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An Old Concept Towards Green: The Confucian Impacts on Architecture and Urban Design in Traditional Chinese Society

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Abstract: Chinese civilization is one of the few ancient continuous civilizations. As a consequence, it is able to draw lessons from a very long historical evolution. It can be observed that the civilization center shifted several times in Chinese primitive society; and each time the shifts followed an environmental collapse at the former site. The disapproval of large-scale constructions could be found in the oldest texts in Chinese culture. Confucian philosophy, which became the dominant philosophy of Chinese society, have adopted those values and generated it into the concept of promoting modesty living style. This eventually lead to a more resilient and sustainable society in old China. My hypothesis is that Confucian ideal of modesty and humbleness was an essential element for keeping sustainability of the society. I am arguing that, the Confucian impacts on urban design in old China such as restriction of large-scale constructions and depressing of development of high level architectures, acted as a safety valve to avoid extreme environmental and social collapse. My proposal is that the examination of how Confucian values influenced architecture and urban design in different periods of Chinese history could be helpful to understand the profound effects of philosophical concepts on the social choices of urbanization.

Keywords: Confucianism, Green Urban Culture, Sustainable Society

1. The Ecological and Cultural Backgrounds of the Formation of Confucianism

Urban landscape of Chinese cities has experienced tremendous changes over the past one hundred years. China embraced modern technology along with modern architectural and urban design system from the western world. The expense of excessive urbanization is environment degradation and lost of the identities of the old cities. All this forced us to reflect our choices of urban design, was it right to reject all the old concepts from the past?

Confucianism is the most influential philosophical system in China; it is also the official and essential ideology of traditional Chinese society which has had a great impact on traditional Chinese architecture and urban design. Throughout history, Confucianism has acted as a safety valve to avoid extreme environmental and social collapse in China and its concepts and theories influenced the architectural and urban design and made the society more green and smart. Explaining how Confucian values influenced architecture and urban design in different periods of Chinese history could also be helpful to understand the profound effects of philosophical concepts on the social choices of urbanization. Some of the concepts are still valuable references for building today's green and smart city.

The formation of Confucianism based on Chinese civilization mainly represented by Huaxia civilization located in Central Plain region of China around Songshan Mountain and Yi-Luo River basin. It is the only civilization which has evolved without interruption over 8000 years. Before the beginning of Xia Dynasty, multiple cultures have flourished around Central Plain region, such as Hongshan culture in the North, Liangzhu culture in Yangtze River Delta and Shijiahe Culture in Hubei. All of those cultures declined after a short period of prosperity before entering the next stage of civilization. The reasons of the declination and continuation of cultures are complicated, but several social tendency differences can be observed in those early Chinese cultures [1].

In the ascent stage of the declined cultures we can often observe excessive exploitation of natural resources. Large scale cities, religious monuments, palaces and tombs are often discovered in archaeological sites of those cultures. The ideologies behind those large construction activities are the belief that human requirements are of paramount importance. Therefore, most of those societies advocated extravagant life style and considered that the resource of the nature can be taken ceaselessly. The booms caused by overexploitation were followed by the exhaustion of resources and the degradation of the environment. This in turn might be one of the major causes for the declinations of the civilizations

On the contrary, the cultures in Central Plain region have chosen a moderate developing style. The archaeological finds in this area do not include large scale tombs, lavish sacrificial remains or evidences of extravagant lifestyle. It seems that, Huaxia civilization has learned from cultures around the center region. When referring to Emperor Yao, the legendary leader of one tribe in the Central Plain region, later scholar said that "his thatched roof was untrimmed and his beam unplanned. He ate unpolished grain and made soup of coarse greens and wore deerskin garments in winter and rough fibre-cloth in summer. Even the clothes and provisions of a gate-keeper were not more scanty than his." [2] The legend of Emperor Yao may be lack of concrete archaeological evidence, but he and other legendary emperors like Shun and Yu become the moral examples of Confucian virtues for the

later rulers in Chinese history. Confucianism, which began to shape during this period adopted the moderate philosophy for development and the respecting attitude towards nature.

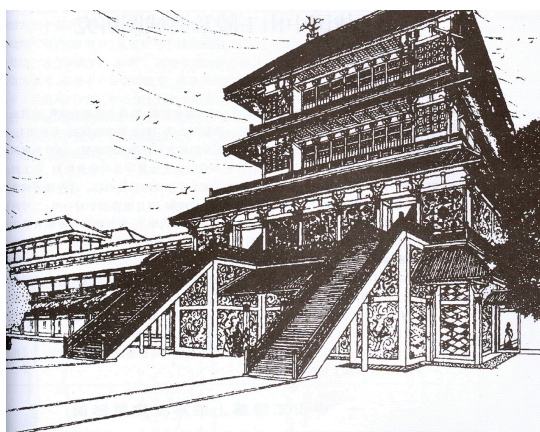
2. Confucian Concepts of Restricting Excessive Construction to Keep a Sustainable Society

To keep the sustainability of society and avoid social and environmental collapse, Confucianism promotes the virtues of humbleness and modesty. It formulated a complex ideological system for the restriction of extravagancy and over development in the society. This ideological system is all-pervasive which affected both the emperors and civilians and have an impact on many aspects of architecture and urban design.

The central Confucian virtue of modesty has influenced urban design by restricting large-scale building construction. Comparing with western architectures from the same historical period, Chinese architectures are of a smaller scale and the evolution of architectural style is not as tremendous. The underlying forces of this phenomenon are the strong inhibition efforts of the dominating ideology of Confucianism in the society.

In the canon of Confucianism *Analects of Confucius*, Confucius comments on the legendary Emperor Yu, “He made the palace humble but instead emphasized on hydraulic engineering projects (卑宫室，而尽力乎沟恤).” [3] This comment has become the norm for later Emperors when they made plan for national constructions projects. The idea of “making the palace humble” has become a principle in Chinese imperial ideology.

Figure 1. Conception Drawing of Zhanghua Terrace [4].



Spring and Autumn Period (770-467BC) is a historical period named after the period when Confucius was working on his “Spring and Autumn Annals”. During this time China was constantly in a state of civil war. However, there was a short period of peace after an armistice signed among the states. During that time the competition among the states has shifted from open military conflict to the building of high rise terraces as symbol of political power [5]. Duke Ping of Song (宋平公) started the competition by building the first high rise terrace of that period in 556BC. This was followed by several other high rise terraces built in different states. Among them the most famous one was Zhanghua Terrace (Figure 1) built by King Ling of Chu (楚灵王) in 535BC known at that time as “the first Terrace on the Earth”. The construction of Zhanghua terrace took 6 years. The building materials

were transported from afar and the civilian builders were forced to a much longer work period than usual [6].

This construction has met an open opposition from Confucianists and eventually raised social problems in the state. King Ling of Chu's exploitation of his subjects has finally led to a rebellion and the tyrant was sentenced to death by starvation by the rebels. In *Zuo Zhuan*, the commentary on the *Spring and Autumn Annals* by Zuo Qiuming, the author quoted Confucius' theory of "To subdue one's self and return to propriety, is perfect virtue." for the criticism the doom of King Ling of Chu was a moral example that a ruler should be more temperate [7].

Throughout Chinese history whenever the emperors were engaged with massive constructions, they always incur criticism from Confucianists. Since Confucianism has become the dominating ideology in the traditional Chinese society, most historians were in fact Confucianists. Therefore in their annals of past emperors, Confucian historians always included morals and criticisms of emperor's rule. This certainly would have an impact on the political decisions of following rulers.

For example, Emperor Wu of Han (157-87BC) was now regarded as one of the greatest emperor in Chinese history. He has led Han China to great prosperous on military, economy and culture. Yet he has also constructed grandeur palaces and imperial gardens for his luxury life. This have drawn him severe criticism of historians. In *Zizhi Tongjian* (literally: "Comprehensive Mirror in Aid of Governance"), which is an important chronicle written for the emperors' references, the author Sima Guang (1019-1086AD) compared him with the famous tyrant in the history, First Emperor of Qin, because of his excessive constructions and luxury lifestyle [8].

Figure 2. Painting of Wang's Garden (painted by Qian Gu 钱穀, National Palace Museum in Taipei).



The restriction of extravagancy was not only on the imperial household but also on everyone in traditional Chinese society. Traditional Chinese society has established a complete system for the restriction of constructions and has legislated against excessive building from Tang Dynasty (832AD).

The restriction was not only on the building area, scale and architectural forms but also on ornaments. Even though some constructions were not openly restricted, such as building luxury private gardens, they nevertheless would arouse negative social opinion. For instance, the private garden of Wang Shizhen (1526-1590AD), a scholar in Ming Dynasty, became the target of criticism for being too luxury (Figure 2) and Wang was forced to open the garden to public under the pressure of social opinion.

Thus, by restricting excessive construction at every level of society, and advocating simple lifestyle, Confucianism has made traditional Chinese society green and smart and avoided potential environmental degradation and social collapse.

3. Confucian Concepts on Ideal Sites of Green Cities

Confucian philosophy advocates harmony between human beings and nature as co-equal. The philosophy of harmonizing relationships between nature and human beings has been reflected by the Confucian canon *I Ching (Classic of Changes)*. The Confucian concepts of universe and nature have strongly influenced Feng Shui theory, which has historically been used for choosing sites for cities and architectures.

The main concept of choosing the site for settlements, cities and architectures is conforming to nature instead of transforming nature. Several central factors for choosing city sites have modern scientific justification. The topography of mountains and rivers could have a strong influence on the microclimate of the sites; testing the quality and quantity of water and soil could avoid potential pollution or natural disasters; choosing the right orientation for the site could make maximum utilization to solar energy; and choosing a site with northern mountains for the shelter from the northern wind could preserve heat better in the winter.

When referring to the principles for choosing city sites, *Guanzi*, the book named after the 7th century BC philosopher Guan Zhong, have offered several suggestions, “Always situate the capital and urban centers (du 都) either at the foot of a great mountain or above the bank of broad river. To insure sufficient water, avoid placing them so high as to approach the drought level. To conserve on the need for canals and embankments, avoid placing them so low as to approach the flood level. Take advantage of the resources of Heaven and adapt yourself to the strategic features of Earth. Hence city and suburban walls need not rigidly accord with the compass and square, nor roads with the level and marking line.” [9] The urban plan theory of *Guanzi* have shown Confucianism’s respect to the nature, it recommend to take advantage of the nature resources and terrain features, choose appropriate sites, which could spare the effort of fighting against the negative effect of the nature. This theory becomes one of the dominating theories for urban planning in ancient China [10].

The choosing of site of the cities and architectures are also closely related to climate and geography of China. Although China is a country with great diversity, much part of the land have hot summer and cold winter, which makes choosing the macroclimate of essential importance for site planning. For instance most of the houses in the cities will choose south as the main orientation. By which the residents could obtain more sunlight.

Being close to water is also important for site choosing, because water is an essential resource for both agriculture and basic commodity. It can also adjust microclimate. Traditional Chinese wisdom for

complying with nature also dictated that cities should be built in the inner curve of the river. The effort to achieve this ideal site is called Gong Rui (攻汭) in Chinese, literally means strive for the inner curves of river. Rui (汭) and Auspicious (瑞) are homophones in Chinese. Meandering rivers always erode the bund of the outer curve and deposit the sediment on the inner curve, which will make the land of the inner curve “grow” over time. The water close to the inner curve is shallower and slower, which made the bank safer than the outer curve.

In Feng Shui, setting the sites at the south of mountains is also an important part for site choosing. The mountains in the north would shelter the city or buildings from northern wind in the winter. By this means, the settlement would become more amiable and warm in the winter, and reduce the consumption of fuel for heating (Figure 3).

Figure 3. Ideal site of Rui water and mountains, traditional village in western Hunan China [11].



4. Confucian Concepts on Harmonious Urban Layout and Smart Architectural Design

The Confucian ideology regards a good society as stable, well ordered, friendly and impartial. It encourages cooperation instead of vicious competition within the society. As a result, the urban layout of traditional Chinese cities presents a harmonious picture.

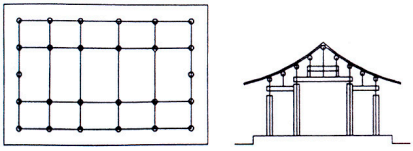
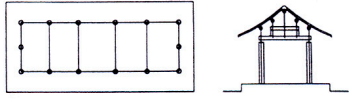
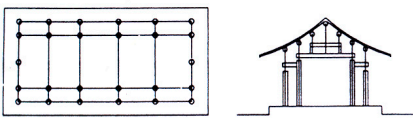
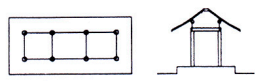
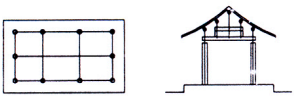
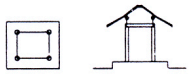
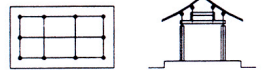
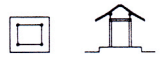
Confucianism has greatest esteem for ritual system, regarding it as the right means of conduct for keeping social harmony. The Confucian ritual system strived to integrate all social norms and relations by institutionalizing them in morality and law. As previously mentioned, China legislated restriction of construction according to Confucian ritual system into building code (*Statutes of Building and Repairs* 营缮令) since Tang Dynasty. Similar building codes were issued in each later dynasty. The building code has regulated the scale and forms of construction in Cities, which prevented contests in the city and avoid disorder of the urban landscape (Figure 4).

For instance, the restriction of building height in residential district was always one important clause of the building code. The prohibition of building storied houses was not only to prevent

extravagant lifestyle, but also an important means to protect privacy of the residents and ensure that every family could enjoy the natural environment equally. As prescribed by the building code of Tang Dynasty (*Statutes of Building and Repairs of Tang Dynasty 唐营缮令*), “Neither gentry or civilian should built storied building in government or private houses, in case one can peek other’s home.” [12] It has stated the restriction on building height is for protection of privacy. In this legal situation the landscape of most part of ancient Chinese cities are broad and low. Each family could enjoy the same sunlight exposure and breeze. The scenery of surrounded mountains could be seen in every courtyards and gardens in the city. High rise buildings were limited to city gates, pagodas and towers built for Fengshui or scenery reasons, which became public sights for cities. These all made traditional Chinese city more livable and green.

Besides influencing on urban layout, Confucianism also played an important part on the design of individual dwellings, where Confucianists have also fostered aesthetics of simplicity. Confucian ideology praised thrifty as a virtue. In the *Analects of Confucius*, Confucius praised his student Hui for his virtue of able to enjoy a simple life [13], and Hui become a moral model for Confucianists. Liu Yuxi (772-842AD), a poet of Tang Dynasty composed his most famous poem, “*My Humble Home (陋室铭)*” [14] and described the life of himself in a simple dwelling but close to nature, refining in culture and rich in character, this lifestyle is respected and followed by literati.

Figure 4. Restriction of Architectural Forms by *Statutes of Building and Repairs of Tang Dynasty* [15].

	Plan and Section of the Houses	Plan and Section of the Gates
Officer higher than the Third Grade		
Officer higher than the Fifth Grade		
Officer Lower than Sixth and Seventh Grade		
Common people		

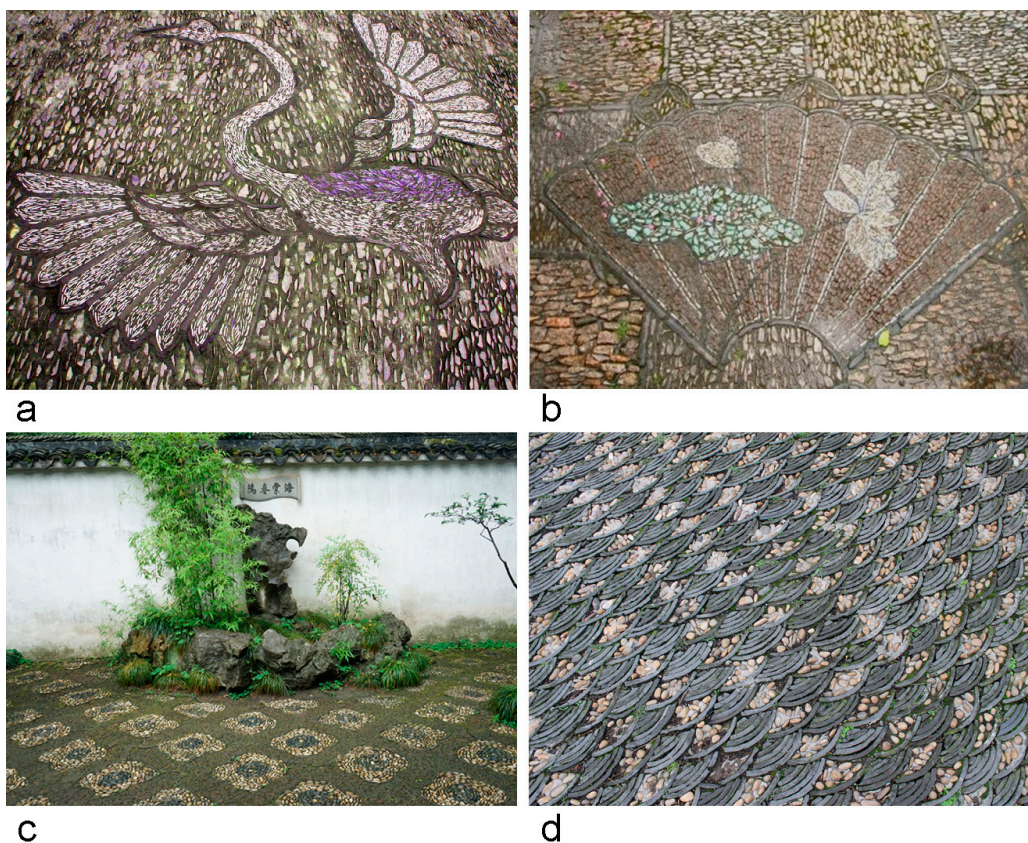
However, the Confucian aesthetic does not demand extreme thrifty. The premise of the simple lifestyle is a pleasant life. So on architecture design, it does not demand the building to be shabby, but tried to express the beauty of the natural texture of the materials. For Confucianists, ornamentation was not regarded as crime. Ornaments were necessary, but should balance with the material texture. In

confucius’ opinion, “if the ornament is over natural texture, it will become vulgar, if the natural texture is over ornament, it will become ostentatious, only when ornament and natural texture are well blended, it could archive the best virtue.” [16] Therefore, out of Confucian aesthetic, the design of traditional Chinese architecture is cautious towards ornament.

Moreover, according to Confucius, “vermilion lacquer does not need refinement, and white jade does not need polishing. Why? Because, when the natural state is abundant, it does not need to receive embellishment” [17] Ornaments should not be added when the natural texture of materials is beautiful and of good quality. This idea is also implemented in Chinese traditional architecture design. For example, building structure made of valuable timbers, such as nanmu or cypress, would not be painted.

Influenced by Confucianism, traditional Chinese constructors prefer smart ideas over magnificence. They believed that luxury is due to lack of creativity, and originality is great refinement [18]. For example, it is a tradition for the traditional Chinese buildings to reutilize old or residual building materials, especially for construction of gardens. In the gardens the pavements can be made by residual tiles and stones. The patterns are abundant with different designs, some are even been paved as paintings (Figure 5). Local building materials are also encouraged to be used on architectures. The city produced bamboos adopted bamboo as walls and tiles. City near the sea often adopt oyster cells as building material to build their house. These kinds of ideas on architecture design all worked to make traditional Chinese cities more smart and green.

Figure 5. (a) Pavement in the Humble Administrator's Garden, Suzhou China. (b) Pavement in the master-of-nets garden, Suzhou China. (c) Pavement in the Humble Administrator's Garden 2, Suzhou China. (d) Pavement in Hes' Garden, Yangzhou China. (Shot by the authors).



4. Conclusions

Confucianism has profoundly influenced traditional Chinese urban and architecture design. It has been formatted in a cultural background that has learned the lesson of environmental degradation thus selected a moderate and ecological friendly strategy of development. Its ideology of ritual system have restricted excessive large scale constructions and made the urban layout harmonious. Its philosophical and aesthetic concepts have helped to encourage creative designs; therefore making cities more green and smart. I believe that Confucian ideology could still be beneficial for today's urban planning and architecture design practice.

Conflict of Interest

The authors declare no conflict of interest.

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3. Legge, J. Analects of Confucius Book eight. *The Chinese classics*. Hong Kong University Press: Hong Kong, 1960; “I can find no flaw in the character of Yu. He used himself coarse food and drink, but displayed the utmost filial piety towards the spirits. His ordinary garments were poor, but he displayed the utmost elegance in his sacrificial cap and apron. He lived in a low mean house, but expended all his strength on the ditches and water-channels. I can find nothing like a flaw in Yu. 子曰、禹吾无间然矣、菲饮食、而致孝乎鬼神、恶衣服、而致美乎黻冕、卑宫室、而尽力乎沟恤、禹吾无间然矣。”
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13. Legge, J. Analects of Confucius Book Six. *The Chinese classics*. Hong Kong University Press: Hong Kong, 1960; “The Master said, 'Admirable indeed was the virtue of Hui! With a single bamboo dish of rice, a single gourd dish of drink, and living in his mean narrow lane, while others could not have endured the distress, he did not allow his joy to be affected by it. Admirable indeed was the virtue of Hui!"; “子曰、贤哉回也、一簞食、一瓢饮、在陋巷、人不堪其忧、回也不改其乐、贤哉回也。”
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18. Li, Y.; Jiang, J.; Lu, S. *Xian qing ou ji*. Shanghai gu ji chu ban she : Xin hua shu dian Shanghai fa xing suo fa xing: Shanghai, 1998 “土木之事，最忌奢靡。匪特庶民之家当崇俭朴，即王公大人亦当以此为尚。盖居室之制，贵精不贵丽，贵新奇大雅，不贵纤巧烂漫。凡人止好富丽者，非好富丽，因其不能创异标新，舍富丽无所见长，只得以此塞贵。”