the financial center of old Shanghai. Today the Bund is the symbol of Shanghai and the urban context of pluralistic cultures has become part of truly Shanghai.

In addition to the parts of the city that are clearly derived from either China or the West, a hybrid culture came into being through the integration of Chinese and Western cultures. For example, the Longtang (alley) or Shikumen (stone door) housing **(fig.61)** is the most

typical and representative case showing the integration of Chinese and western cultures, which has been the dominant urban living pattern within the city for nearly a century. This housing type of two or three stories in height was developed in the early twentieth century to supply affordable housing to the lower middle classes. It combined the Chinese traditional courtyard housing with the layout of row housing originated from the West. Such integration was also reflected in the architectural fragment of this housing type such as the housing gate **(fig.62)**. The frame, door panels, and knockers of the gate were the characteristics of Chinese traditional architecture, but the triangular pediment on curve ornaments on its lintel were inspired by western architectural designs. Furthermore, the special feature of Chinese and Western integration in Longtang houses can be found in the way of life in the Longtang houses **(fig.63)**. Residents have kept the traditional Chinese living pattern as well as adapting themselves to a new lifestyle in a modern city (Li, 1993)

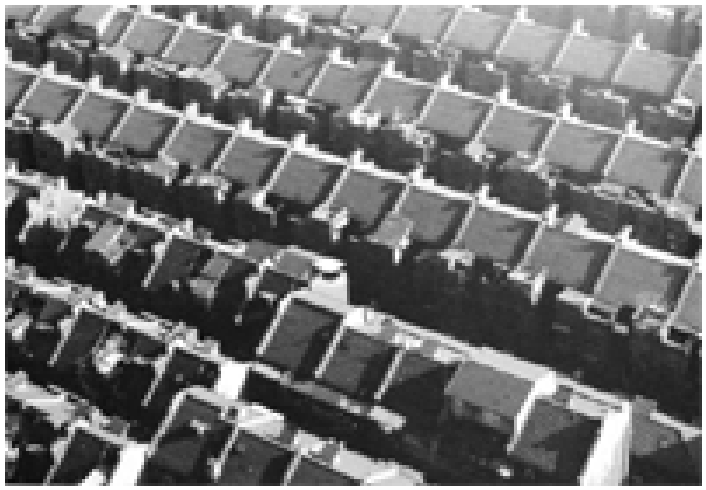


Figure.61. *The bird view of Longtang or Shikumen housing, Shanghai.*

Figure.62. *The gate of Shikumen, Shanghai.*

Figure.63. *Daily life in the Shikumen housing, Shanghi.*

Modern Shanghai is divided into two areas: Pudong (east of the Huangpu River) and Puxi (west of the Huangpu River). Pudong, the new financial district of Shanghai, used to be a suburban area of Shanghai. Now it houses the most impressive skyscrapers in China and has become the brightest developing point of Shanghai now and, based on the

development plan of the Shanghai government, in the future. Since 1990, when Shanghai was chosen as the city to drive China's economic progress, over one thousand skyscrapers have been erected in Shanghai. In the mid-1990s more than half the world's high-rise cranes were looming over Shanghai. Besides the 1000 skyscrapers, a subway line, highway overpasses, bridges and tunnels have been constructed and more is to follow (Ahokas, 2002). The Jinmao Tower, the tallest building in China, is located in the area.

While Beijing is the capital, recognized as the center of politics and culture, nowadays Shanghai is regarded as the financial center of China, a progressive city open to new ideas. Today, as the main window to the west and China’s largest and most important industrial and commercial center, the phenomenon of urbanization and modernization is most evident in Shanghai as compared with other Chinese metropolises. The relationship between new construction and preservation has become an urgent issue for modern Shanghai.

With its high-speed economic development, the over-expanding urbanization of Shanghai has created a chaotic urban situation. The most conspicuous transformation in Shanghai in the past ten years has been the growth of skyscrapers and office towers, which changes fundamentally the skyline of this city **(refer to fig. 2, 3)**. The city lacks a well-developed planning policy to limit the development of skyscrapers. High-rise buildings can be found everywhere in Shanghai and they dominate the whole urban landscape. Thus the urban structure is divided into hundreds of interrupted spaces.

Furthermore, due to its booming urban development, Shanghai becomes the best show place for different architectural schools and styles from modernist ideal to post-modernist philosophy. Flooded with thousands of commercialized buildings with various styles, along with economic boom, the character of modern urban fabric in Shanghai is hard to appreciate **(fig.64)**. The new development creates in this city a chaotic situation. The identities of old Shanghai are fading away and being replaced by a universal culture and technology while the government supports ambitious, unrestrained urban development. The uncontrolled development is turning Shanghai into an international metropolis with a similar universal appearance without sense of place as other cities in the world such as Chicago, Hong Kong and Singapore **(refer to fig.5-8)**.

Figure.64. *Commercial buildings with various styles dominate the urban landscape of Shanghai.*

Besides the urban history and structure, Shanghai has a climate with four distinct seasons, which is characterized by a warm spring, hot summer, cool autumn and cold winter. But it is not as distinct as the northern cities such as Beijing. Compared to Beijing, Shanghai's has a much milder climate. Generally the Shanghai region has generous sunshine and abundant rainfall.

Fortunately, things have started to change recently. Three case studies of different building types presented next will focus on current representative examples to demonstrate various efforts towards a regionalist built environment of modern Shanghai.

On the one hand, one can find proof that the Chinese tradition is not completely forgotten and regionalist efforts are evident in some new buildings. For example, the shape of the new Shanghai Museum is designed to resemble an antique Chinese bronze vessel. The Jinmao Tower design is actually based on the form of ancient pagodas. On the other hand, the pluralistic urban context provides different ways to reinterpret regional and traditional characteristics. For example, the Shanghai Library is a good example to manifest a hybrid tradition of old Shanghai.

Since critical regionalism is an attitude rather than a rule. It always prefers an effort towards the combination of modern and tradition. Although not all of modern building types have historical precedents or reference, these examples present design ideas synthesizing tradition and the new functional requirements. Although there are many limitations or even shortcoming of these examples, they show a clear intention towards a truly regionalist architecture—one sensitive to Shanghai's history.

CASE STUDY FOUR: SHANGHAI MUSEUM

The Shanghai Museum, built in 1995, is a case indicating formal metaphor of historical and cultural references. The architect, Xing Tonghe, attempts to express a cultural linkage with tradition by formal responses to historical, cultural roots in a contemporary advanced cultural facility.

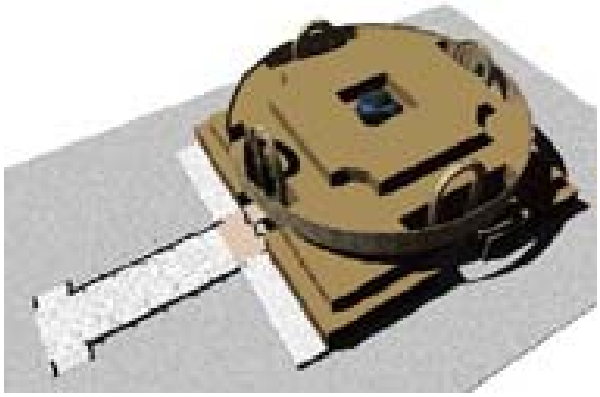
As a modern museum, Shanghai Museum employs advanced universal technology to its service facilities. Besides climate-controlled galleries, this museum has installed advanced security and fire alarm systems, a computerized library and an automation system (Yan, 1999, p3).

Despite its high technology, the built form of the museum introduces the ancient Chinese philosophical concept that “the heaven is round and the earth is square” by formal metaphor**(fig.65)**. The concept symbolizes the relationship between earth and heaven, the human world and God's world, which stands at the heart of Chinese cosmogony. Dating back to pre-Confucian times, the circle was widely adopted in the design of the temple's main building on the basis of this traditional concept. It is in accord with people's imagination of heaven at ancient times (Pan, 2001).

The best example representing the ancient philosophical concept is the Temple of Heaven **(fig.66)**. Situated in the southern part of Beijing, the Temple of Heaven was built in 1420 A.D. during the Ming Dynasty. The principle buildings include the Altar of Prayer for Good Harvests, Imperial Vault of Heaven and Circular Mound Altar. It was the place

where the emperors of the Ming and Qing dynasties worshipped heaven and prayed for good harvests. The complex is set in gardens and surrounded by historic pinewoods. The complex simply and graphically illustrates an ancient Chinese thought of “the heaven is round and the earth is square” (Pan, 2001).

Figure.65. *Computer model of Shanghai Museum. The architectural form is a manifestation of ancient Chinese philosophy.*



The architecture and layout of the temple of Heaven is based on elaborate symbolism and numerology. In its overall layout, the northern part within the wall is semicircular symbolizing the heavens and the southern part is square symbolizing the earth. The northern part is higher than the southern part. This design shows that the heaven is high and the earth is low. The buildings in the Temple of Heaven are round, like the sky, while the foundations and axes of the complex are rectilinear, like the earth. The Hall of Prayer for Good Harvest is a big palace with round roof covered with black, yellow and green colored glaze representing the heavens, the earth and everything on earth. Also, complex numerological permutations operate within its design. Inside the Hall are 28 huge posts. The four posts along the inner circle represent four seasons-spring, summer, autumn and

winter. The 12 posts along the middle circle represent the 12 months (Pan, 2001). The use of forms of historical and cultural significance provides the main inspiration for the form of the museum.

Figure.66. *The temple of Heaven reflects the ancient philosophical concept that "the heaven is round and the earth is square".*

In addition, the architect is inspired by the major collection of the museum. The form of the museum evokes the form of the Neolithic Chinese bronze that are an important part of the museum's collections. Adding four handle-like arches to the entrances on every side that rise from the circular roof, the whole composition resembles a Neolithic bronze with

decorative holders displayed in this museum **(fig.67)**. The architect highlights this significant collection through formal expression. To reinforce the metaphor, the round wall above the main entrance and the granite walls of the building are all ornamented with the patterns of glyphs taken from ancient bronze wares, reinforcing a cultural linkage with ancient China **(fig.68)**.

Figure.67. *Vase Ding, a Neolithic bronze container displayed in Shanghai Museum.*

Figure.68. *Formal reference of Neolithic bronze culture is evident in the architectural form of Shanghai Museum.*

The design tactics of the museum demonstrates an important attitude of generating vital forms by using formal precedents taken from the regional culture, an attitude that is appreciated by critical regionalism. It presents that historical roots constitutes a very important part in architectural expression for contemporary Chinese regionalism architecture, even in a modern urban context like Shanghai.

1. A preference for regional intentions over normative optimization.

In the Shanghai museum normative optimization takes the back seat to the creation of an expressive form that evokes an ancient culture. It is obvious that the huge round top with heavy square base is neither the reflection of an optimum structure nor an economic architectural form. This unique form is deliberately selected for its symbolic capacity. It signifies an old belief of ancient Chinese culture, that the sky was round and the earth was square, as just discussed. Similar to the Yanhuang Art Museum in Beijing, modern technologies are used to meet the requirements of modern museums and to serve regionalist intentions rather than to achieve normative optimization.

2. A consciously bounded architecture.

This museum design is very similar to Beijing's Yanhuang Art Museum, which presents a good response to tradition. Despite the use of forms that link it to the culture of its site, it is not a strong positive example of a bounded architecture.

On the one hand, rather than creating a spatial boundary, it is a free-standing built form. This museum is a symmetrical and monumental volume that dominates the built

environment of the People's Square, one of the most valuable plots of Shanghai. The large-scale museum is the visual focus of the square **(fig.69)**. Due to its huge volume and the sculpture-like form, to some degree it alleviates the crowded built environment that is replete with commercial buildings of different styles. It seems that this design fails to create a bounded space. On the other hand, the formal metaphor, either signifying the ancient philosophical concept of the square Earth and round sky or evoking a Neolithic bronze image, has good linkage with historical roots. To reinforce this metaphor, the round wall above the main entrance and the granite walls of the building are all ornamented with the patterns of glyph taken from ancient bronze wares, resulting in a cultural linkage with ancient culture **(fig.70, 71)**.

Figure.69. *The built environment shows the museum is the visual focus of the People's Square.*

3. More than simply scenographic episodes or sentimental historicism.

This museum uses an abstract mannerism to link itself with ancient culture, thus avoiding mere sentimental simulation. The main formal theme of this museum is its monumental

volume with a square bottom and a circular, as recently discussed in the introduction to this case study. Here, the traditional idea that the sky was round and the earth was square, is transformed into the built form. Similar to the Yanhuang Art Museum, the monumental volume provides an efficient plan layout and thus makes convenient services available for visitors and researchers.

Moreover, the formal similarity to the works of the Neolithic culture further strengthens the cultural linkage with the museum. The forms used to make the cultural linkage are not simply copied from old buildings and applied to buildings built with completely different technologies, instead they are forms re-interpreted from culturally significant forms that were not originally buildings.

These historical references strengthen the museum's linkage with tradition. In fact, the museum itself is a good statement and demonstration of historical roots. On the one hand, the formal metaphor evokes the ancient philosophical concept. On the other hand, the metaphor of a Neolithic bronze presents the highlight of the museum**.**

4. A responsiveness to local conditions and climate.

Appropriate responses to natural features, such as light and climate, are preferred by critical regionalism. Again, similar to the Yanhuang Art Museum, natural light is ignored in the Shanghai museum. This building demonstrates an inner built environment with climate-controlled galleries which are equipped with the latest lighting and display techniques. The huge enclosed volume distances the interior from the nature **(fig.72, 73).**

In brief, there is no clear evidence reflecting a close relation with nature, though, as with any museum, the need to isolate the artifacts from the environment, does make it more difficult to create a strong link with the environment.

Figure.70&71. *The round wall above the main entrance and the granite walls of the building are all ornamented with the patterns of glyph taken from ancient bronze wares.*

Figure.70.

Figure.71.

Figure.72

Figure.73

Figure.72&73. *The interiors demonstrate an climate-controlled inner built environment.*

5. An emphasis on the tactile.

Although the museum creates a favorable visual experiences to meet specific needs of display, similar to the Yanhuang Art Museum, the tactile is not emphasized in the museum. Difference between areas displaying different arts are almost exclusively visual. For example, in the Gallery of Ancient Chinese Sculpture **(fig.74)**, the environmental illumination is weak while the sculptures are highlighted by spotlights; the strong contrast enhances the depth of space and provides a favorable background for the display of sculptures. In the Gallery of Ancient Chinese Bronze **(fig.75)**, implied by the blue-green gentle illumination, the visitors are walking into a dreamlike old-age world filled with various kinds of ancient bronze wares (Zhang, 2000). In neither case do these

transitions leads to any tactile experience, even if the temperature differences of open spaces and the scent differences of a living garden are not possible in the controlled environment of the museum, tactile differences could be created by using different flooring/paving materials as done in parts of the Fragrant Hill Hotel.

Figure.74. *The Gallery of Ancient Chinese Sculpture.*

Figure.75. *The Gallery of Ancient Chinese Bronze*.

In conclusion, the regionalist intentions, such as dialogue with nature and emphasis on the tactile, are not fulfilled in the Shanghai Museum. But the design demonstrates several important characteristics of critical regionalism. First, the unique and uneconomic form with its symbolic capacity favors cultural linkage over normative optimization. Second, the architectural form of an abstract mannerism, which is inspired by ancient philosophy or a Neolithic bronze image, makes itself unique from nostalgic historicism. In both of

these ways, the architectural expression of historical roots form the critical regionalist aspect of a synthesis of traditional Chinese culture and advanced technology that looks toward a new contemporary hybrid culture.

CASE STUDY FIVE: SHANGHAI LIBRARY

Shanghai Library is a case that demonstrates its deference to regional culture and identity while employs modern construction technology. The reinterpretation of regional culture is fulfilled through connection with the unique urban context of pluralistic cultures.

It is the largest public library in China and also one of the ten largest libraries in the world, on account of its collections, which contain some 48.5 million items. The library was opened to the public in 1996. Its predecessor, the Shanghai Public Library, was founded in 1952. At that time, Shanghai Racecourse Club **(fig.76)**, built in the English style, was remodeled for use as the Shanghai Public Library. A new library was proposed to be built in a new site, a typical urban context of Shanghai, with different types of buildings reflecting various cultures. For example, the surrounding area includes some modern educational facilities, including a high school and college buildings, and western style buildings such as European churches and American schools built a hundred years ago **(fig.77)**. Based upon the specific built environment, the architects attempt to respond the pluralistic characteristics of the neighborhoods (Chen, 1999).

At the same time, as a large modern library, the library absorbs contemporary design principles, such as the idea of modular space, and industrialized technology such as concrete structural systems. The idea of modular space, which can be dated back to Mies van der Rohe's "freely flowing space", is one of the most characteristic features of 20th century modernism. The concept of modular space is completely based upon modern technology and new building materials, which make bigger spaces possible.

The library presents major concerns emphasized by critical regionalism. For example, the design stresses the historical and cultural continuity. Its respect to the specific urban context and climate reflects the architects' environmental awareness.

Figure.76. *Racecourse Club Shanghai was remodeled for use as Shanghai Public Library in 1952.*

Figure.77. *Shanghai Library in the urban context with western style building.*

1. A preference for regional intentions over normative optimization.

This library design assimilates the essential principle of modular space which is introduced by modern architecture. The modular space is characterized by a uniform column span, uniform story height and similar loading capacity per square footage. As a result, big spaces can be further divided into different functional spaces, which adapt to

the needs of a large multifunctional library. Therefore, this library design manifests a positive attitude to the progressive aspect of modern architectural legacy. On the other hand, the disadvantages of modern modular libraries, for example, the monotonous interior space, are conspicuous and may be due to the demands of normative optimization. Making use of natural factors, the architect introduces openings for natural light and ventilation to break the mass layout of the modular space. At the same time, the setback layout at the entrance further breaks the mass volume and forms a rich roofline **(fig.78)**. These tactics help lessen the impact of the drawbacks of modern modular libraries, but even so, this case study reveals some of the problems with a focus on normative optimization that Frampton is guarding against when he suggests an attitude that distances itself from normative optimization.

Figure.78. *The setback layout breaks the mass volume and forms a rich roofline.*

2. A consciously bounded architecture.

First, the Shanghai Library is sensitive to the built environment. The street of the site is narrow and there are few open spaces along the street. To respond to this, the architect created an open space in the main entrance by a series of setbacks in architectural plans **(fig.79, 80)**, which emphasizes the building as an architectural form responding to its site rather than a freestanding object. The open entrance square **(fig.82)** becomes the transitional space between the street and the building. This open entrance space effectively alleviates the tension between the urban public space and the interior space of the building. Therefore, it is a positive improvement to the unfavorable urban built environment by creating a spatial boundary that brings in the outside and reaches beyond the physical limits of the building. Similarly, the setback profile of this building in form also reflects this intention.

Second, the architect seeks a cultural link to this library. The infusion of Chinese and western historical references in the design can be viewed as the cultural endeavor to express the urban pluralistic characteristic of Shanghai, which is partly Chinese and partly Western. For example, the architects merged historical references such as Chinese traditional courtyards and western classical architectural languages such as column style and architectural details.

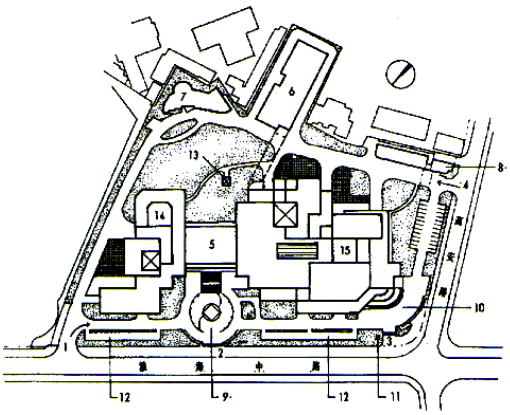


Figure.79. *Site plan shows a series of setback at the front elevation.*

Figure.80. *Shanghai Libray model shows an open space in the main entry.*

Figure.81. *Entry plaza is defined by the colonnade.*

3. More than simply scenographic episodes or sentimental historicism.

In the Shanghai Library design, the architect uses a lot of regional architectural elements. These elements are simplified and transformed to respond to the characteristics of the site and the built environment. For example, the top part of the tower building is reminiscent of its predecessor, the old Shanghai Public Library established in 1952. The old library, which had a bell tower on the top, was once an urban landmark **(fig.82, 83)**. The architect Zhang Jie Zheng argues that “the historical reference is to evoke the old Shanghai rather

than a simple imitation of architectural element." (Zhang, 1998) The old bell tower was in a typical English baroque style. The tower form of the new Shanghai Library is a simplified roof profile with no relation to any specific period in history.

Another part of the library illustrates the architect's same attempt to evoke the old Shanghai while using proper architectural element as a response to the built environment. In the main entrance, the round western colonnade episode encloses a transitional space **(fig.84)**. Again, the architect simplifies the colonnade. Different from the western classical colonnade, the episode is separated from the facade of building and becomes a relatively independent element. The semi-round form of this episode creates a physical boundary in the entrance and establishes a harmonious formal relation with the setback form of the building.

Figure.82. *Entry The bell tower of old Shanghai Library.*

Figure.83. *Tower top of Shanghai Library.*

Figure.84. *Main entrance with a reinterpretation of western colonnade.*

Unfortunately, the principle of simplifying traditional architectural elements doesn't carry through the whole project. The interior courtyard uses a highly literal image of a Chinese traditional pagoda to frame a "window picture" **(fig.85)**. It is no doubt that such imitative treatment weakens the attempt of reinterpreting tradition.

Figure.85. *The Chinese courtyard in Shanghai Library where there is a window picture, evoking the traditional pagoda profile.*

4. A responsiveness to local conditions and climate.

The Shanghai Library responds well regional climate and natural light in the design. The plan layout centralizes all functional areas in a whole block, which decreases

consumption of energy while providing convenient and effective services. The favorable climate of the spring and autumn in the Shanghai region makes natural ventilation and day-lighting possible for buildings rather than completely relying on air-conditioning and artificial illumination. Therefore, in the Shanghai Library, the architects introduce natural light and ventilation by setting two interior courtyards within the building. Such openings create transitional spaces between nature and the interior. Thus, reading rooms and administration offices can be placed around the interior courtyards which provide favorable daylight for the readers and library staff. Also, green plants are introduced into the interior and help to create a favorable environment **(fig.86, 87)**.

Figure.86&87. *The green plants are introduced into the interior and help to creates a favorable environment.*

Figure.86

Figure.87

5. An emphasis on the tactile.

In the Shanghai Library, the emphasis on the tactile is manifested in the paving finish of the entrance. The natural stone finish, which was an element of Chinese traditional garden, is used in the entrance floor. When people walk into the library, they can realize the transition from the outside to inside by experiencing involuntary changes in posture and gait. This special treatment enhances architectural tactile experience.

In conclusion, the Shanghai Library is a successful example to demonstrate an effort towards regionalist architecture. First, the formal references of urban pluralistic fabric and the setback form sensitive to narrow urban street space addresses itself as a bounded architecture. Second, this library design is in an intense dialogue with nature through the introduction of local light. Third, the materials of entrance pavement emphasize the tactile perception. Fourth, the architect attempts to cultivate a hybrid urban culture through an appropriate assimilation of different cultural characteristics in architecture. But the vague attitude to sentimental vernacular such as the window picture of the courtyard, a literal imitation of a vernacular pagoda profile, indicates some of the design choices that Frampton's critical regionalism suggests avoiding.

CASE STUDY SIX: JINMAO TOWER

The Jinmao Tower is situated in the heart of the Lujiazui financial and trade zone, the most valuable lot of Pudong, Shanghai. The tower is a synthesis of a design concept recalling traditional culture and advanced contemporary technology. Of all the case studies, the Jinmao tower is the one most obviously influenced by the products of the West and the drive for a universal culture. Although its form varies from the simple glass box, such as those of Mies van der Rohe, for the most part it differs little from the skyscrapers that populate the cities of the world. Even though it is very similar to many other skyscrapers, we can still learn more about critical regionalism because of the Jinmao Tower's treatment of the cultural linkage with tradition.

Modern high-rise buildings first appeared in Chicago in the late of 19th century as the result of the desire to get maximum use of a limited and expensive lot in the downtown area **(fig.88)**. Seen as a proof of the emerging role in the international community and a symbol of successful modernization by Chinese government, the modern skyscraper was introduced into China's urban environment with an initial misunderstanding of the skyscraper's value. While the West has begun to debate the skyscraper's appropriateness in the urban context due to its huge consumption of energy, pollution to its environment and difficulty of fire control, China is currently is the midst of a massive boom in the construction of skyscrapers.

Today skyscrapers are shaping the skylines of major cities in China along with the urban expansion and economic boom. This phenomenon further deepens the conflict between

the old and new urban fabric. The situation is almost the worst in Shanghai, a city that is on of the main centers of Chinese economic development.

Figure.88. *Reliance building, a typical Chicago high-rise building.*

The Jinmao Tower, completed in 1999, is a new landmark for Shanghai. The complex includes the tower building and a skirt building, offering auxiliary facilities, retail stores, business offices space and a luxury hotel. The total construction area is about 290,000 square meters **(fig.89)**.

The Jinmao Tower with a height of 1403 feet, with 88 stories, is the tallest building in China and the third tallest in the world, after Petronas Towers in Kuala Lumpur, Malaysia and the Sears Tower in Chicago. The building employs the highest levels of technology. For example, the foundations consist of 80-metre-deep high capacity steel driven piles, which are the longest steel piles ever used in a land-based building. Moreover this

skyscraper is designed to withstand winds of as much as 125 mph during a typhoon. Built on a former river delta, engineers had to drive pilings 100m (328 ft.) down to reach bedrock. Also, The tower has a very advanced glass screen wall (Qiao, 2002).

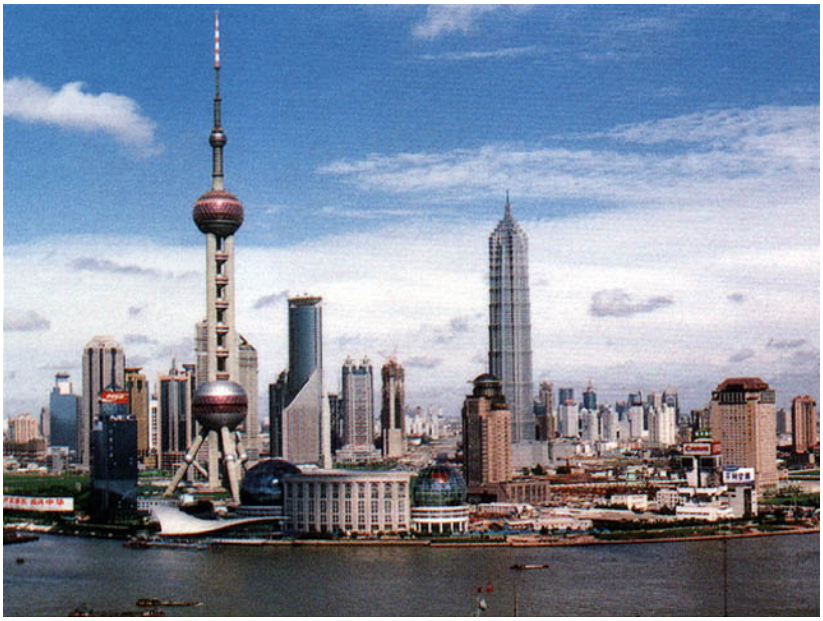


Figure.89. *Jinmao Tower in the urban context.*

The architect Adrian Smith takes ancient pagodas as “a fitting reference point from which to begin thinking about the design of a Chinese skyscraper.”

Before the commercial era, traditional high-rise structures mainly served for religious purposes, such as the Gothic churches of the west or multistoried pagodas of the east. In China, the typical high structure is pagoda.

The pagodas were originally built to preserve Buddhist relics. The earliest pagodas built in China were multistoried. For instance, the pagoda at the White Horse Temple near Luoyang, built in 68, the pagoda in Xuzhou, built between 188 and 193, and the one at Yongmng Temple in Luoyang, constructed in 516, are all tall buildings of seven or nine stories. Among the 3000 existing pagodas, many construction techniques have been used, so there are all-timber pagodas, brick pagodas, stone pagodas, bronze pagodas and iron pagodas.

During the Ming and Qing dynasties, many pagodas were built simply to decorate the landscape. Even their names were no longer connected with Buddhism. Pagodas of various styles embellish the landscape of their surrounding areas. They were the delight of the landscape architects and often sited on hilltops or mountain slopes that could be seen through the main gateway at the end of the vista. They often served as a landmark of cities and districts without serving any specific living function. Thus a special relationship between a pagoda and city region was formed. For instance, Baochu Pagoda on top of Precious Stone Hill is the landmark of the scenic city of Hangzhou with its beautiful West Lake. The Big Wild Goose Pagoda in Xi‘an became the symbol of the city. Pagodas symbolizing good geomancy, prosperity and good fortune were built in great numbers. Except for the use of the term futu or Buddhist pagoda, nothing about the pagoda was related to Buddhism. Ancient pagodas built as part of the landscape are found everywhere in the country. In fact, pagodas have become an inseparable part of scenic spots in China **(fig.90, 91)** (Pan, 2001).

Besides using the influence of ancient pagodas, the design of the Jinmao Tower reflects Chinese traditional culture here and there. For example, the Chinese lucky number eight figures prominently into the tower's composition. The mind-bending mathematics of Jinmao's stepped-back form is best explained by the formula: Each segment's height is reduced by one-eighth of the original base height and continues until the segment height is eight levels. At this point the Hotel begins and each segment reduces one-eighth of the 8-level segment until it reaches the 88th level. Eights also appear in Jinmao's advanced structural engineering system, which fortifies the building against the typhoon winds and earthquakes typical of the region. The composite steel-and-concrete structure features eight mega columns of concrete and eight columns of steel situated around the tower's concrete core (Qiao, 2003).

Figure.90. *Ancient wood pagoda.*

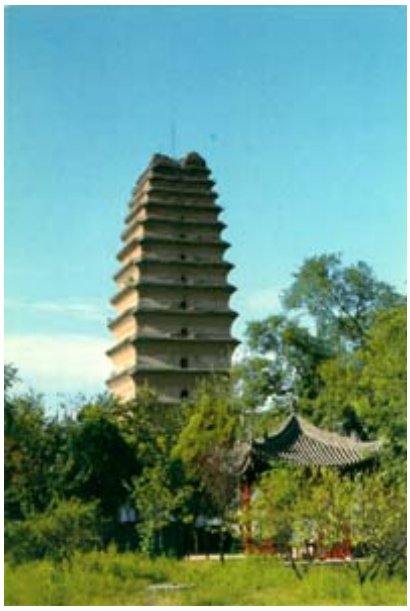


Figure.91. *Ancient brick pagoda.*

The Jinmao Tower demonstrates key points emphasized by critical regionalism such as intentions over normative optimization and the authenticity of formal reference. It also raises important questions as to whether a skyscraper can succeed as a piece of critical regional architecture.

1. A preference for regional intentions over normative optimization.

Generally, high-rise buildings, characterized by prefabricated modular assembly and identical units and stories, are good examples to demonstrate the influence of a focus on normative optimization. They are the epitome of the large-scale architecture that was the product of the highly industrialized European nations. In the case of the Jinmao Tower and many other skyscrapers there is the question of whether the values of Frampton's critical regionalism can be built into a skyscraper. Frampton's first point calls for a distancing from the demands of normative optimization, which the Jinmao Tower does, but also calls for avoidance of large projects, which the massive Jinmao Tower did not. In this case, although it employs the most contemporary technologies and building materials, the Jinmao Tower's complex form clearly distances itself from the normative optimization, thus revealing a direction for architecture revealing a formal sensitivity to cultural issues. A rhythmic pattern achieved by gradually stepping back is neither an economical form nor in line with an optimum structure. Tapered into 13 segments by a series of setbacks, the built form of Jinmao Tower considerably increases the complexity of structure and difficulty of construction **(fig.92)**. The intention of the designer is to show a cultural continuity with the traditional Chinese pagoda instead of conforming to an optimization of technology. The architect Adrian Smith argues that "it in some way

evoked the culture and memory of China, that was unmistakably Chinese." (Smith, 2003) In brief, a regionalist intention, evoking a cultural identity, takes precedence, in this modern high-rise, to questions of normative optimization, but still it reveals some of the tension between the demands of a skyscraper and the attitudes of critical regionalism.

Figure.92. *A rhythmic pattern of the built form achieved by gradually stepping back is neither an economical form nor in line with an optimum structure.*

2. A consciously bounded architecture.

First, like many high-rises in the downtown area, this skyscraper is a totally free-standing building. Rather than creating any physical boundary, it encloses a huge vertical space and dominates the urban skyline **(fig.93, 94)**.

Second, culturally it is inspired by traditional landscape pattern. The architect Adrian Smith applies the pagoda-city/region pattern to his design. Jinmao Tower's pagoda-like

profile evokes such Chinese ancient pattern. In this case, the architect passes on the message of Jinmao Tower's status as the new landmark of Shanghai. From this point, the tower is a successful reference of architectural tradition, and it's status as a visible landmark helps make it part of the city as a whole, even as it stands apart.

Figure.93. *The aerial perspective shows Jinmao Tower is a freestanding building in the urban environment.*

Figure.94. *The rear elevation of Jinmao Tower is completely enclosed and doesn't have any contribution to the urban environment.*

Although the design shows cultural linkage with tradition, Jinmao Tower fails to become a bounded architecture that creates a place; instead it is the sort of free-standing building that distances the building from the rest of it's environment. It is this aspect of critical regionalism that seems most difficult to reconcile with skyscrapers: by their very nature as towers trying to put as much floor space as possible into a given site, they seem to have trouble creating bounded spaces. However, although the skyscraper is somehow a production of limited urban land, it can sometimes provide favorable a bounded space as a complement to the urban environment when the plan is properly set in the site. For example, Bank of China in Hong Kong illustrates a strategy to create a comfortable transitional space between the urban environment and the building. The site is tiny and is hemmed in on three sides by highway overpasses (Wiseman, 1990, 288). At ground level, the tower is pulled back from the street to create a welcoming pedestrian environment that is fully accessible **(fig.95).** It is surrounded by a broad promenade, and flanked by cooling water gardens that muffle the activity and noise of surrounding traffic **(fig.96).** Whether a space like this is "good enough" to satisfy the dictates of critical regionalism is open to debate, but it does reveal a possibility of setting a skyscraper into its site so that it creates a positive bounded space.

3. More than simply scenographic episodes or sentimental historicism.

Critical regionalism emphasizes the authenticity of formal reference and opposes a literal imitation of vernacular. On the one hand, the architect succeeded in choosing the legitimate pagoda model that was one of the types of high buildings in ancient China. Adrian Smith sought a cultural linkage to the past in reference to the building "that in

some way evoked the culture and memory of China, that was unmistakably Chinese." As noted earlier, traditionally the high pagoda was erected as a landmark for a city or region. As the city's tallest skyscraper, Jinmao is a new urban landmark for Shanghai. From this point, the metaphor of traditional pagoda-city/region pattern is appropriate.

Figure.95. *The tower of Bank of China is pulled back from the street to create a welcoming pedestrian environment that is fully accessible.*

Figure.96. *The cooling water gardens muffle the activity and noise of surrounding traffic.*

On the other hand, Jinmao has a similar profile to ancient high-rise pagodas although the built form is refined by the application of modern technology and materials. The built form of Jinmao Tower evokes Chinese ancient imagery of pagoda. Formally, the roofs of

traditional pagoda are gradually set further back until the top roof is considerably smaller than the bottom. Jinmao tower applies the same principle to the built form.

Besides the metaphor of ancient pagodas, the stepping system of Jinmao Tower is one of major forms of modern skyscrapers. The architect argues that “one of the main massing attributes was the way the building wall steps back as it rises to the sky. I tried stepping in 8 floor segments but determined that this was too static. So I tried modulating from larger stepped segments at the bottom of the tower to progressively shorter segments at the top. This approach solved the issue of the tower feeling complete even when the view of the lower levels was blocked by adjacent structures. These were actually the first form of high-rise buildings” (Smith, 2003) Therefore, the inspiration comes from not only from Chinese traditional legitimate model of high building pagoda but also modern high-rise built form.

Moreover, Jinmao Tower shows a light and bright personality with a transparent curtain wall frame made of high quality glass and steel. The brightly illuminated built form of the tower distinguishes itself from the historical reference. Supported by brick or wood structural systems, traditional pagodas have heavy, solid structural profiles. Also, the details of the skyscraper demonstrate a typical feature of technological aesthetics. The whole curtain wall is decorated by elegant metal lattice, which is a typical design application of high-tech architecture **(fig.97)**. This tactic may seem similar in the Hong Kong Bank by Norman Foster **(fig.98)** and the Lloyds Building by Richard Rogers

(fig.99). But as for the Hong Kong Bank and the Lloyds Building, the metal lattices are used as functional sunshading devices instead of decorative components.

Jinmao Tower is a good example to demonstrate a proper modern reinterpretation of traditional architectural model.

Figure.97. *Architectural details of curtain wall system.*

Figure.98. *Details of Hong Kong Bank demonstrates technological aesthetics.*

Figure.99. *Details of the Lloyds Building demonstrates technological aesthetics.*

Figure.100. *Unfavorable dazzled light of Jinmao Tower.*

4. A responsiveness to local conditions and climate.

A Critical Regionalist architecture emphasizes not only cultural characteristics of the region but also natural aspects of the site. Although cultural characteristics are greatly stressed in this project, particularly in the formal expression, natural features of the region, such as climate and light, are not presented in a positive way. A completely enclosed interior environment is one common feature of high-rise buildings, and the Jinmao Tower is no exception. As a result, climate-control equipment, such as air-conditioning systems, is necessary to maintain a favorable interior environment. Such universal treatment keeps the building far from nature. Frampton argues that "Critical Regionalism is opposed to the tendency of 'universal civilization' to optimize the use of air-condition" (Frampton, 1992, p327). This project doesn't show any favorable response to natural features. In addition, the modern materials used in this building are called in question due to its negative influence on the built environment nearby. For example, on the one hand the reflective glass of curtain wall reduces solar gain, which can be seen as a positive response to the climatic conditions. On the other hand the large-scale reflective glass of the high-rise brings about unfavorable dazzled light to the neighborhood **(fig.100)**. Such light pollution is becoming a serious problem for public spaces nowadays in China. In a word, this case leaves much to be desired in its response to nature and its site. However, it is also worth noting that insensitivity to environment may not be inherent to all skyscrapers—as demonstrated by Ken Yeang's Bio-Climactic Skyscraper in Malasyia.

5. An emphasis on the tactile.

Critical Regionalism stresses complementary perceptions except visual experience as a strategy against information experience dominated by the media age. As noted earlier, Jinmao Tower represents the highest architectural science and technology. It emphasizes the decorative visual characteristics of high quality modern materials rather than creating rich tactile perceptions. It pays more attention to textures and colors of different modern materials, which is evident in interior spaces **(fig.101, 102)**.

Figure.101&102. *The interior of Jinmao Tower emphasizes the the decorative visual characteristics of high quality modern materials.*

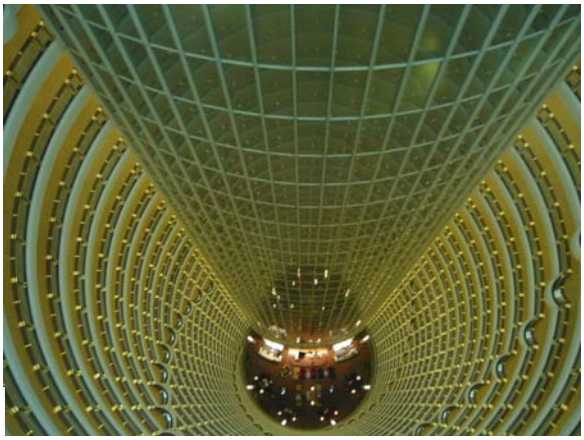


Figure.101

Figure.102

In conclusion, Jinmao Tower demonstrates an effort towards regionalist architecture although it leaves much to be desired. First, the Jinmao Tower shows a regionalist

intention against normative optimization through its unique and uneconomic structural form. Second, the metaphor of vernacular pagoda, indicating the landmark status of the Jinmao Tower in the new urban context, is a good reference of traditional culture. Third, contemporary advanced technology reinterprets traditional Chinese culture, showing a synthesis of regional culture and universal culture. But similar to a general high-rise building, the Jinmao Tower doesn't pay a close attention to natural characteristics of the site and the tactile perceptions.

As has been noted, the Jinmao Tower case reveals some of the conflicts between the desires of skyscraper design and the desires of critical regionalism. Although we see that the Jinmao Tower is not entirely successful, other examples, such as the Bank of China in Hong Kong and Ken Yeang's Bio-Climactic Skyscraper, show that at least some of the weaknesses of the Jinmao Tower can be avoided, and thus it is possible to create skyscrapers that are sensitive to the full range of attitudes suggested by critical regionalism.

4.0 CONCLUSION

China has entered an era of rapid industrialization. The changes in Shanghai's Pudong district over the last decade have shown just how quickly and how significantly the urban fabric and character can be shaped and altered in a short time.

The introduction to this thesis argued that this rapid development threatens negative changes in the urban environment. I. M. Pei's concerns about building skyscrapers in the heart of Beijing, and the damage such buildings would inflict on the urban environment, is the same sort of concern for the urban fabric as the concern that motivates this thesis. Further it was argued that there is a need for a coherent set of principles to guide the development of Chinese urban areas to prevent this sort of damage to the urban fabric. Kenneth Frampton's notion of a critical regionalism, most clearly described in his History of Modern Architecture, was taken to be the guide for these principles.

The second chapter attempted to describe Frampton's critical regionalism and the role it would take in this thesis: Critical regionalism becomes the lens through which our examination of contemporary architecture is viewed. Four of the seven points made by Frampton are used in this examination, two of Frampton's points are merged to create another point used in this thesis, while the seventh—the need for an environment that will permit regionalist architecture to develop and thrive—is argued to be in place in China. Frampton describes his points as 'attitudes' designers should adopt. He does not view them as hard and fast rules but rather guidelines to shape design thinking; they are goals he encourages architects to seek rather than criteria necessary for a work to be considered a work of critical regionalism.

The bulk of the thesis is contained in the third chapter, where six case studies are examined. The cities of Beijing and Shanghai have seen very different patterns of development, and for both of these urban areas three specific case studies were chosen. These two cities were chosen as general models for two important groups of cities found in China today. As Frampton argued, and as we see in the case studies, regionalist intentions are necessarily sensitive to local history and conditions. For China, these conditions vary widely, thus some cities, like Beijing, are more closely tied into their history as centers of Chinese culture, and others, like Shanghai, respond to a wider range of influences, in Shanghai's case, a blending of China and Europe. Although these patterns of development and the use of influences are widely varied, both patterns of development can lead to their own, distinct form of critical regionalist architecture.

Cities like Beijing are striving to preserve a highly traditional urban environment. In cities like Beijing, deference to traditional culture has to be central; this deference is the starting point for designs like the Yanhuang Art Museum, and attempts to utilize newer technologies, such as construction technologies or the technologies necessary in modern art museums, within the framework of deference for tradition. Other very traditional cities like Zhengzhou and Suzhou have also had new development that being to express important aspects of a positive Chinese regionalism. For example, in Zhengzhou, the Henan Museum uses strategies similar to those of the Yanhuang Art Museum and incorporates modern technologies to serve its function as a museum **(refer to fig.52, 53)**. In Suzhou, a famous historical city in the south of China, the Tongfang residential

quarter, a housing development in the old city, provides another example similar to the Ju'er Hutong neighborhood. Its plan concept is inspired by the traditional street pattern of "lane-nong-zhinong" from south China. The inner areas of this residential quarter are dwelling areas while the outer skirts consist of offices, shopping and services. It forms a contemporary living environment based around quiet, traditional "lane spaces." The houses in the district are all within three stories in height; with white walls and grey tiles, they reflect the architectural characteristics of traditional Suzhou garden design **(fig.103, 104)**.

Figure.103&104. *The plan concept of Tongfang residential quarter is inspired by the traditional street pattern of "lane-nong-zhinong" of south China.*

Figure.103.

Figure.104.

By contrast to Beijing, in Shanghai there is a much greater mingling of traditional Chinese influences with foreign influences, and a building like the Jinmao tower, a skyscraper among skyscrapers, matches its environment in the very modern Pudong district but also utilizes a formal metaphor that can be associated with traditional Chinese agrarian culture. In other coastal cities of southern China, like Guangzhou and Xiamen, rapid economic development has led to a greater assimilation of alien influences. Compared to the regions with traditional urban contexts, these coastal regions take a more open attitude to accept alien cultures while remodeling vernacular. The Museum of Nanyue King's Tomb, located in Guangzhou, is an example of the synthesis of historical reference and modern technology **(fig.105)**. This museum uses a metaphoric strategy to link the formal design with an ancient culture. For instance, the inverse of a pyramid-shaped glass cover of this museum design evokes the tomb's image of kings in the Xihan dynasty. In this example, the architect uses modern architectural language and contemporary materials and technologies to reinterpret vernacular culture. Another example is the Xiamen Gaoqi International Airport **(fig.106, 107)**. The linear design, with a traditional roof-like structural form, recalls a traditional Chinese profile through the application of modern technologies. The open and unique roof form reinterprets the traditional structural supporting system of wood brackets and provides shade and natural light for the terminal interior as a response to the specific ocean climate. In this example, the architect attempts to localize modern technologies through a linkage with tradition.

In the examination of the six case studies presented in the thesis, the five points of critical regionalism can be seen to appear sporadically. These buildings were not built to satisfy

Frampton's theory (or at least we do not have evidence to demonstrate that these works were built under the influence of Frampton's theory), and we see that the five points of critical regionalism are not always satisfied or addressed by these projects—for example, although the form of the Shanghai Museum is culturally motivated and attempts to respond to ancient formal inspiration while integrating that motivation with the capabilities of the technology used (a successful application of principle 3, which argues for reinterpretation of historic forms rather than simple imitation), it is not as successful in establishing a bounded space or in responding to the local conditions of light and climate. While there is much new architecture in China that is worthy, still there are ways in which a theory of Chinese critical regionalism could help improve Chinese architecture.

Figure.105. *The museum of Nanyue King's tomb. The inverse of a pyramid-shaped glass cover of this museum design evokes the tomb's image of kings in the Xihan dynasty.*

Figure.106.

Figure.107.

Figure.106& 107. *The Xiamen Gaoqi International Airport. The open and unique roof form reinterprets the traditional structural supporting system of wood brackets and provides the shade and natural light for the terminal interior response to the specific ocean climate.*

This thesis puts forward five points, a further development of the suggestions of Frampton, to guide further development of Chinese regionalist architecture.

1. In China, which is not as heavily industrialized as many western industrialized countries, the search for optimization and marginal practice come together more easily. In the west, industrialized and mechanized building techniques predominate and are well

suited to large projects. In China, where manpower is much more plentiful, projects of smaller scale are better suited, and because these products are not industrially produced, they can also incorporate greater variation. The Ju'er Hutong neighborhood shows how efficiency through use of available man-power combines with a large project that is really a collection of smaller projects guided by a central vision.

On the other hand, the architects' efforts to respond to regional influences often create large-scale, highly technological architecture that abandons the modernist concern for normative optimization in order to create a striking form, such as that of the Shanghai Museum. In China tradition and ancient culture are significant inputs for regionalist architecture, and architects often seek inspiration from the past in the attempt to contribute to the continuity of living tradition. The predominant regionalist intention often leads to built form that is unusual and uneconomic. The forms, either inspired from historical references in architecture such as Yuanhuang Museum or from the ancient culture such as Shanghai Museum, illustrate a willingness to favor regionalist intentions over normative optimization. Unfortunately, in some of these cases, such as the Jinmao Tower or the Shanghai Museum, the formal success is not matched with significant appreciation for the non-visual dimensions of architecture that are an important aspect of Frampton's ideas.

In brief, widely available local techniques and craftwork, if being properly employed, are a superior technique for the creation regionalist architecture in contrast to the use of universalized industrial technology to create culturally sensitive form. However, a formal

linkage to tradition is a significant strategy to maintain regional identity and promote the living tradition, one worthy of pursuing even if questions of efficiency and normative optimization must be put aside.

2. A bounded architecture has physical and cultural meanings. Physically, the boundary helps to create an intimate relationship between architecture and the built site. The physical boundary is not only an organic part of the building but also a transition between architecture and the site. Culturally, a bounded architecture illustrates the continuity and authenticity of living tradition.

The case studies explore the possibility and feasibility of using Chinese tradition to support a bounded architecture. Rich historical references and cultural heritage are good resources for contemporary Chinese regionalism architecture.

On the one hand, one can get inspirations of how to physically integrate the building into the built environment by learning from traditional planning and architecture. For example, China's rich traditional values in urban planning, such as the urban structure and tissue of Old City of Beijing, and lasting architectural prototypes, such as courtyard housing and traditional Chinese gardens, already are very much concerned with creating architecture that claims territory instead of architecture that is a free-standing object. For example, Chinese palaces are typically groups of buildings instead of single buildings, and these groups of buildings are meant to work within a bounded space. The Forbidden City of Beijing is a classic example of this. Or, as another example, the courtyard prototype is a

good physical boundary to create a semi-private space, an outdoor space that is part of the bounded architecture of the building. These strong traditions give Chinese regionalism the advantage that the attempt to reinterpret forms is already starting with a bounded architecture: the traditional models are often good examples of bounded architecture, or at least, as in the case of the comparison between traditional courtyard housing in Beijing and the Ju'er Hutong neighborhood, the traditional model is a good starting point for development that can improve living conditions by integrating some new ideas along with the traditional ones. As the Forbidden City shows, the idea of bounded architecture is not just valid for housing but could also be used for monumental, and public buildings including such building types such as museums, and libraries, where people can enjoy architecture and the built environment in a pleasant retreat and open space.

On the other hand, besides traditional architecture, rich Chinese ancient cultures are also potential sources ready for contemporary regionalist architects. The architect Xing Tonghe of Shanghai Museum, getting inspiration from ancient philosophy rather than traditional architecture, provides a new perspective for this direction. Some architects attempt to reinterpret tradition and culture by other ways, such as through the linkage with Chinese traditional arts. For example, the inspiration for the built form of Nanning New Commercial Center comes from ancient Chinese calligraphy. The architect Zhao Bing chooses the Chinese character dragon from a masterpiece of Caoshu style, one of popular styles of traditional calligraphy, by Zhang Xu, from the Tang dynasty as the formal reference. Dragon, a Chinese cultural symbol, is deeply rooted in the Chinese culture. The Chinese often consider themselves "the descendants of the dragon". The

Chinese Dragon is look upon as the ultimate symbol of Good Fortune. The architect Zhao argues that: “Calligraphy is a 2-dimension art working on the paper. And architecture is a kind of creation building on the earth. My idea is to create a built form that can be viewed as a 3-dimension calligraphy in space. The reinterpretation of traditional calligraphy in architecture somehow is a presentation of oriental culture.” (Zhao, 2002, p35) The complex presents the calligraphy of dragon by the plan layout (**fig.108, 109**).

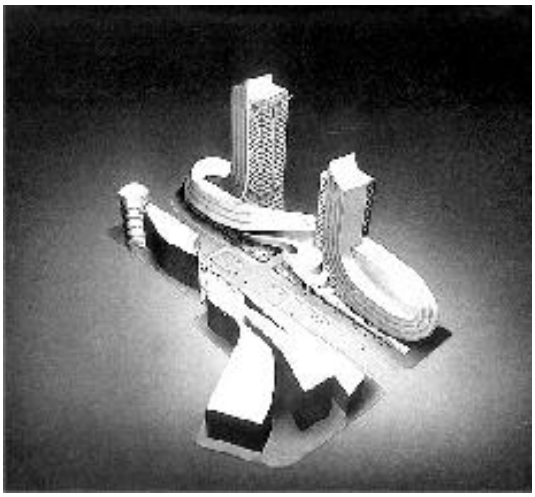
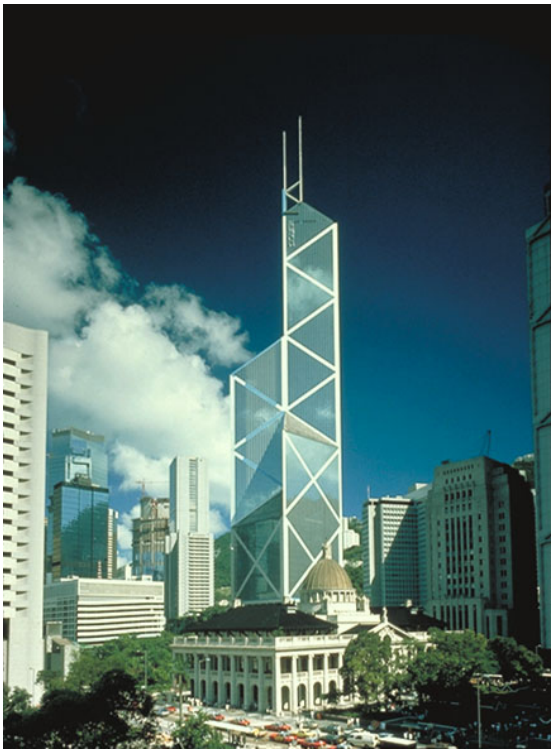


Figure.108. *The built form of Nanning New Commercial Center is inspired by traditional calligraphy.*

Figure.109. *A calligraphy masterpiece of the character “dragon” by Zhang Xu, Tang Dynasty.*

Moreover, besides taking inspiration from art, cultural ideas are potential sources for architecture. For example the Bank of China of Hong Kong shows attention to traditional culture. In Chinese culture, bamboo is one of the four favorite plants along with Chinese

plum, orchid and chrysanthemum. These plants are taken as possessing some human nature and the characters of the four plants are highly admired by Chinese people. The tower of the Bank of China Building employs triangular stepped-back plan. The sectioned trunk is inspired by the growth patterns of bamboo: its sectioned trunk being propelled higher and higher by each new growth. Pei invoked an image of the trunk of a bamboo pushing upward with each joint: a metaphor for the search for strength and excellence (Wiseman, 1990, 289). The four triangular shafts which form the building grow more narrow as the building rises. The built form resembles growing bamboo shoots, representing revitalization and hope (**fig.110, 111**). At the same time, the step-backs are structural adaptations to the high wind loads caused by Hong Kong typhoons.



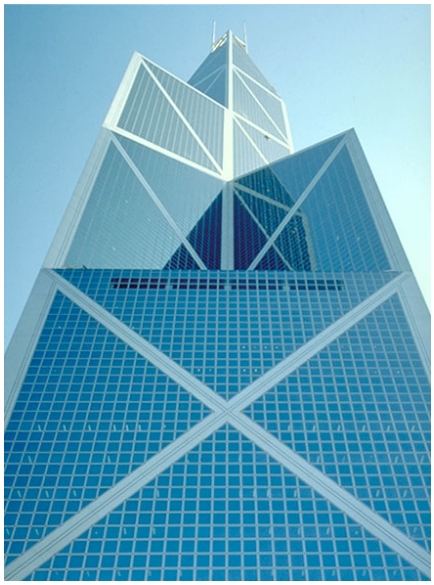


Figure.111.

Figure.110.

Figure.110 & 110. *The built form of Bank of China, Hong kong resembles growing bamboo shoots, representing revitalization and hope.*

In a word, tradition and culture can provide different perspectives for contemporary Chinese regionalism architecture through proper interpretations.

3. Chinese regional architecture should not copy traditional forms only for their appearance. Misuse of forms comes from trying to apply them only because of the form, not because of other reasons, like the roofs of the Beijing West Railway station. When forms are the product of imitation rather than derived from all the relevant important concerns, concerns like structure, function, as well as tradition or other social or cultural issues. Buildings like the Xiamen Gaoqi International Airport, or like Kenneth Yeang's Roof Roof House, reinterpret traditional forms in ways that accommodate non-traditional technologies and needs. The Xiamen Gaoqi International Airport references similar traditional roof forms as the Beijing West Railway station, but the forms are reinterpreted, revised and renewed by modern needs—an airport terminal—and by modern technologies, while the forms of the Beijing West Railway station more closely imitate traditional forms, despite the modern needs and technologies of the building.

One major issue for contemporary regionalist architecture is to make sure the built form presents authenticity rather than sentimental imitation. The principles to reinterpret tradition and culture in contemporary built environment are addressed as follows: First, it requires a proper reference of historical forms or cultural symbols which are still valid for today. Second, there is a necessary reinterpretation of the historical forms combined with modern and alien influences. Third, the built form should be consistent with the structural characteristics of materials. Fourth, the built form is a complement of the built

environment, responding to regional climate or creating favorable spaces with respect to the built environment immediately surrounding the site.

4. China is a large country and has many very diverse environments. The conditions of Beijing and Shanghai are very different which can be viewed as representatives of the northern China and southern China. Architectural responses of regionalism architecture to those conditions of light and climate must also be very different. For example, Beijing has very distinct four seasons and is characterized by cold and windy winter. Therefore, it requires an enclosed transitional space from the severe climate. The courtyard space of traditional Beijing housing is a response to regional climate. However, the climate in Shanghai is much milder and generous sunshine is an obvious characteristic which requires shading devices and open and ventilation space for architecture. Besides learning from traditional climatic strategies, regionalist architecture can make use of modern technology and materials such as bio-climatic technologies, like those used by Ken Yeang's Bio-climactic skyscraper, to respond regional conditions.

Besides the climate, natural conditions of the built site concern many other issues such as orientation, light, topography and site selection. Chinese architects can benefit from traditional culture such as ancient Fengshui theory. Fengshui, which is supposed to be related to the law and order of the universe and the power of nature, is an ancient Chinese concept that simply means "wind and water". It is a traditional Chinese study of the natural and "built" environment that has been practiced for thousands of years. As for architecture, it treats the environment as an integral part of the art of living. According to

the principles of Fengshui, seasonal cycles, locations, orientations and weather conditions could create imbalances. Therefore, creating balance and positive energy flow is essential. Architectural design elements can enhance or weaken the effects of positive or negative energies on those who live, work, or pass through a particular building or space. Fengshui emphasizes the combination of interior and exterior space, light, sounds, smells, materials, furniture arrangement, etc. The Fengshui principles, Yin and Yang, and harmony and balance, dominates all architectural activity hence the preference for concentric or symmetrical construction. For example, courtyards were built with traditional Fengshui concepts of the five elements that were believed to constitute the universe **(fig.112)**. The gate is placed at the southeast corner, which is the wind corner, while the main building is placed to the north, which is associated with the 'water' element, an element that opposes fire. Fengshui theories are a rich Chinese tradition that can guide us in seeking naturally beneficial site conditions and designing landscapes and buildings that are responsive to the local conditions.

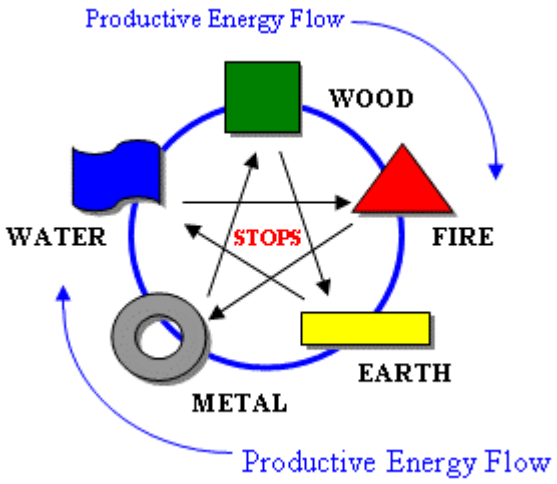


Figure.112. *The pattern of five elements of Fengshi theory.*

5. The tactile element of architecture that Frampton recommends can be applied to Chinese regionalist architecture in different ways. One important way is to use local materials. Different kinds of local pavements and variations in kinds of pavements create a varying experience of the architecture. Another aspect is the traditional use of outdoor spaces associated with buildings. Traditional gardens are closely integrated with the architecture and the plants of gardens contribute to olfactory experience. Another aspect is the traditional design of interior spaces: ceiling heights are varied to create different spatial feelings. For example, sometimes at the entrance, the ceiling was lowered and the main space such as lobby was much higher than the entry space; when you walk through the entry to the lobby, you will experience this change in the space. A similar strategy is used in palace buildings, such as the Forbidden City in Beijing, by the contrast of different sizes and shapes of courtyard. Such tactile and experiential variety was lost under the universalizing drive of Modernism as architects sought to create uniform spaces that created uniform, efficient results; critical regionalism can regain this tactile and experiential richness, perhaps only with a loss of efficiency, by focusing on the value of such experience and the possibilities for such experience afforded by regional conditions and traditions.

In conclusion, these five points, based on Kenneth Frampton's idea of critical regional, give directions for the development of a critical Chinese regionalism. Like Frampton, this thesis views these points as attitudes to strive for, not rules that must be followed. It is possible that successful Chinese regionalist architecture could be developed without these points, but these five points are intended to provide some guidance.

China is a large and varied country. In many ways it shares a unified cultural identity, but in others, there are distinct regional differences. This variety in climate and in history leads to distinct patterns of regionalism. In some cities, like Beijing, maintaining the traditional fabric is a necessary condition of good regionalism; in other cities, like Shanghai, a regeneration of a coherent urban fabric, one that blends the different historical traditions of the city as well as the explosive growth of the recent past, is what is called for. The two distinct lines of development suggest very different possibilities for critical regionalism: for example, in Beijing there is the question of how to increase density without building skyscrapers, while in Shanghai there is the question of how to integrate skyscrapers into the urban fabric without losing the regional characteristics and local history of Shanghai. Critical regionalism may avoid large projects, but in Shanghai it is possible to build a skyscraper that still has many positive, critical regionalist qualities, whereas in Beijing, skyscrapers are out of place. The history of the cities, including the development of the European settlement of Shanghai and I. M. Pei's refusal to build a skyscraper in Beijing, helps determine how to build critical regionalist architecture. Building a Chinese regionalist architecture will require attention to history and local conditions in addition to allowing for the exuberance of a period of rapid economic growth.

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