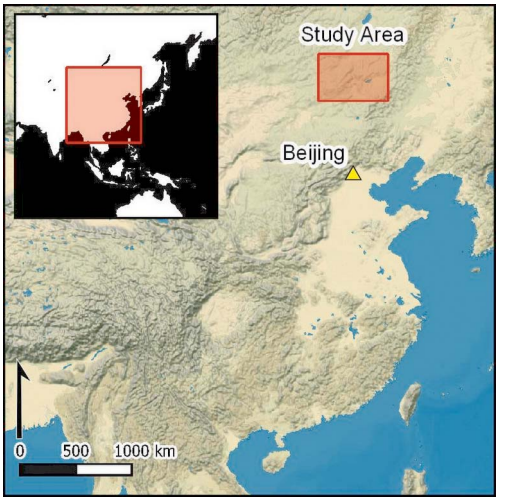
Antiquity 2020 Vol. 0 (0): 1–18
https://doi.org/10.15184/aqy.2020.51

Research Article

Medieval long-wall construction on the Mongolian Steppe during the eleventh to thirteenth centuries AD

Gideon Shelach-Lavi[1,*], Ido Wachtel[2], Dan Golan[3], Otgonjargal Batzorig[4], Chunag Amartuvshin[5], Ronnie Ellenblum[6] & William Honeychurch[7]

[1] Department of Asian Studies, Hebrew University of Jerusalem, Israel
[2] Institute of Archaeology, Hebrew University of Jerusalem, Israel
[3] Independent Researcher
[4] Oyu Tolgoi Mines, Inc., Ulaanbaatar, Mongolia
[5] Institute of History and Archaeology, Mongolian Academy of Sciences, Ulaanbaatar, Mongolia
[6] Department of Geography, Hebrew University of Jerusalem, Israel
[7] Department of Anthropology, Yale University, New Haven, USA
* Author for correspondence: ✉ gideon.shelach@mail.huji.ac.il



The long walls of China and the Eurasian Steppe are considered to have functioned as either defensive structures against aggressive nomadic tribes, or as elements to control the movement of local nomadic groups following imperialist expansion. This article focuses on a hitherto understudied 737km-long medieval wall running from northern China into north-eastern Mongolia. Built by either the Liao or Jin Dynasties, the wall features numerous auxiliary structures that hint at its function. In research relevant to interpreting other Eurasian and global wall-building episodes, the authors employ extensive archaeological survey and GIS analysis to understand better the reasons behind the wall's construction, as well as its various possible functions.

Keywords: China, Mongolia, Liao, Jin, long walls, pastoralism

Introduction

Periodic construction and use of long (or 'great') walls occurred in China from the last centuries BC to the seventeenth century AD (Waldron 1990; Jing 2006; Pines 2018). These walls are often considered to demarcate an ecological boundary between agriculture and pastoralism—the classic 'steppe *vs* sown' division (Lattimore 1937). The wall that forms the focus of this article (the 'northern line' in Figure 1), however, is located deep inside the eastern Steppe zone, and could not have represented a border between ecological zones. This wall forms one part of a complex wall system that was built sometime between the eleventh to the

Received: 13 June 2019; Revised: 15 August 2019; Accepted: 11 September 2019

Fig. 1 - Colour online, Colour in print

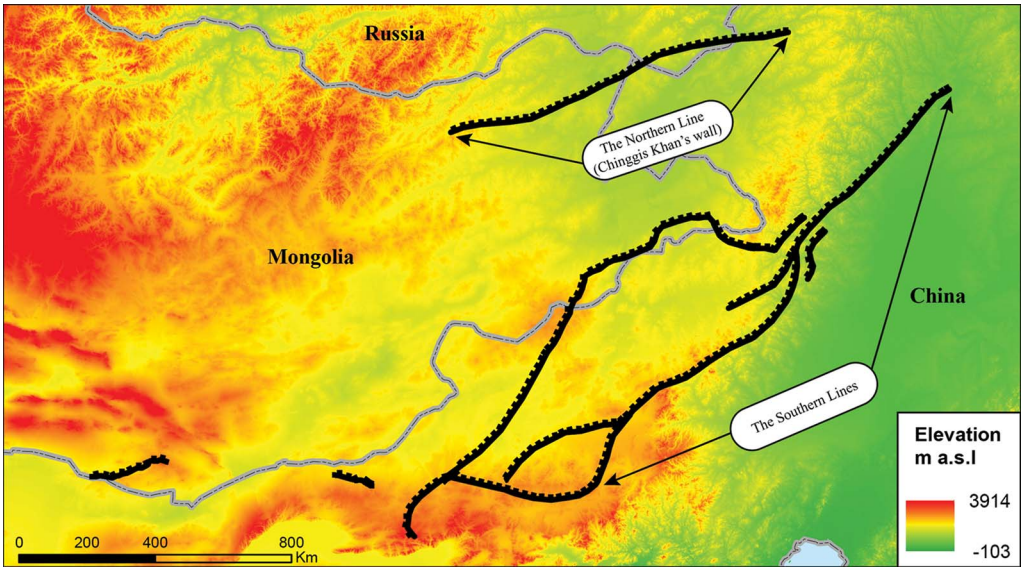


Figure 1. General locations of the medieval wall systems mentioned in the text (after Tan 1996).

thirteenth centuries AD (Figure 1), and spanned over 3500km (Jing & Miao 2008: 22). If all of the parallel wall lines are taken into account, however, the accumulated length exceeds 6500km (Ping 2008: 101), making it one of the longest wall complexes, and largest monuments, ever constructed. Despite its massive size, little research has been done on this medieval wall system, and it is barely mentioned in the most authoritative historical works. Waldron's (1990) *The Great Wall of China: from history to myth*, for example, never mentions medieval wall-building episodes. Similarly, the *Cambridge history of China* (Franke & Twitchett 2008) dedicates only one short paragraph to a schematic description of the walls (Franke 2008: 250).

Beyond basic questions of when the northern wall was built and by whom, its unique characteristics raise the more pressing issue of why it was constructed. Was it, for example, a military installation built to defend a territory against invading armies? Did it function as a symbolic demarcation of a frontier borderland? Or did deteriorating climatic and ecological conditions catalyse a need to control and monitor the movement of populations across the walls and into state-controlled lands? Our study offers a first step towards addressing these questions.

This article presents the results of fieldwork focusing on a section of the northern wall located in Dornod Province, north-eastern Mongolia. Intensive archaeological survey, GIS analysis, drone photography and the analysis of satellite imagery allow us to explore the function of the wall and the logic behind its construction.

Historical background

The tenth to thirteenth centuries AD were a dynamic period in the history of Central and East Asia. The zenith of nomadic power in Eurasia culminated in the early thirteenth century

with the rise of the Mongol Empire, the largest land empire ever established (Biran 2007; Fitzhugh *et al.* 2013). The two dynasties most often associated with construction of the medieval wall systems in question are the Khitan-Liao (907–1125) and the Jin (1115–1234), both of which were established by nomadic or semi-nomadic groups. By the end of the first millennium AD, the Khitan people had conquered large parts of Manchuria, eastern Inner Mongolia and the Mongolian Steppe to form the Khitan-Liao Empire (Figure 2A). The Liao Dynasty combined Chinese and nomadic elements and was a formidable enemy of the Northern Song (960–1127), the reigning Chinese dynasty to the south. During the early twelfth century, the Jurchen tribes of Manchuria—previously vassals of the Liao—united and quickly destroyed the Liao and pushed the Song southward. As the Jin Dynasty, they established rule over all of north China until, by the mid thirteenth century, it was conquered by the Mongol armies (Figure 2B).

Although the Liao and Jin Dynasties, along with the contemporaneous Northern and Southern Song dynasties, kept extensive historical records, none of those histories or related documents mention the construction of these wall systems. This is perhaps surprising given the massive undertaking that would have demanded a large workforce over a long period of time.

The Chinese historian Wang Guowei (1877–1927) suggested that the wall systems were built by the Jin Dynasty over a short period of time, in their attempt to repel the invasion of Chinggis Khan's Mongol armies (Wang 1921). In Western scholarship, Lattimore (1963: 5) attributed the walls' construction to the early Jin Dynasty, associating it with a change in administrative policy from the Liao Dynasty's active involvement in the Mongolian Steppe to the retreat eastwards and defensive policy adopted by the Jin. Both of these hypotheses, however, seem to refer mainly to the southern wall lines, which resemble the known historic borders of the Jin (compare Figures 1 & 2B). Indeed, the southern wall lines continue to be assigned to the Jin period (Jing 2006; Franke 2008: 250; Jing & Miao 2008; Sun 2010), although some scholars have recently challenged this, attributing at least the westernmost parts of the southern wall lines to the Western Xia Dynasty (1038–1227) (Figure 2; Kovalev & Erdenebaatar 2010).

Historical analysis suggests that the northern wall line, on which our research focuses, was located beyond the borders of the Jin Dynasty, but within the area controlled by the Liao (compare Figures 1 and 2A) (Tan 1996; Franke 2008: 236–37; Ma 2013). Thus, our working hypothesis concerning this northernmost line (but not necessarily for other parts of the medieval wall system) is that it was planned and built by the Liao Dynasty in order to meet specific strategic objectives. The presence of the Liao in the region, from at least the eleventh century, is undisputable, and some records suggest the existence of fortifications in this region (Ma 2013), although Liao official history (*Liaoshi* 遼史) does not mention the construction of a substantial wall in these northern territories.

Archaeological research on the medieval 'Great Walls'

Surprisingly little archaeological work has concentrated on this medieval wall system, particularly the northern section. A survey of the different southern sub-lines in China has been conducted (Sun & Wang 2008; Sun 2010: 142–46), and the reconstructed wall line appears in

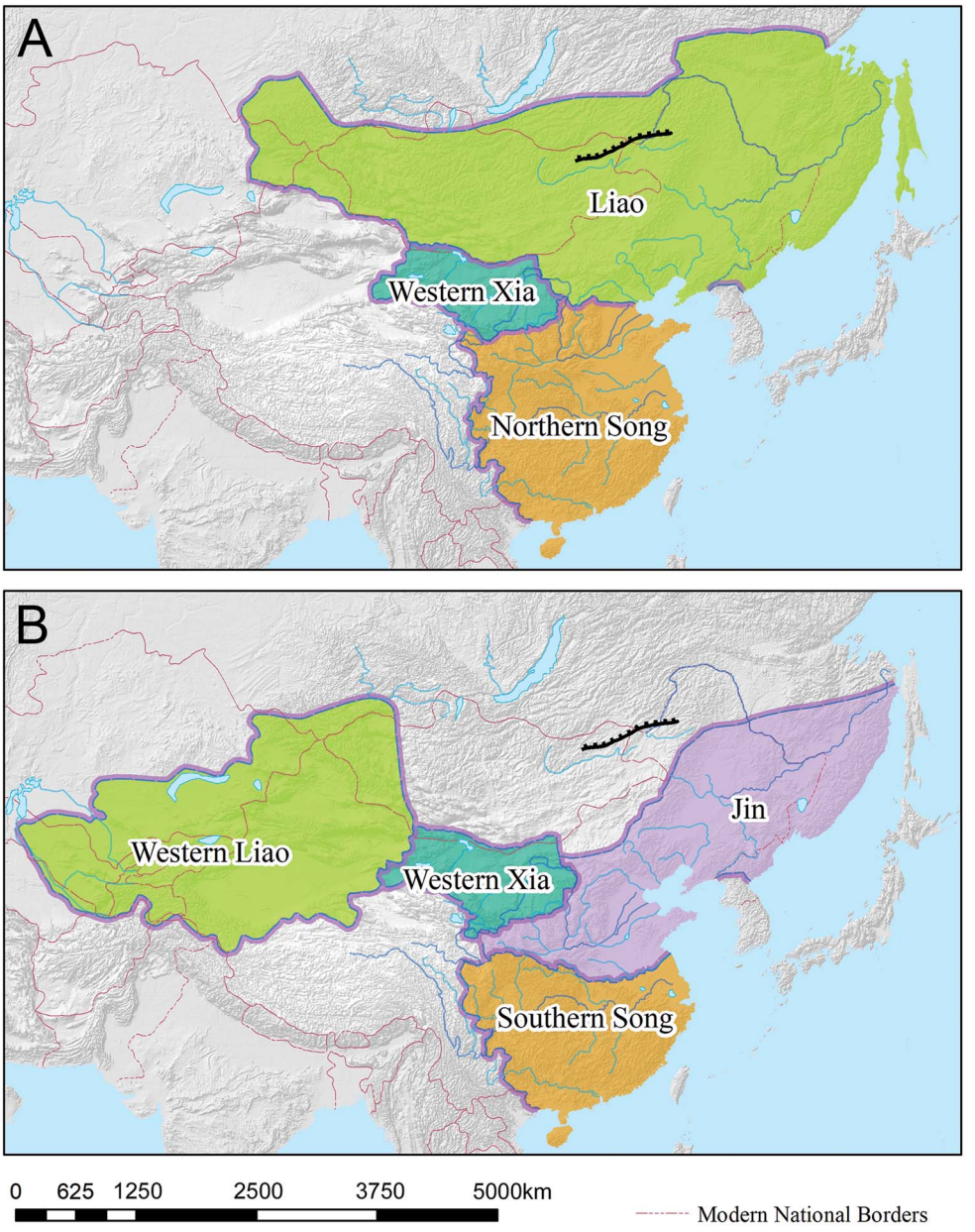


Fig. 2 - Colour online, Colour in print

Figure 2. Maps of East Asia and Mongolia during the eleventh (A) and twelfth (B) centuries AD. The route of the northern wall line is marked in black on the two maps (figure by the authors).

the Chinese historical atlas (Tan 1996). This survey work has documented the dimensions of the aboveground remains, tracing and mapping the visible wall lines. In some cases, the remains of auxiliary features, such as towers and camps, are also documented (e.g. Jing 2006; Jing & Miao 2008).

The northern line of the wall has received far less research attention. Early descriptions of this wall and its associated features date back to eighteenth-century European travellers (see Lunkov *et al.* 2011). More recently, Chinese archaeologists have carried out sporadic documentation on parts of the northern line, while Russian archaeologists have conducted more extensive field research on the part of the wall located in south-eastern Siberia and in Mongolia. In the 1950s, Kiselev (1958) dated the northern wall to the eleventh to twelfth centuries AD based on pottery collected from the surface of a circular structure located to the south of the wall. Later work includes the Soviet-Mongolian expedition in the late 1980s, which excavated sections of the wall in north-eastern Mongolia (Chichagov *et al.* 1995). The Russian archaeologists Kirillov and Kovychev (2002) mapped and conducted test excavations on Siberian sections of the wall and associated forts (for a more recent detailed analysis of these Siberian sections, see Lunkov *et al.* (2011)). The consensus among Russian and Mongolian archaeologists is that the northern wall should date to the Liao period. Its function and its location within Liao territory, however, have so far not been addressed.

Current field research on the wall and associated structures in north-eastern Mongolia

At the outset of our project, we used high-resolution satellite imagery to identify systematically the line of the wall and any structures associated with it. This remote-sensing approach revealed that the structures along the wall are arranged in distinct clusters. We have traced the entire length of the wall, which, at 737km, corresponds well with previous estimates (Lunkov *et al.* 2011; Ma 2013). Along the wall line, we identified 72 individual structures arranged in 42 clusters (see Table S1 in the online supplementary material (OSM)). This is far more than the few structures described in even the most detailed published descriptions (e.g. Baasan 2006; Lunkov *et al.* 2011; Ma 2013). The clusters of structures are spread more or less evenly along the wall line, with distances between clusters varying from 8–29km (with one irregular 48km interval where the wall crosses the Argun River). We therefore suggest that travelling between most clusters on horseback, using ox-carts or even on foot would take no more than a few hours.

Fieldwork conducted in 2018 focused on exploring the wall line and a selection of structure clusters, located in Dornod Province. This collaborative project involved archaeologists from the Hebrew University, the Mongolian Academy of Sciences and Yale University, and consisted of three components:

1. A systematic pedestrian survey of areas around a small section of the wall near cluster 27.
2. A field survey, mapping and drone photography of 16 structures (in addition to the three structures of cluster 27).
3. Vehicular reconnaissance and observations along the wall to its westernmost terminus.

The intensive survey was based on a well-established protocol previously used in north-east China (Shelach-Lavi *et al.* 2016). Two groups were each assigned a different survey tract

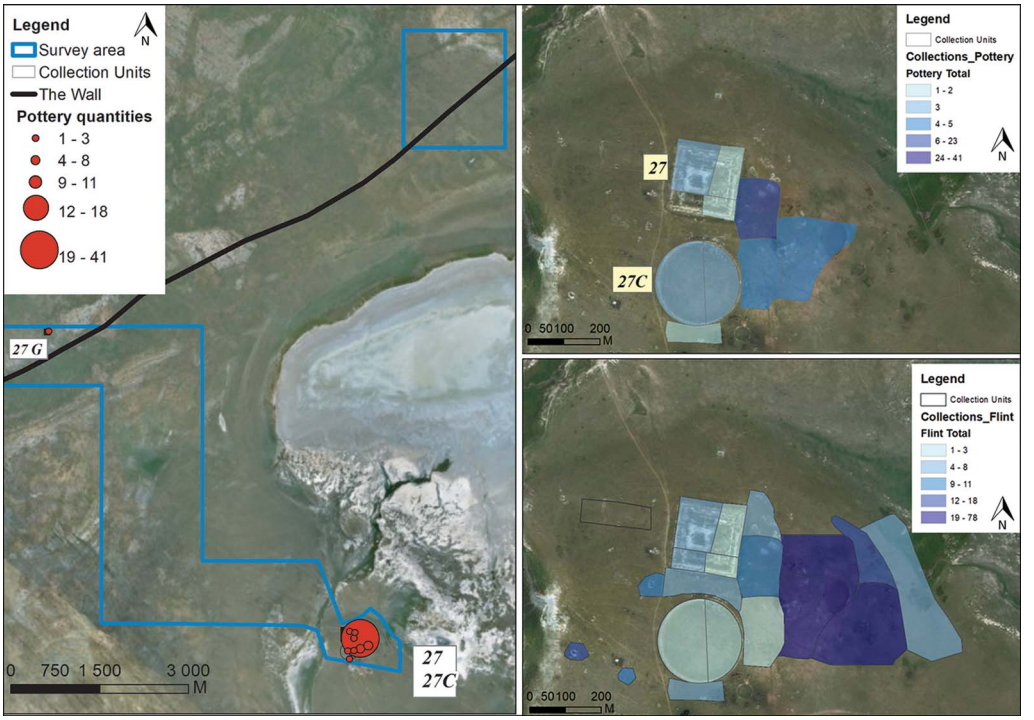


Fig. 3 - Colour online, Colour in print

Figure 3. Survey results: left) quadrants surveyed, and the location of the collections and features; right) collection units made around cluster 27. The size of each circle represents the density of artefacts found in the collection; top right) distribution of potsherds; bottom right) distribution of stone artefacts. The area of each collection unit is marked with a black line and the density of artefacts found within them is indicated by the colour (figure by the authors).

marked on a high-resolution satellite image. As our predominant interest lies in non-sedentary societies and small communities in the vicinity of the wall, we anticipated that some sites under investigation would be small, with low densities of surface artefacts. During the survey, team members therefore walked slowly in a line, at 20m-interval spacing, carefully observing the ground for single artefacts. The basic unit of data recording was surface collection, established when the survey line encountered a threshold of three artefacts spread no more than 50m from each other (although when only a single artefact was found it was also recorded as a 'findspot'). When artefacts were encountered by the survey group, the line halted to allow for intensive surface inspection. The boundaries of the artefact distribution (i.e. a collection unit) were marked on the printed satellite image and recorded with a GPS device. To ensure high resolution, we kept collection units small (0.67ha on average), and if artefacts continued to be found towards the periphery of an existing unit, we proceeded to open a new collection unit. This method is both efficient and accurate, as it does not depend on the subjective definition of a site, and the recording of the units is very accurate.

We intensively surveyed a total area of 16.8km^2 across two separate but nearby quadrants (Figure 3, left). The first quadrant consisted of a larger survey area around cluster 27, proceeding from that cluster towards the wall line. The second quadrant comprised a rectangular area along the wall line and farther to the east (Figure 3). In total, we made 36 collections of

Fig. 4 - Colour online, Colour in print

Figure 4. A typical collection of ceramic fragments found during our pedestrian survey from areas around cluster 27 (photograph by the authors).

artefacts, and the accumulated size of the collection units was 24.4ha. The distribution of collection units and artefacts clearly shows that the only major concentration of artefacts is located around the structures comprising cluster 27. Here, we recovered large quantities of pot sherds and lithic artefacts (Figure 3); other collections usually contained one or two stray objects for which we recorded the findspot.

The most common finds were hard-fired greyware sherds with punctate decorations. Mongolian archaeologists and others have identified these as Liao/Khitan ceramics (Figure 4; Makino 2007). Our assemblages correspond well with those from previously published archaeological surveys and excavations along the wall in Mongolia and Russia (Kiselev 1958; Baasan 2006; Lunkov *et al.* 2011). Flint artefacts, including tools, flakes and cores, were also commonly encountered. The concentration of stone artefacts was especially dense at some collections near cluster 27, perhaps suggesting the location of Early to Middle Holocene sites (Janz *et al.* 2017).

In addition to the systematic survey, we also surveyed in and around the structures at clusters 1, 2, 7, 12, 22, 23, 24, 26 and 28. Finds at these clusters were very similar to those at

cluster 27. It seems clear that these clusters were centres of human activity probably contemporaneous with the wall being in use. The rectangular structures, for instance, could have functioned as bases for people—soldiers, perhaps—who operated the wall system, and the circular structures may have been used as animal corrals. These hypotheses, however, require further research. The scarcity of finds in areas away from the structures, including near the wall line, suggests that these places were not occupied and were subject to minimal human activity.

A metal detector was used during our surveys to find metallic artefacts, particularly coins, that would allow us to date more accurately the use of the wall system. Although we recovered some small artefacts, such as nails and buttons, no coins were found. While the ceramics we recovered during the surveys are often dated to the Liao period (907–1125), they may well be from slightly later periods. Efforts to refine the ceramic typology using comparative techniques, as well as absolute dating of contexts associated with such ceramics in other parts of Mongolia, are underway (Makino 2007: 32–37 & 71; Shiraishi & Tsogtbaatar 2009; Park *et al.* 2019a).

Remains of the wall and accompanying structures

Although the wall is poorly preserved in some places, drone photography clearly shows that it is a continuous structure. The better-preserved sections survive to 1m above ground level. The current width of the wall is approximately 10m, some of which may be attributed to collapse and/or erosion of upper portions. This corresponds to Lunkov *et al.*'s (2011: 105) observations of the Russian section of the wall. Drone photography suggests the presence of a narrow ditch on the northern side of the wall, as evidenced by thicker vegetation compared to the southern side (Figure 5). In some places, especially on the westernmost parts of the wall, we identified structural openings (near cluster 35 for example) that are also visible on the satellite images. While it is possible that some of these openings are modern, we hypothesise that most represent ancient gates. This theory will be explored in future excavations.

We identified four major types of auxiliary structures through field survey and satellite imagery: large rectangular/square structures (n = 42) with an average enclosed area of 1625m^2; small rectangular structures (n = 11) ranging between 265 and 578m^2 in area; mini rectangular structures (n = 6) with estimated areas between 10 and 50m^2; and circular structures (n = 16), ranging in size from 4185–20 106m^2 (Figure 6). Lunkov *et al.* (2011: 116) suggest that these structures usually appear in pairs. Our survey of all the structures, including those located on satellite images, however, shows that the large rectangular structures are focal features around which other features sometimes appear to cluster. These large rectangular structures can appear alone (n = 24) or together in a cluster with other types of structure (n = 18) (Table S1).

The large rectangular structures are made of earthen walls that survive to a greater height than the linear wall, in some places preserved to a height of 2m. In most cases, the layout is approximately square, with the corners usually oriented to the cardinal directions. The width of the walls at the corners of the best-preserved structures are wider, suggesting that they may have supported additional structures on top of them. Occasionally, an opening is present in a structure's wall that may have served as the entrance. Furthermore, we often identified

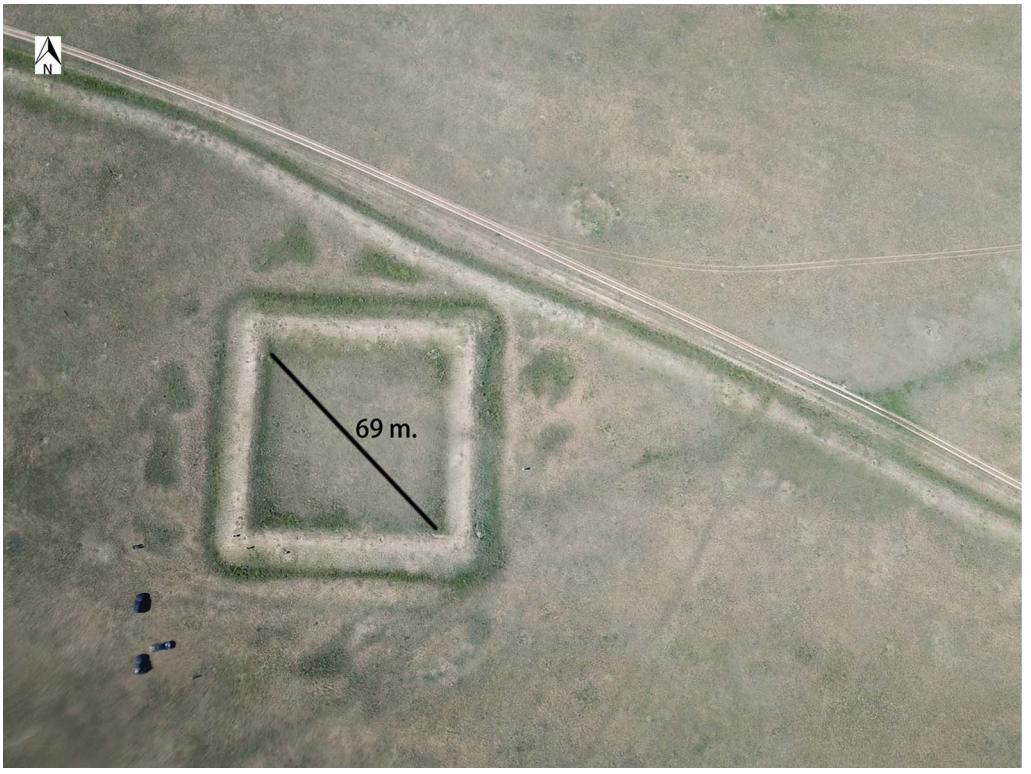


Fig. 5 - Colour online, Colour in print

Figure 5. The wall line near cluster 12 (drone photograph by G. Shelach-Lavi).

depressions circumscribing the walls. These most likely represent a surrounding ditch from which soil was excavated during construction of the earthen-walled features (Figures 5–6).

The 11 small rectangular structures morphologically resemble their larger counterparts. Some of these small structures are located inside the larger ones, while others are located outside, but in close proximity to the larger structures. The six mini rectangular structures were identified on satellite imagery but were not visited on the ground. They are located very close to the wall, sometimes adjacent to what may be openings in the wall. Unlike the other structures that are located south of the wall line, five of the mini-structures are located on the northern side of the wall. Their intimate association with the wall may suggest that these mini rectangular structures functioned as small shelters for gatekeepers, but again, this hypothesis requires archaeological investigation.

Sixteen circular structures were also identified. Their walls are shorter than both those of the rectangular structures and the linear wall, in most cases rising to no more than 0.5m above ground level. Eight of the circular structures enclose a rectangular structure, with independent circular structures most often located on the southern side of a rectangular structure.

At some of the cluster locations, we identified the putative remains of other types of installations. In cluster 27, for example, we recorded an additional small circular structure adjacent to the large circular structure. To the west of the rectangular structure, we identified shallow walls that seem to belong to elongated features. It is unclear whether these additional walls are

Figure 6. Clusters 24 (left) and 23 (right) (drone photographs by N. Doron).

Fig. 6 - Colour online, Colour in print

part of the same cluster and are contemporaneous with the rectangular and circular structures in cluster 27.

Analysis of the wall system

Analysis of the high-resolution satellite imagery indicates the pre-planned nature of the wall system. Not only are the clusters of structures located more or less equidistant along the wall, but also the wall's geographic location suggests that it was strategically placed. The wall stretches between two mountain ranges, the Da Xingan range in the east and the Khentii Mountains in the west, essentially blocking the wide lowland area between these two mountain ranges (Figure 7).

All the clusters of structures associated with the western wall section, from 1–21 (excluding two unverified examples), comprise one large rectangular feature with no additional structures. In contrast, almost all the clusters at the middle section of the wall, from 22–35, have both rectangular and circular structures, along with occasional additional structures. Clusters 36–42, associated with the section of the wall to the east of the Argun River, comprise predominantly single structures, although we documented some cases of combined rectangular and circular features within a single structure (Figure 8 & Table S1).

The location of the individual clusters vis-à-vis their immediate environment provides another important aspect of our geographic analysis of the wall system. If the clusters were part of a military defence system, we would expect them to be located in elevated places that would allow control over their surroundings and provide clear lines of sight towards the wall and adjacent clusters. To test this hypothesis, we created a cross section of the topography along a line that connected all clusters. The results did not confirm the hypothesis, but rather demonstrated a preference for locating the clusters at lower elevations (Figure 9). These data are also supported by a viewshed analysis of clusters 26–34. Using GIS tools, we compared the areas visible from clusters 26–34 to the areas visible from eight points located close to those clusters, but on higher ground (Figure 10). The difference is very clear, with each cluster on average 'seeing' 137 862 pixels of 30 × 30m, while each of the comparison points 'sees' an area almost ten times larger (1 259 007 pixels). Raising the height of the clusters' viewpoints by 3m—assuming that people could have used taller buildings for observation—had a negligible effect on the results.

While the location of clusters at lower elevations could be associated with the position of local streams, they are more likely to have been associated with roads and paths that connected areas to the north and south of the wall. This notion is supported by the location of modern local pathways, many of which cross the wall at, or very near to, the location of major clusters. Although modern, these routes were not planned or built by the Mongolian government. Instead, they represent the natural development of travel routes taken by the local nomadic population. Thus, we argue that they represent 'logical' paths probably taken by nomadic groups since the medieval period. Similar research on the development of informal road systems in other parts of Mongolia supports this argument (Burentogtokh 2017: 185–86).

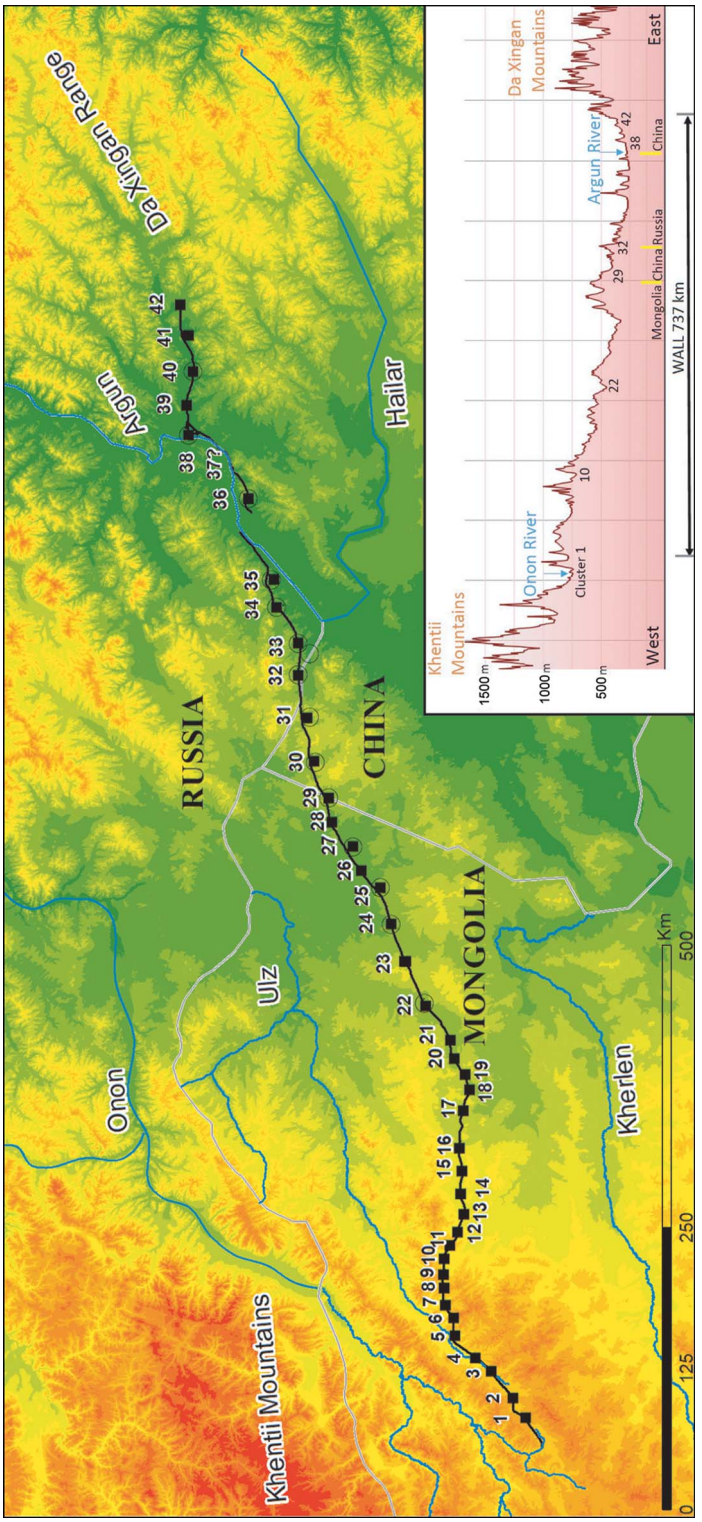


Figure 7. Map of the wall line and a geographic cross-section of it. For a Google Maps version and additional information, see: tinyurl.com/y4hbyduv3 (figure by the authors).

Fig. 7 - Colour online, Colour in print

Fig. 8 - Colour online, Colour in print

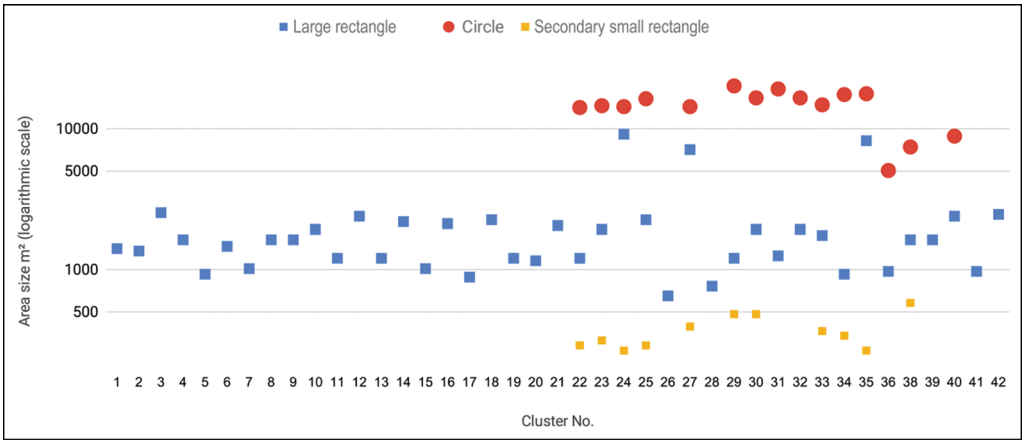


Figure 8. Graph of the types and sizes of structures identified along the wall line (figure by the authors).

Fig. 9 - B/W online, B/W in print

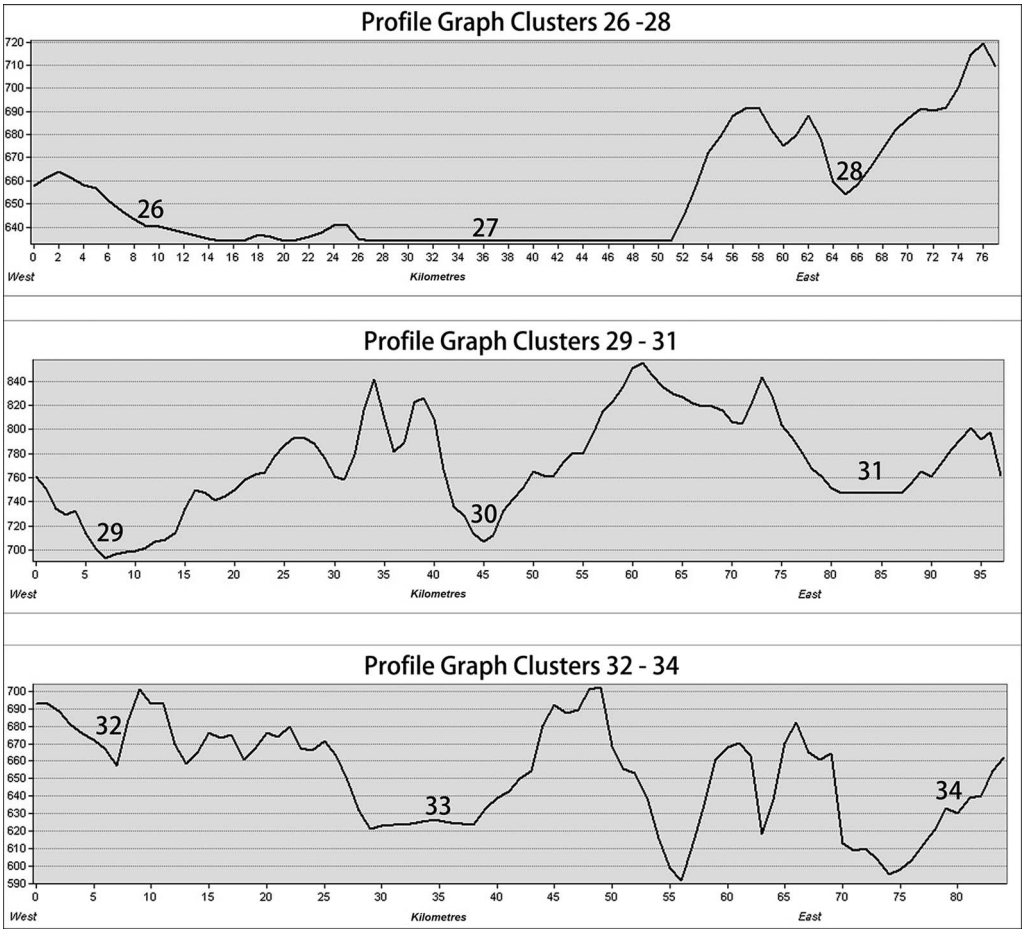


Figure 9. Topographic cross-sections showing the location of clusters (numbers) in relation to the topography of their immediate environment; Y-axis represents elevation above sea level (figure by the authors).

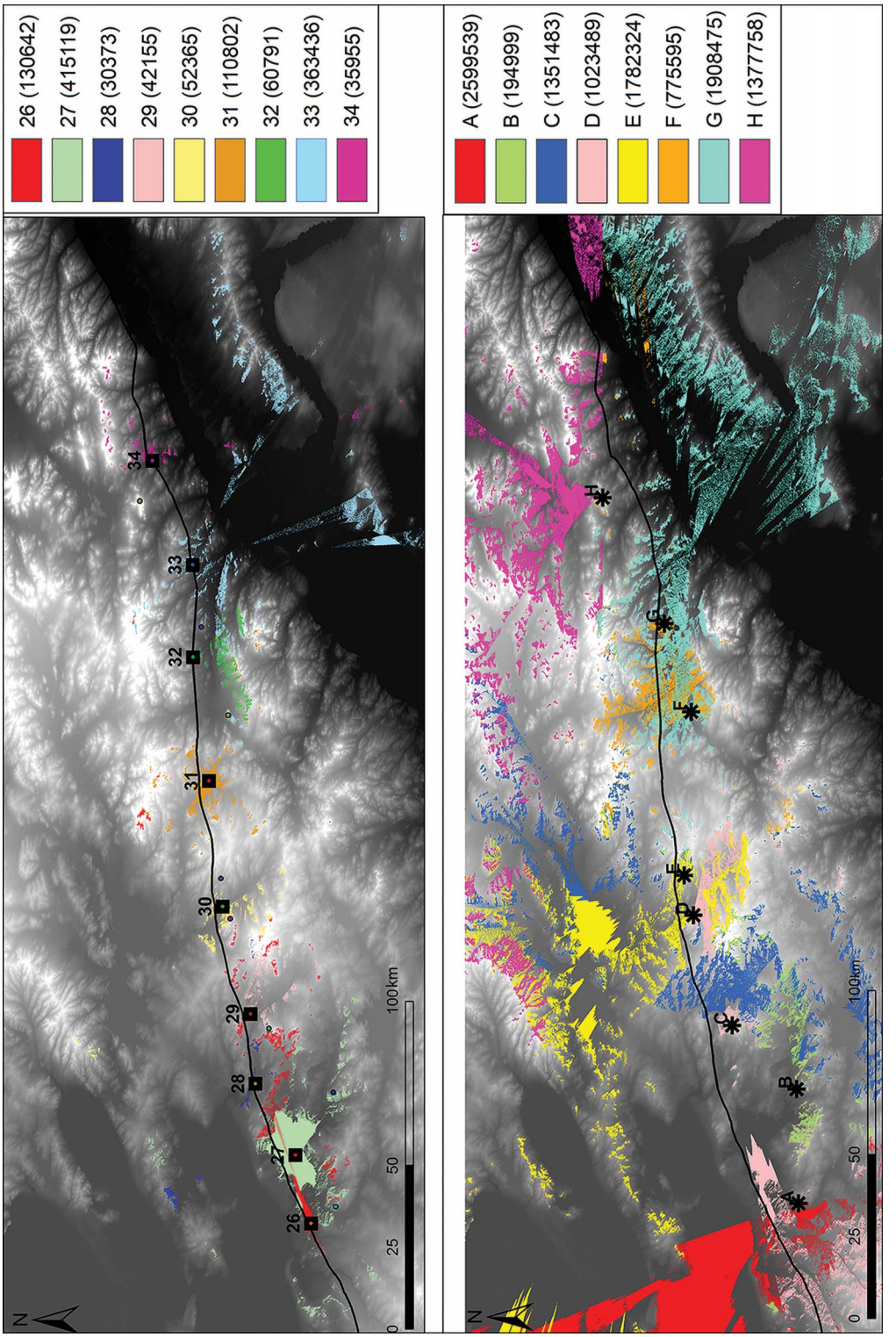


Figure 10. Viewshed analysis of: top) areas visible from clusters 26–34 (in parentheses are the number of 30 × 30m pixels visible from each cluster); bottom) areas visible from eight comparison points.

Fig. 10 - Colour online, Colour in print

Discussion

Our analysis suggests that the northern wall line was pre-planned and systematically built. Its location between two mountain ranges, the organised placement of its auxiliary structures and the combination of different types of structures all suggest a carefully considered design. We have little doubt that this massive structure facilitated an intended set of functions related to protecting, observing, monitoring and/or in some way demarcating this northern zone.

We argue, however, that the northern wall line was probably not the fortified border that it is sometimes considered to represent (e.g. Wang 1921; Jing & Miao 2008; Sun 2010). Both the Liao and Jin Dynasties, for instance, probably did not conceive of their polity as bounded by what is the very modern notion of rigid borders. Rather, their view of empire was more concerned with the control of people, many of them nomads, rather than focused on clearly defined land borders (Standen 2007). Moreover, while the wall line lies to the west of the reconstructed borders of the Jin State, it was situated inside Liao territory (Tan 1996).

The construction of the wall across a relatively flat lowland area between two mountain ranges, and the placing of structures at locations that seem to favour natural pathways through the wall (as opposed to elevated locations with high visibility), both suggest that the wall system was intended to control the movement of *people*, rather than to defend against *armies*. Furthermore, the detrimental socio-economic impact that frequent cold spells and droughts can have on the fragile ecology of the Steppe may provide an additional reason for establishing such control. Known as *dzud* in Mongolian, their devastating effects on nomadic pastoralist communities are well documented for historic and modern periods. Between 2000 and 2002 and again in the winter of 2009, for example, intense cold conditions killed 10.8 and 10.3 million head of livestock, respectively. In some regions of Mongolia, between 20 and 40 per cent of all livestock perished during these extreme events, causing the mass migration of herders who had lost their livelihood to the capital city of Ulaanbaatar (Rao *et al.* 2015; Sternberg 2016).

Although local occurrences of such climatic events are common, a concentration of extreme events over a period of 10–20 years can have severe socio-economic impacts, as documented, for example, in the historic record of the late eleventh and early twelfth centuries (Li *et al.* 2019). Climatic instability in contemporaneous parts of Asia, known collectively as the Medieval Climate Anomaly (Stocker *et al.* 2013), caused large-scale migration events (Ellenblum 2012). These effects should not be understood as the result of climatic change alone; they must also be considered in the context of contemporaneous historical and political upheaval. While small-scale movements of people—potentially associated with sporadic climatically driven hardship—were probably mitigated at the local level, the Liao may have wanted to prevent, or at least control, larger-scale migrations into the heart of their polity. This hypothesis should be investigated with access to more accurate palaeoclimatic data along with an improved knowledge of contemporaneous interactions and political conditions within and beyond this northern zone.

The wall was probably intended to not only control large-scale population movements, but also movement of different types, such as those related to trade. Thus, the wall could have functioned to control the movement of both people and commodities out of Liao territory and into areas inhabited by unaffiliated nomadic communities beyond the polity. The Liao history, for example, mentions prohibitions on the export of iron materials and implements to the *Huihu* (回鶻) and *Zubu* (阻卜) tribes, which were meant to be enforced

on the frontiers of the Liao Empire (Wittfogel & Feng 1949: 178). The technological impacts of these restrictions on local nomadic communities have been recently documented by archaeological fieldwork in parts of eastern Mongolia (Park *et al.* 2019b: 96–97).

The wall system described here, and particularly the location of camps associated with north–south routes, were instrumental in the enforcing of such regulations and inspection of people travelling to and from Liao territories to those beyond its control. The large rectangular enclosures present in all clusters probably acted as base camps for small units that supervised the closest parts of the wall and associated crossing points. The existence of such units and their camps are described in the histories of the Khitan-Liao and Jin Dynasties, as well as in the Western Xia documents (Wittfogel & Feng 1949; Kovalev & Erdenebaatar 2010; Sun 2010; Ma 2013). The absence of visible structures inside most of the enclosures detected by our fieldwork may suggest that they were not used for long-term habitation, although this requires verification by future excavations.

The large circular features are found only in the central, flat area of the wall line. While much larger in area than other structures, their encircling walls are much more diminutive. These structures could have been used as corrals, perhaps for animals belonging to those who served along the wall, or for animals either confiscated from nomadic tribes trying to cross the wall line, or offered as tribute or taxation. Another possibility is that these enclosed areas represent the locations of border markets described in Liao history (Wittfogel & Feng 1949: 171). We intend to test these hypotheses in the future using excavation and geo-archaeological methods (e.g. Shahack-Gross 2011).

Conclusions

A major debate concerning the 'Great Wall(s)' of China juxtaposes the traditional view, which considers walls as defensive structures against the aggression of the nomadic tribes living to the north (e.g. Barfield 1989), with a revisionist perspective, which argues that the wall was part of an imperial expansion that acquired lands previously inhabited by nomadic populations (Di Cosmo 2002). The research presented here on one episode of East Asian wall-building tends to support the revisionist model. The location of the northern wall deep inside the Steppe region suggests that it was not a dividing line between sedentary agricultural and nomadic pastoralist territories, but rather was located within a region long inhabited by pastoral nomadic groups.

Our analysis, however, also suggests a subtle twist to the 'conquer-and-control' model. First, the people who built the wall—either the Liao or the Jin—were themselves part of a political tradition of creating large-scale 'nomadic polities' that had been established on the Steppe for over a thousand years. Once such polities were founded by nomadic or semi-nomadic peoples, they tended to adopt and innovate attributes of a sedentary bureaucratic state, while simultaneously retaining parts of their nomadic identity and legacy (Standen 2007). Thus, we argue that the function of the wall was not to defend against nomadic armies or raids into sedentary lands, but rather to provide a method for monitoring and controlling the movement of nomadic populations. A better way to interpret this wall may not be through the lens of a Chinese-nomadic dichotomy, but rather through a better understanding of the internal dynamics of political society among the nomads and semi-nomads of the

Steppe regions. While more archaeological work is needed to test our various hypotheses, the data and analysis presented in this article are relevant not only to facilitate a better understanding of medieval wall systems, but also other episodes of wall-building in Mongolia and China, and perhaps to other places and periods around the world.

Acknowledgements

This research was supported by funding provided by the Mandel Scholion Research Center, the Louis Frieberg Chair of East Asian Studies and by the Ring Family Foundation for Atmospheric and Global Studies, all based at the Hebrew University of Jerusalem. In addition to the authors, field research team members were: Bymbatseren Batdalai, Dashzeveg Ganbat, Tulgaa Murdorj, Perliilkhunduv Baigalmaa, Nachem Doron, Yotam Toib, Chen Zeigen, Mika Ullman and Talia Abulafia.

Supplementary material

To view supplementary material for this article, please visit https://doi.org/10.15184/aqy.2020.51.

References

Baasan, T. 2006. *Chingisiin Dalan gezh iuu ve?* Ulaanbaatar: Admon.

Barfield, T.J. 1989. *The perilous frontier: nomadic empires and China*. Oxford: Oxford University Press.

Biran, M. 2007. *Chinggis Khan*. Oxford: One World.

Burentogtokh, J. 2017. Pastoralists, communities and monumentality during the Mongolian Bronze Age. Unpublished PhD dissertation, Yale University.

Chichagov, V.P., O.A. Chichagova, A.E. Cherkinskii & B. Avirmid. 1995. Novye dannye o vozraste 'Vala Chingiskhana'. *Izvestiia Rossiiskoi akademii nauk, Seriia geograficheskaia* 1: 97–106.

Di Cosmo, N. 2002. *Ancient China and its enemies*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511511967

Ellenblum, R. 2012. *The collapse of the Eastern Mediterranean: climate change and the decline of the East, 950–1072*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139151054

Fitzhugh, W., M. Rossabi & W. Honeychurch (ed.). 2013. *Genghis Khan and the Mongol Empire* (2nd edition). Washington, D.C.: Smithsonian Institution.

Franke, H. 2008. The Chin Dynasty, in H. Franke & D. Twitchett (ed.) *The Cambridge history of China, volume 6: alien regimes and border states, 907–1368*: 215–320. Cambridge: Cambridge University Press. https://doi.org/10.1017/CHOL9780521243315.005

Franke, H. & D. Twitchett (ed.). 2008. *The Cambridge history of China, volume 6: alien regimes and border states, 907–1368*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CHOL9780521243315

Janz, L., D. Odsuren & D. Bukhchuluun. 2017. Transitions in palaeoecology and technology: hunter-gatherers and early herders in the Gobi Desert. *Journal of World Prehistory* 30: 1–80. https://doi.org/10.1007/s10963-016-9100-5

Jing, A. 2006. *Zhongguo Changcheng Shi*. Shanghai: Shanghai Renmin Chubanshe.

Jing, A. & T. Miao. 2008. Liao Jin bianhao yu changcheng. *Dongbei Shidi* 6: 18–31.

Kirillov, I. & E. Kovychev. 2002. Kidanskie drevnosti Priargun'ia. *Arkheologiia Dalnauka*: 245–52.

Kiselev, S. 1958. Drevnie goroda Zabaikal'ia. *Sovetskaia Arkheologiia* 4: 107–19.

Kovalev, A. & D. Erdenebaatar. 2010. About Chinggis Khaan's wall in Mongolia. *Nomadic Studies* 17: 28–33.

Lattimore, O. 1937. Origins of the Great Wall of China: a frontier concept in theory and practice. *Geographical Review* 27: 529–49. https://doi.org/10.2307/209853

– 1963. The geography of Chingis Khan. *The Geographical Journal* 129: 1–7. https://doi.org/10.2307/1794892

Li, Y., G. Shelach-Lavi & R. Ellenblum. 2019. Short-term climatic catastrophes and the collapse of the Liao Dynasty (907–1125): the textual evidence. *Journal of Interdisciplinary History* 49: 591–610. https://doi.org/10.1162/jinh_a_01339

Lunkov, A., A.V. Kharinskii, N.N. Kradin & E.V. Kovychev. 2011. The frontier fortification of the Liao Empire in eastern Transbaikalia. *The Silk Road* 9: 104–21.

Ma, Y. 2013. Jin jiehao beixian' zhi yiyi. *The Chinese Great Wall Museum Journal*: 37–43.

Makino, K. 2007. Typological and chronological analysis of Khitan-type pottery in the Middle Gobi Desert, Mongolia. Unpublished MA dissertation, Harvard University.

Park, J., W. Honeychurch & A. Chunag. 2019a. The technological and chronological implication of ^{14}C concentrations in carbon samples extracted from Mongolian cast iron artifacts. *Radiocarbon* 61: 831–43. https://doi.org/10.1017/RDC.2019.4

Park, J., W. Honeychurch & A. Chunag 2019b. Novel micro-scale steel-making from molten cast iron practised in medieval nomadic communities of east Mongolia. *Archaeometry* 61: 83–98. https://doi.org/10.1111/arcm.12413

Pines, Y. 2018. The earliest 'Great Wall'? The Long Wall of Qi revisited. *Journal of the American Oriental Society* 138: 743–62. https://doi.org/10.7817/jameroriesoci.138.4.0743

Ping, Y. 2008. Jin Changcheng de kaogu faxian yu yanjiu, in W. Sun & Y. Wang (ed.) *Jin Changcheng yanjiu lunji*: 88–166. Changchun: Jilin wenshi chubanshe.

Rao, M.P., N.K. Davi, R.D. D'Arrigo, J. Skees, B. Nachin, C. Leland, B. Lyon, S.-Y. Wang & O. Byambasuren. 2015. Dzuds, droughts, and livestock mortality in Mongolia. *Environmental Research Letters* 10: 074012. https://doi.org/10.1088/1748-9326/10/7/074012

Shahack-Gross, R. 2011. Herbivorous livestock dung: formation, taphonomy, methods for identification, and archaeological implications. *Journal of Archaeological Science* 38: 205–18. https://doi.org/10.1016/j.jas.2010.09.019

Shelach-Lavi, G., M. Teng, Y. Goldsmith, I. Wachtel, A. Ovadia, X. Wan & O. Marder. 2016. Human adaptation and socio-economic change in northeast China: results of the Fuxin regional survey. *Journal of Field Archaeology* 41: 467–85. https://doi.org/10.1080/00934690.2016.1194688

Shiraishi, N. & B. Tsogtbaatar. 2009. A preliminary report on the Japanese-Mongolian joint archaeological excavation at the Avraga site: the Great Ordu of Chinggis Khan, in J. Bemmann & E. Pohl (ed.) *Current archaeological research in Mongolia* (Bonn Contributions to Asian Archaeology 4): 549–62. Bonn: Rheinische Friedrich-Wilhelms-Universität Bonn.

Standen, N. 2007. *Unbounded loyalty: frontier crossings in Liao China*. Honolulu: University of Hawai'i Press.

Sternberg, T. 2016. Investigating the presumed causal links between drought and dzud in Mongolia. *Natural Hazards*: 1–17. https://doi.org/10.1007/s11069-017-2848-9

Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex & P.M. Midgley. 2013. *Climate change 2013: the physical science basis: contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Available at: http://www.climatechange2013.org/report (accessed: 12 March 2020).

Sun, W. 2010. Jin Changcheng yanjiu gaishu. *Zhongguo bianjiang shidi yanjiu* 20(1):139–47.

Sun, W. & Y. Wang (ed.). 2008. *Jin Changcheng yanjiu lunji*. Changchun: Jilin wenshi chubanshe.

Tan, Q. (ed.). 1996. *Zhongguo lishi dituji*. Beijing: Zhongguo ditu chubanshe.

Waldron, A. 1990. *The Great Wall of China: from history to myth*. Cambridge: Cambridge University Press.

Wang, G. 1921. *Jin jie haokao*. Beijing: Zhonghua shuju.

Wittfogel, K.A. & C. Feng. 1949. *History of Chinese society: Liao*. New York: Macmillan.