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Sustainability in Early Modern China through the Evolution of the Jesuit Accommodation Method

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Abstract: This article clarifies the often overlooked facts attributed to European missionaries in Asia, especially Jesuits, who acted as catalysts of a kind of nuanced acculturation named *Accommodatio* (adaptation). To a great extent, they became harbingers of culture and science more than faith itself to the dismay of many, including the Roman Church. Such cultural and scientific transference was actually two-pronged, for simultaneously they presented in Europe unique findings related to language, e.g., the Chinese characters (considered to be the sole natural language), geography, cosmology and even governance. Here we try to prove that such procedure contributed positively to the modern scientific notions of sustainability and to provide the kind of accoutrements that model the modern world as we know it. However, in the process, many Jesuits clearly became sinified and eventually acculturated.

Keywords: Asian architecture; Asian heritage; China; Japan; urban design; garden and landscape design; reformation of the arts

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1. Introduction

Arguably, due to a variety of circumstances, the encounter of Western missionaries with the far East, particularly with China and Japan, was in many ways different to that in the Americas. The political and social system, the warfare and moreover the cultural stance with a large Imperial Body of Scholars which mastered the ancient and paramount invention of printed word was considered to have evolved much more in East Asia than in the New Continent [1]. The Jesuits, an early presence in the area through the evangelization work of Francis Xavier [2], soon realized this fact and acted in accordance. From the 1600s, all the envoys to China had to be versed in mathematics and astronomy in order to be allowed to penetrate in that forbidden realm. Most of them had studied the famous *Aula de Sfaera* under magister Clavius, a rudimentary geometric system to decipher the mysteries of the earth globe and the sun movement, mainly intended for navigation [3].

It is important to stress that Xavier decided on his own will to pursue the evangelization of China as a prerequisite to fully attain the desired conversions in Japan, a fact that paradoxically led to his passing away due to illness and derelictionL in the tropical island of SangChuan [2] (上川). In the wake of an epic pursuit, Matteo Ricci [4] (Figure 1) continued his goal and performed in retrospect, a thorough process of acculturation that included writing in Chinese of a notable literary standard and being renowned as "the wise man from the West". He acknowledged the high level of erudition achieved by Chinese Confucian and Buddhist Scholars and often engaged in lengthy discussions with their representatives and counterparts. Although, it must be said that the premises were not alike for Daoist priests [4].

Figure 1. Adam Schall (left) and Matteo Ricci (right) holding the map of China. *China Monumentis* by Athanassius Kircher, 1667.

In their "Letters" (*Lettera della Cina, Lettres edifiantes et curieuses*), a complete body of knowledge is enshrined. Much can be gained from its detailed study [5]. These illustrated actions were undertaken in China, Japan, India, Tibet and Vietnam with outstanding results such us compiling a new *quốc ngữ*. (Vietnamese romanized language) by Alexandre Rhodes and his companions. Other times, like in China, the missionaries erected temples, gardens and even palaces to the Emperor [6]. In Kyūshū (九州), Japan, several wooden churches now protected as heritage were built [7].

In conclusion, the intellectual emphasis on the Jesuit's accommodation method [8] derived not merely from their own intellectual inclinations, but also from what they perceived in the character of the Japanese and the Chinese. In the following sections we describe how and why the whole process took place and in which way it came to transform sustainability as we know it today.

2. Accomodatio Method

To comprehend the *Accommodatio* method used by the Society of Jesus in East Asia, it is necessary to understand the modus operandi by which the Catholic Church had spread itself throughout the world in that era of discoveries.

Unlike America's Spanish dominions, a high-handed imposition of Western culture on China and Japan did not seem to be feasible. The embedded characteristics of diplomacy and structural complexity in Chinese and Japanese societies prevented European entry to social life [9] as, for instance, inter-marriages were ruled out.

The accommodation assumed inculturation as a sophisticated intellectual method of penetration into the Far East. Jesuit Missionaries were not agents of colonialism, but they studied those complex civilizations, with their different morality, their refinement, their hierarchies and divergent paradigms [10]. In Alessandro Valignano's *Advertimentos e avisos dos costumes e catangues de Japão* (one of the main writings on Accomodatio) [11], three main points stand out: adaptation, emulation and familiarization.

- Adaptation implied trying to assimilate the European and catholic paradigms with Asian equivalents (e.g., The Buddha Danichi Nyora大日如来 with Deus; the use of tatami or rice-straw mats as furnishings for religious venues).
- Emulation or following of the Asian culture costumes and habits (*Katagi* in Japanese).
- Familiarization: the missionaries needed to be incorporated and belong to the social context.

Obviously, *Accommodatio* was more than an innocent adaption to the local culture or to the intention of purely humanistic understanding. The ultimate interest for the Society of Jesus was the evangelization, while Asian objectives may have recalled political agendas.

2.1. The Formation of Christian Towns and Arts, Nagasaki, Nanban School and Macau

The town of Nagasaki (長崎) was pivotal in the enactment of acculturations hereby discussed and we would like to depict the territorial and urban reasons for this singularity. The enclave was Iberian in origin and foundation, but later developed in a Japanese fashion until today (Figure 2). The secular isolation of the Japanese archipelago, called by many as *sakoku* (鎖国), which can be translated as "enchained country", implies that Western influences were not very deep or lasting and hence the originality of this town.

Figure 2. Ports used by Portuguese Merchants to trade with Japan. Source: Gutierrez-Villarrubia. 2021.

In fact, it is in *Nanban bijutsu* (南蛮美術) or *Nanban* Art and their moods, where the effervescence generated by the cultural encounter between East and West is reflected. Language terms (*pan* (麺麭) bread, *tabako* (煙草) tobacco, *marumero* (榲桲) or quince), gastronomy and moreover artistic objects of great beauty become relics of a rich history in time.

How did the Japanese, who were the first to be in contact with missionaries from Europe, envision a brighter prospective? To answer this question, we have judged it necessary to divide the explication into three parts:

2.2. The Nanban Paintings

First, we focus on the *Nanban* paintings, literally the paintings of the 'Southern barbarians' (considering the typical Chinese division of the territory according to the four cardinal

points), and how we can identify an early attempt to achieve a better atmosphere, thanks to the Japanese fascination for images brought overseas by the members of the Jesus Society.

The evangelization of the Jesuits brought forth an interesting process of acculturation, based on the premises of *Accommodatio*. The ingredients of *Accommodatio* were persuasion within a propaganda framework of images, essential to carry out the Counter-Reformation process. To perform this, the vow of obedience was necessary, but also to encourage the inventive capacity of the missionaries in adaptation to the customs of the people. The instruction of these religious explorers included astronomy, arithmetic, geometry, geography and training in instruments that would help to create maps.

In our opinion, the idea of *Accommodatio* has another very interesting aspect to understand the art produced by the Japanese, in relation to the concepts here discussed: transcendence. Not only transcendence as a spiritual value encompassed in Christian beliefs, but in the very act of painting, where the right side of the brain is exercised and we are immersed, as creators, in a non-linear temporal concept. The remoteness undoubtedly helps to convey the image of alien spaces, sieved through the lens of those who had never trodden on them, with a sometimes-fanciful bias, which gives us, in turn, many clues about how a possible future was imagined. However, in order to be aware of remoteness, it is first necessary to know that that other exists: such, no less, is the feat attained by the missionaries.

This method is in frank opposition to the colonizing frenzy that spread two centuries later on the whole planet. Today we refuse to accept the Eurocentric pride in the phrase "They cannot represent themselves: they must be represented". Seeing the other as an enemy prevents us to build a more sustainable world, as the famous etching *Die Gelbe Gefahr* (The Yellow Peril) depicts, even with a Buddha included in the background [12].

From mid-16th century (1570), the Portuguese established the end-line of their trade route at the Nagasaki Bay. Shared art and techniques were positive products that endured, even after the short century of contact between the Jesuits and the Japanese people had ended.

When the Portuguese landed, the Kano school had achieved a new exaltation of idealistic Nipponese art. In this context, an expedition began and would culminate in Japan. Francis Xavier (1506–1552) set sail from Portugal in 1541 bound for the East Indies [13].

Japan had already experienced the first contact with Europe seven years earlier with the arrival of a Portuguese ship on the shores of Kyūshū. In 1549, Francis Xavier alights on Kagoshima (鹿児島). Soon, he would realize that for the evangelization of the archipelago he would need to open up to the people and satisfy the questions of the curious Japanese individuals [7]. In order to be allowed to preach, he could not present himself empty-handed before a feudal lord or *daimyō* (大名). He relates that the Christianized Japanese, Paulo da Santa Fe went to speak with *daimyō* Ōuchi Yoshitaka (1507–1551), 大内義隆 to whom he gifted an image of the Virgin [7].

Francis Xavier's letters speak of the amazement of the *daimyō* with religious fervor, but the important thing about it, is that Xavier earns the respect of the *daimyō* Ōuchi Yoshitaka with the sample of an etching of a surprising figurative level for the Japanese. However, after the amazement, the Japanese wanted to reflect those distant worlds by two-dimensional means. The first screens painted with elements from afar were still made with Japanese techniques, in this case on *washi* (和紙 rice-straw) paper. They reflect an initial trend in which Japanese artists used traditional painting to describe large European cities [14].

In the famous *Nanban Byōbu* (屏風 folding screen) of Rome (Figure 3), it is easy to recognize the figures of important ancient monuments like the Pantheon and Castell Sant'Angelo near the Vatican. From the first objects and works that Xavier brought to Japanese lands, so much interest was aroused that a greater number of works was necessary for the evangelizing quest. They imported from Europe large amounts of engravings, oil-paintings, carvings and furniture for the decoration of churches and for commitments with powerful individuals as well [15]. It is very likely that the references to depict those cities,

came from the "guidebook" of the time, the book *Civitates Orbis Terrarum*, dedicated to the famous capitals of the world.

Figure 3. The screen representing Rome. Rome Byōbu (16th century). Ikenaga collection, Kōbe-shiritsu Hakubutsukan (神戸市立博物館, Kobe City Museum).

In three of these four screens, it is evident that the *Civitates* was used as a model, even in the screen of Lisbon, where the width of the image is narrowed to fit the frame, but the same point of view in the perspective remains. The last screen was dedicated to Istanbul [16].

This is not the case of Seville, which seems a tale apart from the four pictures that had been created throughout the different editions of *Civitates*. We can see how the Japanese culture itself was projected in the imagination of a city. As we know, the Latin name for Seville is *Hispalis*, which comes from the Phoenician root "*pal*", meaning 'flat'. That is in truth a typical feature of this town. It does not possess any mountain range to protect it, as would be appropriate for the foundation of capitals in Chinese geomancy called *Feng Shui* (風水) or *Hōgaku* (方角 in Japanese. However, the anonymous artist represented this new world as it would be coherent for his own culture [17].

In those capitals that followed the prescriptions of *Feng Shui*, the favorable orientation is extended towards the south, the city is protected from the north by soaring mountains, and defended in the east and the west through lakes or hills. There is a constant presence of the so-called Four Mythological Guardians, Four Heavenly Kings or *Shitennō* (四天王) [14]. With invented mountains (Figure 4), an enclave was imagined in this screen of Seville, that elicits the charm and wonder of combining East and West. Moreover, the construction and garrisoning of the city gates is endowed in East Asia with enormous significance and mysticism.

In summary, the author of these paintings made such renowned capitals remain protected according to his own imagination. This can be interpreted as an attempt to build a much more idyllic and pristine new world, since precisely the plague (and typhus) ravaged the city of Seville in five notorious outbreaks during the sixteenth century (1507, 1524, 1568, 1582 and 1599) and the population was greatly decimated. We often wonder if its disposition, so contrary to geomancy, which eventually embodies a considerable degree of traditional building lore, had something to do with the said epidemics. It is also evident that the Nipponese artists learned about a different way to create towns, less rigid and at times more sustainable because this kind of use of the land is certainly advantageous. On the other hand, the missionaries acknowledged the importance of orientation and

respect for nature in city planning—a fact unheard of, that they took good care to transmit to Europe.

Figure 4. The view of Sevilla in one of the Four known Nanban Screens. Seville Byōbu (16th century). Ikenaga collection, Kōbe-shiritsu Hakubutsukan (神戸市立博物館, Kobe City Museum).

2.3. Nagasaki, towards a Nanban Urbanism?

It is in the founding and evolution of the town of Nagasaki where acculturation between East and West materialized more deeply. Located in a natural haven of Kyūshū Island, it lies in the southernmost of the five main islands of Japan.

Shortly after arriving on Japanese soil for the first time (1542), on the tiny southern island of Tanegashima (種子島) (the main reason why they were called *Nanban*, or southern barbarians), Portuguese merchants began trading with existing ports, such as Hirado (平戸), Funai (府内), Yokoseura (横瀬浦), Sakai (堺), Fukuda (福田), Yamaguchi (山口), Kagoshima, etc. However, none of these enterprises was in the end auspicious, due to several misadventures, namely, typhoons, fires, riots or clashes between different lords and so forth [7].

However, to understand the tenacity of the Portuguese peddlers, we must realize that, for first time, the Earth had been interconnected through the Spanish and Portuguese routes, linking distant cities around the globe like Seville, Lisbon, Goa, Macau, Acapulco or Lima. For them, Japan and especially Nagasaki were a necessary step to complete the circle.

Why was the relationship between the Iberian-Europeans and the Japanese successful? Europeans aspired to global hegemony, not always through religion or straight conquest, but also through international trade [12].

In addition, the agents of the Catholic Faith also sought for evangelization of the lands that they already encountered, through missionaries like the Jesuits. To be sure, the Japanese, for their part, were interested in trade, especially for technological advances, which could incline the balance in favor of some *kinglet* in a feudal period like the *Sengoku* (戦国) era.

All this would culminate with the founding of the city and port of Nagasaki as a bridge in between two cultures. On the one hand, the *daimyō* Ōmura Sumitada (大村純忠, 1533–1587) and Bernardo Nagasaki Jinzaemon Sumikage (甚左衛門炭影). On the other, the Portuguese merchants and the Jesuits Luis de Almeida (1525–1583), Cosme de Torres (1510–1570), Gaspar Vilela (1526–1572), Alessandro Valignano (1539–1606), Luis Fróis (1532–1597) and others. The first, in charge of the justice, the second, of teaching and trade. Both entwined to plan a new city [17].

Let us discuss what urban imprint formed as a result in this hybrid city. As mentioned above, traditional Japanese urban planning is based on the precepts of Chinese *Feng Shui* geomancy, where it is mandatory to face south, the direction of *Shujaku* (朱雀) the Crimson Phoenix, and be protected to the east by *Seiryū* (青竜) the Turquoise Dragon, the west by *Byakko* (白虎) the White Tiger, and from the north with *Genbu* (玄武), the Mysterious War of Tortoise and Serpent, while *Kōryū* (黄龍) or the yellow dragon stayed hidden at the center [18]. These Mythological Creatures represent in turn the *Shitennō*. There is also an inauspicious direction to the northeast called *kimon* (鬼門, which must be protected by mountains and singular temples (Figure 5).

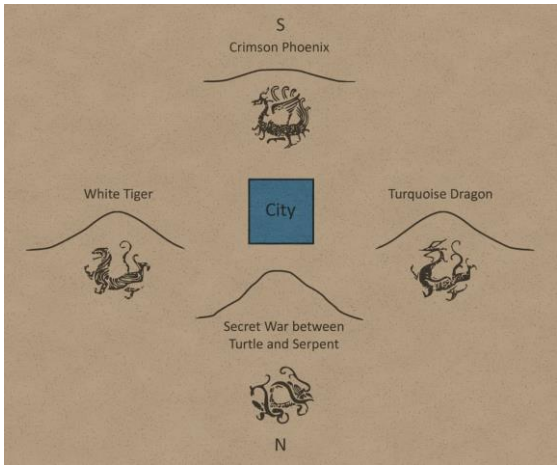


Figure 5. Orientation of a building or town according to *Feng Shui*. Design by Gutierrez-Villarrubia. 2021.

The so-called diagram of the Nine Palaces, Nine Halls Diagram or *Jiŭ gōng tú* (九宮圖), composed by nine square blocks, is also relevant, since the plan of the cities will evolve from this structure [18].

The archetypal city, based in the Chinese capital of *Chang'an* (長安), would usually be displayed on a plain in an orthogonal grid of lineal streets or *machi* (町), conceited by mountains to the north, east and west and open to the south. *Machi* worked not only as circulation and transit streets, but also as linear public spaces and as places of identity as in European neighborhoods. It should be symmetrical, like the human body, with the palace to the north as its head. The rivers should flow without altering their course, from northeast to southwest. The Chinese version has surrounding walls, but its Japanese versions mostly lack significant defensive elements.

This *Feng Shui* urban plan can be observed in Japanese imperial cities such as Nara (奈良) and Heian-Kyo (平安京), later re-founded under the name of Kyoto [19]. However, Nagasaki was to be very different from this. The grid still exists, though it becomes curvilinear and deformed. Mountains roughly surround it to the north, east, and west, and it is open to the south, but has little flat terrain, so it grows on a hill and not in a plain. The rivers run from northeast to southeast, but they are altered and crossed by stone bridges (Figure 6).

Such was the pervasive legacy of the Jesuits in Japan: intricate streets, neighborhood organized in parishes around the churches. Stone foundations for seminars, colleges, hospitals, etc. Open urban spaces resembling squares and inner courtyards inside the blocks. A city protected at the harbor by some defensive structures.

That is the reason why we still define Nagasaki as "The least Japanese city in Japan" In only a century (Table 1), the acculturation between East and West took place in a brand-new town in Southern Japan. The lessons were permanent for the course of sustainability and even today Nagasaki is a preferred destination for its exoticism and alternative values. However, not only the urban plan of the city itself was a superlative example: Western medicine, books printed in press, Japanese-Portuguese and Latin translations, and the

Nanban Art all flourished there over the vanishing of the Christian mission, heralding a much vaunted new era [20].

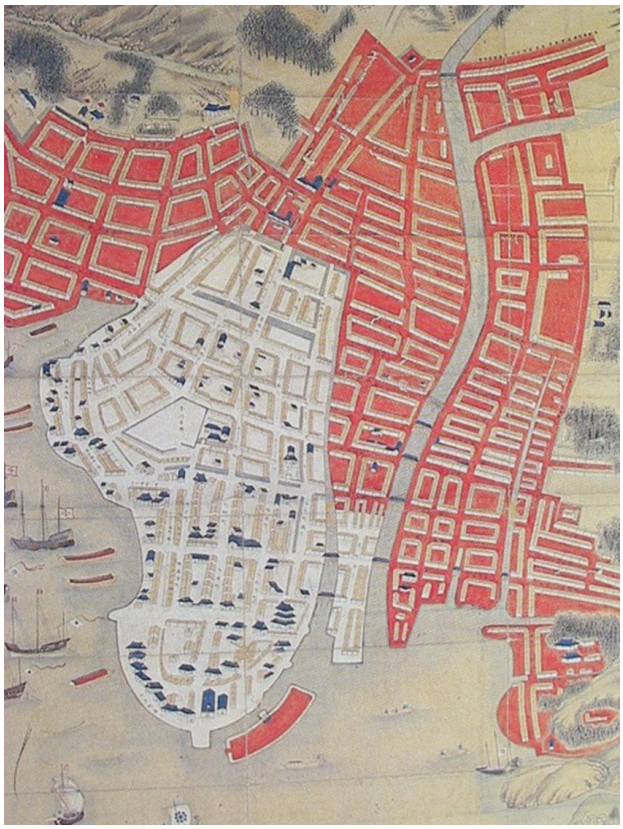


Figure 6. *Nagasaki City Plan*. Nagasaki Museum of History and Culture. Photograph by Cabeza-Lainez.

Table 1. Summary of the main events of the mission in Japan until its extinction.

Period	Year	Event
Sengoku jidai	1521	Ashikaga Yoshiharu is proclaimed Shōgun
	1526	Go-Nara is proclaimed Emperor
	1543	Portuguese merchants wrecked in Tanegashima
	1546	Ashikaga Yoshiteru is proclaimed Shōgun
	1549	Francis Xavier reached Kagoshima
Azuchi-Momoyama jidai	1557	Emperor Ōgimachi
	1558	Ashikaga Yoshihide is proclaimed Shōgun
	1558	Ashikaga Yoshiaki is proclaimed Shōgun
	1569	Nagasaki city foundation
	1573	Oda Nobunaga entered Kyōto
	1580	Arima's Seminary is founded
	1586	Go-Yōzei
	1587	Purgue Directive Order to the Jesuits
	1590	Toyotomi Hideyoshi is proclaimed Kanpaku
	1597	26 Christian martyrs of Nagasaki
	1599	Sekigahara Battle

Table 1. *Cont.*

Period	Year	Event
Edo jidai	1603	Tokugawa Ieyasu is proclaimed Shōgun
	1605	Tokugawa Hidetada is proclaimed Shōgun
	1611	Go-Mizunoo is proclaimed Emperor
	1614	Expulsion Directive Order to missionaries
	1623	Tokugawa Iemitsu is proclaimed Shōgun
	1629	Meishō is proclaimed Empress
	1634	Dejima island is built
	1637	Shimabara rebellion
	1639	Sakoku-rei
	1641	Dutch East India Company (VOC) moved to Dejima

2.4. Architectural Inceptions from Macau

To the Eastern Empire of China, the Jesuit Mission arrived by virtue of a misguided happenstance. Before accepting Christendom, the impassive Japanese Abbots inquired Francis Xavier about the reason why the Chinese Scholars had never mentioned Deus in their scriptures or treatises [7]. Such tautological question provoked a hasty and inordinate evangelic streak that resulted in Xavier's own decease in the island of SangChuan (上川島) (the name derives from São João) at the very gates of Macau. The deed was not in vain, since it represented a new dawn for the Western Missions. In order to fulfill their herculean task, they had to inevitably face the grander, superior and more self-centered Empire that ever was [18].

The first realizations that embodied these complex notions and kindred spirits were the Madre de Deus church also known as St. Paul in Macau (Figure 7), the Sao Lorenço church and later the St. Joseph Macanese seminary.

Figure 7. Extant façade of the Madre de Deus Church, Macau (Source: J. Cabeza-Lainez).

The Madre de Deus church was in all likelihood, the first clerical building made in stone in Asia [21] and as such it incorporated few innovations compared with European traditions. However, being erected in part by Japanese Christians who fled from prosecutions in Japan, in the façade we can recognise oriental motifs like the dragon of multiple heads and the lotus flower, deemed to provide spiritual protection from foes of any kind. Moreover, the orientation of the said main façade is south, which implies that it was adapted to the Chinese geomancy as explained previously. The western entrance, favoured in most European ancient churches was considered inauspicious and discarded by the Jesuits [14]. Another pivotal example of the adoption of Chinese cosmology in line

with the *Accommodatio* method, lies in the dome of the Church of Saint Joseph in Macau (Figure 8).

Figure 8. Interior of the illuminated dome of St. Joseph in Macau. Source: Cabeza-Lainez.

It is the authors' belief that the reason for avoiding domes in Chinese construction was lack of confidence in the skills of local builders, who were not familiar with such uses of masonry or compressive materials and were more prone to employ wooden structures. Fear of weather, typhoons, earthquakes and other unknown phenomena may explain for the rest [22]. The sky-lit dome, that is, the Triumph of Baroque Architecture in Europe, is seldom featured in Asian Churches; in lieu of it, tall and delicately framed windows used to be the sole elements of fenestration. However, in this graceful church of Saint Joseph [23], in a place almost secluded from the Chinese Empire, the miracle of thirty-two tiny apertures in two tiers of sixteen, which echo the Houses of the Calendar of Beijing, both in disposition and number, reveals itself. A precious fusion of baroque from East and West only visible to the faithful who dared enter the Holy Space or Adytum. In this way, the tableau was set for further bi-directional advances in sustainability that we will subsequently describe.

3. Artistic and Architectural Vestiges of the Jesuit's Prevalence in China

All in all, these monumental endeavours engendered the so-called Chinese rites of the Catholic Church, which attracted unabated political controversies and criticism as distant in time as 1950. Similar rites precipitated the extinction of the catholic missions in China. In the previous paragraphs, we have discussed the theories of accommodation but from now on we will try to explain how, step by step, this subtle transmission of doctrine and faith was to give way to a more audacious approach which prefigured acculturation for some outstanding missionaries. The Jesuits at the *Qing* Court (清) justly excelled in astronomical knowledge and subsequent prediction of time events by manufacturing watches, astrolabes and diverse mechanical tools of measurement for the Emperor [24].

In accordance for their services, they received distinctions and were promoted to the post of Imperial Scholars. The discovery of the rudiments of longitude, was elegantly inscribed in the Nantang (南堂) Cathedral in Beijing (see Section 3.2) with the fixture of two voluminous clocks at each side of the main façade towers, marking simultaneously the time in China and that of Rome. The former fact indicates that they had observed, by exchanging letters in the occasion of eclipses, the significant magnitude of the time-lag between both places, although they were still incapable of tracing a proper meridian (see Section 3.1). In fact, the north–south line of the Celestial Horse called *Wu*午, present at the entranceway to the Forbidden City, the Meridian Gate, which divided the Empire in two halves, was the only similar feature enforced at the time. The repercussions of

adequate knowledge of time lapse and longitude were fundamental for sustainability not only because of the division of the world between empires that had taken place from the Treaty of Tordesillas, but for securing the maritime access route to the economic currency of the epoch, spices, porcelain and foremostly silk.

3.1. The Horoscopium Catholicum Societas Iesu

An evident witness of the long quest for terrestrial longitude in geographical sciences, is the prodigious mandala-like representation known as the *Horoscopium Catholicum* (Figure 9). The *Horoscopium*, attributed to the polyhistor Athanasius Kircher [25], is a sort of global map and clock, conceived after the fashion of a family tree (*sicut olive fructifera*), at the roots of which lies the revered founder Saint Ignatius Loyola. The ascending branches naturally reach out for the sun and every bunch of leaves bears the name in Latin of a distant province and its tributary cities, that is, *Hibernia, China* or *Iaponia*, and then, *Nangasachi or Meaco* (Figure 10). The astonishing particularity is that the label tags of the provinces are constituted by semi-circular diagrams with successive number inscriptions in the fringe, which reveal with considerable accuracy at what hour, compared to Rome, each Jesuit college of the world should be performing its prescribed activities.

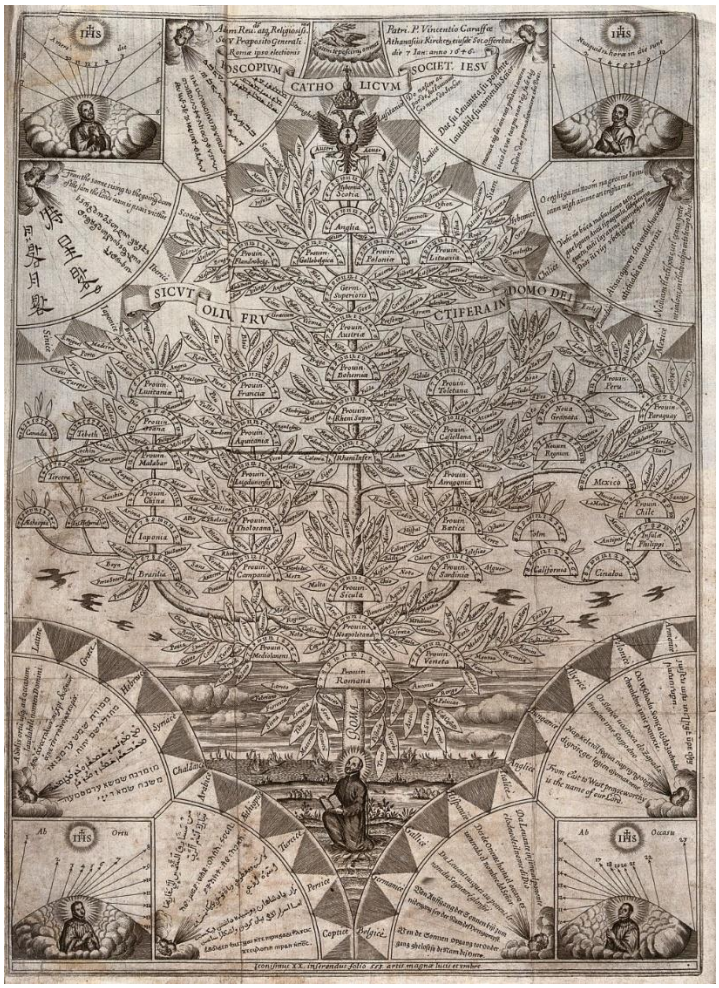


Figure 9. Horoscopium Catholicum Societ. Iesu (1646) Athanasius Kircher. Source: Ars Magna Lucis et Umbrae.

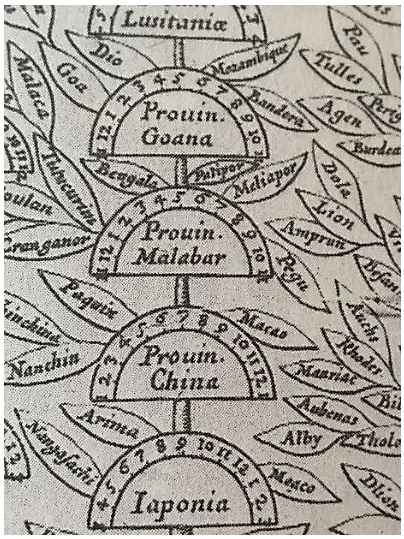


Figure 10. Particular detail of the Horoscopium featuring Japan and China.

Moreover, at every corner of the map, the cardinal winds, each apparently presided by a Jesuit Saint, proclaimed the same sentence, "from the rising of the sun to the sun-setting, praised be the name of the Lord" (Psalms), in the different and often enigmatic scripts and languages of the sundry provinces, including Chinese, Hindi or Arabic [26].

In this tree-like representation, we perceive a further advance towards nature and sustainability in the sense that the Society of Jesus begins to identify itself with a vegetal network ever growing like a climbing plant on fertile ground and not in barren deserts like those in North Africa or Arabia. The inspiration for this diagram in the new bountiful worlds seems rather clear. The introduction of foreign languages is also significant as an authorized mean of expression for the Jesuit diaspora.

3.2. The Southern Cathedral of Beijing

The ensuing instance in the discussion, Nantang, is no longer an extant catholic church in Beijing. It was built by Jesuit Missionaries at the beginning of the 17th century, but suffered several disasters until it was ruined by the second Opium War in the 19th century (Figure 11).

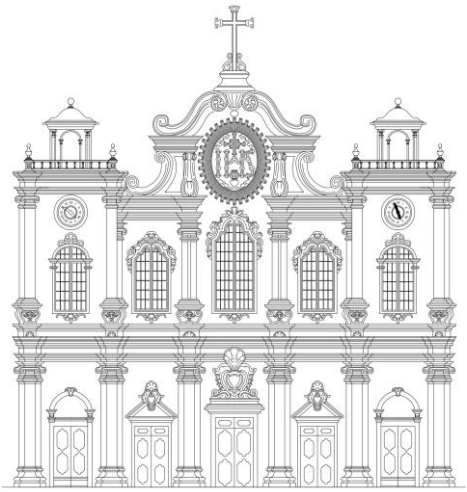


Figure 11. South façade of the Nantang Cathedral, reconstructed from the original plans preserved at the Arquivo Historico Ultramarino (Lisbon. Source: H. Ojeda and J. Cabeza-Lainez).

Later, a new, rather nondescript church was erected on the same site, but it does not retain any of the excellent features that the former incorporated. The ancient church was a paradigm of sinification, as we will try to demonstrate (Figure 12).

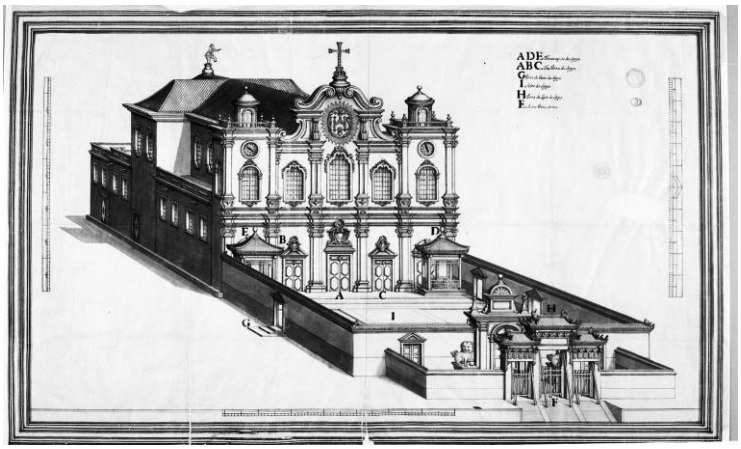


Figure 12. Cathedral's original perspective drawing by Ferdinando Moggi. (Lisbon Overseas Archives). 1729.

The Jesuits had prepared detailed plans and even a rarity: a perspective depiction (Figure 12) in order to facilitate the construction of the church. Many curious features appear in the original drawings that the Portuguese historic archives maintain today. One of them is the triple ceremonial gate flanked by stone lions to protect the building from evil appearances. The plans present writings in Portuguese language, but complete inscriptions in Chinese also appear. One such inscription shows the cardinal points or directions of Heaven, as mentioned in Daoist scriptures, specifically indicating that the main façade has to face due south for the same reason of harmonizing with the cosmos and to avert calamities [18]. The main builders of the Nantang were Giuseppe Castiglione known as Lang Shining, 郎世寧, painter; Ferdinand Bonaventure Moggi, called Li Po-Ming, 利博明, architect; Ignace Sichelbart, Sing Ngan, 艾啓蒙, painter and architect; Jean Dennis Atiret, 王志成, Wang Che cheng, painter; Michael Benoist or Tsiang YeouJen, 蔣友仁, engineer; plus Égide Thébaaut, Yang Tseu-Tsin, clockmaker and ironsmith, and an unidentified number of Chinese workers.

The overall style of the building did not resort to classic ornaments to resolve customary problems of expression, but rather seems to adopt baroque features like the *stipite* column as a starting point to create something new and capable of accommodating Chinese sensibility. It is convenient to remark that the concept of *jiān* traditionally represents the typical module for buildings in China, a sort of cuboidal pattern that can be replicated bi-dimensionally. The *jiān* character (間) is etymologically composed of gate and sun. The main door of a building or even a certain town had to face south as explained before to ensure that the sunlight filtered through it for most part of the day. This is the primordial function of the *Toranas* in ancient Indian architecture and the *Torii* gates of the Japanese precincts. Cycles of seasons evolved around such perceptual notion. Until the erection of Nantang, the door of a building in China, especially in a temple, was the sole source of light, in a disposition not unlike the cave [18].

Because of their knowledge about the *Aula de Sfaera*, the Jesuit-turned-scholars by Imperial mandate knew the trajectory of the sun because they could easily calculate the latitude of any place with an astrolabe. By an entirely different procedure, they would also estimate longitudes as we have seen in the *Horoscopium* (Figures 9 and 10) and the presence in the premises of the church of the twin-tower clocks attests [27]. Apart from the façade and its deliberate Daoist disposition, the features of the remaining walls do not present copious details. Nevertheless, from a different drawing by Ferdinando Moggi, we know

that the interior had gorgeous decorations, it possessed lierne vaults with sculpted and colored pieces of wood that embossed geometric motifs (Figure 13).

Figure 13. Nantang's Cathedral detail of the vaulted interior. Ferdinando Moggi. 1729.

Since, for several impositions, the façade of a European cathedral had to face west as described earlier, by adapting their architecture to the *Feng Shui* prescribed orientations, the Jesuits were capable of playing with a rare and precious building material unknown to the Chinese builders: Light. For as Guarino Guarini had exposed, "the magic of insuperable wondrous mathematics shines brightly on marvelous and truly regal Architecture" [28]. The carefully positioned clerestories that the Jesuits designed on the south, east and west façades of Nantang became a marvelous eye-opener that contributed to lift the spirits of a cultivated elite of potential believers. It also implied a relevant step towards sustainability of buildings in China.

Such gift allowed for another unexpected instrument in which Giuseppe Castiglione (1688–1766) or, more properly, Lang Shining (郎世寧), a Milanese and arguably the last grand Chinese painter, infused his most treasured talent. It is on the inner walls of this Cathedral that the realistic murals of his creation were in display. The admission of daylight on interior volumes, made it feasible to exhibit a plethora of images that would educate the converses in a more compelling way, without need for words or sounds [29].

To ascertain the sustainability values of a notable construction like the present one, we have simulated the building with the assistance of modern software, in terms of adequacy of orientation and distribution of daylight [21], obtaining the results presented in Figures 14 and 15. The church possessed a nearly perfect orientation according to the current climate of Beijing; the decision to change the typical direction of the entrance to the south as prescribed by *Feng Shui* and other Chinese traditions can be evaluated as opportune and correct (Figure 14).

With respect to the lighting conditions the levels are very consistent especially on vertical surfaces with values of over 500 lux, in all seasons, which would imply an accurate visibility of the minute details of the frescoes executed by Giuseppe Castiglione.

Once this has been established, we can enter in the realm of subtleties by which the Jesuit decided to apply his mastery to illustrate the walls with scenes that might result appealing to Pekinese adepts in a sort of "mural" language.

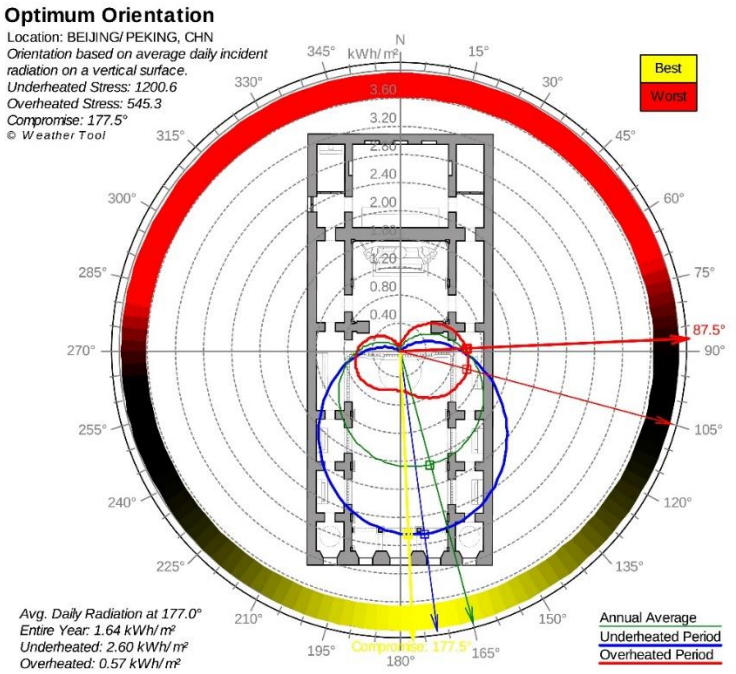
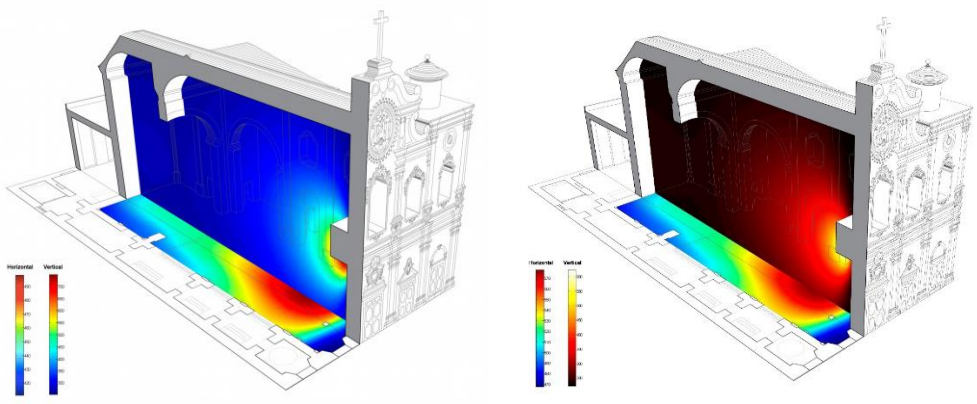


Figure 14. Evaluation of the plan of Nantang Cathedral, taking into account solar radiation and temperatures in Beijing to determine the optimal orientation. Software: Weather tool.



(**a**) (**b**)

Figure 15. Light distribution in the Nantang Cathedral in plan and section to evaluate the visibility levels: (**a**) Winter situation; (**b**) Summer condition. Source: Joseph Cabeza Lainez.

The process of introducing three-dimensional pictorial spaces in murals had been initiated in the Scrovegni Chapel by Pietro Aretino (Figure 16) and later Giotto [30], Castiglione became familiar with the technique in Padova and then in his own apprenticeship at Genoa's cathedral [31], marbled in black and white

Stained glass and fenestration from early Renaissance periods introduced the practice of framing the void surfaces between windows and using them to depict sundry expedients related to the catholic liturgy, not merely limiting these effigies to altarpieces where the clerics would usually perform, but making them more accessible to the audience. As we have seen elsewhere, framed pictures were unknown in the East, and the same happened to canvas warp. The preferred fabric for painting was silk cloth and sometimes reinforced paper used in scrolls or folding screens. Both were not usually on display, but remained rolled or folded until a visitor required its opening for contemplation. The concept of permanent exhibition of art in frames or murals was a complete and sudden innovation that the Jesuits incorporated for good in Asia.

Figure 16. A fragment of the lateral wall of the Scrovegni Chapel; notice the frames with biblical scenes in perspective. Source: Cabeza-Lainez.

Since the original Nantang was sadly razed, the only source to reconstruct the scenes conceived by Castiglione is a surviving text by Yao YuanZhi. His writings are amazingly accurate, so much so, that the authors have been able to objectively trace back much of the scenery that he described. Yao wrote two texts about the murals [32]. We judged it important to transcribe the final fragment of the first one here: "the table within the room, if you see it at a certain distance is placed in perfect order and you would like to dwell inside but if you go for it you will realize that is only a wall!"

> "There was no perspective in ancient epochs. Since it is as accurate as this, you can only regret that our ancestors were not able to see it. That is why I had to record this tale."
>
> 室内几案，遙而望之，秩如也，可以入矣。即之，則油然壁也。线法古無之，而其精乃如此，惜古人未之見也，特記之。

The final line is important for the history of art. Not only does it acknowledge the merits of the artist but also the lack of perspective drawing in China and its necessity.

In Figures 17 and 18, different computer-graphics interpretations of the first text are presented.

The spaces and objects hereby represented are Chinese in a way, but they had never been perceived in this form, as for instance, they look much more ordered and perfectly lit than in reality. We believe that the reason for this stylistic audacity is that Castiglione wanted to create an impression of proximity and lightness within the unfamiliar space of a western brick-and-stone robust church. Certainly, he was not capable of producing a real Chinese building with filigree wooden elements, but he would disclose it in such a way that Nantang may not appear as alien to their eyes by virtue of pictorial illusion. In compelling and astonishing the Chinese to the utmost with this miraculous recital of European Art and Architecture, the advantages of a new faith would be self-evident [33].

Figure 17. Digitally reconstructed detail of the first mural at Nantang featuring a Chinese chamber with typical objects in bifocal perspective. Courtesy of Yulu Yang.

(**a**) (**b**)

Figure 18. Different views of the chambers in a virtual approach to the first mural by G. Castiglione: (**a**) Aerial perspective; (**b**) Reverse view of the main chamber. Courtesy of Yulu Yang.

Having arrived at this point, we would like to remember that "Still Life" scenes are rarely considered in Japanese or Chinese traditional painting as they were often compared to a "stillborn". Nature that comprises the Dao must be represented teeming with life at all times [34]. If the Jesuits needed to impress the Court, such inanimate matters should be better avoided, and an impeccable exercise in realistic perspective was to prove effective and reassuring at the same time.

The second fresco that Castiglione composed was more figurative. According to Yao, several celestial beings that we consider to be angels, saints and even the Virgin, intervene in a colorful tapestry in order to animate the scene. Perhaps this was a private concession to the Jesuit brothers who had missed such representations a long time, or else we would never know. We are working also in the production of an accurate rendering of this other mural albeit for obvious reasons it has proven to be a lengthy and exacting task.

As we have expounded, the artistic skills of the missionaries focused on works previously unnecessary to the Chinese, namely, churches or even recreational divertimentos in the sphere of music, plays or architecture. Occasionally, geography and commented maps of the new worlds were on demand [35]. From time to time, an audacious treatise on mathematics, perspective or painting emerged. This haphazard quest encompassed almost two and a half centuries (1582–1820) of patiently seeping and infusing European Sciences and Arts, lest other more blatant procedures would bring forth turmoil and doom, which nevertheless surfaced near the end [36].

4. Daoism, Cosmology and Ultimate Incorporation of Nature in Jesuit Expression

In the last and most fruitful stage of collaboration and service of the Jesuits to the Empire, during the reign of Qianlong, Castiglione achieved an admirable synthesis which the Court seemed to appreciate. The first example appears in Figure 19. The painter

accompanied its sovereign to immortalize whatever events could happen in his august campaigns. Far from the capital, the royal throne could not benefit from the protection of mountains to the north. On that occasion, a piece of furniture with a marble slab that resembles a mountain was placed at the back of the regalia. In this extraordinary painting, Lang Shining reveals the supernatural in the natural, the Tao. We wonder how he could have become acculturated to such an extreme when his conspicuous predecessor Ricci had claimed openly against false adoration and idolatry [4,8,37].

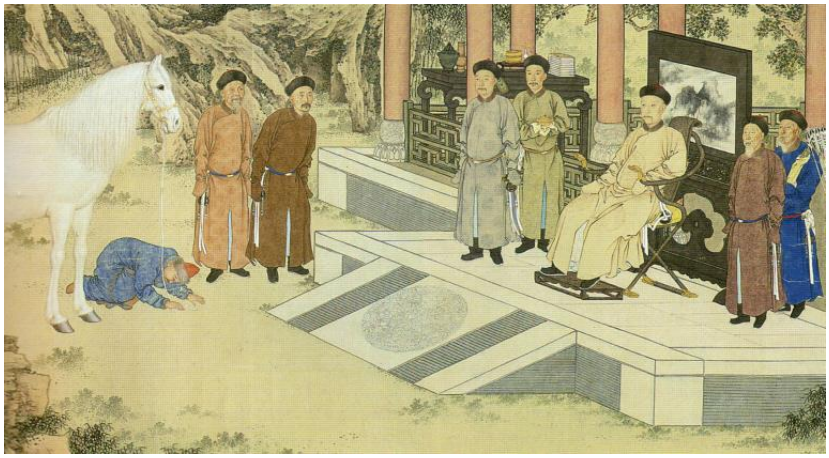


Figure 19. The Emperor Qianlong receives a tribute of horses from the Zhungars. G. Castiglione. Qing Dynasty. Guimet Museum. Source: https://commons.wikimedia.org/wiki/File:Qazak_pay_tribute_to_Qianlong.jpg. Last Accessed: 22 October 2021.

Finally, we arrive at the complex of western style in the garden park of YuanMing Yuan, or gardens of perfect clarity, 圓明園. Here, a group of twenty versed Jesuits did their best to demonstrate the quality of Christian Art. Besides the one mentioned above in the construction of the Nantang, we have received the names of Charlier, Cha JouYu, clock-maker and machinist; Pierre Cheron d'Incarville, Tang TeeTong, botanist and landscape gardener; and Martial Cibot, known as Han KouoYing, horticultor and landscape gardener (their remains lie at the Zhalan cemetery). Apparently, a set of twenty pavilions had been commissioned to Castiglione in the north-eastern corner of the YuanMing gardens, the Xiyang Lou 西洋樓 (Western Mansions) to lodge the ever-expanding collection of curios and foreign pieces that the Emperor possessed.

It began with the Yuanying guan, 遠瀛觀 (Figure 20), an observatory cum deck whose title translates as "the views of a distant ocean". Here again we contemplate the twin clocks together with an armillary sphere in the terrace of a splendid pavilion which featured white stone walls with faience yellow and blue tiles on the roofs. A complete architectural fusion of East and West which, while heralding surrealism for its spectral baroque strangeness, notwithstanding, showcased recent discoveries of science in the matter of cosmology [38].

The former pavilion sublimely contrasts with the Haiyan Tang, 海晏堂 (Figure 21), or Pavilion of a Tranquil Sea, a splendid palace accessed through imperial curved stairs at the foot of which lies an ornamental fountain with twelve eerie animal figures dressed as Taoist sages. In fact, the basement of the palace is a massive water reservoir designed by the said Fr. Michael Benoist to induce jets and other hydraulic effects on the adjoining basin [14].

Once again in this case, the extraordinary theme is not solely artistic or stylistic. The fact is that the Jesuits, paragons of modern astronomy in China, indulged in conceiving a grand water-clock in which the "hour-bell" would correspond with sprays of water from the heads of one of the twelve celestial branches of the Chinese horoscope. Since ancient times, not only the years were named after this zodiac as we do now, but the hours of the day were marked by these mythical animals, noon being the horse 午, or meridian, and

midnight the rat 子. These hours lasted for one hundred and twenty minutes and thus their modern counterparts are called small hours (小時).

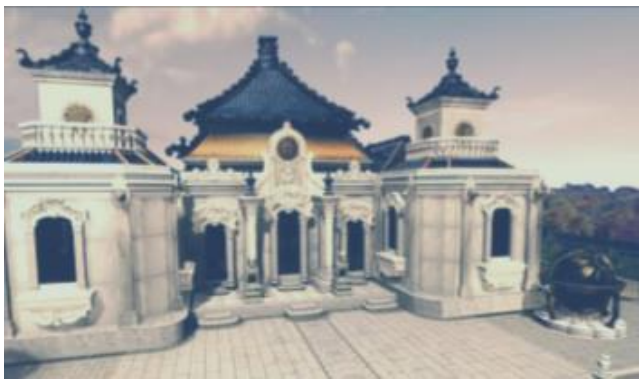


Figure 20. The Observatory known as YuanYing Guan in Beijing. G. Castiglione. Source: Photographs by Cabeza Lainez from the explicative panels of the site YuanMing Yuan. Beijing.

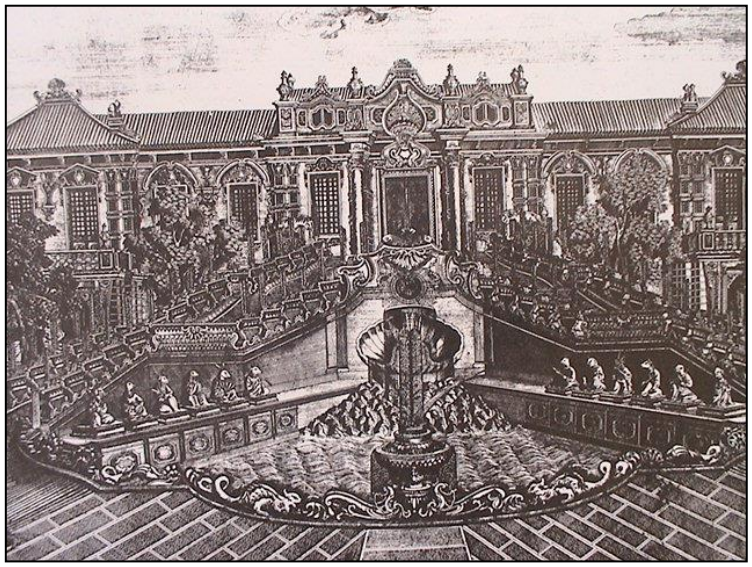


Figure 21. The pavilion of Haiyan Tang in Beijing. Source: Photographs by Cabeza Lainez from the explicative panels of the site YuanMing Yuan. Beijing.

Since the typical course order of the hours is, Rat (24 h) Ox (2 h), Tiger (4 h), Hare (6 h), Dragon (8 h) Serpent (10 h), Horse (12 h) Ram (14 h), Ape (16 h), Bird (18 h), Dog (20 h) and Boar (22 h), and they do not appear in this way in the fountain, some scholars argue that the missionaries were ignorant and used these figures just as a mere decoration. A more detailed research conducted by Joseph Cabeza Lainez (Figure 22) reveals that the Jesuits were totally aware of the conventions, only they had disposed the figures in two opposing wings to add on to the choreographic effect of the complex and facilitate hydraulic maneuvers [14].

It suffices to say that such finding results paradoxical indeed. The envoys who had precisely arrived to China to accurately predict calendar events, after a century long became transmogrified to the point of measuring time by means of the agonist's cosmological scheme.

In 1933, when modern architect Bruno Taut was forced by the Nazi regime to exile in Japan, he published two books on Japanese architectural culture. In them, being treatises on the vernacular, he had to address the question of geomancy and he drew the following graphic (Figure 23) which uses the same characters as in Figure 22. He explained that these

were (in his own words) "the axis of superstition" (aberglaube) commonly employed to design every building in Japan.

Ox 丑 Rat 子
Hare 卯 Tiger 寅
Serpent 巳 Dragon 辰
Ram 未 Horse 午
Bird 酉 Ape 申
Boar 亥 Dog 戌

Figure 22. The cosmological disposition of the twelve animals in the fountain of HaiYan tang 海晏堂. The hour of the rat is midnight and the hour of the horse is noon; the order alternates each wing of the basin to add movement. Source Joseph Cabeza-Lainez.

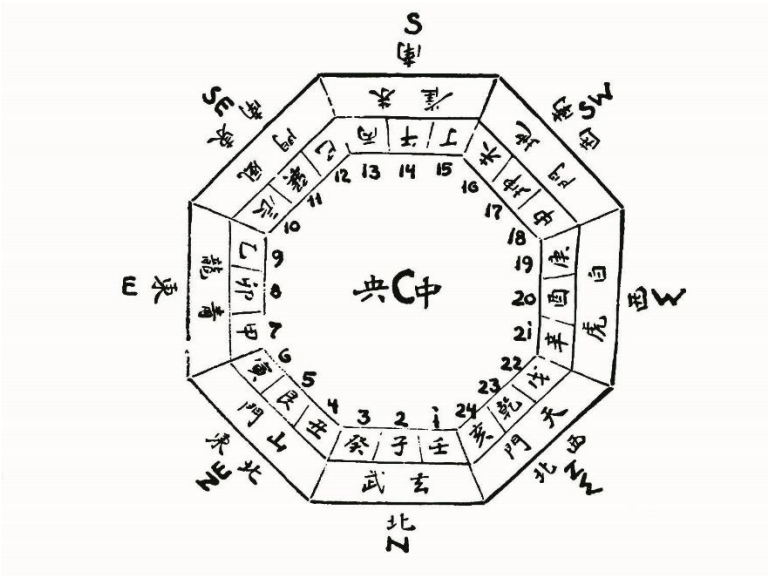
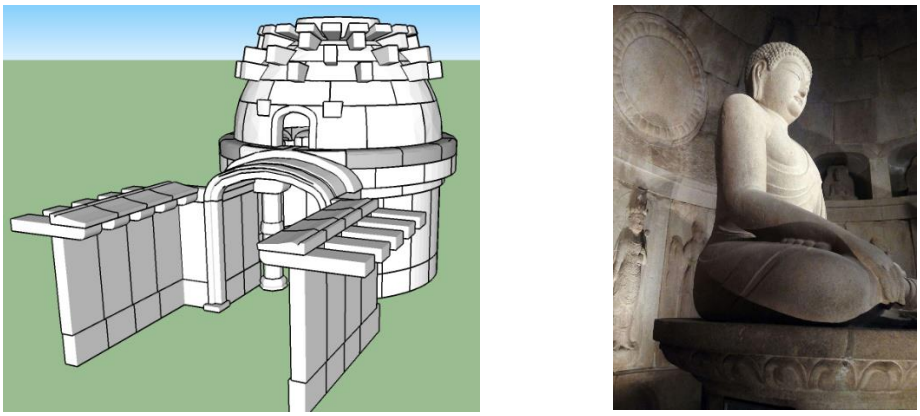


Figure 23. The same disposition reproduced by Bruno Taut under the title "Axis of Superstition". Notice that he deftly wrote the Chinese characters without having any idea of their meaning. Cabeza-Lainez.

Assuming in its entirety the Chinese cosmological system was one of the revealing feats achieved by the missionaries by means of their successful *Accommodatio* method, that later proved insufficient or condemned to irrelevance. Another would have been to experiment with bold new conceptions of space that defied the Chinese and Japanese notions which were based in strict modules of what could be realized in wood and consequently had not developed structures intended to sustain massive loads like masonry, arches, buttresses or vaults.

In contrast, halls did arrange in China around empty spaces following cosmic schemes as the *bāguā* that often result in an imposed rigid geometry. As if humans tried to enforce their own intellectual concepts about order and harmony over nature [18].

The spaces newly conceived by the Jesuits in China permitted the transmission of light to the core of the buildings, a boon that had never been achieved earlier in religious or representative architecture. Prior to that innovation, the temples often adopted a cave-like disposition similar to the hermits' abode in the mountains. It made no difference if the cave was an artificial creation in wood or stone as we find in many Buddhist sanctuaries throughout Asia (Figure 24).



(**a**) (**b**)

Figure 24. Outside and inside views of the Buddhist artificial grotto of Seokguram in Korea. Human Heritage Site: (**a**) Scheme of the cave-like temple with a suggested former opening; (**b**) Statue of the great Buddha on the inside. Source Francisco Salguero Andujar.

It is fair to say that the Jesuits' constructive systems freed Asian Architecture from the ever-present petticoat of wooden post and rafter and its dubious sustainability, especially in large-scale buildings [22].

On the other hand, the Jesuit missionaries accepted nature in a much higher regard and consideration, especially in landscape designs (Nagasaki) and open space enclaves like the YuanMing Yuan 圓明園. In fact, the popular gardening style known in Europe as Anglo-chinois evolved from this melange of cultures throughout design (Figure 25).

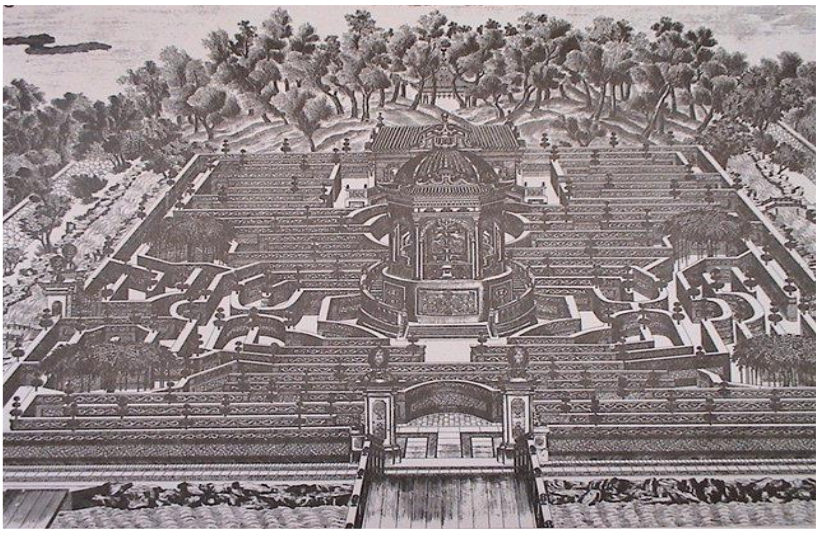


Figure 25. The surrealistic etching of the terracotta labyrinth in the YuanMing Yuan. 1783–1786. Source: Photographs by Cabeza Lainez from the explicative panels of the site YuanMing Yuan.

The Wanhua Zhen, 萬花陣, maze of one hundred flowers, is an example of the architectural syncretism attained. It had to evoke hedge and mirth labyrinths common in European palaces like Versailles and Schonbrunn, but instead, the central pavilion admitted a Chinese hipped roof and the scheme of the plan incorporated the Chinese numerology in nine circular rotundas (four for the cardinal directions, two for the vertical and three for moments in time, past, present and future). The surprising circumstance that it was made of terracotta and not of vegetal shrubs spared it from the devastation effected by Anglo-French troops in 1860 [39]. Apparently, the trimmed hedges were rejected as too rude a way to domesticate hallowed Nature.

Traces of such recurrent discussion reside in the celebrated poem of Bai Juyi (772–846) "Climbing Mount Incense Burner" and its consequences for sustainability, *avant la lettre* [40].

> "My new hut has three bays, and five columns, with stone steps and wooden pillars made of katsura tree. I put a door on the north side to let in cool breezes and to fend off oppressive heat; I made the southern rafters high to admit the sunlight in case there should be severe cold. The beams were trimmed but left unpainted, the walls plastered but not given a final coat of white. I have used slabs of stone for paving and stairs, sheets of paper to cover the windows; and the bamboo blinds and hemp curtains are of a similar makeshift nature. Added four wooden benches and two screen partitions. A serene brook traverses my piece of land but it rarely splashes out. Next spring, I will thatch the side room to the east; fit it with paper panels and reed blinds for my poems of Meng Guang."
>
> 五架三間新草堂,
> 石階桂柱竹編牆。
> 南簷納日冬天暖,
> 北戶迎風夏月涼。
> 灑砌飛泉纔有點,
> 拂窗斜竹不成行。
> 來春更葺東廂屋,
> 紙閣蘆簾著孟光。

Master Castiglione, or Lang Shining in Chinese, deemed the last grand Chinese painter, devised the European technique of focal perspective to illuminate and beckon the believers. At first he opposed frames to expanding scrolls but finally succumbed to the power of boundless expression to adorn the Imperial Chambers with the same spirit.

In the miraculous oeuvre of Giuseppe Castiglione at the *Juanqinzhai* (卷勤斋), the retirement palace of Emperor *Qianlong* (乾隆, 1711–1799), it is possible to admire a sublime reconciliation between natural life and abstract geometry by virtue of unifocal perspective. He painted an entire ceiling showing a bamboo arbour of hanging wisterias (hallowed flower of China) in full bloom (Figures 26 and 27) [41]. Such was the astonishing Mural Language of Lang Shining. Finally, a Universal Language much larger than Life.

Figure 26. The wisteria arbor painted by Castiglione on the ceiling of the *Juanqinzhai.* Source: Cabeza-Lainez.

Figure 27. Castiglione, detail of the purple wisteria flowers.

5. Conclusions

A new type of art, in harmony with European, Chinese and Japanese sources was engendered under the auspices of the Jesuit Missionaries. In Japan, such art was named *Nanban* (after the Southern Barbarians). As for China, it received no specific denomination, but it is known that in the wake of Castiglione and his companions, Sino-baroque gardening and architecture survived for decades in places outside East Asia, for instance in England, Germany or Turkey.

What brought these astronomers-turned-artists to East Asia is contained in equal terms in the dictum of Thucydides: τὰ γὰρ διὰ πλείστου πάντες ἴσμεν θαυμαζόμενα καὶ τὰ πεῖραν ἥκιστα τῆς δόξης δόντα, *we all know that the object of highest admiration is the furthest whose reputation cannot be put to test* [42].

Cross-cultural relationships did influence the development of empires, in all directions, based on what contemporary philosophers like Bucci-Glucksmann have justly called a "Baroque reason", which encompasses mathematics and geometry, art, science and literature [43].

From the cultural point of view, the lessons that we should learn relate to sustainability, nature and the harmonious coexistence between the environment and civilization, almost to the point that it would be hard to tell the master from the disciple in these aspects. Realms appeared and faded in search of such elusive ideal.

In the Oriental Empire of China, which even now calls itself the Empire of the Centre (中国), parallel questions were poised through *Daoist* (道) numerology and geomancy, evoking the perennial symmetry of Nature also present in Japan. Eventually, a fusion of horizons was attained.

For the unequal struggle towards Sustainability in the Modern World, the hypotheses and facts hereby exposed appear both paradoxical and prophetic as hundreds of years have passed, but still Human Culture seems at odds to sustain life on the planet. If something does not dovetail, how should we make amends?

As Watsuji Tetsurō (和辻 哲郎) once stated, the answer lies in that we can neither separate History from Climate nor Climate from History. Nature and Culture and their respective forking paths must ultimately entwine in inextricable though endearing ways [14].

Author Contributions: I.R.-C. and J.C.-L. were helpful in conceptualizing the scope and issues of the article. J.C.-L. developed the main theories and introduced the Chinese characters. M.G.-V. was instrumental in visualizing the cultural and artistic implications of the task. F.S.-A. brought the instrumentation and evaluated the available software. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest: The authors declare no conflict of interest.

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