The Mongol Empire and Pre-Modern Physical Infrastructure in China

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The article deals with the rather unexpectedly creative, as opposed to destructive, role that the Mongol Empire performed at the apex of its power on the Eurasian landmass, namely that of construction and connectivity with particular focus on what can be described as 'physical infrastructure'. Roughly following chronological order, the paper briefly examines the most clear-cut manifestations of this constructed environment that the Mongols created in what today territorially amounts to China. Based on an inter-disciplinary theoretical approach to physical infrastructure as a technopolitical system of power and control over space, as well as secondary academic literature by recognised scholars in Mongol and Chinese frontier studies, and the author's own field observations, the analysis reveals that nomadic rule in China was not only characterised by immobile material features, but also proved to be innovative in this regard. Contrary to the established wisdom, physical infrastructure is not exclusive to agriculture-based polities, including modern nation-states to which this concept usually remains confined.

Keywords: Mongol Empire, China, Yuan dynasty, physical infrastructure.

Except for today's Mongols themselves, the nomadic superpower created by their ancestors eight centuries ago has long been associated with carnage and destruction from China to Europe. This article attempts to highlight the opposite role that the world's largest contiguous empire ever (1206–1368) performed at the apex of its power, namely that of construction and connectivity with particular focus on what would much later be called 'physical infrastructure'. Roughly following chronological order, the paper briefly examines the most clear-cut manifestations of physical infrastructure that Genghis Khan (r. 1206–1227) and his descendants built in what today territorially amounts to the People's Republic of China. Based on some of the most recognised scholars in the area of Mongol and Chinese frontier studies as well as the author's own field observations, the analysis reveals that nomadic rule in China was not only characterised by immobile material features almost as much as was the rule of their sedentary dynastic predecessors and successors, but also proved to be remarkably innovative in this regard. Contrary to established wisdom, physical infrastructure is not exclusive to agriculture-based polities,

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The Ming Great Wall – built against the post-imperial Mongols (taken by the author)

including modern nation-states to which this concept is usually confined.

In a decidedly modern fashion, 'non-military infrastructure' is defined by Webster's Dictionary as "the fundamental facilities and systems serving a country, city, or area, as transportation and communication systems, power plants, and schools"[1]. The latter, along with facilities of the financial, health care, law enforcement or governmental systems, are considered to be 'soft infrastructure', while the rest (i.e. roads, bridges, tunnels, water supply, sewers, electrical and telecommunication grids etc.) correspond to 'hard' infrastructure, pre-modern manifestations of which are synonymously called 'physical' in this article. Besides the conventional types of infrastructure pertaining to transportation, utilities, irrigation or mining, the consciously expanded working definition of pre-modern physical infrastructure would also include various means of enclosure, ranging from major walls to medieval cities understood as walled infrastructural nodes within their respective logistical and defensive networks.

The article employs an inter-disciplinary theoretical approach to physical infrastructure as a technopolitical system of power and control over space, and thus, by extension, over the people located in it, that stays in line with the general trend of a return of philosophical interest in the spatial, as opposed to the temporal dimension of human existence, associated primarily with such luminaries of 20th century French thought as Gaston Bachelard[2], Michel Foucault[3], Pierre Bourdieu[4] and Henri Lefebvre[5]. Largely based on their insights, American anthropologist Brian Larkin, who saw infrastructure as a constructed network facilitating the flow of goods, ideas, waste, power, people, or finance and allowing for

1 *Webster's Dictionary*, 2006, p. 980.

2 Bachelard, 1994.
3 Foucault, 1986.
4 Bourdieu, 1989.
5 Lefebvre, 1991.

their exchange over space, also noticed its embedded 'technopolitical' nature[6]. In that sense, it is essential to what Foucault called 'governmentality'[7], and sociologist Michael Mann 'infrastructural power'[8], namely the capacity and the organised practices of the state to enforce its policies over all the subjects throughout its entire territory. The actual analysis is therefore based on careful reading of relevant secondary sources that usually deal with issues pertaining to physical infrastructure only indirectly and rather inconsistently, instead giving priority to historical, technological and economic descriptions of the general constructed environment. In addition, photographs taken by the author are provided to support the argument as explanatory and visualised 'spatialisations of the written word'[9], thus following the advice of another major authority figure in a constantly expanding social study of spatial phenomena.

Genghis Khan's Acquaintance with Physical Infrastructure and Expansion into China

In the Great Eurasian Steppe, the Mongol Empire marked the apex of nomadic power that had gradually accumulated since the first major tribal confederations some 1500 years before, namely the Scythians in the west and the Xiongnu in the east. The latter entity was widely understood as an existential threat, the quintessential 'other' by the first two imperial dynasties of unified China, the Qin (221 BC–206 BC) and the Han (206 BC–220 AD). Although the sedentary empire was forced to pursue relatively peaceful economic and cultural contacts with the neighbouring 'barbarian' great power on several occasions, its posture largely remained hostile and defensive. The most clear-cut manifestation of that was the construction of imperial China's paradigmatic infrastructural legacy – the so-called long wall(s) (*chang cheng*) which in their much later guise came to be known as the Great Wall.

A complex communication and transportation network, rather than a single object of purely defensive nature, it was largely created by the (in)famous First Emperor of Qin (r. 221 BC–210 BC) through unification of previously existing smaller systems of walls and watchtowers that used to protect pre-imperial 'warring states' from each other and the northern nomads. However, the lasting defensive value of the long walls proved to be limited at best since the 'intramural' China proper suffered from numerous successful invasions by fully or partially nomadic peoples of Turkic, Mongolic, Sino-Tibetan and Tungusic ethno-linguistic stock, the most powerful of whom even created their own dynastic 'empires' north of the Yangtze River, such as the Tuoba Northern Wei (386–535), the Khitan Liao (907–1125), the Tangut Western Xia (1038–1227) and the Jurchen Jin (1115–1234), respectively.

As the unifier of the Mongols, Genghis Khan understood that largely economically sedentarised and culturally sinified neighbouring Tangut and Jurchen em-

6 Larkin, 2013, pp. 327–328.
7 Foucault, 2010, p. 70.
8 Mann, 1984.
9 Harvey, 1990, p. 206.

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Mongol horses – key factor in imperial expansion and the *jam* (taken by the author)

pires, as well as the remnants of the Song dynasty (960–1279) in Southern China, would not sit idle as a new purely nomadic great power emerged in the north. Following the footsteps of previous steppe conquerors, the fearsome Mongol leader outmanoeuvred the long walls and other defences of their descendants and initiated historically unprecedented nomadic military penetration into China proper, which was successfully completed by his sons and grandsons. Genghis Khan's military strategy of conquest emphasised the most important comparative advantage of his army – the unmatched mobility of its multi-skilled, highly-disciplined and meritocratically organised mounted archers. His strategy of administrating acquired territorial possessions also followed an example practiced by previous nomadic powers that strove to somewhat divest themselves from direct rule by establishing control over key geographic points, roads, and trade routes, and to tie everything up with a rapidly deployable combat force that did away with the need for massive garrisons and fortifications. This structure of a 'formless empire'[10] allowed the nomads to retain their mobility and substantially lower manpower costs.

Nevertheless, the same crucial goal of ensuring mobility meant that the Mongols paid great attention to transportation infrastructure and logistics. Although Genghis Khan spurned the construction of castles, forts, cities or walls in his huge domain, he probably left for future generations more bridges than any ruler in history before or since[11]. Similar motivation explained the building spree of numerous roads and granaries throughout the empire[12]. This network gradually evolved into one of the most important, famous and lasting Mongol imperial institutions that merits separate discussion – the *jam* (also known by its Turkic transliteration – *yam*), or courier and relay (i.e. postal) system.

10 Mott, 2015, p. 41.
11 Weatherford, 2004, p. 16.
12 Rossabi, 2012, p. 46.

The *Jam* System as a Physical Infrastructural Network

Like many other Mongol practices, the *jam* had several prototypes in previous great powers established as early as the Persian Achaemenid (550 BC–330 BC) or Roman (27 BC–395 AD) sedentary empires and reaching their times through the Jin dynasty of the Tungusic Jurchens. It was Genghis Khan's nascent nomadic state, however, that made it unprecedentedly potent, extended and efficient. The great conqueror himself provided an informal basis for its foundation. After vanquishing most of Northern China he ordered all his civilian subjects to supply imperial envoys bearing the famous Mongol tablets of requisition (*gerege*/*paiza*/*paizi*), i.e. usually circular or rectangular engraved metal pendants akin to the modern combined passports and credit cards[13], with whatever remounts and provisions they needed. The couriers riding on government business would simply exchange their own tired horses for any fresh one they saw on the road, and any passing envoy had to become the honoured guest of the local population[14].

The *jam* system was institutionalised by Genghis Khan's son and successor Ögedei (r. 1229–1241), aptly called the true architect of the empire[15]. In order to reduce the crippling pressure on households that its informal forerunner usually caused, an official network of often lavishly-furnished and well-guarded permanent postal relay and remount stations (*örtöö*) was set up at intervals of some 40–45 km or an average day's journey on a horse. Since this structure allowed the Mongol riders (or rather the messages themselves) to move basically non-stop, they covered up to 200 km per day, a speed unprecedented up to the modern industrial era. Notably, besides information delivery purposes, in wartime the *jam* served to maintain logistics for the army and to defend the imperial territory because many checkpoints also functioned as *de facto* road-forts[16]. The staff of the relay stations living in attached households tended the herd of horses, supplied remounts to the envoys, and served them specified rations. Despite the provisions that the *jam* was technically to be used only by those bearing an official *gerege*, exceptions were often made for couriers carrying military intelligence or rarities for the sovereign[17].

Although subsequent Mongol emperors extended the network further, it was Genghis Khan's grandson Kublai, the fifth great khan (r. 1260–1294), and the founder of the Yuan dynasty (1271–1368), who secured most of the fame in this regard[18]. As the empire reached its territorial apogee with Southern Song's conquest in 1279, the new ruler of re-unified China and Mongolia turned towards the emphasis on quality as opposed to quantity of the *jam*. Besides the construction of additional roads, wells and stations, Kublai paid particular attention to various types of supporting physical infrastructure, including special posts exclusively for the highest officials, and water transport, adding canals, ferries

13 Weatherford, 2018, p. 2.
14 Atwood, 2004, p. 258.
15 May, 2018, p. 118.
16 Luttwak, 2012, p. 91.
17 Atwood, 2004, pp. 258–259.
18 Man, 2015, p. 321.

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Remains of Karakorum – the first stationary imperial capital (taken by the author)

and new bridges to the huge network. As a result, around 1330 only the Yuan part alone of the disintegrating Mongol empire allegedly maintained 1,400 stations, of which 913 were conventional horse relays with 44,135 horses, 424 were water relays with 5,921 boats, and the rest sedan chair, ox cart, and simple foot relays. Notably, in Manchuria 15 dogsled relays disposed of 218 dogs[19]. The Mongols went as far as to plant trees along the roads to shade travellers in the summer months, while stone pillars were used to mark those many paths where trees could not grow at all[20].

It would be hard to overestimate the *jam's* political, economic and military significance for the Mongol Empire and the world in general. It allowed Genghis Khan and his descendants to govern their huge domains effectively. Some present-day scholars even call the *jam* a type of soft power, a lifeline constructed to economically tie the empire together and keep disparate areas integrated[21]. Although the system's substantial maintenance costs probably contributed to popular animosity towards the Mongol rulers, thanks to its fundamental efficiency this institution was retained in Ming (1368–1644) and Manchu Qing (1644–1912) China, Muscovite Russia (1283–1917) and many parts of the Muslim world long after the Genghisids lost their political power in Eurasia[22].

The *jam* proved to be critical in the later stages of what came to be known as the terrestrial Silk Road[23] which was not itself a clear-cut object of physical infrastructure. Although not an actual 'road' but rather a patchwork of drifting trails and unmarked footpaths across massive expanses of hostile grassland, harsh deserts and mostly impenetrable mountains[24], it still led to considerable commerce across Eurasia, and even more importantly, to cultural,

19 Atwood, 2004, p. 259.

20 Weatherford, 2004, p. 160.

21 Mott, 2015, p. 36.

22 Biran, 2015, p. 6.

23 Perdue, 2005, p. 38.

24 Hansen, 2012, pp. 5–8.

Miaoying White Stūpa – the only Yuan structure left in central Beijing (taken by the author)

artistic and technological interactions and exchange among different civilisations that eventually transmitted Asian knowledge to Europe and thus provided a stepping stone for its later rise to worldwide predominance.

Kublai's Embrace of Physical Infrastructure in the Yuan Apogee

The decades-long rule of Kublai Khan marked the apogee of Mongol power, especially in its Yuan dynastic form. Sometime before the Chinese-style proclamation of his own dynasty, Genghis Khan's remarkable descendant initiated the construction of a new capital city. The most telling manifestation of both the sedentarisation of the Mongol court and its unprecedented infrastructural complexity, the project required highly skilled craftsmen from all parts of the huge empire. As in previously examined cases, Kublai largely followed long-established local practices. Thus, the area chosen for the new capital had served this purpose since China's pre-imperial era when it hosted the seat of a major 'warring state' – the Yan. During the era of semi-nomadic conqueror dynasties, a secondary capital of the Mongolic Khitan Empire initially emerged there only to be eventually replaced by the main imperial seat of the Jurchens. Known as Zhongdu ('Central Capital') to its Chinese contemporaries, the city was notoriously occupied by Genghis Khan in 1215. The Mongol conqueror restored its ancient name of Yanjing ('Yan Capital') which remained official until Kublai decided to build a new city on its outskirts.

Aptly called Da(i)du ('Great Capital') by the Mongols and Chinese, the city was known to its many foreign residents and guests by the no less telling Turco-Mongol name – Khan-Baligh ('City of the Khan'). The location of the new capital, which was basically on the border between the sedentary and nomadic realms and physically separated by long walls stretching some 60 km to the north of it, expressed Kublai's

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The Grand Canal in Hangzhou – upgraded by the Mongols (taken by the author)

desire to symbolically connect them and materially ensure control over both. Although Daidu marked the second attempt to create a permanent sedentary capital for the Mongol Empire, its predecessor (and successor) in the Great Steppe, Karakorum, had proved to be an inadequate location for such a role as it simply lacked a hinterland that could readily supply the city's burgeoning population with food and other necessities[25]. The new capital was a product of intricate predominantly classical Chinese design that took full advantage of the existing geographical features of the area[26]. On its outskirts, distinctive infrastructural features were established, namely the military-industrial colonies of craftsmen and artisans from Central Asia, Persia and China itself[27]. Three main postal roads served the strategically crucial function of connecting Daidu to the former capital in Mongolia: the eastern horse station (*morin jam*) route via Shangdu ('Upper Capital' that served as the ruler's summer retreat), the central wagon station (*tergen jam*) path, and the fine station (*narin jam*) route in the western direction[28].

As the embryo of modern Beijing, Daidu had only one major drawback – the lack of sufficient grain for a large population. Kublai resolved this problem with another remarkable infrastructural feat of his whole lineage – the major extension of the Grand Canal, previous parts of which had been in operation since the Sui dynasty (581–618). After the completion of its leg to Daidu, the 1,800 km long waterway for the first time joined the Yuan capital with its largest city and the Southern Song's former seat Lin'an (today's Hangzhou) and made the delivery of surplus rice from the Yangtze basin both rapid and less expensive[29]. Rather surprisingly considering his steppe origins, Kublai also presided over the empire's transformation into a great

25 Rossabi, 2012, p. 76.
26 Chen, 2015, p. 38.
27 May, 2007, p. 69.
28 Shim, 2017, pp. 110–111.
29 Cunliffe, 2015, p. 430.

naval power, as a new network of seaports and a huge fleet built there assured its military and commercial predominance in the neighbouring parts of the Western Pacific[30]. Despite well-known expansionary setbacks in Japan, Vietnam or Java, the Mongols sustained the Maritime Silk Road.

Nevertheless, long-term maintenance of such infrastructural mega-projects, particularly the Grand Canal, required an increasing quantity of resources, both human and financial. It was thus no coincidence that the Red Turban Rebellion that eventually led to the overthrow of Mongol rule in China started precisely among the canal workers[31]. The last Yuan emperor Toghon Temür (r. 1333–1368) was forced to abandon Daidu by fleeing to the ancestral steppe in 1368, a move that the Ming adversaries interpreted as being the loss of the Mandate of Heaven to them. Although the founder of the new ethnically Chinese dynasty Zhu Yuanzhang, or the Hongwu Emperor (r. 1368–1398), despised the steppe and its people, numerous features of his immediate imperial predecessors, including those in the domain of infrastructure, were soon recognized as too effective and lasting to be shunned, thus contributing to the creation of modern China.

Conclusions

Contrary to its 'barbarian' and purely nomadic image still prevalent in the world in general and China in particular, the Mongol Empire produced formidable examples of physical infrastructure, fixed by definition and thus contradicting its alleged peripatetic nature. In order to build these, it learned a great deal from previous empires, both semi-nomadic and sedentary in nature, and attracted numerous foreign specialists who were deemed of utmost value by the imperial court. Genghis Khan's acquaintance with physical infrastructure was mostly associated with his military goals and contributed to the Mongol expansion beyond the steppe areas, including into China. Its further construction mirrored the increasing complexity of an empire unifying the nomadic and sedentary worlds. Finally, the apogee of the Yuan dynasty under Kublai was intimately related with his full embrace of physical infrastructure that formalised the *jam* into a truly formidable network, gave birth to the current shape of the Grand Canal, and solidified the political primacy of a new capital city that continues up to this day. In other words, starting from roads and bridges under Genghis Khan, the fixed man-made landscape of the empire rapidly evolved into a sophisticated network of relay stations, road-forts, military-industrial colonies, ports and major urban areas interconnected by both terrestrial routes and waterways under his gifted grandson.

The physical infrastructure of the world's largest contiguous empire, particularly the *jam*, proved to be of extreme significance for the brief period of relative peace and prosperity in Eurasia, known as *Pax Mongolica* ('Mongolian peace') and widely held as a pre-cursor of today's economic and cultural globalisation. It ensured mutual learning across both space

30 Weatherford, 2018, p. 5.

31 Atwood, 2004, p. 610.

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and time as various civilisations interacted with each other within and alongside the realm created by the Genghisids, while the empires that replaced them preserved some of the most efficient and universal 'Mongol' structures and institutions. It is no surprise that today's China is willing to re-emphasise the positive nature of the interactions associated primarily with the Silk Road. However, if the medieval Mongol Empire holds any lessons for us today, then one of them would definitely be that rulers should not financially and otherwise overextend on huge infrastructure projects that they would not be able to maintain later. Only time will tell whether such a legacy will prove beneficial for the world's largest economy in the making.

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