

Fang Wang

Geo-Architecture and Landscape in China's Geographic and Historic Context

Volume 2 Geo-Architecture Inhabiting
the Universe



 Springer

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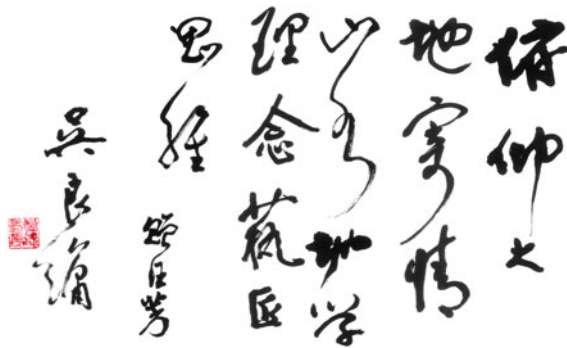
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Inscription by Liangyong Wu



*Admire the great earth,
Impart your emotions to the mountains and the waters.
The rationale of geography,
The thinking of the architect.*

Gifted to Fang Wang

From Liangyong Wu

Professor, School of Architecture, Tsinghua University

Member, Chinese Academy of Sciences

Member, Chinese Academy of Engineering

The Laureate of Supreme Prize of Science
and Technology of China in 2011

Foreword

Conservation in the broadest sense is an instrument for any society to modulate the rate of change in the (built) environment. Today, conservation discourse and practice extends from the preservation of historic artifacts to the natural environment in the most inclusive sense. Habitats, historic cities and buildings, cultural landscapes, and even intangible heritage are all part of that repertoire we call our inheritance. Naturally, in the process of rapid urbanization and transformation, the memory of these crucial aspects of our heritage is often compromised. Furthermore, the questions of conservation are often clearly not central to the agenda of development, nor for that matter even with the broader cultural or education discourse. Naturally this varies across countries and through different cultures and political regimes. In this context, China is an interesting case where rapid urbanization over the last 30 years put development at the forefront of its agenda often at the risk of the sudden erasure of its wonderful historic fabric. A condition where the memories of its rich heritage and the relationship of its people to their traditional built and natural environment was severely interrupted.

In fact, traditional practices of building in Chinese culture were about codifying man's relationship with nature—of how human beings should ideally situate themselves in this context. While in other cultures, like India, these rules were often codified through religion and thus often distorted in their practice, in China, traditional practices, premised largely on geomancy, stayed intact through the centuries. With the onslaught of rapid development and transformation in the built environment in China, questions of protecting the natural and historic built environment receded into the background. New codes to determine and facilitate “quick” growth took precedent. China and its landscape transformed like nothing witnessed in history before.

It is now, many decades later, that a new generation of architects and designers as well as historians and environmentalist are motivated to reclaim these traditions and weave a narrative of continuity between China's historically rich past and its incredible achievements of the present. It is in this context that this four-volume

collection titled *Geo-Architecture and Landscape in China's Geographic and Historic Context* is of critical importance. This work by Prof. Wang is a skillfully compiled collection of deep research on the historic and geographic relationship of the built environment and nature in China. This question is however interrogated in the most interesting and rigorous way by introducing the category of geography, which she extends into geo-architecture—a suggestion that architecture and its relationship to a particular geography is also a way to understand the social and cultural contracts that have evolved in that geography. And resulting from this relationship, the architecture that is manifested is usually a very particular response to its social, economic, and cultural context. This understanding clarifies not only the relationship of architecture to the land per se, but also the people, rituals, and cultural contracts that are associated with or a result of an architectural intervention. It goes further to interrogate the spiritual—the uncodifiable or the invisible that has often informed ways those societies are organized and their built environment conceived. In the context of China, this is a refreshing and brave departure, which promises to set down the foundation to engage these questions in the mainstream of architectural debate.

Professor Wang's understanding of culture as an ever-evolving phenomenon is also useful. I have known Prof. Wang since 1999 and remember her preoccupation with this issue since those transformative years in China. She sees culture as being dynamic, and really, the unwritten rules in society that evolve with conflicts, development, and the general evolution of a society. This has a direct bearing on the architecture of a place and attitudes of a society toward building as well as material culture. The historic environment is merely a yardstick to register this change. In the four volumes, the case studies are a wonderful supplement to the text, where examples illustrate these somewhat subjective readings of this implicit culture as well as history of building in China. The range of cases from rural and urban houses to institutional buildings as well as from deep traditions and colonial influences supplements the arguments very appropriately as well as vividly. The methodology of the work is unique in that it brings history, geography, and culture as well as the precision of architectural documentation together in the same collection. Clearly structured, a complex argument is made precise and in ways that can speak to planners and designer. In that sense, it could serve as an instrument that would be extremely useful not only for advocacy but also for pedagogy, more generally, in sensitizing a new generation of Chinese architects to the land on which they build.

The collection also sets an important precedent for the examination of traditions in landscape and architectural design for many parts of Asia. While India and China pose the polar ends of this spectrum of Asia, the resonance the book, say for Myanmar as it takes on the path of development or for Vietnam, would be equally powerful—a reminder to these cultures that the delicate balance between man-made and natural environments have deep historic traditions and are sensitive ecologies that can be leveraged for development and not seen as deterrents. As debates of ecology and sustainability take the fore in our discussions about architecture and

planning and we understand more clearly the interconnected nature of our existence on the planet, this book adds a powerful voice from China to the global debate. *Geo-Architecture and Landscape in China's Geographic and Historic Context* is a welcome addition to this growing body of literature, which will mold the thinking about design in rigorous as well as refreshingly new ways.

April 2015

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Preface

There is a close relationship between architecture and its geographic environment. In the context of reevaluating cultural globalization and increased focus on the geographic nature of architecture, architectural research from a geographic perspective has become increasingly significant. Of the forces that shape architecture, world-renowned Indian architect Charles Correa once said:

At the deep structural level, climate conditions culture and its expression, its rites and rituals. In itself, climate is the source of myth: thus the metaphysical quantities attributed to open-to-sky space in the cultures of India and Mexico are concomitants of the warm climate in which they exist: just as the films of Ingmar Bergman would be inconceivable without the dark brooding Swedish winter.¹

Climate is only one of several geographic factors, but from Correa's comments, we gain a glimpse of the impact that geography can have upon architecture. Further, we can extrapolate from our understanding of the relationship between geography and architecture a new perspective on the connotations for humanity itself.

1 Geo-Architecture Is not a Label for a Certain Form of Architecture

In related research both in China and elsewhere, a number of concepts draw close to geo-architecture, including regional architecture, vernacular architecture, and local architecture, to name only a few. It is not necessary here to compare all such notions in detail; for an illustrative example, compare geo-architecture with regional architecture: these two areas of study represent different viewpoints—those of geography and architecture, respectively—from which one might approach the built environment. The historical background, basic theories and analytical methods that

¹Correa, C. Regionalism in Architecture. *Journal of the University of New Mexico*, 1992, Vol. IX, Spring: 4–5.

underlie and characterize them are, for the most part, fundamentally different. Just as architecture scholars are often unfamiliar with geo-architecture studies, geography scholars are often equally unfamiliar with regional architecture concepts. However, while geography is a highly developed field with roots in antiquity, “regional study” has not yet to receive formal recognition as a scholarly discipline. To the extent that there arises a need to relate or differentiate the two approaches, “scale” provides us with a useful perspective. From a geographical perspective, different influences on architecture can be categorized according to the scale on which said influences act. In general, influences are considered to act on zone (macro), region (middle), and site (micro) scales. Regional architectural studies focus largely on the influence of a regional culture and a region’s natural features upon architecture. Geo-architecture studies, by contrast, are primarily concerned with the differences that arise between entire geological zones—for example, the appearance of differing architecture across different latitudes. Site characteristics, in turn, are the most basic of geographical factors (e.g., micro-landforms), which cause the architectural differences.

It is particularly important to assert that geo-architecture is neither a particular architecture type nor a label for a certain group of architecture forms. At some level, all buildings express geographic characteristics. Thus, the notion of geo-architecture includes all architecture to some degree.

2 Geo-Architecture Is a Research Thinking

Geo-architecture borrows perspectives, concepts, and methodology from the study of geography to investigate architectural phenomena and the processes that produce such phenomena. Geo-architecture is concerned not only with understanding the past, present, and, to whatever extent possible, the future of the physical architectural landscape but also with the human or social features of architecture. As such, geo-architecture draws particularly on theory and methodology from natural geography, human geography, and historical geography. Natural geography involves the study of geology, landforms, climate, hydrology, and vegetation, as well as the Gobi desert, Tibetan Plateau, loess landform, and other such typical physiognomy types. Human geography examines the intersection between geography and religion, nationality, custom, belief, economics, and politics. Historical geography deals primarily with population migration, regime change, foreign influence, etc.

Geo-architecture, within itself, is inherently a cross-disciplinary pursuit. The study aims to appraise the myriad influences of natural, human, and historical factors upon architecture. These influences are considered in three categories, namely the interaction between architecture and nature, the interaction between architecture and its human users, and the change in architecture over time; each category serves as a lens. Augmenting these lenses is the research factor of the Time–Person–Place concept, which is applied on three geographic scales in order of

decreasing magnitude: zone, region, and site. The analysis ultimately focuses on two aspects: geographic influence on architecture and architectural response to geography. Architecture research to date has dealt primarily with the regional scale and factors related to technology and the arts. From an architectural studies perspective, the research presented here is creative and unique in its consideration of multiple scales, multiple timelines, and multiple cognitive agents. Similarly, geography research to date has been predominately concerned with macro-scale phenomena. This research reflects new interest in micro-scale phenomena.

3 The Research Object Selection for Geo-Architecture

The term “architecture,” as used in geo-architecture, refers to more than individual buildings or groups of buildings and includes a wide range of subject matter not often touched upon in traditional studies of architecture. Sites such as the Mani field, the ancient postal road, and the tree-embracing pagoda—rarely, if at all, dealt within the predominant body of architecture research—are considered in great depth here. Some works that are especially representative of individual geographic locations, for example, the Lingqu Canal, which connects the Xiang and Li Rivers, and the Gaocheng Astronomical Observatory, which marks the earth’s core, are included as well. Each case is no less than an exquisite expression of human wisdom.

It is the authors’ hope that this work also spreads to some of China’s academic knowledge in the fields of the humanities and geography. Violent geological activity has made China, located at the intersection between several tectonic plates, home to a stunning variety of natural landforms: there are towering snow-capped mountains, extensive prairies, and rivers that surge through deep, winding gorges. Against this backdrop, Chinese civilization has, over a period of several thousand years, produced colorful cultures. Thus, selected cases are chosen to reflect as many landforms, geology, and culture types as possible.

This series *Geo-Architecture and Landscape* covers 103 cases distributed throughout 30 provinces, including autonomous regions, municipalities, and special administrative regions, all over China. To obtain first-hand materials, the research team for this work made great efforts to travel to the architectural sites in question for the investigation. Thus, over 95 % of the cases featured in this series were visited, experienced, and scrutinized by the research team members in person.

Each case study in these books investigates the interaction between architecture and geography from the aspects of climate, geology, vegetation, culture, and history. The beautiful pictures presented within the books strive to illustrate how architectural works exercise compliance, echo, and change to exist amongst mountains, water, stones, vegetation, and human society. This work seeks to analyze the Chinese natural and cultural identity; thus, all of the architectural works chosen for analysis are located in China. However, the theory presented here in the series is universally viable and thus can be valuably applied to architecture in other

countries as well. Architecture is the treasured heritage of human civilization in that it reflects the profound ways in which people of different skin colors and localities understood the geographical world around them.

Upon finishing this series, I could not help asking myself: what new thinking regarding the relationship between architecture and geography will the next sight of some mysterious or familiar geo-architecture lead to? This process of discovery has, if anything, made me all the more aware of my ignorance and enamored by the breadth and depth of the field; it is from these that I draw the strength and encouragement to press on without hesitation.

July 2015

Fang Wang

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I began working on the research for *Geo-Architecture and Landscape* in November 2007. Time has really flown. I would like to take this opportunity to extend my sincere thanks and appreciation to a number of individuals and organizations who have helped, contributed, and supported in various ways the realization of this series over the past 8 years.

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Help from the many people who provided illustrations, an important component of this series, is very much appreciated. Although too numerous to list, I greatly appreciate the kindness and generosity of those individuals, firms, and photographers who made accessible their beautiful photographs and drawings—on which the series has depended so greatly. Every effort has been made to credit sources appropriately in the captions, but apologies are due for any omissions or inaccuracies.

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In closing, this series *Geo-Architecture and Landscape* is dedicated to my husband, Shuai; our son, Han; and our parents, who have given me the adequate

work time, precious love, and valuable encouragement that I needed to persevere over the years.

In short, many thanks to all with whom I have worked and by whom I was helped over the last 8 years between 2007 and 2015 on *Geo-Architecture and Landscape*.

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Notes in Volume 2

Azure Dragon in the east is one of the Four Symbols and is the mythological guardian of east and also represents spring and property of wood.

Bagua, also named Eight Trigrams, is a basic philosophical concept of ancient China. It is a *yin* and *yang* system that can be composed of eight different forms and used to symbolize various natural and human phenomena.

Black Turtle-Snake in the north is one of the Four Symbols and is a creature that is a combination of turtle and snake, the mythological guardian of north that represents winter and the property of water.

Book of the Later Han (Mandarin: *hou han shu*), an official Chinese historical text from 25 to 220 AD on the period of the Han Dynasty, was mainly compiled by Fan Ye during the Liu Song Dynasty (420–479).

Chi, *cun*, and *zhang* are traditional ancient Chinese units of length. 1 meter \approx 3 *chi*, 1 meter \approx 0.3 *zhang*, 3.33 centimeters \approx 1 *cun*.

Column-and-tie construction is a typical style of traditional Chinese timber structures in which columns and beams are connected by mortise and tenon joints.

Cool lane is a type of narrow alley formed by building clusters which could help to organize the natural ventilation and cool the house. It is commonly found in the traditional *Lingnan* architecture in the south of China.

Diaojiaolou, also known as the stilted house, is a type of hanging foot building in China. It is built on a slope and supported by several wooden columns and is also called a hanging house because the pillars supporting the house are sometimes located outside the walls.

Dougong, a unique structural element and later an ornamental element in traditional Chinese architecture, is the wooden bracket that joins pillars and columns to the frame of the roof.

Fengshui (lit. wind and water) is also known as geomantic omen, and is a Chinese philosophy that seeks ways to harmonize humans with the surrounding environment.

Firm-mountain-sloped roof is a typical roof style of the traditional Chinese dwellings, usually comprised of two sloping roofs.

Fu (lit. prefecture) was an administrative division during the Tang (618–907), Ming (1368–1644), and Qing (1644–1911) Dynasties of China. It was also called “*Jun*” prior to the Tang Dynasty.

Gable-and-hip roof is a typical roof style in traditional Chinese architecture, usually comprising four sloping roofs with two large roof sections in the front and back, whereas on each of the other two sides is a smaller roof section with a gable.

Hexi Corridor is a historical route in northwest China that lies to the west of the Yellow River. It was the main access point from ancient *Zhongyuan* (lit. the Central Plain region in China) to Central Asia and West Asia for trade and military.

Horse-head wall is one of the most important elements with unique characteristics in Huizhou-style architecture of the Han nationality in China. It refers to the top parts of gable walls above the rooftop on both sides and gets this name from its horse-head like shape. During a fire, the horse-head wall built of stone could cut off the spread of flame and prevent neighboring wood-framed buildings from damage.

Jiangnan refers to the region to the south of the Yangtze River.

Jin Dynasty (265–420), Chinese dynasty, including the Western and Eastern Jin periods, is different from the Jin Kingdom (1115–1234) by Jurchen in northern China.

Jin Kingdom (1115–1234) was a kingdom dominated by the Jurchen people in northern China, and differs from the Jin Dynasty (265–420), which was ruled by the Han people.

Jinshen, a unit to measure the depth of the building, refers to the distance between two columns in the gable of the traditional Chinese wooden architecture.

Jun (lit. commandery or prefecture), was a traditional administrative division in China from the Warring States period (475–221 BC) until the early Tang Dynasty (618–907). Before the Qing Dynasty (1644–1911), it was smaller than a county, and it was larger than a county afterwards. Since the Tang Dynasty, it has been called “*Fu*.”

Kaijian, also known as *miankuo*, is a unit to measure the width of the building, which refers to the distance between two columns in the frontage of the traditional Chinese wooden architecture.

Kangxi Dictionary (Mandarin: *kang xi zi dian*), a standard Chinese dictionary during the eighteenth and nineteenth centuries, was edited by scholars of the Qing Dynasty (1644–1911). It was named after Emperor Kangxi (reign 1662–1722), who initiated compilation of the dictionary in 1710.

Kylin is a Chinese mythical creature that signifies luck and happiness.

Lease of Kiao-Chau (Mandarin: *jiao ao zu jie tiao yue*) was a treaty that was signed between the Qing Dynasty (1644–1911) and Germany in 1898 to transfer Kiao-Chau (known as Jiaoao and now Jiaozhou Bay) to Germany on a 99-year lease.

Lingnan culture is an important culture in southern China covering what are now the Guangdong, Guangxi, and Hainan Provinces.

Lingnan region originally referred to the region south of the Five Ranges and now generally covers the modern Chinese provinces of Guangdong, Guangxi, and Hainan.

Lingxing Gate, a type of gate commonly used in residences and temples. Usually the gate was built with a plaque in the upper part between two wooden columns and had three doors installed. After the Ming and Qing Dynasties, stone columns were more widely used for mausoleums and temples.

Negative (Yin) and positive (Yang) (lit. backing to the dark and confronting with the bright) is a traditional site selection discipline in ancient China that was believed to better harmonize the living and natural environments.

Paifang (lit. memorial gate), one type of monument in the form of gates and arches, is used to commemorate the merit or worship the ancestor.

Qi-Lu culture is the general term for the *Qi* and *Lu* cultures. The *Qi-Lu* region refers to the hodiernal Shandong Province. During the Spring and Autumn periods (770–476 BC), Confucianism theory as represented by Confucius (551–497 BC) was established in Lu State. The philosophers in the Qi State absorbed the local culture and made additional developments. The area of Mount Tai is one of the cultural centers of the *Qi-Lu* region.

Raised-beam frame is one type of timber frame in traditional Chinese architecture. It is characterized by using beams that are borne up by columns placed in the direction of depth, with layers of shorter columns and beams overlapped on the beam up to the ridge of the roof.

Serindia or the Western region (Mandarin: *xi yu*), refers to the regions to the west of the Yangguan and Yumenguan Passes in Dunhuang, including what is now Sinkiang and parts of Central Asia, although it is sometimes used more generally to refer to other regions to the west of China as well, such as the Indian subcontinent.

Sheng Jing Tong Zhi Tu, an official illustrated record of Shengjing Prefecture (modern Shenyang), was compiled by Chen Menglei during the Qing Dynasty (1644–1911).

Shi Ji Zheng Yi is an annotated collection of Sima Qian's famous *Historical Records*, literally *Historical Records of Justice*, which was completed by Zhang Shoujie in the Tang Dynasty (618–907).

Siheyuan, also as Chinese quadrangles, a historical type of residence, is commonly found throughout China, most famously in Beijing. It composes of a courtyard surrounded by buildings on all four sides.

Tai Shang Dong Yuan Shen Zhou Jing, a Taoist classic of the late Tang Dynasty (618–907) and literally *The Most High Dongyuan Scripture of Divine Spells*, was first created during the Western Jin Dynasty (265–316) and was edited by various authors over time.

Thang-ga is a unique painting form in Tibetan culture, which is a religious scroll painting that is suspended and has a consecrated mounting with colored satin.

Treatise on the Western Qiang (Mandarin: *xi qiang zhuan*), part of *Book of the Later Han*, was mainly about the history of Western Qiang ethnic minority tribe during the same historical period in the latter part of the Han Dynasty.

Vermilion Bird in the south is one of the Four Symbols and is the mythological guardian of the south and also represents summer and the property of fire.

White Tiger in the west is one of the Four Symbols and is the mythological guardian of west and also represents autumn and the property of gold.

Wu xing, literally Five Elements (namely, Fire, Earth, Metal, Water, and Wood), is included in traditional Chinese thought and used in the fields of philosophy, medicine, astrology, *fengshui*, etc.

Wudian roof is a four slopes roof and is the most distinguished roof form in ancient Chinese architecture and is commonly used in paramount buildings for the royals and religions.

Xu Xiu Da Yue Tai He Shan Zhi is a monograph on the Great Taihe Mountains (known as the Wudang Mountains) that is literally *A Continuous Record of the Record of Great Mountain–Taihe Mountain*, and was edited by Chen Qingnian in 1922 based on an edition of the *Record of Great Mountain–Taihe Mountain* by Wang Gai in 1744.

Xuanshan roof is a two slopes roof that is one of the most common ancient forms of roof in the history of Chinese architecture.

Yin and yang are a pair of traditional Chinese philosophical concepts that represent the two opposite or contrary principles in nature and how they give rise to each other as they interrelate to one another. They are used in various fields of traditional Chinese culture, including religion, philosophy, calendar, *fengshui*, etc.

Yu the Great (Mandarin: *da yu*), a legendary ruler in ancient China famed for his introduction of flood control, inaugurated dynastic rule in China by founding the Xia Dynasty in the twenty-first century BC.

Zhang, *chi*, and *cun* are traditional ancient Chinese units of length. 1 meter \approx 3 *chi*, 1 meter \approx 0.3 *zhang*, 3.33 centimeters \approx 1 *cun*.

Zhongyuan culture (lit. culture of the Central Plain region in China) is the origin and core part of the Chinese culture centered in Henan Province and distributed in the middle and lower reaches of the Yellow River, which can be traced back to the Neolithic from 6000 to 3000 BC.

Zhongyuan is referred to the central plain region in China, where dynasties were usually led by the Han people in the ancient China.

About the Author

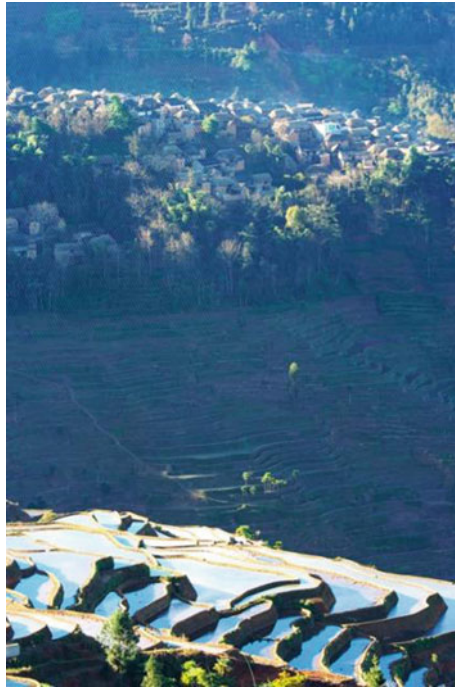


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Dr. Wang’s research concentrates on introducing geographical philosophy, methods, and techniques into the traditional engineering-dominated fields of urban planning and architectural design. Her focus is also known as “geographical planning and design,” i.e., research on the influence of geography upon urban planning and design and reflexively, urban planning and design responses to geography. She is interested in the following research: the preservation and renewal of cultural landscapes and historical districts and planning and design of sightseeing districts and geo-architecture. She has published over 70 academic papers and three books (one in Springer) and has translated nine books from English to Chinese for publication. She has piloted one China Natural Science Foundation project, three Sino-German Center projects, and six other projects of provincial and ministry-level funding. As the team leader, she won the Second Prize of Land Resources Science and Technology Award in 2015, sponsored by Ministry of Land and Resources of the People’s Republic of China.

Part I

Houses and Tombs



Hani Ethnic Villages.
Source Photograph by Fan Yin

Chapter 1

Introduction

Animals all have their own resting places in nature. For instance, birds build nests and ants dig holes. The structure of the residence best reflects the builder's intelligence and adaptive abilities. Houses, the homes of the living, and tombs, the homes of the dead, are the resting places of human beings, designed to keep humans out the wind and rain, as well as safe from other external threats. On the one hand, houses are more practical than the latter, as they are the foundation of physical life and reveal how human adapt to and depend on nature. On the other, a tomb is more of a memorial than a pragmatic dwelling; a reflection of the spiritual world that reveals how humans respect nature and pursue their spirit worlds. Houses and tombs provide direct evidence of human intelligence in an era when science and technology was relatively underdeveloped. Houses and tombs are both a result of the long-term process of human adaption to a variety of geographical and cultural settings, with which they gradually merged together. In this book, the mausoleum, as the type of tomb for powerful and wealthy owners, will be paid more attention for its typicality.

A more evident difference between houses and tombs is the difference in the intended time of preservation. Houses, composing the majority of constructions, are built for residential purposes, and therefore convenience rather than memorability or survival is paid more attention. Typically, once losing function, a house will be abandoned or rebuilt immediately. Similar to other necessities of life, houses are consumed after a short amount of time to accomplish a basic purpose and then will be destroyed (Li 2005). Tombs built for the dead, unlike houses, are monumental buildings that aim to preserve the deceased body. Tombs are built to last, and thus a large number of them have been well preserved.

The history of architecture originates with residential houses (Li 2005). Houses have a wide range of uses among people of different classes. Mausoleums, however, have a narrower scope of application—most of them were built for emperors and other powerful holders. Common people did not have the right to build a mausoleum, and therefore we can see how ordinary people in earlier ages adapted to environmental conditions through their houses. From mausoleums, we can see

how the social hierarchy was designed and how the elite groups used their wisdom to survive and keep human bodies facing the challenges of nature through the architectural styles of the previous eras.

1.1 Geographical Roots of Architecture

Liang Sicheng (1901–1972), an important Chinese architect and architectural historian, once stated in his work *History of Chinese Architecture* that, originally, “the occurrence of architectural styles is a direct result of the fulfillment of practical needs. Architecture is confined by physical settings rather than patterns or styles. The systematization of structures and stylistic categories are the consequence of available materials and environment” (Liang 2005). Environmental surroundings are thus the foundation of architectural techniques in the case of both houses and tombs. Architecture is influenced not only by natural geographic conditions but also by human and cultural factors. Ito Chuta (1867–1954), a Japanese architectural historian and critic, in his version of the *History of Chinese Architecture*, said, “Chinese art varies with location. ... Different locations have common characteristics, but many more differences occur in regard to details. Reasons for these differences fall within two categories, one is the type of land, and the other is the temperament of the dwellers.”

1.1.1 Houses

(1) Natural Geographical Conditions

Taking climatic constraints first, China possesses a vast terrain stretching across five temperature zones from south to north. At the same time, the country extends across several different zones of moisture, from the wet southeast to the dry northwest. For purposes of ventilation, lighting, and insulation, people in these wide-ranging regions have assembled materials to overcome the limitations of challenging environments by creating appropriate residential environments through the efficient organization of space and the utilization of creative construction techniques.

Concerning the geomorphologic constraints, the various types of terraces in China can be divided into three regions, from the southwest Tibetan Plateau, to the northwest deserts and the snow-capped mountains, to the eastern hills, cliffs and beaches. In agricultural societies, farmland is the basic source of subsistence. To leave the flat and fertile land for agricultural use, houses in hilly areas are mostly built where farming is hard to conduct (Sha 1998). Residents are usually unable to make major changes to the terrain and can only try their best to take advantage of the micro topography in the regions where they choose to settle, which is most obviously reflected in the methods they use for building houses on slopes. For example, people of the Hani ethnic villages in the Valley of the Honghe River live mainly on the terraced fields, with their villages located on the slope. Terrain and

water availability both have an impact on house construction, so residences are usually built near a river. The relationship of water and landform to architecture is a key element in the study of traditional construction techniques.

(2) Socio-economic Modes

For a significantly long period in history, the main method of production in Chinese society was small-scale agriculture. The natural economy was dominant, and producers prioritized the fulfillment of their own needs rather than utilizing a barter system. Even today, many villages retain a traditional, self-sufficiency mode of production and economy when limited by a lack of opportunities for communication and transportation. When a village's access to external resources is limited, only local material is available for house construction. Construction materials and methods thus heavily depend on the surrounding geographical environment. The socio-economic model of natural economy limits the development of residential buildings, resulting in regional and cultural variations in house characteristics, as well as in humanistic beliefs such as nature worship.

(3) Cultural Backgrounds

According to the conclusion of Shan Deqi, a professor in the School of Architecture, Tsinghua University, the cultural norms inherent in traditional architecture include a number of key elements: an ecological view that humanity is closely related to heaven, a morphological view that emptiness and existence create each other, and a sentimental view that refined and popular tastes should be synthesized (Shan 2004). The view dictates that human beings constitute a part of nature. As the body will decay into soil after burial, all human affairs and endeavors must conform to the laws of nature to function and develop. This can also be regarded as a belief in humanity's intrinsic responsibility for nature, which is rooted in respect for the surrounding environment. Simultaneously, different ethnic groups have their own cultures and forms of ideological worship. For example, the Aba Tibetan Villages' buildings incorporate windows with a wide upper pane and a narrow lower pane, which is representative of the Tibetan worship of the plateaus and snow peaks.

1.1.2 Tombs

The mystery of death piques irrational speculation and superstitions. The location and construction methods of tombs are constrained by the limitations of natural geographical settings, traditional classical philosophy, and religious beliefs. However, the initial reason for the construction of a tomb is "to serve the dead as if alive." Though tradition maintains that life has a natural end, it also claims that after death, people go on to another world that could still bring fortune and disaster to earthly lives. Tombs are also the residences of the deceased's soul. Descendants pray for their ancestors to bring about happiness and protect their offspring, and they serve the dead with respect and devotion in their daily life.

(1) Natural Geographical Conditions

Tombs, similar to houses, are constrained by the limitations of the surrounding terrain; however, tombs are more adaptable. The reason mainly lies in the greater number of possibilities for tomb location selection. Furthermore, unlike houses, mausoleums are usually built in groups for members of the royal family and thus are usually located not far from downtown capital cities.

Mausoleums are often large in scale and, according to the traditional *fengshui*¹ concept of construction, built near mountains. For instance, the Qianlin Mausoleum from the Tang Dynasty (618–907) takes the neighboring mountain as its foundation. Tomb structure emphasizes balance and visual stability, balancing the architecture with its surroundings and carefully considering the form of the architecture itself. For instance, the worship path of the Changlin Mausoleum from the Ming Dynasty (1368–1644) bends to extend along the mountain. To achieve balance, the cubic volume of the mountains to the left and right of a sacred area should be nearly equal visually; thus, the path of worship curves are built nearer to the side of the smaller mountain.

Moreover, because part of the tomb is always buried underground or under the hill, the tomb location is sensitive to geological changes. For optimized conservation, the tomb should be kept stable and firm, and the local geological conditions and the effects of natural disasters should be taken into account in every decision of the architect.

(2) View of *Fengshui*

The idea of “*fengshui*” originated with the construction of houses but has also significantly influenced the sites and layout of tombs. *fengshui*, is based on a view of nature that introduces the knowledge of astronomy, climate, geography, hydrology and ecology into the art of the laying out of sites (Yu 1996). It is a comprehensive reflection of traditional Chinese views of the universe, nature, aesthetics, and the environment. To choose an enclosed space surrounded by mountains and rivers is a basic rule of site choice in *fengshui*. Royal tombs are representative of not only a family’s dignity and wealth but also those of a dynasty. Therefore, royal families in particular expend great effort in tomb construction. For example, the Mausoleum of the Emperor Qin Shi Huang (259–210 BC) rests on the Lishan Mountain and faces the Weihe River, so that the entire region is visible from the tomb site. The terrain is in the shape of a lotus, which makes it a particularly excellent site according to the principles of *fengshui*. Although the concept of *fengshui* may be to some degree superstitious, the requirement that site choice should conform to geographical demands is important for scientific construction.

(3) Rise and Fall of Dynasties

Classical philosophy dictates that mausoleums play a special role in the structural representations of historic dynasties. Therefore, the layout and construction of a

¹*Fengshui* (lit. wind and water) is also known as geomantic omen, and is a Chinese philosophy that seeks ways to harmonize humans with the surrounding environment.

tomb will be more complete when a dynasty prospers and will be cruder when the dynasty is forced to spend resources waging war. Moreover, the thoughts and views on values of different eras can be observed through an analysis of mausoleum layout, pattern, and scale. During the Song Dynasty (960–1279), for example, burial traditions were simple but decorous.

1.2 Geographical Revelation of Houses and Tombs

1.2.1 Houses

(1) Location Determines Form

Location determines form due to the requirement that construction should be adaptable to local climate and terrace.

Climatic control can be approached from many directions. For example, the depth and material of walls can change to control internal heat, and the direction and size of windows can control the amount of light and air that enter a room. The material and the slope of a roof can be adjusted according to rainy or dry weather conditions, and spatial arrangements can take advantage of light and air. For instance, Yangchi Ancient Village is well adapted to a warm and moist subtropical monsoon climate through its comb-shaped distribution and ventilation features. With regard to architectural composition, special forms can be adopted to exploit temperature, light and air. For example, in the Aba Tibetan villages, houses are built with stone, stairs grow wider upwards, and windows are small to ensure that the house is warm in winter and cool in summer.

When the geographical setting incorporates land and water, the overall house and village reflect a response to their specific surroundings. Gongtan Ancient Town is a typical example in which architecture has adapted to the steep riverside slopes of Fenghuang Hill. The type of building, *diaojiolou*,² built on stilts, represents the results of adaptation to terrain and ventilation requirements. Some special houses, such as those in the Marine Fishing Village at Sandu Bay, take on a unique form—floating on the water—to satisfy the needs of production and daily life.

Regarding culture, houses reflect the lifestyles and beliefs of different ethnic groups, thus forming different modes of architecture. Mongolians live as nomads on the prairie and have developed the Mongolian yurt in response to frequent migration.

(2) Use What Is Available

The materials of traditional residential architecture are usually locally available. The constraints of transportation and economy mean that village residents are unlikely

²*Diaojiolou*, also known as the stilted house, is a type of hanging foot building in China. It is built on a slope and supported by several wooden columns and is also called a hanging house because the pillars supporting the house are sometimes located outside the walls.