

# ALEXANDRIA: EXCAVATIONS AND PRESERVATION WORK ON KOM EL-DIKKA, SEASONS 2012 AND 2013

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**Abstract:** Archaeological research in the 2012 and 2013 seasons was focused on excavations in area U in the northwestern part of the site of Kom el-Dikka in Alexandria. Previously discovered structures of early Roman age continued to be explored. A large *forica* and other buildings have been found to follow an unusual, strictly geographical orientation, the reason for which has yet to be ascertained. A large group of burials belonging to three successive phases of the early Islamic cemetery (8th–12th century AD) was excavated in the same area. Additional testing in already cleared auditoria T, U and B as well as next to auditorium H helped to verify issues of stratigraphy and chronology of the academic complex to which these auditoria belonged.

Preservation work focused mainly on an overhaul of the mosaic shelter (Villa of the Birds), including treatment of mosaic floors. Equally important tasks were the conservation of remains of domestic architecture in area W<sub>1</sub>N, restoration of a well in the cistern (area L), and finally preservation of auditorium RS.

**Keywords:** Alexandria, late antiquity, auditoria, amphorae, mosaics, conservation, Islamic cemetery

The fieldwork at Kom el-Dikka, sponsored jointly by the Polish Centre of Mediterranean Archaeology, University of Warsaw and the Egyptian Ministry of Antiquities, continued with varied intensity during the respective two seasons. As before, the agenda included diverse tasks covering both the conservation and the archaeological program.

Activities were conditioned by the requirements of an ongoing Site Presentation Project, approved by Egypt's Supreme Council of Antiquities back in 2005. With regard to archaeological excava-

tion, this revolved largely around already running projects, beginning with further investigations of early Roman structures in area U, exploration of another part of the medieval cemetery in the same area and, finally, a study and verification of the stratigraphy and chronology of the auditoria complex (areas AS, CW, G and H). Preservation work focused on several monuments belonging to the late Roman (4th–7th century AD) phase of urban development in the area. Work was conducted in the domestic quarter (area W<sub>1</sub>N, east of the R4 street), the cistern

(area L) and auditoria (area CW). The precious early Roman mosaics in the mosaic shelter (Villa of the Birds) again necessitated maintenance conservation [Fig. 1].

Study and documentation activities centered on ceramological and anthropological studies. Medieval glazed pottery originating from various production centers in Sicily and southern Italy, mostly protomajolica wares from the 13th–14th century AD [see Fig. 9 bottom left], was studied by Anna Zawadzińska. Skeletal

material from the medieval necropolis, excavated in the past in areas M, CW and AS, was examined by Robert Mahler; measurements and morphological data were collected from some 50 individuals identified in the process. Off site research on the material will be continued.

Following customary practice from previous seasons, the team offered field training in basic excavation and recording techniques to a number of members of the junior staff from the Egyptian Ministry of Antiquities.

#### Team

*Dates of work:* 6 February–30 June 2012; 4 February–31 August 2013

*Director:* Dr. Grzegorz Majcherek, archaeologist (PCMA UW; 2012, 2013)

*Deputy director:* Renata Kucharczyk, glass specialist (PCMA UW; 2012, 2013)

*MSA representatives:* Nesreen al-Goma (2012), Mona Othman Hussein (2012), Mona Mohammed Abdullah (2012), Iman Yussuf (2012), Amani Shaaban (2012), Marianne Samir Mareed (2013), Ibrahim Mustafa (2013), Edmon Fikry (2013), Karim Adel Abd el-Fatah (2013), Mohammed Ismail Omar (2013)

*Archaeologists:* Emanuela Kulicka (independent; 2012, 2013), Katarzyna Kapiec (independent; 2012), Agata Smilgin (independent; 2012, 2013), Alicja Jurgielewicz (student; 2012), Walter Wójtowicz (independent; 2013), Marcin Romaniuk (student; 2013)

*Archaeologist/ceramologist:* Anna Zawadzińska (PhD candidate, University of Warsaw; 2012, 2013)

*Epigraphist:* Prof. Adam Łukaszewicz (Institute of Archaeology, University of Warsaw; 2012, 2013)

*Numismatists:* Prof. Barbara Lichocka (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences; 2012, 2013), Katarzyna Lach (PhD candidate; 2012, 2013)

*Anthropologist:* Robert Mahler (PCMA UW; 2012)

*Conservators:* Ewa Parandowska (National Museum, Warsaw; 2012, 2013), Arkadiusz Ostasz (freelance; 2012, 2013), Szymon Gąsienica-Sieczka (freelance; 2012, 2013), Zygmunt Nawrot (freelance; 2012, 2013)

*Architects:* Aureliusz Pisarzewski (freelance; 2012, 2013), Marcin Polak (freelance; 2012, 2013), Karolina Majdzik (PhD candidate, Wrocław University of Technology; 2013), Anna Kubicka (2013)

*Documentalist:* Agnieszka Dzwonek-Kozieł (2013)

#### Acknowledgments

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## ARCHAEOLOGICAL EXCAVATIONS

### AREA U

The field seasons in 2012 and 2013 saw a continuation of exploration undertaken last season in the northwestern part of the site. Investigations in this area had been initiated back in 1980–1981 (Rodziewicz 1991a) and were continued in 1990–1991 (Majcherek 1992: 7–10). In the 2012 campaign, research was focused in the northern part of area U, in a rather

restricted spot forming a triangle roughly 12 m by 15 m (trench supervisors Emanuela Kulicka and Alicja Jurgielewicz). The upper strata in this area corresponded to the construction and subsequent occupation of the late Roman civic center, including the nearby Portico, Bath and complex of lecture halls. Although largely disturbed by early Islamic graves of the so-called Lower Necropolis (8th–9th century AD),

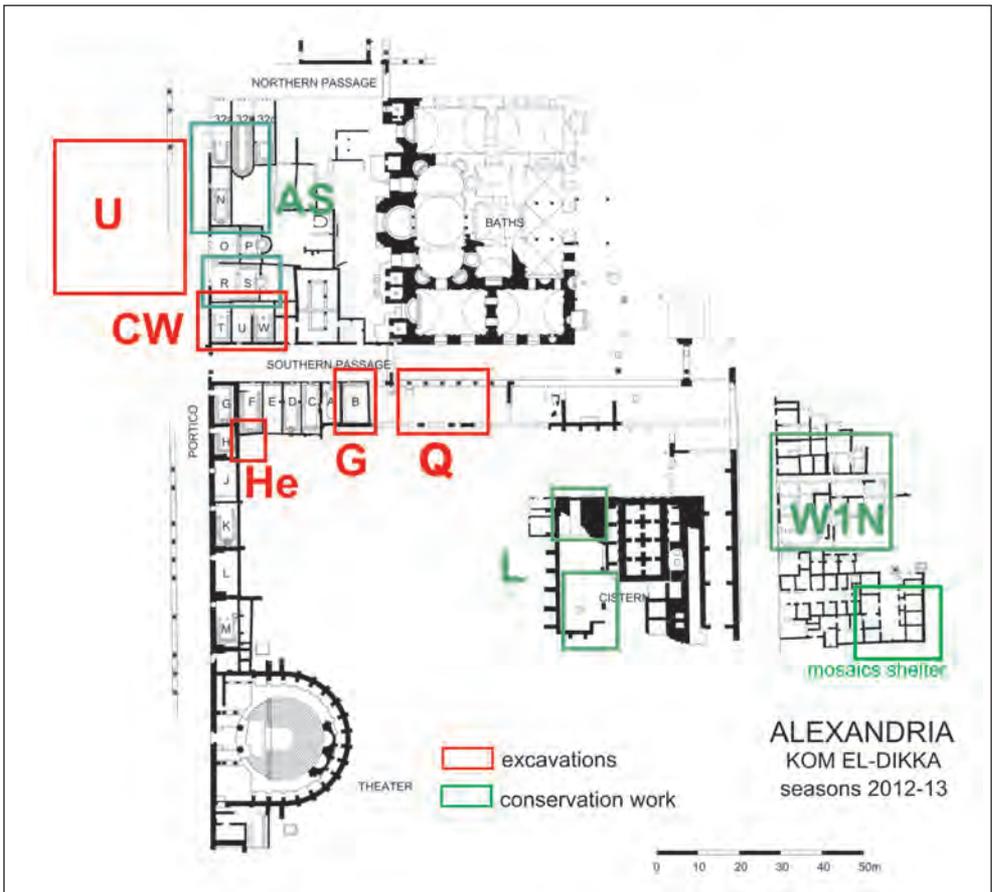


Fig. 1. Kom el-Dikka site: areas of excavation and conservation work in the 2012 and 2013 seasons (Drawing W. Kolqataj, D. Tarara)

it provides additional evidence for the chronology of the area in the late Roman period. It is clear that the area located west of the Portico was left open in this period, being used most probably as a park or large square surrounded with porticoes (Rodziewicz 1991a: 76–77). One should bear in mind that the Tychaion, one of the architectural landmarks of ancient Alexandria, is located traditionally in the immediate neighborhood (McKenzie and Reyes 2013). According to sources from the 4th–5th century AD, the temple stood most probably close to the intersection of the city's main street L-1 (Via Cano-

pica) with street R5. Consequently, our presumed square/park could have functioned as a kind of public space, linking the Tychaion with the complex of lecture halls.

The artefactual material recovered from this strata consisted of some rather badly corroded and mostly illegible coins of late Roman date (including a coin of Constans II), lamp fragments, glass finds and pottery, all belonging to the 4th–6th century AD horizon. The pottery represented the usual range of types. Apart from a few examples of Egyptian tablewares (both ERSA and ERSB) [Fig. 2:1–2] and

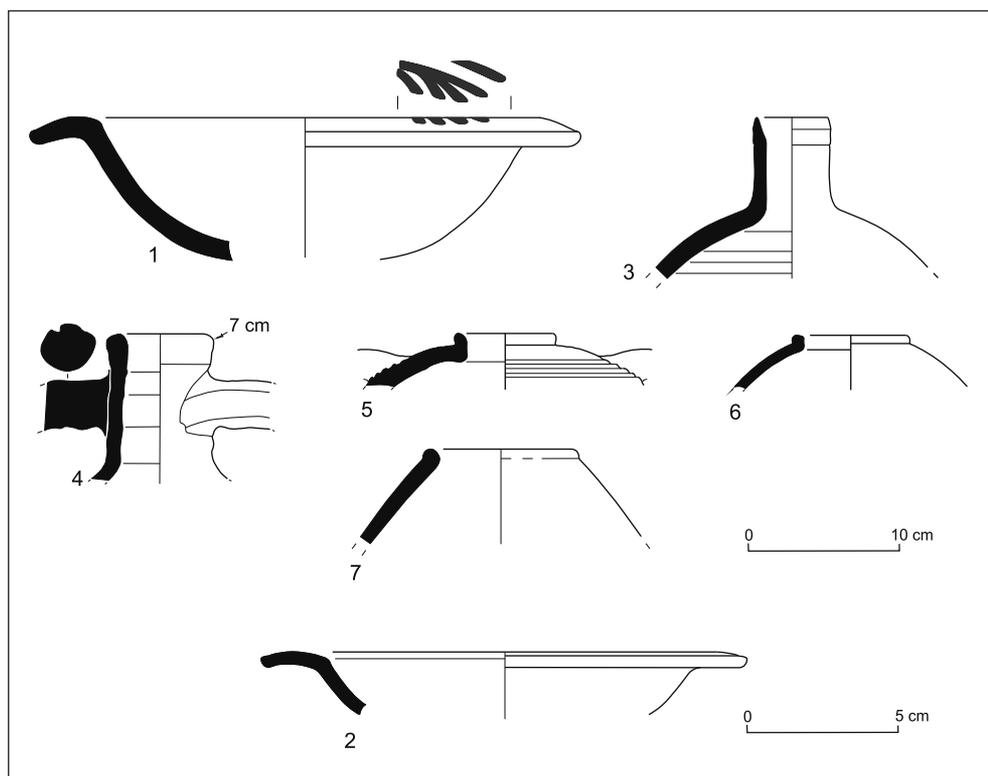


Fig. 2. Selection of Late Antique pottery: 1 – ERSA bowl; 2 – ERSB bowl; 3 – Aswan-made costrel; 4 – LRA1; 5–7 – Gazan amphorae (LRA4) (Drawing A. Dzwonek, K. Juszczyk)

some Aswan-made kegs [Fig. 2:3], most of the recorded examples belonged to common Mediterranean amphorae types of both Egyptian and foreign origin. Late Roman I amphorae both of earlier (LRA1a) [Fig. 2:4] and later (LRA1b) variety were present (Pieri 2005: 70–85), along with some occasional sherds of LRA2. Gazan amphorae (LRA4) traditionally formed a numerically predominant group. As in other deposits of the same age analyzed at the Kom el-Dikka site, this group included at least three distinct forms (LRA4b–c) [Fig. 2:5–7], representing different production periods (Majcherek 1995). The stratum yielded also a considerable number of fragmentarily preserved glass finds. According to the project's glass specialist, Renata Kucharczyk, the assemblage comprised mainly simple and undecorated products of local manufacture intended for everyday use. It included chiefly various types of lamps, bottles and jugs with ribbed handles, and bowls with diverse rims furnished with high-ring bases, made of yellowish-greenish glass of low quality. The distinctive feature of this material is its plainness. Very limited numbers of vessels were blown into a mold to obtain decoration. Vessel forms represented standard late Roman types recorded at Kom el-Dikka as well as from the excavations in Marina el-Alamein and Marea (Kucharczyk 2008; 2010a; 2010b; 2011). The assemblage included also quite a few residual glass fragments from the 1st–3rd century AD: toilet bottles, beakers and bowls, a few made of colorless glass. Of greatest significance is a large fragment of a cast-glass mosaic floral plaque, which presents vegetal decoration composed of sections and segments of preformed composite mosaic canes and colored strips

arranged symmetrically as stylized flowers, fruits, leaves and stems set into a black field (Kucharczyk forthcoming). Plaques of this kind were being produced in Egypt most probably from the late Ptolemaic to the early Roman period.

A huge building collapse, a continuation of the tumble already recorded earlier in the 2011 season, was cleared throughout the trench. The substantial construction trench of the nearby Portico and drainage channel built along the western side of the stylobate had cut through it. In turn, both the channel and stylobate suffered from the wholesome dismantling of standing walls that took place most probably already in late antiquity (Majcherek and Kucharczyk 2014).

Repeating the results of earlier work in the area, a substantial quantity of loose fragments of painted plaster and numerous broken architectural limestone elements were found in the collapse. These included: fluted half-columns, capital fragments and denticulated cornices [see Fig. 5 top left]. A large amount of broken marble revetment representing imported and Egyptian stones (travertine, porphyry, green *lapis laeodemonius*, various Aegean marbles, etc.) was also noted. Among other finds one should mention a portable *mancala* game board cut in a block of soft limestone [Fig. 5 top right]. The tumble itself was found to be over 1.20 m thick in places. Its westward slumping may be interpreted as a result of destruction of a yet unknown structure further to the east. The collapse was formed at the end of the 3rd–beginning of the 4th century AD and subsequently covered with accumulation associated with the construction and usage of the civic center (including Portico and Bath).

Immediately below some remains of early Roman structures were cleared. They formed the end section (2.70 m long) of a sewage channel of the large *forica* discovered last season (Majcherek and



Kucharczyk 2014: 33–35) [Fig. 3 bottom]. On the western and northern sides of the channel, several patches of flooring made of assorted fragments of marble tiles were cleared [Fig. 3 top]. A fragmentary preserved section of the perpendicular wall marks the end, or rather the beginning of the channel. A small hole pierced in this wall (approximately 18 cm in diameter) at floor level was most probably used as an outlet for water spilling over the pavement, draining it into the channel. No evidence of a water supply system has been found so far. Users may have actually brought the water needed for hygienic purposes with them in vessels. The western limits of the latrine could have been marked by a huge wall, the negative of which parallels the channel at a distance of approximately 2.30 m [Fig. 4]. Remnants



Fig. 3. Latrine channel: top, northern end; bottom, looking south (Photos G. Majcherek)

of this wall found to the north of the sewer consisted of a short, preserved section; it was 0.80 m wide and was built of large blocks exceeding, each one, 0.40 m in length. The location of the entrance and communication with other structures previously uncovered in the area remains to be determined, although the building follows the same orientation.

The *forica* uncovered in area U represents an unusual type. Public latrines

discovered previously at the site featured a typical rectangular layout with a waste channel running along the four walls, sometimes arranged around a central peristyled courtyard. Such structures of late Roman date were uncovered next to the bath complex, in areas C, AN (Rodziewicz 1991c with earlier bibliography), and F (Woźniak 2008). The presently uncovered latrine has a linear layout, however, with a single channel running along its east

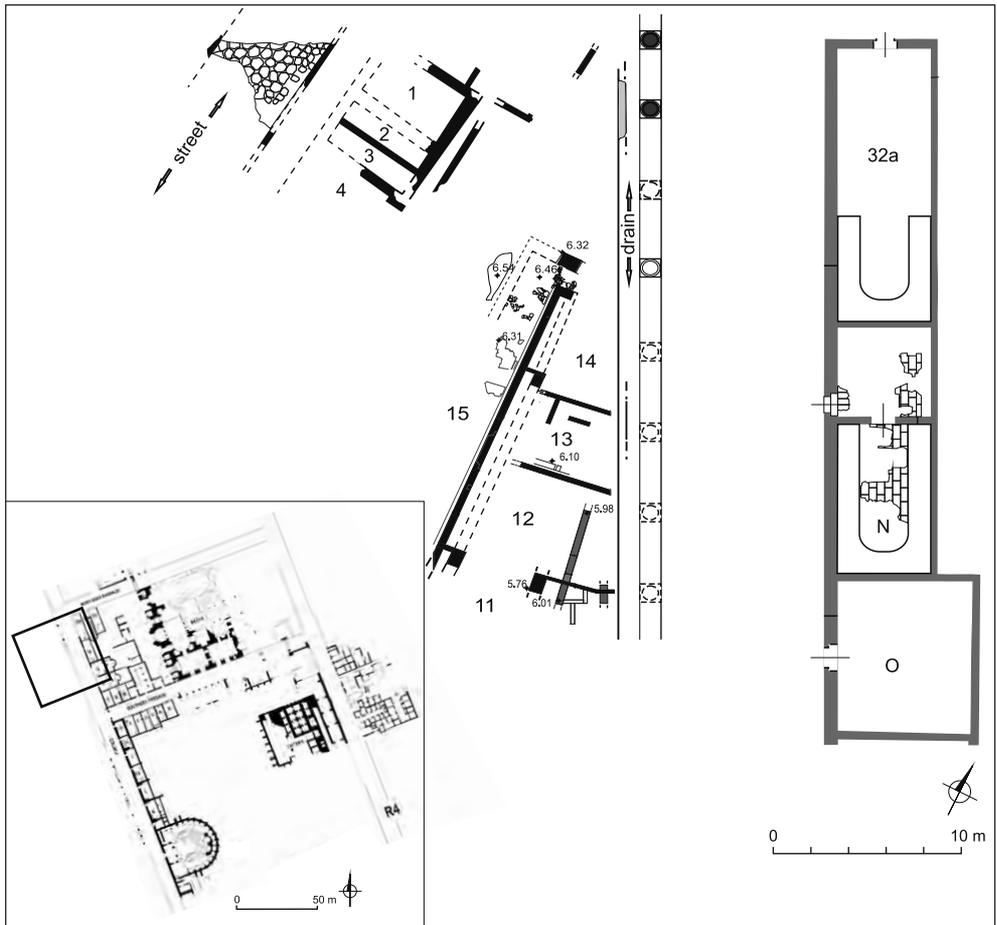


Fig. 4. Plan of early Roman structures in area US  
(Drawing M. Polak, A. Pisarzewski, G. Majcherek)

wall. This layout is paralleled by only one example, that is, a linear *forica* from the Largo Argentina area in Rome (built at the end of the 1st century BC).

A large number of finds (mostly pottery, glasses and some fragmentarily preserved terracotta figurines) from the excavation of the latrine and its surroundings set a relatively sound chronological basis. Some come from the occupational deposits in room 12, while others were found in the latrine fill. At this stage of research one

can assume that the initial phase of latrine usage is dated securely to the beginning of the 1st century AD. However, most of the objects that could be dated came from the 2nd–3rd century AD. Exploration of the sewer produced some pottery fragments belonging to forms recorded last season in the fill of another, smaller latrine discovered in room 13 to the north. Standing out among them were Egyptian imitations of common Cypriot Sigillata bowl (form P40). Of interest is an extremely large

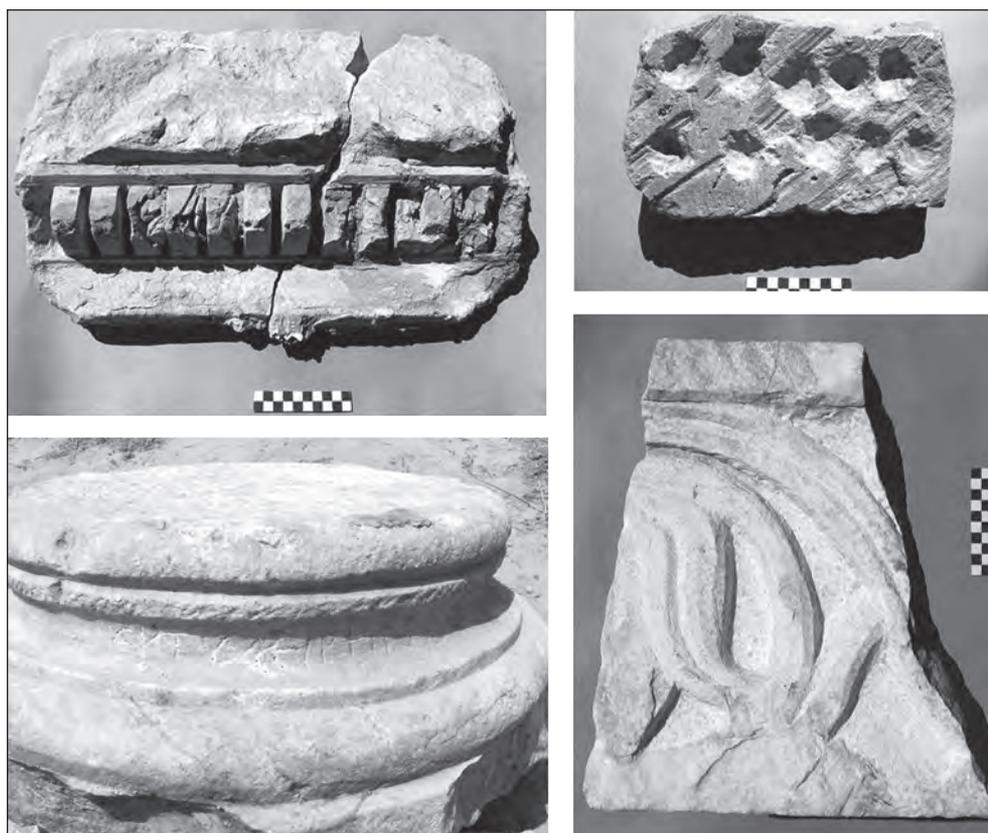
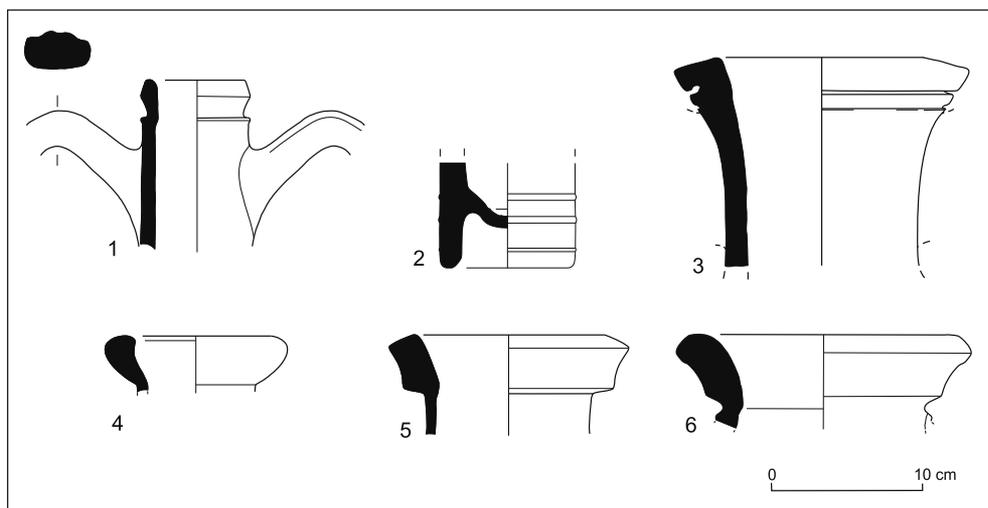


Fig. 5. Limestone and marble elements from the excavations: top left, fragment of a limestone cornice; top right, limestone mancala game board; bottom right, fragment of a marble frieze reused as a latrine gutter; bottom left, inscribed marble base from area Q (for the bottom two, see below, pages 43 and 48 (Photos G. Majcherek)

number of foreign common wares found in the accompanying strata. There was a marked presence of transport amphorae originating mostly from the Aegean and Palestine. One should mention Kapitän II [see *Fig. 6:1–2*], Kingsholm 117 and some Cretan types (AC1–3). Quite exotic in Alexandrian contexts were fragments of amphorae identified as class Zeest 80 of Aegean or Pontic origin [*Fig. 6:3*]. Apart from the usual high frequency of Egyptian containers mostly of Mareotic manufacture, quite a number of western vessels were also recorded. Of great interest is the unexpectedly high quantity of oil containers produced in Africa Proconsularis and Tripolitania (Africana I and II, and Tripolitanian I and II amphorae) [*Fig. 6:4–6*]. Their presence is direct evidence of considerable oil imports from these provinces, confirming once again the significance of Alexandria as a consumption site. The number of glass recovered there by contrast

to the last season is small and comprises only a few pieces, representing body shards of plain bottles, a few types of beakers and plates. All examples were blown of almost colorless glass.

In the 2013 season, the excavation was focused on the underfloor layers in room 12, in order to assess architectural development and chronology (trench supervisor Walter Wójtowicz). The results were somewhat ambiguous and disappointing however. It turned out that the area was occupied continuously at least from the late 1st century AD. Minute exploration produced a series of occupational layers that could not be dated precisely and several earlier structures which also could not be identified satisfactorily owing to a fragmentary state of preservation of the architecture [*Fig. 7 top*]. Remains of a solid wall (about 0.35–0.40 m wide) were discovered in the eastern part of the trench [*A in Fig. 7 bottom*]. Structured of large regular



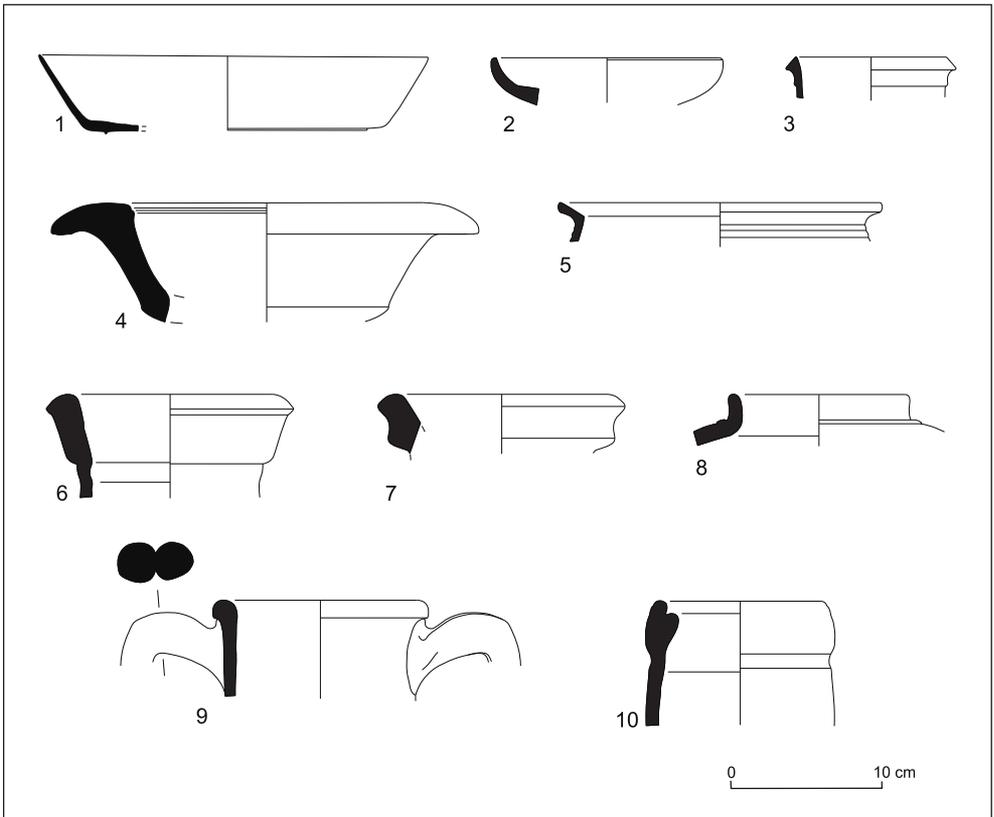
*Fig. 6. Selection of Roman amphorae: 1–2 – Kapitän II; 3 – Zeest 80 of Aegean or Pontic origin; 4–6 – Africana I, and Tripolitanian I and II amphorae (Drawing A. Dzwonek, K. Juszczyk)*



Fig. 7. Earlier structures in room 12 in area US: top, view of the remains below the floor of room 12, looking east; bottom, view looking south, A – earlier wall, B – later wall, C – wall enclosing the area from the east (Photos G. Majcherek)

masonry and retaining the plaster coating, this wall ran northward for a distance of 3.70 m; at this point it breaks off before reaching a later wall dividing units 12 and 13. It was replaced apparently by another wall, built on a foundation of small assorted stones, set in clay mortar [B in *Fig. 7* bottom]. Only its southern end, exceeding 0.70 m in width, has been preserved. The function of the latter remains unknown, although one should note that it was built parallel to the wall of the *forica*.

The pottery finds recovered from early Roman contexts, although quite numerous, were limited to some well-known type-series ranging mostly from the 2nd to the 3rd century AD. Several highly corroded coins pointed to the same period. Fine wares were rather rare and were represented by fragments of Eastern Sigillata A [*Fig. 8:1-2*] and a few specimens of Egyptian-made imitations of small Cypriote Sigillata bowls (type P40) [*Fig. 8:3*]. Imported Italian mortars



*Fig. 8. Selection of early Roman fine wares from room 13: 1-2 – Eastern Sigillata A; 3 – Egyptian-made imitation of Cypriote Sigillata bowl type P40; 4 – Italian mortar; 5 – Egyptian Nile-silt cooking pot; 6 – Tripolitanian II amphora; 7 – Tripolitanian III amphora; 8 – LR4A amphora; 9 – Coan (Aegean) amphora; 10 – Mareotis AE 3 amphora (Drawing A. Dzwonek)*

and numerous Egyptian Nile silt-made cooking pots characterized the common wares group [Fig. 8:4–5]. Transport amphorae were more prolific as a rule. Numerous fragments of Tripolitanian II and III amphorae [Fig. 8:6–7] and some Aegean (Coan) [Fig. 8:9] forms were again recorded. Nonetheless, the most numerous group among the imported containers was made up of LR4 amphorae, the direct predecessors of later Gazan vessels [Fig. 8:8]. Egyptian industries were represented by numerous fragments of AE 3 vessels produced in the Mareotis region [Fig. 8:10].

The excavations in area U yielded few glasses compared to earlier seasons (information provided by Renata Kucharczyk). Most of them were non-diagnostic body fragments of cast and free-blown vessels. A few fragments of flat, colorless windowpanes made in the cast process characteristic of the early Roman period, and several small, neatly made glass beads were also recorded. Colors ranged from colorless glass, to turquoise, light green, yellow and bluish-green glass and due to the inferior quality, it seems reasonable to assume that all the glass was locally made. A neck fragment from a bottle severely deformed by high temperatures may support this assumption.

As emphasized already in an earlier report (Majcherek and Kucharczyk 2014), the importance of structures discovered in this area lies in their unusual orientation. All the walls discovered in area U followed cardinal directions (Rodziewicz 1991b). The reason for this orientation is still unknown. However, this year it became clear that the orientation was certainly confined to a rather small area. It appeared that the eastern limit of the zone thus

oriented was reached at the southeastern edge of the trench. From the large wall [see C in Fig. 7 bottom] eastward, the direction of uncovered structures of early Roman age conforms to the basic orthogonal grid recognized not only throughout the site, but in other urban parts of Alexandria as well.

#### AREA U: ISLAMIC NECROPOLIS

In season 2013, the excavated portion of area U was expanded further to the west. A strip over 23 m long and approximately 4–5 m wide was explored (trench supervisors Emanuela Kulicka and Marcin Romaniuk). The western limit of the excavated area was delineated by the escarpment planned as part of the site presentation project.

Excavations in this area focused on the exploration of yet another part of the medieval cemetery. A large section of this necropolis was excavated in the early 1980s (Rodziewicz 1991a: 71–76, Fig. 4). This season a group of 30 or so graves was cleared within the trench limit. Two stratigraphically separate groups of tombs were identified, belonging to the so-called Upper and Middle Necropolis (Kulicka 2015, in this volume).

The strata overlying the necropolis proved to be particularly rich in pottery finds and produced the usual broad range of ceramics of the 12th–15th century AD originating from Egypt and other Mediterranean regions [Fig. 9 top]. Egyptian production was represented mostly by Mamluk Sgraff and Slip Painted wares. A waster from a Mamluk Slip painted bowl is an interesting find, pointing once again to the possibility of glazed pottery production in medieval Alexandria. Some Cypriote and Aegean examples were also



Fig. 9. Medieval pottery from layers overlying the cemetery in area U: top, Islamic glazed pottery, 12th–15th century; bottom left, Italian protomajolica sherd; bottom right, sherds of Chinese celadon wares (Photos G. Majcherek, A. Zawadzka)

identified. Western imports, although less numerous, were also recorded. Some tiny sherds of Spanish luster wares were found along with fragments of large Tunisian vessels of Hafsid date. Several glazed oil lamps of Ayyubid–Mamluk age were likewise recognized. Quite surprising was a relatively large number of fragments of Chinese celadon wares [Fig. 9 bottom right]. The same layers yielded also a blue glass coin weight, bearing a stamped inscription in Arabic.

Exploration of the graves and associated layers produced a limited number of artifacts. Some sherds of Fatimid incised pottery and some monochromatic (blue glaze on frit body) as well as several examples of 10th–11th century splashed wares (“Fayumi”) were recorded. The Islamic-period glass (Omayyad through Mamluk), despite being fragmentary, displayed quite a wide variety of shapes and colors (for parallels from earlier excavations, see Kucharczyk 2005). Particularly noteworthy is the presence of examples of enameled glass typical of the Mamluk period (see Kucharczyk 2015, in this volume).

#### AREA CW

Stratigraphic research carried out in auditoria T and U (trench supervisors Emanuela Kulicka and Katarzyna Kapiec) resulted in ample new evidence for the stratigraphy and chronology of the area.

A trench dug across auditorium T confirmed to a large extent conclusions reached already with regard to auditorium OP (Majcherek 2013). The original massive backwall of the portico turned out to have been seriously damaged sometime in the first half of the 6th century AD. It was rebuilt as a much narrower structure (approximately 0.75–0.80 m wide, instead

of the original 1.50–1.55 m). The position of benches, encroaching partly onto the earlier backwall of the portico, leaves no doubt as to that auditorium T was formed only after this rebuilding.

Consequently, it appears that the entire northern part of the auditoria complex, sharing common characteristics and belonging to the same stratigraphic context, was built most probably at the same time, that is, in the mid-6th century AD.

A section of perpendicular wall (of E–W orientation) was cleared at the bottom of the trench, immediately below the thick layer of stone detritus. Found at a level of approximately 5.50 m a.s.l. (lower than the offset of the backwall), it obviously belonged to some unknown structures of the early Roman age. Similarly dated structures were previously recognized in deep trenches dug in front of the auditorium M (Majcherek 2000).

Ceramics from the trench were scarce and rather typical. The glass finds, however, although few in number, formed quite an important assemblage. Most of the finds can be assigned to the 4th–5th century AD horizon and include the hollow stem of a bowl-shaped lamp and a bowl with flaring walls and looped-in rim. Both specimens were made of variously shaded green glass.

Excavations in nearby locus U offered basically similar conclusions as far as the chronology is concerned. Some surprising evidence came, however, from a small trench dug next to the west wall of the unit. From below the late Roman occupational level came a number of vessels, apparently reused by the ancient masons as pans for mixing mortar. All were the upper sections of transport amphorae, carefully cut, their rims sealed with plaster. They were found filled with lime mortar, being

obviously disposed of following the end of construction work. They represented Gazan amphorae of LRA4a form, usually dated not later than the 4th century AD [Fig. 10].

Next to them a large number of discarded marble elements was found, including two marble fragments of a latrine gutter, apparently recut from decorative elements of earlier date. On one of them a large-scale carved floral decoration motif was preserved [see Fig. 5 bottom right].

#### AREA G

In the 2009/2010 season the southwestern entrance to the bath basement was identified and excavated in this area (Majcherek 2013: 37–39). The entrance and adjacent vaulted chamber not only gave access to the furnaces located along the western wing of the bath, but served also the purpose of evacuating ashes from the subterranean furnaces. On top of this underground chamber sat auditorium B,

built sometime in the late antique period. The latter was excavated in the 1986–1987 seasons, when a stone bench, partly preserved in the southwestern corner, was uncovered (Kiss et al. 2000: 9–13).

In the late 6th century AD the auditorium was abandoned and the benches were covered with a new floor. It was ascertained that the floor made of a thick layer of tamped lime mortar set on clay bedding covered most probably the entire room, including a north–south wall (0.30–0.35 m wide) built in typical pillar technique, previously enclosing the room from the east. The chamber itself was remodeled substantially.

The present exploration (trench supervisor Agata Smilgin) concentrated on deposits sandwiched between the said floor, preserved in the southern part of room B, and the top of the collapsed vault. The exploration produced ample and fairly well dated pottery finds. However, much to the excavators' surprise, most of the identified

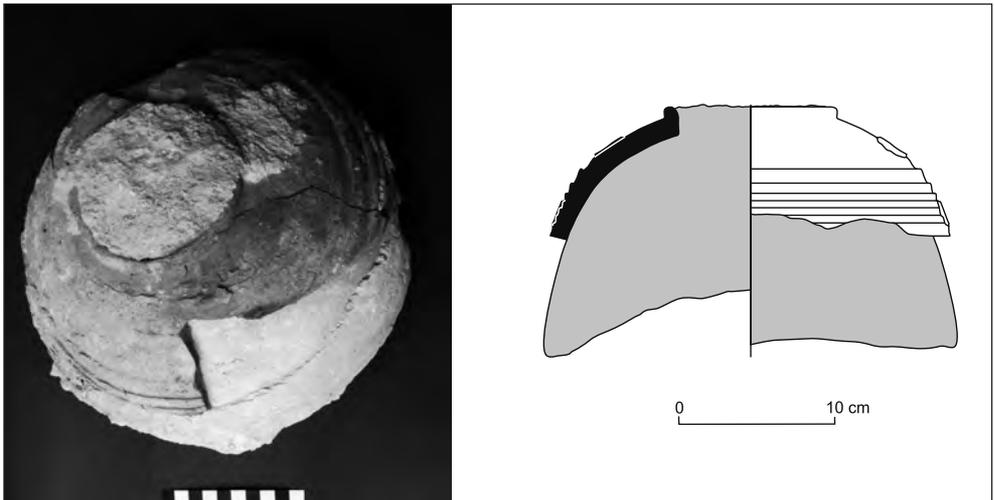


Fig. 10. *Gazan amphora top used as mortar container*  
(Photo and drawing K. Juszczuk)

examples were of earlier than expected date and did not reach beyond the late 5th–early 6th century AD horizon. The bulk of the pottery was made up of amphorae, mostly LRA1 and LRA4, as well as early variants of LRA7. Noteworthy was a fairly numerous collection of tableware. Apart from a few examples of Egyptian Red Slip A and B wares, a large number of African Red Slip ware fragments was recorded. Stamped with various motifs: crosses, trefoils, etc., they represented mostly forms LRP 67 [Fig. 11:1–2], LRP 76 [Fig. 11:3] and LRP 84 [Fig. 11:4]. Several red painted ostraca and *dipinti* in Greek were recorded, mostly on the LRA1 and LRA4 body sherds (these inscriptions were studied by Prof. Adam Łukaszewicz).

The glass material dated to the 4th–6th century AD is very fragmentary; almost all are non-diagnostic small body fragments, representing type-forms common in the glass assemblages from Kom el-Dikka.

A stretch of perpendicular east–west wall was uncovered in the southern part of the room, immediately below the upper floor level. It was made of a single course of large blocks, not joined with mortar. Its function, however, remains unknown. Still lower, at a level of approximately 9.40–9.50 m a.s.l., yet another lime floor was cleared. Several stone blocks and one large segment of a brick wall retaining red waterproof plaster, apparently originating from the bath or cisterns, were uncovered. Both the position of the blocks and some imprints left on the floor may point to the presence of a single bench built along the south wall of the room [Fig. 12]. The cleared floor is in all probability a continuation of a floor uncovered in 1987 next to the western bench.

Remnants of a vault were cleared immediately below. Although apparently subsided (in the middle part approximately 0.40–0.60 m) and structurally unstable, it

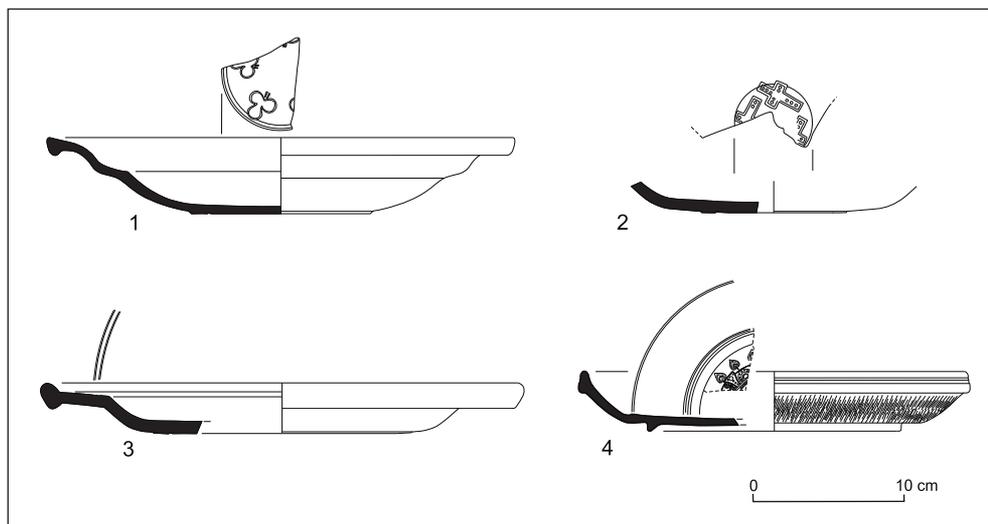


Fig. 11. African Red Slip Ware plates from original floor levels in auditorium B in area G: 1–2 – LRP 67; 3 – LRP 76; 4 – LRP 84 (Drawing A. Dzwonek)



*Fig. 12. Underfloor layers and cleared extrados of the bath vaulted chambers, uncovered in auditorium B in area G (Photo A. Smilgin)*



*Fig. 13. Collapsed vault of the bath entrance chamber, view looking south (Photo G. Majcherek)*

retained most of the blocks in the original position. An outer coating, made of small assorted stones set in ashy mortar, was preserved over a large part of the vault, applied directly onto the extrados.

A circular oven (1.30–1.40 m in diameter) was uncovered in the northwestern corner of the room, below the presumed occupation level of auditorium B. Only the eastern section of the brick structure survived (approximately one half of the original circumference, preserved to a height of two brick courses). Its purpose is unclear, but it appears to belong to a series of similar ovens or kilns previously discovered in this area, predating the construction of the auditoria.

Deposits predating the collapse and abandonment of the vaulted chamber were explored in a test trench sunk in the northern part of room B, taking advantage of a missing section of the vault. While the vault itself proved to be seriously damaged, the side walls of the chamber, which was 3.05–3.10 m wide, were found to be fairly

well preserved. An interesting irregularity was observed. The west wall of the chamber was built in regular masonry, with blocks measuring approximately 0.30–0.40 m by 0.50–0.55 m. The eastern one, however, was made of much smaller blocks (0.18–0.20 m by 0.25–0.30 m).

The barrel vault was built in a remarkable way. Both springings rested on the middle of the supporting wall rather than on its edge, resulting in a substantial (approximately 10–15 cm) offset of the wall in relation to the intrados. This aesthetically unattractive feature was then masked by raising the face of the supporting wall with additional courses of thinner masonry, causing the vault to look segmental rather than semicircular.

The common presence of this unusual feature also in other vaults in the underground complex is explained most probably by technological requirements. The projecting edges of the wall could have served as ready corbels for a reduced wooden vault centering, a viable reason in country like Egypt suffering from an acute shortage of appropriate timber. Moreover, examples of this technique are not strange to Roman architecture. Offsetting walls apparently used to support centering are perhaps best observed in the stone vaulted horreum in Caesarea (Patrich 1996: Fig. 4).

The vault, which was preserved on the whole as loose and dislocated blocks resting directly on accumulated fill, turned out to be shattered and subsided, but still strong in a few locations, to the extent that it retained space, 0.30–0.40 m high, under the keystones. All the identified layers accumulated there ran almost horizontally through the entire span of the underground chamber, pointing to a rather slow and regular deposition process [Fig. 13].

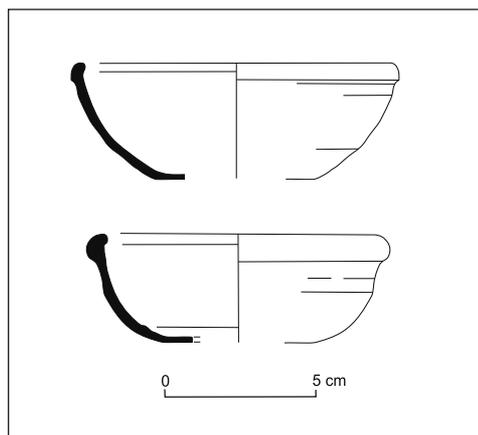


Fig. 14. Egyptian Red Slip A bowls from the fill of the underground chamber in the bath (Drawing A. Dzwonek)

Contrary to other chambers of the underground service area explored in the 1960s and 1970s, it was not filled with extensive ash deposits. Some thin ash layers were recorded in the lower strata, but most of the identified layers were fine sediments, either windblown or water transported. This in turn may be taken as evidence that the chamber remained open until the end of operations in the bath complex. The chronological evidence for the final closing of the chamber is inconclusive. Several heavily corroded coins (studied by Katarzyna Lach) could be assigned generally to the late antique period. Available ceramic evidence usually took the form of heavily fragmented



Fig. 15. Example of a Gazan amphora (LRA4a) from the H(e) test trench in area H (Photo G. Majcherek)

sherds. Examples of LRA1, LRA3, LRA4, LRA5/6 and LRA7 were identified, most forms representing the late 6th–7th century AD horizon. This chronological range was further corroborated by several fragments of Egyptian Red Slip A ware [Fig. 14], especially bowls representing Gempeler's form T324 (Gempeler 1992: 96).

Glass material was again very fragmentary and generally similar to that obtained from contexts overlying the vaults. Most of the fragments represent a very limited variety of types characteristic of the 4th–6th century AD. These domestic plain wares, mostly bottles and lamps, were blown of low quality bluish and yellowish-greenish glass (information provided by Renata Kucharczyk).

The floor of the chamber was reached at 6.63–6.87 m a.s.l. The level made of beaten clay appeared to be cut by two foundation trenches(?) visible along the side walls of the chamber. This observation may point to a rather late construction or rebuilding of the chamber. Investigations will be pursued next season.

#### AREA H

Test trench H(e) was dug in the 2009–2010 season east of auditorium H, in the corner formed by the east wall of the latter and south wall of auditorium F (Majcherek 2013: 41–43). It was small in area (3 m by 3 m) and reached then a depth of 8.50 m a.s.l. (i.e., the footing of the east wall of auditorium H). The wall was built at a rather surprisingly late date (6th century AD) and it appears that it might have been part of a later rebuilding or adaptation.

This season exploration continued for another meter in depth. It was already

ascertained earlier (Majcherek 2013) that the south pillar-type wall of auditorium F was built on top of the huge earlier wall forming the southern perimeter of the Imperial bath complex. This heavily buttressed wall displayed parameters similar to other structures preserved further east, in areas G and F, as well as to a huge wall constituting the northern border of the southern passage leading to the bath.

The cut of the foundation trench of the huge wall and the buttress was identified in the compact soil. Dating material from the trench and predating the accompanying layers was rather modest in number and largely inconclusive, consisting mostly of common ware sherds. Un unexpected find was a nearly complete Gazan amphora (LRA4a), found in the northeastern corner of the foundation trench [Fig. 15]. It must have obviously served as an impromptu burial, as evidenced by infant bones found inside it. Apart from some earlier, residual examples, most of the pottery finds pointed to the 4th century AD as the most plausible date for the wall construction event. It is

therefore reasonable to treat it as part of the original design of the late antique civic zone. The assumption conforms well to previous observations on the urban and architectural development of this quarter of the ancient city.

### AREA Q

During cleaning operations seen as a prerequisite for planned conservation, a column marble base was cleared. The Attic type base was quite well preserved save for the broken-off corners of the plinth. A crudely scratched Greek inscription was identified on the scotia: ΕΥΤΥΧ[Ω]Σ ΕΙΡΗΝΟΣ ΑΙΑΝΙΟΣ [see Fig. 5 bottom left]. The inscription (of an acclamation type) was dated provisionally to the 6th century AD on paleographic grounds (reading by Prof. Adam Łukaszewicz). The base is of slightly smaller size (0.84 m by 0.84 m, upper torus Diam. 0.66 m) than those used in the southern portico of the bath. It is quite probable that it may have originally supported one of the columns in the lateral wings of the palaestra, and the inscription was made while the base was still in its original position.

## CONSERVATION

The conservation program during the two reported seasons encompassed the continuation of already well-advanced operations in several areas of the site.

### MOSAIC SHELTER (VILLA OF THE BIRDS)

Preservation of mosaics in place and their display as a set in the original architectural context were the tenets of the Mosaic Preservation Project (completed in 2000) in keeping with contemporary

conservation theory and practice (Kołątaj, Majcherek, and Parandowska 2007). This approach produced a rare example of successful *in situ* mosaic conservation, but it also led to complications that, 12 years after the completion of the shelter, called for immediate and comprehensive intervention. The conditions inside the shelter (peaks in temperature, humidity fluctuation, condensation and rising damp) seriously affected the state of the mosaics, necessitating an overhaul of the

building. The aim was to prevent significant deterioration of the decorated floors and to ensure control of the microclimate in the Villa. The operation involved input not only from mosaic conservators, but also from architects and engineers.

The most demanding operation undertaken in the 2012–2013 seasons was the continued overhaul and upgrading of the roofing (by Zygmunt Nawrot). In order to reduce the high humidity inside the shelter and to avoid the risks of roof-space condensation, a vapour permeable membrane (mdm AQ 180) was introduced between the steel cladding and a Styrofoam thermal insulation layer. The operation commenced in 2011 (Majcherek and Kucharczyk 2014) and was completed in the 2012 season. Next, a simple aeration system that was found to be the most effective and low-cost form of ventilation was installed. In this system, air enters a room through the windows, doors, etc. and forces out the warm and damp air through ventilation skylights in the roof. To achieve the desired effect, specially designed exhaust apertures (about 1.5 cm high) were formed, following a thorough remodelling of the roof ridge made of triangular-shaped sheet metal, which was raised to achieve the purpose. It was now supported on bolts furnished with a rubber pad. The sheet iron welded along the ridge and screening it from inside was removed to create the 14.50 cm wide intake aperture along the entire length of the ridge (15 m). Corrosion-resistant aluminium wire mesh was installed to keep the openings free from being blocked (with environmental and urban-generated waste, etc.). Two strips of such mesh were installed: the one from inside (23 cm wide) was fixed to the steel rafters

[*Fig. 16*], while the outer one (18 cm wide) was laid on the corrugated sheet iron cladding. In both cases, the aluminium mesh was fixed with regularly spaced stainless bolts (3 mm). The system has proved to be fairly effective. Measurements with an electronic air velocity meter indicated that air flowed through the apertures with a mean velocity of approximately 0.9–1.0 m/s.

Necessary repairs were made to the structure of the shelter itself, especially to the west wall of panel glass which had suffered extensive damages in the part of the gables and the gap between the shelter and adjoining architecture. Some of the smoked glass panels here had been broken and these were now reinstated. A new wall coping was shaped, and the gap itself covered with new panels set in fittings fixed to the shelter's horizontal steel frames [*Fig. 17* left]. They were laid slightly inclined outward to secure rainwater drainage and additionally secured with silicone foam to prevent leakage.

Considerable emphasis was placed on the continuation of already well-advanced conservation operations on the mosaic floors on display inside the shelter, special attention being given to the three most exquisite ones: mosaic with panther ( $\alpha$ -6), mosaic with birds ( $\alpha$ -5) and geometrical mosaic  $\alpha$ -3. Mosaic conservation was performed by a team composed of Arkadiusz Ostasz, Ewa Parandowska and Szymon Gąsienica-Sieczka, accompanied by two apprentices from the SCA, E. Mohsen Ahmed Shehawy and Mona Mohammed Abdallah.

Conservation entailed a set of commonly accepted procedures. All the mosaics were first cleaned mechanically

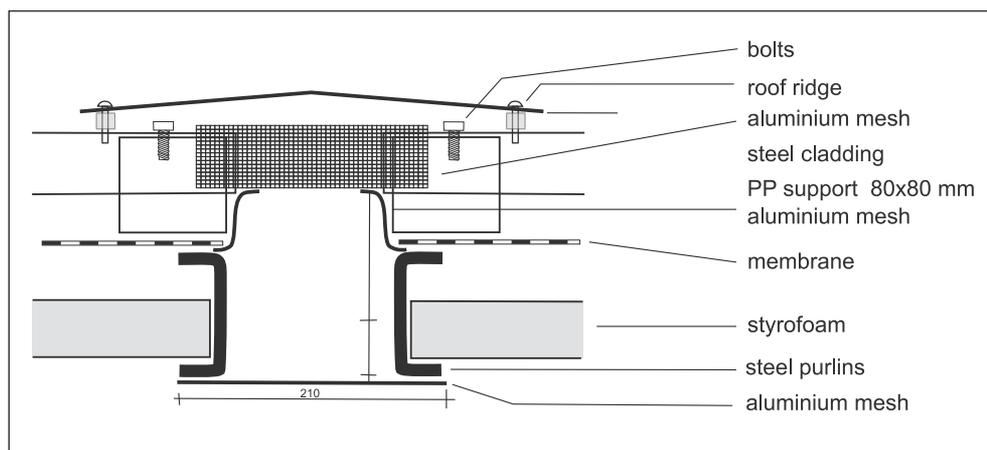


Fig. 16. Scheme of the aeration aperture in the shelter roof  
(Drawing Z. Nawrot, G. Majcherek)



Fig. 17. Maintenance conservation in the Mosaic Shelter: left, repaired west glass wall; top right, ventilation grille around the mosaic with panther ( $\alpha$ -6); bottom right, restored edges of the mosaic with birds ( $\alpha$ -5) (Photos G. Majcherek)

by brushing and blowing. Salt efflorescence was removed from the surface using scalpels and hard brushes. Some salt leftovers were removed using repeated desalinating poultices, made of paper tissue soaked in a 2.5–5% solution of acetic acid and distilled water and left to dry. Quite a large number of loose tesserae were treated. They were fixed using new mortar composed of sand, lime and MOVILITH D25 in proportions 3:1:0.1. Disintegrated edge bands of mosaics  $\alpha$ -5 and  $\alpha$ -6 were then replaced with new ones. New bands were made of lime–sand mortar with added acrylic emulsion PRIMAL AC33 (1:3:0.2) [Fig. 17 bottom right]. Whenever the bedding had disintegrated owing to salt precipitation, it was reinforced by injecting a 10% solution of PRIMAL AC33. Similar procedures were applied also in the case of the *opus sectile* pavement. Loose marble tiles were cleaned with distilled water, thoroughly degreased with acetone, glued using ARALDITE and eventually fixed to the bedding using a sand–lime mortar with a 0.5% solution of MOVILITH D25.

The conservation of the mosaic with panther ( $\alpha$ -6) necessitated more complex procedures. The small squared emblem of this mosaic was detached and relaid on a new bedding (mortar composed of washed and sifted sand, slaked lime and PRIMAL AC33 in proportions 3:1:0.5), supported by a AEROLAM® aluminium honeycomb panel.

The draining around the mosaic was cleaned and rearranged. The surrounding draining trench (approximately 0.7 m deep) remained open in order to increase air circulation and to prevent further damping. The trench was covered with an especially designed iron frame (made of

angled iron) supporting an expanded iron mesh [Fig. 17 top right]. All sections of the frame followed exactly the shape of the relevant section of the preserved mosaic edge. Finally, the frames were filled with a thin layer of pebbles.

The cleaning of the ancient walls of the Villa covered with a heavy salt incrustation was also continued. They were cleaned mechanically with brushes, spatulas, or scalpels.

#### AREA W<sub>N</sub>

##### (DOMESTIC QUARTER)

The program continued to focus on preservation of remains of domestic architecture uncovered in the quarter (work supervised by Marcin Polak). Ever since the completion of excavations in the early 1990s limited conservation work has been ongoing on a continuous basis. However, the planned opening of the site required a more comprehensive approach. Work on the conservation of walls and other structures started in 2009, aimed at stopping the process of degradation caused mostly by damaging atmospheric conditions and enhancing the legibility of all excavated architectural structures. Since not all the endangered walls could be treated in a single fieldwork season, priorities were established based on two essential criteria: scale of structural disintegration and rate of stone weathering.

Oolitic limestone was the principal stone building material used in Alexandria in the Ptolemaic and Roman periods. It was quarried west of the city and was easy to process owing to rock content and its physical properties. At the same time it made it prone to natural weathering, which was particularly accelerated by environmental conditions. High moisture

content in the air and substantial rainfall are the basic destructive factors affecting stone material in Alexandria. The rate of decay can be alarming: 20–25% of the original mass lost over a ten-year period. Blocks of stone lose their original shape, but also mechanical strength. Another factor adding to the problem is the washing out of the original mortar in joints, causing deep faults in the structures and easing water penetration. Applying the princi-

ple of minimum intervention, the team's restorers gave priority to all structures that appeared to have lost their coherence or showed signs of heavy erosion.

In the 2012 and 2013 campaigns these procedures were applied to a series of pre-selected walls. Wherever necessary, the most deteriorated stones were replaced. Well seasoned blocks obtained from nearby excavations were used in such cases. All joints were repaired and com-

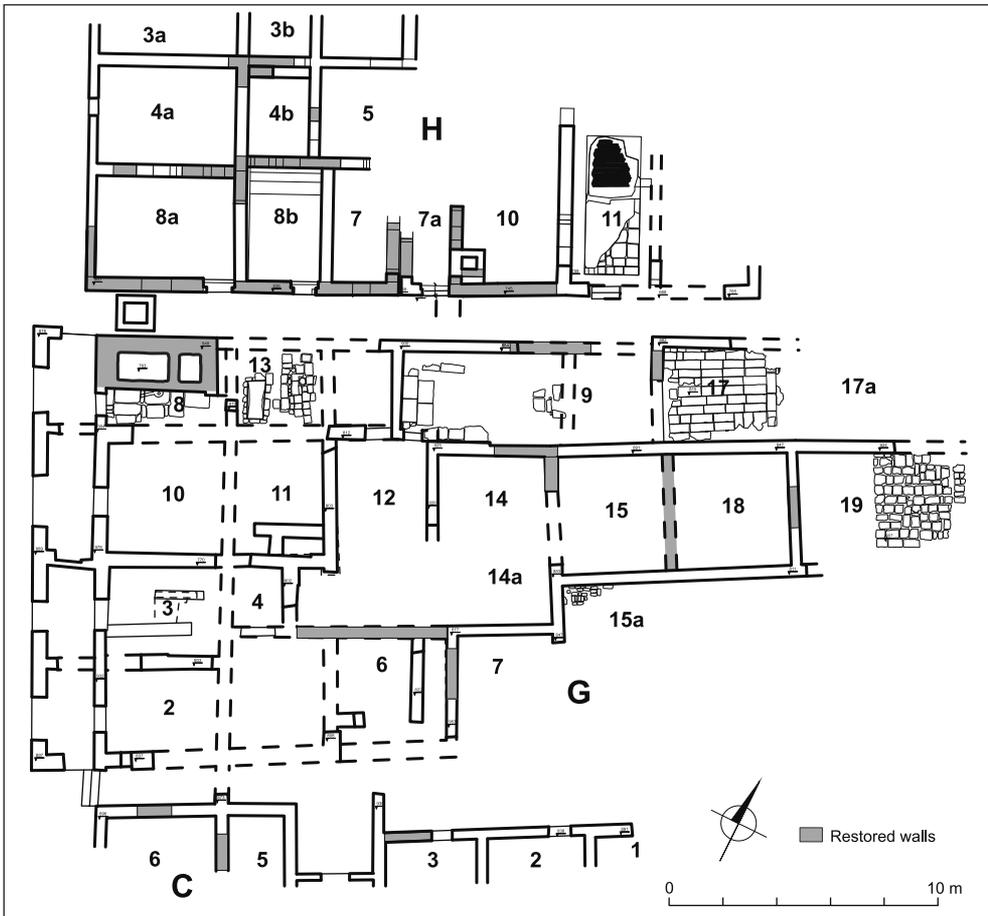


Fig. 18. Domestic quarter: plan showing walls restored in the 2012 and 2013 seasons (Drawing G. Karpińska, M. Polak)



*Fig. 19. Restoration in the domestic quarter: top, southwestern corner of building H after restoration; bottom, restored north wall of rooms H8a and H8b (Photos G. Majcherek, M. Polak)*

pleted with new mortar. In order to prevent further water penetration, new wall copings were shaped using new stones separated with a layer of bitumen tar paper, acting as an insulation layer as well as a marker separating modern wall fabric from the ancient one. Similar rules were also adopted in other limited restoration operations.

A substantial number of walls in the eastern part of the area had undergone conservation in the past. Current activities were focused in the western parts of buildings G and H, in the part adjoining street R4 [Fig. 18]. In building H, the height of a large section of the south wall enclosing rooms H7, H8 and H10 along the side street, some 14 m long [Fig. 19 top], was built up with a course of masonry (approximately 0.35 m high) added on top of the previously restored wall. As a measure preventing rainwater penetration, a slanting wall coping was formed, using a more resilient layer of mortar with some white cement added. Doors leading to consecutive rooms were now blocked with smaller assorted stones in a manner similar to that frequently used in antiquity.

A small section of the perpendicular wall forming the western limit of room H10 was also restored. The restoration was necessitated by technical requirements to stabilize the nearby water-well (heightened and used still in the Fatimid period), its structure rising well above adjacent walls.

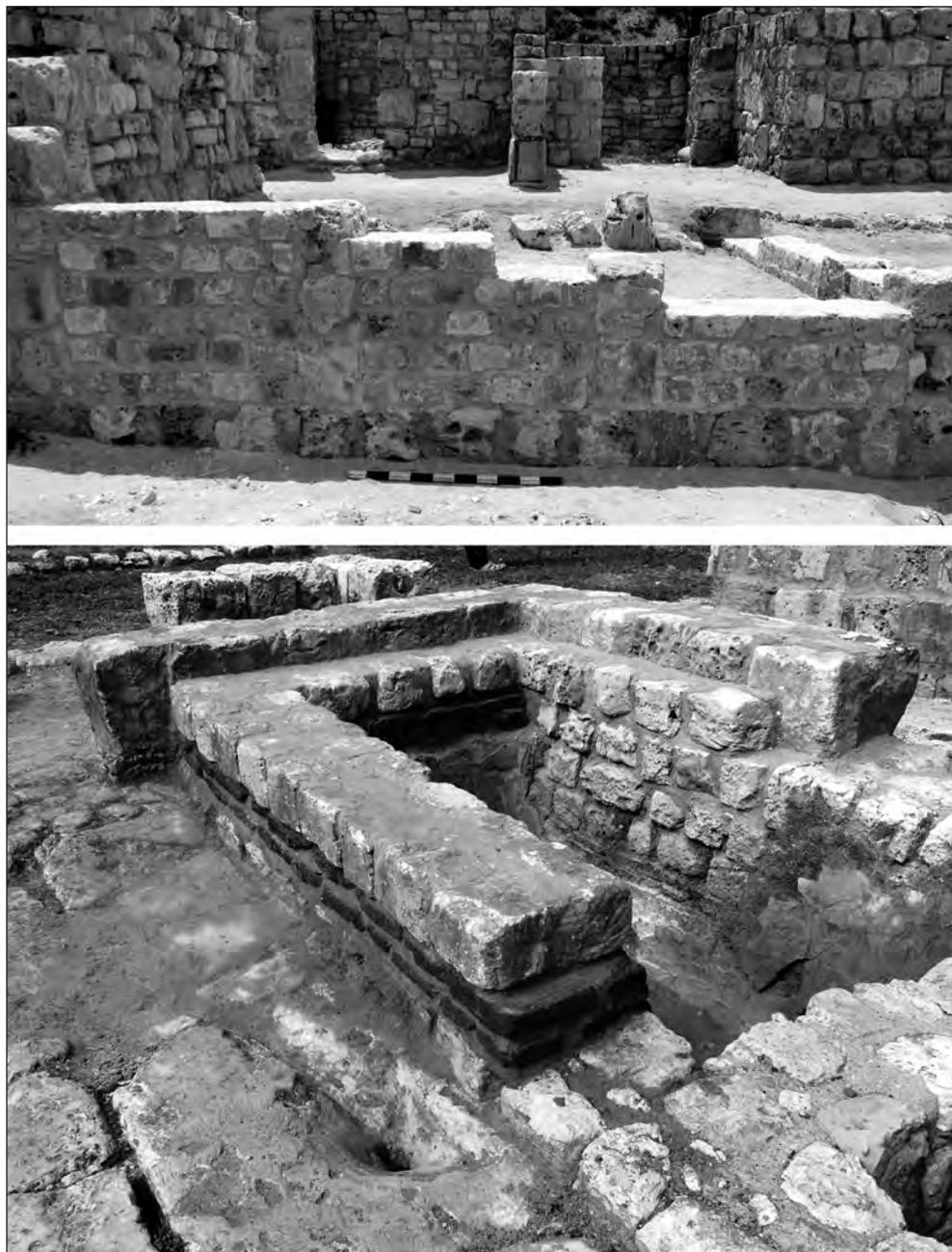
Two walls dividing rooms H4a–b and H8a–b, respectively 4.50 m and 3.50 m long, were treated [Fig. 19 bottom]. A section of wall between H4a–b and H3a–b was likewise conserved. In both cases some limited restoration was involved. A small fragment of wall between rooms H4b and H5 was consolidated. Two adjacent

parallel walls (approximately 1.60 m long), structured in large blocks of dressed stones, between rooms H7 and H7a, were partly restored. In the late Roman/early Islamic period, these walls were already robbed to the foundations. Two new courses of stone were laid, bringing the whole structure some 0.60 m above ground level.

Similar conservation measures were also undertaken in building G. Some parts of walls dividing rooms G9–G17 and G14–G15 were built higher, but the technique here was different: pillars of ashlar masonry with smaller irregular stones as the filling. The wall dividing G6 and G14a, which had been dismantled completely in late antiquity, was reconstructed [Fig. 20 top]. The task was relatively easy since all the basic parameters of the wall (course, thickness, footing level and structuring technique) were identified in the excavation. To achieve proper stability the wall was laid on a modern footing made of breakstone set in cement mortar.

Some sections of walls partly restored in the 2010–2011 seasons were now made higher by adding one or two courses of blocks. Such procedures were applied in the case of the west wall of room G18 as well as the wall dividing G9 and G14. A fragment of the north wall of room G9 was rebuilt entirely. Another section (4.40 m long) of a wall dividing rooms G15 and G18 was also rebuilt. Dismantled down to the foundations in antiquity, the wall was now laid on a modern footing made of breakstone set in a light cement mortar in order to ensure proper stability. The wall itself was structured applying the historic technique.

Basins located in room G8 (northwestern part of house G) were also subject to



*Fig. 20. Restoration in the domestic quarter: top, north wall of room G6 after restoration; bottom, basins in room G8 following conservation (Photos G. Majcherek, M. Polak)*

conservation measures. They were uncovered already in the 1989 season and were then temporarily protected (Majcherek 1990: 82–83, Fig. 1). The complete installation consists of two basins of unequal size (the larger one measuring 1.00 m by 1.85 m, the smaller one 1.00 m by 0.85 m). Both were constructed in mixed technique, of small stones and bricks set in mortar with substantial amounts of ashes added. On the inside of the basins the walls were covered with a red *opus signinum* (*cocciopesto*) plaster. Each of the basins was furnished with an outlet for discharging the fluid contents. The western, northern and southern sections of their mixed stone

and brick structure were consolidated and partly restored [Fig. 20 bottom].

Some supplementary conservation work was also performed in buildings C and D located further south. There, however, activities were focused on stabilization and repairs of walls restored already in the 1970s (Rodziewicz 1984). After more than 35 years of exposition to unfavorable climatic conditions, several wall sections were in dire need of repair. Standard procedures were applied, limited to new mortar in missing joints and new stone replacing badly weathered fragments. Such operations were performed in rooms G7 (east wall) and D5 (staircase walls).

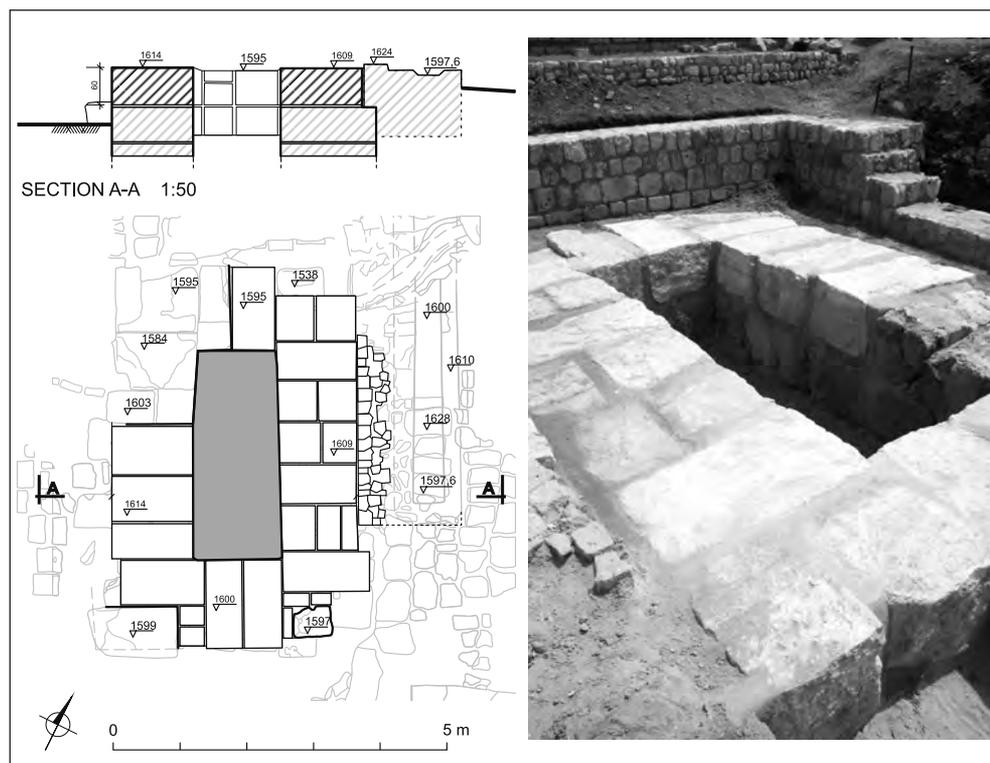


Fig. 21. Southwestern well in the cistern: left, plan; right, view after restoration (Drawing and photo A. Pisarzewski)

In room C6, the north, south and east walls were also treated. In some cases, also a new wall coping was formed and a bitumen tar paper insulation layer was introduced. The north wall of room C3 was a special case. There, corrosion seriously affected some of the lower masonry courses. In order to replace them, it was necessary to dismantle whole sections of the walls. Once the new blocks were put in place, the wall was reassembled.

### BATHS

The large pool excavated in the 1960s underwent thorough conservation in 2009 (work carried out by Szymon Gąsienica-Sieczka). This year some minor maintenance work was carried out. Several parts of the weathered edges of the original plastering preserved on the walls of the pool were either repaired

or stabilized with new bands made of mortar composed of lime, sand, some white cement and crushed bricks added as a coloring agent. The inner brick facing of the pool was treated likewise. Heavily deteriorated bricks were replaced. A fragment of green marble (*cippolino*) *pluteus* broken by vandals was fixed back in place with polyester resin, whereupon some missing joints in the *pluteus* structure were completed.

### AREA L (CISTERN)

A large well located in the southwestern part of the cistern was restored, completing a project initiated in 2011 (under the supervision of Aureliusz Pisarzewski). The well head, originally made of extremely large blocks (some exceeding 1.20 m in length), was entirely restored. New blocks of dressed stones were set in prescribed



Fig. 22. North wall of the cistern: left, before, and right, after conservation (Photos G. Majcherek)



*Fig. 23. Apse and pavement in auditorium S after restoration  
(Photo A. Pisarzewski)*



*Fig. 24. North wall of vestibule R after restoration  
(Photo A. Pisarzewski)*

position and fixed with mortar [Fig. 21]. An adjacent section of the water channel was also consolidated and repaired.

Monitoring revealed that some sections of the original cistern walls had suffered from long-term exposure to the elements. Some mortar joints had totally disappeared, wide and deep cracks were common, and several low quality masonry blocks lost more than half of their original mass. Such walls were in imminent danger of collapse. This was the case of a large wall (No. 30) built in the northwestern part of the building across earlier structures (corridor and adjacent water tanks).

The wall, 8.50 m long and preserved 3.00 m high in places, arching slightly northward, required immediate intervention. Constructed in the latest phase of the cistern (6th century AD), it was originally built of large regular masonry blocks (0.30 m by 0.40 m) set in lime mortar (Rodziewicz 1986). All the joints were now thoroughly repaired, missing or deteriorated blocks were replaced with new similar ones and the whole structure stabilized [Fig. 22].

The restoration of the south outer wall of the cistern was completed, a time-consuming task in itself owing to the length (approximately 7.00 m) and width (1.25 m) of the restored part. It supported an adjoining section of the modern paved visitors route. The last, topmost course of the masonry was added in the 2013 season, allowing the adjoining escarpment to be landscaped and stabilized to reduce rainfall impact. Vegetation to prevent erosion was also introduced.

#### AREA AS

In the 2012 campaign, a section some 6.50 m long of a portico back wall

enclosing auditorium N from the west was largely restored. Large masonry blocks found nearby during excavations were used for the purpose. Two courses of masonry were added above the existing original fabric. An adjacent part of the western wing of the auditorium benches was also restored.

In neighboring auditorium 32A conservation focused on preserving the original wall fabric. This part of the auditoria complex was excavated and partly restored in the 1980s, but the long exposition resulting in inevitable damages and deterioration required immediate intervention. Large sections of the original wall fabric were treated. Missing joints were filled, and patches of extant plastering secured.

#### AREA CW

In this part of the auditoria complex, the restoration of auditorium S was the main focus of activities (supervised by Aureliusz Pisarzewski). Some work was performed already in the 2007 season, when the building apse was restored (Majcherek 2010). Two rows of the damaged or missing benches were restored in 2012, as well as an adjacent part of the apse. The benches in the apse were found to extend originally some 0.80–0.90 m into the room. A northern box-like base supporting those benches was found to be fairly well preserved, while the southern one was gone entirely. The dimensions of the latter can be established, however, thanks to the imprints left in the pavement of the room. It was restored to the full height of the preserved northern base, i.e., one course of blocks above the pavement (approximately 0.35 m). Neighboring wall sections were also treated,

missing joints completed and the whole structure reinforced. In addition, the topmost bench approximately 1.20 m long was reconstructed along the south wall of the room. An equally important operation was the reconstruction of the missing patches of pavement. This was done not only in view of enhancing the aesthetic value of the extant edifice, but also in order to protect existing remnants of the pavement. Limestone pavers (some 7–10 cm thick) found during the excavations in this area were used for this purpose. Given their find spot, it is quite possible that they may have originated from the pavement. At least three large missing sections of pavement located in the eastern part of the building were now restored. Newly added pavers (1.00–1.20 m long) were laid following the original design [Fig. 23].

More restoration work was also carried out on the north wall of vestibule R (dividing it from vestibule O). The said wall, which had been dismantled almost completely, was found to be structured in a typical pillar technique. Most of the damages had been caused apparently by a large number of graves from the Upper Necropolis. Some of them were found to be dug directly on top of the wall, destroying substantial sections of it in the process. The entire section (4.60 m long, 0.40 m wide and 1.30–1.50 m high) of the wall was rebuilt [Fig. 24]. This operation restored not only valuable fragments of the original wall fabric, but also redressed the visual balance between adjacent auditoria O and P, and R and S. As a result, a long bench preserved in room O could now be properly consolidated and protected.

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