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REVIEWING THE NOTION OF PROGRESS IN THE QUEST FOR SUSTAINABILITY: THE EXAMPLE OF CHINESE ARCHITECTURE

Mengbi LI*

First Year College and Institute for Sustainable Industries and Liveable Cities, Victoria University

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Abstract. Progress is a frequently admired concept in modern societies, yet defining and achieving it requires renewed consideration in the context of sustainability and low-carbon living. This paper suggests that in China, the modern concept of progress came as a result of certain historical events in the late nineteenth and early twentieth centuries when the country was trapped in crisis. This concept was useful in stimulating society at that time and contributed to the rapid development that followed, but whether it can still meet the new challenges of today's China is questionable. Focusing on the discipline of architecture, this paper suggests that now is the time for a critical rethink of the concept of progress. There are valuable notions to be found in China's history when addressing these challenges.

Keywords: progress, sustainability, architecture, critical review, China, history, dilemma.

Introduction

It has been more than thirty years since the concept of sustainability was officially launched by the United Nations in 1987, but many issues subsist and have even grown more acute. For example, the consumption of resources and energy has not declined, instead it has kept increasing over the years. Steel and concrete are the main materials used in the construction industry. The annual consumption of both steel and cement has been growing steadily over time and is now more than double what it was thirty years ago (U.S. Geological Survey, 2019; World Steel Association, 2019). The same situation applies in the consumption of fossil fuel and the creation of carbon emissions (Centre for Energy Economics Research and Policy, 2019; Le Quéré et al., 2018; Smil, 2016). These results contrast with the degree of interest that sustainability has generated in the press and in public opinion. One explanation for this dilemma could be simply that the population is growing. Even so, between 1987 and 2019, the world's population increased from 5.02 billion to 7.713 billion (The World Bank, 2017; United Nations, 2019), a much slower growth rate than in the consumption of resources such as steel and cement. Taking this discussion one-step further, the question arises as to what is sustaining all this unabated growth, including the growth in population. No doubt, all people acting individually or together as nations aspire to a better tomorrow in the near or distant future, and are prepared to make the efforts to achieve that goal.

The concept of sustainability has achieved global recognition since it was introduced, but the relationship between this newly shaped goal and society's existing goals can be complex. It deserves sensible scrutiny. Among the many existing goals is the deep-rooted notion of progress. The divergence between the pursuit of progress and that of sustainability is particularly noticeable in the field of architecture. The building industry is directly related to architecture and consumes about 45% of all energy and resources. Because its contribution to GDP is so important, the health of this industry is today regarded as a significant benchmark of progress and prosperity.

The idea of progress not only has a substantial impact on architecture, it also has permeated virtually every facet of life and work. As David Suzuki observed, it has become a common theme raised by politicians, scientists, and developers when they speak of achievements. In modern societies, citizens appraise their lives and their success in terms of progress. J. B. Bury comments that progress is no longer just an idea, but an omnipresent faith: "the animating and controlling idea" (Bury, 1987). Prominent architectural historian Kenneth Frampton has studied the history of modern architecture for decades. After half a century of observation and research, he reached the conclusion

*Corresponding author. E-mail: *mengbi.li@vu.edu.au*

that the pursuit of progress is dominant in modern architecture. He notes "politics, economics and culture are all united under the banner of progress" (Frampton, 2007). Given the important role the idea of progress has played in stimulating the rapid development of modern architecture, its unwanted consequences can be easily overlooked. As Frampton goes on to point out "The bourgeois modernity of capitalist civilization and the aesthetic modernity of modernist culture are given a common denominator while the underlying conflicts and discrepancies are ignored… Progress is seen as harmonious and continuous, as though it developed to the advantage of everyone and without any significant interruptions" (Frampton, 2007). Prominent architect and theorist Reinier de Graaf (2017) wrote a book exposing the complex system that underpins the discipline of architecture. The book ends with a declaration of architecture's unrelenting devotion to progress.

The incompatibility bordering on conflict between progress and sustainability in architecture is especially striking in China. China is the largest consumer of steel and cement in the world. It is the largest construction site worldwide and experiences rapid urbanisation. Over the past decade, the average speed of Chinese urbanisation has been more than double the world's average, yet its urbanisation rate is still lower than many well developed countries and only reached the world average level recently (Richien & Roser, 2018; United Nations, 2018). China's progress is closely tied with the well-being of billions, not only the Chinese, but also other populations economically dependent on China. What does progress mean for China? How does it form and evolve? Also, is it possible to refine it in the quest for sustainability in architecture? This study finds that a historical perspective can provide meaningful insights into these questions. By reviewing the etymology and semantic changes to the notion of progress, it suggests that the concept of progress in modern Chinese was formed when the country was trapped in a series of crises, but even after the crises were over, the entrenched notion of progress continued to have currency. This paper finds ancient, yet enlightening interpretations in historical literature. Based on the evolution of the idea of progress and considering the situation in today's China, this paper suggests that it is necessary to re-examine the concept of progress, especially in architecture. Some inspiring thoughts and scholarly discussions taken from historical literature and practice remain relevant today since they may provide a fresh perspective on the notion of progress.

1. The evolution of the notion of progress

It is instructive to consult the history of the notion of progress. It has never been static: it kept evolving throughout history to fit each period. Furthermore, because the idea of progress evolves to adapt to the requirements of the era, it remains constantly relevant and significant. For instance, the Middle Ages gave rise to a belief that there would be a golden age and a better future ahead. Between the Banishment from the Garden of Eden and the Last Judgment, there is a pattern of progress (Benoist, 2008). The "Joachimist future", by anticipating a golden age ahead, promoted confidence and hope in the Middle Ages (Hobsbawm, 1971). This faith encouraged people to be tolerant and forbearing (Reeves, 1969).

The Renaissance was the cradle of modern science, technology and the modern concept of progress. Over this period, curiosity about nature and science was promoted and people were encouraged to explore what they observed in their surroundings. Individual potential was regarded as reason enough to seek total perfection (Cassirer, Kristeller, & Randall, 2011). Together with the enlightenment and the development of the theory of evolution, the concept of progress came to resemble a law of nature. Shortly after the publication of Darwin's *On the Origin of Species* came theories of cultural evolution. Influential scholars of the period such as Edward Burnett Tylor (1870, 1871) and Lewis Henry Morgan (1907) believed there was a functional, universally applicable basis for the evolution of society and civilization. *Ancient Society or Researches in the Lines of Human Progress from Savagery through Barbarism to Civilization* argued that the progress of mankind follows an upward trajectory marked by inventions and discoveries. Herbert Spencer used concepts derived from Charles Darwin's *On the Origin of Species* to analyse society on a broader scale. In Spencer's (1896) view, history follows an evolving pattern. Influenced by Lewis Henry Morgan's theory, Karl Marx and Friedrich Engels also developed theories based on ideologies of progress. They interpreted the stages of human history as progress towards an ideal (Cohen, 2000). During the postmodern era, many modern concepts were criticised and "progress" was one of them (Ferraris & Segre, 1988; Lyotard, 2018). Postmodernism started the trend of deconstructing a series of modern values and thoughts that act as fundamentals. Any absolute belief or metanarrative way of reviewing progress was viewed as dubious. When sustainability won global attention, a new mode of social development was proposed. This mode introduced a long-term vision and highlighted the finite nature of the resources and energy of this world.

The idea of progress has never ceased to evolve. Its values, aims and scope vary according to the culture and politics of the times. Recent trends have provided a timely cue for a more focused critical review of the notion of progress in China, which can serve for architecture. Postmodernism, by focusing on deconstructing the concept of progress, provided an opportunity to challenge and rethink it. It would be more positive however to examine how best to reconstruct. The notion of sustainability introduced the broad perspective required to consider whether future generations will be able to meet their needs. The question remains whether such "needs" might be growing, with historical data showing that consumption has grown faster than population numbers over the past few decades. Moreover, without addressing the rivalry between new and existing goals, there remains a problem. For example,

the updating of green standards and technology could become new excuses for the demolition and reconstruction of buildings.

2. A historical review of the concept of progress in China

The origin of the modern Chinese concept of progress can be traced back in history. It dates back to China's late nineteenth century paradigm shift or transformation that continued into the twentieth century. At that time, China experienced colonization and a collapse of federation that triggered a series of national crises. There was a great need for Chinese citizens to salvage the nation. One after another, radical scholars and thinkers tried hard to promote fundamental ideological changes and importantly the idea of progress. During this transformation, many representative works were written. These include Yan Fu's *Tian Yan Lun* (Yan, 1986 first published in 1898), Liang Qichao's *The New Citizen: On Progress* (Liang, 1989 first published between 1902 and 1906), Sun Yat-sen's *To Understand Is Difficult; to Act Is Easy* (Sun, 1994 first published in 1911), Pan Guangdan's *About the Legitimacy of Family Name, Marriage and Family* (Pan, 1932) and Cai Yuanpei's *On Education* (Cai, 1984 first published in 1901).

In today's China, the notion of progress is both radical and stimulating. It is consistently seen as positive and never critically questioned. After reviewing some 500 records containing the key word "progress" in recently published books, this paper found a consistently positive connotation to the term. The authoritative dictionary of modern Chinese *Xinhua Zidian*'s definition of the word "progress" dwells on the proactive aspect of the notion. There are two succinct but dynamic meanings. One defines progress as being "better *than before*". The emphasis is on comparison to demonstrate improvement. The mere pursuit of betterment can hardly lead to a sustainable future, especially when it comes to evaluating buildings. As the Brundtland Commission of the United Nations pointed out, sustainable development refers to "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). If our needs keep growing and being supplanted, then the luxuries of old may become the basics of the future. Thus, progress may lead to an endless cycle of renewing, upgrading and ultimately overhauling, but the result is still unsatisfactory.

The second definition of the word progress in modern Chinese is "to benefit the development of society" (Institute of Linguistics, Chinese Academy of Social Sciences, 2010). In modern China, it is viewed in Marxist terms. According to Karl Marx, progress refers to industrialization, urbanisation and technological progress, which generally follows a six-stage trajectory: primitive communism, slave society, feudalism, capitalism, socialism and communism (Wood, 1987). The progress of a social system is determined by the accumulation of capital. This is understandable because when progress is a matter of economic growth, it becomes easier to measure and learn from. With such a definition, it is unlikely that progress can be achieved without a great deal of consumption.

To critically re-examine the modern Chinese concept of progress, it would be useful to study the ancient meaning of the word *jinbu* 进步 (progress). Before the transformation in the late nineteenth and early twentieth centuries, progress was rarely discussed in literature. It mattered far less then than it does in modern China. This paper seeks to demonstrate that the pre-modern meaning of progress in China was subtly but profoundly different from its current meaning.

Before the formation of the modern concept of progress, there were generally two main meanings to the Chinese word *jinbu* in historical literature. One existed in ancient times when it was used as a verb to describe the physical movement of a body through space. It usually meant "move forward". More specifically it could signify "walk forward", "run forward", "dance forward" or "step forward". This meaning has since disappeared in modern Chinese. Another ancient meaning was a deepened comprehension and experience of religion, the classics, philosophy and divine will. It was more about self-improvement in terms of morality, understanding, knowledge and realization than about material advancement.

The literary works that used the word *jinbu* to express its initial meaning can be traced back to 475–221 BCE or earlier. For instance, in the dialogue between *Jiang Taigong* and Emperor Wu of the Zhou dynasty, the word "progress" was used to describe the forward progression of an army (Lv, Kong, & Nie, 2005 first published between 475 BCE and 221 BCE). In the Han dynasty, the first comprehensive Chinese dictionary *Shuowen jiezi* 说文解字 [Explaining and analysing Chinese text and characters] was published. In this dictionary, progress was defined as '进，登也'; '步，行也' (to climb higher or walk forward) (Xu, 2006 first published between 100 CE and 121 CE). In the Tang dynasty, the word "progress" appeared in narrative writings and was also used to describe actual movement such as dancing forward (Zhang, 1957 first published between 618 CE and 906 CE). A similar interpretation could be found in later literature and persisted until the Qing Dynasty (Wu, 1980 first published in the 16th century; Xu, 1998 first published between 1279 CE and 1368 CE; Zhang, Chen, & Li, 2005 first published in 1711).

Elsewhere in literature where *jinbu* appeared, the word was used to express its second meaning: a deepened comprehension, awareness and cognition. For example, in *Zhuzi yulei* 朱子语类 [The words of Zhuzi], Zhu Xi wrote articles on achieving progress through study and deepening one's understanding. He encouraged people to transcend reading, to reflect more and gain profound insights. He also discussed methods for achieving a deeper understanding of the classics and philosophy. He encouraged students to overcome obstacles and reminded them that they should not neglect nuances (Zhu & Long, 1998 first

published in 1270 CE). Both Xiang Ziying's poem *Huanxisha* and Shi Daoyuan's *Jingdechuandenglu* were intended to encourage people to strive for a better understanding of Buddhist ideals (Shi, 2010 first published between 960 CE and 1127 CE; Xiang, 1965 first published between 1085CE and 1152 CE).

Of greater interest to this study is its second meaning, that of deepened comprehension, awareness and cognition. There were three noteworthy features in the meaning of progress in ancient Chinese. First, there was an emphasis on the intangible and the profound rather than on material improvement or innovation. Second, the concept did not involve any relationship to growth, originality or creation. Third, a great weight was given to *wu* (spiritual enlightenment)[1] which referred to a deeper awareness and comprehension.

Although the traditional meanings of *jinbu* have disappeared from modern Chinese, these seemingly outdated meanings may provide a broader insight into the Chinese notion of progress. This is useful in dealing with sustainability issues in architecture, and particularly so in a rapidly developing modern China.

3. Ambivalence towards "Progress"

The fact is that the modern Chinese concept of progress arose in a specific historical period when China was in difficulty. It fulfilled its role in motivating the population and contributed to the country's rapid economic development. Now that sustainability and low-carbon living have gained momentum however, the pursuit of the current notion of progress in architecture is causing a dilemma.

As the result of a long-term environmental campaign, it is now generally recognized that the quantity of resources and energy available to the planet is limited. The construction industry is the largest consumer, accounting for 45% of world energy consumption and producing large quantities of carbon dioxide and waste. Nevertheless, the construction industry remains an important engine of GDP and urbanisation. It is regarded as necessary for achieving prosperity and a higher standard of living.

In actual fact, economic growth is often cited as a benchmark of progress in today's society, and this is where the debate arises. When politicians or corporate CEOs are asked how well they performed last year, they will generally refer to economic growth indicators. Government, media and public opinion are preoccupied with the GDP as a benchmark for progress. In practice however, this can lead to problems. For instance, the construction industry is invariably evaluated in terms of its contribution to annual GDP growth. Recycling building materials is good for sustainability but may contribute much less to GDP than building from raw materials (Suzuki, 2014). Another solution might be to promote a culture of frugality where reduced consumption creates less waste to be recycled. This could be a more efficient approach to sustainability because it saves the cost and waste involved in experimenting with recycling technology. The disadvantage is that reducing the amount and scale of production and construction could slow the growth of GDP and urbanisation. Considering the complex web of conflicting interests and constraints, architecture as a profession needs to defend its own values and establish a benchmark for progress that incorporates sustainability.

Architecture in the twentieth century was built on a legacy from the last generation of great architects. Whether this legacy can still serve today's new goal of sustainability however, requires a critical review. In the second half of the century, the post-war world urgently needed to rebuild accommodation and infrastructure. Just at that time, the introduction of new building materials and remarkable improvements in technology revolutionised architecture. The largely craft-based approach to building was becoming obsolete. In this context, architects sought out new methods of design and construction, which subsequently gave rise to new ways of living and consuming.

One of the most influential architects, Le Corbusier (1931) stated "A great epoch has begun. There exists a new spirit. There exists a mass of work conceived in the new spirit; …Our own epoch is determining, day by day, its own style". Adolf Loos (1998) also emphasised "every epoch had its style". He advised "Do not weep. Do you not see the greatness of our age?" In his influential book, *Space, Time and Architecture*, Sigfried Giedion comments that one of the architect's main goals is to find a new way of life for our time (Wang, 2011). In addition to the quest for innovation, there was a need to break from tradition. Filippo Tommaso Marinetti (1909) called for the admiration of new and powerful objects; he advocated destroying older forms of culture and rejecting the past. Antonio Sant'Elia (2008) echoed Marinetti and claimed "The art of construction has been able to evolve with time, and to pass from one style to another". He noted "in the course of history, changes of fashion are frequent" and described admirable architecture as architecture that "cannot be subjected to any law of historical continuity. It must be new, just as our state of mind is new". Marinetti and Antonio Sant'Elia (1970) proclaimed, "We must invent and rebuild the Futurist city". Max Weber (1946, 1993) commented that breaking from previous times formed the core of modernity.

These thoughts and tenets still resonate with us and influence our designs, especially in countries experiencing rapid development and urbanisation. Implicated as it is in the global economic system, modern China is no exception to the rule. In a strong megatrend of renewal and urbanisation, substantial buildings and structures were demolished far before the end of their intended lifespans lives. Statistics show that because of large-scale demolition programs, the average actual life of China's urban buildings is less than 30 years, which is only half of their

[1] he term can be similar to realization, profound cognition, illumination, metanoia, and revelation.

intended lifespans of 50 to 70 years (Jing, 2011). It is estimated that 16% of housing stock was dismantled in China between 2005 and 2010. That accounts for 1,830 km^2 in floor space, more than the whole of that of Greater London (Shepard, 21 October, 2015). What follows the demolition is an even larger scale construction of new buildings. With 2 billion square meters of floor space completed every year, China has become the largest construction site in the world (Shan, 2006). An ever-shorter turnover cycle of destruction and construction has developed: the old is replaced by the new and the new is replaced by the newer. A general obsession with innovation, splendour and luxury in buildings fuels the growth of its construction industry and the development of its architecture. In turn, the large number of construction projects and the demand for energy and resources fuel the growth of its GDP. As a colossal construction site, China consumes 46.4% of the world's steel and more than half of its cement (U.S. Department of the Interior & U.S. Geological Survey, 2018; World Steel Association, 2019). The cycle of destruction and construction is not only accelerating, it is also difficult to stop. Until now, GDP has been a crucial indicator of government performance. Recently, the inadequacy of this evaluation marker has been recognized, but it has yet to be improved upon (Guo & Hu, 2014; Xi, 2017; Zhu & Xu, 2013). More than half the income of local governments is derived from real estate (Huang, 2017). This is a complex issue involving the competing interests of a range of stakeholders.

As the pace of urbanisation and the prosperity of the real estate industry increase in China, so do the environmental challenges. According to the *National State of the Environment Report, 2014* from the Ministry of Environmental Protection of the People's Republic of China, air pollution has reached an alarming level. The report examines the air quality of 161 cities, with only 9 reaching national air quality minimum standards.[2] The pass rate is barely 5.6%.[3] As reported by ABC news in Australia in November 2015, air pollution in north-eastern China is almost 50 times higher than the World Health Organization's recommended level.[4]

Discussion and conclusions

All the contradictions concentrate upon one point: the idea of progress, so can we agree to abandon this goal or reject it, retaining only the goal of sustainability? That would be unhelpful and probably impossible. The fact that postmodern scholars have exercised greater caution in using the word "progress" does not mean that its pervasive influence has been eliminated or even weakened. As Raymond Duncan Gastil noted, progress is regarded as essential for humanity. It is about *hope*. "We need to believe in a chance for something beyond, for positive change, for escape through time to a better life – after work, tomorrow, next year" (Gastil, 1993). Thus, it is unwise to reject or suppress the desire for progress. Instead, a redefinition of the goal at an appropriate time and how it can be achieved would be beneficial. As revealed from a revisit of the history of the idea of progress, there is nothing static about the concept, it evolves constantly and contributes to the culture and politics of different historical periods.

It is noteworthy that the modern concept of progress in China was formed in a special historical circumstance, when China was trapped in multiple crises and had an urgent need to motivate its citizens to salvage the nation. Consequently, the concept of progress was imbued with a radical meaning. Today, the national crises have ceased, but the concept of progress remains resonant and provides complex hindrances to the pursuit of today's new goal of sustainability. This dilemma is acute in architecture. Some legacy from China's own history and culture may offer a promising remedy.

This paper suggests that the ancient meaning of *jinbu* (progress) provides a valuable way to redefine the meaning of progress in architecture, especially in modern China. Before the creation of the modern notion of progress, *jinbu* had two earlier meanings. One was of deepened awareness and self-realisation. It is evident that this notion referred to the philosophical aspect of progress. Architecture creates a rich resonance that transcends the physical forms of buildings. This element of value aligns with the goal of sustainability and suits the discipline of architecture. Thus, in addition to their highly focused motivation to explore energy-saving technology and sustainable materials, architects and scholars in architecture may be able to use such a discipline-based insight to attract more attention to the intangible benefits available in architecture. Notably in countries such as China, if people aspire essentially to material wealth, they develop a commensurate appetite for consumption. Fortunately, in Chinese history, there has been an inspiring debate as to the type of building that represents good architecture. *Huainanzi* asserted that it was moral to build a shelter without luxury, ornamentation or decoration and it was virtuous to lead a simple life. A good house should never be overbuilt. All that was required was shelter against harmful moisture from the land, rainfall and haze from the sky, as well as four walls to protect the interior from strong winds. The building should need neither decoration nor any change to the landform. The woodwork and other elements used in construction should be neither elaborately processed nor over decorated. The hall did not need to be large, just sufficiently so to conduct rituals and hold liturgies. The rooms should be sufficiently quiet and clean to accommodate sacrifices to the high gods and ceremonies devoted to the spirits and deities (Liu, 2016 first published

[2] The assessment of the air quality is according to *Ambient Air Quality Standards*, coding: GB 3095-2012.

[3] The Reference Number of the official document is 000014672/2014-00747 as reported by Ministry of Environmental Protection of the People's Republic of China.

[4] ABC News by China correspondent Bill Birtles on 9 November, 2015.

in ca. 139 BCE). These principles, which date back more than two thousand years, embody the philosophy of sound architecture. What matters is not the awesome span, astonishing height, stylish form or luxury decoration, but rather the meaning of the place. Throughout the whole lifecycle of a building, from design, earthwork and construction to occupancy, the notion of frugality was consistently present. Beyond its economic connotation, it was more admired as an ethical practice. Interestingly, the wisdom conveyed by such ancient principles seems not outdated, but aligns with today's pursuit for sustainability and provides a possible reason to revisit the meaning of progress in architecture.

The second meaning of *jinbu* was actual movement, such as walking forward, pacing forward, dancing forward, and climbing forward. This may provide an indirect but possible way to pursue the exploration of the contextual potential of architecture in practice. Beyond the question of what physical improvements updated buildings can bring, the focus could be on their interaction with existing buildings. Being able to drift forward within an architectural space is an uplifting experience, but it seems there is little opportunity for such leisure in today's fast-paced life. Home is more like an ephemeral place. Relocation, brief stays, the selling and buying of property seem to be the modern norm. This dynamic helps the housing market, but inevitably prevents residents from developing an attachment to their dwelling. What adds to this is the limited time actually spent at home for those people who spend the majority of the day working. The question naturally arises that if the modern home is such an ephemeral place, is the workplace the best place to experience architecture? The answer to this question seems rather obvious: the longest time spent at the workplace is in the small area in front of the office desk. Overall, there is still plenty of room to experience the interaction with existing buildings. It makes sense also to devote some of one's time enjoying an existing building that would otherwise be spent on planning an upgrade to the family house/apartment or office. The guiding principle may be *buyi jingyi* (drift forward and different scenes will unfold), *promenade architecturale* or the ancient meaning of *jinbu*.

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