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THE KHI-LAND PROJECT:
An archaeological programme and research in the area of Khar Bukh Balgas, Mongolia.

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The KHI-LAND Khitan Landscapes Project involves landscape archaeological studies of the monuments of the Khitan period (10th-11th century) in the Bulgan Aimag province of Central Mongolia with a special focus on the fortified settlement of Khar Bukh Balgas in the Dashinchilen Sum district (Fig. 1). The project is a collaborative venture between the Research Centre for the Humanities of the Hungarian Academy of Sciences and the Institute of History and Archaeology of the Mongolian Academy of Sciences under the cooperative agreement: Mongolian and Hungarian Joint Research – Khitan Landscapes in Mongolia Project 2017-2023. Although archaeological research has been carried out already in some Khitan-period fortified settlements in Mongolia, their environment and links with the contemporary settlement network has not yet been studied in detail. The aim of our project is to examine the Khitan sites in the surrounding landscape in order to understand their role in the history and organization of the Liao Empire (947–1125), and to gain information on their function within the northern frontier zone of that empire.

Fig. 1: Digital surface model of the fortified settlement of Khar Bukh Balgas generated from aerial pictures

The Hungarian Academy of Sciences have been involved in research of Inner Asia and Mongolia since the 1950's. This work was initiated by Louis Ligeti who, as a linguist, also studied the Khitans. His work was followed by György Kara and András Róna-Tas, the latter of whom is still involved in the study of Khitan script.[1] István Erdélyi was a Hungarian archaeologist who conducted archaeological research in Mongolia between 1961-1990. He studied all the main historical periods of Mongolia from the Bronze Age to the Middle Ages, and he analysed thoroughly the Xiongnu and Turkish periods. Our project aims to follow in his footsteps by carrying out archaeological research in the territory of Mongolia involving Hungarian researchers.

THE KHITAN EMPIRE

Khitan people first appeared in the Chinese annals in the 5th century. They fought several times with the Turks during the 7th century for sovereignty over a part of Central Asia. Under the Uyghur Khaganate (745-840) the Khitans lost their territory. The Kirghiz incursion and the later collapse of the Tang dynasty in China then provided the Khitans with an opportunity for a major breakthrough, allowing them to found their own state across a large part of present-day Mongolia and Manchuria (*Fig. 2*).

[1] A research team formed voluntarily at the Department of Altaic Studies of the University of Szeged. Their findings can be found on their website: http://khitan.bibl.u-szeged.hu/

Fig. 2: The location of the Khitan/Liao Empire

The most dominant of the eight Khitan tribes was the Yelü. Under the rule of Abaoji (872–926) a well-organized united tribal federation arose by 906. Historical legends describe this new leader as a powerful ruler who, according to tradition, was able to walk at the age of three months and talk fluently when he was one year old, and could foresee the future. Abaoji had a Chinese advisor, founded Buddhist, Confucian and Taoist temples and in 920 ordered the creation the 'large script' (Dazi). The 'small script' was invented in 925 based on Uyghur characters. Although Abaoji lost his life in a campaign against the Bohai in 926, he bequeathed a strong and centralised empire to his son, Emperor Taizong (927-947).

In 947 the Khitan state accepted the name Liao, and from that time onwards the dynasty ruled North-Eastern China, Mongolia and Manchuria for almost two centuries. The Khitans adopted Chinese customs during their rule. Buddhism became the state religion of the Liao period. At the same time religious tolerance was a characteristic of the Khitan administration. Manicheism and Nestorian Christianity were also present in the empire, as well as the two main beliefs of Chinese civilisation, Taoism and Confucianism.

In Inner Asia, Khitan cities were the leading centres of religion, trade and agriculture. Mercantile trade on the Silk Road and diplomatic relations with Central Asia were controlled from these cities. The administration of the Liao state combined numerous elements of both nomadic and settled traditions. It was gradually divided into two distinct parts where the northern territories, with pastoral population, were governed according to the traditional nomadic military system; while the southern area with its settled, agricultural population was controlled by a Chinese system.

In 1125 the Khitans were swept away from northern Manchuria by the Jurchens, who took power. Some of the Khitans fled to the western part of Central Asia, founding the Western Liao dynasty, the Qara Khitai Empire. In 1216, the Qara Khitans were obliged to pay homage to Genghis Khan, the former state was then absorbed into the Great Mongol Empire.

The Khitans occupied the eastern and central parts of present-day Mongolia where they established major settlements. In order to defend their frontiers and control the neighbouring nomadic population, the Khitans built a series of forts in the valleys of the Tuul and Kherlen Rivers. At the same time an agricultural population appeared in this area. The fortified settlements usually have a rectangular groundplan with the surrounding walls oriented towards the cardinal points. Projecting towers can be observed on the walls in most cases. The fortified walls were built with the hangtu building technique using rammed earth, well known in Northern China. This method requires layers of soil to be bonded together through ramming, resulting in a hardened, solid structure. Gates with L-shaped protecting screen walls were erected at the middle section of each wall of the settlements. The inner parts of the fortresses were usually divided by two main streets, intersecting each other at right angles. The settlements covered large areas: their perimeter edge is approximately 5-800 metres, covering an area of 40-80 hectares.

THE FORTIFIED SETTLEMENT OF KHAR BUKH BALGAS

Khar Bukh Balgas site studied by our project is a larger fortified settlement. The ruins are located at the coordinates 47° 52' 249'' N and 103° 53' 051'' E, 1015 meters above sea level. It is surrounded by rammed-earth walls oriented to the cardinal points. The walls were placed to form a square, but the lengths of the eastern and northern sides are not equal. The extant walls are 3-4m wide and 2-2.5 m high. An earthen gate with an L-shaped outer structure was opened in the middle section of each settlement wall. The corners were strengthened with corner towers, and between the corner towers and the middle gates a further 3 or 4 square towers were erected on each side (*Fig. 3*). Within the walls, the four gates were joined together with roads running from N-S and E-W. These approximately 30m wide roads divided the inner area of the fortified settlement into 4 parts. Buildings once stood along these avenues. The outer wall is surrounded by a moat with smaller side ditches running out of it. The main moat gains its water from the Khar Bukh stream.

Fig. 3: L-shaped external gate tower on the settlement's eastern defensive wall

Fig: 4: Morning on the shore of Khar Bukh stream

The remains at Khar Bukh Balgas have been studied by Russian and Mongolian researchers since the 19th century. Excavations were conducted by A. Ochir and L. Erdenebold in 2002-2003 and 2011-2012, during which they also studied the later periods of the site. A large number of archaeological features can be detected at the site and within its vicinity. The remains of a pottery kiln were detected 35m from the NW corner of Khar Bukh Balgas on the eastern bank of Khar Bukh stream (*Fig. 4*). Remains from agricultural work in the form of small ditches and millstones can also be observed around the walls of the fortified settlement.

In the 16th-17th century a Buddhist monastery was built within its walls. The buildings of the monastery were made of ashlar, and have remained erect at 2-3m in height. The monastery included several buildings. Excavation within the central sanctuary resulted a large number of artefacts in connection with religious activities, including depictions of the Buddha, textile and metal remains. One peculiarity of the excavation was that well-preserved manuscripts were also found among the remains (*Fig. 5*).

FIELD RESEARCH

Our research team visited the site in two field seasons in October 2016 and May 2017 (*Fig. 6*). Our visit at the end of October 2016 was greatly influenced by the extremely strong wind and daytime temperatures of around -10° C. The cold did not prevent us, however, from using a manual GPS to determine the position

Fig. 5: Buildings of the 16th-17th-century Buddhist monastery with the central sanctuary in front

Fig. 6: Our arrival to the museum caretaker's yurt at the entrance to the site

Fig. 7: Geophysics expert, L. Ganbaatar, prospecting the site

of the walls0 while we were also able to take aerial photographs using a DJI Phantom 3 Standard Drone (UAV), which was later upgraded to an advanced one.

In May 2017, we carried out more extensive field work on the site. During our second visit we captured more detailed aerial photographs than in the previous year, carried out field surveys both inside and outside the fortress, and also took geophysical test measurements (performed by the Mongolian geophysicist L. Ganbaatar (*Fig. 7*). During the 2017 field work, we took aerial photographs of the inner area of the fortress, of a walled area north from the walls, and also of two areas where circular objects had been observed on the satellite imagery of Google Earth. In addition to that, further aerial photographs were taken in the area south, north and east of the fort, and in the area of what may have been a pottery kiln near the Khar Bukh stream.

The flights resulted in more than 4000 aerial photographs. During the flights, we ensured that there was an 80% overlap of images, which meant that there were 5 or more images overlapping for at least 90% of the area. It also meant that to measure one point we used 5 different images, which gave us the correct level of accuracy.

The images were processed using Pix4D and DroneDeploy applications, which are suitable for point cloud and orthophoto creation. The resulting point cloud enables us to map the surface objects in more detail. Digital surface models follow the WGS84 projection system, as GPS coordinates are recorded in the exif files of the images. With the help of the present model we are able to produce contour lines or generate cross sections anywhere in the measured area.

The first surface model, which we created from the aerial shots of 2016, showed immediately a dense building coverage on the fortified area. In 2017, we prepared detailed photographic and descriptive documentation of the previously-mapped building remains, including the Khitan and the 16th-17th century stone buildings.

We carried out field surveys outside the fortress in order to determine the extent of the former settlements and to identify the different economic activity zones. It is highly feasible that the Khitan settlement extended beyond the area of the fortification; consequently, we examined the areas south and east in 20 or 50 meter grids, approximately 500 meters distant from the southern walls. The ceramic and roof tile density on the surface in both areas indicate with high probability that the settlement continued for several hundred meters (2-300 m from the southern walls and 4-500 m from the eastern wall). We also surveyed the Khar Bukh riverbank near the assumed pottery kiln, where a 10 x 20 m oval area had a very intense ceramic coverage. There is, however, an empty area between the kiln and the walls.

Geophysical test measurements were performed by the Mongolian geophysicist, L. Ganbaatar, who carried out magnetometer and resistivity measurements in two areas: inside the fort and within the circular objects north of the walls. Based on the tests carried out inside the fort, it can be seen that the mounds cover the remains of buildings with probably well-preserved walls. Further measurements will be needed in the future to learn more about them. Resistivity measurements of the circular objects indicate the presence of water or a channel, which suggests that these objects could have been related to water management.

We process the materials collected using a GIS system which enables us to analyse at once information obtained at different times and with various methods (UAV, metering station, GPS, photo). Our system is based on the orthophoto and 3D model derived from drone (UAV) images. Vectorisation of the objects appearing on the images gives a close to accurate plan of the inner area of the fortress (*Fig. 8*).

The dataset collected during the fieldwork is still being processed. Nevertheless, the Khar Bukh Balgas site and its surroundings raise several further questions. Can we consider these fortified settlements to be the results of an urbanization process? Where were the real boundaries of the resident's activities? What

Fig. 8: View of the site from the southern gate with the avenue leading from north to south

role did this settlement have in the local settlement network? Why did life disappear from this site? To answer these questions, further years of research will be needed.

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