

## **Report on the Activities of the Seventh Field Season of the Joint Shida Kartli Project (2015)**

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### **Introduction**

The seventh field season of the Shida Kartli project of the Ca' Foscari University of Venice (Italy) in cooperation with the Georgian National Museum (Georgia) took place from June 18<sup>th</sup> to August 4<sup>th</sup>, 2015. The Italian team arrived in Tbilisi on July 18<sup>th</sup>, and reached the town of Kareli on June 20<sup>th</sup>. Excavation activities started on June 21<sup>th</sup> and were completed on July 31<sup>th</sup>. On August 1<sup>st</sup>, the team returned to Tbilisi.

The Italian team was composed by the following archaeologists: Prof. Elena Rova (co-director of the project, chief of the Italian group), Katia Gavagnin and Elisa Girotto, PhD, Davit Darejanashvili and Marta Aquilano, MA (PhD candidates at Ca' Foscari University), Livia Gervasi and Laura Tonetto, MA (students at the SISBA archaeology specialisation school), Chiara Mariotto, MA candidate and Cristina Martin (students at Ca' Foscari University), and Stefano Camellini, MA (topographer), joined for shorter periods by Prof. Marilyn Kelly-Buccellati (UCLA University of Los Angeles, USA), Lorenzo Crescioli, MA (PhD candidate at Ca' Foscari), Giampaolo Ceccarini, MA, Alessandro Armigliato, Mirko Furlanetto and Angelo Di Michele, MA (topographers). The Georgian component of the team included the following archaeologists: prof. Iulon Gagoshidze (co-director, chief of the Georgian group), Tinatin Chanishvili, Nana Gogiberidze, Tinatin Kutelia (GNM), Davit Gagoshidze and Soso Ukhleba (MA and respectively BA students at the Ivane Javakhishvili Tbilisi State University).

Like in the previous seasons, the expedition was joined by experts in different fields: Prof. Francesca Bertoldi (physical anthropologist, Ca' Foscari University of Venice), Prof. Giovanni Boschian (geoarchaeologist, University of Pisa), Veronica Scandellari, MA (palaeozoologist), Ketevan Esebua (palaeobotanist, MA student at Sokhumi State University), Fabio Fratini, MA (geologist, CNR, Institute for the Preservation and Valorisation of Cultural Heritage, Firenze) and Eleonora Venier (architect, MA student at the IUAV University of Venice).

12 workmen from the villages of Doghlauri and from the town of Kareli were engaged in the excavation; Mr. Emzari Tzulukidze drove the mission's minibus and took care of logistics.

On 29/07/2015 the expedition received the visit of Dr. Stefano Crescenzi, First Secretary of the Italian Embassy in Tbilisi. It was also visited by the following colleagues: Mr. Alvaro Higuera (21/07/2015), Dr. Zurab Makharadze, Dr. Mindia Jalabadze, Prof. Marina Puturidze (22/07/2015), Dr. Modwene Poulmar'ch, Dr. Estelle Herrscher and Dr. Eliso Kvavadze (22/07/2015), a group from Khashuri Museum (23/07/2015), Mrs. Kathryn Weber (23/07/2015), Prof. Giorgi Mindiashvili (26/07/2015), Prof. Annegret Plontke-Lüning and a group of students from Jena University (26/07/2015), and by the following television teams: Trialeti, First National Channel (03/07/2015).

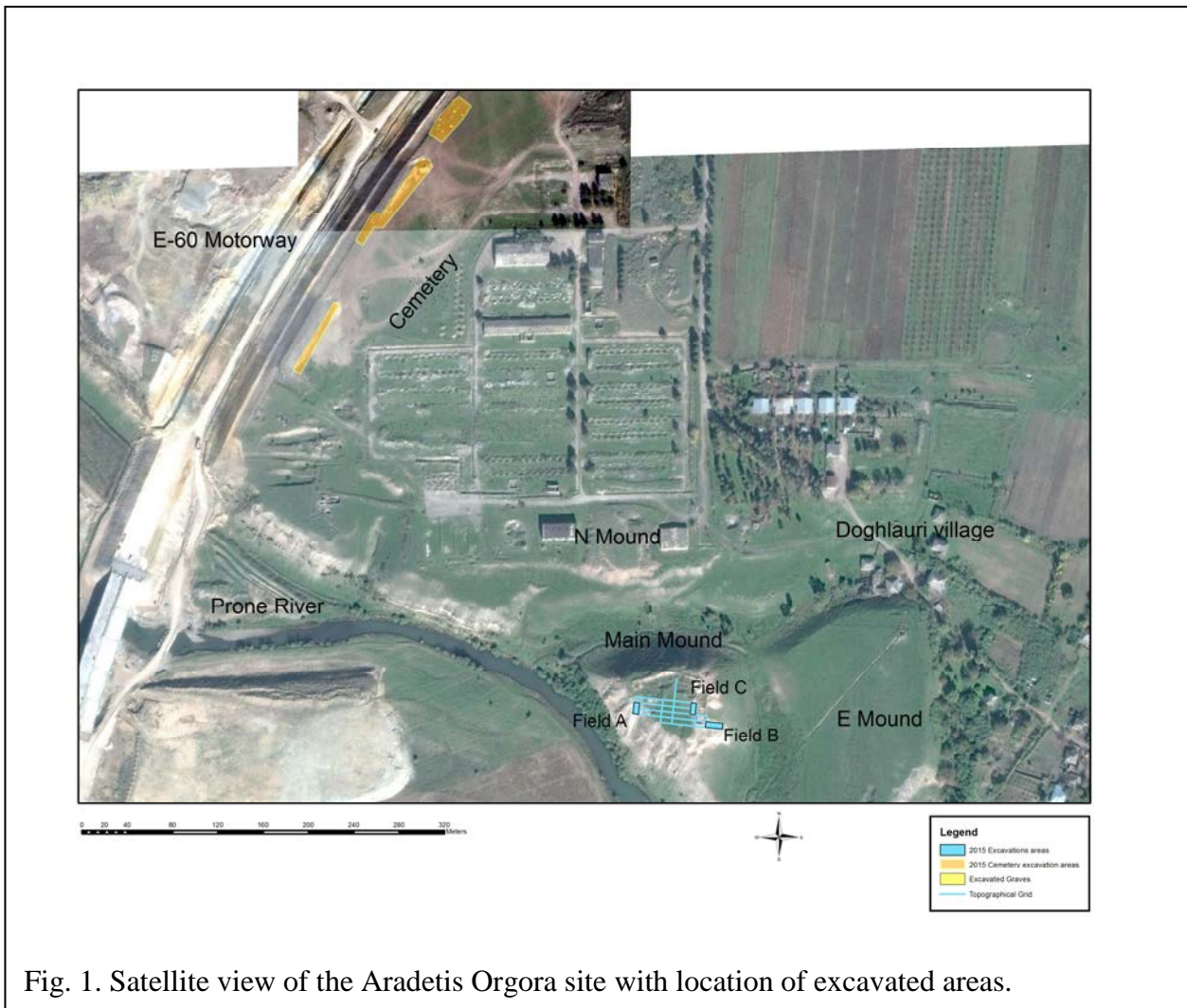


Fig. 1. Satellite view of the Aradetis Orgora site with location of excavated areas.

This year's campaign was characterised by a closer interaction between the two components of the expedition. Excavations were carried out in three different areas (Fields A, B, and C) of the Main Mound (Dedoplis Gora) of the Aradetis Orgora multimound site (Figs. 1, 2), all of which had already been excavated in the course of the 2013 and 2014 seasons (Fig. 3).

Field C is situated on top of the eastern side of the mound, and its aim is to complete the exposure of the eastern wing of the Late Hellenistic/Early Imperial palatial building. Excavation was carried out by the Georgian team under the responsibility of Prof. Gagoshidze. The group of topographers, architects/experts in cultural heritage preservation (Camellini, Fratini and Venier) produced a plan of the excavated area, took samples of the building materials and produced a preliminary report of the building's present state of preservation with the aim of proposing an overall plan for its future preservation.

Fields A and B represent the continuation of the two stratigraphic soundings initiated in 2013 on the opposite (Western and Eastern) sides of the mound with the aims of verifying the settlement's pre-classical occupational sequence and of obtaining a corpus of stratigraphically secure artefacts and ecofacts from the different occupational phases: they were excavated by a mixed Georgian-Italian team under the responsibility of Prof. Elena Rova (sites supervisors Davit Darejanashvili, Katia Gavagnin and Livia Gervasi).

In addition, the team exploited the opportunity offered by the contemporary presence at the site of a Georgian team headed by Prof. Gagoshidze working of the neighbouring Aradetis Orgora (Doghlauri) cemetery in the framework of a salvage excavation of a Governmental project financed by the World Bank for the building of the new Tbilisi-Batumi highway for opening a new field of

investigation. Marta Aquilano and Veronica Scandellari helped removing the human bones from the excavated graves, and physical anthropologist Francesca Bertoldi studied them at the expedition's house in Kareli. She also made a preliminary analysis of the bones from the salvage excavations of the previous years, which are presently housed in Tbilisi under the responsibility of Prof. Lia Bitadze (Ivane Javakhishvili Tbilisi State University). The excavated graves belong to the main periods of occupation (Kura-Araxes and respectively Late Bronze/Iron Age) represented in both stratigraphic soundings (Fields A and B): this will provide a unique opportunity for a comprehensive analysis of the site's ancient population.

As far as the palaeoenvironmental sector the expedition's research project is concerned, geoarchaeological and soil micromorphological research continued this year under the responsibility of Prof. Giovanni Boschian, analysis of palaeofaunal and palaeobotanical finds under the responsibility of Veronica Scandellari and respectively Ketevan Esebua. Samples for radiometric dating were collected by the members of the team according to the instruction provided by Dr. Elisabetta Boaretto (Weizmann Institute of Science, Rehovot, Israel), who could not take part to the field season this year, but will take care of the samples' analyses in the course of the next winter. Sampling for palinological analysis and for archaeometric analysis of pottery and obsidian was also carried out in the course of the season.

Finally, some experiments in the replication of Kura-Araxes and Late Bronze Age firing installations excavated during the previous seasons took place at the expedition's house in Kareli under the responsibility of Davit Darejanashvili, Marta Aquilano and Livia Gervasi.

The field season was very productive in all respects: not only was the main objective of the excavation on the Aradetis Orgora Main Mound (to obtain a complete stratigraphical sequence of the mound's pre-classical occupation) reached, and a huge amount of data concerning the site's ancient populations was collected, but some unexpected important discoveries were also made. In particular, the Kura-Araxes levels in Field B yielded a portion of a large building in which a zoomorphic ritual vessel and fragments of two similar ones were recovered. Finally, both stratigraphical soundings yielded evidence of occupation of the Middle Bronze period (a.o., Trialeti painted and incised pottery sherds), a fact hitherto unparalleled in the Shida Kartli region.

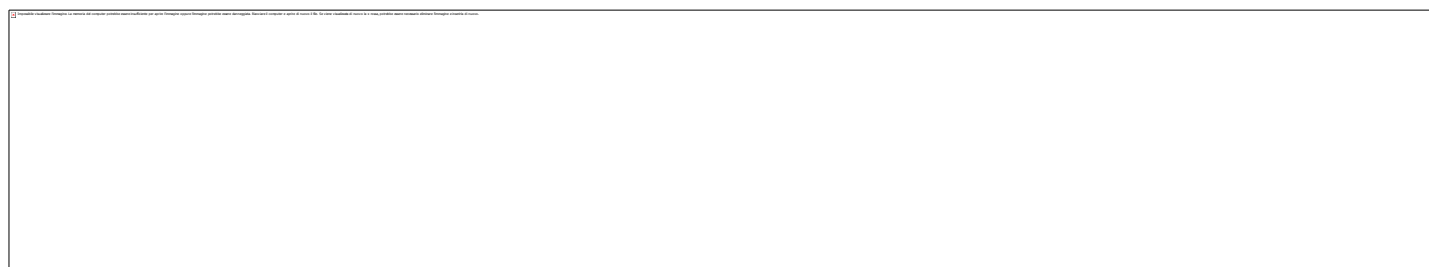


Fig. 2. Panoramic view of the Aradetis Orgora Main mound from E.





## Field A (Western stratigraphic sounding)

In Field A, situated on the South-Western slope of the mound, excavation continued in both quadrants (097.100d, 097.099b) already excavated in 2013 and 2014 but expanded, toward the end of the season, to a small portion of quadrant 097.099d to the S, on the outer edge of the mound's slope (Fig. 4). Excavation was carried out in parallel on two steps, namely at the top (in the N half of quadrant 097.100d) and at the bottom (in the S half of quadrant 097.100d and in quadrant 097.099b) of the ancient slope of the mound exposed in 2013, with the aim of investigating the earlier Late Bronze sequence of occupation of the area. The total depth of the excavated layers amounted to ca 60 cm on both steps; the last exposed level can be tentatively attributed to the 14th century BC on the basis of ceramic parallels. In the course of the last week of excavation, a 150 cm deep sounding was carried out on a 150 x 350 cm large area located at the SW limit of the Field. This reached alt. 666.35 a.s.l., thus bringing the total depth of archaeological layers excavated in the area in the course of three years to more than 6.15 m (from 672.50 m a.s.l., corresponding to the bottom of the Late Hellenistic/Early Imperial palace, to 666.35).



Fig. 4. Field A, general view of the excavation area from N.

In quadrant 097.100d, we completely removed what was left of the very thick pebbles filling (loci 1531-1554-1567) partially excavated at the end of the 2014 season. This covered a layer characterised by the presence of massive stone walls (1571, 1572, 1573, 1574) oriented in different directions, which had been levelled almost down to their bottom. A large post-hole surrounded by a circle of stones (1569) was discovered at the junction between walls 1571 and 1572. No floor was found leaning to these walls, so that it is possible that they had a mere terracing function; on the other hand, the absence of the floor may be due to the bad state of preservation of the level. The relation of walls 1571, 1572, 1573, 1574 with the stone walls (1400, 1401) discovered in 2013 at the S limit of the excavation area just under the ancient mound's slope is not certain: it appears that

the latter cut the former and are therefore later, although both belong to the same main phase of occupation.

Walls 1571, 1572, 1573, 1574 lay on a hard surface of trampled clay (1568) which covered the following level. This was heavily disturbed by the presence of some large pits; only after emptying them, during the last days of excavation, some traces of structures (a mud-brick wall, 1905, a possible firing installation, 1589, fragments of possible floors and wall plaster) were starting to emerge. Ceramic material from this earliest level apparently dated to the earlier Late Bronze period (13th-14th century BC ?), although a precise synchronisation with the sequence of



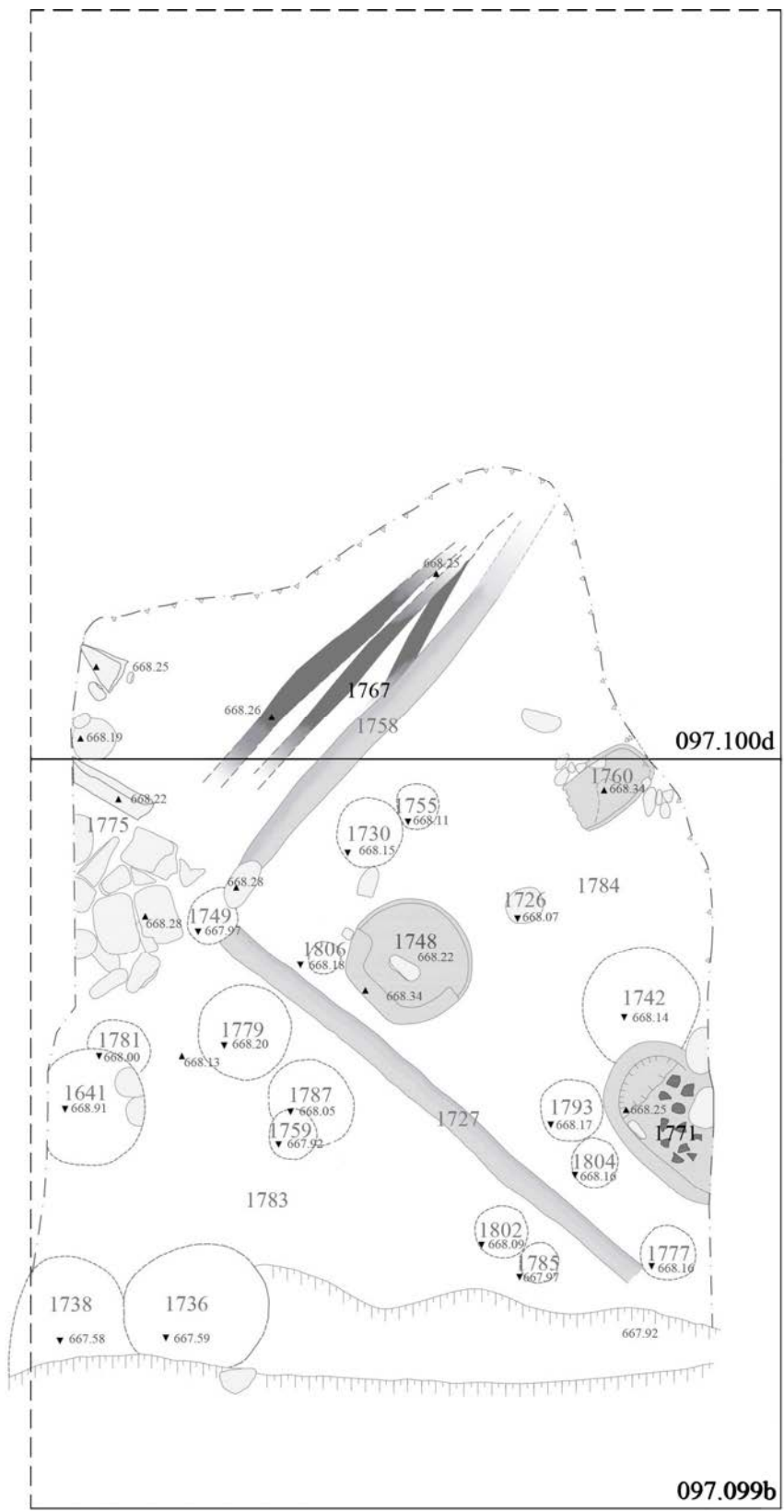
Fig. 5. Field A, terracotta stamp seal (pintadera) 1599-M-1, with modern impression (left) and impressed Late Bronze sherd 1596-C-78 (right) with similar design from quadrant 097.099d.

the adjacent quadrant 097.099b is not yet possible.

A welcome find from the last day of excavation in the area was a terracotta stamp seal or pintadera (Fig. 5, left) decorated with a geometric pattern possibly representing a stylised long-horned quadruped standing to the left. Similar objects are attested during the Late Bronze Age over the whole territory of Georgia; since no clay impressions of them are known, they are generally interpreted as pintaderas rather than as stamp seals. In this respect, it is interesting to observe that very similar designs, although generally of smaller dimensions, were also impressed on contemporary pottery vessels (Fig. 5, right).

On the lower step of the excavation, in the S part of quadrant 097.099b and over the whole area of quadrant 097.099b, we continued the investigation of level 10 (earlier phase of the Late Bronze Age) whose top had been exposed during the last days of the 2014 season. Level 10 was ca 60 cm thick, and could be divided into two main sub-phases, each one with further internal subdivision (Figs. 6, 7). The function and general layout of the excavated area remained the same throughout the whole period, and were not much different from those of Level 9 excavated in 2014, which suggests a significant continuity of occupation of this portion of the settlement throughout the Late Bronze Age.

The excavated area was divided into three different spaces dedicated to different functions. Space 1776, in its NW part, was a open area with no formal floor filled with successive layers (1740, 1844, 1863) of dark-grey brown muddy soil with small sparse charcoals containing a huge number of large animal bones and pottery sherds. According to the expedition's palaeozoologist, the space may have contained the remains of butchering activities. Space 1783, in the SW part of the excavated area, was an open area located in close proximity to the ancient mound's slope, and was



არადეთის ორგორა  
დედოქლის გორა

Aradeti Orgora  
(Dedoplis Gora)

Field A

Plan of Level 10, later stage

Legend










-  = Stone
-  = Brick wall
-  = Pottery
-  = Pit
-  = Installation
-  = Limit of Square
-  = Limit of Quadrant
-  = Limit of Excavation
-  = Slope



Fig. 6. Field A, Quadrants 097.100d, 097.099b, plan of Level 10 (later stage)

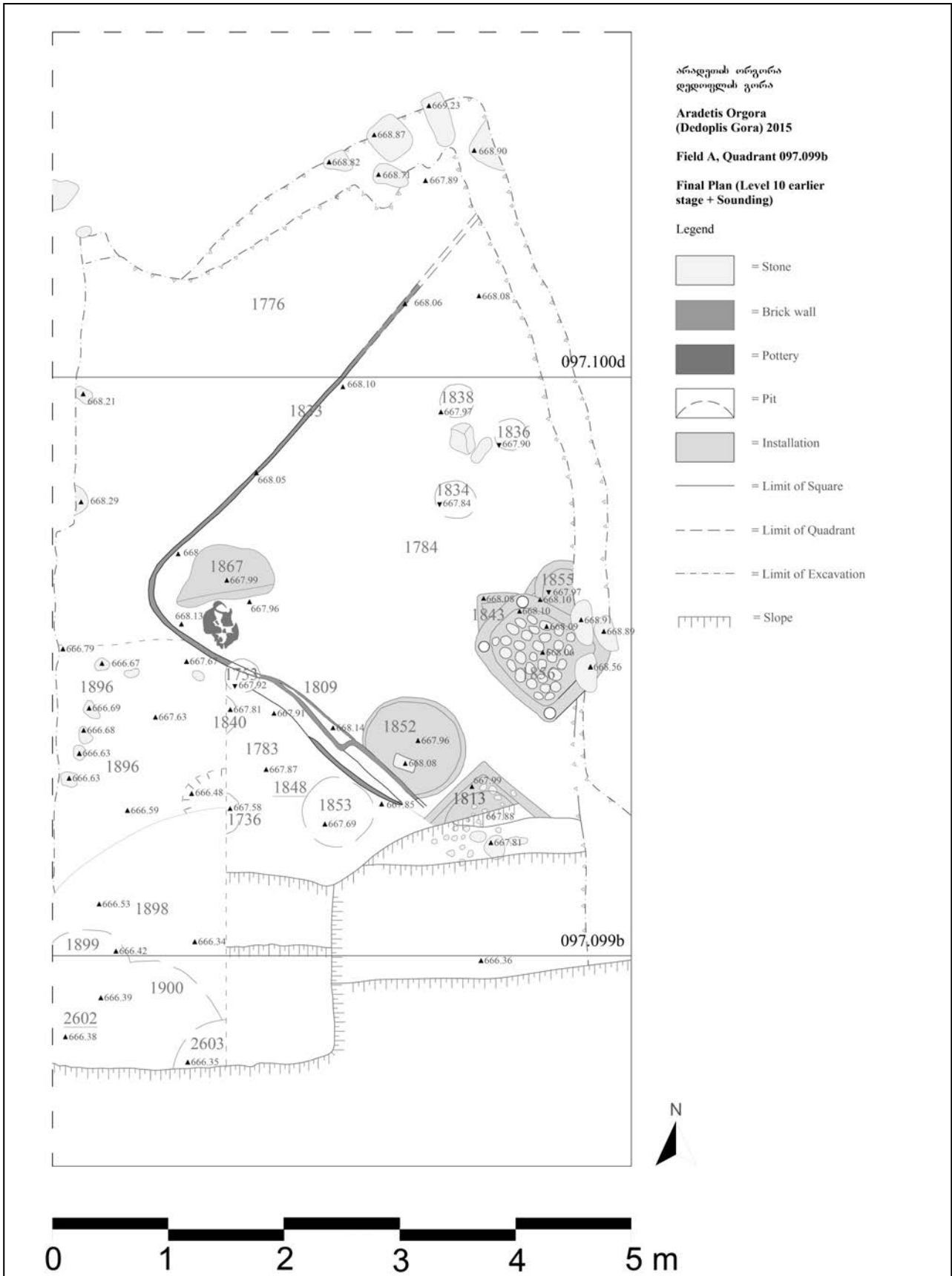


Fig. 7. Field A, final plan of Quadrant 104.099d.



occupied by shallow pits, frequently cutting each other but apparently disposed in different layers separated by thin layers of compacted soil.

The area between spaces 1776 and 1783 was occupied by a large platform of compacted clay oriented in SW-NE direction (locus 1784), which extended over the whole eastern half of quadrant 097.099b, and continued in E direction beyond the limit of excavation. During the later sub-phase, platform 1748 was surrounded by two narrow channels (gutters 1727 and 1758), which abutted a small pit (1789) located near the W corner of the platform. During the earlier sub-phase, the outer limit of the platform was coated with a thick layer of white plaster, which had been repeatedly renewed.

The top of platform 1748 had no formal floor, but traces of different surfaces of use could be distinguished on it; it was occupied by a large number of firing installations of different shapes (some were round-shaped, while others were quadrangular with rounded corners) (Fig. 8). These were often re-built in approximately the same position, occasionally cutting similar features belonging to a previous stage. The installations had generally been levelled to just a few cm above their bottom: most of them appeared to have been surrounded by a shallow clay wall, on top of which some post-holes were occasionally observed, although one or two of them may have been small covered ovens, to judge from the fragments of a possible collapsed roof which filled them. The firing area, consisting of a flat surface of burnt clay, was generally underlain by a layer of pottery sherds, which in its turn overlay a layer of small pebbles, a pattern which has been observed elsewhere in the Late Bronze period at the site (e.g., in quadrant 104.099d in Field B). Soil micromorphology analysis of these features is in progress in order to ascertain whether their morphological variety may be linked to different specific functions.



Fig. 8. Field A, examples of firing installations on top of platform 1784.

To the W of the W corner of platform 1784, spaces 1776 and 1783 were divided by an irregular assemblage of stones, which had a different shape and orientation in the two sub-phases of the layer (loci 1775, 1842), and may represent the remains of stone walls continuing in the unexcavated area to the W of quadrant 097.099b.

At alt 667.40 ca., the bottom of platform 1784 can be considered to represent the base of Level 10. The underlying layers were only excavated in the area of sounding 1886 in the SW corner of quadrant 097.099b, extending over a small part of adjacent quadrant 097.099d. The upper part of the sequence, which according to its ceramic finds can be dated to the transitional MB/LB period (15th century BC) consisted of a succession of surfaces of yellowish clay overlain by a thin layer of grey burnt soil (possible walking surfaces of an external space). Under these there was a ca 60 cm high succession of thick layers of dark grey-brown mud cut by few pits and by two possible firing installations, which contained a large quantity of animal bones and, interestingly enough, a huge amount of obsidian fragments, including both tiny flakes and rather large blocks, as had never been found in any of the overlying level. Ceramic material from this earlier part of the sequence was mixed: besides a small amount of Late Bronze sherds, possibly intrusive from the nearby eroded slope, it mainly contained MB material, including one Trialeti incised sherd, joined by occasional Early Bronze age sherds (a handful of Kura-Araxes sherds, and, notably, one possibly Bedeni sherd). Excavation stopped at the bottom of the sequence of muddy layers, where, at alt. 666.38, the remains of an earlier occupational phase (a yellowish surface, a floor covered by grey ashes) started to appear. No diagnostic material was recovered from these surfaces, but they may represent the interface between the MB and the EB occupation in this part of the settlement.

In spite of the small excavated surface, sounding 1886 clearly proved that the top of the Dedoplis Gora mound was not completely abandoned during the MB period, but was continuously occupied, although apparently with a less intensive pattern of occupation than during the following LB period. Besides elements of continuity with the latter phase (e.g. the presence of large amounts of discharged animal bones, which indicates that animal breeding played an important role in the economy of the ancient local population), new elements appear to characterise the MB occupation, the most significant of which being the large amount of obsidian flakes. This may suggest that the local population had a privileged access, during this period, to the sources of obsidian (presumably the Chikhiani volcano in the region of lake Paravani) located to the South, beyond the Southern Caucasus range.



## Field B (Eastern stratigraphic sounding)

After reaching, at the end of the 2014 season, virgin soil in the easternmost quadrant (105.099d) of the EW-oriented step-trench sounding (Field B) opened in 2013 on the SE side of the mound, work continued this year only in two of the sounding's steps (quadrants 104.099d and respectively 105.099c), with the aim of completing the exposure of the Late Bronze and respectively Kura-Araxes period occupational sequence.

In quadrant 104.099d, we continued excavating the space (2179) to the W of stone wall 2202-2128 down to its earliest stage, and dug a small, 170 cm deep sounding from the base of it (Fig. 9). We thus reached, at alt. 669.53, the bottom of this massive stone wall, and ascertained that its erection dates back to an early phase of the Late Bronze period (possibly to the 14th century BC). We also confirmed that the inner wall's face was entirely made of river pebbles and not, like its outer face exposed in 2013, of squared stone blocks, and was equipped with at least one buttress made of the same river pebbles.

Space 2179 was an open area occupied by a number of different installations, which showed a considerable continuity over what may be considered a long occupational phase with several sub-phases. The upper part of its sequence (tentatively dated to the 11th-12th century BC) had been excavated in 2014, while the lower one (excavated this year) can be tentatively dated to the 13th-14th centuries BC. The S part of the space hosted a complex of firing installations cut into a yellowish clay platform whose limit run parallel to stone wall 2202-2128 at a distance of ca 1 m from it, while its N part was occupied by a white-plastered stepped clay platform, on top of which a shallow basin with a layer of pebbles at the base and a burnt surface was situated. Both the complex of firing installations and the stepped platform were repeatedly renewed in the course of time, probably at approximately the same moments, thus marking a number of different sub-phases in the area's occupational sequence.

The main feature of the complex of firing installations was a large fireplace of squarish shape with rounded corners (2154-2188-2196) located approximately in the centre of the quadrant, which was surrounded by a low clay wall and filled with several successive layers of small pebbles alternating with pottery sherds. After dismantling fireplace 2188, partially excavated in 2014, we unearthed its predecessor, fireplace 2196, which showed at least two different phases of use. It was originally surrounded by two other firing installations (2504, 2517) (Fig. 10), which during the later sub-phase had both been filled by thick ash layers (Fig. 11).

The 100 x 80 cm large sounding dug in the NE corner of space 2179 under the walking surface corresponding to the earliest phase of fireplace 2196 revealed a ca 50 cm high sequence of early Late Bronze fillings alternating with walking surfaces, the earliest of which antedate the erection of stone wall 2202-2128. This was underlain by ca 60 cm of layers containing materials attributable to the Transitional LB-MB period (15th century BC?),







Fig. 11. Quadrant 104.099d, view of space 2179 (later phase) from S.

which yielded, among others, a small round-shaped stone structure internally paved with small pebbles and a floor equipped with a firing installation. At alt. 668.56, there appeared a 30 cm thick yellowish compact layer, underlain by a sequence of two floors cut by post-holes alignments, which covered a possible stone wall, at the level of which (667.91) excavation stopped. This last part of the sequence contained exclusively MB period pottery, including some sherds of painted and incised Trialeti ware (Fig. 12).

The importance of this discovery deserves to be especially underlined: first of all, for the first time Trialeti pottery has been discovered in a settlement context in the Shida Kartli region; secondly, we are clearly confronted not only with a sporadic MB occupation, but with a sequence of stratified floors equipped at least with some light architectural structures. This suggests that the traditional view, according to which the MB population practised a mobile way of life and stable settlements were virtually abandoned during this period, should be at least



Fig. 12. Examples of Trialeti ware from the sounding in Quadrant 104.099d.

partially revised, in that it is by now proved that a limited amount of settled occupation may have persisted throughout the period at least at the largest sites of the region as, e.g., at Aradetis Orgora.

It is also interesting to observe that this part of the site's occupational sequence was completely absent on the external, eastern side of stone wall 2202-2128, which had been excavated by us in 2013 in adjacent quadrant 105.099c. There, the massive stone wall appeared to have been founded directly on an ancient eroded slope of the mound, which overlay the latest layers of the Kura-Araxes period.

The continuing investigation of the Kura-Araxes levels in quadrant 105.099c yielded some of the most important discoveries of this year's campaign. We completed the excavation of the ca 4 meter thick occupational sequence of the period (Fig. 13) by excavating more than 1 meter of it and thus reaching the top of the earliest levels excavated last year in adjacent quadrant 105.099d. Four main Kura-Araxes levels yielding remains of architecture and/or floors with installations and *in situ* materials have been identified this year in square 105.099c. Interestingly enough, both the layout of the excavated area, and the used construction techniques differed considerably from one level to the next one.



Fig. 13. Quadrant 105.099c, view of the Northern section from S.

The latest level (top alt. 666.71), already partially excavated last year, yielded a wattle-and-daub wall (2296-2401) running in NS direction through the whole quadrant approximately in its centre, and continuing beyond its limits. Wall 2296-2401 was coated by four successive layers of plaster. A sequence of well preserved floors yielding, among other, a large *in situ* jar, was leaning to this wall. A platform (2421) built on a preparation of small pebbles and cut by 4 post-holes, located in the N part of the quadrant to the E of wall 2296, belongs to the same phase. The SW part of the



quadrant was characterised by the presence of a thick accumulation of burnt debris, mainly deriving from the collapse of the wall and of different firing installations. It is not clear if the wall divided two different rooms, or a room and an open area.



Fig. 14. Quadrant 105.099c, view of room 2413 with *in situ* material, from S.

The second level (Figs. 14, 15) yielded a portion of a large room (2413), probably of rectangular shape with rounded corners, oriented W-E and delimited by a 20-30 cm thick wall of compact yellowish clay (2435). The upper part of the filling of this structure consisted of a thick layer of burnt debris. A very thick plastered floor (2434) showing at least 3 different remakings was unearthed under this collapsed material that probably derived from the building's roof. The inner space of the room was divided by a row of four NS oriented post-holes into two different areas: in the W one, near the NW limit of the excavated area, a fireplace was found on floor 2434.

In the portion of the room located to the E of the row of post-holes, an exceptional find was made: three rython-like ritual vessels with zoomorphic/anthropomorphic features (Fig. 16) lay on the floor near a large jar, which was apparently leaning to the room's NW corner. These outstanding vessels, for which no exact parallels are known, and the large size of the room in which they were found strongly suggest that the latter did not belong to a normal domestic unit, but rather to a special building, most probably with a religious function. The S half of the quadrant, outside of the wall of room 2413, was occupied by an open space, in which, a.o. a very poorly preserved installation or platform (2418) with traces of red painting and a post-hole cutting its top have been found.

A thick grey layer full of small fragments of charcoal, animal bones and potsherds extending over the whole quadrant divided the second from the third occupational level. At the time of the latter, a stones alignment (2449) oriented in NE-SW direction divided the excavated area into two







Fig. 16. Kura-Araxes ritual vessels 2414-M-2, 2414-M-3, 2434-M-5 from room 2413.

parts. A whitish compact floor (2446) equipped with a fireplace was found to the W of this possible wall, while the area to the NE of it was occupied by a surface of small pebbles, and a brownish surface full of small pieces of charcoal, potsherds and animal bones was identified to the SE of it.

The fourth level excavated this year yielded the surface of a probably open area with several fireplaces, burnt areas and a number of small pits. To the same phase belonged also a slightly curved alignment of stones oriented EW, and scanty remains of a white-plastered floor.

Ca 5 cm under the floor of the fourth level, at alt. 665.54, a compact surface of yellowish clay cut by post-holes was investigated over a limited portion of the quadrant. The continuation of this surface had already been excavated in 2014 at the W limit of quadrant 105.099d to the E, where it represented the highest Kura-Araxes level preserved under the old eroded mound's slope. The investigation of the stratigraphical sequence of this part of the mound can thus be considered successfully concluded.

### Field C (Excavation of the Late Hellenistic/Early Imperial palace)

Field C, in the E part of the Dedoplis Gora mound, is dedicated to the continuing investigation of the Late Hellenistic-Early Imperial palace. One of the aims of this year's campaign was to explore a small section of the building's inner court situated to the west of the portico in front of Room no. 20 excavated during the previous seasons (quadrant 102.100d).

Excavation started from the present mound's surface, whose elevation varied from 677.55 to 676.45 m. a.s.l. After removing the thick surface layer, at alt. 676.50 we discovered a layer of stones, to be interpreted as the base of a mud-brick wall of the Early Medieval period (Level I). We suppose that this wall represents the W wall of the Level I building, excavated in 2014, which was located above Room no. 20 and the portico of the Hellenistic palace (Fig. 17). The building, which had been built directly on the palace's ruins, was equipped with large vine jars.

Not much was preserved of Level I in the E part of the quadrant, where we encountered the remains of a collapsed mud-brick wall belonging to the Hellenistic palace (Level II), whose bricks lay in vertical position (Fig. 18), running in NS direction where the mound's E slope begins, at a distance of 8 m from the western wall of Room no. 20, and extending until the centre of the quadrant. To the W of the wall, we excavated three small Level I pits, in one of which we discovered some wood remains, that we interpret as belonging to wooden columns.



Fig. 17. Quadrant 102.100d, General view of the excavated area, from S.





Fig. 18. Quadrant 102.100d, view of the collapsed mud-bricks wall and small pits, from S.

In the W half of the quadrant we exposed a layer of clay plaster, which belonged to some sort of installation located at a depth of 80 cm from the top of the stone wall (Figs. 17, 19). The clay surface showed evidence of fire activity, in the form of some black spots. The upper part of a clay jar (*kvevri*) had been inserted into the clay surface; its rim had also been surrounded with clay. It appears that the function of this feature was that of a drainage pit; similar ones had already been discovered in the Early Medieval level in previous excavation seasons.

Interesting ceramic material was unearthed in the Early Medieval level; in comparison with the 2014 campaign we have less fragments of tiles (these can be dated to the IV-V century AD), but a larger number of ceramic sherds. The majority of them belong to cooking outs and fragments of *louteria*. The majority of the vessels are black and grey, while the *louteria* are red-burnished. There were also many jug fragments – most of them are decorated –, fragments of two-handled amphora(s), of bowls whose body was decorated with grooved horizontal lines, and of large pottery jars.

Especially interesting finds were a

cooking pot which contained three impressed sealings (*bullae*), and a vessel for salt, which was found next to it. At the level of the clay installation we also found some fragments of a very large ceramic basin, which were similar to those recovered on top of the altars discovered several years ago, two clay spindle-whorls, and two bone pins. All this material is characteristic of the upper levels of Dedoplis Gora. Some fragments of glass vessels were also found: they can be dated to the V century AD.

Only in the eastern part of the quadrant we managed to explore the level of the Hellenistic palace (Level II). Here, a large



Fig. 19. Quadrant 102.100d, detail of the Level I installation, from S.

accumulation of stones was found under the collapsed mud-brick wall, divided from it by a layer of charcoals (Fig. 20). The floor of the court could be reached only on a 1 x 1 m wide area; this allowed to understand that its surface was originally sloping in W direction.

Excavation of the original surface of the courtyard area was not completed due to the higher priority given to the second goal of the season, namely work aiming at developing a plan for the future preservation of the Hellenistic building. In order for the team of specialists to carry out their preliminary analysis of the wall degradation process and to produce a photogrammetric survey of the surviving walls by Photo-Scanner technology, which yielded a three-dimensional model of the parts examined (see below), it was necessary to uncover the remains of Room 20 and the portion of the portico excavated in 2013-2014 and submit them to careful cleaning.

At the end of the excavation season, the ruins were covered again, an action which is especially necessary for their future preservation, considering their rather unstable present status, and the complex phenomena of structural degradation they turned out to have been subjected to.



Fig. 20. View of the Level II walls and floor, from E.



## Excavations at Doghlauri cemetery

The cemetery of the Aradetis Orgora settlement lies on the second terrace of the Kura, at the Southern limit of the gently sloping Dedoplis Mindori plain, at a height of 20 meters above the level of the river. The area had been previously investigated, between 1979 and 1982, by I. Gagoshidze on behalf of the S. Janashia State Museum (11 EBA, 56 LB/EAI graves and a LBA kurgan were brought to light by this expedition) and, again, between 2012 and 2014 in the framework of salvage excavations connected with the construction of the Ruisi-Agara section of the new Tbilisi-Batumi Highway, which resulted in the excavation of 415 additional graves.

The construction, in spring 2015, of artificial terraces flanking the path of the highway, destroyed a few additional graves and thus caused the necessity of a new salvage excavation. This was carried out between June 22th and July 13th by a team of the Georgian National Museum headed by I. Gagoshidze with the assistance of members (M. Aquilano, V. Scandellari, F. Bertoldi, S. Camellini and M. Furlanetto) and workmen of the "Shida Kartli Archeological project".

Work was carried out over an irregular area occupying a maximal total surface of 260 x 20 m. It involved: 1) documentation of what was left of some graves damaged by the construction of the highway terrace, which were still visible on the section of the excavated area and, 2) excavation of all the graves and related features visible in the delimited area after removing of the 30-40 cm thick humus layer. All the graves had been dug into the 1.5 m thick layer of yellowish clay overlying the 3-4 m thick layer of pebbles conglomerate which constitutes the river terrace; as a consequence, their pits were easily distinguishable, on the background of the yellowish clay, as areas filled with dark-coloured soil and stones.

Excavation resulted into the discovery of 33 different graves and related features. These included: three Early Bronze Age (Kura-Araxes) graves (Nos. 2, 3 and 5), 26 Late Bronze Age graves (Nos. 1, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 26, 28, 29, 30, 31, 32, 33), three of which (Nos. 19, 20, and 26) were apparently cenotaphs, and four stone-filled pits, occasionally containing a few pottery sherds (Nos. 22, 24, 25, 27).



Fig. 21. Doghlauri cemetery, view of Grave No. 2 from N.

Among the Kura-Araxes graves, especially interesting is No. 2 (Fig. 21), whose burial pit was surrounded by a wall of cobblestones. It contained the remains of two individuals, one of which was lying in foetal position in the centre of the pit while the bones of the other had been shifted to one side, and a number of pottery vessels and metal ornaments.

Graves belonging to the Late Bronze Age mostly consisted of individual pit graves covered with a small mound of stones. They were oriented in N-S direction, and the bodies were placed in foetal position on the right or left side, with the head pointing N (Fig. 22). Burial goods include pottery vessels (Fig. 23), metal weapons and ornaments and, notably, for the first time in Doghlauri cemetery, a diadem (Grave no. 15) and the remains of a threshing board (Grave no. 18).

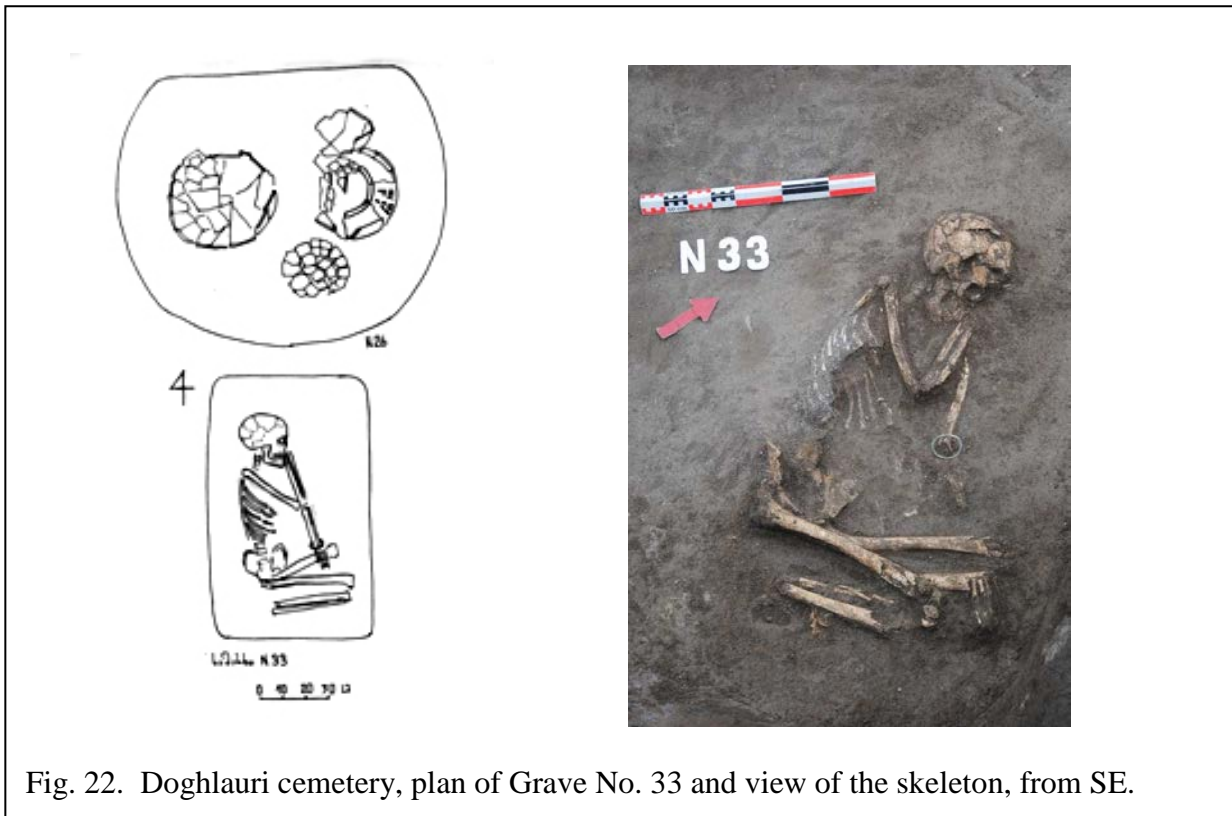


Fig. 22. Doghlauri cemetery, plan of Grave No. 33 and view of the skeleton, from SE.

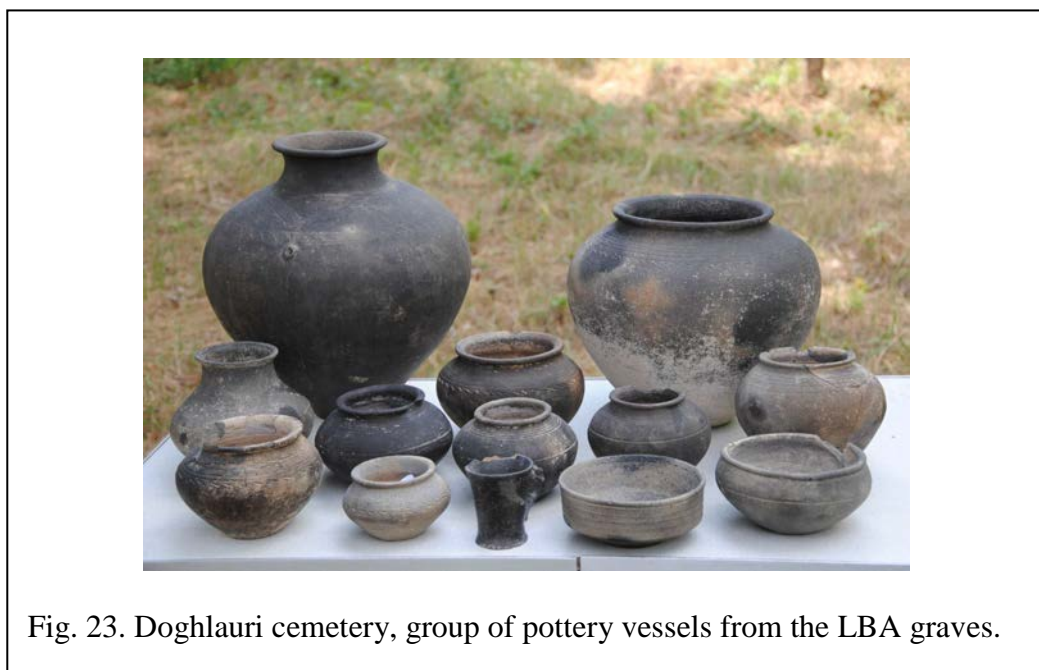


Fig. 23. Doghlauri cemetery, group of pottery vessels from the LBA graves.

## **Preliminary analysis of the palaeobotanical remains from Aradetis Orgora**

During the 2015 season on the Aradetis Orgora Main Mound samples for paleobotanical analysis were taken on the field and processed in the expedition house laboratory by Ketevan Esebua. Among the carpological finds there were mainly cereals and legumes, but also remains of non domesticated plants. Cereals are represented by several kinds of wheat: mainly Einkorn wheat (*Triticum dicocum*) and Emmer wheat (*Triticum durum aestivum*). Nevertheless, a small quantity of Rye (*Secale cereale*) was also discovered. We could assume that, in this part of Shida Kartli, Rye was not cultivated, but was present as a self-grown wild plant in cornfields. We also distinguished few seeds of Pea (*Pisum sativum*), while Bitter Vetch (*Vicia ervilia*) and Faba bean (*Vicia faba*; SP.) are also represented by few seeds. According to a preliminary analysis of the available data, wild plants could be: thorough wax (*Bufoleum rotundifolium*), chaff (*Lolium* sp.), and ball mustard (*Neslia paniculata*).

Carpological finds mainly come from the LBA horizons in both Field A (quadrants 097.100d and 097.099b, loci 1756, 1741, 1740, 1759, 1567, 1772, 1769, 1561, 1791, 1584, 1845, 1812, 1811, 1814, 1951, 1813, 1864, 1869, 1831, 1865, 1879, 1894) and Field B (quadrant 104.099d, 2508, 2516, 2515, 2518, 2509, 2503). On the contrary, only few seeds were recovered from the Kura-Araxes horizons, where samples were taken from layers 2404, 2414, 2424, 2431, 2439, 2443, 2445, 2444, 2447, 2448, 2453, 2451, 2416.

According to our preliminary observations, wild plants from LBA layers in Fields A and B are identical to each other, and few in number. This fact provides reasons to assume that cereals were already prepared for use; in other words they were brought to the settlement after having been purified, and ready to use.

Soil samples were also taken from Field C, i.e. from the area of the Hellenistic/Early Imperial palace. The carpological sample consisted of Emmer wheat, Einkorn seeds, and seeds of domesticated Grape (*Vitis vinifera*). Paleobotanical samples also contained fruit seeds.

## **Preliminary analysis of the faunal remains from Aradetis Orgora and Doghlauri cemetery**

The analysis done upon the animal findings of the 2015 Aradetis Orgora excavation campaign by Veronica Scandellari consisted in preliminary observations of the animal bones both on the field and in the house laboratory. The bones have been washed, restored, photographed and recognised by direct observation (E. Schmidt, *Atlas of Animal Bones for Prehistorians, Archaeologists and Quaternary Geologists* Amsterdam-London-New York, 1972), paying special attention to the possible presence of cut and bite marks on the surface of the bone, with the aim of recognising traces of anthropic activity. When possible, measurements were taken using the guide edited by the Peabody Museum of Archaeology and Ethnology (A. Von Den Driesch, *A Guide to the Measurement of Animal Bones from Archaeological Sites*, Peabody Museum Bulletins, 1, Harvard University, 1976); for teeth findings, special analysis regarding dental wear stage were made, with the aim of indentifying the class age of the animal at death, using Annie Grant's method, as displayed in S. Hillson, Teeth, in *Cambridge Manual of Archaeology* ed. by G. Barker, Cambridge University Press, 2005.

In general, the samples collected yielded huge amounts of fragments of very small to medium/large size, which covered different stages of preservation. The cortex of the bones was eroded in many cases, and they show wide cracks due to the high weathering incidence on their preservation; in spite of this, it was possible to recognise and determine a high percentage of the findings. This allowed to understand patterns of animals distribution and use at the site, through the determination of age, size (and possibly sex) of the individuals at death.



Faunal analysis revealed the presence of the usual domestic species of the area: *Ovis/Capra*, *Bos*, *Sus*, *Cervus*, *Canis*, *Lepus*, *Equus*, of rodents (*Mus/Sorex* and *Castor*), birds (in particular *Cygnus*,) and fish. The frequency of the various species by their numerical representation (in decreasing order) is the following: *Ovis/Capra*; *Sus*; *Bos*; *Cervus*; *Equus*; *Lupus*; *Lepus*; Fish; *Castor*; and *Cygnus*. Taphonomic observations on *Sus* findings seem to suggest that this species was neither completely domesticated nor completely wild, for the bones exhibit features in-between the two species.

To judge from preliminary analysis animals, including both domestic and wild species, were present at the site in particularly high quantity in the Late (and possibly Middle) Bronze Age period. In particular, Late Bronze period loci 1740 and 1844 yielded huge amounts of animal bones (1065 fragments in total), although only 179 of these were diagnostic and could therefore be analysed. The analysis showed that the most represented animal was *Sus* (34%), followed by *Bos* (32%), *Ovis/Capra* (20%), *Equus* (5%), and others (Birds 3%, Rodents 2%, Fish 1%, *Canis lupus* 0,5%). The majority of fragments consists of arms and legs anatomical elements, which derive from the parts of the body that contain less meat (forearms and forelegs, i.e. *radii* and *tibiae*, and the bones of *Carpus* and *Metacarpus*, and *Tarsus* and *Metatarsus*). This fact leads to consider that the finds could derive from a butchering area, especially since most bones were whole or cut precisely in halves. Unfortunately, the high incidence of weather and soil agents on the preservation of the cortex probably erased in most cases the presence of possible cut marks (the few which could be identified were photographed with a microscope camera). The majority of the epiphysis belonged to young and juvenile individuals. This pattern is confirmed by the dental wear stage, which also shows a higher presence of young and juvenile individuals compared to older ones.

The animal bones from the Kura-Araxes levels were in a very bad state of preservation. The cortex is even more deeply eroded than in those from the LB levels, the incidence of weathering and soil agents is higher. Furthermore, their contexts of recovery often consisted of ash layers, with the bones heavily affected by heat and burning. On 226 diagnostic fragments from the entire lot of KA levels, the most represented animals were *Ovis/Capra* (67%), followed by *Bos* (14%), *Cervus* (7,5%), *Sus* (4%), *Lepus* (3%) and others (Birds 2,2%, *Lupus* 0,4%, Fish 0,4%, *Equus* 0,4%, *Castor* 0,4%). This displays a pattern where hunting was still a main feeding resource besides sheep/goat breeding.

Finally, two graves from the Doghlauri cemetery contained some animal bones. The conditions of preservation of these fragments was unfortunately very poor: in fact the bones had been affected by weather and soil agents, and their cortical layer was completely eroded.

Two species have been identified from Grave 7 of Late Bronze period. The sample consists of a small amount of fragments:

- 1 Cattle radius broken just under the proximal epiphysis, which belonged to a right arm. It is possible to recognise the fusion line with its ulna, which is lacking. No accurate measure can be taken, but the breadth of the proximal epiphysis is ca. 8 cm, suggesting a middle-sized animal, possibly a juvenile individual;
- 1 broken bone from the distal row of the *Carpus* of a Cattle (*capitato trapezoide*), still from the right arm. Also in this case it was impossible to take precise measurements, but the breadth of the fragment is ca. 3 cm, which suggests again a middle-sized individual, possibly a juvenile;
- Various small fragments belonging to a Sheep/goat maxilla in the zygomatic area of the cranium, with 8 teeth no more in locus. The teeth are broken and eroded as the rest of the bone sample; they had completely lost their enamel layers, so that it is impossible to try any attribution of age of death of the individual. Anyway, the teeth are very small, and the presence of the empty crown of a Molar suggests that it was still in eruption at the moment of death, an event that generally occurs between 9 and 12 months. This observation is still uncertain, because the determination of the age of death by the eruption of teeth is more precise using mandibles;

- 1 unfused half distal epiphysis of a Sheep/goat Metacarpus or Metatarsus, more likely the second one, which suggests an infant or juvenile individual, for the distal epiphysis in these bones start to fuse after 12 months in sheep/goat.

One species has been identified from the various uncertain fragments contained in Grave 12, also of the Late Bronze period:

- 1 fragment of *Incisura radialis* from a left Cattle ulna, measuring ca. 3 cm, which is coherent with the dimensions of the radius found in Grave 7.

The presence in both graves of bones belonging to the same skeletal region, possibly killed at the same stage of life (juvenile), may suggest the habit to offer Cattle forearms to the buried individuals, a custom which may appear peculiar for this part of the limb is the part with less meat on it. On the other hand, one may be dealing with a deliberate choice, driven by the desire not to waste meat on burials, but at the same time to present a good offering to the dead.

The sheep/goat bones belong to an infant individual, such as a lamb. This is the most common species used throughout human history both for ritual and for burial offerings; its presence in the Doghlauri graves further confirms the worldwide diffusion of this custom. According to one theory, lambs are so often chosen for such offerings because sheep and goats breed more frequently than cattle, and the statistics related to successful pregnancies are higher for sheep and goat than for cattle.

### **Study of the human osteological remains from the Doghlauri cemetery**

In the course of the field season, physical anthropologist Francesca Bertoldi analysed the human remains from 10 graves recovered from the salvage excavation by Prof. Gagoshidze at the Doghlauri cemetery. These mostly consisted of fully articulated adult skeletons dating back to the Late Bronze age. The skeletal remains have been recovered paying particular attention to taphonomical data such as: orientation of the grave, position of the body and of the skeletal segments, ordinary position of the head, relation with the grave goods, contemporary or delayed burial of more than one subject in multiple burials. The samples have been processed through an accurate cleaning with running water, followed by slow drying in the shade, given the nature of the clay soil adhering to them, and then reassembled with water-based glue.

The anthropological and archeological analysis of the human remains and of paleoenvironmental samples from burial contexts consisted of:

- sex and age determination,
- metrical, morphometrical and morphological analysis of cranial and post-cranial bones,
- analysis of discontinuous or discrete traits and of markers of occupational stress,
- paleopathological analysis of bones and teeth,
- sampling of teeth to be evaluated by x-rays for age determination following Cameriere's method,
- sampling of teeth for stable isotope analysis,
- field sampling of human teeth and bones for DNA analysis,
- field sampling of soil for pollen analysis,
- archaeozoological analysis of animal bones associated with grave goods in the burials (by Veronica Scandellari).

The graves with human remains that have been excavated and analysed from a taphonomical and anthropological perspective are:

- Grave no. 2, dating back to Early Bronze Age (Kura Araxes period);
- Graves nos. 7, 10, 12, 13, 15, 17, 18, 23 and 33, dating back to the Late Bronze Age.

Human skeletal materials are generally in a bad preservation state, with cortical surfaces of long bones eroded and cracked, epiphyseal surfaces incomplete and in some cases absent (such as in vertebral bodies), dental enamel damaged with enamel defects hardly observable, because of a variety of post-depositional factors.

Age and sex determination gave a sample formed by the following subjects:

<b>GRAVE</b>	<b>SEX</b>	<b>AGE</b>
2	F?	35-45
2 sp	F	mature
2 sp	M	young adult
7	F	35-45
10	M	adult
12	M	25-30
13	F?	adult
15	JUV	15-16
17	M	35-45
18	F?	adult
23	M?	mature
33	JUV	14-15

The group is formed by 12 subjects (5 males, 5 females and two sub-adults); few children bones discovered in Grave no. 5 have unfortunately not been recovered. Stature estimation values could not be calculated because of the incompleteness of long bones, while preliminary paleopathological data recorded the common presence of dental pathologies and *cribra orbitalia*.

### **Sampling for soil micromorphology analysis**

The geoarchaeological and soil micromorphological studies carried out in 2015 on the archaeological sedimentary sequences of the Aradeti Orgora site continue the work started in 2013 by Giovanni Boschian (University of Pisa), and continued by Valentina Villa (PhD student, University of Paris 1) in 2014. Archaeological soil micromorphology deals with the study of soils and sediments at microscopic scale, aiming at understanding their origin, retracing their history and identifying the environmental and anthropogenic signatures that characterise them. Micromorphological analyses are carried out on undisturbed and oriented sediment monoliths that preserve the original organisation and features of soils and archaeological sediments. Monoliths are collected with special care in the field, and processed in laboratory by impregnating them with resin, and finally cut into slides 30 micron thick, which can be observed under a petrographic microscope. Micromorphological studies of the collected samples will be carried out in Italy, and will be focused on the sedimentary record of human activities in the site, in order to better understand the stratigraphic sequence, and the site-formation and site-modifying processes. The aim is to recognise specific site-settlement activities to understand the use of the site and of its areas.

Nineteen undisturbed monoliths of sediment were collected in the field, in the period from July the 10th to July the 18th, from all excavation areas (Fig. 24).

Sampling was oriented at solving two main issues:

- construction techniques and use of the combustion features. The characteristics of these installations look rather homogeneous throughout the site, but local functional differences may be put into light by the identification of microstructural characteristics and differences in the fuel. Moreover, micromorphological studies will show the differences between superimposed installations, possibly explaining the reasons for their rebuilding, as well as some differences in their localisation.
- fine-scale characteristics of prepared floors and plastered walls. Monoliths from floors and occupation surfaces were collected by including the prepared floors, which include high amounts of vegetal material, as well as the overlying layers, which contain traces of past human activities (processing of cereals, stabling, etc.) and help to infer the use of different areas and the organisation of the settlement.





a



b

a. Sample localisation in installation 1823, area 097.099B. b. Detail of sample localisation.



c



d

c. Sample localisation on the western profile, area 105.099. d. Monolith sample AO15/2427-2423.

Fig. 24. Sampling for soil micromorphology analysis.

Other samples were collected from the stratigraphic profiles and from installations, in order to solve specific questions about their origin.

### Sampling for palaeoenvironmental research, archaeometric analyses, radiometric dating

In the framework of the long-term program of palaeoenvironmental research about the Aradeti Orgora microregion, samples for palaeobotanic and palinological analyses were taken from some of the graves of the Doghlauri cemetery and from the profiles of the excavated areas in both Fields A and B. Like in the previous years, they will be analysed by Dr. Eliso Kvavadze (GNM).

The study of malacofaunal material from the Aradeti Orgora excavations has been entrusted to Dr. Marco Palmieri (Bologna), who will carry it out in Italy during the next winter. In order to provide him with a reference collection, present-day examples have been collected by the members of the expedition in different environments in the area surrounding the site.

Due to the impossibility by Dr. Elisabetta Boaretto (Weizmann Institute of Science, Rehovot, Israel), responsible for <sup>14</sup>C analysis at the site, to take part in the field season, samples for radiometric dating were collected by the members of the team according to her instructions in the course of the excavation. Sampling strategy this year focused on the one side on the continuation of the pilot study for the high-precision dating of the Kura-Araxes sequence in quadrant 105.099c

(Field B) initiated last year and, on the other one, on obtaining a number of reliable dates for the MB-LB parallel sequences from the soundings in quadrants 097.099b (Field A) and 104.099d (Field B), to be associated with the stratified pottery unearthed there.

Like in the previous years, samples were also collected for archaeometric analysis of obsidian fragments and pottery sherds of different periods (Kura-Araxes, Middle and Late Bronze), which will be analysed in Italy (persons in charge Profs. D. Visonà, University of Padua, Prof. L. Lazzarini, IUAV University of Venice), and respectively in France (person in charge Dr. B. Gratuze, CNRS Bordeaux).

## Experimental archaeology

In order to better understand the technology of ancient firing installations recovered in archaeological contexts in the Shida Kartli region, M. Aquilano, D. Darejanashvili, and L. Gervasi decided to try to produce modern replicas of EBA (Kura-Araxes) and LBA hearths/fireplaces discovered at Aradetis Orgora and other archaeological sites of the region (e.g. Natsargora, Kvatskhela, etc.) and to use them in controlled conditions and with different types of fuel. As for the LBA firing installation in particular, one main issue was to understand the function of the recurring preparation of alternating layers of pebbles, pottery sherds and clay which is typical of the LBA installations discovered in 2014 and 2015 at Aradetis Orgora. For producing the replicas, we decided to use clay from a place next to the site (Doghlauri village), since this area is rather rich in clay; in fact, all around, down to 60 cm, a thick clay layer is present. We first sieved the clay and we added water to it, leaving it to rest for three days, so that it could absorb the water; during this period, we covered the paste with a tent and uncovered it every day for one hour. After three days we added sand and quartz (mineral tempers) and barley straw (vegetal temper) to the paste and mixed it for a long time using feet and hands, and constantly adding water. The preparation process was long because the clay from this area is already mineralised by natural minerals (this is the reason why its colour is whitish); for this reason the clay gets dry sooner compared to other varieties of clay. For the experiment we used two different types of fabric: for the Kura-Araxes hearth we added more sand and quartz (temper 1) to the clay, while for the Late Bronze hearth we didn't add much sand and we didn't mix quartz into it (temper 2).



Fig. 25. Construction of the replica of the Kura-Araxes hearth (left) and its explosion during open-air firing (right).

The next step consisted of making the object (hearth/fireplace). At first we tried to produce a hearth simulating the fixed hearths with inner projections typical of the Kura-Araxes period in the Shida Kartli region (Fig. 25). When we finished making it we left it dry in a closed environment, in order to avoid that it could be damaged from wind or intense sun. We then tried to fire it in an open fire, using pine wood as fuel, but when the fire reached 700 degrees the artefact exploded. We concluded that the hearth should not have been fired separately, but should have maybe been placed directly into its final destination, into a cavity dug into the soil, when it had reached "leather hardness", and not when it was completely dry, and then fire should have been lit directly into it, and the firing process should have been more gradual, with temperature increasing day after day of a few degrees.

We also tried to replicate a Late Bronze fireplace (Fig. 26). First we constructed a soil platform, and delimited it with stones and bricks. We then built the fireplace on it, by using a layer of large pebbles from the Aradetis Orgora site as a base. Over the large pebbles we built the slightly raised fireplace's walls using the prepared clay; then we plastered its base with the same clay. On this thin clay layer we fixed a first layer of medium-sized pebbles; we coated the surface of this again with clay. On this clay plaster we laid a layer of pottery sherds; over the sherds, we laid another layer of clay, to be used as firing surface.

We left the fireplace dry for three days in a covered environment, in order to avoid that it got exposed to direct sun. We then lit a fire inside it. On the first day we used pinecones, straw, wood and animal dung collected on the Aradetis Orgora mound as fuel. We reached a temperature of 860 degrees (measured by thermocouple). During the experiment we were not able to maintain a stable temperature till the moment when fire transformed into embers (where we could maintain a stable temperature of 650-660 degrees); after this, we successfully fired in the fireplace a small pot made by us using the same clay of the fireplace sides (temper 2). On the next day, we repeated the experiment by using straw, dung and wood; we reached 780-800 degrees, but it was difficult to maintain a stable temperature. In particular, dung maintained the fire for a longer time than the remaining fuels, but it could not maintain a higher and stable temperature. When we repeated the experiment for the third time, we could reach a maximum of 830 degree, and we also managed to reach a stable temperature by using a wooden log with a diameter of ca 15-20 cm. We tried to fire in the fireplace another small pot made by us with a different clay mixture, namely the same used



Fig. 26. Construction (left) and use (right) of the replica of the Late Bronze fireplace.



for the Kura-Araxes hearth (temper 1): the pot crashed like the Kura-Araxes hearth. We also burnt some animal bones in the fire, in order to understand how their colour and structure were modified depending on their location within the fireplace.

After terminating the fire, we measured how long it took to the firing surface to get cold: we could thus ascertain that even after 17 hours it was still hot, most probably due to the presence of the sherds and pebbles layers below it, although this point needs to be further confirmed by comparing its temperature with that of a simple clay surface without pebbles and sherds preparation.

Before concluding the experiment, we collected samples of pure clay, a sample of clay prepared and mixed by us, fragments of the Kura-Araxes hearth, two fragments of the LB fireplace (one very close, and one less close to the fire), fragments of the firing surface, several pot sherds and pebbles, and pieces of the fired pot (to compare the difference between the fragments of hearth and the fired pot) for future laboratory analyses.

### **Diagnostic campaign for the site's preservation**

The first step of a project aiming at the preservation of the Dedoplis Gora archaeological site was carried out in July 2015 during the field campaign of the Georgian-Italian archaeological expedition. It involved an interdisciplinary survey of the site by a group of specialists (a student in architecture, E. Venier, and a geologist/restorer, F. Fratini) in order to inspect and identify structural evidence for future conservation.

Particular interest was paid to the excavation of Room 20 in the NE portion of the Hellenistic palace, and to the porch in front of it. A graphic rendition of the surviving walls was realised using Photo-Scanner technology, which provided a three-dimensional model of the parts examined (Fig. 27). During this first inspection the progress of the wall degradation was carefully examined along with the static conditions of the buildings. The whole site was thoroughly recorded using photographic documentation for planning future restoration programs.



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Fig. 27. Preliminary photogrammetric survey of room 20 of the Hellenistic palatial building.



### Sampling of materials of the building structures

Sampling of representative construction materials, such as bricks, earthen bedding mortar, sandstone ashlars, river pebbles, wooden beams, earthen plasters were taken in particular from Room 20. These materials will be analysed in the laboratory in order to determine their composition and mechanical characteristics. These data are necessary for the restoration process.

### Observed degradation phenomena

Today the palace is still standing but in an unstable status of conservation. The turning point in the life of the palace was the result of a terrible fire that likely occurred around 70 AD, damaging it heavily. This event probably originated from the overheating of the earthen bedding mortars (deducted by shrinkage and developed cracks, fragmentation of almost all the basalt pebbles). The degradation of the raw materials caused a strong de-cohesion of the masonry (Fig. 28). Subsequently the atmospheric erosion phenomena easily affected the structures, fracturing the mortar and washing away portions of the masonry. In addition the freezing-thaw phenomena, frequent in the region, deteriorated the section of the masonry less touched by the fire.

### Preliminary stage of intervention

The restoration process may be divided into three stages, aiming to show different aspects of the life, development and technology employed in the palace. The first step envisions clearing all of the area of the palace on top of the site, thereby shedding light on the Hellenistic structure of the building. During this part of the restoration process, the stability of the walls will be ensured and the ruined features will be maintained. This step will assist the visitors to the site to understand the shape of the palace and its overall function. As a second step, a room could be reconstructed in a partial way, showing the engineering technology of the wooden beams and plaster adjustments. The



Fig. 28. Detail of one of the walls, showing the main degradation phenomena affecting the building.

third step envisions the reconstruction of the entire corner tower allowing the tourists to view the entire building from a higher visual perspective.

The inclusion of a path through the archaeological excavations of the earlier periods may complete the conservation plan. The two trenches are located on the Eastern and Western slopes of the hill, the former reaching the 4th mill. BC and the latter the 3rd mill BC. This path, with an appropriate single, would allow the visitor to understand the importance of the site and its continuity of occupation: a continuity with a visual impact that few other archaeological sites in Georgia could offer.

This project embodied two main aspects of cultural heritage preservation: architecture and archaeology. The emphasis on conservation of ancient structures and archaeology has the goal of preserving for the visitors not only ancient technological knowledge, but also ancient sensitivities for their architectural environment. In order to do this, conservation of structural data must be studied in order to plan for further restoration. In Aradeti Orgora the important archaeological heritage can be preserved through site management strategies that take into account the unique monumental character and historical importance of the site.

## **Conclusions**

The 2105 excavation season of the "Georgian-Italian Shida Kartli Archaeological Project" was very productive in all respects: not only were all the main objectives of the excavation reached, but some unexpected important discoveries were also made. In particular: 1) the Kura-Araxes levels in Field B yielded a portion of a large building in which a zoomorphic ritual vessel and fragments of two additional ones were recovered and, 2) both stratigraphical soundings yielded, for the first time in the Shida Kartli region, evidence of occupation of the site during the Middle Bronze period.

The aim of the first three seasons of work at the site (the recovery of the complete sequence of pre-classical occupation of the Aradeti Orgora Main Mound) can be considered as accomplished through the completion of the two stratigraphic soundings (Field A and B).

Interdisciplinary work by different specialists allowed to collect and process a huge amount of data concerning the ancient occupation of the Aradeti Orgora territory and its evolution in the course of time, by adding new fields of investigation (experimental archaeology, analysis of the ancient human remains, of the malacological data, etc.) to those already practiced in the course of the previous seasons.

Finally, the continuing investigation of the Late Hellenistic/early Imperial palace this year was especially focused on gaining a better knowledge of the building materials and of their state of preservation under the control of an architect and an expert restorer, with the aim of avoiding further damage to the very fragile structure of the walls and of planning a future intervention of preservation.

## **Acknowledgements**

Thanks are due to Prof. Davit Lordkipanidze (General Director, Georgian National Museum) and Dr. Zurab Makharadze (Director of Archaeological centre, GNM) for granting us the permission to excavate at Aradeti Orgora and for their constant support to our activities.