



TESI DI DOTTORATO
POLITECNICO DI TORINO



Yuanming Yuan Garden: Space Arrangement Principles among Italy and China in Eighteenth Century

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Tutor: Professor Marco Trisciuglio

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Architettura e Progettazione Edilizia

D.AD - Dipartimento di Architettura e Design

Castello del Valentino - Politecnico di Torino

Commissione Esaminatrice:

Innovazione tecnica e progettazione nell'architettura

Professor Gianfranco Cavaglià

Professor Françoise Véry

Professor Pier Antonio Val

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Tutor: Professor Marco Trisciuglio

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for your courses and for your kind advices, help us discover a new field and find directions.

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Scudo

for the possibility to study in Italy. for all the friendly helps.

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ASTRATTO

Yuanming Yuan è l'unico giardino Imperiale nella storia cinese, unisce giardini classici cinesi e giardini dell'Italia Rinascimentale e Barocca.

Architetto Significativo per Yuanming Yuan

Giuseppe Castiglione (1688 – 1766): La storia del Western Mansions ha inizio nel 1747, quando l'architetto, Giuseppe Castiglione riceve l'incarico di intraprendere i lavori del nuovo giardino Italiano dentro il giardino imperiale Yuanming Yuan.

Giuseppe Castiglione ha avuto un ruolo importante come pittore, architetto, e politico nei tempi suoi in Cina. Castiglione riunì cultura tra Oriente e Occidente, teoria e pratica, potenza e virtù, pensiero e azione.

Il Preludio: una genealogia di ricerche accademiche occidentali dei Yuanming Yuan (dal 1743 ad oggi).

Nel primo capitolo vengono presentati i principi di arrangiamento dello spazio del Western Mansions – gli assi ortogonali per rappresentare la pianificazione territoriale, la prospettiva geometrica per ricercare la sequenza spazio, e gli elementi Italiani per leggere compositivamente il giardino.

Nel secondo capitolo seguiranno note sui tradizionali giardini Cinesi di Yuanming Yuan – un sistema di Modularità. Il capitolo presenta Le Quaranta scene di Yuanming Yuan (1744) e la Cartografia di giardini anglo-cinese da Georges Louis Le Rouge (1707 – 1790), che sono stati analizzati per ricercare il sistema di Modularità del giardino Yuanming Yuan.

Queste note servono a introdurre il terzo capitolo – il capitolo delle sperimentazioni sui giardini. I campioni rappresentativi delle sperimentazioni provengono dalle Bibliothèque nationale de France, dalle Mission Palais d'été, e dall'Università Tsinghua. Gli strumenti della mia ricerca scientifica sono stati: il modello tridimensionale digitale, il calcolo matematico, e l'analisi tipologica.

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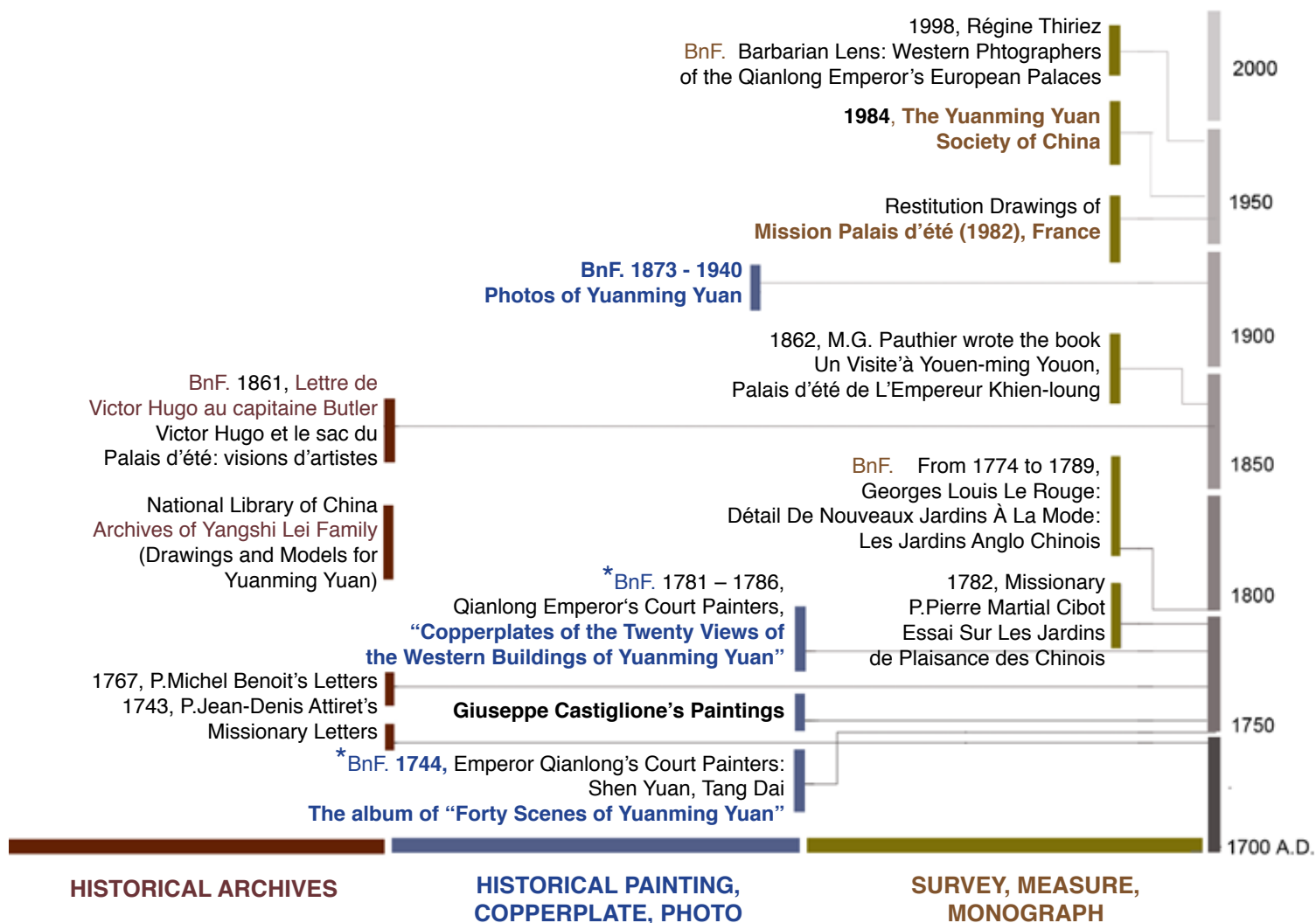
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Prelude

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- II. List of Illustrations
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Spatio-temporality of Yuanming Yuan
- V. List of Western Academic Researches of Yuanming
Yuan (From 1743 till now)

Research Methodology:

1. Genealogy of Yuanming Yuan Academic Researches (From 1743 till Now):



2. Italy Principles and China Principles Research

ITALY

Architect Giuseppe Castiglione (1688 – 1766, Milano, Italia)

Projects



The Western Mansions of Yuanming Yuan

Culture Background

Italy Villa, Italy Philosophy, and Italy Culture

Design Principles

Italy Garden Space Principles (18th Century) Embodied in Western Mansions

- **The System of Arrangement:**
Axis, Bilateral Symmetry,
and Geometric Module of Squares
- **The System of Perspective:**
Quadratura Painting (also called trompe-l'oeil)
Viewpoints, Horizon, and the Panorama
- **The System of Space Sequence:**
Rhythm and Proportion
- **Italy Classical Garden Elements Embodied in Western Mansions**

CHINA

Architect Yangshi Lei Family

Projects

Chinese traditional gardens in Yuanming Yuan:

Garden of Perfect Brightness
Garden of Eternal Spring
Elegant Spring Garden



Culture Background

Chinese traditional gardens, Philosophy, Cosmology

Design Principles

Chinese Garden Space Principles (18th Century) Embodied in Chinese traditional gardens of Yuanming Yuan

- **The System of Arrangement:**
Tangible Axis and
Codified Space Sequences
- **The System of Combination:**
Axiom of Modularity
- **Inspirations for Kaleidoscopic Spaces:**
Lyrical Literature
- **Typologies of architecture forms inside Yuanming Yuan**

3. Garden Experiments

I.Experiments of Western Mansions:

Experiment: Perspective System – View and Horizon of the Western Mansions

- Representative Samples for the Experiment:

- *Copperplates of the Twenty Views of the Western Buildings of Yuanming Yuan, (1781 - 1786)*

Bibliothèque nationale de France

- *Restitution Drawings of Western Mansions come from “Mission Palais d’été” (c. 1985),*

Bibliothèque nationale de France.

- My Experiment Methodology:

Strategies: Digital Models, Mathematical calculations, and Perspectival System Diagrams

Step 1: Make Scientific Three-dimensional Digital Models:

Data of the digital model of Western Mansions comes from “Guo Daiheng Studio in Beijing Urban Planning Design and Research Institute of Tsinghua University”;

For the details of garden design, refer to the Archives of Drawings and Models of Lei Family, from China History Archives No.1 and from the National Library of China.

Step 2: Analyze Spaces Sequence: Graph of Relation Diagrams between eye height, the distance to the horizon and perceptible height behind the horizon

The Mathematical calculation Formula for View Points and Horizon comes from TUDelft; Data collection comes from Tsinghua University.

Step 3: Analyze the Perspectival System: Composition Scheme

Transverse Space Sequence

Longitudinal Space Sequence

Make Axonometric Projection and research active composition elements.

My Work: 1. Design the experiment methodology and the scientific research program.

2. Make a Digital Three-dimensional Models for Western Mansions; make the Axonometric Projection to analyze the space sequence.

3. The active composition elements study.

II.Experiments of Chinese Traditional Gardens: “Forty Scenes of Yuanming Yuan”

Experiment : Axiom of Modularity in “Forty Scenes of Yuanming Yuan”

- Representative Samples for the Experiment:

- The album “*Forty Scenes of Yuanming Yuan*” (1744) from Bibliothèque nationale de France, Paris
- *The Forty Garden Plans of “Forty Scenes of Yuanming Yuan”*, Restitution on Paper by Prof. He Zhongyi, Tsinghua University, Beijing.

Experiment Theories and Inspirations from:

- The logic of Typology and Modularity Derivation refer to Prof. Marco Trisciuoglio, *Scatola di Montaggio, L’architettura, gli Elementi della Composizione e le Ragioni Costruttive della Forma*, Carocci editore, Roma, 2008
- The Axiom of Modularity Theories in Chinese Art refer to Ledderose, *Ten thousand things: module and mass production in Chinese art*, Princeton University Press, 2000.
- The Logic of State-action Trees Schemata refer to William J. Mitchell, *The Logic of Architecture: Design, Computation, and Cognition*, Cambridge, MIT, 1990

- My Experiment Methodology:

The System of Garden Form: The Axiom of Modularity

Step 1: Absolute Essences of the Chinese Traditional Garden Form

Step 2: Recognition and Labeling Rules:

Extraction of A Primal Sketch of the combination of every scene.

Step 3: Derivation of Alternative Elements.

Drawing A Tree Diagram depicting the derivation and structure of the Composition Scheme
Order of garden design.

- My Work:
1. Design the experiment methodology and the scientific research program
 2. Draw analysis charts to analyze the Axiom of Modularity in Space Arrangement of Yuanming Yuan.
 3. Apply Processing (A Programming JAVA Language for Visual Art and Design) into Typology Diagrams.

List of Abbreviations

GENOVA, ITALY

ISTITUTO PIO RICOVERO MARTINEZ

PARIS, FRANCE

BIBLIOTHÈQUE NATIONALE DE FRANCE

MUSÉE NATIONAL DES ARTS ASIATIQUES-GUIMET

BEIJING, CHINA

THE PALACE MUSEUM

THE NATIONAL LIBRARY OF CHINA

CHINA HISTORY ARCHIVES No.1

TAIBEI, TAIWAN, CHINA

NATIONAL PALACE MUSEUM

ACADEMIA SINICA

INSTITUTE OF MODERN HISTORY

UNIVERSITIES

POLITECNICO DI TORINO

TSINGHUA UNIVERSITY

DELFT UNIVERSITY OF TECHNOLOGY

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- Chinese Garden Art:

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Fig (P.116 -P.155). ***The album of “Forty senses of Yuanming Yuan”***. Source: Richelieu Library, département des Estampes et de la Photographie de la Bibliothèque nationale de France. Photo by Jiang Qingyu

List of Historical Events: Spatio-temporality of Yuanming Yuan Garden, Cross the Datum of Yuanming Yuan in 18th Century

The Chronology of Qing dynasty refers to Qing Emperors' archives in China History Archives No.1 (Beijing). The Chronology of Yuanming Yuan construction refers to the documents of Lei Family from the Palace Museum (Beijing). The information of Western Mansions refer to the archives of Bibliothèque nationale de France (Paris).

My work: research these archives, summarize significant events, and display the Yuanming Yuan history through a comprehensive perspective.

1707, 46th year, Kangxi Emperor

The initial constructions started.

1709, 48th year, Kangxi Emperor

Kangxi gave his son, Prince Yinzheng (the future Yongzheng Emperor) a small garden, named it Yuanming Yuan (Garden of Perfect Brightness).

1715, 54th year, Kangxi Emperor

Giuseppe Castiglione arrived Beijing. In 1716, Castiglione participated in the Royal Painting Institution (inside the Forbidden City).

1725, 3rd year, Yongzheng Emperor

Yongzheng Emperor furthered the constructions of Yuanming Yuan: enlarged the area to the northwestern suburbs of Beijing.

1736, 1st year, Qianlong Emperor

Qianlong Emperor inherited Yuanming Yuan from Yongzheng Emperor.

1744, 9th year, Qianlong Emperor

During the period of Qianlong Emperor, the *"Forty Scenes of Yuanming Yuan"* completed. Qianlong Emperor selected forty best sceneries by himself, named each of them a poetic title, and ordered best court artists to make the paintings and the calligraphies. Today, this album have been kept in Bibliothèque nationale de France, Paris.

1747, 12th year, Qianlong Emperor

The construction of Western Mansions began. Western Mansion designed by Giuseppe Castiglione (1688 – 1766), consisted ten Western style buildings.

1751, 16th year, Qianlong Emperor

Changchun Yuan (the Garden of Eternal Spring) and Qichun Yuan (the Garden of Blossoming Spring) were built to the east of Yuanming Yuan.

1773, 48th, Qianlong Emperor

The construction of Western Mansions had completed.

From 1781 – 1786, Qianlong Emperor

Copperplates of the Twenty Views of the Western Buildings of Yuanming Yuan had completed.

These copperplates have been kept in Bibliothèque nationale de France, Paris.
For each Copperplate: 26 kilograms of red bronze, the size is 65 cm in height and 90cm in width.

List of Western Academic Researches of Yuanming Yuan Genealogy Researches From 1743 till Now:

- **The Epoch before Second Opium War 1860:** Ultimately, much of the theory and European research concerned with Yuanming Yuan can be traced back to Missionary Letters of 18th century.

In 1743, P.Jean-Denis Attiret¹ (1702 - 1768), wrote a letter to his friend M.D'Assault. In the letter, Attiret described the grandeur scenes inside Yuanming Yuan.

In 1767, another Missionary P.Michel Benoit (1715-1774), who designed the hydraulic system inside Western Mansions, wrote to M.Papillon d'Auteroche and described the marvelous Yuanming Yuan with passion.

In 1782, Missionary P.Pierre Martial Cibot² wrote a book *Essai Sur Les Jardins de Plaisance des Chinois*. This book analyzed the design strategies of Yuanming Yuan. Missionary P.Pierre Martial Cibot had worked inside Yuanming Yuan with Giuseppe Castiglione for a long time. This monograph published in Europe, and had a widespread influence in the academic fields³.

From 1774 to 1789, Georges Louis Le Rouge, published a series of books: *Détail De Nouveaux Jardins À La Mode: Les Jardins Anglo Chinois*. The volume IV included the *Forty Scenes of Yuanming Yuan* redrawn by Le Rouge himself in ink.

In 2004, Bibliothèque nationale de France reedited Le Rouge's researches, published his studies in book *Georges Louis Le Rouge: Les jardins anglo-chinois*. The monograph not only contained *Forty Scenes of Yanming Yuan* redrawn by Le Rouge in ink, but also analyzed the anglo-chinois (Italiano: anglo-cinese) gardens of 18th century in Europe.

1 Refer to J.-D. Attiret, *Lettre à M. d'Assault 1743, dans Lettres Edifiantes et Curieuses de Chine par les Missionnaires Jésuites*, 1749, vol. XXVII, p-1-61; reedited, 2003
French missionary Jean Denis Attiret (1702-1768) had cooperated with Giuseppe Castiglione for Yuanming Yuan design and construction.

2 P.Pierre Martial Cibot, had worked inside Yuanming Yuan as a court painter, and had researched Chinese traditional garden design for decades.

3 See Guo Daiheng, *Yuanmingyuan from Digital Perspectives: Selected Proceedings of the International Symposium on Research and Conservation*, Zhongxi Book Company press, 2010, page 5
Prof. Guo is the vice president of Yuanming Yuan Society of China. Guo had written and published several authoritative monographs about Yuanming Yuan research.

- From the Second Opium War (1860) to the First Half of 20th Century:



Victor Hugo's Statue in the Western Mansions of Yuanming Yuan (Beijing).
Photo by Jiang Qingyu (2013).

Victor Hugo (1802 – 1885), the great French poet, novelist, and dramatist, gave high praise to the art of Yuanming Yuan in *Lettre au capitaine Butler*⁴(1861). In this letter, Hugo described Yuanming Yuan as “*un rêve des mille et une nuits*” (a dream of one thousand and one nights), and commented the garden art as a “*chef-d’œuvre*” (masterpiece). Hugo wrote:

“Cet édifice, qui avait l’énormité d’une ville, avait été bâti par les siècles, pour qui? pour les peuples. Car ce que fait le temps appartient à l’homme. Les artistes, les poètes, les philosophes, connaissaient le Palais d’été; Voltaire en parle. On disait: le Parthénon en Grèce, les Pyramides en Egypte, le Colisée à Rome, Notre-Dame à Paris, le Palais d’été en Orient. Si on ne le voyait pas, on le rêvait. C’était une sorte d’effrayant chef-d’œuvre inconnu entrevu au loin dans on ne sait quel crépuscule, comme une silhouette de la civilisation d’Asie sur l’horizon de la civilisation d’Europe”⁵ (Victor Hugo, 1861).

Victor Hugo’s letter emphasized the arts of Yuanming Yuan, denounced the war, and called for the the world peace. Hugo’s letters, his literature works, and his noble characters touched the heart of Chinese people. Today, a statue for Victor Hugo’s locates inside the Western Mansions. The whole China will be remembered the great man, the kind friend of China forever.

The historical photos of Yuanming Yuan (1873 - 1940): Regine Thiriez, in monograph *Barbarian Lens: Western Photographers of the Qianlong Emperor’s European Palaces*, presented precious photos of Yuanming Yuan from 1873 to 1940. Today, this monograph could be read in research library of Bibliothèque nationale de France, is one of the most important historical archives analysis for Yuanming Yuan.

4 Victor Hugo’s *Lettre au capitaine Butler* (1861) is very famous in China. Today, in Yuanming Yuan, there is a statue for Hugo inside Western Mansions.

5 See Che Bing Chiu, Gilles Baud-Berthier, *Yuanming yuan: le Jardin de la clarté parfaite*, Besançon: Éd. de l’Imprimeur, 2000.

Gilles Baud-Berthier’s research contains “*Lettre de Victor Hugo au capitaine Butler, Hauteville-House, 25 novembre 1861*” (Letter from Victor Hugo to Captain Butler), bibliographical references. page. 347 - 348.

See also Nora Wang, Ye Xin, *Victor Hugo et le sac du palais d’été*, Publication: les indes savantes, Paris, 2003. BnF., Richelieu - Estampes et photographie

- Influential Contemporary Research from the second half of 20th Century till now:

Mission Palais d'été⁶: The Great International Academic Collaborative Research for Yuanming Yuan, established and promoted by French government and Chinese government (Ministry of Culture) since 1983.

French representative is Jacques Langer; Chinese representative is Vice Minister Zhou Weizhi. French experts and scholars were responsible for the mapping and restitution drawings of Western Mansions in Yuanming Yuan. Chinese experts focus on researches of Chinese classic gardens in Yuanming Yuan.

In summary, research works include:

1. Study the paintings by Giuseppe Castiglione.
2. Analyze the history of the Western Mansions.
3. Collect and research the old photographic and archives from 1873 to 1940.
4. Garden art and landscape research, restitution drawings of Western Mansions.
5. Documentation of academic archeology sources, analysis of Jesuits missionary letters (since 1743).

Bibliothèque nationale de France contains a large number of historical archives of Yuanming Yuan (La Palais d'été) in Richelieu Library, such as engravings, antiques, paintings, writings:

1. Historical Engravings (1781 - 1786) of Buildings in Western Mansions of Yuanming Yuan, for example, *Copperplates of the Twenty Views of the Western Mansions* (1781 – 1786). These copperplates are precious culture heritages, which present the grandeur and original appearance of Western Mansions in front of us.
2. Restitution Drawings of Mission Palais d'été: for example, the plan of the Western Mansions, the façade of Fangwaiguan (Belvedere) etc. French experts, such as Ms. Michèle Pirazzoli-t'Serstevens and Mr. Antoine Durand, played significant roles in academic fields, completed many important Restitution drawings for Yuanming Yuan.
3. Antiques from Yuanming Yuan, for example, historical ornaments from palaces in Western Mansions.
4. Monographs about Yuanming Yuan survey and measure.

⁶ Photographic researches of "Mission Palais d'été" refer to Regine Thiriez, *Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces*, Gordon and Breach Publishers, 1998; See also Michèle Pirazzoli-t'Serstevens, *Giuseppe Castiglione: 1688-1766, Peintre et architecte à la cour de Chine*, ©Thalia Edition, Paris, 2007, © Archives Michèle Pirazzoli-t'Serstevens, Paris, 2007

Chapter1:

Italy Principles Embodied in Western Mansions of Yuanming Yuan

Chapter1: Italy Principles Embodied in Western Mansions

1.1 Giuseppe Castiglione (1688 – 1766): the Architect of Western Mansions and the Chief Consultant of European Art in Chinese Court (Qing Dynasty)

Giuseppe Castiglione, (Chinese name: Lang Shining), (July 19, 1688 – July 17, 1766).

Giuseppe Castiglione is an Italian Jesuit Brother, travelled to China as a missionary.

In Chinese architectural history, Castiglione possessed an extraordinary position. Castiglione was the chief royal consultant of European art in court. His masterpiece is the Western Mansions, the unique Italy style garden inside Yuanming Yuan.

He is a painter, but more than a painter. He is the unique one who synthesized the Chinese painting style and Western painting skills in perfect harmony.

He is the leader responsible for the great project “Western Mansion” inside Yuanming Yuan. Yuanming Yuan, in Chinese architectural academic field, is considered to be the historical peak of garden design¹.

He is a genius architect. Castiglione researched an abundant of blueprints of Italian gardens from Rome. The design team for Western Mansions includes artists, scientists, and technicians²: Jean Denis Attiret, Gilles Thebatult, and Ignaz Sichelbarth.

He is a poet, a master of traditional Chinese language and Manchu language (Lingua Mancese)³. His Chinese calligraphy achieved Qianlong Emperor’s high compliments.

He is a bridge connecting East and West. He is a window, presenting Renaissance and Baroque arts in front of China.

He was born in Milano, passed away in Beijing. Three hundred years ago, Castiglione left his native land Italy, came to China with his talent, his honest, and his enthusiasm. Cross the time datum of hundreds of years till now, the great man is famous around the whole China and will be remembered forever.

1 Yuanmingyuan Garden, a popular name in China was the “Garden of Gardens”. This name was first mentioned in French missionary Jean Denis Attiret’s letter in 18th century.

2 Yangshilei Family (the Imperial Architects Family of Qing dynasty), French missionary Jean Denis Attiret (Chinese name: Wang Zhicheng, 1702 – 1768), Gilles Thebatult (Chinese name: Yang Zixin, 1703 – 1766), Ignaz Sichelbarth (Chinese name: Ai Qimeng, 1708 – 1780).

3 Qing Dynasty (1644 – 1912) founded by Manchu people, is the last feudal imperial dynasty of China. Historically, the Qing became highly integrated with “Han Chinese”, synthesized various cultures over the course of its reign. Manchu language is the first language for nobility in Qing dynasty..

The Youth of Giuseppe Castiglione:

Three hundred years ago, Castiglione left his native land (Milano, Italia), sailed to China. Michèle Pirazzoli-t'Serstevens, the famous expert, participated in the program “Mission Palais d'été”, researched on Giuseppe Castiglione and Western Mansions inside Yuanming Yuan for decades. In her monograph *Giuseppe Castiglione: 1688-1766, Peintre et architecte à la cour de Chine*, she narrated several significant events in the early life of Giuseppe Castiglione.

- Giuseppe Castiglione born in Milano, on 19 July 1688.
- At the age of nineteen (1707), Castiglione joined the Society of Jesus (Compagnia di Gesù).
- In his adolescence, he studied in Milano and practiced his painting, probably in the workshop of Filippo Abbiati (1640-1715)⁴.
- In 1709, Giuseppe Castiglione accepted the mission and went to China. He stayed in Portugal for some time. After that, he continued his journey and arrived Macau (south part of China) in 1715, accompanied with another Italian Jesuit Giuseppe da Costa⁵ (1679-1747). In December of the same year, Castiglione arrived Beijing. At that time, Castiglione did not know that one day in future, he would become a great man, who make the Chinese architectural history.

4 See, Michèle Pirazzoli-t'Serstevens, *Giuseppe Castiglione: 1688-1766, Peintre et architecte à la cour de Chine*, ©Thalia Edition, Paris, 2007, © Archives Michèle Pirazzoli-t'Serstevens, Paris, 2007, page 9 – 11

5 See Michèle Pirazzoli-t'Serstevens, *Giuseppe Castiglione: 1688-1766, Peintre et architecte à la cour de Chine*, ©Thalia Edition, Paris, 2007, © Archives Michèle Pirazzoli-t'Serstevens, Paris, 2007, page 8

Giuseppe da Costa (1679-1747) is an Italian Jesuit came to China, accompanied with Giuseppe Castiglione. Giuseppe da Costa was a physician and worked in Beijing for thirty-two years.

The following analysis about Giuseppe Castiglione's works base on my research of archives records in the National Palace Museum (Beijing), and in the China History Archives No.1, classifying according to the chronology.

Eminent: the Genius Painter in Chinese Court

(Giuseppe Castiglione and Kangxi emperor)

According to the archives in the National Palace Museum (Beijing), around 1715, all of the Court Painters worked together in the Royal Painting Institution, which located inside the Forbidden City (the Imperial Palace, Beijing).

When Castiglione met the emperor Kangxi, he submitted two paintings to the aged emperor: one is *Pine, Hawk and Glossy Ganoderma: symbols of immortality in Chinese culture*, (*Songxianyingzhi tu* 1724)⁶, another is *Numerous auspicious signs* (*Jurui tu* 1723)⁷.

These two paintings represent Castiglione's superb talent in painting – creative and unique – combines the Chinese traditional painting style with Italy painting skills together. In Chinese cognition of art, the traditional paintings should contain philosophy meanings, the poem, and the calligraphy – not to seek for a realistic image, but to arouse an intangible mood from soul.

Castiglione is the master who well versed in the underlying painting principles among China and Italy. Historically, Castiglione is the first painter who synthesized the Chinese painting style and Italy painting strategies in perfect harmony.

Promote the Perspective Geometry in China

(Giuseppe Castiglione and Yongzheng emperor)

After Yongzheng emperor acceded to the throne, Yongzheng began to further the constructions of Yuanming Yuan in 1725: enlarged the area to the northwestern suburbs of Beijing.

According to the record in the Chinese History Archives No.1, Yongzheng invited Castiglione to participate the Chinese palaces construction. Castiglione presented his excellent talent in Quadratura paintings (also called trompe-l'œil) in many projects. Through these Quadrature paintings, Castiglione made a fixed optimal viewpoint for observing the illu-

⁶ Giuseppe Castiglione, *Songxianyingzhi tu* (*Pine, Hawk and Glossy Ganoderma: symbols of immortality in Chinese culture*), 1724, Vertical Scroll, Ink and Colors on Silk.

This is one of his early paintings in Chinese Court. From that time, Castiglione began to combine Chinese painting styles with Italy painting skills together. Today, this painting is kept in The Palace Museum, Beijing, inv. n°Gu 5357.

⁷ Giuseppe Castiglione, *Jurui tu* (*Numerous auspicious signs*) 1723, Vertical Scroll, Ink and Colors on Silk, H.173 cm; L. 86.1 cm, National Palace Museum, Taipei

sionist spatial continuity between palaces.

In China royal court, Giuseppe Castiglione is not only an outstanding painter, but also a respected scholar who promote the development of Geometry science in China.

Castiglione wrote the First Perspectival Monograph in China, *The Theories of Perspective (in Chinese: Shi Xue)*, which analyze the axiom of perspective geometry and clarify the skills of western paintings.

The Chief Royal Consultant of European Art in Court

(Giuseppe Castiglione and Qianlong emperor)

When young Emperor Qianlong was still a young prince, Castiglione had already been his best friend. Castiglione had painted a portrait for adolescent Qianlong and his father Emperor Yongzheng, which named *Spring and Peace Messages*, (*Pingan chunxin tu 1735*)⁸. According to the archives record in the National Palace Museum (Beijing), Castiglione and Qianlong Emperor met almost everyday, discussed the paintings, poetries, and philosophies. Throughout Qianlong's whole life, Castiglione is his most trusting friend, imperial painter, and the chief consultant for European affairs.

In the middle of the 18th century, Castiglione was the chief consultant of European art in China court. At the same time, China reached the economy peak of 18th century: the period of Emperor Qianlong's reign is the most prosperous era in Qing dynasty. The golden age supported a strong economy foundation for the construction of Western Mansions in Yuanming Yuan.

Beurdeley (1971), in his monograph, commented that "Castiglione submitted to Qianlong designs of a fascinating kind of Baroque, reminiscent of the style of Borromini."⁹ There is no doubt that Castiglione's paintings and the West Mansions construction provide precious testimonies of the civilizations synthesis.

8 Giuseppe Castiglione, *Pingan chunxin tu (Spring and Peace Messages)*, 1735, Vertical Scroll, Ink and Colors on Silk, H. 68.8 cm, L. 40.8 cm, The Palace Museum, Beijing, inv. n° Gu 5361.

9 See, Beurdeley, Cecile and Michel, 1971, Giuseppi Castiglione: A Jesuit Painter at the Court of the Chinese Emperors. Transl. Michael Bullock. Rutland, Vt., and Tokyo: Charles E. Tuttle Co. page45, 59, 66 – 67.

Al. Q. in X. P. L.
Gen. 3. Nov. 1725
Castiglione

Desideraria molto potermi stendere in ammorare un pezzo con V. B. ma il tempo mi è così scarso di giorno e di notte che mi è impossibile far altro, che chiedere della salute di V. B. il che adesso faccio con tutto quel affetto, che mi è possibile, e prego il S. Spirito, che assista a V. B. e li dia grazia di sempre più amare questa povera missione, conformandosi però sempre con le divine disposizioni, che sempre sono admirabili. La pittura, che V. B. desiderava di mia mano non gliela rimetto, e che non gli vedo il y chi. Il nostro M. Q. L. Generale si è degnato di ricordarmi di me povero, scrivendo al S. P. Carlo De Rozonde V. Bro, che mi desse di parte di S. P. L. la sua Paternale congratulazione, la quale ricevo con la testa china, e con la faccia piena di rossore, e vedere che S. P. L. si ricordi di questo niente, io non ardisco ne meno di scrivere a S. P. L. in questo punto, solo presto inginocchiarmi chiedo umil. La sua pater. ben. Suplico a V. B. di recapitarmi questa lettera inclusa a mio Fratello, che solo non mancare alla carità di servirlo, io non so dove lui stia, e così suplico V. B. di fare alcuna diligenza in Roma alla Madalena, che è dove lui fu novizio, che certam. quei Padri sapranno dove stia. Del rimanente io continuo l'esercizio della mia arte, e gratia a Dio, che io lo faccia y suo amore. Non o altro y che le altre cose li lascio agli portogones. Nei S. S. di V. B. M. mi rae
 Lettina 2. di gho 1725 D. L. Q.

Se V. B. ricevesse alcuna lettera y mi del detto mio Fratello La suplico di rimetermela

Min. S. in X. P. L.
 Giuseppe Castiglione

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Fig. 4 The letter of Giuseppe Castiglione, 1725.

At that time (1725), Castiglione was the Court Painter in the Forbidden City, Beijing, China. Source: Michèle Pirazzoli-t'Serstevens, *Giuseppe Castiglione: 1688-1766, Peintre et architecte à la cour de Chine*, ©Thalia Edition, Paris, 2007, © Archives Michèle Pirazzoli-t'Serstevens, Paris, 2007



Fig. 1
 Giuseppe Castiglione
 Tobias and the Archangel
 Raphael, 1707 - 1709,
 oil on canvas,
 H. 175 cm, L. 265cm,
 saint hospice Martinez
 (Istituto Pio Ricovero Martinez),
 Genova, Italia.



Fig. 2
 Giuseppe Castiglione
 Moses at Rephidim,
 1707 - 1709,
 oil on canvas,
 H. 190 cm, L. 266cm,
 saint hospice Martinez
 (Istituto Pio Ricovero Martinez),
 Genova, Italia.



Fig. 3
 Giuseppe Castiglione
 Christ and
 the Samaritan,
 1707 - 1709,
 oil on canvas,
 H. 185 cm, L. 265cm,
 saint hospice Martinez
 (Istituto Pio Ricovero Martinez),
 Genova, Italia.

Fig1 - 3, Source: Michèle Pirazzoli-t'Serstevens, *Giuseppe Castiglione: 1688-1766, Peintre et architecte à la cour de Chine*, ©Thalia Edition, Paris, 2007, © Archives Michèle Pirazzoli-t'Serstevens, Paris, 2007



Fig. 5
Giuseppe Castiglione,
Jurui tu (Numerous auspicious signs) 1723,
Vertical Scroll, Ink and Colors on Silk, H.173 cm; L.
86.1 cm, National Palace Museum, Taipei.



Fig. 6
Giuseppe Castiglione, Songxianyingzhi tu
(Pine, Hawk and Glossy Ganoderma: symbols of immortality in
Chinese culture), 1724, Vertical Scroll, Ink and Colors on Silk,
The Palace Museum, Beijing, inv. n°Gu 5357.



Fig. 7 Detail.
The signature of Giuseppe Castiglione as Court painter of China.

The Calligraphy in this painting is the comment written by Emperor Qianlong, means “Shining (Giuseppe Castiglione)’s painting is so excellent that I see my teenager portrait.”



Fig. 8
Giuseppe Castiglione
Pingan chun xin tu (Spring and Peace Messages), 1735
vertical scroll, ink and colors on silk, H. 68.8 cm, L. 40.8 cm, The Palace Museum, Beijing, inv. n°Gu 5361

The Painting “Pingan chun xin tu (Fig. 8)” is the Portraits of Emperor Yongzheng and his son Prince Hongli (the future Emperor Qianlong).



Fig9
Giuseppe Castiglione, Portrait Equestrian of Emperor Qianlong, undated, 1739 or 1758, Vertical Scroll, Ink and Colors on Silk, H.322 cm; L. 232 cm, The Palace Museum, Beijing, inv. n°Gu 8761



Fig.10
Giuseppe Castiglione, Portrait of Emperor Qianlong, 1735 or 1736, Vertical Scroll, Ink and Colors on Silk, H.242 cm; L. 179 cm, The Palace Museum, Beijing, inv. n°Gu 6464

1.2 A Comprehensive View of Western Mansions: the History Archives in Bibliothèque nationale de France

Western Mansions, known as European Palaces, *les palais europeens du Yuen-ming-yuen* (French), *Xiyang Lou* (Chinese pinyin), or *Western-Style Buildings*, located in the northern end of the Eternal Spring Garden (Changchun Yuan). There is no doubt that the Western Mansions are the most extraordinary garden project in Chinese architectural history.

The Western Mansions originated from an interesting historical event¹⁰: one day in 1747, Qianlong emperor saw a painting of a magnificent European fountain. Qianlong was fascinated by the western garden element, not only by the Baroque style, but also by the technique - the mechanical theory of spouting water.

The period of Emperor Qianlong's reign is the most prosperous era in Qing dynasty. The young emperor told Giuseppe Castiglione that he wished to build such a fountain inside Yuanming Yuan. At that time, in court, French Father Benoit¹¹ was famous as a hydraulics engineer. Benoit studied the aqueduct and canal system of Yuanming Yuan (the canal system included two parts: first, the Yuquan River, originates from Yuquan Mountain; second, the Wanquan River, converged by twenty-eight natural springs in Wanquan town), helped Castiglione to design the first fountain. The initial team had formed, which began to make the history of the Western Mansions.

Castiglione and Benoit constructed the first fountain, which is now in front of *the Palace of the Delights of Harmony* (*Xieqiqu*). Since that time, Castiglione began to research Italy villa and Italy gardens. The splendid creation encouraged Qianlong emperor, evoked his eager to expand a series of constructions in the next few decades. For the next decades, Castiglione designed a series magnificent western palaces. The whole Western Mansions had been completed in 1773.

¹⁰ The story in Chinese, refer to He Zhongyi, *Yuanming Yuan Garden Art*. (Chinese name: Yuanming Yuan Yuanlin Yishu), Chinese & English, Encyclopedia of China Publishing House Press, 2010, ISBN 9787500084044

See also Régine Thiriez, *Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces*, Gordon and Breach Publishers, 1998

¹¹ Refer to Wu Boya, *Yuanmingyuan Shihua* (*A Brief History of Yuanmingyuan Summer Palace in China*), Social Sciences Academic Press (China), 2012, page 18;

East Meets West:

Historically, much of the architectural theories concerned with cultural exchanges can be traced back, ultimately, to *Tang dynasty (618 AD – 907 AD)*. The “Silk Road” (in Italiano: Via della seta) which was the main pre-modern Eurasian trade route linking China and Europe, played an extraordinary role in commercial trades, technical communications and cultural exchanges between Asia and Europe. The “Silk Road” has a large influence on Chinese social cognitions of western culture.

In Yuan dynasty, the culture exchanges became more usual. “Under the Eurasian Empire created by Mongols, European culture, especially Christian influence, permeated into China along the Silk Road”¹² (Wong, 2001).

Marco Polo (1254 – 1324), the famous Italian merchant traveler, came to China along the Silk Road in Yuan dynasty, written his adventures and elaborated the cultural exchanges in his book *Il Milione*¹³.

In Qing dynasty, around the 17th century, the *Canton system*, as the only one treaty port between countries, plays a critical role in the popularization of western-style commercial buildings and residential houses in China. The cultural exchanges promoted the development of garden art. For imperial gardens in Chinese history, beyond a doubt, the Western Mansions was the uniqueness, which combines Chinese classical gardens and Italy gardens (with Renaissance principles and with Baroque style) together.

The construction of Western Mansions is a great cooperation blending east and west. At the same epoch, the *anglo-chinois (anglo-cinese)* gardens developed in Europe. The 18th century European gardens are defined as an analogy of *a technical laboratory (un laboratorio tecnico)*. As Régine Thiriez had said: “The romance of distance dominated the eighteen century.”¹⁴ In that process, Giuseppe Castiglione and many other Jesuit builders opened a new chapter of the synthesis of the civilizations. The European palaces are the precious spectacles of representation, which demonstrate the communication of ideas, the exchange of techniques, and the international cooperations.

12 Refer to Young-Tsu Wong, *A Paradise Lost: The Imperial Garden Yuanming Yuan*, University of Hawai'i Press, 2001, page 59

13 *Il Milione*, (English: *The Travels of Marco Polo*, French: *Livre des merveilles du monde*).

14 See Régine Thiriez, *Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces*, Gordon and Breach Publishers, 1998, page 52

A Comprehensive View of Western Mansions from Bibliothèque nationale de France (Paris):

To get a comprehensive view of Western Mansions, we should cross the datum of two hundred years (c. 1780 - 1985). Here, Bibliothèque nationale de France (Paris) contains a large amount of antiques and historical archives for Western Mansions.

- *Copperplates of the Twenty Views of the Western Mansions in Yuanming Yuan* (1781 – 1786)

Today, these copperplates are kept in Bibliothèque nationale de France. For each Copperplate: 26 kilograms of red bronze, the size is 65 cm in height and 90cm in width.

By adopting a panoramic composition, the series of copperplates give a portrayal of ten European palaces and ten sceneries of courtyard. These copperplates are precious testimonies, which display the original grandeur of Western Mansions to us.

- The Monograph: *Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces*. (Author: Régine Thiriez)

As the most important Imperial garden, the whole Yuanming Yuan is scarce seen by other people except the most important members of royal family. Even the princes could not be admitted to travel around the whole garden without emperor's permission. While for European missionaries, they could have a comprehensive view - in Jesuit Attiret's letter (1743), Attiret mentioned that "Of all the Europeans that are here, none ever entered this Inclosure, except the Clock-makers and Painters, whose Employments make it necessary that they should be admitted every where..."¹⁵

This book collects precious photos of Yuanming Yuan from 1873 to 1940, and contains a number of photographers' descriptions about the real Western Mansions.

Today, this monograph could be read in the research library of Richelieu library (BnF.). It is one of the most important historical archives for Yuanming Yuan analysis.

- "Mission Palais d'été": the Great International Academic Collaboration for Yuanming Yuan Research since 1982

In May 1983, French president Mitterrand visited China. The meeting opened the new

¹⁵ The comments from Attiret refers to *Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces*, Gordon and Breach Publishers, 1998, page 35

The record of Jesuit Attiret's work in Yuanming Yuan refers to *Lettres édifiantes et curieuses écrites des missions étrangères par quelques missionnaires de la Compagnie de Jésus*, 34vol., Paris, J. Cusson, 1702 – 1776; édition du Panthéon Littéraire, 4 vol., Paris, 1877

chapter of the great International academic collaboration between China and France. The program “Mission Palais d’été”, promoted by China Ministry of Culture and French Ministry of Foreign Affairs, aims to further the Yuanming Yuan researches. French representative is Jacques Langer; Chinese representative is Vice Minister Zhou Weizhi. French experts and scholars were responsible for the mapping and restitution drawings of Western Mansions.¹⁶

A Comprehensive View of Western Mansions from China Experts’ Research:

- Archives of Western Mansions in China

According to historical archives of Lei Family, No. 077-1, in China National Library, the ground plan of Western Mansions seemed as an alphabet “T”.

- Garden Plan and Terrain

Yuanming Yuan located in Haidian District, the north part of Beijing. The garden is 7km far from Beijing city center. “HaiDian”, in Chinese language, means “plenty of springs”. Obviously, based on natural environment and resources, Giuseppe Castiglione designed diverse Italy fountains and pools for Western Mansions.

- Restitution drawings of the ground plan of the “Forty Scenes of Yuanming Yuan”

- The Yuanming Yuan Society of China (founded in December 1st, 1984), aims to promote the preservation and research of the garden.

- Guo Daiheng Studio in Beijing Urban Planning Design and Research Institute of Tsinghua University¹⁷. Guo Daiheng is the vice president of Yuanming Yuan Society of China and the professor of School of Architecture in Tsinghua University (Beijing).

- Professor He Zhongyi: the mapping and restitution drawings of the ground plan of the “Forty Scenes of Yuanming Yuan”.

- Tsinghua University: Digital Models and Visual Heritage Researches.

¹⁶ See Regine Thiriez, *Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces*, Gordon and Breach Publishers, 1998, page 139

¹⁷ Refer to Guo Daiheng, *Yuanmingyuan from Digital Perspectives: Selected Proceedings of the International Symposium on Research and Conservation*, Zhongxi Book Company press, 2010, Edited by Re-relic Committee (from Urban Planning and Design Institute of Tsinghua University): Guo Daiheng, He Yan, Zhang Qianru, Liu Chuan.



Fig. 12 **The Labyrinth (*Wanhuazhen Huayuan*)**, 1747 – 1751, Copperplate Engraving 1781 – 1786, H. 60cm; L. 95cm, Bibliothèque nationale de France, Paris, inv. Oe 18a Pl.5



Fig. 13 **West façade of Aviary (*Yangquelong Ximian*)**, Copperplate Engraving 1781 – 1786, H. 60cm; L. 95cm, Bibliothèque nationale de France, Paris, inv. Oe 18a Pl.6

Fig. 14 **South façade of the Delights of Harmony Palace (*Xieqiqu Nanmian*)**, 1747 – 1751, Copperplate Engraving 1781 – 1786, H. 60cm; L. 95cm, Bibliothèque nationale de France, Paris, inv. Oe 18a Pl.1

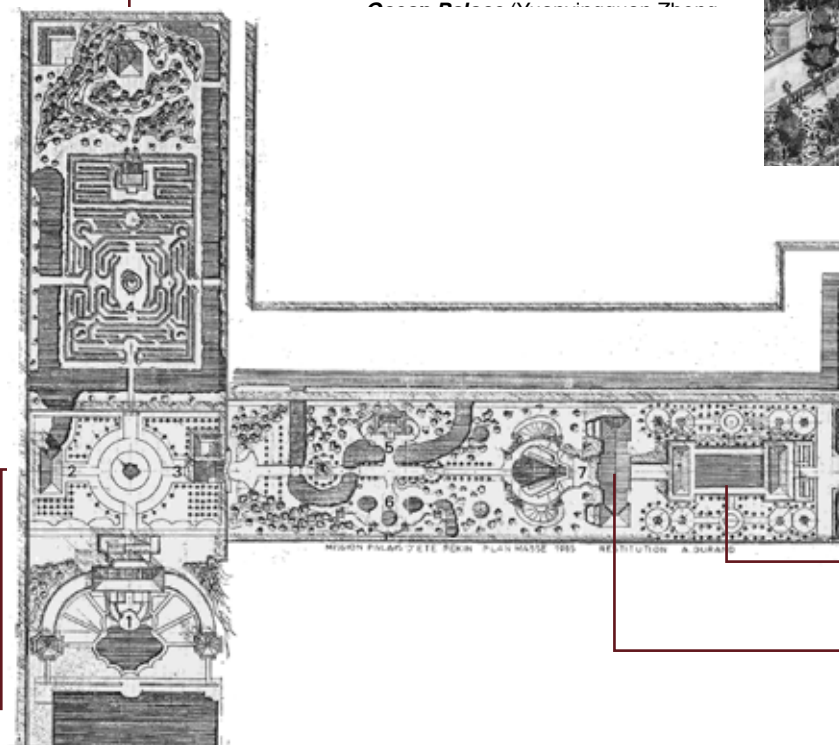


Fig. 17 **South façade of the Vast Green Palace (*Mingyuan*)**





Fig.18 *Painting of the Perspective on the East Bank of Lake (Hudong Xianfahua)*, Copperplate Engraving 1781 – 1786, H. 60cm; L. 95cm, Bibliothèque nationale de France, Paris, inv. Oe 18a Pl.20

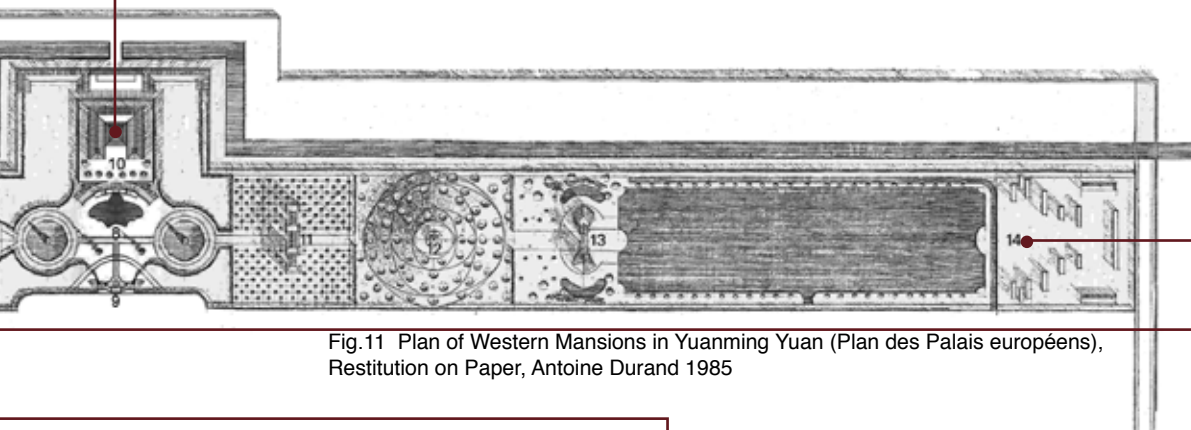


Fig.11 Plan of Western Mansions in Yuanming Yuan (Plan des Palais européens), Restitution on Paper, Antoine Durand 1985

Fig.15 *West façade of the Calm Sea Palace (Haiyantang Ximi-an)*, 1756 – 1759, Copperplate Engraving 1781 – 1786, H. 60cm; L. 95cm, Bibliothèque nationale de France, Paris, inv. Oe 18a Pl.10

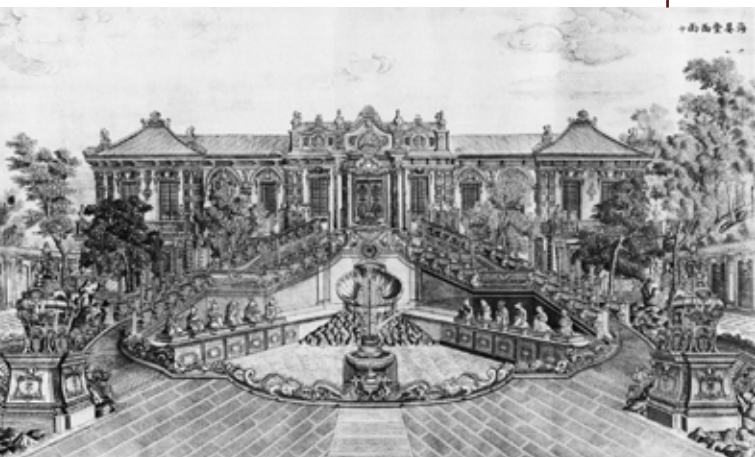


Fig.16 *North façade of the Calm Sea Palace (Haiyantang Beimian)*, 1756 – 1759, Copperplate Engraving 1781 – 1786, H. 60cm; L. 95cm, Bibliothèque nationale de France, Paris, inv. Oe 18a Pl.11



Photos of Xieqiqu, The Delight of Harmony Palace (1873 - 1876)

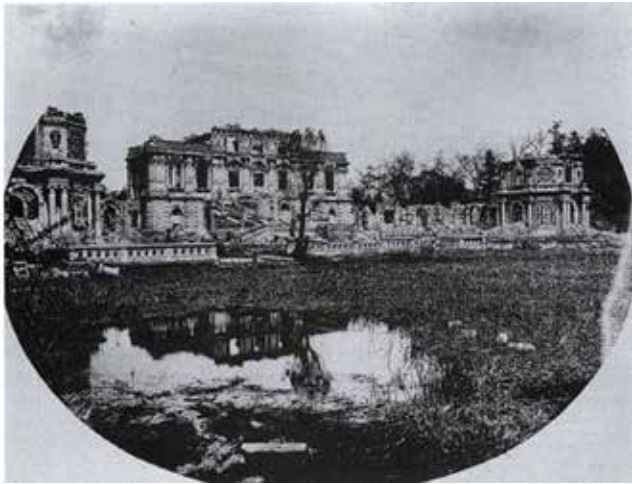


Fig. 19 Xieqiqu, the Delight of Harmony Palace, south across the lake, c. 1876, by A.T. Piry. Albumen print, Source: Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces.



Fig. 20 Xieqiqu, east, c.1873, by E. Ohlmer from wet collodion glass negative. Source: Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces.



Fig. 21 Xieqiqu, north c. 1875, ano. Albumen print. Source: Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces.



Fig. 22 The Model of Xieqiqu (the North façade of the Delight of Harmony Palace) and the Labyrinth. Model Source: The Yuanming Yuan Society of China, Yuanming Yuan Exhibition, Beijing. Photo by Jiang Qingyu (2013).

The Photo of Belvedere (1873)



Fig.23 Belvedere c. 1873 by E. Ohlmer. From wet collodion glass negative. The damage to the emulsion apparent on the left lower corner is old. Source: Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces



Fig. 24 The Model of Belvedere (North façade of Belvedere) and the North façade of the Bamboo gazebos. Model Source: The Yuanming Yuan Society of China, Yuanming Yuan Exhibition, Beijing. Photo by Jiang Qingyu (2013)

The Photo of the Calm Sea Palace (1873)



Fig.25 Haiyantang, west, c. 1873 by E. Ohlmer. From wet collodion glass negative. Source: Barbarian Lens: Western Photographers of the Qianlong Emperor's European Palaces.



Fig. 26 The Model of Haiyantang (the Calm Sea Palace) Model Source: The Yuanming Yuan Society of China, Yuanming Yuan Exhibition, Beijing. Photo by Jiang Qingyu (2013)

The Photo and the Restitution of Yuanyingguan, the Vast Ocean Palace



Fig.27 Yuanyingguan, the Vast Ocean Palace.
Source: Photos by Michèle Pirazzoli-t'Serstevens.



Fig.28 Yuanyingguan, the Vast Ocean Palace.
Photo by Jiang Qingyu (2013).

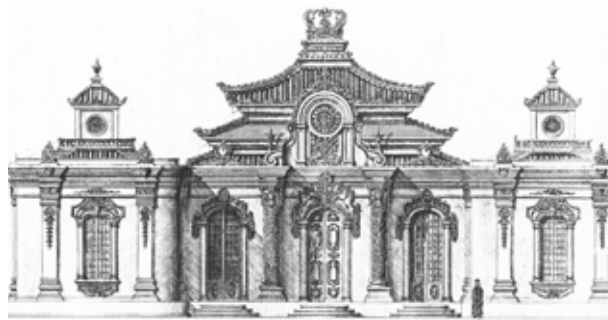


Fig. 29 Yuanyingguan, Restitution on Paper,
Antoine Durand 1987 ©1988 Mission Palais d'été, Paris.

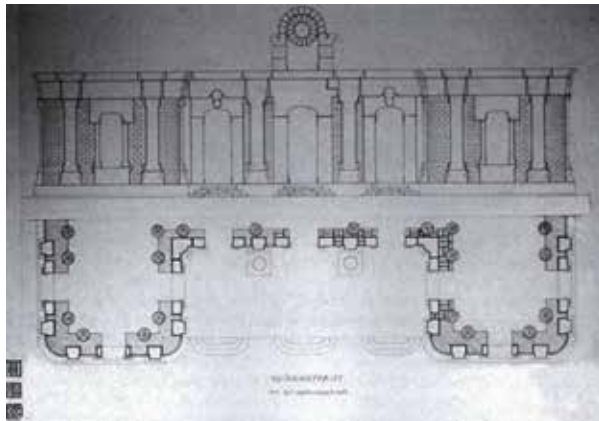


Fig.30 Yuanyingguan, south, apparel and ground map.
Reconstruction, lead on paper by A. Durand, 1985.
©1988 Mission Palais d'été, Paris.

Italy Style:

Formalist Criticism

Beurdeley (1971), in his monograph, stated the historical research that “Castiglione submitted to Qianlong designs of a fascinating kind of Baroque, reminiscent of the style of Borromini.”¹⁸

Michèle Pirazzoli-t'Serstevens, in book *Giuseppe Castiglione: 1688-1766, Peintre et architecte à la cour de Chine*, commented that most palaces and elements in Western Mansions reflected Italy style.

One of the most important monographs in Chinese academy field is Jin Yufeng's book “*Yuanming Yuan Lou Pinxi (1984)*” (*A critical analysis of the European section in the Yuanming Yuan*). Through this monograph, Jin summarized that the Western Mansions contains Italy renaissance principles, Italy baroque ornaments, and a little Chinese elements, such as colorful *Liuli tiles*¹⁹, *Taihu rocks*²⁰, and bamboo pavilions.

Young-Tsu Wong, the famous expert for Yuanming Yuan, through analyzing the Western Mansions, highlighted that the Western Mansions not only contains Italy Baroque palaces, but also applies Italy principles to space arrangement system.

There is a consensus in academy field that the Italian Renaissance and Baroque style have large influences on Western Mansions. Many experts and scholars, through their archeology analysis, architecture researches and historical surveys, confirm that the culture roots of Western Mansions derived from Italy.

18 See, Beurdeley, Cecile and Michel, 1971, *Giuseppi Castiglione: A Jesuit Painter at the Court of the Chinese Emperors*. Transl. Michael Bullock. Rutland, Vt., and Tokyo: Charles E. Tuttle Co. page45, 59, 66 – 67.

19 “Liuli”, in architecture, always refer to tiles of Chinese palaces. It is the main artificial material for Chinese palaces roof. The main component of Liuli is clay. After firing temperatures above 1100 degrees, coated with glaze to form colorful shape.

20 “Taihu Rock” is a kind of natural rocks, comes from Taihu Lake (Taihu Lake is the third largest freshwater lake of China). Taihu Rock has three outstanding characteristics: transparency, wrinkles and skinny, is widely used in Chinese artificial hills.

1.3 Italy Villas Influences

The Italy villa is an infiltration of the Arts. In order to get a comprehensive understanding of Italy gardens, there are two ways to be delivered: the one historical, by analyzing the classical villas; the other logical, by studying the philosophy and the underlying principles.

1.3.1 The Rational Poetics

- Otium and Negotium: from Petrarca to Leonardo Bruni

“In the mid 14th century Francesco Petrarca (1304 – 1374, Petrarch in English) had revived the ancient idea that the contemplative life, the life of artistic and philosophical creativity, the life of otium, could only blossom in the quiet of the countryside. His experience of the noisy, turbulent life of Papal Avignon left only repugnance for the evils of the city existence. In the valley of Vaucluse he found a modest ‘villetta’ of three or four rooms with two gardens, one dedicated to Apollo, and the other to Bacchus. (Lettere familiari, XIII, 8)²¹” (David R. Coffin, 1979).

Although Boccaccio, Petrarca’s friend and student, believed that the pastoral seclusion most pleasant for the poetry creation and monastic contemplation. Petrarca’s Florentine contemporaries, the famous humanists of 14th century, for instances, Salutati, Bruni, had little interest in hermit²². In other words, the villa, contains various social meanings, presents different humanist elites’ different cognitions of cosmology.

The garden art is an universal poem, which people from different countries express the common humanity. In Chinese philosophy, Confucianism emphasizes a similar notion of *negotium*; while the Taoism chases for *otium*, scilicet, flee plagues and political instability. Historically, these two philosophies pervade Chinese traditional garden art.

21 See David R. Coffin, *The Villa in the Life of Renaissance Rome*, Princeton University Press, 1979, page 9

22 Refer to David R. Coffin, *The Villa in the Life of Renaissance Rome*, Princeton University Press, 1979, page 10: “Leonardo Bruni writes in 1401 that he joined Coluccio Salutati and others one day to visit the villa of Roberto Rossi. After viewing the garden, they retired to the loggia where Salutati, inspired by the surroundings, expatiated on the grace and beauty of the buildings of Florence, and Bruni himself emphasized the same theme in his *Laudatio Florentinae Urbis*.”
See also H. Baron, *From Petrarch to Leonardo Bruni*, Chicago and London, 1968, page 238-243

The humanist-architect Leon Battista Alberti (1404 – 1472) in his more original dialogue on the family, *I primi tre libri della famiglia*, considers that the villa not only offers the peace for the life and the contemplation for the soul, but also forms a refuge²³ to flee the tempest of the world.

In anthropology field, Italy villa and Chinese traditional garden are different in approach but equally satisfactory in human nature.

- Arcadia as the Garden Ideal: Monastic Contemplation and Pastoral Seclusion

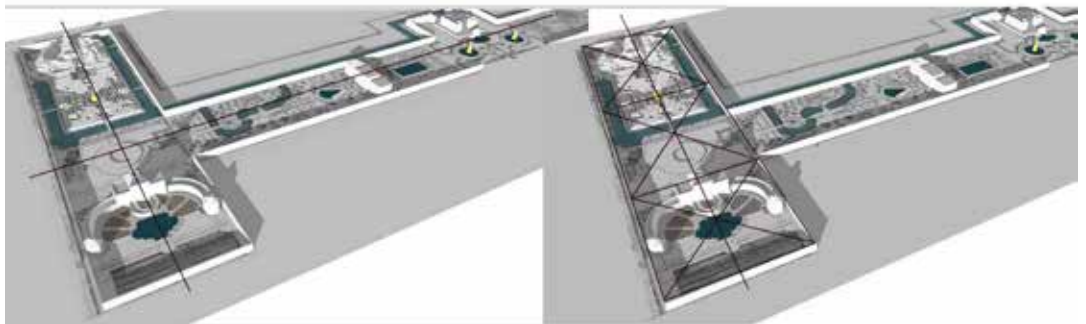
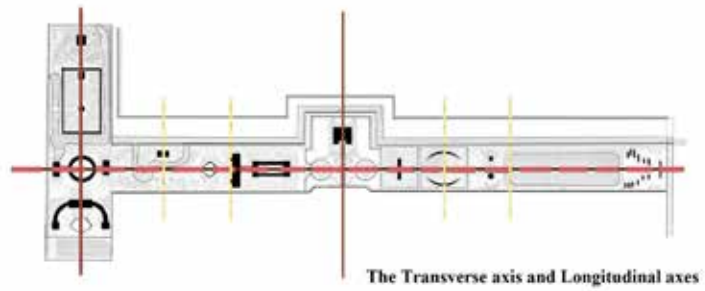
“Yesterday I came to the villa of Careggi, not to cultivate my fields but my soul. Come to us, Marsilio, as soon as possible. Bring with you our Plato’s book *De Summo Bono*. This, I suppose, you have already translated from the Greek language into Latin as you promised. I desire nothing so much as to know the best road to happiness. Farewell, and do not come without the Orphean Lyre.” (Cosimo de’Medici, 1462)

The comment above is famous. In 1462, Cosimo de’Medici wrote to Marsilio, described the Careggi villa as a place for cultivating his soul. The villa culture are pervaded by the spirit of Arcadia. Classical literature and humanist poets promoted the development of humanism. One of the important literatures is *Hypnerotomachia Poliphili* (1499). Different from symbolic medieval representation of paradise, the Renaissance villas were inspired by poetics of rational ideals, endowed sensuous pleasure to tangible nature.

Italy villas influences are the roots of the Western Mansions design. The ideal Italy classic garden is an infiltration arts, which combines monastic contemplation and pastoral seclusion, reflects *Vergilian* and *Ovidian* pastoral poetry. Furthermore, the numerology, the geometry, and the divine order pervade Italy villa design. The villa, presents a humanist elite’s cognition of cosmology. For the Western Mansions, with Renaissance principles and with Baroque styles, the characteristic of garden forms not only summed up the whole past, but also shared a historical statement of emulation, sublimation, and creation.

23 See L. B. Alberti, *I primi tre libri della famiglia*, Florence, 1946, page 309, page 313
See also D. R. Coffin, *The Villa in the Life of Renaissance Rome*, Princeton University Press, 1979, page 10: “a refuge to flee those uproars, those tumults, that tempest of the world, of the piazza, of the palace. “

Complex Composition Strategy: Orthogonal Axes and Bilateral Symmetry.



Geometric Module of Squares
Digital Model by Jiang Qingyu.

1.4 The Italy Principles Embodied in Western Mansions

1.4.1 The System of Arrangement: Axis, Bilateral Symmetry, and Geometric Module of Squares

There are three main strategies for the complex composition of Western Mansions: Orthogonal Axes, Bilateral Symmetry, and Geometric Grids of Squares.

- Orthogonal Axes of Western Mansions:

The axes of Western Mansions, superimposed onto the landscape of the whole garden. Based on these Orthogonal Axes, Giuseppe Castiglione design a series of magnificent sceneries.

a. Longitudinal Axes: Space Sequence from South to North

The Fountain – Palace of the Delights of Harmony (Xieqiqu) – Reservoir (Xushuilou) – Chinese bridge – labyrinth (Wanhuaazhen) – Hill – Pavilion

b. Transverse Axes: Space Sequence from West to East

Reservoir (Xushuilou) – Aviary (Yangquelong) – Belvedere (Fangwaiguan) – Bamboo gazebos (Zhu ting) – Palace of the Calm Sea (Haiyantang) – The Vast Ocean Palace (Yuanyingguan) – The Great Fountain (Dashuifa) – Triumphal Arch – Hill of Perspective (Xianfa Shan) – Fang Pool (Fanghe) – Paintings of the Perspective

The east-west axis, which formally connects the Reservoir (Xushuilou) and the Paintings of the Perspective, is situated centrally and symmetrically within overlap.

- Bilateral Symmetry:

Through researching on the Composition Scheme of Western Mansions, the strategy of “Bilateral Symmetry” has been widely used in garden plan design by Giuseppe Castiglione.

For the definition of the term Symmetry, W. J. Mitchell gave an interpretation in his monograph *The Logic of Architecture* (1990): “The word Symmetry, which derives from Greek term Symmetria, but it has come, by a gradual process of differentiation of notions, to refers to a different kind of formal regularity from that connected to modules, ratios, dimensioning disciplines, and progressions.”²⁴

24 William J. Mitchell, *The Logic of Architecture: Design, Computation, and Cognition*, Cambridge, MIT, 1990, page 29

Renaissance villas frequently suggested the formal properties of bilateral symmetry. The composition scheme of Western Mansions emphasized that every palace is situated in such a way: its architectural axis coincides with the correspondence axis of the garden (the longitudinal axis or the transverse axis). Most garden elements are arranged according to the mode of bilateral symmetry.

- Rational Management for Spaces: Intangible Geometric System of Square Grids

Euclid, the “father of geometry”²⁵, established the research field of geometry in the history of mathematics. In architectural field, much of the theory concerned with the numerology and the geometry could be traced back to the Pythagoreans. C. Steenbergen and W. Reh²⁶, summarized that with the authority of Pythagorean, the Platonic, the neo-Platonic, and theologians, there was an explicit relationship between geometry and harmony concept of arts.

Western Mansions embodied the harmonic ratios. The underlying geometric system of Western Mansions can be seen as a dimensional scheme. Based on the hypothetical geometric system of square (module), the arrangement of magnificent palaces, the spaces sequence inside the garden, and the surrounding landscape outside the garden, are controlled mathematically.

The design grammar of Giuseppe Castiglione is a geometric interpretation of *integrazione scenica* of the garden. The plan of Western Mansions conforms to square grids, which functions as a margin and appears to occur regularly.

25 Refer to Euclid, *The Thirteen Books of Euclid's Elements*, Trans. Thomas L. Heath, New York: Dover, 1956

26 Clemens Steenbergen and Wouter Reh, *Architecture and Landscape – The Design Experiment of the Great European Gardens and Landscapes*, THOTH Publishers, Netherlands, 2003, page 23: “Divine numbers (such as 3,4,7,12,40), divine proportions (golden section) and divine forms (the equilateral triangle, the square, the circle) were partly derived from Holy Scripture as a secret canon, preserved by the guilds and used by the masters in works of art.”

1.4.2 The System of Perspective

Around 1729, Giuseppe Castiglione had wrote the First Perspectival Monograph in China, *The Theories of Perspective (in Chinese: Shi Xue)*, which analyze the axiom of perspective geometry and clarify the skills of western paintings.

The perspective not only had large influences on the history of painting, but also played a critical role in the history of geometry. In the book *The Projective Cast – Architecture and Its Three Geometries*²⁷, Robin Evens proposed that “Perspective did what theology aspired to, and what painting and architecture simulated.”

Significant theories who researched on rationalizing subjective observation by perspective experiments: “Alberti (*Trattato della pittura*, 1435), Jean Pélerin (*De artificiali perspectiva*, 1505), Albrecht Dürer (*Unterweysung der Messung*, 1525). Leonardo da Vinci (1452 – 1519) experimented with it in his paintings and constructed practical perspective into a method known as ‘costruzione legittima’.”²⁸

Giuseppe Castiglione’s strategy for space arrangement of West Mansions is to form a series of spectacular perspectival scenes. That is to say, through making geometric spaces sequence, Castiglione fixed an optimal viewpoint for visitors. In the visual perceptual field, an array of such sceneries falling on visitors’ retinal constitutes various sensations.

1.4.2.1 Quadratura Painting (also called trompe-l’œil)

Before the construction of Western Mansions, Giuseppe Castiglione had completed several quadratura paintings (trompe-l’œil) in Juanqizhai (Juanqi hall) for the emperor. In the middle of the hall, there is a Chinese pavilion used as the stage of traditional Chinese theatre. By adjusting these quadratura paintings, Juanqi hall had a fixed optimal viewpoint for observing this illusionist spatial continuity between the stage (the pavilion), the actors, the musicians, the audiences, and the painted pictures (natural sceneries). In summary, through these quadratura paintings, Giuseppe Castiglione made a fantastic perspective relationship between the stage props and the painted decors. Today, we can appreciate Castiglione’s paintings in the National Palace Museum (Beijing).

27 Refer to Robin Evens, *The Projective Cast – Architecture and Its Three Geometries*, Massachusetts Institute of Technology all rights reserved, First MIT Press paperback edition, 2000, page 130 - 131

28 Refer to Clemens Steenbergen and Wouter Reh, *Architecture and Landscape – The Design Experiment of the Great European Gardens and Landscapes*, THOTH Publishers, Bussum, Netherlands, 2003, page 26

1.4.2.2 Viewpoints, Horizons, and the Panorama:

Chinese Gardens outside Western Mansions as a Landscape Theatre

At the top of each palace, visitors could appreciate the magnificent panorama – the surrounding Chinese traditional gardens of Yuanming Yuan. Giuseppe Castiglione synthesized the whole Yuanming Yuan sceneries into Western Mansions: made the Chinese traditional gardens around Western Mansions as a landscape theatre.

There are several views from the Delights of Harmony Palace (Xieqiqu):

The location of the Delights of Harmony Palace adjoins the Chinese gardens. The two wings of the palace unite the views over the Garden of Eternal Spring (Changchun Yuan) and over the northern sceneries of Western Mansion.

At the top of the palace, visitors can achieve a fantastic visual sensation. The windows opens out, almost as if by surprise, to the panorama of the Garden of Eternal Spring, direct the view to infinity.

The view from the top of the Clam Sea Palace (Haiyan tang):

The Calm Sea Palace stands on the east-west oriented main axis, is the most magnificent building of Western Mansions. The view from the top of the Clam Sea Palace makes the panorama of the Garden of Eternal Spring as a landscape theatre.

The view from the Vast Ocean Palace (Yuanying guan):

The Vast Ocean Palace is situated in such a way that its architectural axis coincides with the north-south axis of the whole Garden of Eternal Spring (Changchun yuan). The visitor could appreciate the splendid panorama.

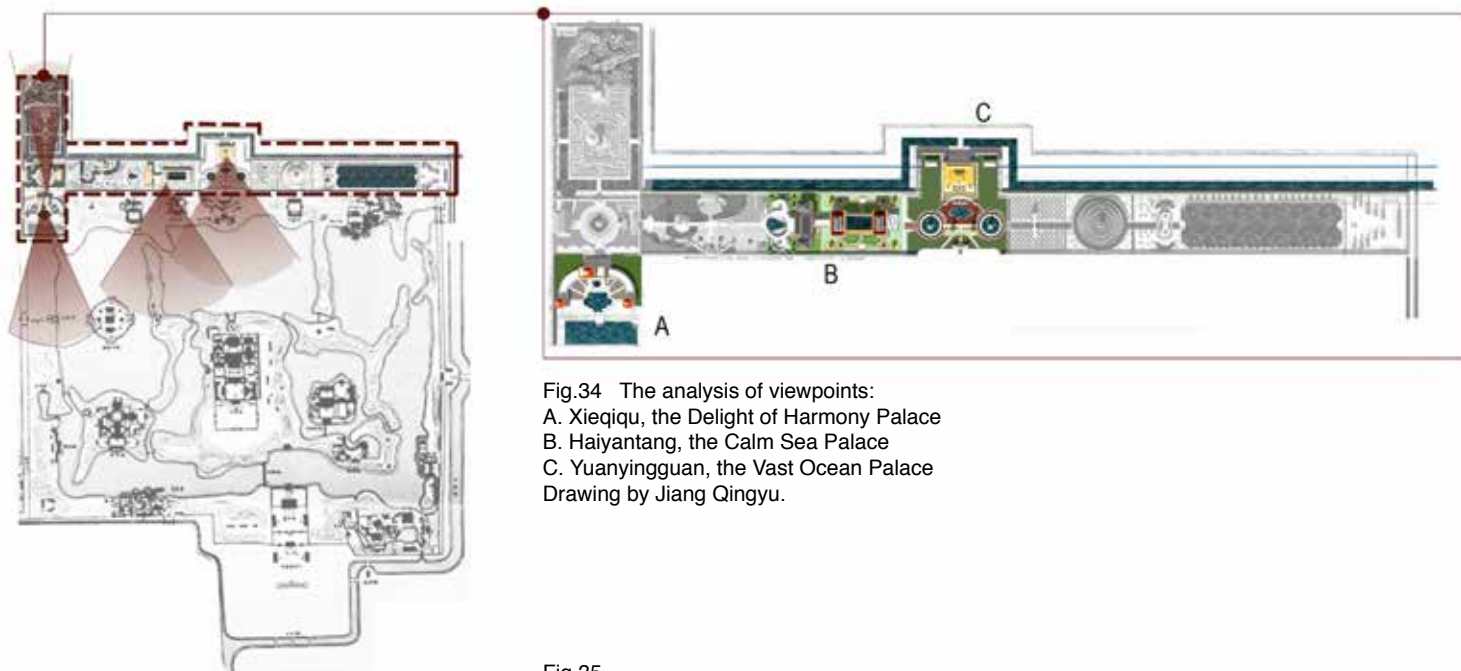


Fig.34 The analysis of viewpoints:
 A. Xieqiku, the Delight of Harmony Palace
 B. Haiyantang, the Calm Sea Palace
 C. Yuanyingguan, the Vast Ocean Palace
 Drawing by Jiang Qingyu.

Fig.35
 The Panorama from the viewpoints of Xieqiku (the Delight of Harmony Palace)
 Model Source: The Yuanming Yuan Society of China, Yuanming Yuan Exhibition, Beijing.
 Photo by Jiang Qingyu (2013)



1.4.3 Rhythm and Proportion: Space Sequence inside the Western Mansions

Castiglione researched the principles of classical Italy villas, designed the Western Mansions in rhythmic and well-proportioned mode.

The origination of the predicate rhythm could be traced back to a Greek term *rhythmos*. Jerome J. Pollitt gave a definition in his monograph *The Ancient View of Greek Art* (1974) that “Rhythmos: repetition of elements at regular intervals.”²⁹ There is no doubt that most palaces inside Western Mansions emphasize the principle of rhythm. Take the Palace of the Delights of Harmony (Xieqiqu) as an example: Castiglione designed the façade with an array of columns and pilasters, as a symphony, not only illustrates harmonic ratios and bilateral symmetry (with two symmetrical logia surrounding), but also displays marvelous Baroque decorative details and asymmetry of fantastic shadows.

From a macro point of view, the notion *integrazione scenica*, plays a very important role in the arrangement system of Western Mansions. The well-proportioned space sequence, which is controlled mathematically by Castiglione, includes two advantages: firstly, maintains the harmonic dimension for each small garden; secondly, forms an integrated composition of several magnificent sceneries, in order to fix the optimal visual sensation for visitors.

The Italy space sequence above reflects the rational poetics of Renaissance gardens. For Western Mansions, Castiglione not only followed the tradition, but also created new ideas as a pioneer. By retracing the steps of the emperors, we could find out that Castiglione designed the Western Mansions as an art of perspective within the rational continuum of space. The central avenue forms the central transverse axis. Winding footpaths, such as the trod in front of the Clam Sea Palace (Haiyan tang), although parted from the main east-west axis, still weaving in and out of correspondence with it.

29 Jerome J. Pollitt, *The Ancient View of Greek Art*, New Haven: Yale University Press, 1974

The Transverse Space Sequence:

Various elements are united to a great space sequence by the central transverse avenue, which on one side connects the Fountain Plaza to the east bank of Fang Pool (reflecting pool); on the other hand, the Clam Sea Palace (Haiyan tang), on the middle of the avenue, directs the view to infinity.

Flanked by cypresses and pines, the visitor proceeded through the central avenue from the Aviary (Yangque long) to the Clam Sea Palace (Haiyan tang). Due to the manipulation of visual impressions and the enforced detour in its approach, the Clam Sea Palace (Haiyan tang), which when seen from the lowest level appeared to be a comprehensible axial scheme. Combined with the sceneries such as the Fountain Plaza, the Aviary (Yangque long), the Belvedere and the Bamboo Pavilion, the visual impression of Clam Sea Palace is gradually revealed as a magnificent and mysterious complex.

1.4.4 Italy Classical Garden Elements Embodied in Western Mansions

Labyrinth:

The labyrinth is a western conception. One of the earliest mazes could be traced back to Egypt, near the lake Moeris. Labyrinth emerged as garden elements in the second half of fifteenth century, while became a regular ornament in Italy Renaissance villas. During the sixteenth and seventeenth centuries, labyrinth becomes popular in European garden design.

“Alberti, nel *De re aedificatoria*, non discorre di labirinti: il giardino ch’egli teorizza – composto da “cerchi, semicerchi e altre figure geometriche” – resta fissato da una rigorosa ratio che non ammette trasgressioni o stravaganze di sorta. Per primo Filarete, nel suo *Trattato di architettura*, propone la figura di un grande labirinto a protezione del parco del re Zogalia. Più avanti nel tempo, Sebastiano Serlio, nel Quarto libro (Venezia 1537), inserisce, fra alcuni modelli di giardino, due schemi a labirinto.”³⁰ (Paolo Carpeggiani)

The labyrinth inside the Western Mansions locates in the middle of the north-south axis symmetrically. In the middle of the labyrinth inside Western Mansions, there is an octagonal kiosk with one eclectic style dome and two circular stairs. Different from plant structure maze, it was made of bricks and surrounded by pines. Michèle Pirazzoli-t’Serstevens³¹ (2007) speculated that one reason is the difficulty of maintaining. A labyrinth without European plant specialists prompted the Italian Jesuits to choose bricks as the main material for the final design.

The Ceremony of Entry:

The original approach to enter the Western Mansions is from the Southern entrance, from the south gate leading to the Delights of Harmony Palace (Xieqiqu). The Palace is a rectangular building with two wings projecting to the front. These two wings were designed as a ceremony of entry for the whole garden.



The octagonal kiosk in the middle of Western Mansions labyrinth, Yuanming Yuan, Beijing.
Photo by Jiang Qingyu (2013)



The Digital model of the labyrinth inside Western Mansions.
by Jiang Qingyu

³⁰ See Paolo Carpeggiani, *I labirinti nella cultura del tardo Rinascimento*.

Refer to Monique Mosser e Georges Teyssot, *L'architettura dei giardini d'Occidente – dal Rinascimento al Novecento*, © Mondadori Electa Spa, Milano, 2005, page 80

³¹ Michèle Pirazzoli-t'Serstevens (2007), *Giuseppe Castiglione: 1688-1766, Peintre et architecte à la cour de Chine*, wrote “La présence d’un labyrinthe dans un ensemble conçu par un jésuite italien n’arien d’étonnant, tant il est vrai qu’il s’agit d’une composante obligée du jardin occidental du XVI au XVIII siècle... il s’agit d’une construction en brique et non d’une structure végétale. On peut penser que la difficulté d’entretenir, à Pékin, un labyrinthe végétal sans les services d’un spécialiste européen incita les jésuites à construire le Huayuan dès l’origine en dur ou à refaire en brique un labyrinthe d’abord conçu en arbustes taillés.”

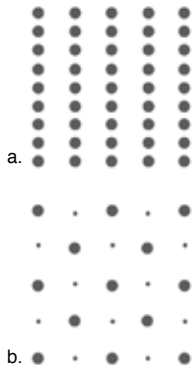
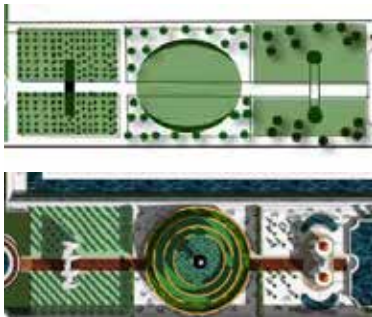


Figure 36: Gestalt laws
a. Proximity creates columns
b. Similarity creates diagonals
Source: Kurt Koffka, *Principles of Gestalt Psychology*, page. 6



The vegetation in the east part of the Western Mansions, surround the Perspective Hill.
Analysis diagram and Digital Model designed by Jiang Qingyu

The Geometric Clipped Topiary Garden:

“In Italy... the topiary garden is an extraction from nature. The secrets and patterns of nature are revealed in this geometric garden and controlled by imitation.” (C. Steenbergen, W. Reh, 2010)

In Western Mansions, especially the plants around the Clam Sea Palace (Haiyan tang), trees and hedges are transformed into spheres, cones and status. Cypressess and pines are arranged rhythmically surrounding by willows and bamboo.

In Western Mansions, the arrangement of the 18th century Geometric Clipped Topiary echoes the modern Gestalt psychologists’ theories. From Gestalt psychologists’ point of view, people’s perceptions of spatio-temporality base on the physical stimuli, which are transduced from perceptual receptor system. Gestalt psychologists also formulated various “Gestalt laws”³² to clarify the figure perception mechanism such as “Proximity” and “Similarity”. Giuseppe Castiglione not only designed the clipped topiary into similar geometric shapes, but also grouped these similar shapes into a matrix of composition. Through that process, Castiglione endowed the topiary garden with formal properties, such as proportion and symmetry.

Fountains:

A series of fantastic fountains make the Western Mansions as a paradise garden. Take the fountain in front of the Clam Sea Palace (Haiyan tang) as an example, the splendid fountain gives rise to a palatial impression. A large fountain located in center of the pool, surrounded by one Chinese-style water clock and twelve Chinese zodiac animals. The Chinese zodiac animals spouted water sequentially, symbolized the twenty-four hours of the whole day. Western zodiacal symbols and Chinese zodiac animals are different in approach but similar in calendar methods.

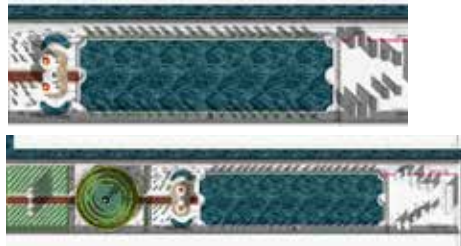
Another great fountain, which is in front of the south façade of the Vast Ocean Palace, named the Great Fountain (Dashuifa). A Baroque arch located in the southern part of the palace, in front of the great fountain. The baroque fountain is the aesthetic peak of art. In the middle of the pool, Giuseppe Castiglione designed a series of sculptures: a running deer with ten hounds chasing behind. Facing the fountain, there was the imperial throne for emperor Qianlong, from which the emperor could have the best viewpoint to appreciate the scenes.

³² See, for instance, Rudolf Arnheim, *Art and Visual Perception*. Berkeley: University of California Press, 1954. See also Kurt Koffka, *Principles of Gestalt Psychology*, New York, Harcourt Brace, 1935.

Reflecting Pool:

In the east part of Western Mansion, Giuseppe Castiglione designed the Fang Pool. As an important element, the reflecting pool has been widely used in Italy classical garden designs. The remains of gigantic Villa Hadriana (built between 118 and 138 AD) have two elegant reflecting pools, which inspire many Renaissance architects. In many other famous villas, such as Villa Gamberaia, Villa D'Este, etc., the pool not only mirrors nature, but also presents its images to people.

The Fang pool, mirrored the surrounding and extended to *the Painting of the Perspective* on the east bank; while the Hill of Perspective located in the west bank. In summary, Castiglione applied the perspective geometry into space arrangement system: made the reflecting pool as a medium, linking a series of spaces and presenting the magnificent perspectival sceneries.



The Fang pool in Western Mansions.
Digital Model by Jiang Qingyu

Chapter 2:
Chinese Principles Embodied in Traditional Gardens
of Yuanming Yuan

2.1 Yangshi Lei Family: Architect Family for Chinese Court (*Qing dynasty*)

Lei Family, the Imperial architects of Qing dynasty, was responsible for traditional Chinese gardens design of Yuanming Yuan. Generally, people call Lei Family as Yangshi Lei (in English means 'Model Masters, Lei Family').

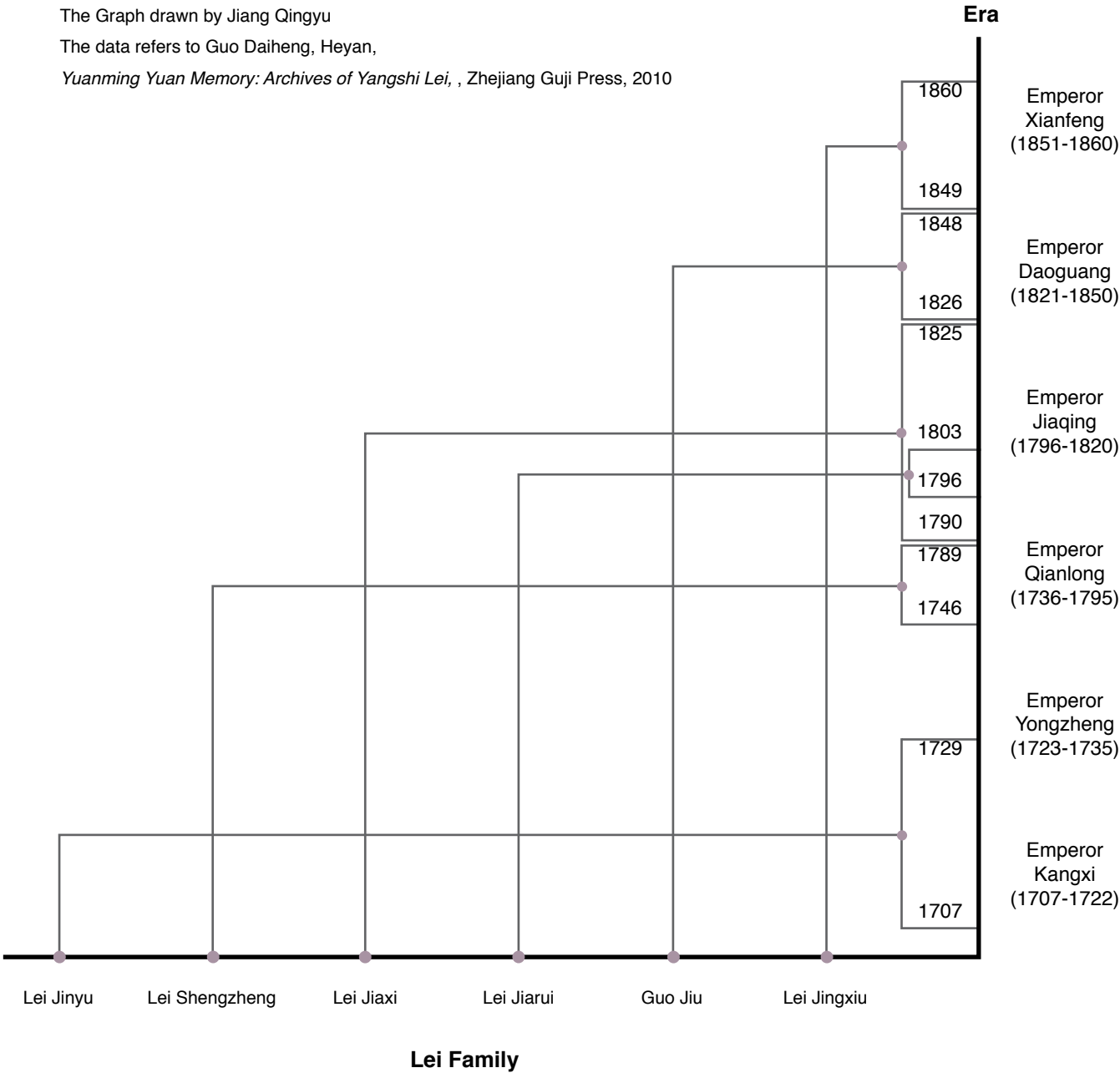
For several generations, as royal architects, the Lei Family obtained an art studio inside Yuanming Yuan. They executed the new construction programs, repaired the weathering timber structures, and maintained the previous projects. The Lei family have the dexterous ability to make colorful classical edifice models by various materials, such as stone, timber, and paper. Today, hundreds of Lei's models are exhibited in the National Palace Museum (Beijing), displaying architects' sophisticated craftsmanship, presenting the magnificence of Yuanming Yuan .

In order to get a comprehensive understanding of the garden arts of Lei Family, we should trace back to a significant canon, *Yuan Ye (The Craft of Gardens)*¹, wrote by Ji Cheng in seventeenth century. This book is one of the most important monographs for summarizing the principles of Chinese garden art. Ji Cheng made the typology work for Chinese traditional architecture forms. His research based on the edifice functions and on garden elements organizations. For the English edition of Yuan ye, we could refer to the edition translated by Alison Hardie, *The Craft of Gardens (1988)*, Yale University press.

Yangshi Lei Family had drew much of their aesthetic theory from *Yuan Ye*, so it is not surprising to find that they applied all the architectural forms of *Yuan Ye* to the design of Yuanming Yuan. Their designs rooted in Chinese culture, reflected the syncretic relationship among Confucianism, Taoism, and Buddhism.

¹ Refer to Ji Cheng, trans by Alison Hardie, *The Craft of Gardens*, New Haven: Yale University Press, 1988

The Graph drawn by Jiang Qingyu
The data refers to Guo Daiheng, Heyan,
Yuanming Yuan Memory: Archives of Yangshi Lei, , Zhejiang Guji Press, 2010



2.2 The album “Forty Scenes of Yuanming Yuan”: A Comprehensive View from Bibliothèque nationale de France

Today, the album is kept in the “département des Estampes et de la Photographie de la Bibliothèque nationale de France (Site Richelieu-Louvois).”

The album “*Forty Scenes of Yuanming Yuan*” was completed in 1744. The album is a high mark for the art of Yuanming Yuan.

Two court painters, Shen Yuan and Tang Dai undertook the paintings. Qianlong Emperor selected forty best sceneries by himself, named each of them with a poetic title. The album not only includes the paintings, but also the poems. Every page with calligraphy and inscription (describing the fascinating garden) on the facing side, wrote by a famous calligrapher, Wang Youdun. The album has eighty pages. The size of each page is 62.3 cm in height and width. In Chinese cognition of artistic, the traditional paintings should combine the philosophy, the poem, and the calligraphy together. The album is an infiltration of arts – not to seek for a realistic image, but to arouse an intangible mood from soul.

- Georges Louis Le Rouge (c. 1707 – c. 1790):

Cartography for Yuanming Yuan and Anglo-chinois Gardens

As an outstanding cartographer and a geographical engineer of King Louis XV², Georges Louis Le Rouge had completed the Copy Paintings of “Forty Scenes of Yuanming Yuan” (Pen and Ink on Paper) around 1786 .

From 1774 to 1789, Georges Louis Le Rouge, published a series of books: *Détail De Nouveaux Jardins À La Mode: Les Jardins Anglo Chinois*. His atlases analyzed the magnificent Yuanming Yuan and Chinese traditional gardens, investigated the universe cognitions inside the anglo-chinois (anglo-cinese) gardens, and summarized the typology of the forms of *anglo-chinois* gardens in Europe.

2 Bernard Korzus, in thesis *Georges Louis Le Rouge: un cartographe franco-allemand du XVIII^e siècle*, gave the analysis of the whole life of Le Rouge's. Korzus highlighted that Le Rouge's social intercourse straddled France and Germany.

See also *Georges Louis Le Rouge: Les jardins anglo-chinois*, Bibliothèque nationale de France / Connaissance et Mémoires, 2004, page 45

- Monographs: Yuanming Yuan Study and Anglo-chinois Gardens in Europe

Véronique Royet, Elisabetta Cereghini, Odile Faliu, and Bernard Korzus, they edited the important monograph, *Georges Louis Le Rouge: Jardins anglo-chinois*. The book contains the Yuanming Yuan atlases drew by Georges Louis Le Rouge, and was published by Bibliothèque nationale de France in 2004.

Elisabetta Cereghini, in her scientific thesis *Les Jardins anglo-chinois à la mode, un recueil à l'image des nouveaux jardins du XVIII siècle* (2004), wrote that “Les sources disponibles à l’époque sur les jardins d’Orient sont fondamentales à l’enquête et, en premier lieu, la lettre du père Attiret³ écrite en 1743.”

The comment above clarifies the prelude of anglo-chinois garden history. In 1743, P.Jean-Denis Attiret (1702 - 1768), wrote a letter to his friend M. D’Assaut, described the grandeur scenes of Yuanming Yuan. Cereghini investigated the letter, noted that Yuanming Yuan plays a crucial role in anglo-chinois garden creation of 18th century Europe.

“L’auteur (P.Jean-Denis Attiret) commence sa description du palais de l’empereur à Pékin... le jésuite introduit la distinction substantielle entre les jardins réguliers et irréguliers ou naturels: les premiers, les réguliers, ont eu de l’influence sur la création des nouveaux jardins chinois en France et les seconds, les irréguliers, constituent le modèle pour la création des jardins anglo-chinois.”⁴ (Elisabetta Cereghini, 2004)

The predicate irregular (irréguliers) in Cereghini’s comments gives rise to the formalist criticism – criticism that concerns Chinese gardens primarily with the abstract formal regularities and with the composition strategies. The Chinese perception of traditional garden space privileges the *intangible* over the *tangible*. The underlying principle for space arrangement of Yuanming Yuan is the axiom of modularity.

3 French missionary Jean Denis Attiret (1702-1768), worked with Giuseppe Castiglione, participated the whole Yuanming Yuan construction.

4 See *Georges Louis Le Rouge: Les jardins anglo-chinois*, Bibliothèque nationale de France / Connaissance et Mémoires, 2004, page 55

2.3 Chinese Philosophy and Cosmology: Roots of Yuanming Yuan Art

The Spatio-temporality of Chinese traditional garden origins from the perception of nature, and develops with the infiltration of traditional arts.

Chinese cosmology roots in the canon *I Ching (The Book of Change)*, from which Confucianism and Taoism derived splendid philosophy inspirations. The core values of *I Ching* are *the dialectical bi-polar* and *the derivation process*, which are derived from the territorial influences as well as the sociological significance. Therefore, as a brilliant synthesis of art, the Chinese traditional garden has been designed as a miniature cosmos to evoke contemplation – “to create spaciousness and flexibility senses within a limited area” (Chen Congzhou, 1985) , and to achieve a harmony between man and nature.

2.3.1 Nature: the Roots of Chinese Perception of Spatio-temporality

“Chinese gardens, with their buildings, landscaping and different kinds of flowers and trees, are integrated works of art, lyrical and picturesque. The overall appearance, though man-made, appears to be formed by nature.”⁵ (Chen Congzhou, 1985)

The Initial Nature Worship: The ancient Chinese were fascinated by the magnificent nature and territory. They drew lots of philosophy and aesthetic theories from the nature. Mountains and rivers were perceived as living entities and permanence symbols⁶. The Chinese spatial schema of ritual and ceremonious buildings comes from the initial nature worship. The Chinese garden art, originates from naturism, demonstrates the enlightenment of the spatial orientation cognitions. Because of the influence of traditional philosophies, a sense of underlying harmony pervades Chinese garden design.

The Geography of China: China is a typically continental country with large amount of mountains and highlands. Hills and highlands cover approximately sixty-six percent of the nation’s territory, while the basins and plains cover circa thirty-three percent of the territory.

5 Chen Congzhou (1918 – 2000), the professor in Tongji University (China), the consultant and the friend of I.M.Pei since 1985. He is one of the most famous experts for traditional garden research of China.

Chen Congzhou, *On Chinese Gardens*, (English & Chinese), Tongji University Press, 1985, page1

6 For the further reading about Chinese nature worship, we could refer to Tuan Yifu, *Passing Strange and Wonderful: Aesthetics, Nature and Culture*, Kodansha International, 1993, page 128:

“Reciprocity was the central moral-aesthetic principle at work: Mountains, rivers, forests and other natural features were all considered to be the local embodiments of cosmic energy, in which spirits and deities dwelt; they bestowed benefits, such as good harvests, upon people and, in return, excepted respect and sacrificial offerings.”

Aqueduct and Canal of Yuanming Yuan: Generally, the water resources of Yuanming Yuan include two parts: First, the Yuquan River, originates from Yuquan Mountain; Second, the Wanquan River, converged by twenty-eight natural springs in Wanquan town.

2.3.2 *I Ching (The Book of Changes): the Dialectical Bi-polar and the Derivation Process*

I Ching has great influences on Confucianism, Taoism, Mencius, and many other philosophies of China.

Introduction of *I Ching*: The basic diagram of *I Ching* is the Supreme Ultimate Symbol. The Supreme Ultimate Symbol expresses two core values: one is bi-polar relationship; the other is derivation process (according to certain reasonable principles and rules).

“In premodern times, Chinese scientists used *I Ching*-derived symbolism, numerology, and mathematics to explain a wide range of natural processes and phenomena in the fields of knowledge that we now call physics, astronomy, chemistry, biology, medicine, meteorology, and geology. And even today many devotees of the Changes see in the mathematical symbolism of the document the seeds of modern scientific theories of DNA. In short, to understand much of Chinese history and culture, we need to understand the Changes.”⁷

---- Richard J. Smith, *The I Ching: A Biography*

The Spatio-temporality of Chinese traditional garden drew much of philosophical theory from *I Ching*. The Chinese traditional garden has been designed as a miniature cosmos. Within a limited area, architects created kaleidoscopic spaces and spacious layout in order to evoke the poetic sentiment and contemplation. The garden art aims to achieve a harmony between man and nature.

⁷ Richard J. Smith, *The I Ching: A Biography*, Princeton University Press, Princeton and Oxford, 2012, page 3

2.4 Chinese Principles of Imperial Garden Embodied in Yuanming Yuan

2.4.1 The System of Spaces Arrangement: Tangible Axis and Imperial Codified Space Sequences

The arrangement of palaces in Yuanming Yuan has Tangible Axis and Codified Sequences. Just as western architecture embodied the harmonic ratios, which corresponds with the proportions of human body; the layout of China imperial gardens always match the constellation, geomancy, philosophy, and naturalism.

In Yuanming Yuan design, the Tangible Axis and the Intangible Space-logic form a complementary bi-polar balance. Yuanming Yuan not only contains the lyrical aesthetics from Chinese private gardens, but also emphasized the Imperial Hierarchy and Hegemony. Through researching archives of Yuanming Yuan from the National Library of China, we can get a comprehensive understanding about the codified sequences and underlying rules inside Yuanming Yuan.

The Plan View of Yuanming Yuan

National Library of China, Beijing, archive n°043-1

Drew by Yangshi Lei Family

Date: in the middle of Qianlong Emperor Year, circa 1766

Scale: 1:2000; Ink and Colors on Xuan paper, H.65.7 cm; L. 91.3 cm

By arranging a Macro-Grids for the whole ground plan, court architects Lei Family designed the Yuanming Yuan with a basic calculation and collation. The dimension of every Grid is 10 *zhang* multiplied by 10.4 *zhang*, which equals to 32 meters times 33.3 meters. In Qing dynasty, *zhang* is the Chinese traditional unit of measurement. In Yuanming Yuan design, Yangshi Lei Family use *zhang* as the basic unit to measure the garden. 1 *zhang* equals to 3.2 meters.

Obviously, most palaces are arranged according to Grids. For examples, the right line of No. 19 vertical grids is the North-south axis of *Jiuzhou Qingyan*; the right line of No.4 vertical grids is the North-south axis of *Hongci Yonghu*; the No.28 vertical grids correspond to the dimension of palaces in *Zuoshi Linliu*.

This Marco-Grids layout is one of the key strategies for complex arrangement in Qing dynasty. The Forbidden City, which was the previous political center before Yuanming Yuan construction, has the similar Marco-Grids plan arrangement.



The Plan View of Yuanming Yuan

National Library of China, Beijing, archive n°043-1

Drew by Yangshi Lei Family

Date: in the middle of Qianlong Emperor Year, circa 1766

Scale: 1:2000; Ink and Colors on Xuan paper, H.65.7 cm; L. 91.3 cm

Photo by Jiang Qingyu (2013)

Jiuzhou Qingyan (Nine Continents Clear and Calm): Emperor's Private Residence

Hongci Yonghu (Vast Compassion and Eternal Blessing): Ancestral Shrine

Zuoshi Linliu (Sitting Rocks and the Winding Stream)

The three sceneries above are contained in "The Forty Scenes of Yuanming Yuan".

2.4.2 The System of Combination: Axiom of Modularity

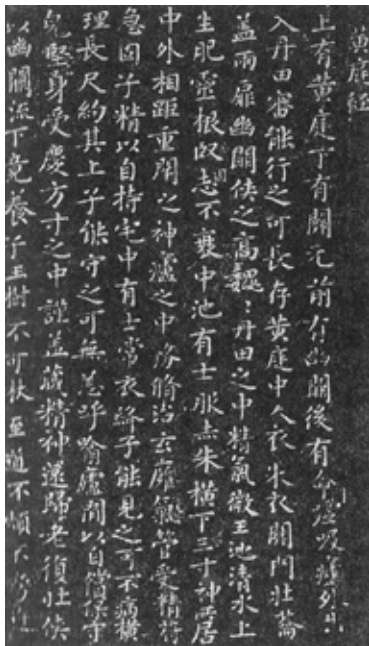
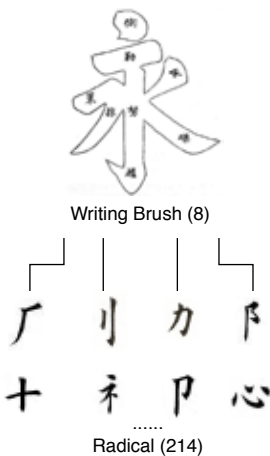
In order to analyze the underlying rules of space arrangement of Chinese traditional gardens, we should refer to Lothar Ledderose's research first, to understand the logic of Chinese art. In Ledderose's famous monograph *Ten thousand things: module and mass production in Chinese art* (2000), he provides a macrocosm classification scheme for describing Chinese art, scilicet, the modularity. Ledderose "*begins with the modular system par excellence*"⁸, clarifies the Chinese modularity within the calligraphy, the ritual bronzes, the terracotta army (Qin dynasty), and the world's first printing system, etc. He devises a hierarchy of five levels: the Element, the Module, the Unit, the Series, and the Mass.

Objectively, Ledderose's research not only reflects the fundamental logic of Chinese arts, but also echoes the Chinese cosmology and philosophy. Chinese traditional modularity originates from the philosophy of *I Ching* (*Classic of Changes*). We know that the basic diagram of *I Ching* is the Supreme Ultimate Symbol. The Supreme Ultimate Symbol expresses two core values: one is bi-polar relationship; the other is derivation process (according to certain reasonable principles and rules). The former emphasizes the Relationship (complementary or contradictory); the later demands Recursive Application of Modularity (eg. the Hexagrams, the organic evolution, etc.).

In summary, axiom of modularity is the central strategy for Chinese art and for Chinese traditional architecture design system.

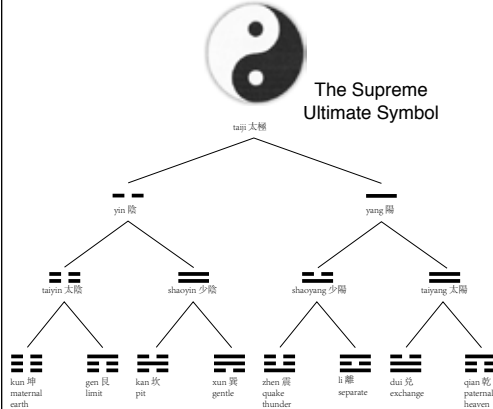
8 Lothar Ledderose, *Ten thousand things: module and mass production in Chinese art*, Princeton, NJ: Princeton University Press, 2000, page 268
Lothar Ledderose holds the chair of East Asian Art at the University of Heidelberg.

The Modularity System of Script
(Lothar Ledderose, 2000)



Characters (c. 50,000)
Figure 37: Book of the Yellow Court (detail),
Calligraphy by Wang Xizhi (303 - 361),
Rubbing, Regular Script, Kaishu Calligraphy.
Source: Ledderose, *Ten thousand things: Module and Mass production in Chinese Art*, page 10, page 21

The Modularity Derivation of
I Ching (Classic of Changes)



Hexagram	Number	Chinese Character	Chinese Name
☰	1	乾	Qian
☷	2	坤	Kun
☳	3	屯	Tūn
☶	4	蒙	Méng
☵	5	需	Xū
☲	6	訟	Sòng
☴	7	師	Shī
☱	8	比	Bǐ
☶	9	小畜	Xiǎoxù (Sheep)
☱	10	履	Lǐ
☲	11	泰	Tài
☳	12	否	Pǐ
☱	13	同人	Tóng rén
☲	14	大有	Dà yǒu
☱	15	謙	Qiān
☶	16	豫	Yù

Hexagram	Number	Chinese Character	Chinese Name
☰	17	隨	Suí
☶	18	蠱	Gǔ
☵	19	臨	Lín
☲	20	觀	Guān
☱	21	噬嗑	Shìkè
☲	22	賁	Bì
☱	23	剝	Bō
☶	24	復	Fù
☱	25	無妄	Wúwàng
☲	26	大畜	Dàxù (Sheep)
☱	27	頤	Yí
☲	28	大過	Dàguò
☱	29	坎	Kǎn (Water)
☲	30	離	Lí
☱	31	咸	Xián
☱	32	恆	Héng

Hexagram	Number	Chinese Character	Chinese Name
☰	33	遯	Pǔn
☷	34	大壯	Dàzhuàng
☳	35	晉	Jìn
☴	36	蒙	Méng
☲	37	家人	Jiā rén
☱	38	睽	Kuí
☲	39	蹇	Jiǎn
☱	40	解	Xiè
☲	41	損	Sǔn
☱	42	益	Yì
☲	43	夬	Guài (Wind)
☱	44	姤	Gòu
☱	45	萃	Cuì
☲	46	升	Shēng
☱	47	困	Kùn
☲	48	井	Jǐng

Hexagram	Number	Chinese Character	Chinese Name
☰	49	革	Gé
☲	50	鼎	Dǐng
☳	51	震	Zhèn
☱	52	艮	Gén
☴	53	漸	Jiàn
☱	54	歸妹	Guī mèi
☲	55	豐	Fēng
☱	56	旅	Lǚ
☲	57	巽	Xùn (Wind)
☱	58	兌	Duì
☲	59	渙	Huàn
☱	60	節	Jié
☲	61	小過	Xiǎoguò
☱	62	既濟	Jìjì
☱	63	未濟	Wèijì

Figure 38: The Supreme Ultimate Symbol and the Hexagrams
Source: Ricard J. Smith, *The I Ching: A Biography*, Princeton University Press, 2012, page xi - xv

The Modularity System in Chinese
Traditional Architecture

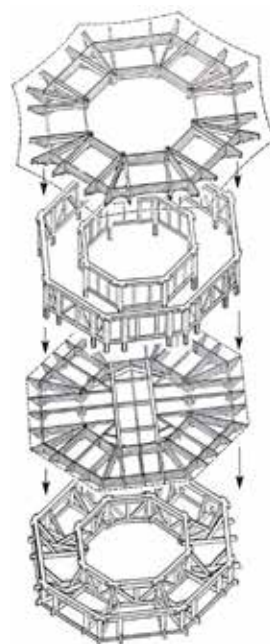


Figure 39:
The modularity system of Chinese timber pagoda
Source: Ledderose, *Ten thousand things: Module and Mass production in Chinese Art*, page 129

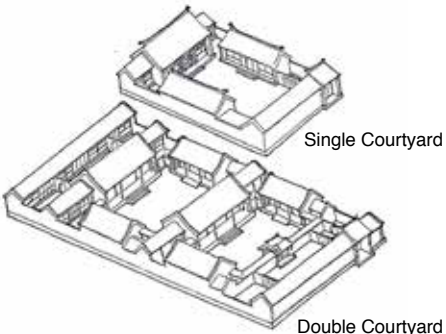


Figure 40: The modularity system of courtyard,
Source: Ledderose, *Ten thousand things: Module and Mass production in Chinese Art*, page 113

The Axiom of Modularity in the Space Arrangement of Yuanming Yuan:

Typology Research

Refer to Ledderose's theories and the Chinese philosophy we elaborated above, I clarify my research mechanism, scilicet, the modular system embodied in the physical typologies of Yuanming Yuan space forms.

- In Macrocosm, the space formation of Yuanming Yuan could be identified as:

Element (palaces and sceneries) – Module (courtyards and complex) – Principles (bi-polar: bilateral symmetry, axes; derivation: repeat, multiplication, reduction, replacement, etc.) – Unit (small garden or buildings, classified according to functions and styles) – Series (Yuanming Yuan, the Garden of Eternal Spring, and the Garden of Blossoming Spring) – Whole

- While in Microcosm, in Subtypes and in Subsystems:

Each subtype modular system, such as an individual garden among "Forty Scenes of Yuanming Yuan", would also include the composition from element to whole. From macrocosm to microcosm, I would like to construct typical hierarchies of subsystems within subsystems, and provide a comprehensive classification scheme for the whole space forms. In Chapter III, I analyze the typology program in detail by experimenting the "Forty Scenes of Yuanming Yuan".

In Summary, the Macrocosm system and the Microcosm subsystem could be clarified as:

- The Bottom-up Strategy for Arrangement Research:

1. The composition scheme: classical vocabulary elements
2. Correctly combined into high-level components

- The Top-down Strategy for Arrangement Research:

1. The central axis; bilateral symmetry; Proportion and Grids: rational stage management
2. The Axiom of Modularity in garden forms and in buildings combination
3. Derivation: Metaphorical spaces and kaleidoscope forms

The top-down and bottom-up strategies are complementary.

2.4.3 Inspirations for Kaleidoscopic Spaces: Lyrical Literature

In Qing dynasty, the classical gardens always get aesthetic inspirations from the lyrical literature and the calligraphy. The Chinese garden design is a syncretic art, which includes the literature, the calligraphy, and the painting.

The literary work *Dream of the Red Chamber*⁹ (also known as *The Story of the Stone*), which is generally acknowledged as a masterpiece in Chinese literature history, describes the ascendancy and fall of an aristocratic family in Qing dynasty. A series of stories happened inside a magnificent garden - *the Grand View Garden*. In the chapter XVII, the author wrote a story: nobility family members make inscriptions on tablets for the kaleidoscopic sceneries inside the Grand View Garden. In the prelude of the chapter, the author remarked that if there is no inscriptions made for the pavilions, for the halls, and for the splendid scenes, even the beauty of hills and springs will fade.

There is no doubt that the lyrical literature have large influences on the design of Yuanming Yuan. In the album “*Forty Scenes of Yuanming Yuan*”, every landscape painting page has a calligraphy or an inscription on the facing side. Emperor Qianlong wrote lots of poems for the sceneries inside Yuanming Yuan. A famous one is composed for praising the lake around *Green Lotus Gazebos*:

“A lotus was carved out of stones, so beautiful
It strikes me, like a Chan Buddhist, a sudden enlightenment
The rock, it appears, has flown here from nowhere
I deserve to have it now
But it pleased me so immensely...”¹⁰

The lyrical literature endows the garden art with romantic, evokes the metaphorical space in Yuanming Yuan design. Yuanming Yuan is a distinct masterpiece, brings together various Chinese aspects, such as poetry, history, paintings, music, etc.

9 “*Dream of the Red Chamber*” wrote by Cao Xueqin (1715 – 1763) in Qing dynasty, circa mid-eighteenth century, is one of China’s Four Great Classical Novels.

There are lots of available translations, the standard English translation refers to *The Story of the Stone*, 5 vols., David Hawkes and J. Minford, trans. Bloomington, IN: Indiana University Press, 1987

10 See Qianlong’s poem with commentary in YMYJ, 1983

See also Young-Tsu Wong, *A Paradise Lost: the Imperial Garden Yuanming Yuan*, University of Hawai’i Press, 2001, page 16

2.4.4 Typologies of Chinese Architecture Forms inside Yuanming Yuan

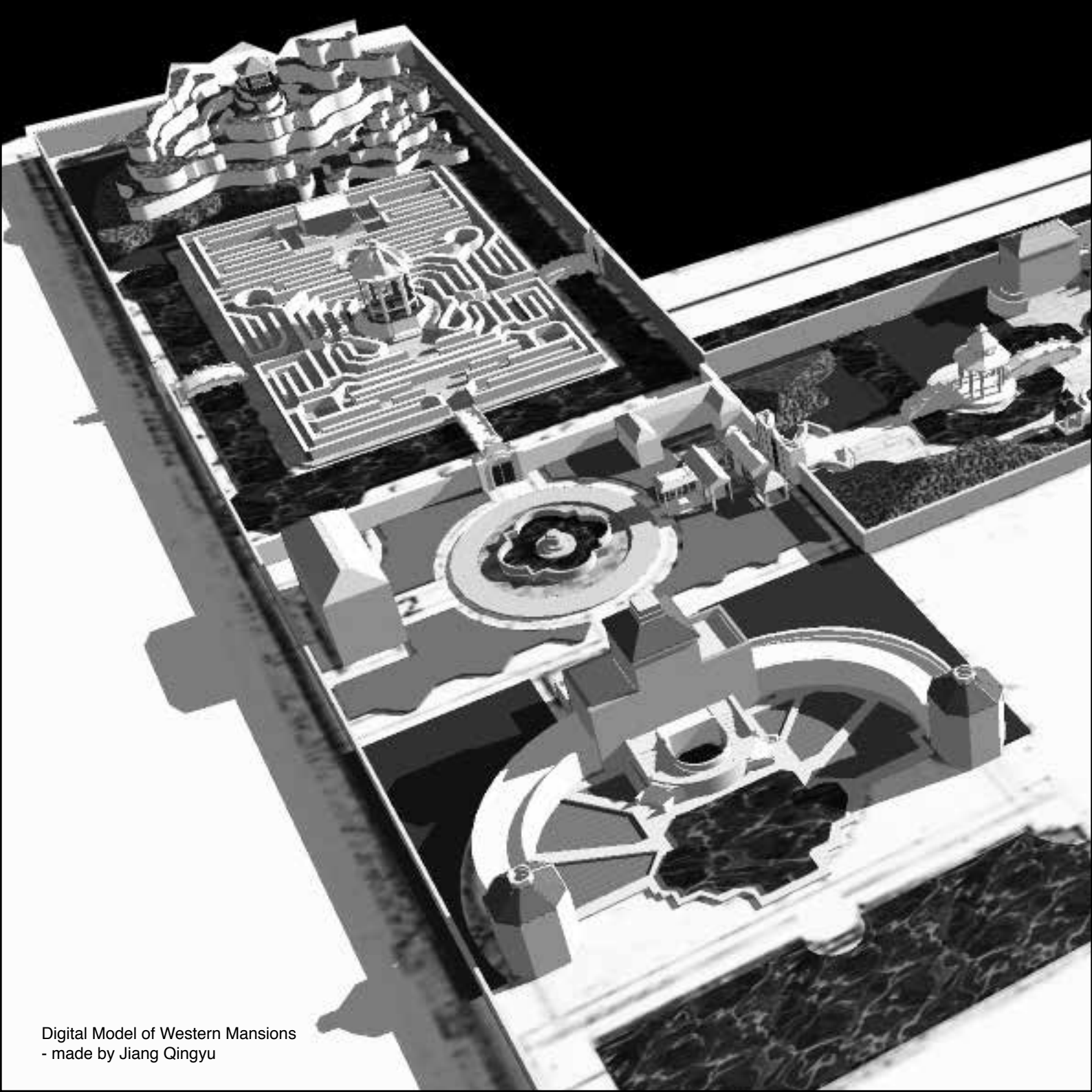
Garden Porche – Covered Walkway is the most important element for complex composition. The porches have two functions: “in-position viewing” and “in-motion viewing”, scilicet, “lingering observation from fixed angles, and moving observation from changing angles.” (Chen Congzhou, 1985) Garden porches connect different palaces, so that an optical journey inside Yuanming Yuan would not be terminated by rain or snow. The porches are the walkways with roof, and have been widely used inside Yuanming Yuan.

Another important element is Pavilion: In Chinese traditional gardens, the pavilion could be located in flexibly ways: on the top of the mountain, on the bottom of the ravine, beside spring and bamboo, or inside a forest. There are various geometric forms of pavilion plan. The function of pavilion is to appreciate the sceneries from the optimal viewpoint.

Belvederes are widely used in garden design. There are two basic functions: one is used to appreciate beautiful scenes alone; the other is used as a library for reading and for contemplation. In order to achieve the best panorama, a belvedere always has two floors. The windows always open to “picturesque” sceneries.

Studios are places used for study and drawing. Chinese emperors are fascinated by lyrical literatures and calligraphies. Royal artists of Qing dynasty, such as Yangshi Lei family and Castiglione, also had their own studio inside Yuanming Yuan for design and for painting.

The main edifice inside Yuanming Yuan is the great hall. Historically, the emperors are regarded as “the son of Heaven”. The divine number “nine” had been emphasized in the space arrangement of Yuanming Yuan. The complex of palaces always has the codified space sequence, which reflects the absolutism and the hegemony of emperor. Therefore, in the layout of great halls, in the arrangement of columns, this principles of numerology had been repeated frequently.



Digital Model of Western Mansions
- made by Jiang Qingyu

Chapter3: Design Experiments for Yuanming Yuan Research:

- Digital Models
- Mathematical Calculations
- Typologies Diagrams
- Computer-aided Processing

I.Experiments of Western Mansions:

Perspective System – View and Horizon of the Western Mansions

- Representative Samples for the Experiment:

Copperplates of the Twenty Views of the Western Buildings of Yuanming Yuan, (1781 - 1786)

Bibliothèque nationale de France, inv. Oe 18a Pl. 1 - 20, Paris

Restitution Drawings of Western Mansions come from “Mission Palais d’été”,

Bibliothèque nationale de France (BnF).

- My Experiment Methodology:

Strategies: Digital Models, Mathematical Calculations, and Perspectival System Diagrams

Step 1: Make Scientific Three-dimensional Digital Models:

Data of the digital model of Western Mansions come from “Guo Daiheng Studio in Beijing Urban Planning Design and Research Institute of Tsinghua University”; For the details of garden design, refer to the Archives of Drawings and Models of Yangshi Lei Family, from China History Archives No.1.

Step 2: Analyze Spaces Sequence: Graph of Relation Diagrams between eye height, the distance to the horizon and perceptible height behind the horizon:

The Mathematical calculation Formula for View Points and Horizon comes from TUDelft research; Data collection comes from Tsinghua University.

Step 3: Analyze the Perspectival System: Composition Scheme

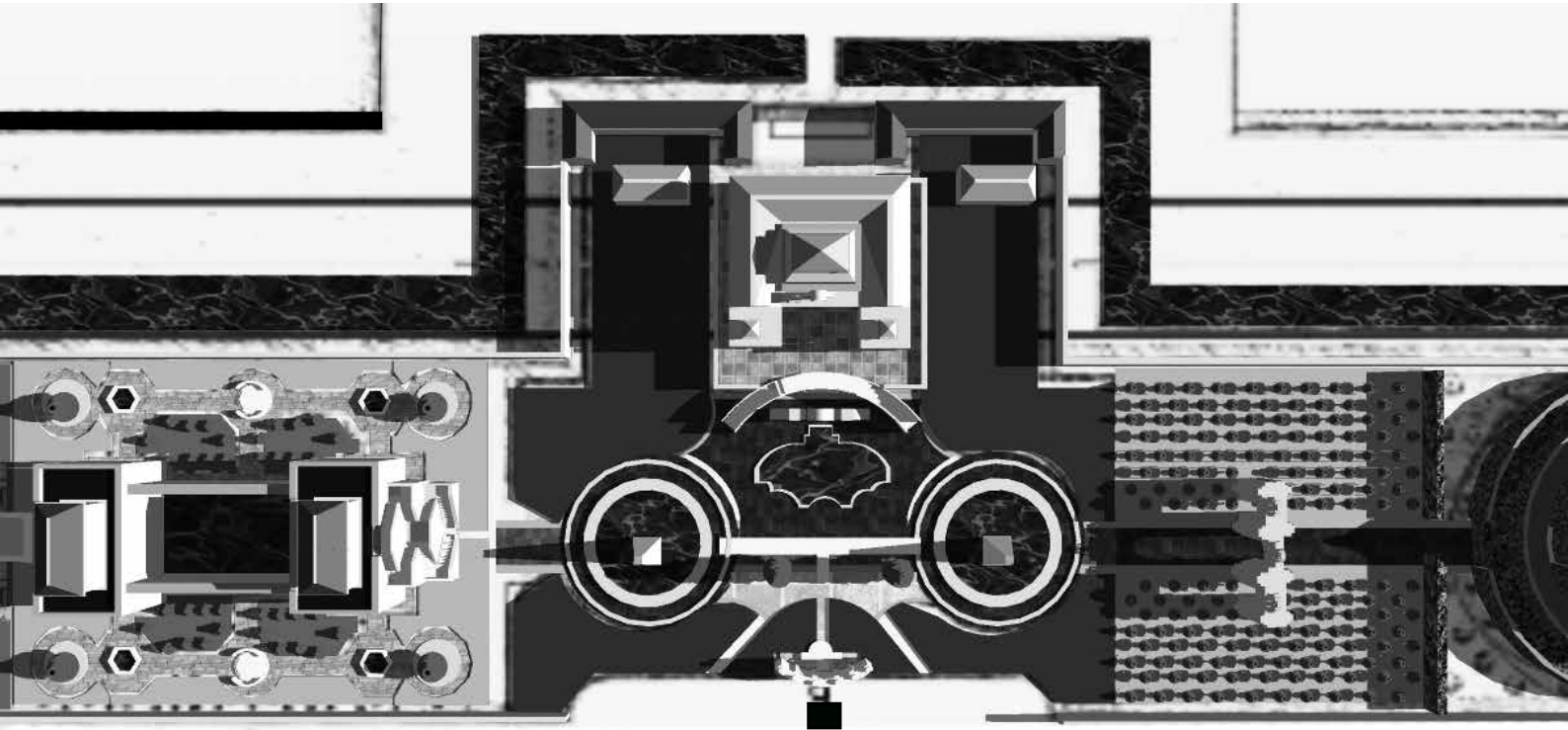
Transverse Space Sequence

Longitudinal Space Sequence

Make Axonometric Projection and research active composition elements.

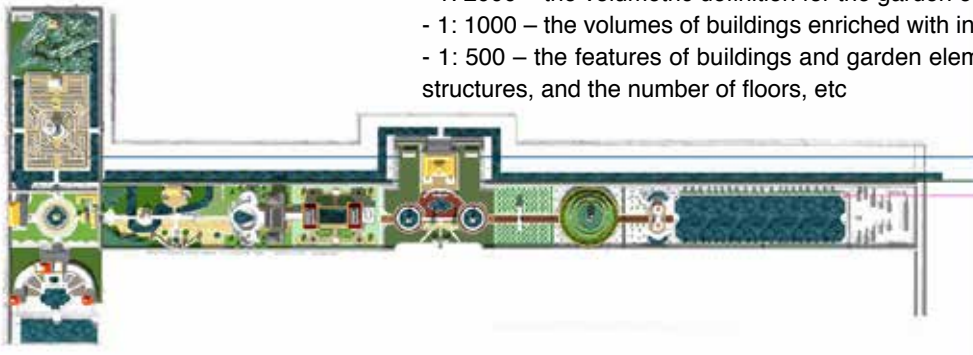
■ Methodological Framework - Scientific research and Three-dimensional Models

I make a full-scale, three-dimensional digital model for Western Mansions. The data collection comes from Tsinghua University, Chinese History Archives No.1, and from Mission Palais d'été. The shapes of buildings and garden elements in the digital model are isometries of shapes in the construction world.



The representations depend on the specific purposes of the work, and normally are typical of the Scales:

- 1: 2000 – the volumetric definition for the garden elements in Western Mansions
- 1: 1000 – the volumes of buildings enriched with information of characteristic elements
- 1: 500 – the features of buildings and garden elements, such as the façade decoration, roof structures, and the number of floors, etc



***Copperplates of the Twenty Views of
the Western Buildings of Yuanming Yuan, (1781 - 1786)***
Bibliothèque nationale de France, inv. Oe 18a Pl. 1 - 20, Paris

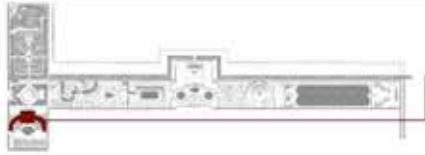
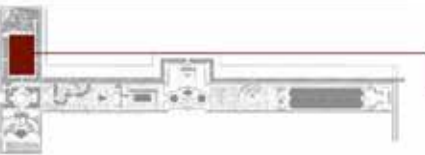
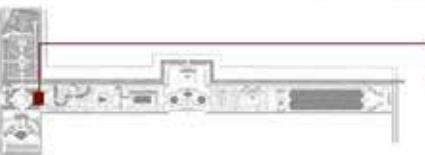
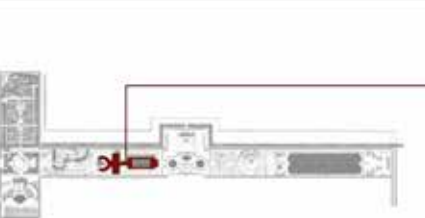
■ Individual Palaces	■ Locations of Palaces	■ Twenty Copperplates (1781 - 1786) Archives, BnF
<ul style="list-style-type: none"> • The Delight of Harmony Palace 		<ul style="list-style-type: none"> No.1 <i>South façade of the Delight of Harmony Palace</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 1 No.2 <i>North façade of the Delight of Harmony Palace</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 2
<ul style="list-style-type: none"> • The Reservoir 		
<ul style="list-style-type: none"> • The Labyrinth 		<ul style="list-style-type: none"> No.4 <i>North façade of the Gateway to the Labyrinth</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 4 No.5 <i>The Labyrinth</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 5
<ul style="list-style-type: none"> • The Aviary 		<ul style="list-style-type: none"> No.6 <i>West façade of Aviary</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 6 No.7 <i>East façade of Aviary</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 7
<ul style="list-style-type: none"> • The Calm Sea Palace 		<ul style="list-style-type: none"> No.10 <i>West façade of the Calm Sea Palace</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 10 No.11 <i>North façade of the Calm Sea Palace</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 11 No.12 <i>East façade of the Calm Sea Palace</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 12 No.13 <i>South façade of the Calm Sea Palace</i>, Bibliothèque nationale de France, inv. Oe 18a Pl. 13

Fig. 41:
The eight figures of this page:
*Copperplates of the Twenty View of
the Western Mansions*
Source:
Bibliothèque nationale de France

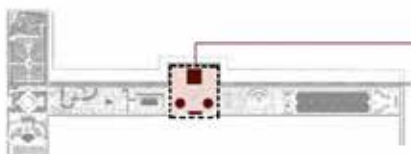


the Belvedere
the Bamboo gazebos



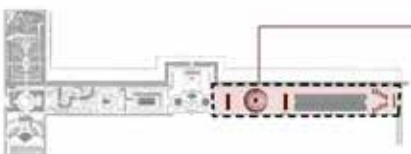
- No.8** *South façade of the Belvedere,*
Bibliothèque nationale de France, inv. Oe 18a Pl. 8
- No.9** *North façade of the Bamboo gazebos,*
Bibliothèque nationale de France, inv. Oe 18a Pl. 9

the Vast Ocean Palace
the Great Fountain



- No.14** *South façade of the Vast Ocean Palace,*
Bibliothèque nationale de France, inv. Oe 18a Pl. 14
- No.15** *South façade of the Great Fountain,*
Bibliothèque nationale de France, inv. Oe 18a Pl. 15
- No.16** *View of the Great Fountain,*
Bibliothèque nationale de France, inv. Oe 18a Pl. 16

Gate West of the Hill of
Perspective
The Hill of Perspective
Gate East of the Hill of
Perspective
Perspective Paintings



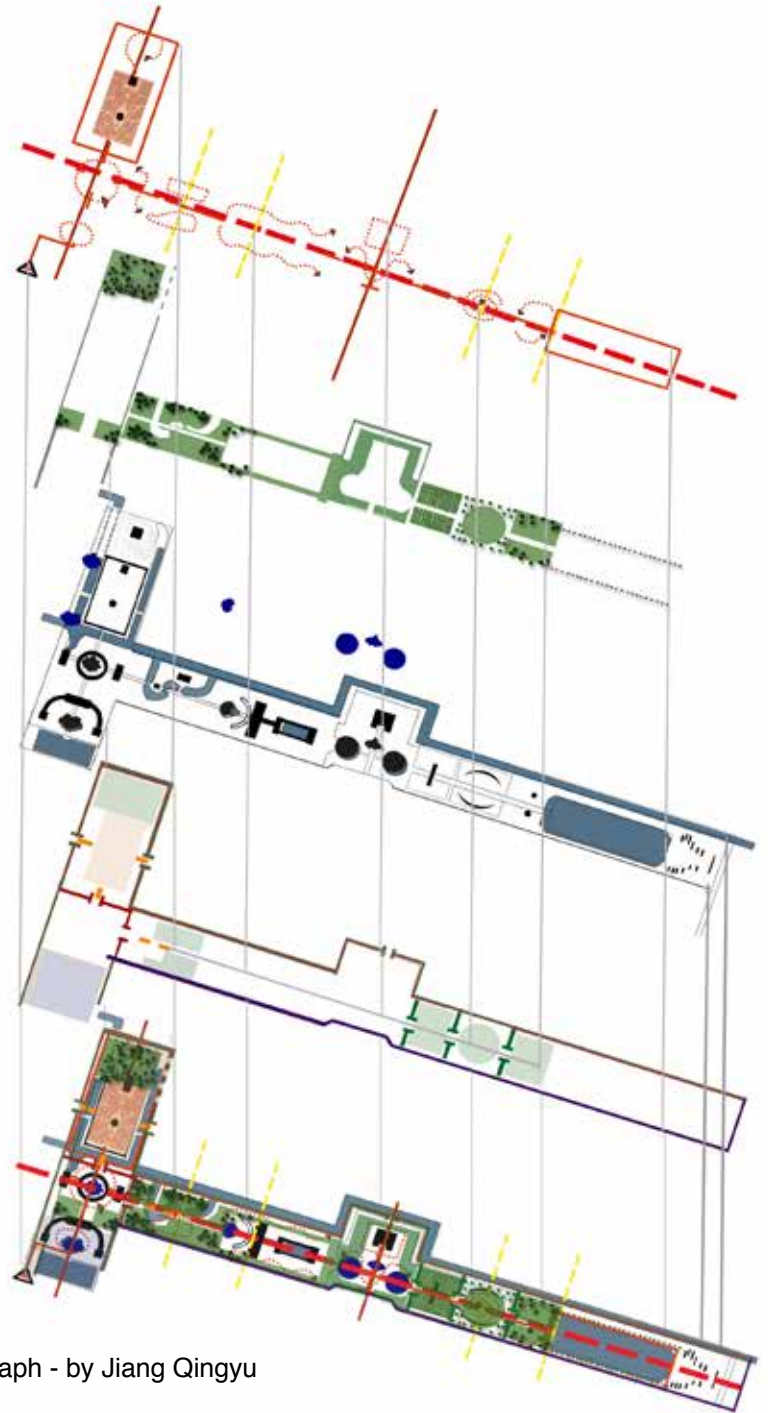
- No.17** *Gate West of the Hill of Perspective,*
Bibliothèque nationale de France, inv. Oe 18a Pl. 17
- No.18** *The Hill of Perspective,*
Bibliothèque nationale de France, inv. Oe 18a Pl. 18
- No.19** *Gate East of the Hill of Perspective,*
Bibliothèque nationale de France, inv. Oe 18a Pl. 18
- No.20** *Perspective Paintings on the East Bank of Lake*
Bibliothèque nationale de France, inv. Oe 18a Pl. 18

Fig. 42
 The six figures of this page:
*Copperplates of the Twenty Views of
 the Western Mansions*
 Source:
 Bibliothèque nationale de France

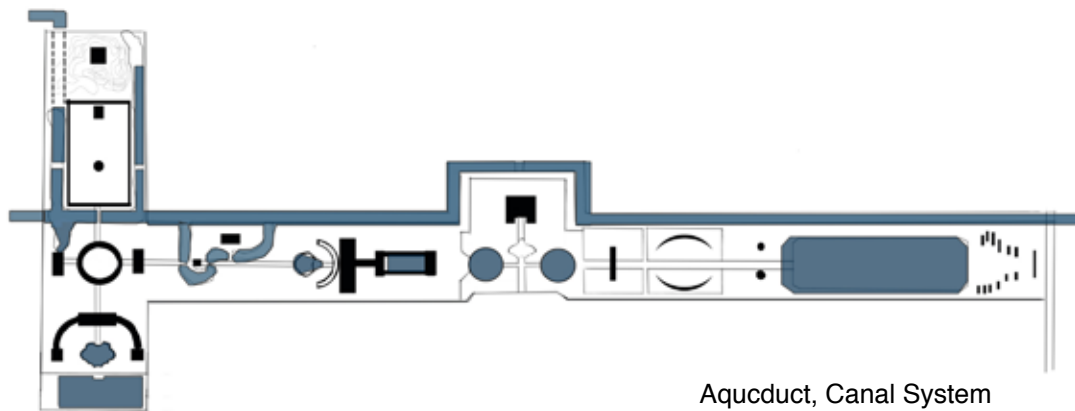


- **Experiments of Western Mansions**

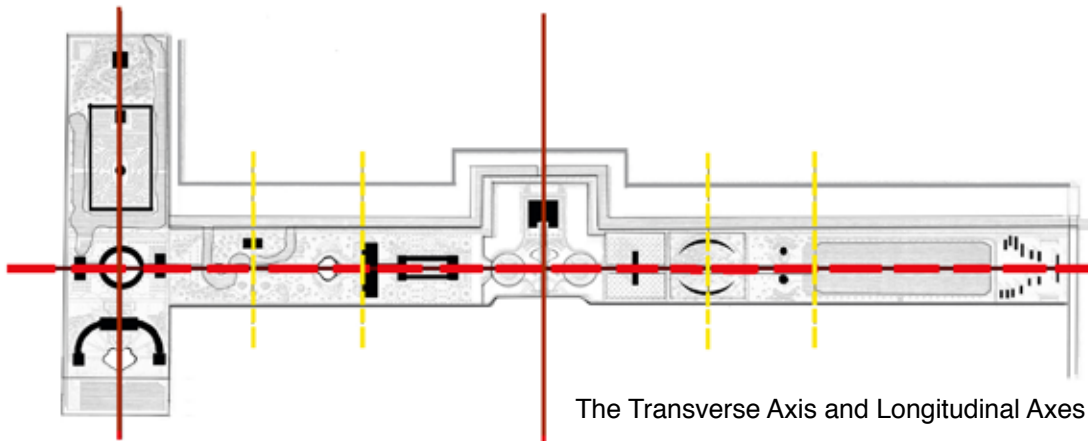
- 3.1.1 Three-dimensional Digital Models:
The Space Arrangement of the Western Mansions



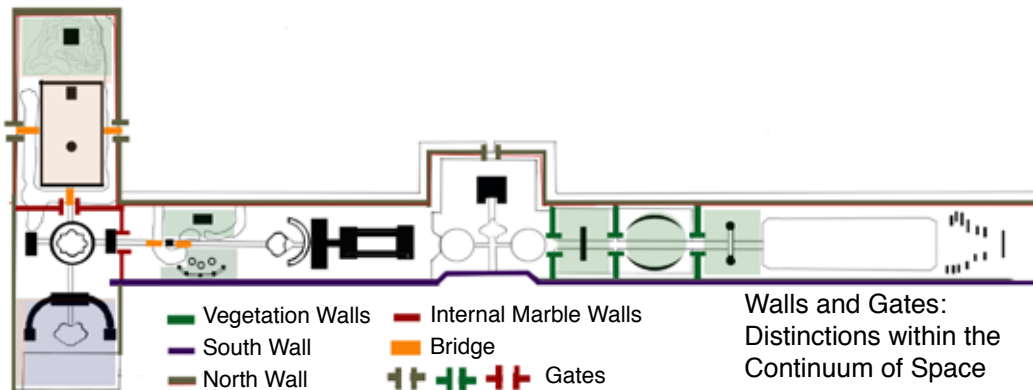
Arrangement analysis graph - by Jiang Qingyu



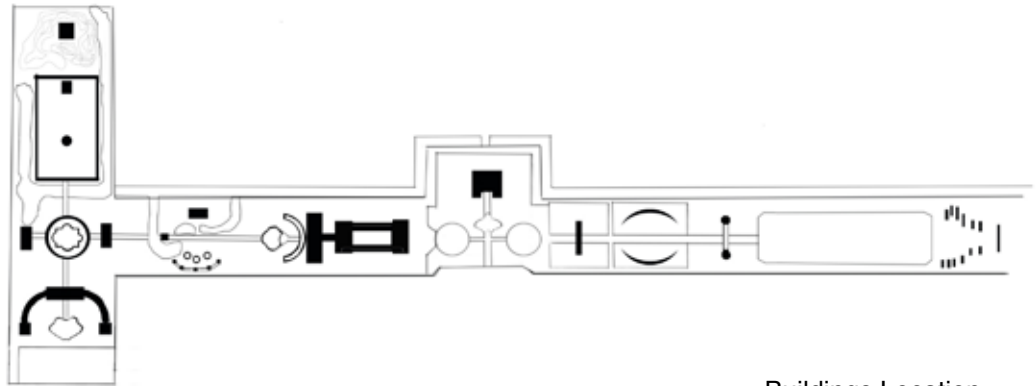
Aqueduct, Canal System



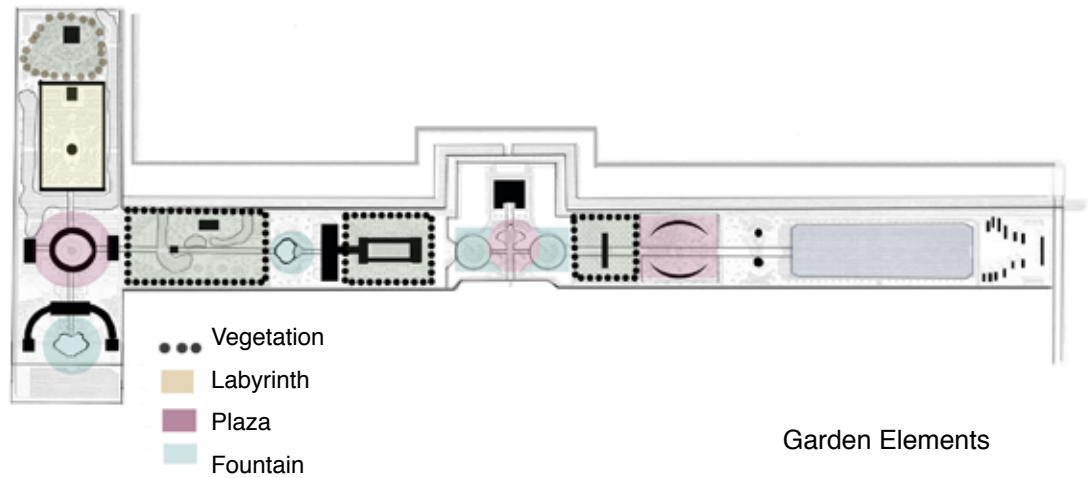
The Transverse Axis and Longitudinal Axes



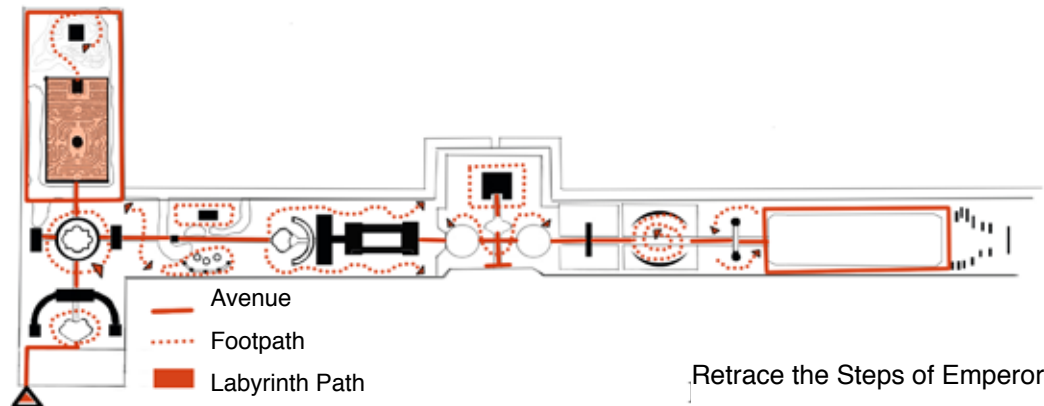
Walls and Gates:
Distinctions within the
Continuum of Space



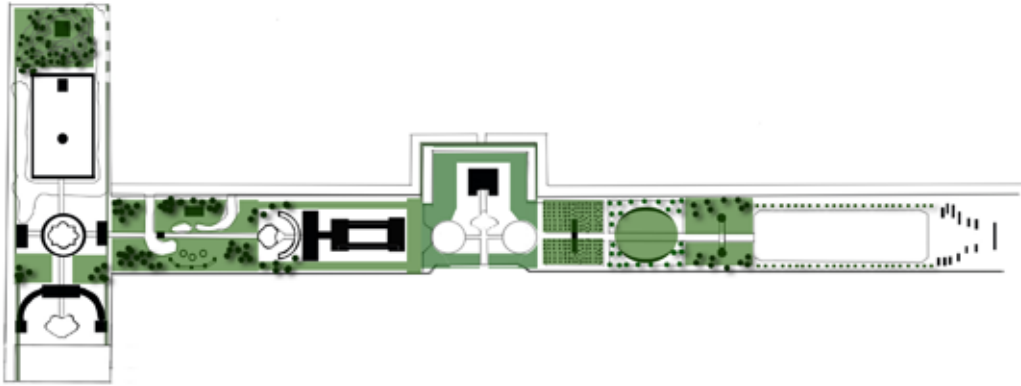
Buildings Location



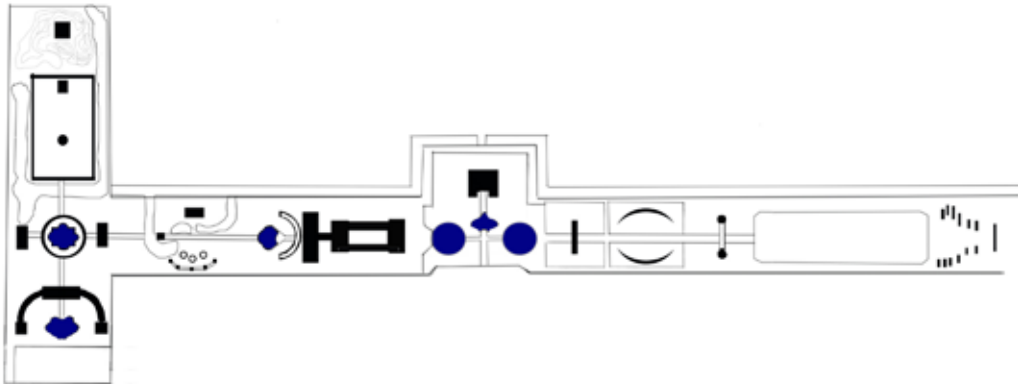
Garden Elements



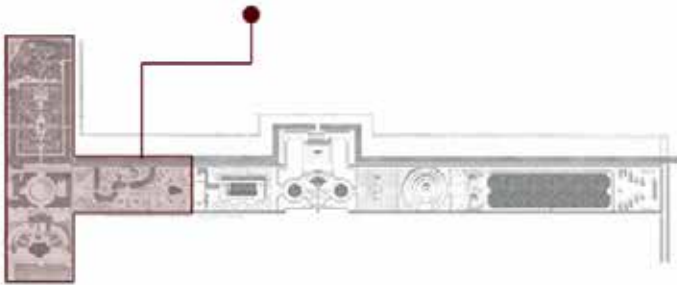
Retrace the Steps of Emperors



Vegetation



Fountains in Western Mansions



Digital Models - from North to South:

The Pavilion

The Labyrinth (Wanhua Zheng)

Reservoir (Xushuilou)

Aviary (Yangquelong)

Belvedere (Fangwaiguan)

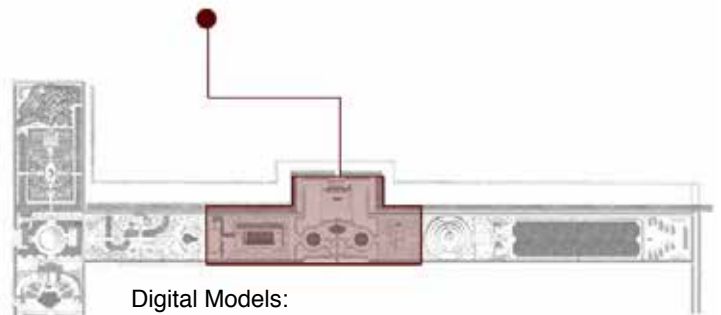
Bamboo gazebos (Zhu ting)



Figure 43:

The Pavilion in the middle of the Maze.

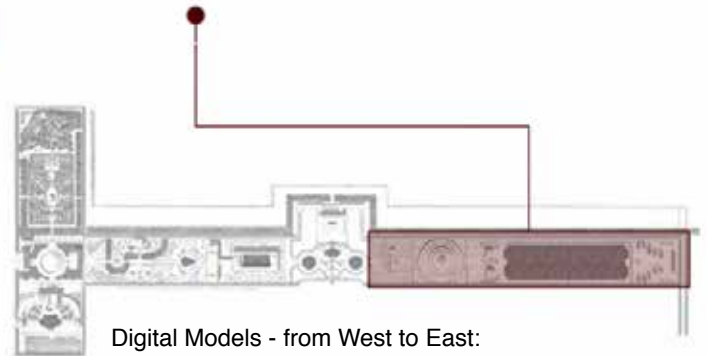
Photo by Jiang Qingyu (2013)



Digital Models:

Palace of the Calm Sea (Haiyantang)
 The Vast Ocean Palace (Yuanyingguan)
 The Great Fountain (Dashuifa)
 Triumphal Arch

Figure 44:
 Model - The Calm Sea Palace and the Vast Ocean Palace.
 Model Source: The Yuanming Yuan Society of China, Yuanming
 Yuan Exhibition, Beijing. Photo by Jiang Qingyu (2013)



Digital Models - from West to East:

Triumphal Arch

The Hill of Perspective (Xianfashan)

Gate East of the Hill of Perspective

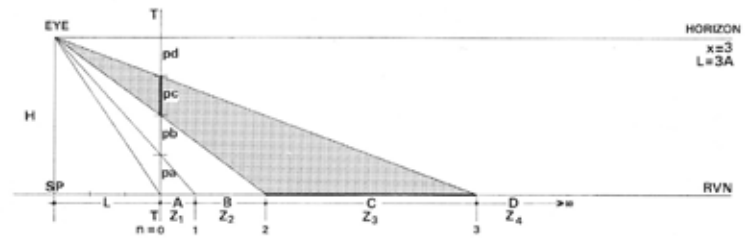
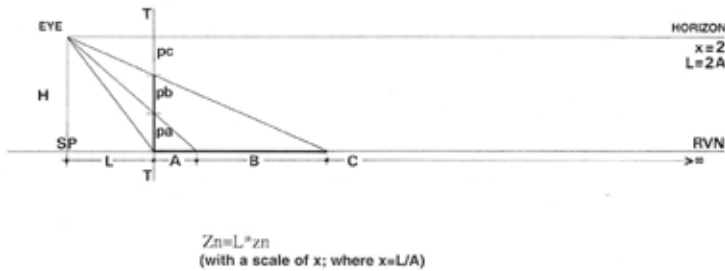
Painting of the Perspective on the East Bank of Lake

- **Experiments of Western Mansions**

3.1.2 View Points and Horizon:

The The Mathematical Calculation for Space Sequence

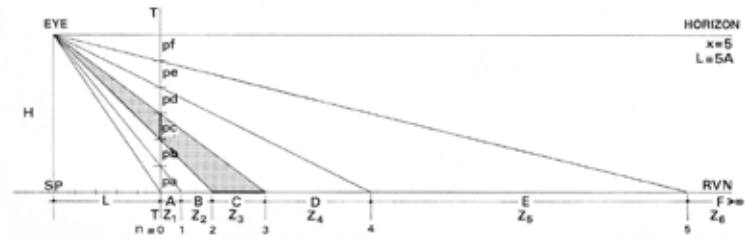
The Mathematical Calculation Formula from TUDelft research



		nth line segment									
z factor		1	2	3	4	5	6	7	8	9	10 enz.
x =	1	1,00	∞								
	2	0,50	1,50	∞							
x =	3	0,33	0,67	2,00	∞						
	4	0,25	0,42	0,83	2,50	∞					
x =	5	0,20	0,30	0,50	1,00	3,00	∞				
	6	0,17	0,23	0,35	0,93	1,17	3,50	∞			
	7	0,14	0,19	0,27	0,40	0,67	1,33	4,00	∞		
	8	0,13	0,16	0,21	0,30	0,45	0,75	1,50	4,50	∞	
	9	0,11	0,14	0,18	0,23	0,33	0,50	1,83	1,67	5,00	∞
	10 enz.	0,10	0,12	0,15	0,20	0,26	0,37	0,55	0,92	1,83	5,50 ∞

Table giving the factor by which L must be multiplied in order to calculate the length of the nth line segment (Z_n) for the given X ($X = L / A$ = number of fields of equal perspectival depth)

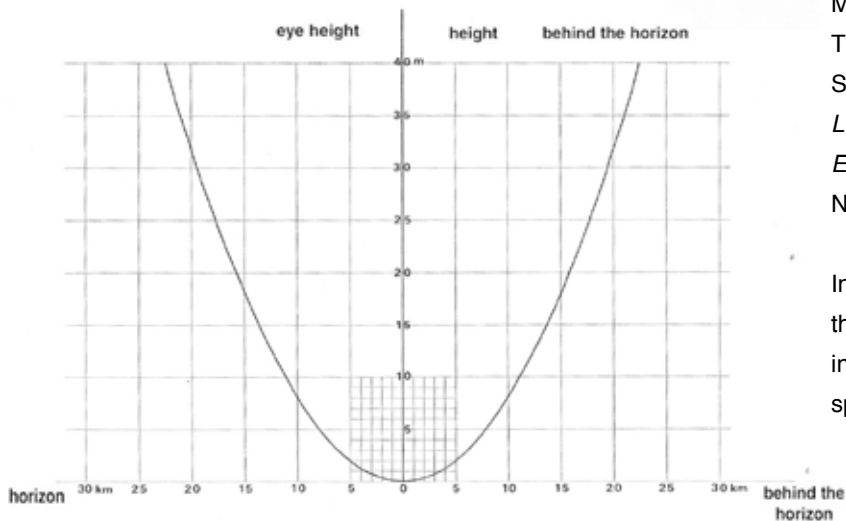
The formula refer to Clemens Steenbergen and Wouter Reh (2003)



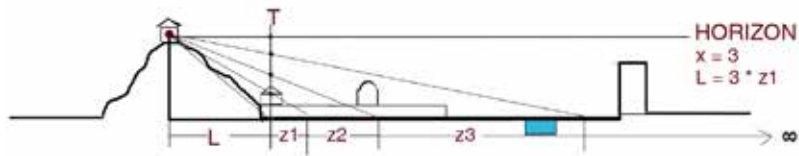
Mathematical Calculation Theory for Perspective Analysis:

The formula of this page comes from Clemens Steenbergen and Wouter Reh, *Architecture and Landscape – The Design Experiment of the Great European Gardens and Landscapes*, THOTH Publishers, Netherlands, 2003, page 163

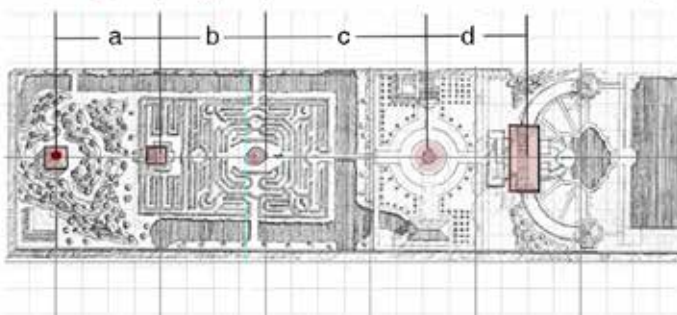
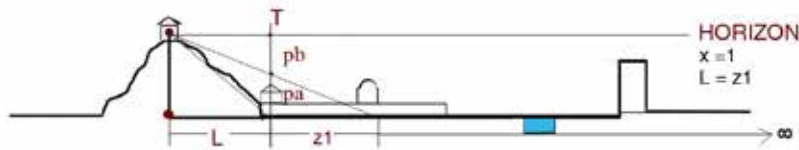
In the following analysis graphs, I will apply the formula to the digital model, bring the data of the Western Mansions into the formula, calculate and research the south-north space sequence designed by Giuseppe Castiglione.



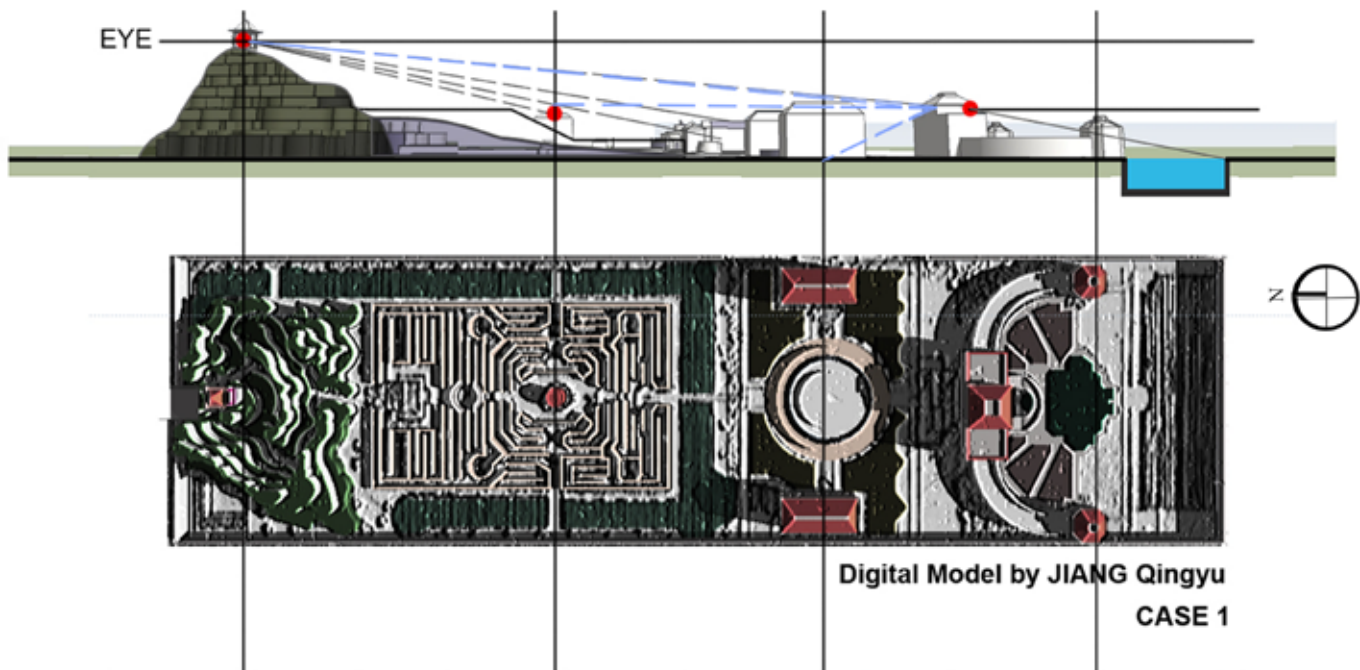
Graph of the relation between eye heigh, the distance to the horizon and perceptible height behind the horizon. (C. Steenbergen and W. Reh)



$$a : b : c : d = 1 : 1 : 1.5 : 1$$

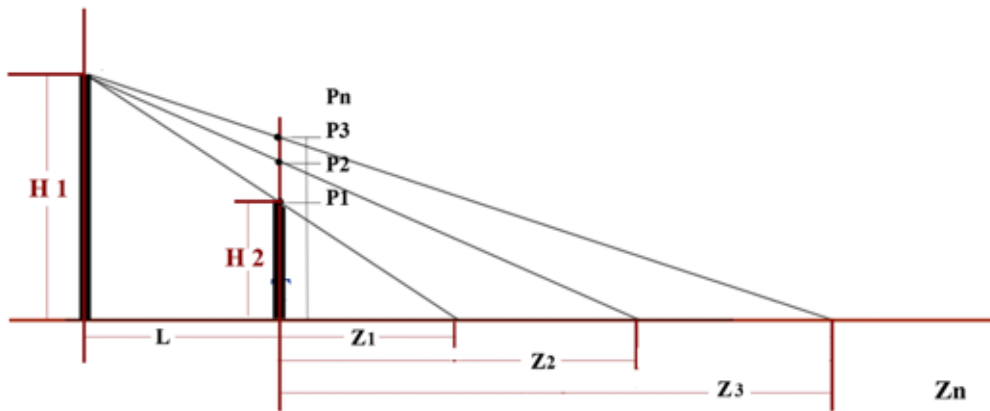


		n th line segment									
z factor		1	2	3	4	5	6	7	8	9	10
x =	1	1,00	∞								
x =	2	0,50	1,50	∞							
x =	3	0,33	0,67	2,00	∞						
	4	0,25	0,42	0,83	2,50	∞					
	5	0,20	0,30	0,50	1,00	3,00	∞				
	6	0,17	0,23	0,35	0,93	1,17	3,50	∞			
	7	0,14	0,19	0,27	0,40	0,67	1,33	4,00	∞		
	8	0,13	0,16	0,21	0,30	0,45	0,75	1,50	4,50	∞	
	9	0,11	0,14	0,18	0,23	0,33	0,50	1,83	1,67	5,00	∞
	10	0,10	0,12	0,15	0,20	0,26	0,37	0,55	0,92	1,83	5,50
enz.											



Graph of relation between eye height, the distance to the horizon and perceptible height behind the horizon: (the Formula comes from TUDelft research, data collection comes from Tsinghua University and Mission Palais d'été)

Calculation for Proportion.



The formula and the graph above aims to calculate the proportion between buildings.
The formula is made by Jiang Qingyu

$$\frac{Z_n}{Z_n + L} = \frac{P_n}{H_1}$$

$$P_n = \frac{Z_n * H_1}{Z_n + L} \quad (P_n \geq H_2)$$

$$\frac{Z_n * H_1}{Z_n + L} \geq H_2$$

$$Z_n * H_1 \geq H_2 * (Z_n + L)$$

$$Z_n * H_1 \geq H_2 * Z_n + H_2 * L$$

$$Z_n * H_1 - H_2 * Z_n \geq H_2 * L$$

$$Z_n \geq \frac{L * H_2}{H_1 - H_2}$$

$$\frac{P_n}{H_1} = \frac{Z_n}{Z_n + L} \quad (P_n \geq H_2)$$

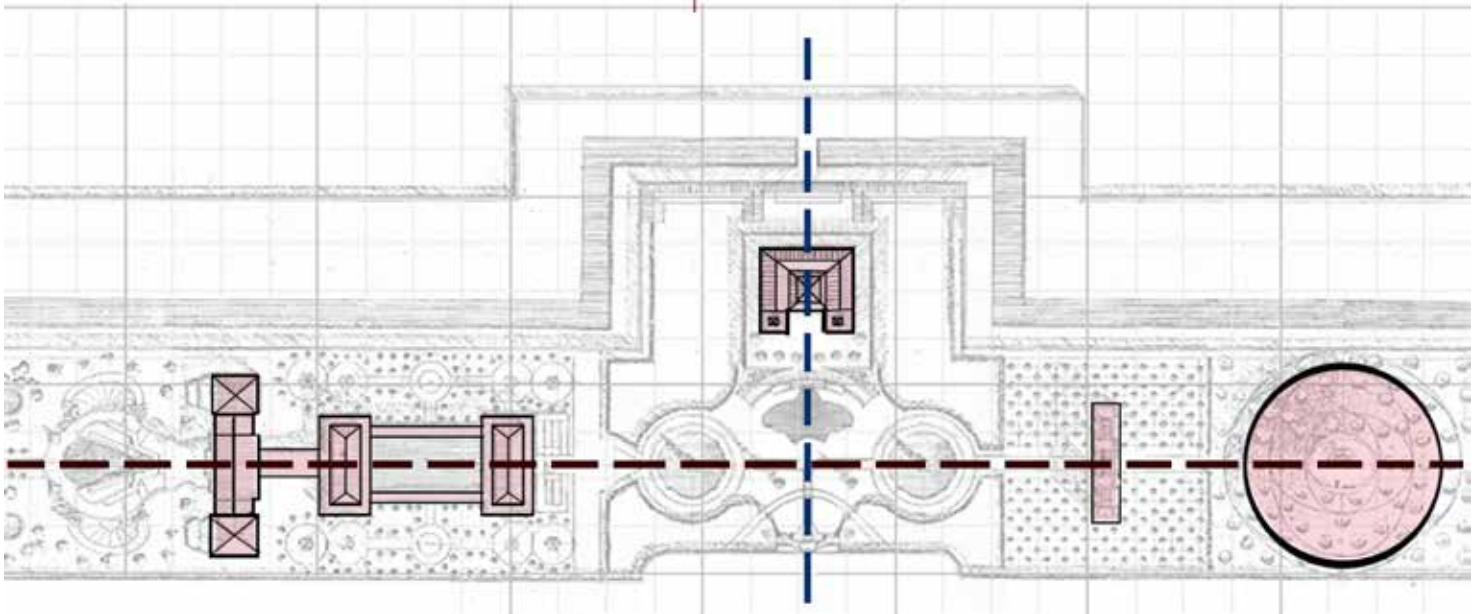
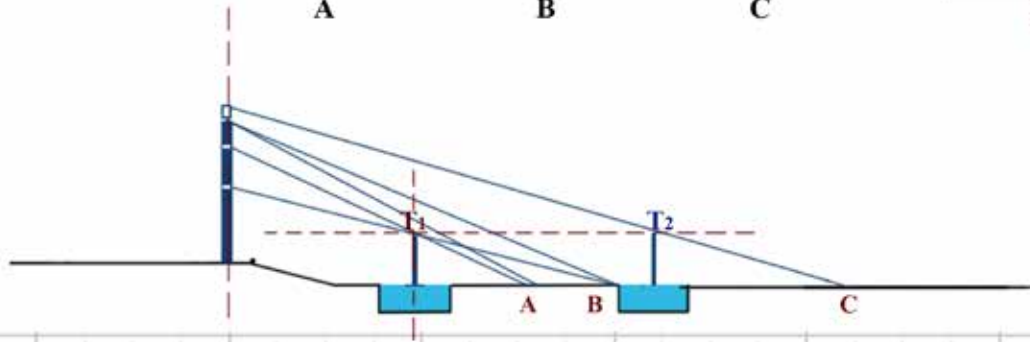
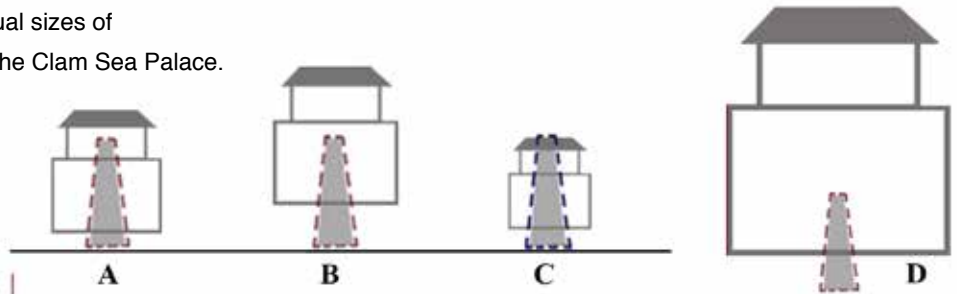
Perspectival relationship in the size (and the visibility) of the Clam Sea Palace (Haiyan tang) with regard to the Fountain Towers, viewed along the axis.

A From the middle of the Great Fountain Plaza

B From the east part of the Great Fountain

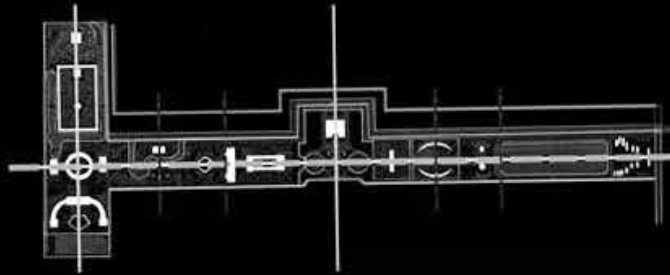
C From the Triumphal Arch

D Normal projection in actual sizes of the Fountain Towers and the Clam Sea Palace.

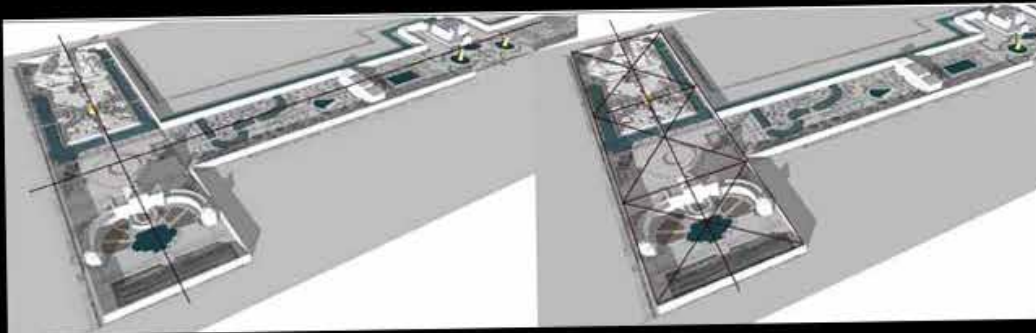


- **Experiments of Western Mansions**

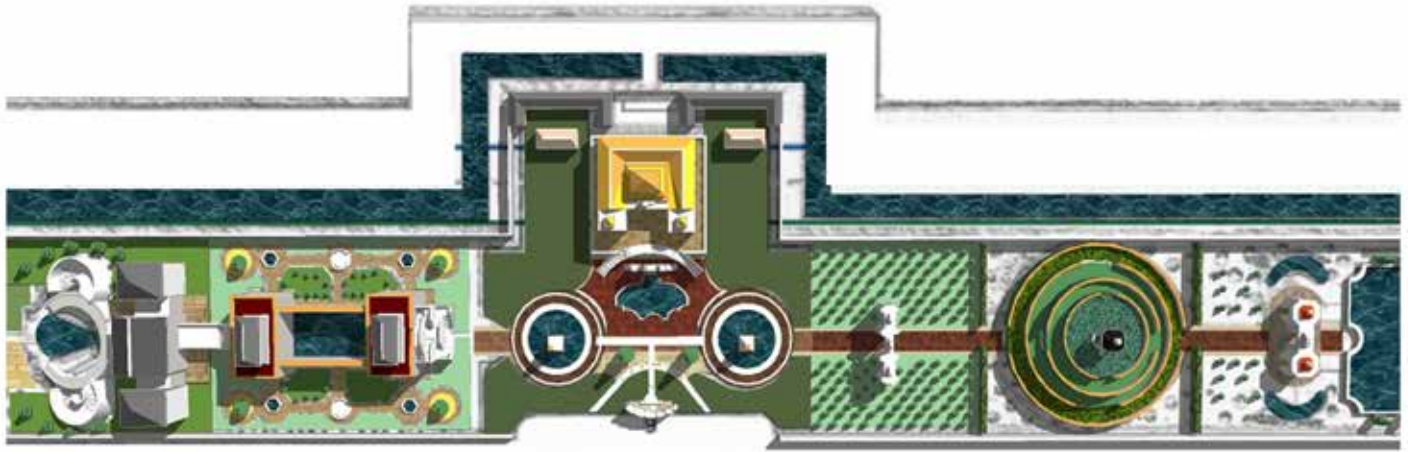
- 3.1.3 The Western Mansions as a Landscape Theater
 - The Perspective System: Viewpoints, Horizons, and the Panorama



The Transverse and Longitudinal Axes
Complex Composition: Orthogonal Axes and Bilateral Symmetry



Geometric Module of Squares
Digital Model by Jiang Qingyu



Digital Models:

Palace of the Calm Sea (Haiyantang)

The Vast Ocean Palace (Yuanyingguan)

The Great Fountain (Dashuifa)

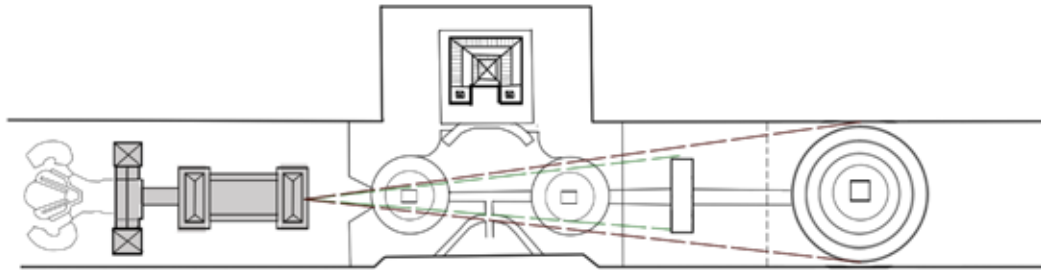
Triumphal Arch

Hill of Perspective (Xianfa Shan)

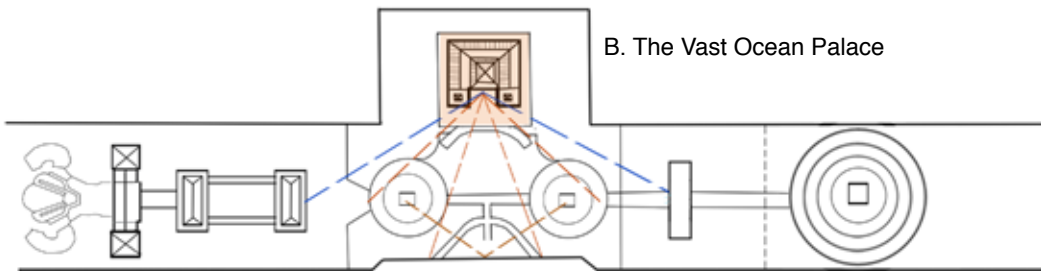


The photo of the Vast Ocean Palace (2013), by Jiang Qingyu

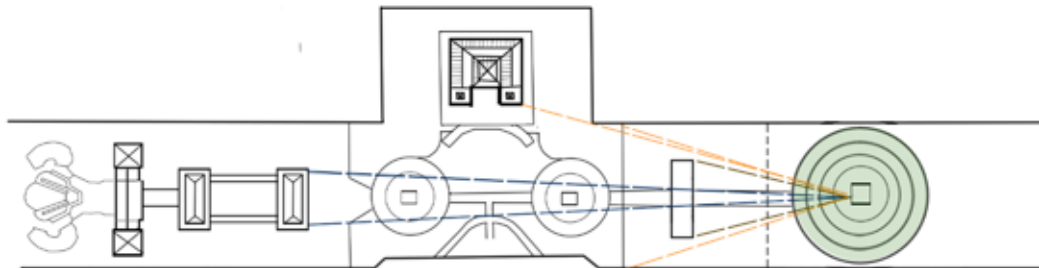
Garden as a Landscape Theater



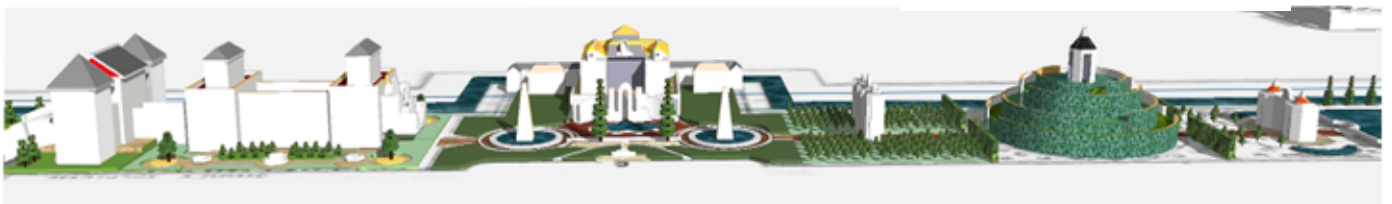
A. The Palace of the Calm Sea



B. The Vast Ocean Palace

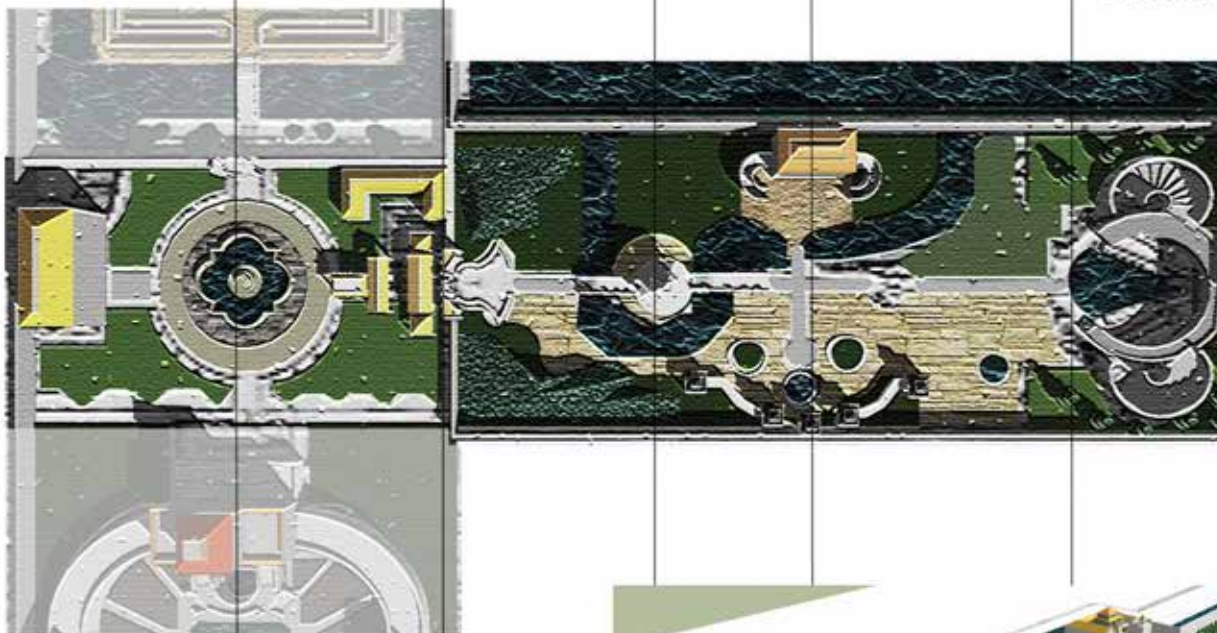


C. The Hill of Perspective





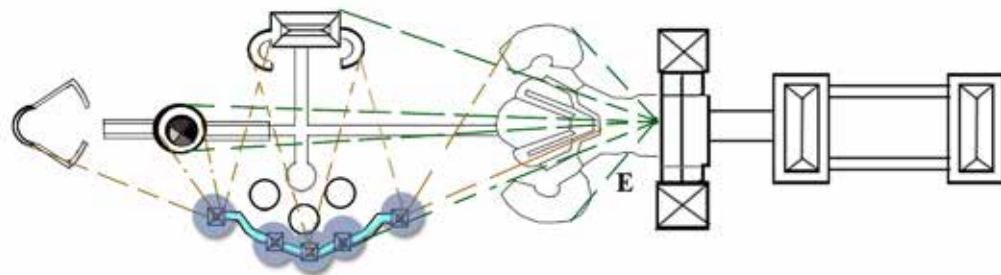
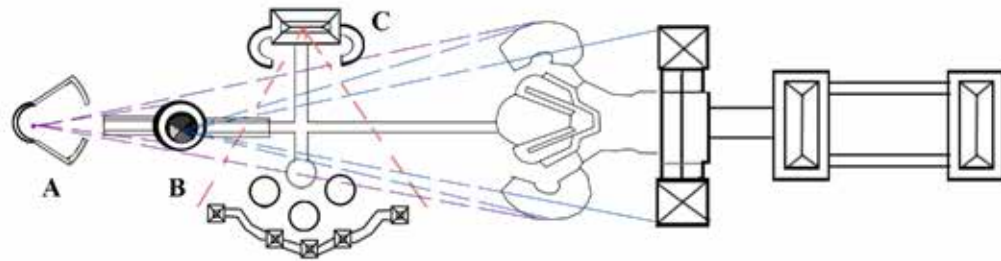
A-A SECTION



Digital Models:
 Reservoir (Xushuilou)
 Aviary (Yangquelong)
 Belvedere (Fangwaiguan)
 Bamboo gazebos (Zhu ting)
 Palace of the Calm Sea (Haiyantang)



Garden as a Landscape Theater

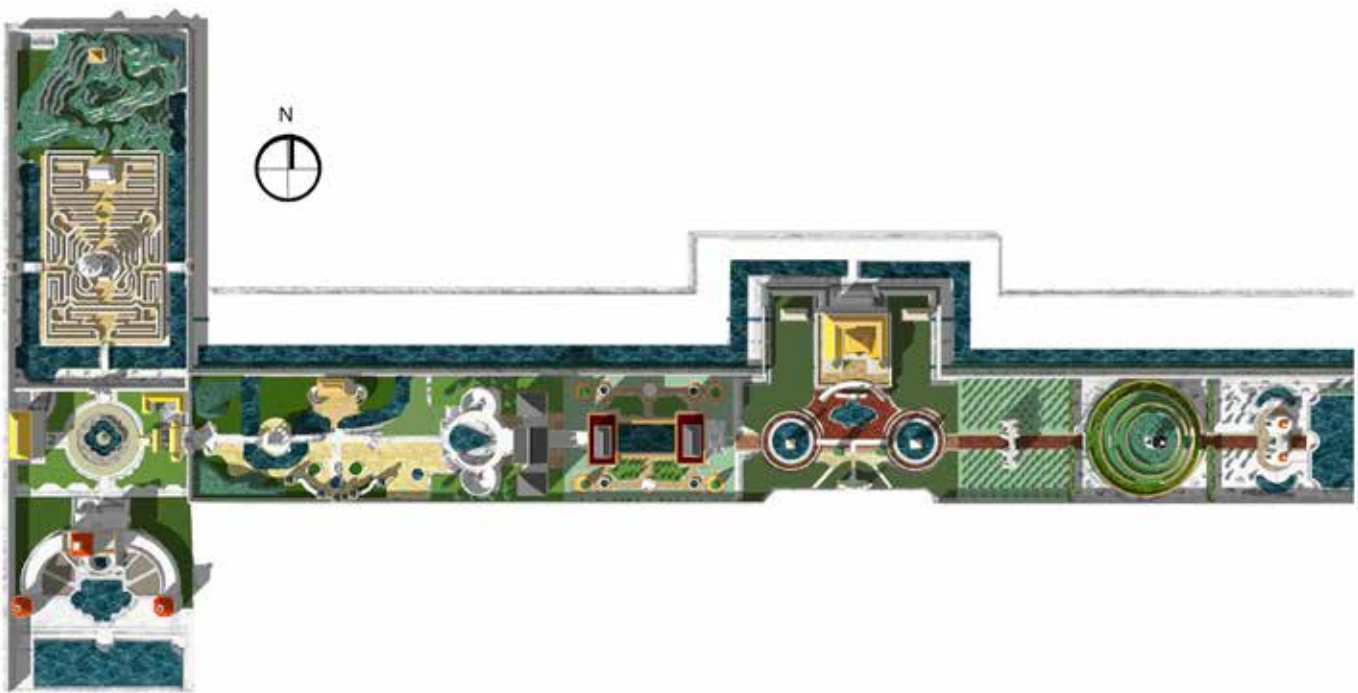


F. Five points



Giuseppe Castiglione combined the Pavilions and the Garden Porches into Western Mansions:

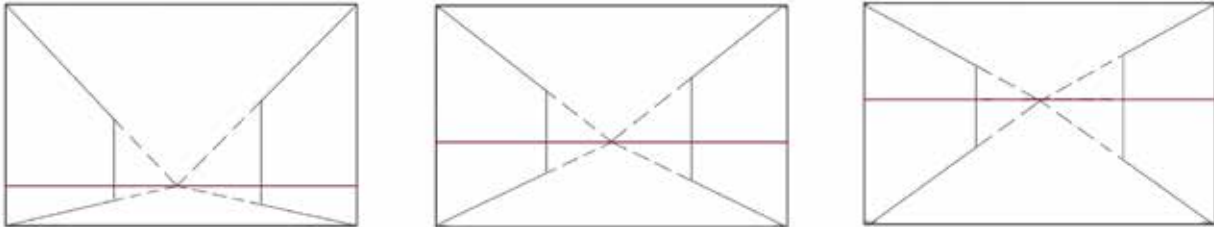
- The Function of Pavilions: Observe from Fixed Angles.
- The Function of Garden Porches: Move and View from Changing Angles.



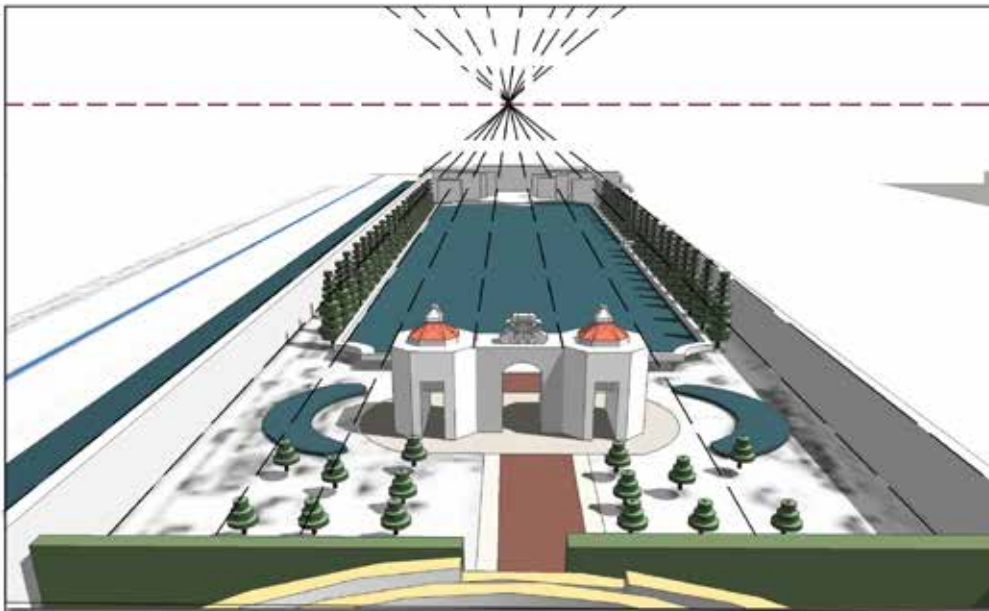
Scenography of the Transverse Axes: Space Sequence from East to West

In the top of the Hill of Perspective (Xianfa Shan):

Triumphal Arch – The Great Fountain (Dashuifa) – The Vast Ocean Palace (Yuanyingguan) – Palace of the Calm Sea (Haiyantang)



Seen from various levels of the Hill of Perspective. The vanishing point is manipulated by the upward horizon mutations.



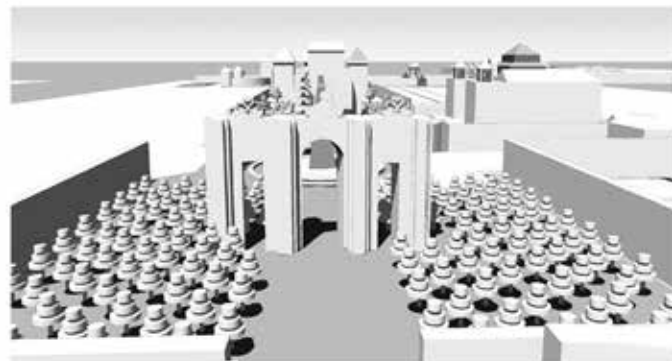
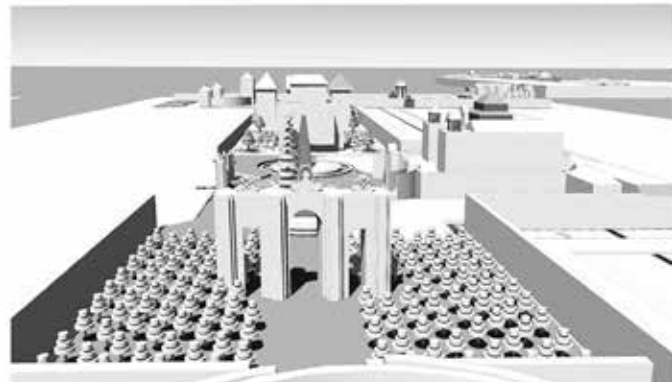
Scenography of the Transverse Axes: Space Sequence from West to East

In the top of the Hill of Perspective (Xianfa Shan):

– Gate East of Hill of Perspective – Fang Pool (Fanghe) – Paintings of the Perspective



C = the Hilltop



Palace of the
Calm Sea

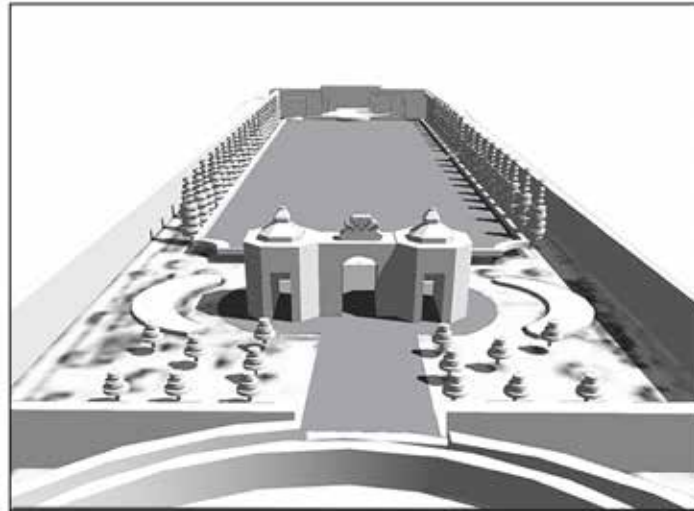
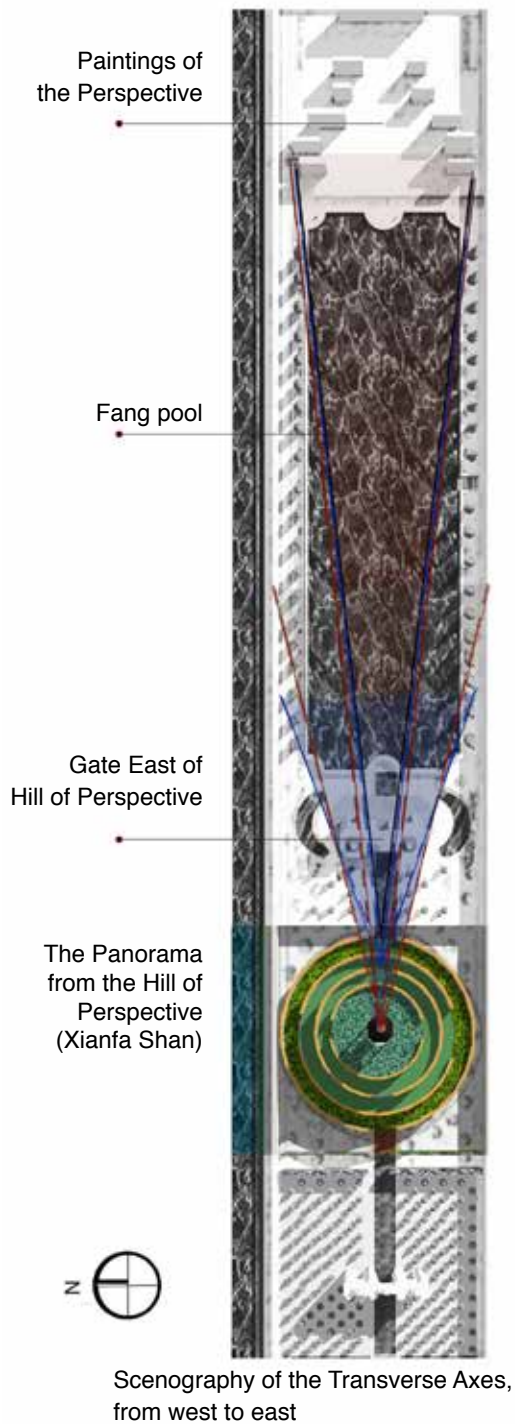
The Vast Ocean
Palace

The Triumphal
Arch

The Panorama
from the Hill of
Perspective
(Xianfa Shan)

B = the third level

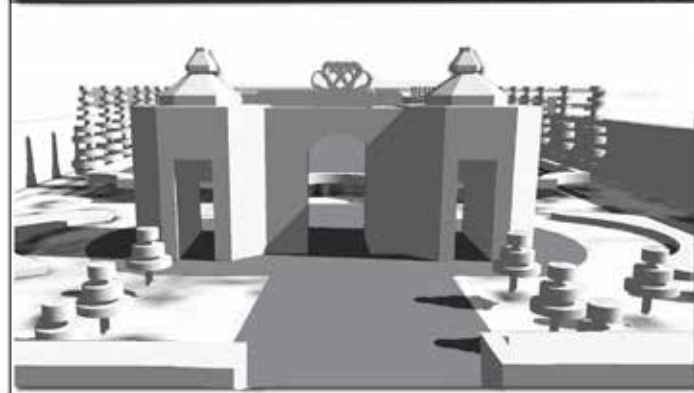
A. = the ground level



C = the Hilltop

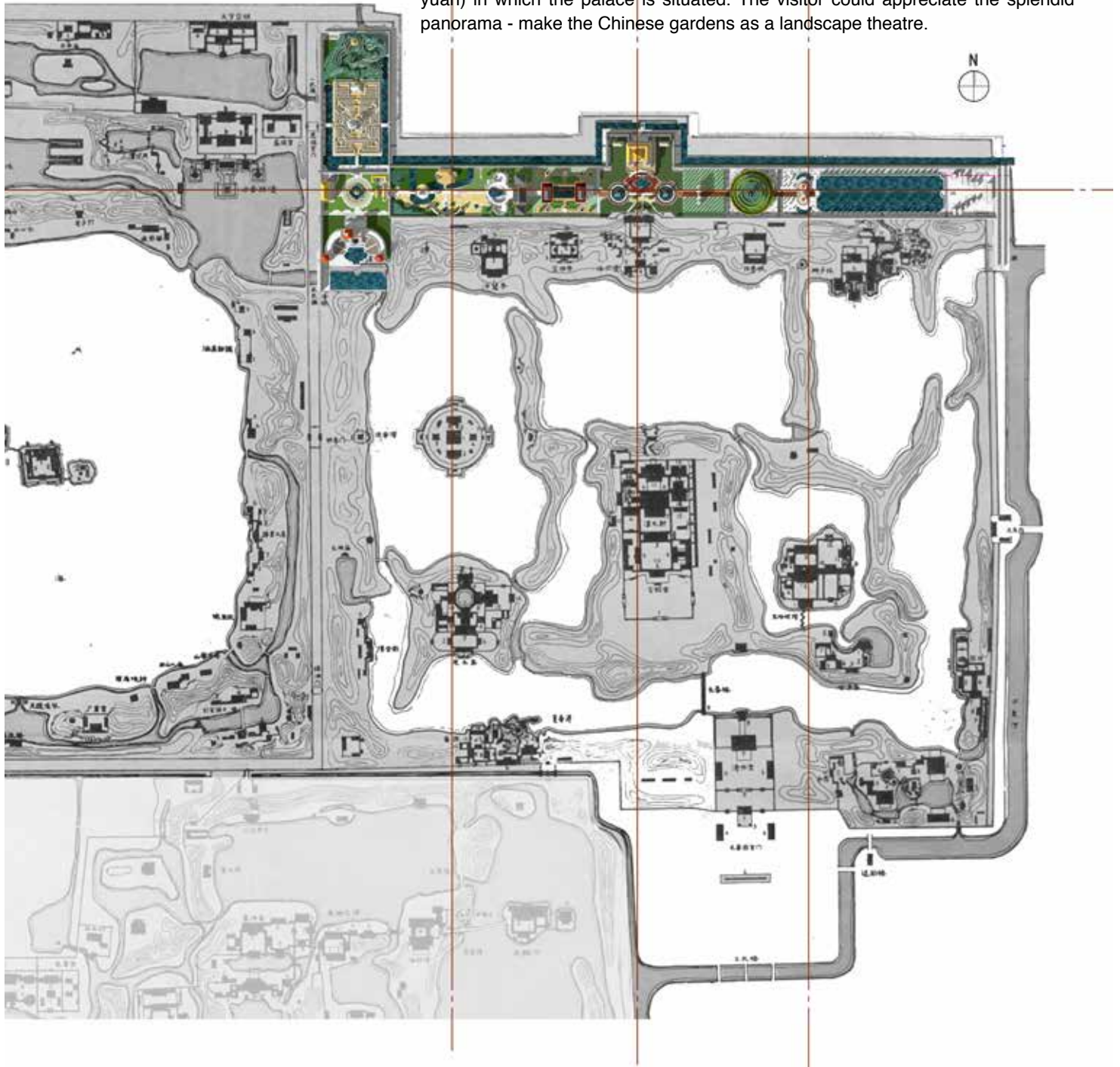


B = the third level



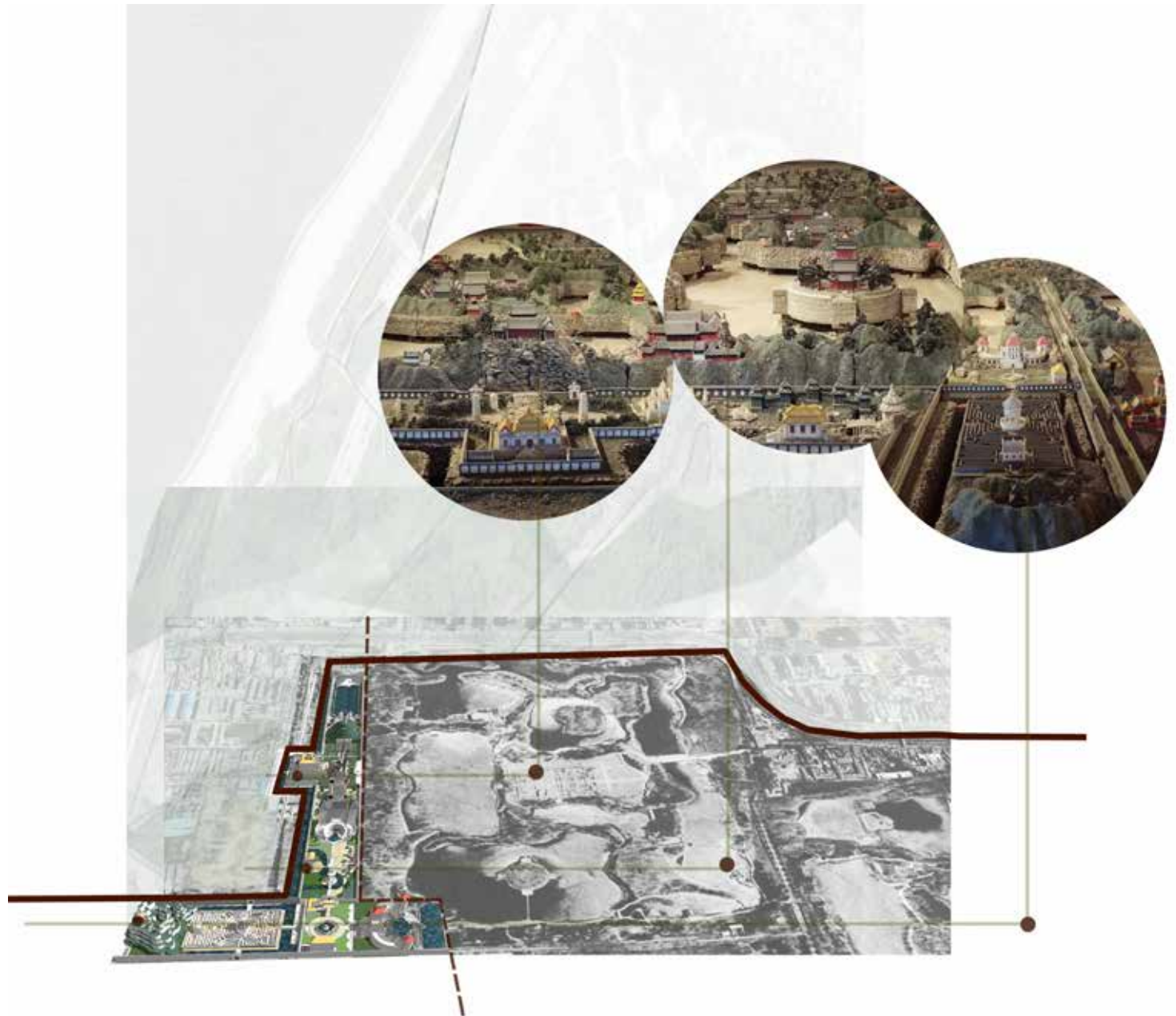
A. = the ground level

The Vast Ocean Palace is situated in such a way that its architectural axis coincides with the north-south axis of the whole Garden of Eternal Spring (Changchun yuan) in which the palace is situated. The visitor could appreciate the splendid panorama - make the Chinese gardens as a landscape theatre.



Viewpoints, Horizons, and the Panorama:

Chinese Gardens outside Western Mansions as a Landscape Theatre





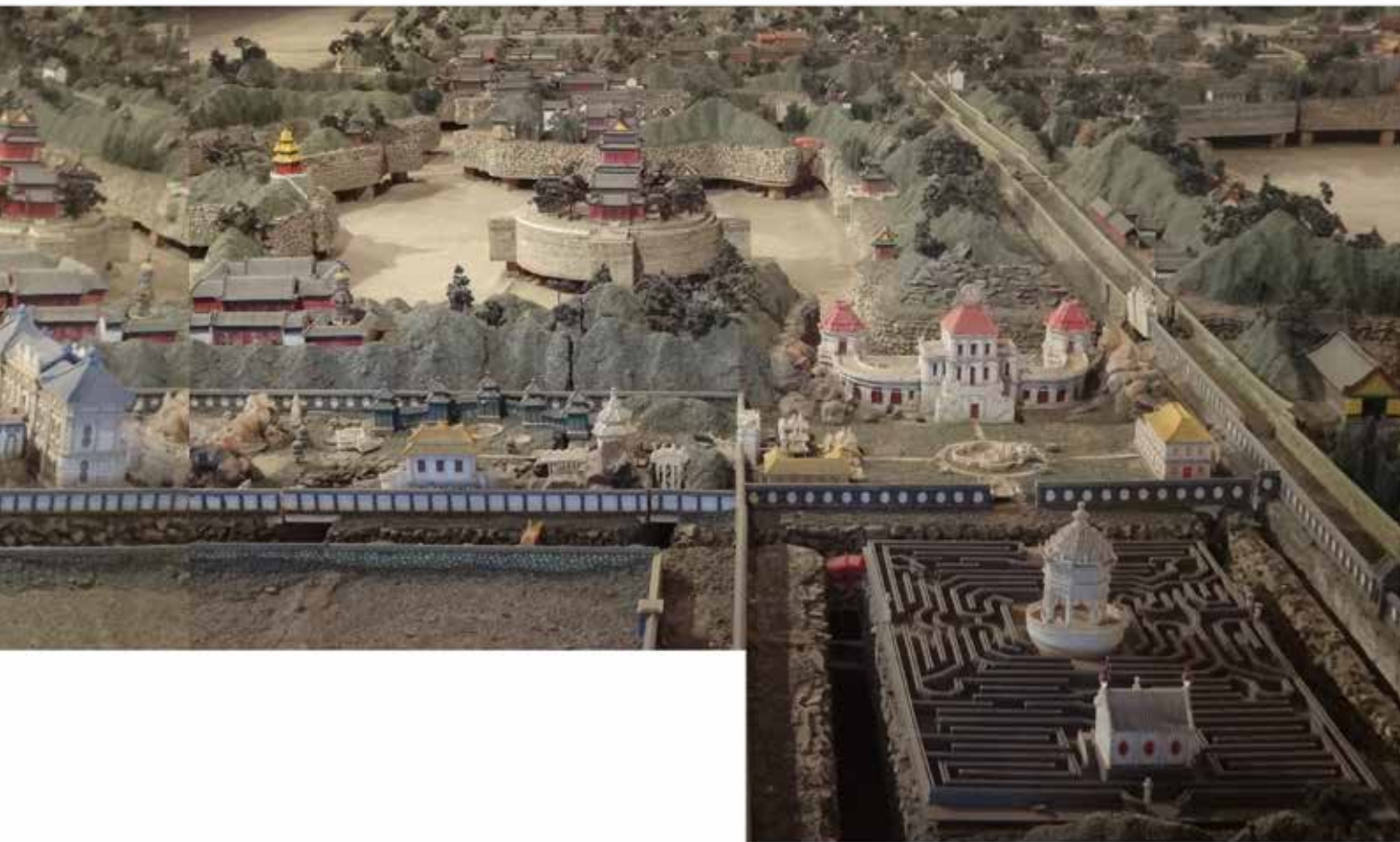


Figure 45:
The Panorama of Chinese Gardens as a Landscape Theatre: View from the Western Mansions
Model Source: The Yuanming Yuan Society of China, Yuanming Yuan Exhibition, Beijing.
Photo by Jiang Qingyu (2013)

- **Experiments for Chinese Gardens**
“Forty Scenes of Yuanming Yuan”

The System of Combination: Axiom of Modularity

II.Experiments of Chinese Traditional Gardens

The System of Combination:

Axiom of Modularity in “Forty Scenes of Yuanming Yuan”

- Representative Samples for the Experiment:

The album “Forty Scenes of Yuanming Yuan” (1744), Bibliothèque nationale de France, Paris
The Forty Garden Plans of “Forty Scenes of Yuanming Yuan”, Restitution on Paper by Prof. He Zhongyi, Tsinghua University, Beijing.

Experiment Theories and Inspirations:

The logic of Typology and Modularity Derivation comes from Professor Marco Trisciuglio, *Scatola di Montaggio, L'architettura, gli Elementi della Composizione e le Ragioni Costruttive della Forma*, Carocci editore, 2008

In monograph, Professor Trisciuglio analyzes the fundamentals of volumetric composition, summarizes ten important principles of form logic:

"Accostare, Sovrapporre, Compattare, Moltiplicare, Semplificare, Complessificare, Compenetrare, Confrontare Incompatibili, Confrontare Dentro E Fuori, Giocare."¹

The Axiom of Modularity Theories in Chinese Art refer to Ledderose, *Ten thousand things: module and mass production in Chinese art* (2000), Princeton University Press, 2000.

The Logic of State-action Trees schemata refer to William J. Mitchell, *The Logic of Architecture: Design, Computation, and Cognition*, Cambridge, MIT, 1990

- My Experiment Methodology (from the Macroscopic System of Garden Form to the Subsystem of Buildings Arrangement):

The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts

Step 1: Absolute Essences of the Chinese Traditional Garden Form:

the Syncretic Relationship among **Architecture, Mountains, and Aqueducts**:

- a. Waters Enclosing Hills and Buildings;
- b. Hills Enclosing Waters and Buildings;
- c. Parallel and Integrated System.

Step 2: Recognition and Labeling Rules:

Extraction of A Primal Sketch of the combination for every scene.

Step 3: Derivation of Alternative Elements.

Drawing A Tree Diagram depicting the derivation and structure of the Composition

¹ Professor Marco Trisciuglio, *Scatola di Montaggio, L'architettura, gli Elementi della Composizione e le Ragioni Costruttive della Forma*, Carocci editore, 2008, page 52 - 58.

Scheme Order of garden form.

- Subsystem for Experiment:

While in microcosm, each modular system such as a courtyard space itself would also incorporate the development from element to whole, constructs hierarchies of subsystems within subsystems, provides a comprehensive classification scheme for the whole garden:

The Subsystem: Principles of Buildings Arrangement in “Forty Scenes of Yuanming Yuan”

Step 1: Absolute Essences of the Chinese Traditional Buildings Arrangement:

Point System: Complex, Single Building

Line System: Line of Garden Porches, Line of Buildings

Volumetric System (Enclosing System): Four Orientations Enclosing, Three Orientations Enclosing, Compound Courtyards

Step 2: Recognition and Labeling Rules:

Extraction of A Primal Sketch of the building combination for every scene.

Step 3: Derivation of Alternative Elements.

Drawing A Tree Diagram depicting the derivation and structure of the Composition Scheme Order of Spaces.

In order to specify the form in a scientific logic, we could parameterize all the elements by computer-aided "*Processing*".

Here, I would like to introduce the "*Processing*"², a programming for visual designers and artists. *Processing* was invented by Casey Reas and Ben Fry in MIT. The programming based on JAVA language.

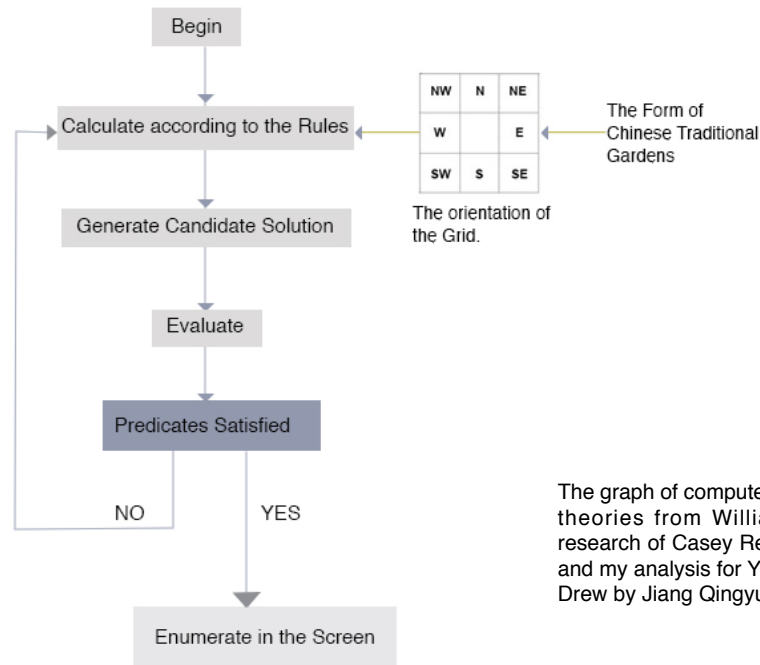
Typology in Motion:

The *Processing* has played a critical role in calculating the possibilities of types in motion. The space arrangement types could be generated by programming, and enumerated in the screen, according to the rules of modularity.

Take the ground plan types of courtyards inside Yuanming Yuan as an example, we could extend the possibilities of various complex combinations by programming.

The *Processing* provides us many significant functions, such as draw(), setup(), fill(), etc.

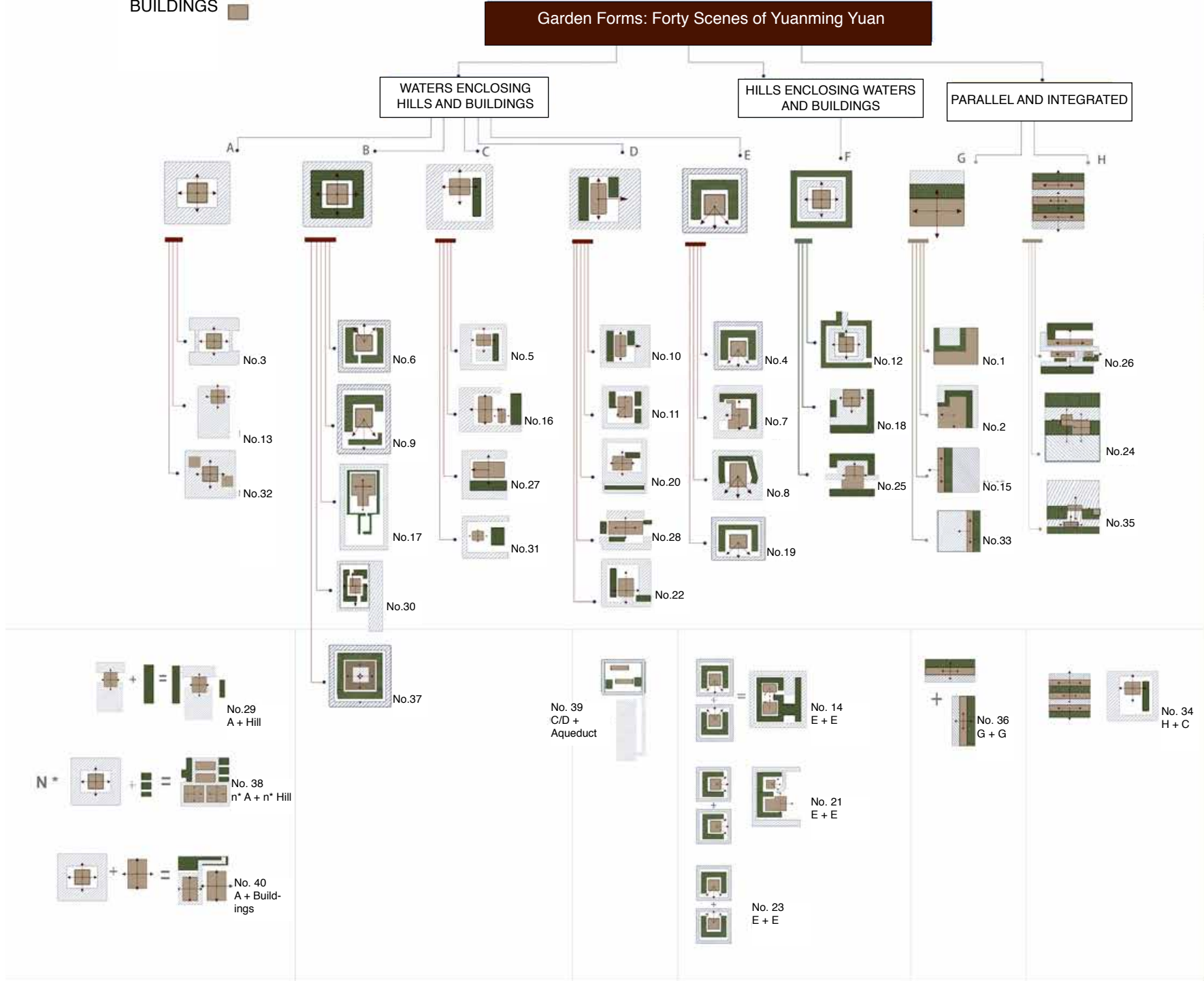
The basic logic of JAVA programming for typology in motion is:



² Casey Reas, Ben Fry, *Processing: A Programming Handbook for Visual Designers and Artists*, the MIT Press, Cambridge, © 2007 Massachusetts Institute of Technology,

WATERS
HILLS
BUILDINGS

ARRANGEMENT PRINCIPLES AMONG HILLS, WATERS, AND BUILDINGS:
THE UNDERLYING RULES OF CHINESE GARDENS IN YUANMING YUAN



-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

-The forty garden plans, Restitution on Paper, by Prof. He Zhongyi, Tsinghua University, Beijing.

- Research Tutor: Prof. Marco Trisciuglio. Analysis Diagram and Experiments are designed by Jiang Qingyu.

Strategies of Derivation

Approach

Superimpose

Compact

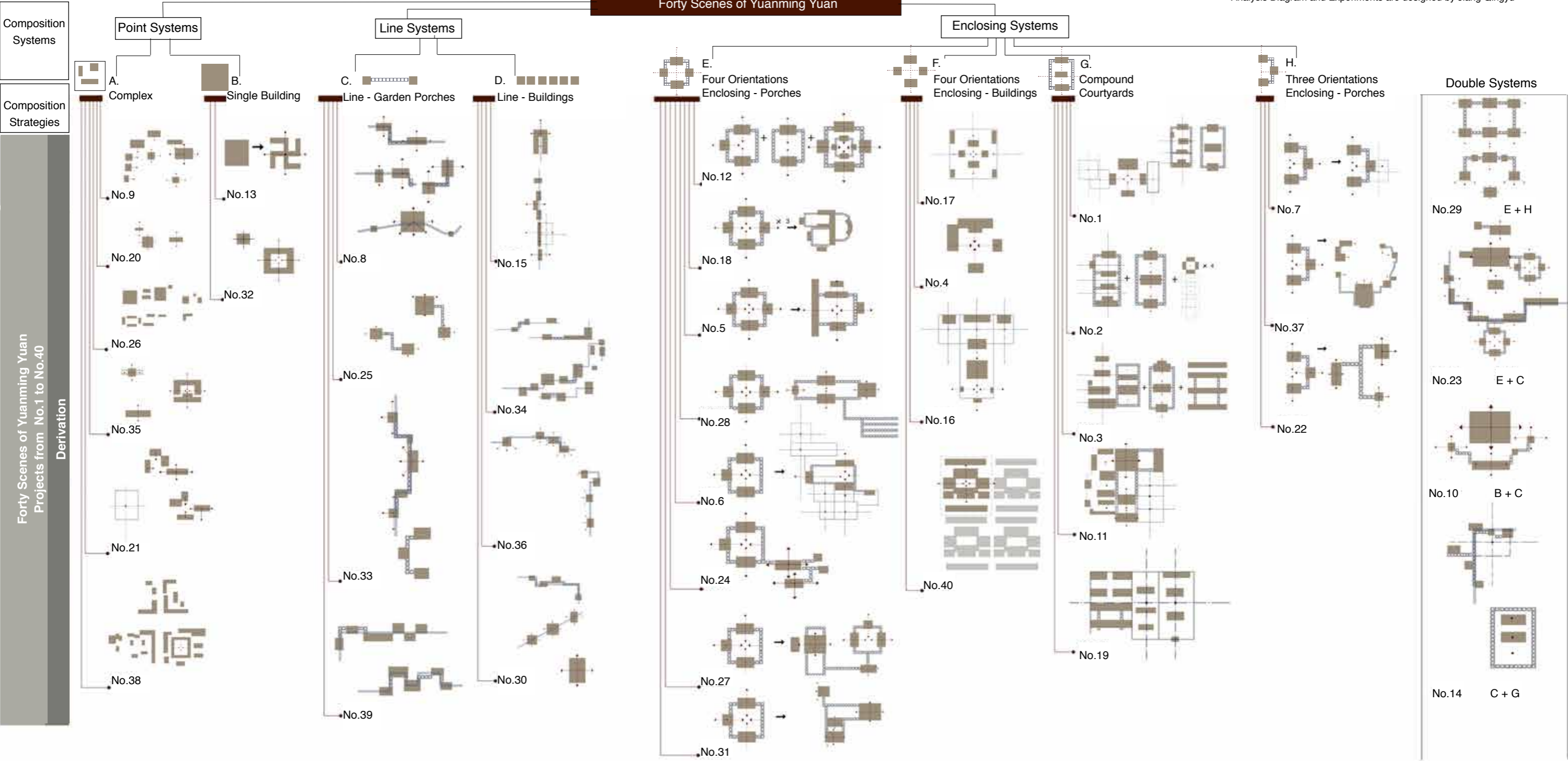
Multiply

Simplify

.....

SPACE ARRANGEMENT PRINCIPLES AMONG BUILDINGS: THE UNDERLYING RULES OF CHINESE GARDENS IN YUANMING YUAN

- Research Tutor: Prof. Marco Trisciuglio.
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Analysis Diagram for “Forty Scenes of Yuanming Yuan”

Hall of Rectitude and Honor

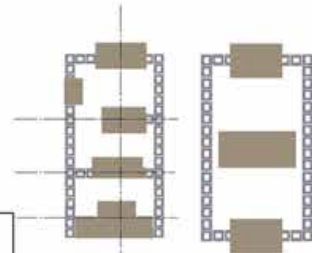
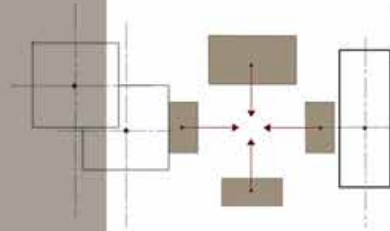
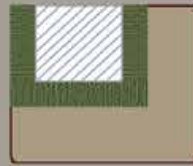
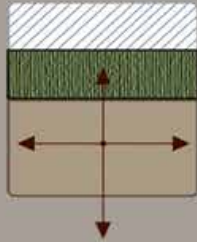
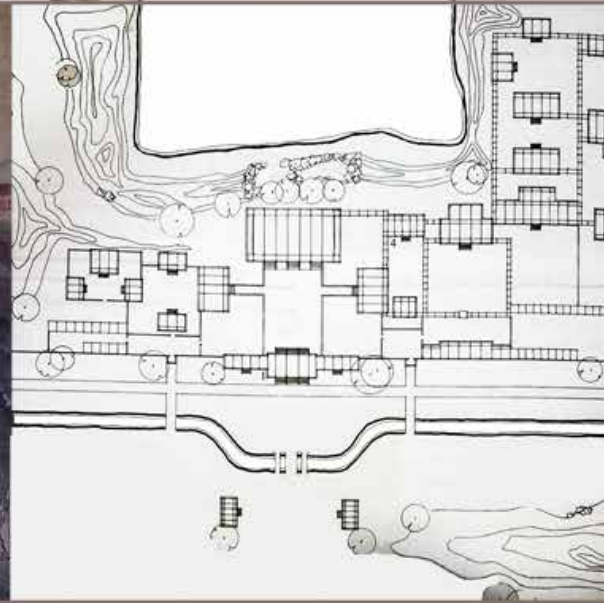
正大光明

No. 1

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The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts

The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Diligent and Talented Government

勤政親賢

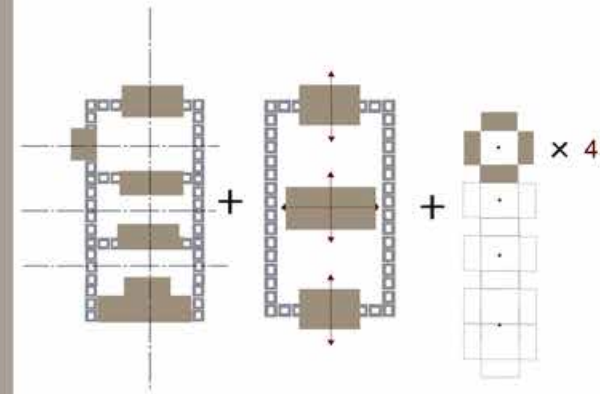
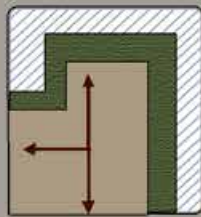
No. 2



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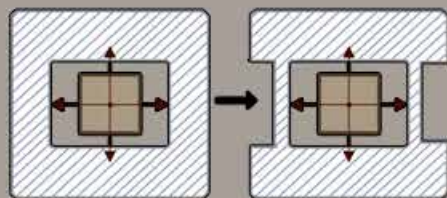
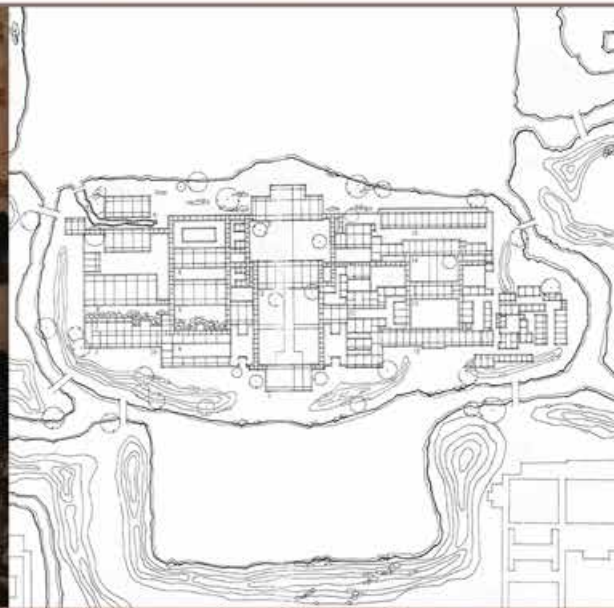
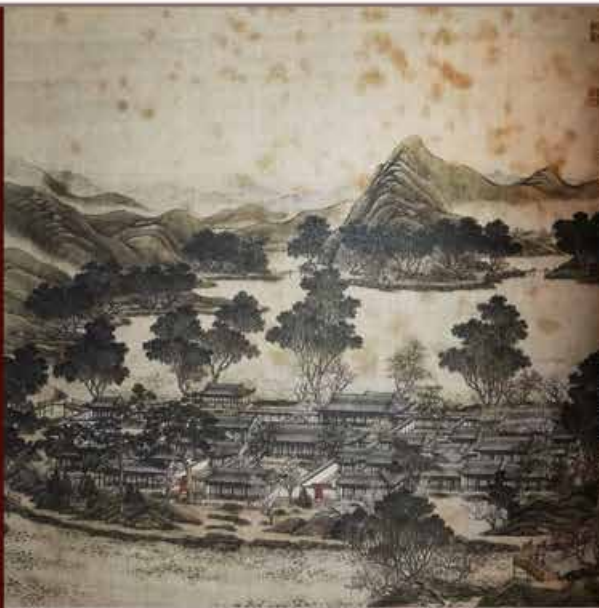
Nine Continents Clear and Calm

九州清晏

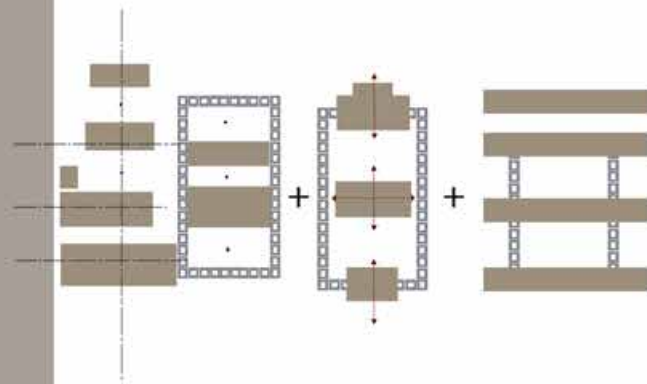
No. 3

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Yuanming Yuan". 1744, 9th
year, Qianlong Emperor, the
size is 62.3 cm (24.5 inches)
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The Macroscopic System of Garden Form: The Axiom of
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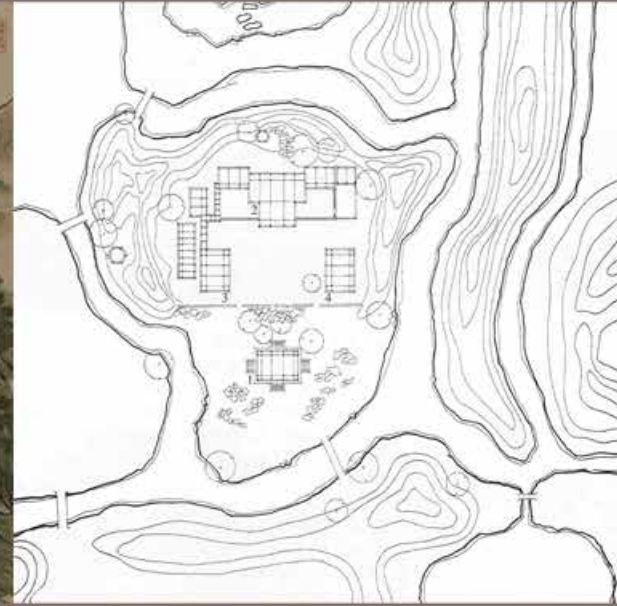


The SubSystem within Macroscopic Garden Form System:
Spaces Arrangement Principles among Buildings

Engraved Moon
Breaking out of Clouds

鑲月開雲

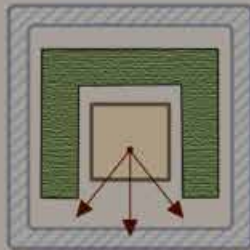
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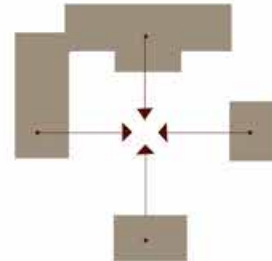
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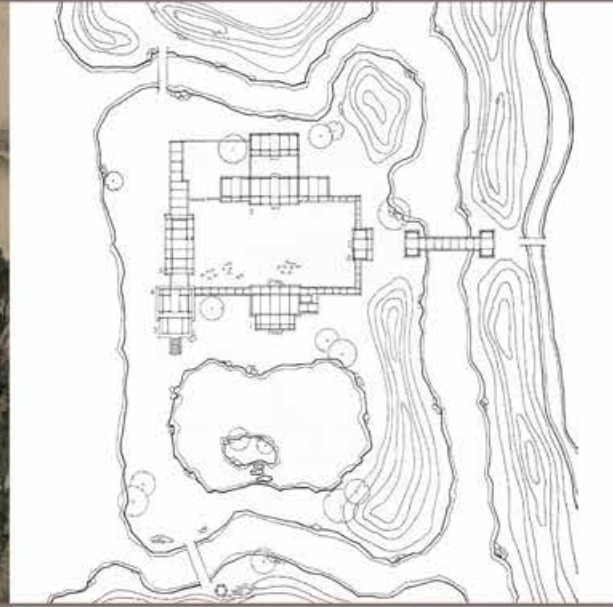
The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts



The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

A Painting of Nature
Chinese
天然圖畫

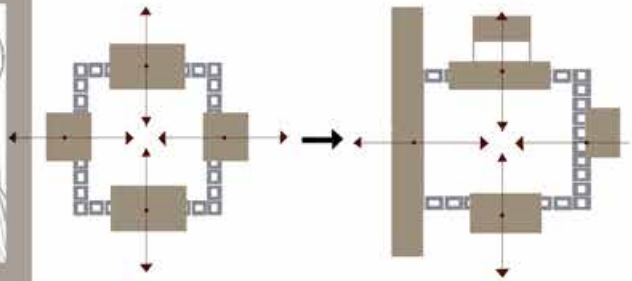
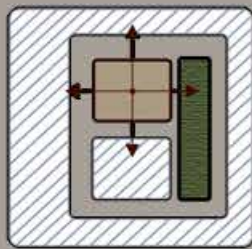
No. 5



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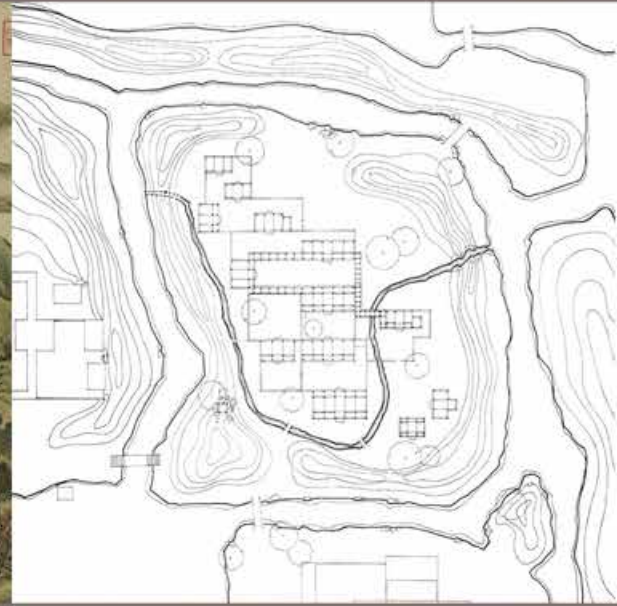
The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts

The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Wutong-Tree Academy

碧桐書院

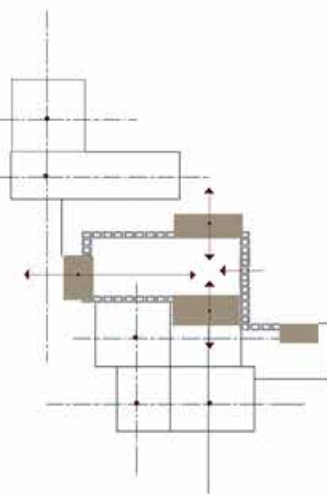
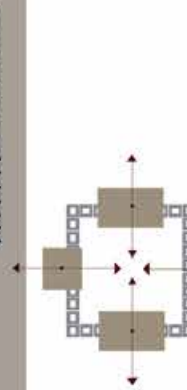
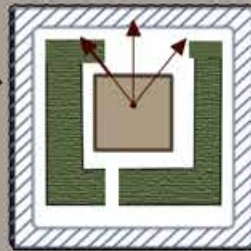
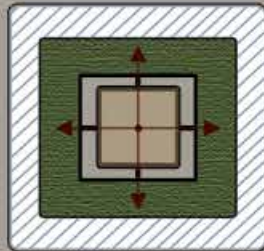
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The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts

The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Merciful Clouds
Protect All

慈雲普護

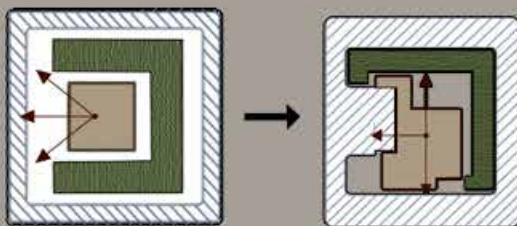
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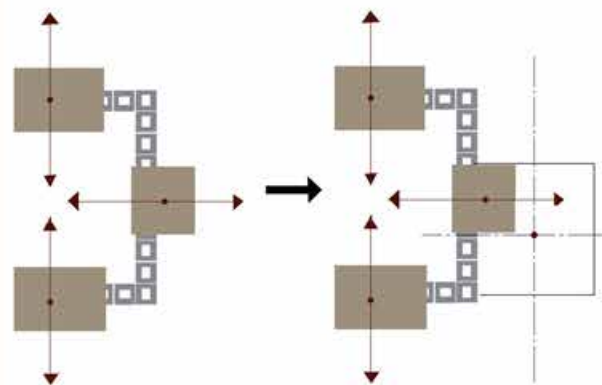
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The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts



The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Heavenly Light Above and Below

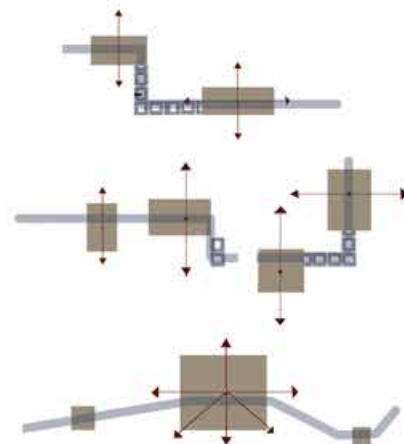
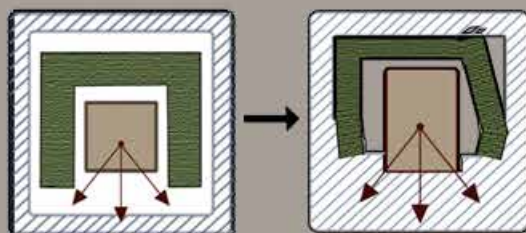
上下天光

No. 8

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Apricot Blossom Spring Villa

杏花春館

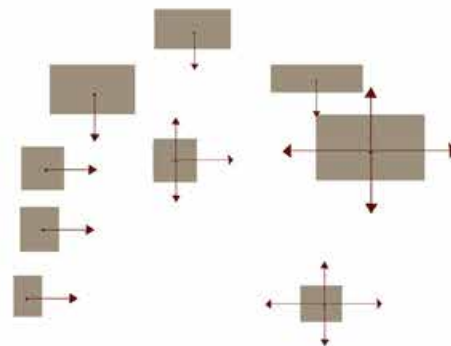
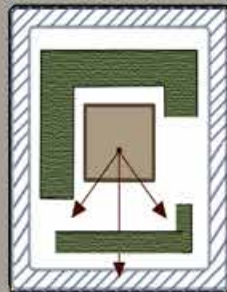
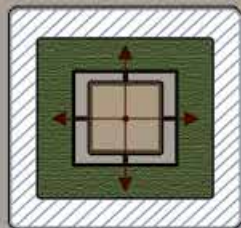
No. 9



-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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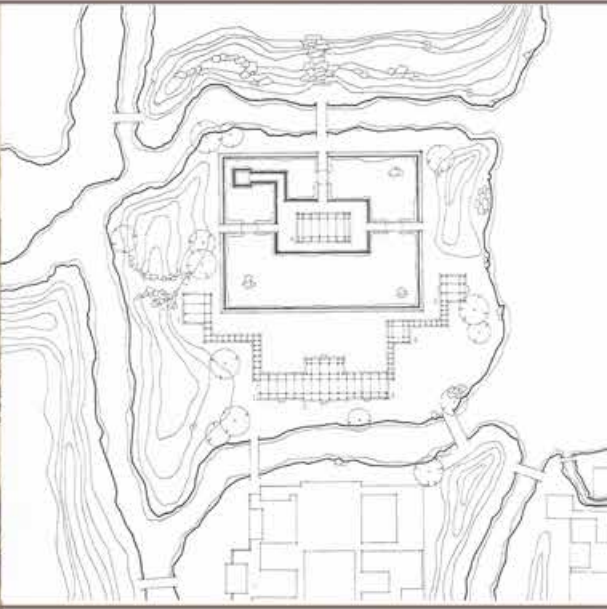
The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts

The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

The Magnanimous World

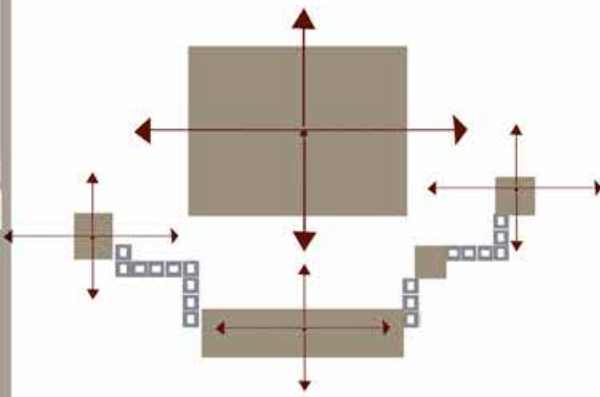
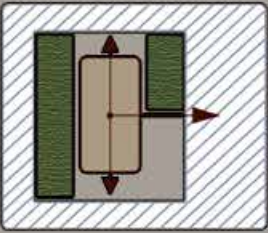
坦坦蕩蕩

No. 10



-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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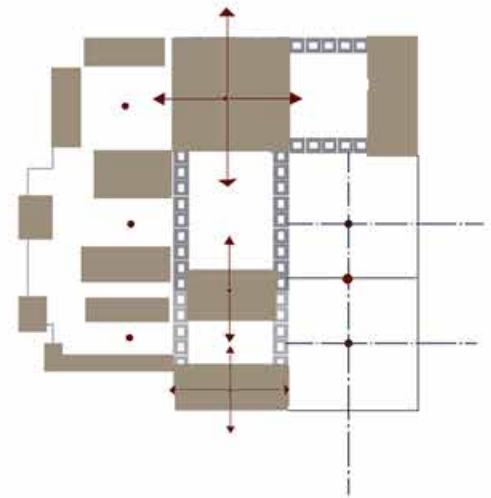
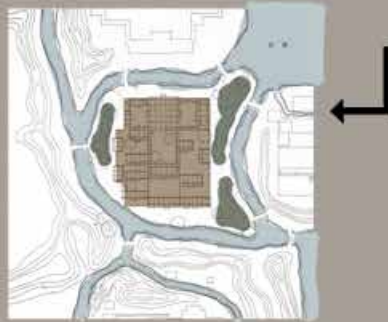
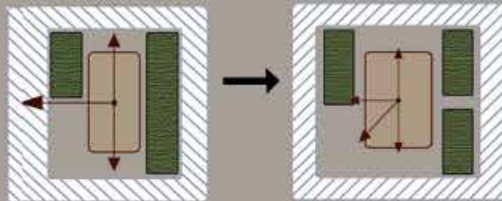
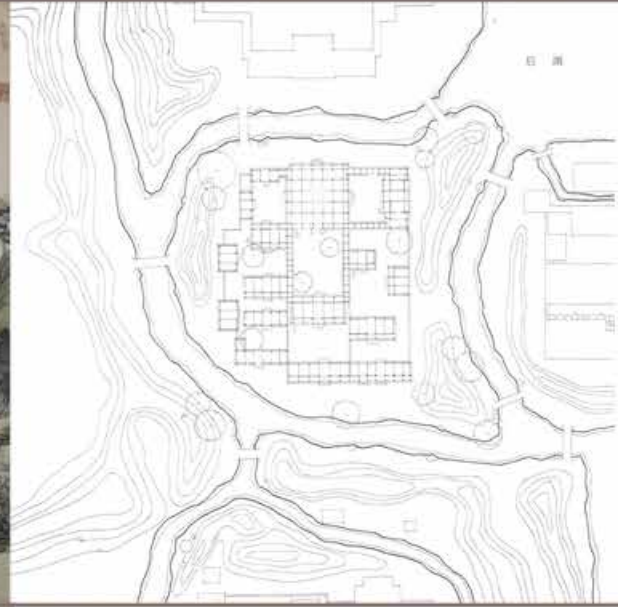
The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Harmony of the Present
with the Past
茹古涵今

No. 11

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Eternal Spring Immortals Hall

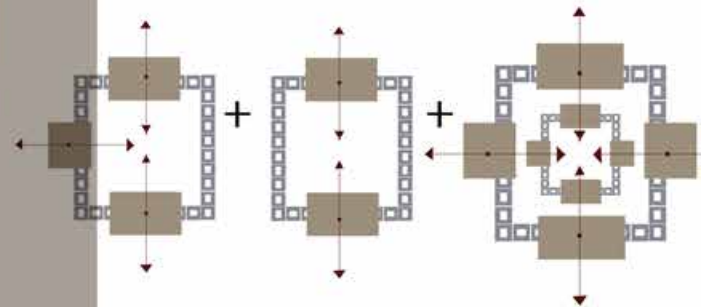
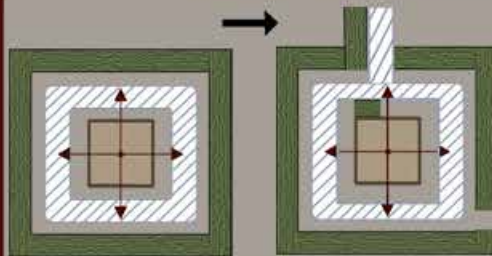
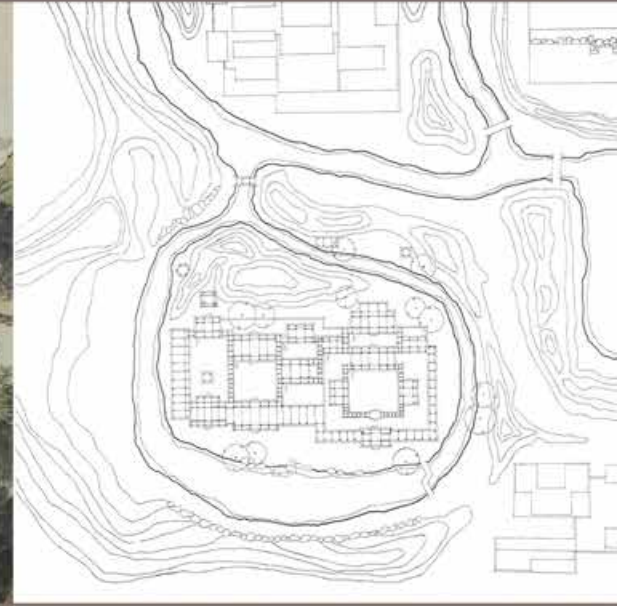
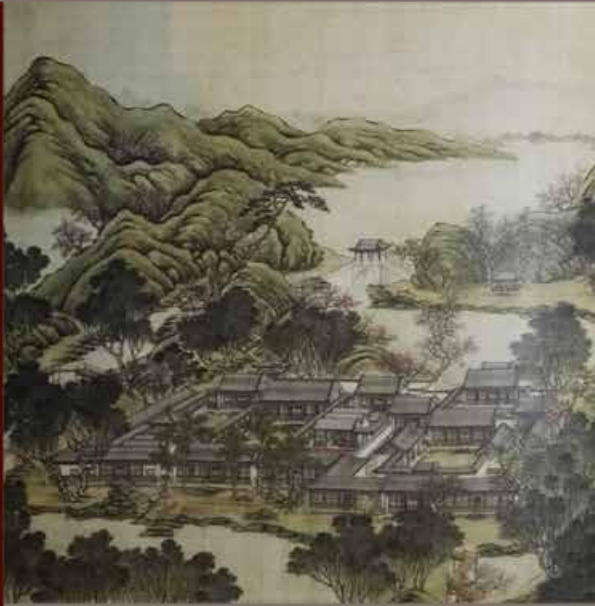
長春仙館

No. 12

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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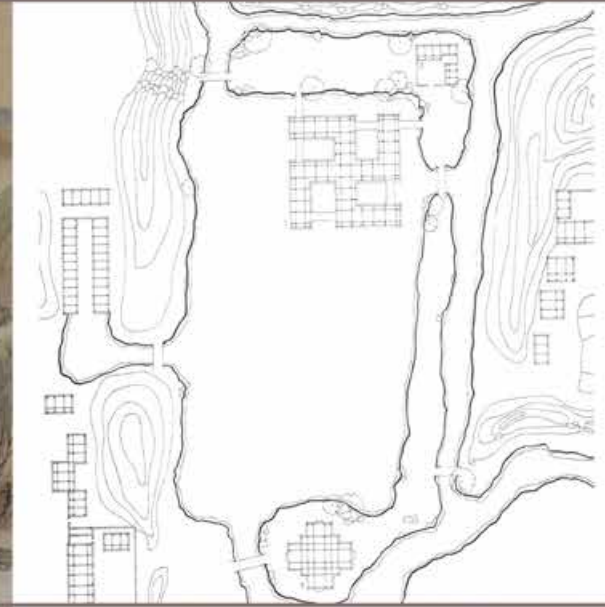
The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts

The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Peace and Harmony Everywhere

万方安和

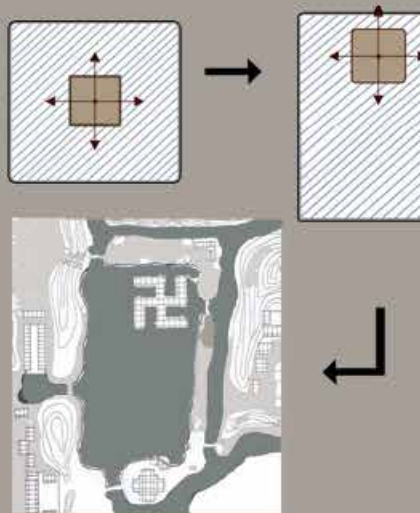
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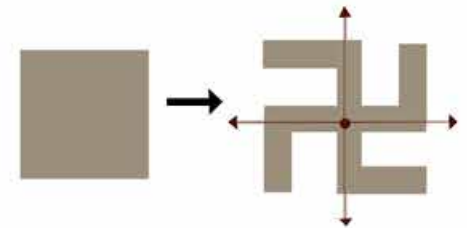
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Spring Color at Wuling

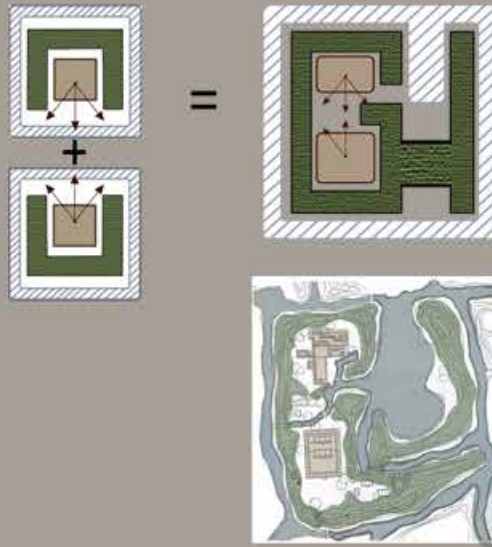
武陵春色

No. 14

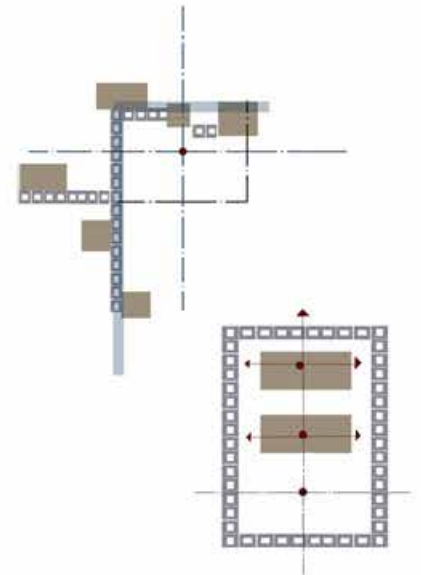
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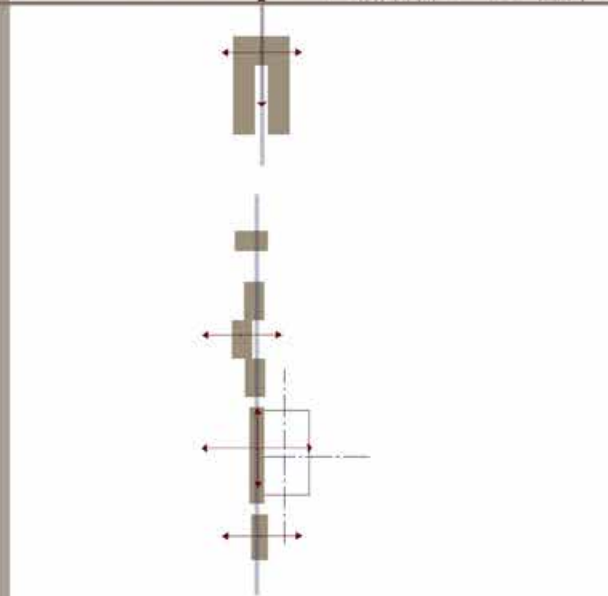
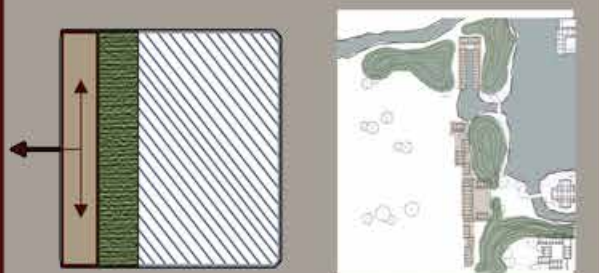


The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Hills High and Waters Long (The Drill Field)

山高水長

No. 15



-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

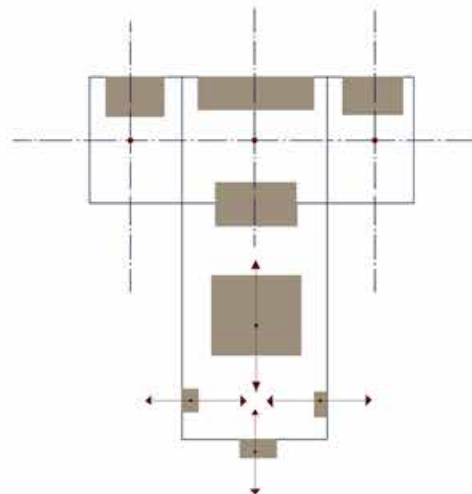
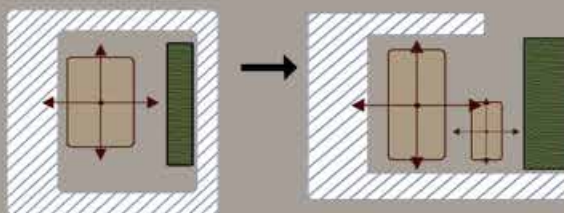
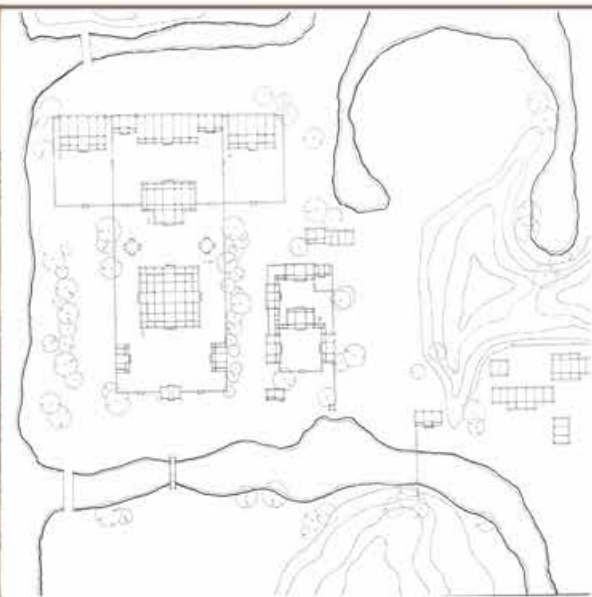
Dwelling of the Moon, Earth, and Clouds

月地雲居

No. 16

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts

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Vast Compassion and Eternal Blessing

鴻慈永祐

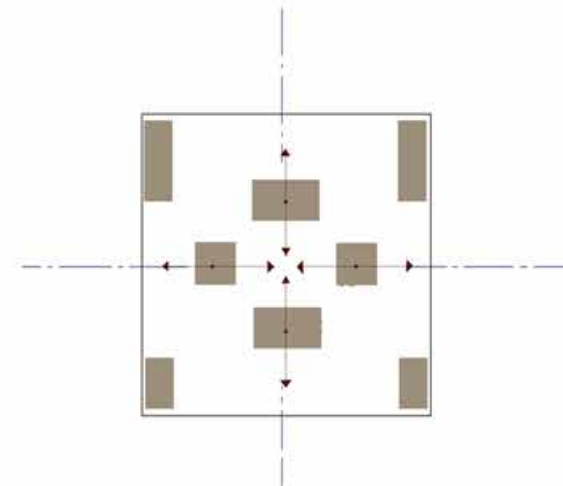
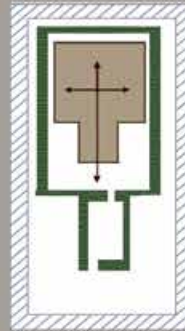
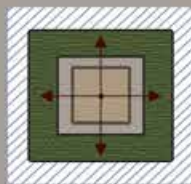
No. 17



-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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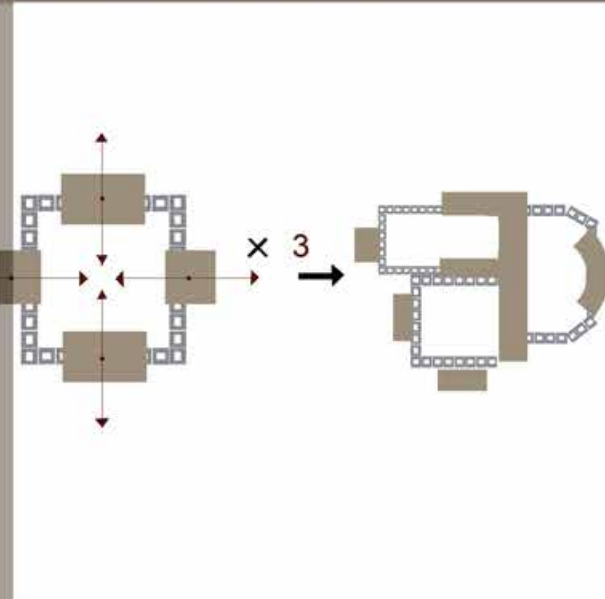
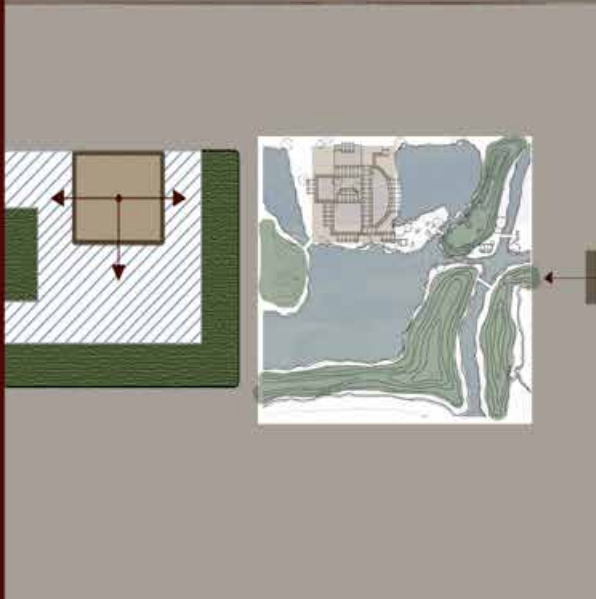
The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts

The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Library of Collected
Fragrances

彙芳書院

No. 18



The Macroscopic System of Garden Form: The Axiom of
Modularity among Architecture, Mountains, and Aqueducts

The SubSystem within Macroscopic Garden Form System:
Spaces Arrangement Principles among Buildings

-The "Forty Scenes of
Yuanming Yuan". 1744, 9th
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Beijing.

- Research Tutor: Prof. Marco
Trisciuglio.
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Qingyu.

Dazzling Eaves Under Heaven

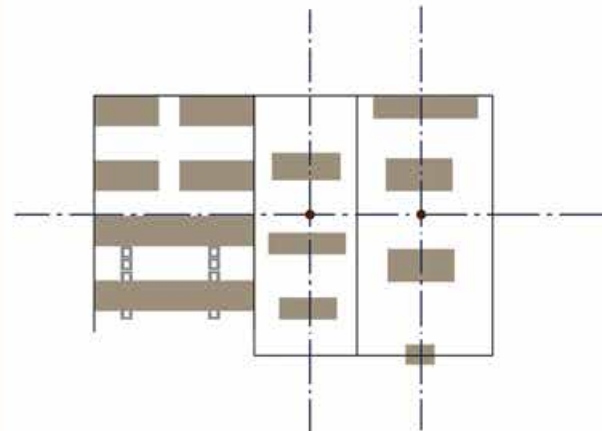
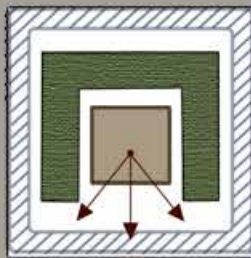
日天琳宇

No. 19

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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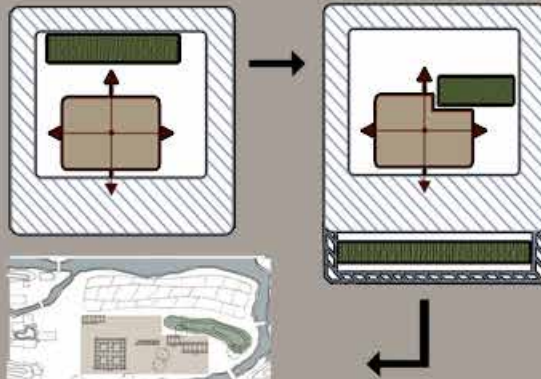
Simple Life in Quietude

澹泊寧靜

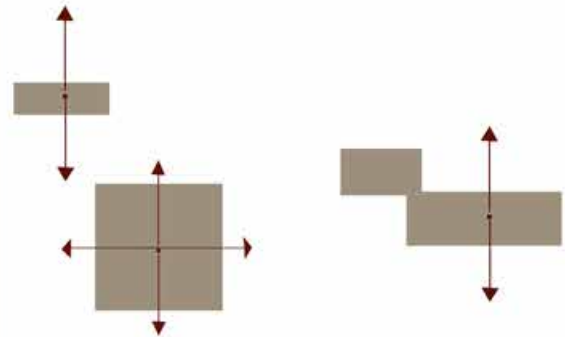
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-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

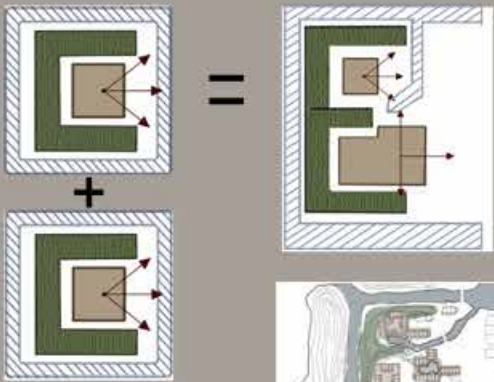
Reflections on Water and
Fragrance of Iris
映水蘭香

No. 21

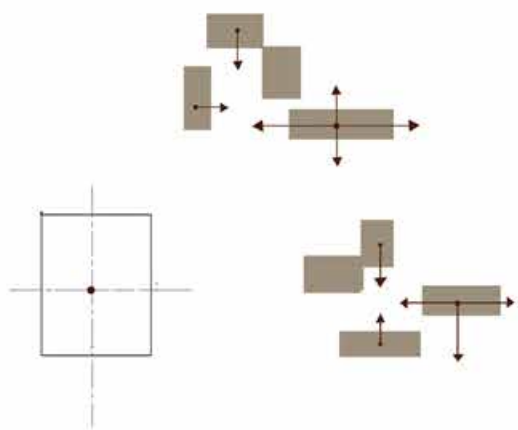


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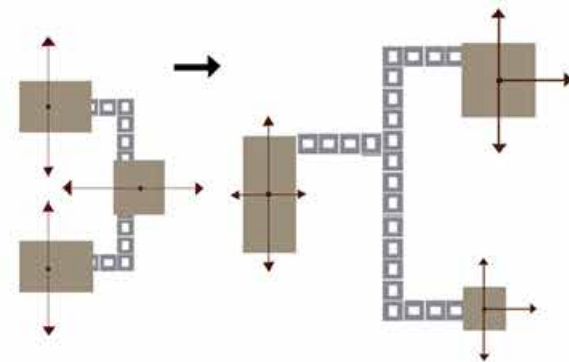
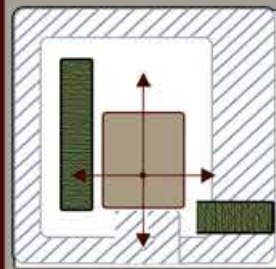


The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Sounds of Trees and Water

水木明瑟

No. 22



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Happy Place of Lianxi

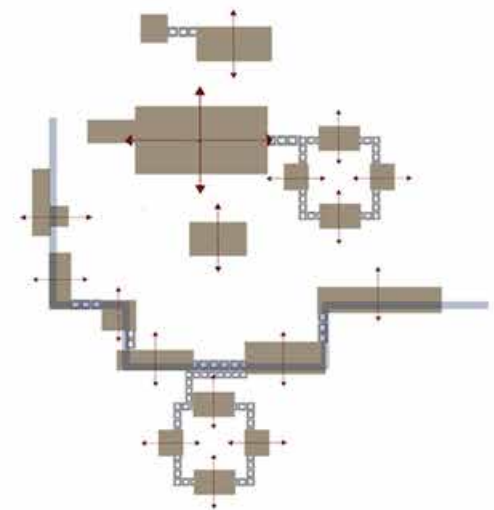
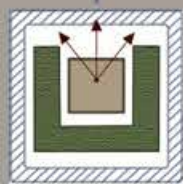
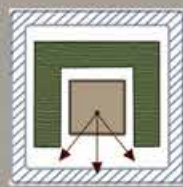
濂溪樂處

No. 23

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Crops as Beautiful as the Clouds

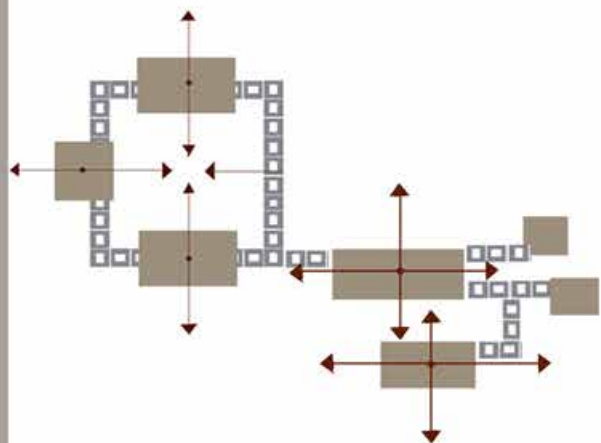
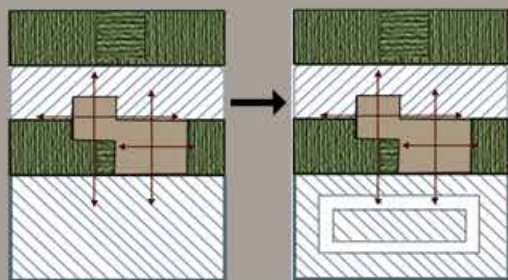
多稼如雲

No. 24

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Fish Leap and Birds Fly

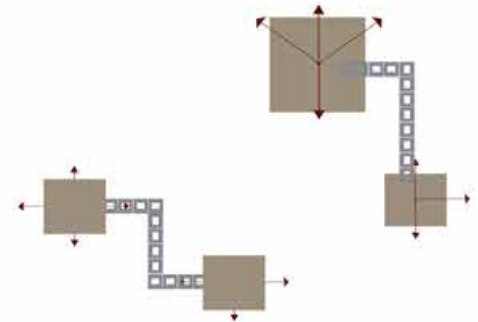
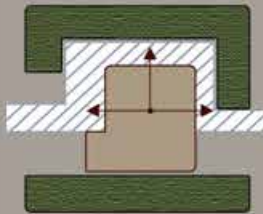
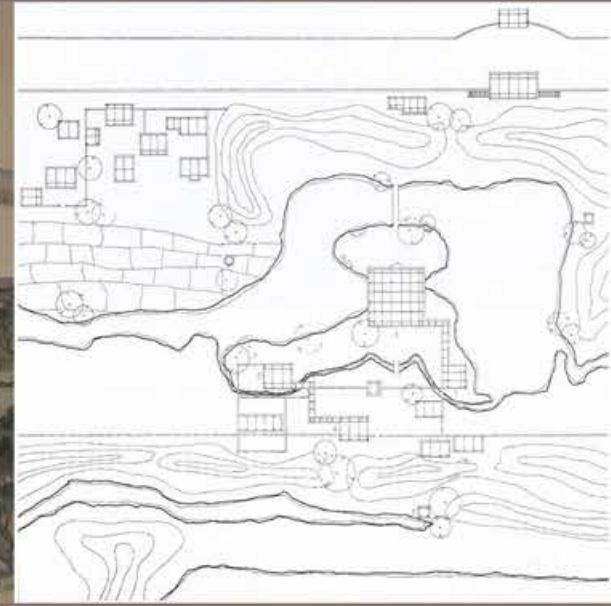
魚躍鳶飛

No. 25

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Village of Distant Northern Mountains

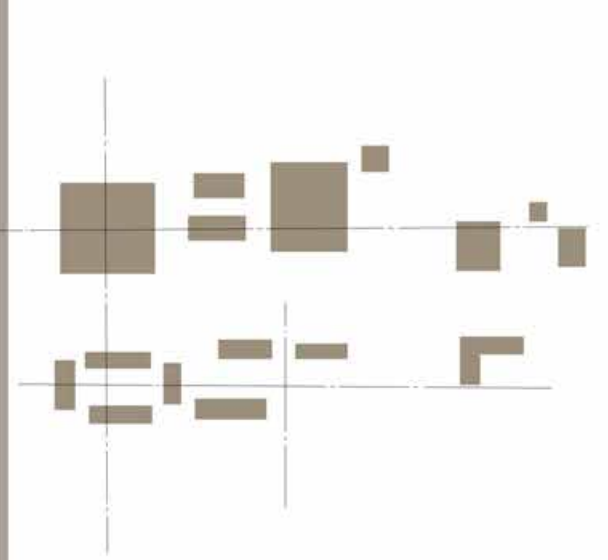
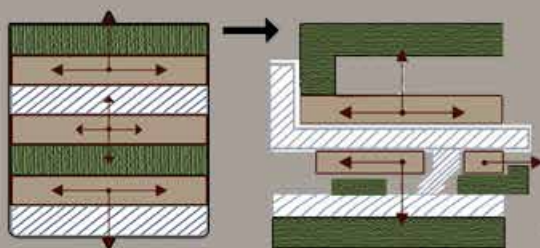
北遠山村

No. 26

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Elegant Color of the Western Peaks

西峰秀色

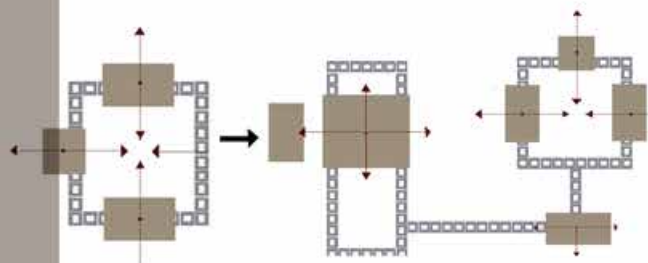
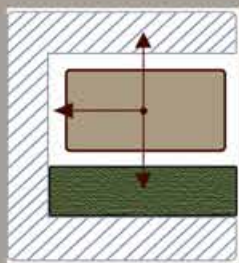
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Library of the Four Seasons

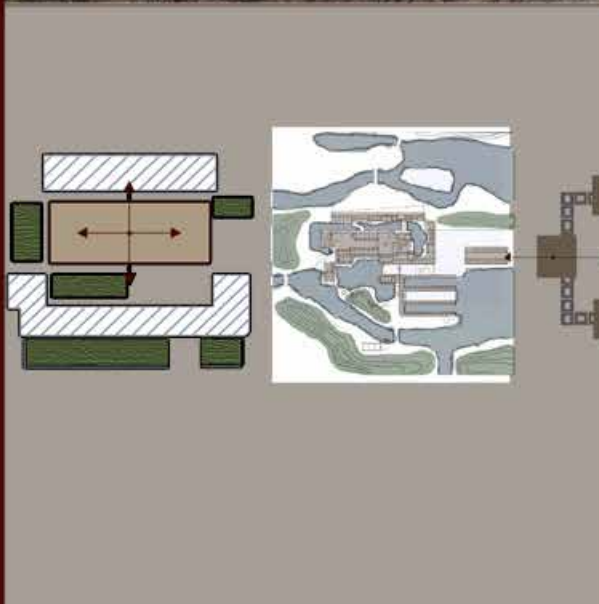
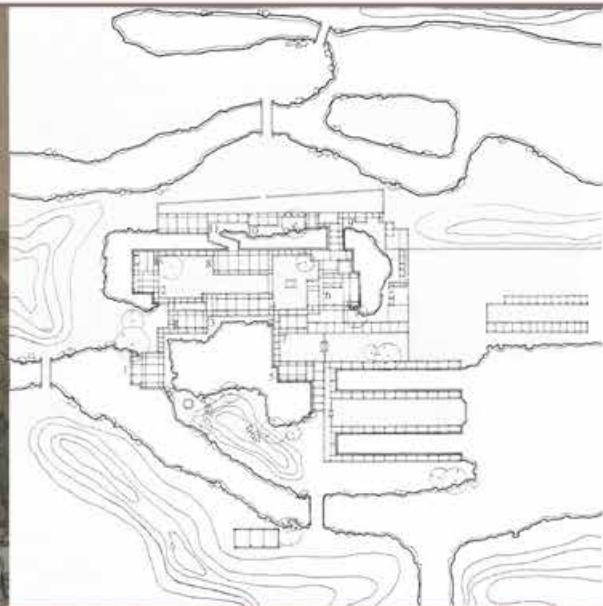
四宜書屋

No. 28

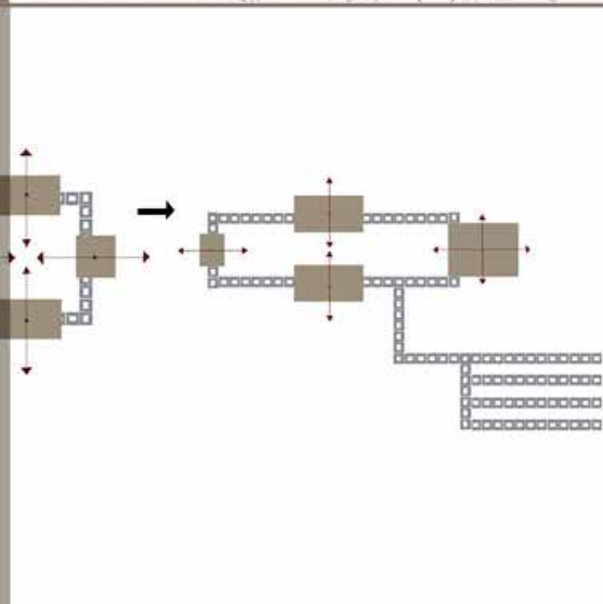
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Beautiful Scene of the Square Pot

方壺勝境

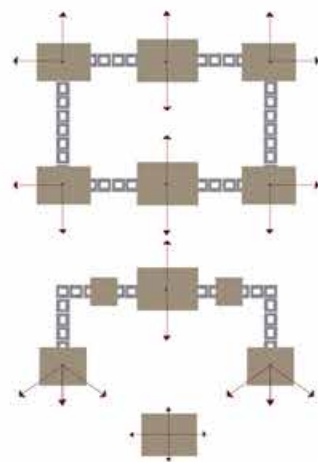
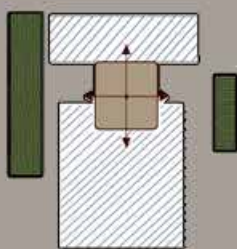
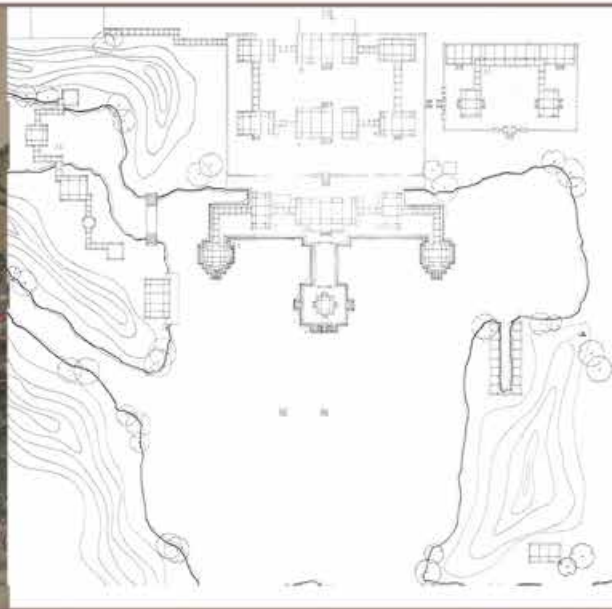
No. 29

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Bath in Virtue

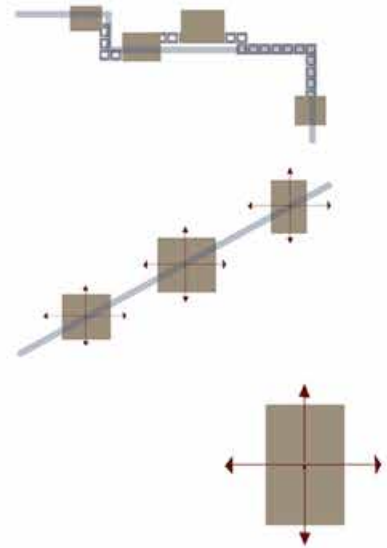
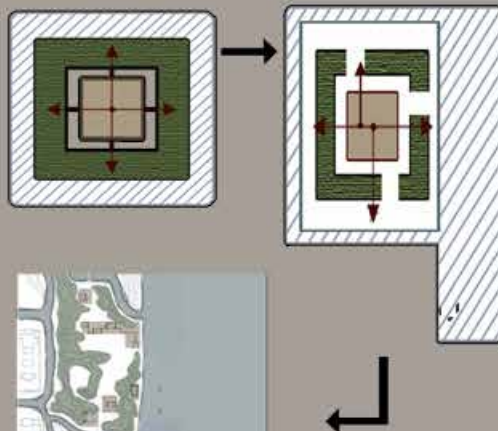
澡身浴德

No. 30

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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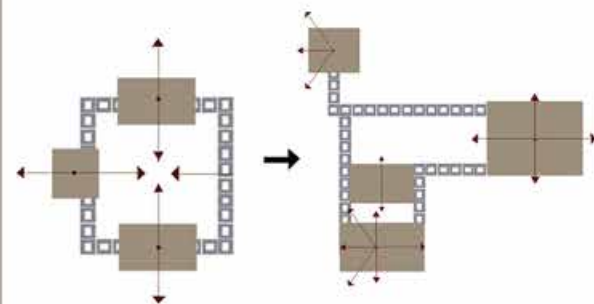
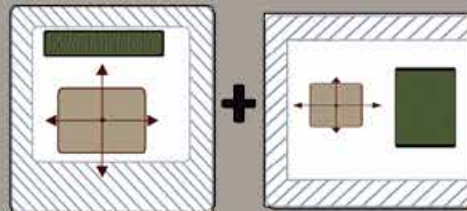
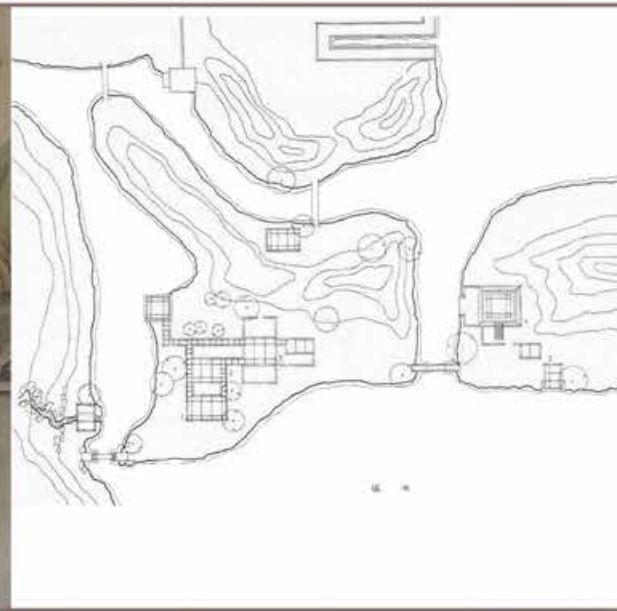
Calm Lake Under the Autumn Moon

平湖秋月

No. 31

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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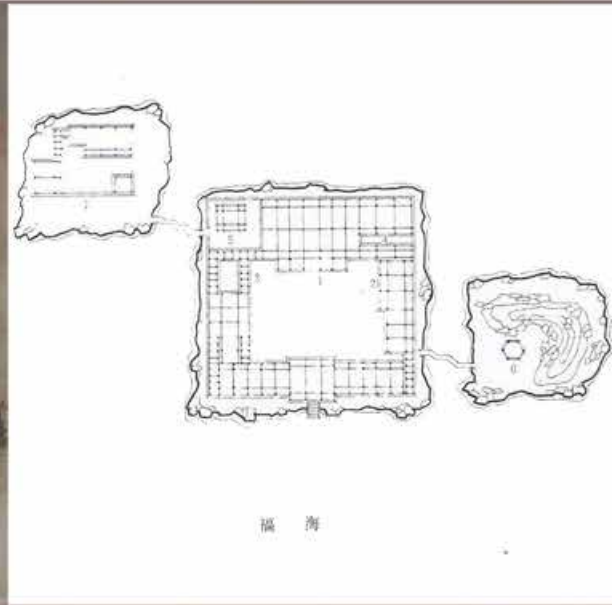


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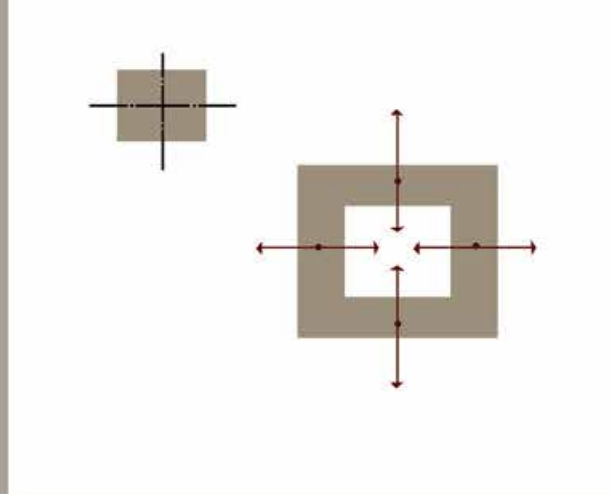
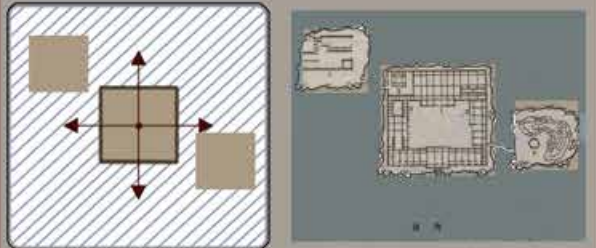
Jade Terrace of Paradise Island
蓬島瑤臺

No. 32



-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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House Which Meets the Beauty of the Hills

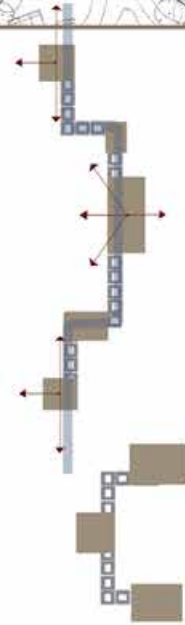
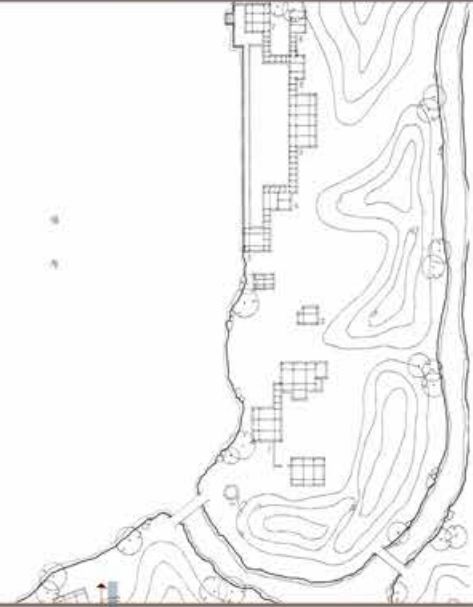
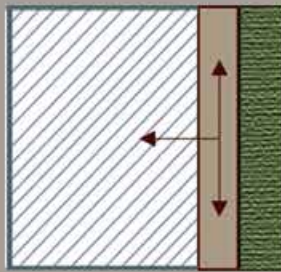
接秀山房

No. 33

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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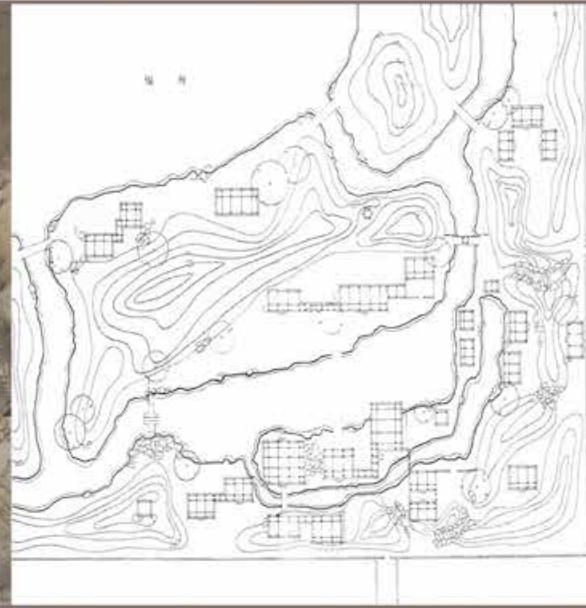


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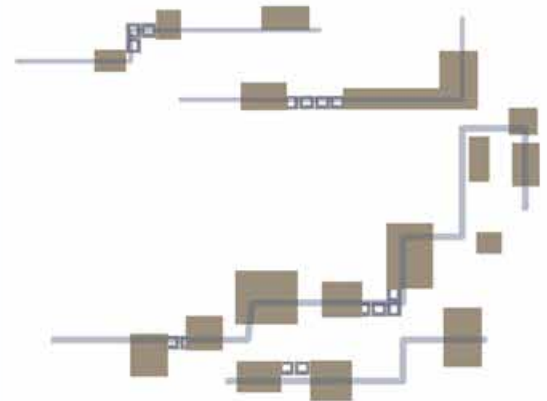
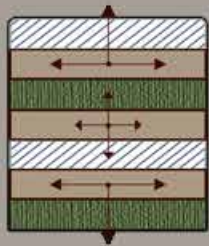
There is Another
Cave of Heaven
別有洞天

No. 34



-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Double Reflection and Sound of the Lute

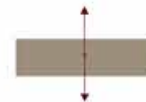
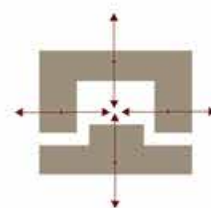
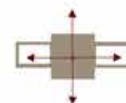
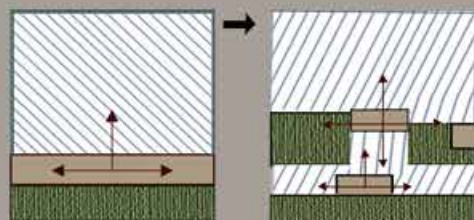
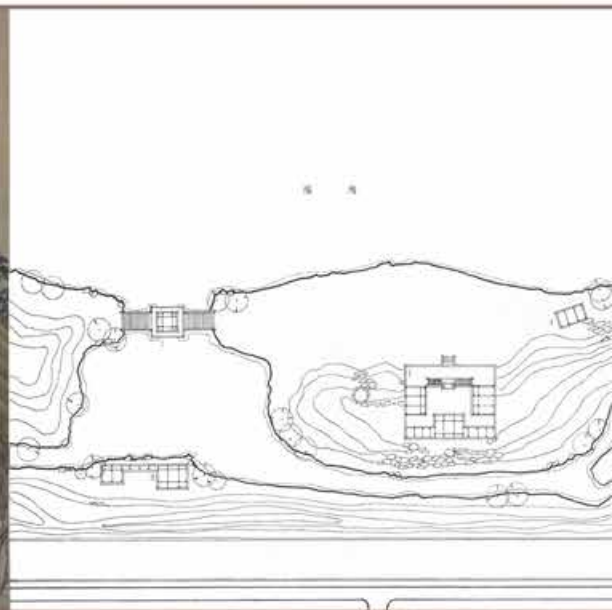
夾鏡鳴琴

No. 35

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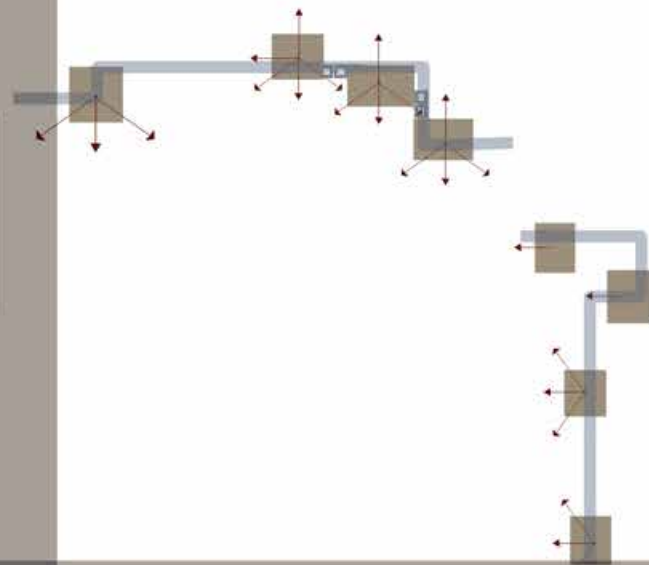
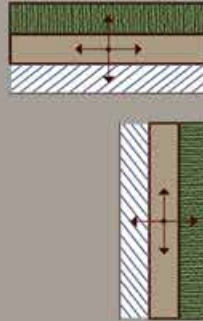
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Vast Empty Clear Mirror

涵虛朗鑒

No. 36



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Analysis Diagram and Experiments are designed by Jiang Qingyu.

The Macroscopic System of Garden Form: The Axiom of Modularity among Architecture, Mountains, and Aqueducts

The SubSystem within Macroscopic Garden Form System: Spaces Arrangement Principles among Buildings

Boundless Impartiality

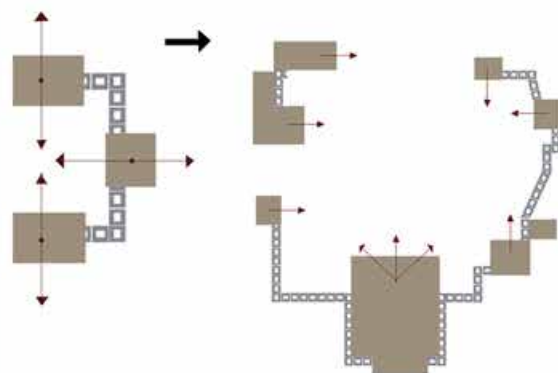
廓然大公

No. 37

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Sitting Rocks and the Winding Stream

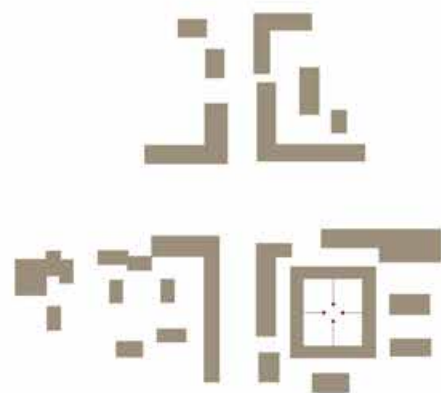
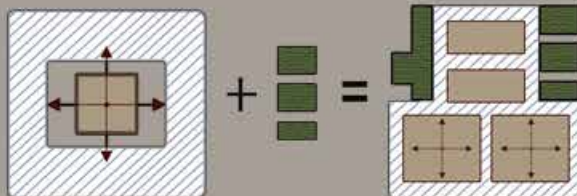
坐石臨流

No. 38

-The "Forty Scenes of
Yuanming Yuan". 1744, 9th
year, Qianlong Emperor, the
size is 62.3 cm (24.5 inches)
in height and width, kept in
Bibliothèque nationale de
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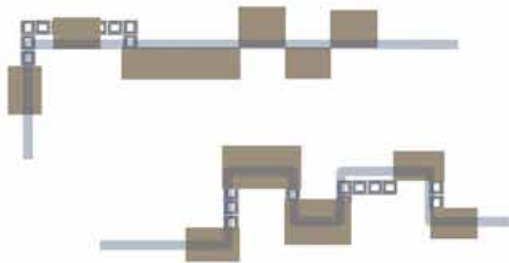
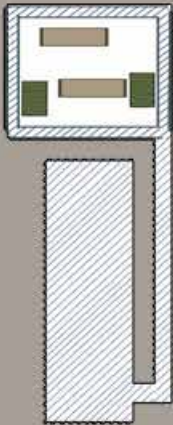
Distillery and Lotus Pond

藕院風荷

No. 39

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Deep Vault of Heaven

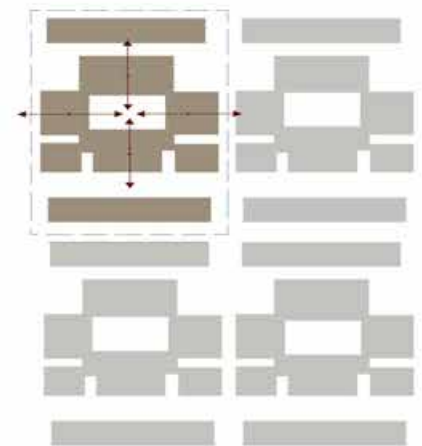
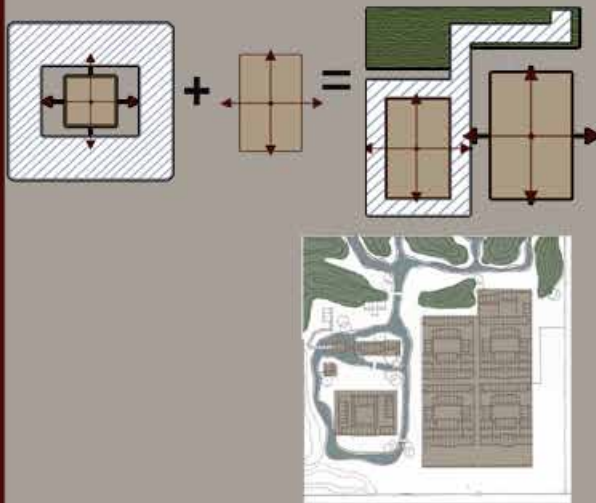
洞天深處

No. 40

-The "Forty Scenes of Yuanming Yuan". 1744, 9th year, Qianlong Emperor, the size is 62.3 cm (24.5 inches) in height and width, kept in Bibliothèque nationale de France, Paris. Photo by Jiang Qingyu.

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Chapter 4:

Future Development of Yuanming Yuan

Chapter 4: Future Development of Yuanming Yuan

4.1 Tourism: Visual Heritage Development



The Digital Model for Yuanming Yuan visual heritage research. Source: Guo Daiheng Studio in Beijing Urban Planning Design and Research Institute of Tsinghua University

“Guo Daiheng Studio in Beijing Urban Planning Design and Research Institute of Tsinghua University” has promoted the contemporary researches of digital models and visual heritage for YuanmingYuan.

In 2008, China National Tourism Administration held the Tourism Projects Promotion Conference on Beijing (2008). Mr. Chen Ming Jie, the director of Yuanmingyuan management office, announced the finance policy for the visual program of Yuanming Yuan would increased dramatically in the next five years. The visual program named “rebuild the brilliance”.

My thesis researches the principles of Yuanming Yuan space arrangement. Through making the digital model of Western Mansions, I wish to present the geometric perspective strategies of Giuseppe Castiglione; by typology analysis of “Forty Scenes of Yuanming Yuan”, I research the underlying rules of modularity system inside Chinese garden form. Furthermore, I believe that computer-aided programming would play a critical role in typology in motion, give us a comprehensive view for the great garden, and promote the Yuanming Yuan study to a splendid future.

4.2 A Historical Reference for Gardens around the World

“Il giardino, forma superiore della creazione umana, nel corso del tempo e attraverso lo spazio ha sempre cercato di combinare armoniosamente le forme più sottili elaborate dalla natura, talvolta piegata dalla mano dell’uomo, e gli artefatti più raffinati.”

Monique Mosser e Georges Teyssot

L’architettura dei giardini d’Occidente – dal Rinascimento al Novecento

Yuanming Yuan is a legend, an immortal memory. What is the root of the garden art? Why the miracle fascinates hundreds and thousands of tourists around world? The grandeur palaces? Think about the great epic about the ascendancy and fall. The fascinating scenes? Yes, certainly, but more than these...

Eternal Friendship (L'amicizia)

Yuanming Yuan represents the Eternal Friendship between Italy and China. Historically, Italy is the window of the world, and has the greatest influence on China than any other European country. Much of the architectural theories concerned with cultural exchanges can be traced back, ultimately, to Tang Dynasty (618 AD – 907 AD), through the “Via della seta” (in English: Silk Road).

Hero (L'eroe)

“The Jesuit builders were themselves a synthesis of the civilizations of their native lands and of the one they had adopted.” (Régine Thiriez, 1998)

Giuseppe Castiglione is a great artist, a great architect, and a great politician. With his artistic talent and enthusiasm, and with the cooperation of many other European technology experts and missionaries, Castiglione completes the great garden and makes the history.

French Jesuit builders: Father Jean-Denis Attiret, Father Michel Benoit, Father Pierre Martial Cibot, they had dedicated their talent, enthusiasm, and knowledge to the great art.

Love and Peace (L'amore e la pace)

The soul of the miracle garden roots in the noble emotion of human beings, that is, love.

Yuanming Yuan is a story about “East meet West”, about mutual appreciations between various cultures, about collaboration, about trust and faith, about love.

The history of Yuanming Yuan emphasizes the peace for human beings. Although many parts of Yuanming Yuan had been destroyed in 20th century wars, it still has the unique status in Chinese garden history and in world academy field.

International Academic Collaboration (La collaborazione accademica)

Three hundred years ago, the garden originated from international collaboration between Italy, France, and China. The Western Mansions occupy the unique high status in the history of Chinese architecture and in the history of Chinese landscape gardening¹.

Today, the history endows us with the new mission – further the Yuanming Yuan research through the international academic cooperation among Italy, France, and China.

¹ Refer to He Zhongyi, Zeng Zhaofen, the monograph *Yuanming Yuan Garden Art*, (Chinese name: Yuanming Yuan Yuanlin Yishu), Chinese & English, Encyclopedia of China Publishing House Press, 2010, ISBN 9787500084044, page 489

APPENDIX

- I. Glossary
- II. Chronology of Chinese Dynasties
- III. Bibliography

GLOSSARY

This glossary includes the names of most of man-made architectures in the “Forty Scenes of Yuanming Yuan” and in “Copperplates of the Twenty Views of the Western Buildings of Yuanming Yuan”.

Chinese to English (Forty Scenes of Yuanming Yuan)

Pingying	Traditional	English	
1. Zhengda Guangming	正大光明	Hall of Rectitude and Honor	Main Audience Hall
2. Qinzhen Ginxian	勤政親賢	Diligent and Talented Government	Hall of Diligent Government
3. Jiuzhou Qingyan	九州清宴	Nine Continents Clear and Calm	Emperor's Private Residence
4. Louyue Kaiyun	鑲月開雲	Engraved Moon Breaking out of Clouds	Peony Terrace
5. Tianran Tuhua	天然圖畫	A Painting of Nature Chinese	
6. Bitong Shuyuan	碧桐書院	Wutong-Tree Academy	
7. Ciyun puhu	慈雲普護	Merciful Clouds Protect All	Island of Shrines
8. Shangxia tianguang	上下天光	Heavenly Light Above and Below	Island of Heavenly Light
9. Xinghua chunguan	杏花春館	Apricot Blossom Spring Villa	Apricot Blossom Spring Villa
10. Tantan Dangdang	坦坦蕩蕩	The Magnanimous World	
11. Rugu Hanjin	茹古涵今	Harmony of the Present with the Past	
12. Changchun Xianguan	長春仙館	Eternal Spring Immortals Hall	
13. Wanfang anhe	万方安和	Peace and Harmony Everywhere	Universal Peace Building (Swastika House)

14. Wuling Chunse	武陵春色	Spring Color at Wuling	
15. Shangao Shuichang	山高水長	Hills High and Waters Long (The Drill Field)	
16. Yuedi Yunju	月地雲居	Dwelling of the Moon, Earth, and Clouds	
17. Hongci yonghu	鴻慈永祐	Vast Compassion and Eternal Blessing	Ancestral Shrine
18. Huifang Shuyuan	彙芳書院	Library of Collected Fragrances	
19. Ritian Linyu	日天琳宇	Dazzling Eaves Under Heaven	Buddhist compound
20. Danbo Ningjing	澹泊寧靜	Simple Life in Quietude (The "Field" Character Building)	
21. Yingshui Lanxiang	映水蘭香	Reflections on Water and Fragrance of Iris	
22. Shuimu Mingsu	水木明瑟	Sounds of Trees and Water	
23. Lianxi lechu	濂溪樂處	Happy Place of Lianxi	Scholar Lianxi's Wonderland
24. Duoja Ruyun	多稼如雲	Crops as Beautiful as the Clouds	
25. Yuyue Yuanfei	魚躍鸞飛	Fish Leap and Birds Fly	
26. Beiyuan Shancun	北遠山村	Village of Distant Northern Mountains	
27. Xifeng Xiuse	西峰秀色	Elegant Color of the Western Peaks	
28. Siyi Shuwu	四宜書屋	Library of the Four Seasons	
29. Fanghu shengjing	方壺勝境	Beautiful Scene of the Square Pot	
30. Saoshen Yude	澡身浴德	Bath in Virtue	

31. Pinghu Qiuyue	平湖秋月	Calm Lake Under the Autumn Moon	
32. Pengdao yaotai	蓬島瑤臺	Jade Terrace of Paradise Island	
33. Jiexiu Shanfang	接秀山房	House Which Meets the Beauty of the Hills	
34. Bieyou dongtian	別有洞天	There is Another Cave of Heaven	
35. Jiajing Mingqin	夾鏡鳴琴	Double Reflection and Sound of the Lute	
36. Hanxu Langjian	涵虛朗鑒	Vast Empty Clear Mirror	
37. Kuoran Dagong	廓然大公	Boundless Impartiality	
38. Zuoshi linliu	坐石臨流	Sitting Rocks and the Winding Stream	
39. Qu yuan fenghe	麴院風荷	Distillery and Lotus Pond	
40. Dongtian shenchu	洞天深處	Deep Vault of Heaven	The Princes' School

Chinese to English (Copperplates of the Twenty Views of the Western Buildings of Yuanming Yuan)

1. Xieqiqu Nanmian	谐奇趣南面	South façade of the Delight of Harmony Palace
2. Xieqiqu Beimian	谐奇趣北面	North façade of the Delight of Harmony Palace
3. Xushuilou Dongmian	蓄水楼东面	East façade of the Reservoir
4. Wanhuaazhen Huanyuanmen Beimian	万花阵花园门北面	North façade of the Gateway to the Labyrinth
5. Wanhuaazhen Huayuan	万花阵花园	The Labyrinth
6. Yangquelong Ximian	养雀笼西面	West façade of Aviary
7. Yangquelong Dongmian	养雀笼东面	East façade of Aviary
8. Fangwaiguan Zhengmian	方外观正面	South façade of the Belvedere
9. Zhuting Beimian	竹亭北面	North façade of the Bamboo gazebos
10. Haiyantang Ximian	海宴堂西面	West façade of the Calm Sea Palace
11. Haiyantang Beimian	海宴堂北面	North façade of the Calm Sea Palace
12. Haiyantang Beimian	海宴堂东面	East façade of the Calm Sea Palace
13. Haiyantang Nanmian	海宴堂南面	South façade of the Calm Sea Palace
14. Yuanyingguan Zhengmian	远瀛观正面	South façade of the Vast Ocean Palace
15. Dashuifa Nanmian	大水法南面	South façade of the Great Fountain
16. Guanshuifa Zhengmian	观水法正面	View of the Great Fountain
17. Xianfashanmen Zhengmian	线法山门正面	Gate West of the Hill of Perspective
18. Xianfashan	线法山	The Hill of Perspective
19. Xianfashan Dongmen	线法山东门	Gate East of the Hill of Perspective
20. Hudong Xianfahua	湖东线法画	Painting of the Perspective on the East Bank of Lake

Chinese Dates and Dynasties

The following are important China dynasties, which are generally accepted in history academic field. Dates cited here, is adapted from Strassberg, Richard E., 2002.

Dates	Dynasty
trad. circa B.C. 1900 - B.C. 1500	Xia 夏
circa B.C. 1600 - B.C. 1046	Shang 商
circa B.C. 1046 - B.C. 256	Zhou 周
circa B.C. 1046 - B.C. 771	Western Zhou 西周
circa B.C. 770 - B.C. 256	Eastern Zhou 东周
circa B.C. 770 - B.C. 476	Spring and Autumn period 春秋时代
circa B.C. 475 - B.C. 221	Warring States period 战国时代
circa B.C. 221 - B.C. 206	Qin 秦
circa B.C. 206 - A.D. 220	Han 汉
circa B.C. 206 - A.D. 25	Western Han 西汉
A.D. 9 - A.D. 23	Xin (Wang Mang interregnum) 新
A.D. 25 - A.D. 220	Eastern Han 东汉
220 - 280	Three Kingdoms 三国
265 - 317	Western Jin 西晋
317 - 420	Eastern Jin 东晋
222 - 589	Six Dynasties 六朝
304 - 439	Sixteen Kingdoms 十六国
420 - 589	Southern and Northern Dynasties 南北朝
581 - 618	Sui 隋
618 - 907	Tang 唐
907- 960	Five Dynasties 五代
907- 979	Ten Kingdoms 十国

960 - 1279	Song 宋
960 - 1127	Northern Song 北宋
1127 - 1279	Southern Song 南宋
907 - 1125	Liao (Qidan/ Khitan) 辽
1122 - 1123	Northern Liao 北辽
1124 - 1211	Western Liao 西辽
1032 - 1227	Western Xia (Dangxiang/ Tangut) 西夏
1115 - 1234	Jin (Nvzhen/ Jirchen) 金
1206 - 1368	Yuan (Menggu/ Mongol) 元
1368 - 1644	Ming 明
1616 - 1911	Qing (Manzhou/ Manchu) 清

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