Historical-archaeological investigations at Akkerman (Bilhorod-Dnistrovsky) fortress, Ukraine 2009

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The July 2009 expedition commenced with what are by now 'expected surprises'. In 2007 timbers within Fisher Tower (30) and the high shore wall next to it smoldered following a fire set by a film crew. In 2008 we witnessed the partial dismantling of the tower by restorers working without archaeological supervision. This year we were stunned by a Disney-like reconstruction of Fisher Tower in new stone and concrete. A bulge on its west face, apparently due to the use of overly heavy restoration materials, certainly dampened our spirits. Yet another surprise lifted them – the veritable jungle in the ditch that grew higher with each season and hampered photography and surveying had mysteriously vanished. Through oral history we learned that rubble and dirt from the dismantled portion of Fisher Tower had been dumped into the ditch and buried much of the vegetation.

Prior to the field season we received digital copies of late 18th century plans of Akkerman preserved in the military-historical archive in Moscow (RGVIA). This was a time when the Russian Empire's forces were pressing the Ottoman northern Black Sea fortresses as never before. These plans are indeed of vital importance for our understanding of the site: they display a high level of detail and, examined in conjunction with the Ottoman archival documents, greatly illuminate the complicated sequence of building works undertaken during the final decades of Ottoman Akkerman. Architectural observation discerned clear structural evidence for the major modifications mentioned in the documents and maps of this decade. Preliminary datings of timber promise to corroborate our identifications and datings of new constructions encountered in the documents, displayed in the maps and found standing today.

Cooperation between historians, archaeologists and dendrochronologists is also turning out to be invaluable in untangling Akkerman's earliest phases and the vexed question of the chronology of the shore wall. Architectural evidence suggests that the fortress plan as it now is was established essentially in ca. 1440, apart from the addition of the low shore wall, built sometime between then and 1484. If this was indeed the case, and the interim results of the dendrochronological analysis would seem to confirm so, then it has wider implications for our understanding of Moldavian capabilities in the early 15th century. Among other things it was established that the crenels in both the Moldavian and Ottoman phases of the shore wall were surprisingly low (their bases at between 50–75cm above the respective parapet walks), presumably to allow for close-range defensive cover against attackers who reached the foot of this wall. Also, the original locations of several of the Moldavian and Ottoman inscriptions removed from the fortress walls by the Russians after ca. 1810 were determined. There is little documentary or architectural evidence of noteworthy structural alterations made to the fortress between its capture by the Ottomans in 1484 and the 18th century, which implies that the original design of the fortress was sufficient for withstanding threats in the intervening centuries, including Cossack land and sea attacks in the 1570s to 1620s.

After a hiatus of one season, in 2009 excavations were resumed, now for the first time ever in the great ditch. A trench 3.0m wide and 8.15–8.43m long near the presumed high point above Dnister liman (between towers 10 and 11) was excavated to a bedrock of yellow limestone, at a depth of 1.5–1.8m (11.7–12.0m below the top of the ditch). Samples for micromorphological, spore-pollen and C14 analyses were taken. The archaeological contexts reflect several cultural layers dating from the 13th–18th century. An interesting find is an iron arrowhead that belongs to a widely dated type common in 10th–13th century sites in non-nomadic areas of Kievan Rus'. Another find, dating from the 12th–13th century, is a turquoise-coloured glass bracelet fragment with dark-red and light-yellow stripe decorations. The artefacts also include different kinds of ceramic ware, without glaze or covered with monochrome and polychrome glaze, as well as red and grey tobacco-pipe bowls from the 17th–18th century, some with stamps and one with an Arabic inscription. Metal finds include iron nails, horseshoes, fragments of cannon balls, a copper button and Tatar and Ottoman coins. The latter include a silver coin 2.9cm in diameter with Arabic inscriptions indicating the reign of Mustafa II and Edirne 110(7?)/1695–1696(?) as the place and date of minting.

Collection of selected mortar and brick samples for petrographic and micro-structural analyses continued this year. Samples were taken from the minaret, bathhouse, barbican and shore walls. It is hoped that these, along with materials already analysed last year, will assist further in elucidating the structural development of the fortress.

An intensive effort was made to complete the geodesic survey of our very large and complicated structure (ignoring the ditch, the outer walls alone are 2km in perimeter and enclose a space of 9ha). Using a Trimble 3M total station and R3 DGPS the geodesic team brought the total number of points measured to beyond 23,000. Such a high number is not only a function of the size of the site, but also of the degree of architectural detail that is being recorded. Processing of the data will yield a 3-dimensional model of the original fortress. This will be imported into ArcView 9.2 for placement in a georeferenced, landscape context that will facilitate a more holistic interpretation of the spatial and historical environment.

Iryna Karashevych surveying the shore ward with a total station. Above are the walls of the garrison ward and to the left the top of the citadel

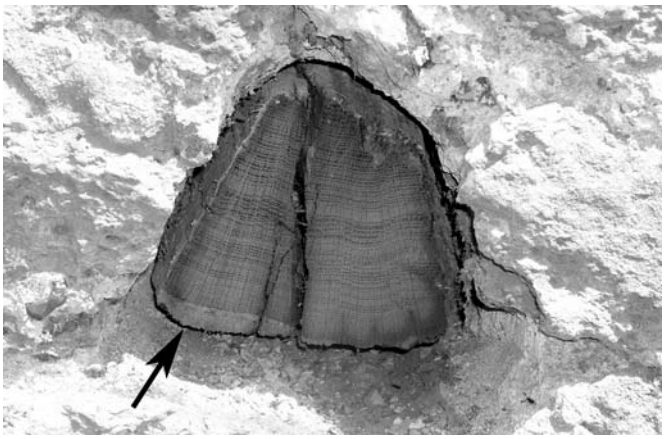
A complete photogrammetric survey of the site was undertaken. Nearly 4,800 photos were shot with a Nikon D5000 DSLR camera and Nikkor wide-angle lens set at 33mm to achieve near 1:1 image ratio; a telephoto lens was used to pick out individual elements deemed worthy of recording separately. The images are being used to create photosynths, a photogrammetric model and photorealistic rendering within the AutoCAD model. The photosynth will enable a unique interaction between the viewer and a pseudo-3D immersive environment. The photogrammetric model will facilitate the extraction of precise, real-world measurements directly from the model. The photorealistic model will be constructed by 'painting' the AutoCAD with images (photo rendering) to create an exact, life-like 3D model. This resulting model will permit the peeling away of layers to reveal coeval elements within the construction and the grouping of similar features for an in-depth analysis of Akkerman's constructional components.

Dendrochronology continues to add exciting data on both Akkerman and the historical dendrochronology of eastern Europe and the Black Sea region. Examination of samples taken last year led to the division of timbers preserved in structures of the fortress into two periods: Moldavian/early Ottoman and late Ottoman. Tree-ring analysis indicates that oak used at Akkerman came from the north and west (Moldavia, southeastern Poland/western Ukraine). During this season the focus was on distinguishing between the Moldavian structures and Ottoman modifications introduced directly after conquest. To achieve this, the dendrochronological team concentrated on the shore walls and wooden structural elements in towers 3B, 25 and 26, which were inaccessible last year without climbing equipment. Special attention was paid to a search and rescue mission of timbers from Fisher Tower. Six beams were found amongst the rubble on the bank of the Dnister and two others in the shore ward. Close reinspection of the fortress yielded a new group of samples that had not been visible or accessible in 2008. Altogether 36 new slices and cores were taken, increasing the total number of samples to 93. It is expected that the new material will provide confirmation of the preliminary dating results, as well as better temporal resolution of obtained datings.

In addition to continued work with finds, documents and maps, timbers and further excavation in the ditch, we are planning two new undertakings in 2010: (1) topographic survey of the grounds of the fortress using a total station and DGPS, which is indispensible for understanding the changes in the terrain of the fortress; (2) geophysical survey of the foundations of one of the cannon platforms that are well-documented in the Ottoman building records, and, if the result is positive, excavation. This would allow us to realise one of the goals of our project – to work at a specific location where both historical and archaeological data are rich and overlap and thereby allow a mutual informing between these two disciplines.

Acknowledgements

In addition to the BIAA, we record our gratitude to the Institute of Archaeology, National Academy of Sciences of Ukraine (NANU); Bilhorod-Dnistrovsky Museum; Cornell Tree-Ring Laboratory; Bilkent University; Archaeology Centre, University of Toronto for photographic equipment; and Bob McNair for a backup total station. The 2009 team included the above authors plus Serhiy Rosomakha (KMS), Iryna Karashevych (NANU): geodesic survey; Alex Turner (SAT Surveys): photo survey; Iryna Karashevych (NANU): excavation; Roman Gutsulyak (KONREST): mortars; Zhanna Matveishyna (NANU): soil analysis; Severin Sagaydak (NANU): dendrochronology; Oleksandr Halenko (NANU): maps and plans; Valentyna Kesar (NANU): finds photography; Kateryna Boltryk (Kyiv Polytechnic Institute): finds database; Denys Mykytenko (Lutsk University): artist.



Cross-section of oak beam from the shore barbican. The tree-ring structure as well as the sapwood – the brighter, outer part of the trunk indicated by an arrow – are visible. The outermost ring of sapwood gives the felling year of the tree