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MIL PLAIN, AZERBAIJAN
Ancient water management

The 2012 activities

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This report summarizes the systematic fieldwork of summer 2012 to investigate various forms of ancient and historical water management in the Mil Plain (southwest Azerbaijan). The "Irrigating the Steppe Project" has relied on analysis of historical and modern remote sensing data to map landscape features. In the field, mainly two areas of investigation (Qala Tepe and surroundings; Ören Qala and surroundings), were central. Here, intensive archaeological survey strategies were implemented to document water-related features, including canals and qanats, and associated settlements. To the west of the site of Ören Qala, a trench into one of the major canals, that is still preserved, could be excavated.

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Head of the project: A. Ricci.
Members of the project: B. Helwing.

In summer 2012, thanks to a National Geographic Research and Exploration Grant ("Irrigating the Steppe"), we explored various forms of ancient water managements in the Mil Plain of southwestern Azerbaijan. Lying towards the confluence of the Kura and the Araxes Rivers, this region is classified as a

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1 The Mil Plain on Landsat imagery with indication of the two main areas of investigation (mapping: A. Ricci on the basis of US Geological Survey).

2 The topographic mapping of the site of Qala Tepe (graphic: A. Kwast, DAI Eurasia Department).

semi-desert with an average of 200–250 mm of rain precipitation per year. Strong seasonal contrasts between an overabundance of water in the spring months and water shortage in the dry summer season characterize the Mil Steppe. These conditions make rain-fed cultivation in the region a risky undertaking: higher and more secure agricultural yields depend on regular water supply, which is obtainable only with significant technological and labor investments.

In the frame of the larger program of geoarchaeological investigations we have been conducting in the region since 2010, we first completed a detailed remote sensing analysis of the available satellite imagery. We identified and mapped potential water-related features such as canals, qanats (underground water tunnels) or conduits on the basis of two sets of CORONA images (mission 1048 and 1110, respectively acquired on 22nd Sep 1968 and 24th May 1970). The comparison of these old satellite images with modern imagery indicated that a number of water features had still remained largely preserved in at least two areas: around the sites of Qala Tepe and Ören Qala (fig. 1).

The former is located in the northern portion of the investigated region. While our cooperation partner Tevekkül Aliyev has been continuing his digging activities through the late Iron Age levels on the citadel, our detailed topographic survey indicates that an artificial ditch divides the acropolis and the extended flat lower town (fig. 2). This ditch surrounds the western, southern and eastern sides of the main mound of the site. The feature tapped the descending water of Qarqarcay River and diverted it to supply the large settlement of Qala Tepe. Moreover, it offered protection to the main mound, similarly to well-known moats surrounding medieval castles in Europe, for examples. The lower town extends to the southeast of the main tell and covers an area of approximately 900 × 350 m. A deep incised rather rectilinear canal cut the eastern edges of this flatter part of the site (fig. 3). On the ground it is still possible to follow the canal approximately 700 m south of the lower town´s southeastern corner; however remote sensing data indicates that this feature belongs to the northwestern stretch of the lengthy Govurarx Canal. This was built in antiquity to irrigate the Mil Steppe

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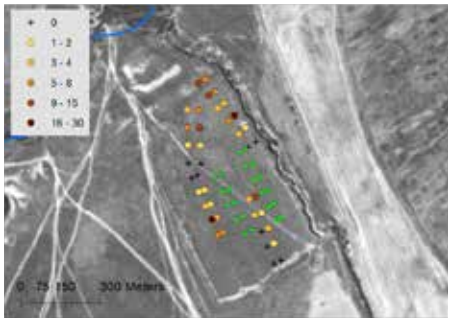

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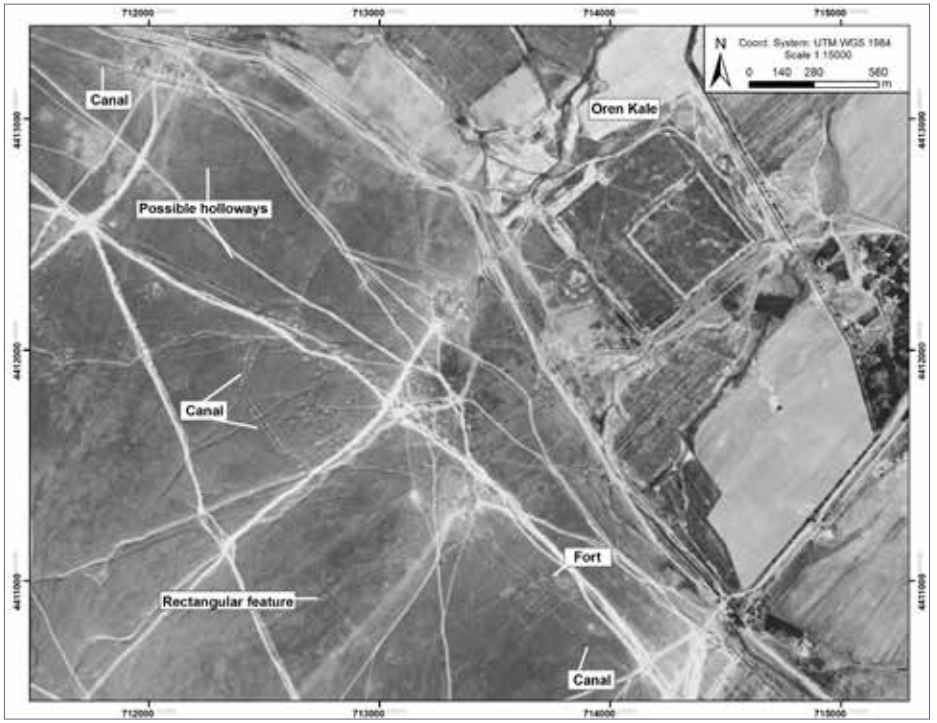

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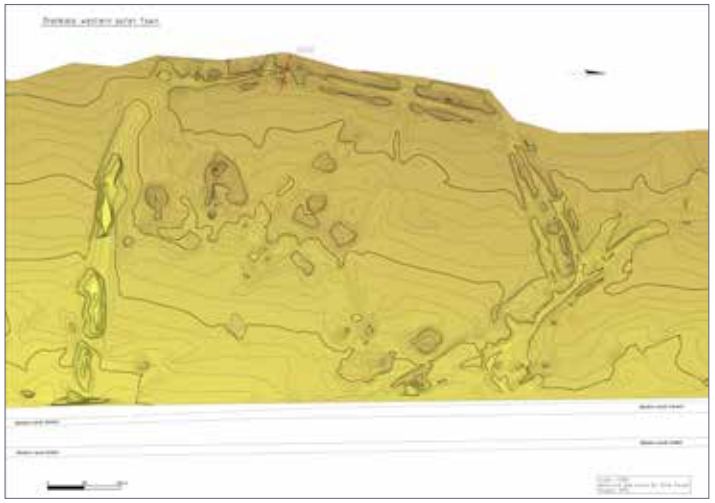
3 The deep canal incision to the east of Qala Tepe east (photo: A. Ricci, DAI Eurasia Department).

4 Block-based collection of artifacts on the extended lower town of Qala Tepe, mapped on a CORONA, taken on 24th Jun 1970 (mapping: A. Ricci/D. Lawrence on the basis of US Geological Survey).

5 Water features and other anomalies west of Ören Qala mapped on a CORONA image, taken on 24th Jun 1970 (A. Ricci on the basis of US Geological Survey).

by diverting the water of the Araxes River to the northwest, all the way up to the Qarqarcay River. In addition, we conducted intensive transect-block based surface collections in the flat lower town of Qala Tepe. With the aim of determining when the lower town had been first settled and if and when it has been extended, dating the phases of the site´s occupation shall provide indirect evidences for the dating of these two water features (i.e. the ditch and the canal). Furthermore, we intensively surveyed the Qarqarcay River banks, to the north and northwest of Qala Tepe. Within a 2,5 km radius from the site, we located three further occupations, dated from the Iron Age to the late medieval period. These sites are small shallow tells, extending less than one hectare. Possibly their inhabitants managed agricultural lands under the sphere of control of Qala Tepe.

Also the site of Ören Qala is situated along the Govurarx canal, some 23 km south of Qala Tepe. Historical sources and older excavations indicate that this large city was established during the Sasanian period. Ören Qala was later enlarged and massively fortified, and became one of the capital cities of the medieval kingdom of Albania. None of the previous archaeological investigations has ever concentrated west of the main fortified site. CORONA satellite images enable detecting a series of ancient features, including a fort, holloways and canals over an extended unwalled flat area west of the large double fortified site (fig. 5). A series of isolated, small mounds – possibly reminiscent of blocks of buildings – largely composed the landscape of this district. Consequently, we completed a detailed topographic mapping of this area (fig. 6). The use of an Unmanned Aerial Vehicle (UAV) enabled to produce more detailed views of specific water related features. In particular, two parallel soil upcasts still marked on the ground the outline of one of the largest canals, previously detected on remote sensing data. This water related feature marks the western limits of the lower town of Ören Qala and it must had been part of a larger hydraulic system. We could further explore this canal by digging a 33 m long test trench into it (fig. 7; also red line on fig. 6) to study the time and nature of sedimentation processes of the canal´s infilling. This canal reached an approximate depth of ca. 3,70 m and was some



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6 Topographic mapping of the western suburbs of Ören Qala. Note the red line, which indicates the position of the trench dug into the canal (graphic: A. Kwast, DAI Eurasia Department).

7 The exploration trench dug into the canal west of Ören Qala (photo: A. Ricci, DAI Eurasia Department).

18 m wide: a massive feature that might have provided water both for agricultural activities and the town itself, but it also must have required constant cleaning because of rapid sedimentation. Three radiocarbon determinations do not provide a clear single dating for the construction and use of this specific water feature, rather they suggest that this canal remained in use for a very long period, possibly from the late Iron Age until the 13th century AD. This latter date well fits with the information that historical documents provide: most of the Mil Plain landscape of irrigation thrived until the western expansion of the Mongols (13th century AD), who deliberately and irrefutably destroyed the majority of local channel systems. In the western suburbs of Ören Qala, we also conducted intensive block-based surface collections in order to determine the size and date of this extended settled area and ultimately to date water features and possible related settlement. First analyses of the collected artifacts suggest that the suburbs of Ören Qala extended over more than 30 ha and that they were possibly inhabited from the 8th century AD onwards.

The 2012 “Irrigating the Steppe” field season has shown the potential of conducting intensive survey to investigate ancient water management strategies in the marginal environment of the Mil Plain. The analysis of historical remote sensing data has shown the presence of a number of potential ancient water features. As most likely the irrigation features remained in use for several centuries, it is impossible at this stage to propose an ultimate dating of the large irrigation scheme, but several detailed observations could be successfully achieved.