

POLISH ARCHAEOLOGY IN THE MEDITERRANEAN

# PAM

27/1  
RESEARCH

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## **POLISH ARCHAEOLOGY IN THE MEDITERRANEAN (PAM)**

Annual of the Polish Centre of Mediterranean Archaeology, University of Warsaw

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POLISH ARCHAEOLOGY IN THE MEDITERRANEAN

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27/1  
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## **POLISH ARCHAEOLOGY IN THE MEDITERRANEAN (PAM)**

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and its successive CEOs Mr. Rashad Mohammed Rashad  
and Mr. Ahmed Mahmoud





## ABBREVIATIONS

AAE	<i>Arabian Archaeology and Epigraphy</i>
ANM	<i>Archéologie du Nil Moyen</i>
AV	<i>Archäologische Veröffentlichungen, Deutsches Archäologisches Institut, Abteilung Kairo</i>
BASOR	<i>Bulletin of the American Schools of Oriental Research</i>
BCH	<i>Bulletin de correspondance hellénique</i>
BIFAO	<i>Bulletin de l'Institut français d'archéologie orientale</i>
BSFE	<i>Bulletin de la Société française d'égyptologie</i>
CRIPPEL	<i>Cahiers de recherches de l'Institut de papyrologie et égyptologie de Lille</i>
EtTrav	<i>Études et travaux. Travaux du Centre d'archéologie méditerranéenne de l'Académie des sciences polonaise</i>
FIFAO	<i>Fouilles de l'Institut français d'archéologie orientale</i>
GAMAR	<i>Gdańsk Archaeological Museum African Reports</i>
GM	<i>Göttinger Miszellen</i>
JEA	<i>Journal of Egyptian Archaeology</i>
JJP	<i>Journal of Juristic Papyrology</i>
MDAIK	<i>Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo</i>
OIP	<i>Oriental Institute Publications</i>
OLA	<i>Orientalia lovaniensia Analecta</i>
PAM	<i>Polish Archaeology in the Mediterranean</i>
PSAS	<i>Proceedings of the Seminar for Arabian Studies</i>
SAAC	<i>Studies in Ancient Art and Civilisation</i>
ZÄS	<i>Zeitschrift für ägyptische Sprache und Altertumskunde</i>



27/1  
RESEARCH

**FIELDWORK**



# Polish Research in 2017

Listed in this section is the fieldwork organized and funded, in full or in part, by the Polish Centre of Mediterranean Archaeology University of Warsaw (PCMA UW), as well as associated grant projects awarded by the National Science Center of the Republic of Poland, conducted in 2017 and in the archaeological season overlapping into 2018. Sites are presented in alphabetical order by country, the sequence of presentation of the latter arbitrary, reflecting the traditional scope of current involvement. Brief summaries of the most important results and relevant publications, including fieldwork dates and teams, appear for projects not reported in full in this volume.

The Syrian projects: Hawarte, Palmyra, Tell Arbid and Tell Qaramel, remain suspended due to the political situation in the region and are not included below. Some of the Egyptian projects were cancelled and others seriously delayed, resulting in decisions to reschedule work.

## EGYPT

**ALEXANDRIA, KOM EL-DIKKA, see in this volume.**

Ongoing research grant: Dr. Katarzyna Lach, “Studies on the character of social contacts in Roman Alexandria based on numismatics research. Analysis of coin finds from Kom el-Dikka in the archaeological context” (NCN Fuga 3: 2014/12/S/HS3/00088)

## BERENIKE

The January–February season in 2017 had to be cancelled due to a delayed permit issue. A study season was organized at the site in the fall. A core team comprised grant holders completing grant-related research on finds stored on-site, the team’s glass specialist and a surveyor preparing a hypsometric map of the site.

*Dates of work:* 16 September–16 October 2017

*Director:* Iwona Zych, archaeologist, small finds specialist (PCMA UW)

*SCA representative:* Mahmud Ahmed Husein (Red Sea Inspectorate)

*Archaeologists and specialists:* Renata Kucharczyk (ancient glass specialist), Joanna Rądkowska (Harbor Temple study), and Marek Woźniak (all PCMA UW)

*Surveyor:* Andrzej Szeszko (freelance)

Three research grants funded by the National Science Center of the Republic of Poland, two from Berenike and one from Aynuna, Saudi Arabia (see below):

Ongoing research grants: Iwona Zych, MA “Religious practices and beliefs in the “Red Land”: religious building complexes and cult objects from the port of Berenike



as a manifestation of the religiousness of the population of the Egyptian Red Sea coast and Eastern Desert from the mid 3rd century BC to the early 6th century AD” (NCN Preludium 7: UMO-2014/13/N/HS3/04400)

Marek Woźniak, MA “From military base to international emporium: the nature and functioning of the Hellenistic port of Berenike on the Red Sea” (NCN Grant Preludium 9: 2015/17/N/HS3/00163)

Prof. Michał Gawlikowski “Infrastructure of the international trade in the Red Sea area in the Roman period” (NCN Harmonia 6: UMO-2014/14/M/HS3/00795)

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- Site name - Current research
- Site name - Past research
- ▲ Restoration and conservation
- Surveyed
- Geophysical project
- Other projects
- Other Polish projects in this volume
- PROJECT - Past survey and salvage project
- PROJECT - Current survey and salvage project





See also: Selected papers of the 2016 conference in Cairo in a Special Studies volume *Research on the Red Sea*, PAM 26/2 (2017): D. Eguiluz Maestro “Conservation interventions at the site of Berenike (Egypt): challenges and solutions in an ancient city of the Eastern Desert” (pp. 211–223); M. Hense “The Great Temple of Berenike: new findings of the Berenike Temple Project” (pp. 133–146); A.M. Kotarba-Morley “Port town and its harbors: sedimentary proxies for landscape and seascape reconstruction of the Greco-Roman site of Berenike Troglodytica on the Red Sea coast of Egypt” (pp. 61–92); R. Kucharczyk “Come and dine with me... Early Roman luxury glass tableware from Berenike – new evidence from the harbor area and the trash dumps” (pp. 147–166); M. Osypińska and P. Osypiński “New evidence for the emergence of the human-pet relation in early Roman Berenike (first–second century AD)” (pp. 167–192); J. Then-Obluska “Beads and pendants from the late Harbor Temple and harbor temenos in the Red Sea port of Berenike (seasons 2010–2013): materials, techniques, functions and cultural” (pp. 193–210); M. Woźniak “Shaping a city and its defenses: fortifications of Hellenistic Berenike Troglodytica” (pp. 43–60); I. Zych “The harbor of early Roman “Imperial” Berenike: overview of excavations from 2009 to 2015” (pp. 93–132)

#### DEIR EL-BAHARI: TEMPLE OF HATSHEPSUT

The conservation effort in the Complex of the Royal Cult on the Upper Terrace of the Temple of Hatshepsut was continued, coupled with documentation and requisite digging. Various ongoing projects were continued, nearing in many cases completion:

- ◊ conservation and restoration of the Complex of the Sun Cult and the Main Sanctuary of Amun-Re; the two parts of the temple have now been opened to the public;
- ◊ restoration of the Osiride statues of Hatshepsut in the façade of the Upper (Coronation) Portico and the queen’s sandstone sphinxes; the North Colossus and the upper part of the Southern Colossus at the edges of the Lower Portico of the Hatshepsut temple (ongoing);
- ◊ reconstruction of the sandstone painted statue of Amenhotep I in the form of a mummiform figure of the god Osiris, found in Asasif.

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Documentation in the Ptolemaic Portico and in the Upper Courtyard as well as by the south wall of the Chapel of Hatshepsut, in the Lower Courtyard and by the Hathor Ramp Gate required additional testing. A Third Intermediate Period cemetery was unearthed in the Upper Terrace. Coffins from the Tomb of Montu Priests were documented and studied and an X-ray examination of the mummies carried out (for the results, see selected articles in the Special Studies volume *PAM 27/2: Deir el-Bahari Studies II*).

Documentation and study on decoration in the Main Sanctuary of Amun-Re, the South Chamber of Amun, and the Punt and Birth Porticoes were carried on in preparation for a monographic publication. The same was concluded for the Chapel of Tuthmosis I. Building *dipinti* and graffiti were documented. The results of 3D scanning as well as Ground Penetrating Radar (GPR) surveys were applied in studies of the temple.

The following projects were continued as part of the larger Deir el-Bahari Project:

- 1) Temple of Tuthmosis III storeroom project, directed by Monika Dolńska (see below in this section);
- 2) Temple of Tuthmosis I storeroom project, catalogue of block fragments by Jadwiga Iwaszczuk;
- 3) Asasif Necropolis Project, directed by Patryk Chudzik (see the report in this volume).

*Acknowledgments:* The project benefited from the generous assistance of Dr. Mohamed Ismail, Director General of Sector for Foreign Missions Affairs, Dr. Mohamed Abdel Aziz, Director General of Upper Egypt, Mr. Talat Abdel Aziz, Director General of the West Bank in Luxor, Mr. Ezz el-Din, Chief Inspector of the West Bank Central Sector, Mr. Ibrahim Souleyman (former director of Karnak) and Dr. Hisham Elleithy, Director of Scientific Publication and Documentation Department.

*Dates of work:* 12 March–9 April 2017

*Director:* Dr. Zbigniew E. Szafrński, egyptologist (PCMA UW)

*Deputy Director:* Dr. Mirosław Barwik, egyptologist (Institute of Archaeology, University of Warsaw)

*SCA representatives:* Omar Fathi Hassan Hasan and Elazab Ragab Ahmed Abd Rabu

*Egyptologists:* Katarzyna Kapiec (PhD candidate, Antiquity of Southeastern Europe Research Center, University of Warsaw), Dr. Edyta Kopp (Faculty of Oriental Studies, University of Warsaw), Adrianna Madej (IKSiO PAN), Dr. Franciszek Pawlicki (PCMA UW), Cynthia May-Sheikholeslami (independent) and Patryk Chudzik (independent), Dr. Filip Taterka (Adam Mickiewicz University in Poznań)

*Architects:* Dr Teresa Dziedzic (Wrocław University of Technology), Sergio Alarcón Robledo (independent)

*Conservators:* Rajmund Gazda, Dr. Maria Lulkiewicz, Dorota Rudzińska (all freelance)

*Engineer:* Mieczysław Michiewicz (freelance)

*Photographer:* Maciej Jawornicki (freelance)

*Documentalists:* Sarah Fortune, registrar (student, University of Manchester), Marek Puzkarski (PCMA UW)

*Student-trainees:* Katarzyna Kasprzycka (Institute of Archaeology, University of Warsaw)

*Volunteer:* G. Katarzyna Szafrńska (Poland)

*Rais:* Ragab Ahmed Yassin

**DEIR EL-BAHARI: ASASIF** (research program), see in this volume.

**DEIR EL-BAHARI: TEMPLE OF TUTHMOSIS III** (research program)

Branch of the Polish-Egyptian Archaeological and Conservation Mission to the Hatshepsut Temple at Deir el-Bahari

Ongoing work on the theoretical reconstruction of various temple chambers based on a reconstruction of the painted relief wall decoration. The team proceeded with a program of checking reconstruction drawings against surviving block fragments, coupled with a complementary project of high quality professional photography supporting a series of photomontages of selected parts of the decoration. The reconstruction of the Hypostyle Hall, Sanctuary, and Rooms D, G and H is nearing completion, in preparation for the final publication.

*Dates of work:* November 2017

*Director:* Dr. Monika Dolińska (National Museum in Warsaw)

*SCA representative:* Abla Abd el-Haq

*Egyptologists:* Janina Wiercińska (National Museum in Warsaw), Nathalie Beaux (IFAO)

*Photographer:* Zbigniew Doliński (National Museum in Warsaw)

*Architect:* Mariusz Caban (PhD candidate, Wrocław University of Science and Technology)

**GEBELEIN ARCHAEOLOGICAL PROJECT (Egypt)**, see in this volume.

**MAREA (Egypt)**

*Basilica project and late antiquity building in Marea and its inhabitants*

Continued exploration of the great Basilica concentrated on the north entrance and staircase in the northwest corner of the church. A few marble pavement slabs still remained from the original interior decoration, whereas the inner walls of the staircase revealed impressions of wooden beams from the steps. Excavations revealed another section of the stylobate supporting the columns separating the northern aisle from the nave; the negative impressions of four columns were noted 230 cm apart. Further fieldwork was also undertaken in the building (H<sub>1</sub>) located east of the basilica, focusing on completing the exploration of the installation in room T<sub>1</sub>, the documentation of the architectural stratigraphy of walls and floors, additional orthophotographs and 3D models, and recording of small finds.

The ceramic material consisted mainly of amphorae: local LRA 5/6 (produced in Abu Mena) dated to the 6th–7th century, types Kellia 187–190, Kellia 167 and LRA 7 (types 173–177) from the 6th–8th centuries, LRA 7, AE 3 and AE 4 from earlier phases at the site, as well as imported LRA 1. The largest assemblage came from the staircase. The material also included ERSW A tableware, fragments of bowls, plates, water jugs (*gullas*) and scarce fragments of kitchenware (“pans”, lids, cooking pots), storage pots and lids. The pottery assemblage recovered from building H<sub>1</sub> in seasons 2014 and 2016 was fully documented. The collection of coins from recent excavations was also cleaned and studied.

A field survey was conducted to evaluate the effectiveness of geophysical methods for locating archaeological features preserved in the vicinity of the basilica. A total of 7600 m<sup>2</sup> were surveyed using the magnetic method, and the resistivity survey was conducted in a sector of 1200 m<sup>2</sup>. The survey areas were positioned in geographical coordinate grid WGS 84 projection UTM (zone 35N: EPSG32635) based on a satellite image downloaded from the Google Earth website.

*Dates of work:* 1–25 November 2017

*Director:* Krzysztof Babraj, archaeologist (Archaeological Museum in Kraków)

*Deputy Director:* Prof. Tomasz Derda, papyrologist, epigrapher (Institute of Archaeology, University of Warsaw)

*SCA representative:* Mai Ibrahim Abed El Monem (archaeology), Amr Ibrahim Ali Noah, Director of the Fawzy el Fakhrany Storage Museum in Marea, Ashref Mohammed Abed El Samea (conservation), Mohamed Abdelbaset Ahmed (conservation), Sherif Ayman Saad Ahmad (survey)

*Archaeologists:* Anna Drzymuchowska, ceramologist (Archaeological Museum in Kraków), Dr. Mariusz Gwiazda (independent), Aleksandra Pawlikowska (independent)

*Architect:* Daria Tarara, chief architect (freelance)

*Numismatist:* Dr. Piotr Jaworski (Institute of Archaeology, University of Warsaw)

*Glass expert:* Renata Kucharczyk (PCMA UW)

*Conservator:* Tomasz Skrzypiec (freelance)

*Geophysical survey:* Prof. Krzysztof Misiewicz (Institute of Archaeology, University of Warsaw)

**MARINA EL-ALAMEIN: CONSERVATION PROJECT**, see in this volume.

**MARINA EL-ALAMEIN: ARCHAEOLOGICAL PROJECT**, see in this volume

**NAQLUN (Deir el-Nekloni)**, season cancelled.

**SAQQARA**, see in this volume.

**SHEIKH ABD EL-GURNA: THE PHARAONIC PROJECT**, season cancelled.

**SHEIKH ABD EL-GURNA MANUSCRIPTS CONSERVATION MISSION**, project suspended.

**TELL EL-FARKHA (GHAZALA)**, see in this volume.

**TELL EL-MURRA (NORTHEASTERN NILE DELTA SURVEY)**, see in this volume.

**TELL EL-RETABA**, see in this volume.

### **VALLEY OF THE KINGS: TOMB OF RAMESSES VI**

The team continued documentation of Roman-age inscriptions from the rock-cut walls, covering sections A to E of the royal tomb. The work still needs to be continued.

*Dates of work:* December 2017

*Director:* Adam Łukaszewicz, archaeologist and epigrapher (Institute of Archaeology, University of Warsaw)

*Archaeologists/documentalists:* Kamila Braulińska, photographer (PhD candidate, Faculty of History, University of Warsaw), Anastazja Golijewskaja, drafts person (Institute of Archaeology, University of Warsaw)

## **SUDAN**

### **DONGOLA (OLD)**

Two programs supported by the Qatar–Sudan Archaeological Project (QSAP#10 and QSAP#31), implemented by the PCMA team.

*Monastery on Kom H:* program of excavations in the courtyard, the Central building in the northern part of the monastery, the Northeastern Building and the northern complex: NC.1 Circular building, NB.2 Church with preserved paintings and inscriptions from the early 14th century, NB.4 storied monastic building from the early 7th century. Wall painting conservation program on newly discovered representations and documentation of inscriptions from the Northwest Building and Church NB.2. Anthropological examination of four 14th-century tombs in the southwestern cemetery and infant pot burials from the monastery courtyard (and the Citadel as well). Pottery studies. Shelter roof constructed over the remains of the NB.2 church with wall paintings.

*Citadel.* Excavation at the SWN site covered the southwestern part of the palace (SWN.B.I) and inside the Church of the Archangel Raphael (SWN.B.V). Conservation of the late 8th century wall paintings found inside the church. Study program encompassing the Funj-period basketry and textiles uncovered in the previous season at the SWN site.

*Mosque (Throne Hall)*. Protection of the porch area, including secure access for tourists. Mounting of the new roof structure, which will have to be continued.

*Rock-cut tombs*. Shelter constructed over two tombs from the 5th/6th century AD, making them accessible to tourists. The work was necessitated by the rapidly growing village of El Ghaddar, which has encroached on the cemetery from the 3rd–5th century AD.

*Deserted village south of the Citadel* (18th–20th century): program of drone photography to record the surviving architecture from the air.

*Dates of work*: 5 November–13 December 2017; 10 January–28 February 2018

*Co-Directors*: Prof. Włodzimierz Godlewski, archaeologist (both seasons); Prof. Adam Łajtar, epigraphist (Institute of Archaeology, University of Warsaw)

*NCAM representative*: Hanna Mirgahani Osman (first season), Sajada Ahmed (second season)

*Archaeologists*: Dr. Dorota Dzierzbicka, archaeologist (Institute of Archaeology, University of Warsaw); Vincent Van Greven (independent)

*Anthropologist*: Robert Mahler (PCMA UW)

*Ceramologist*: Katarzyna Danys (independent; both seasons)

*Basketry specialist*: Dr. Anetta Łyżwa-Piber (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences)

*Textile specialist and restorer*: Barbara Czaja (Museum of King Jan III's Palace at Wilnaów)

*Epigraphist*: Agata Deptuła (PhD candidate, Institute of Archaeology, University of Warsaw; second season)

*Architects*: Dr. Romuald Tarczewski, construction engineer and Monika Drab (Wrocław University of Science and Technology; second season)

*Restorers (wall painting)*: Urszula Kusz, Ewa Parandowska, Aleksandra Stachowicz (freelance)

*Archaeologist/surveyor*: Szymon Lenarczyk (PhD candidate, Institute of Archaeology, University of Warsaw; both seasons)

**EARLY MAKURIA RESEARCH PROJECT: Tanqasi**, see in this volume.

The Early Makuria research project focuses on the beginnings of the Kingdom of Makuria in the region between the Third and Fourth Nile Cataracts. The program sets its scope on identifying the nature of social changes occurring in the area in the 4th and 5th centuries. A core issue under study is the manner and circumstances of the transformation of Meroitic into Makurian society. The social, political and religious changes taking place in the Nile Valley in the 4th and 5th century should be analyzed and interpreted based on regional evidence limited to the territory occupied in the 6th century by the three separate kingdoms of Nobadia, Makuria and Alodia. The project, now directed by Assist. Prof. Mahmoud El-Tayeb, was co-directed until 2007 by Prof. Włodzimierz Godlewski. The list of explored sites, surveyed in 2005, include

el-Zuma (since 2004), el-Detti (since 2014), Merowe Shariq (2006) and Tanqasi (since 2006). The work is reported regularly in *PAM*.

Ongoing research grant: Dr. Urszula Iwaszczuk “Opportunities for research on the economy of the el-Zuma/el-Detti and Tanqasi microregions on the basis of animal bone remains from a funerary context” (NCN Preludium 7, Grant 2014/13/N/HS3/04620)

**GHAZALI ARCHAEOLOGICAL SITE PRESENTATION PROJECT (G.A.S.P.),**  
see in this volume.

**Ongoing research grants related to Nubia:**

Dr. Artur Obluski “Nubian Monasticism. The role of religious institutions in the peripheries of the Byzantine World” (NCN Sonata 7, Grant 2014/13/D/HS3/03829)

Dr. Joanna Then-Obluska “A reconstruction of trade contacts in Northeast Africa: an interdisciplinary analysis of Nubian personal adornment” (NCN Sonata 5, Grant 2013/09/D/HS3/04508)

## CYPRUS

### NEA PAPHOS

Team members participated in a program of studies of the pottery and small finds from more than 50 years of excavations by the PCMA UW project (in alphabetical order):

Dr. Dobiesława Bagińska (Archaeological Museum in Poznań): Roman amphora studies, material from the 2011–2013 excavations;

Dr. Aleksandra Brzozowska-Jawornicka (Wrocław University of Science and Technology): Nabatean-style architectural decoration from the 2011–2013 excavations;

Dr. Agata Dobosz (Paphos Agora Project, Jagiellonian University Kraków): amphora stamps;

Michalina Dzwoniarek-Konieczna\* (PhD candidate, Adam Mickiewicz University in Poznań): stone artifacts and stone use in architecture;

Jacek Hamburg (independent): metal artifacts;

Prof. Elżbieta Jastrzębowska\*: painted wall decoration from the House of Aion;

Prof. Barbara Lichočka\*: coin studies;

Dominika Majchrzak\*: lead weights;

Edyta Marzec (Post-Doc, Fitch Laboratory, British School at Athens): Hellenistic Colour Coated Ware, archaeometric studies;

Dr. Henryk Meyza\*: pottery and stratigraphy of the Villa of Theseus in Nea Paphos;

Julia Mikocka\* (PhD candidate, NCN Preludium grant 2015/19/N/HS3/00907): architecture of the House of Aion;

Marcin Romaniuk\* (PhD candidate): water-supply installations;

Monika Więch\* (PhD candidate, NCN Preludium 2017/25/N/HS3/02910): cooking wares;

(\* Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences)

The Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences, and the PCMA UW co-organized an international conference “Decoration of Hellenistic and Roman buildings in Cyprus. Residences at Nea Paphos and other cities of the region”, held in Warsaw on 10–11 March 2017. Participants in the PAPHOS II: “Nea Paphos and Western Cyprus” conference on 11–15 October 2017 in Paphos included team members Henryk Meyza, Wiktor Andrzej Daszewski, Barbara Lichočka, Aleksandra Brzozowska, Monika Więch, Marcin Romaniuk and Anna Kubicka. Jolanta Młynarczyk sat on the conference’s Scientific Committee.

See also: papers in the volume *PAM 26/1 (2017)*: H. Meyza, M. Romaniuk, M. Więch, “Nea Paphos. Seasons 2014 and 2016” (appendices D. Mazanek-Somerlik, “Glass from the HH Courtyard” and M. Więch, “Note on the Pottery from the Circular Basin S:1/16”), 397–426; M. Romaniuk, “A circular pool in the main courtyard of the “Hellenistic” House in Nea Paphos. Preliminary remarks”, 427–438; M. Więch, “Cooking Ware pottery from the “Hellenistic” House at Nea Paphos. Seasons 2014 and 2016”, 439–450. Also: E. Marzec, E. Kiriati, N.S. Müller, A. Hein, “Provenance and technology of a group of Hellenistic Colour-Coated ware pottery from the excavations at Nea Paphos in Cyprus”, *Journal of Archaeological Science Reports* (<https://doi.org/10.2016/j.jasrep.2017.10.006>); A. Brzozowska-Jawornicka, “In search of a Paphian lost circular building”, *SAAC 22 (2018)*: 41–64

## LEBANON

### CHHĪM

Study seasons in 2017 and 2018 were dedicated primarily to a full catalog and documentation of the pottery finds from excavations in 1996–2016. Common ware and amphoras, more than 8000 fragments, mainly local and regional production, were studied by Urszula Wicenciak. Tableware from all periods: Hellenistic, Roman, late antique and early Byzantine (3rd century BC–7th century AD, mainly terra sigillata and red slip wares), was examined by Krzysztof Domżański. Francisco J. Núñez concluded a typological and chronological description of ceramics from the Late Bronze to the Persian periods. Lamp studies by Małgorzata Kajzer on the assemblages from Chhīm and Jiyeh distinguished macroscopic groups in reference to specific lamp types and a concrete chronology.

See also: M. Krueger, U. Wicenciak, Z. Kowarska, P. Niedzielski, L. Kozak, M. Krueger, K. Jakubowski, J. Proch, M. Mleczek, A. Waśkiewicz, “First results of organic residue analysis on ceramic vessels (Jiyeh and Chhīm, Lebanon) by high performance liquid chromatography with tandem mass spectrometry”, *Mediterranean Archaeology and Archaeometry* 18/1 (2018): 209–220. DOI: 10.5281/zenodo.1165358

*Dates of work*: 31 July–27 August/3 September 2017; 2–13 July 2018

Team

*Director*: Assoc. Prof. Tomasz Waliszewski, archaeologist (Institute of Archaeology, University of Warsaw) (2017, 2018)



*Ceramologists:* Dr. Urszula Wicenciak (PCMA UW; 2017, 2018); Dr. Krzysztof Domżałski (Institute of Archaeology and Ethnology, Polish Academy of Sciences; 2018); Francisco J. Núñez (independent; 2017)

*Pottery lamp studies:* Małgorzata Kajzer (PhD candidate, Institute of Archaeology, Jagiellonian University, Kraków; 2017)

*Archaeologist:* Ingrid Peris -Valero (Universit  Paris Sorbonne Abu Dhabi) (2017, 2018),

*Documentalist:* Marek Puzzkarski (PCMA UW) (2017, 2018)

*Student-trainee:* Jerzy Oleksiak (Institute of Archaeology, University of Warsaw, 2018)

## **Khalde**

The project aimed to record the architecture uncovered by Lebanese archaeologists at the site of Khalde (33°48'32.63"N, 35°28'53.36"E) in the 1970s. Both masonry and rock-cut structures were cleared from sand backfill and vegetation, at least three complexes of wine presses of Roman date were identified, one of these at least two-phased, featuring mosaic floors from the younger phase. Khalde also comprised limestone quarries. One of the quarries took advantage of a Roman-age tomb; some pieces of Roman clay coffins were found. Poorly preserved remains of a bath with semicircular pool and hypocaust were traced next to a mysterious rock-cut building with four pillars. A ceramic survey of the site was also carried out.

*Dates of work:* 13–17 August 2017

*Director:* Dr. Mariusz Gwiazda (freelance)

*Topographer:* Stanisław Rzeźnik (Archeomap Stanisław Rzeźnik)

*Archaeologist:* Karolina Jurczyk (freelance)

*Ceramologist:* Dr. Urszula Wicenciak (PCMA UW)

*Acknowledgments:* The Polish-Lebanese Archaeological Project is greatly indebted to the Minister of Culture Gaby Layoun, for permission to work, as well to Myriam Ziad  for making the work possible.

## **JORDAN**

**KHIRBET EL-SAR/SARA**, see in this volume.

## **IRAQI KURDISTAN**

**IRAQI KURDISTAN SURVEY PROJECT: NEWCOMERS AND AUTOCHTHONS**, see in this volume.

## **ARMENIA**

**METSAMOR**, see in this volume.

## **SAUDI ARABIA**

### **AYNUNA**

The Project, which is carried out in collaboration with the Saudi Commission of Tourism and National Heritage, completed five seasons of explorations between 2016 and 2018, determining the presence of two contemporary sites: the upper city on an inaccessible plateau 50 m above the bed of the Wadi Aynuna, and a complex of units at the wadi edge, interpreted as storage for goods brought by sea to be re-packed for transporting north via camel caravan. Study of the written sources have led to the assumption that the site is ancient Leuke Kome, described as an important harbor and Roman customs house from the 1st century AD in the northern part of the eastern Red Sea. The site lies about 3 km from the bay of Aynuna, which is a safe haven protected from the open sea by a coral reef. In the 1st century AD it was in the hands of the Nabatean kingdom and was the last convenient harbor on the sea route from Yemen and India. A caravan route led from here to Petra and then to Gaza on the Mediterranean coast. The Roman Empire imported exotic goods, such as frankincense, pepper and other spices, Indian muslin and silk from China, but the trade also had a cultural significance, constituting a basis for Rome's contacts with India and the Far East.

The project has cleared 27 units from five buildings (one cleared in its entirety) constituting inns located on the caravan route out of Aynuna. Earlier buildings of the same nature were recorded in lower-lying levels. Radiocarbon dating of samples verified site chronology based on a study of ceramics and coins. There were two principal phases of occupation: in the Nabatean period (1st century BC/1st century AD) and in Roman and early Islamic times (4th century and later). The first phase comprised characteristic Nabatean painted pottery, a Nabatean inscription, unfortunately undated, and 14 coins of which the latest is from AD 16. The intervening period in the 2nd and 3rd century was a time of stagnation, until the 330s marked by a clustering of coins of Constantine and his direct successors. The latest presence at the site is a coin from AD 667 (so-called Arab-Sasanid series), supported by a series of radiocarbon dates.

The archaeological evidence for the functioning of the port and trading center of Aynuna over 700 years from the 1st century BC/1st century AD through the 7th century is the first such evidence available from the northern Hijaz coast. It brings light to bear on the sea contacts of the Nabateans known from very few ancient written sources and on the completely unknown history of this region in the 4th–7th centuries AD.

*Dates of work:* 12 November–15 December 2016/10 January–18 February and 11 October–15 December 2017/17 January–27 February 2018

*Co-Directors:* Prof. Michał Gawlikowski (PCMA University of Warsaw), Dr. Abdullah al-Zahrani and Waleed al Badaywi (Saudi Commission for Tourism and National Heritage)

*Deputy Director:* Dr. Karol Juchniewicz (PCMA University of Warsaw)

*SCTH representative:* Abdel Basset al-Sadeq (Tabuk office)

*Archaeologists:* Marek Truszkowski (PCMA University of Warsaw), Karol Ochnio (independent), Saud al-Amari (Saudi Commission for Tourism and National Heritage)

*Geologist:* Hubert Kiersnowski (independent)

*Glass specialist:* Krystyna Gawlikowska, art historian (independent)

*Documentalist:* Marcin Wagner (Institute of Archaeology, University of Warsaw)

*Funding body:* National Science Center, grant Harmonia 6: UMO-2014/14/M/HS3/00795 “Infrastructure of the international trade in the Red Sea area in the Roman period”.

## KUWAIT

### BAHRA 1, AL-SUBIYAH (AS-SABBIYA)

After seven seasons of fieldwork by the Kuwaiti–Polish Archaeological Mission (KPAM) at the Ubaid-period site of Bahra 1, in the Al-Subiyah region of northern Kuwait, the project implemented a study season to process the finds, prepare the results for publication and set out the most effective plans for future fieldwork. The pottery documentation was brought up to date and the whole collection was re-studied with hindsight, searching for joining pieces and technological marks. The shell specialist continued with a study of the assemblage from House 1, the most fully excavated architectural unit at the site. Archaeologists worked with the topographer, photographer and documentalists on preparing studies of their parts of the fieldwork record. The documentation team advanced preparations towards the publication of a report in book form on the first three seasons of work at the site, since the publication of volumes devoted to the more current seasons preceded it. The Secretary General of the National Council of Culture, Arts and Letters, Dr. Eng. Ali Youha, and the staff of the NCCAL are gratefully acknowledged for their support in the project. Thanks are due also to the Polish Embassy in Kuwait for their hospitality and help in promoting the results of KPAM work in both Kuwait and Poland.

*Dates of work:* 2 October–4 November 2017

*Co-Directors:* Prof. Piotr Bieliński, archaeologist (Institute of Archaeology, University of Warsaw); Dr. Sultan Al-Duwaish, archaeologist (Director, Department of Antiquities and Museums of the State of Kuwait)

*NCCAL representatives:* Hamid al-Mutairi (Department of Antiquities and Museums of the State of Kuwait, Jahra branch)

*Archaeologists:* Dorota Bielińska (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences); Andrzej Reiche, small finds specialist (National Museum in Warsaw)

*Ceramologist:* Dr. Anna Smogorzewska (Institute of Archaeology, University of Warsaw)

*Malacologist:* Victoria Maria Morgan (independent)

*Surveyor:* Piotr Zakrzewski (PhD candidate, Institute of Archaeology, University of Warsaw)

*Documentalists:* Ewa Hander (Archaeological Museum of Chełm); Marta Momot and Agnieszka Szymczak, archaeologists, Dr. Urszula Wicenciak, ceramologist (all Polish Center of Mediterranean Archaeology University of Warsaw University of Warsaw)

*Photographer:* Adam Oleksiak (freelance)

#### **FAILAKA ISLAND: KHARAIB EL-DESHT ARCHAEOLOGICAL PROJECT**

*Dates of work:* 15 March 2018–26 April 2018

*General Director:* Prof. Piotr Bieliński (Institute of Archaeology, University of Warsaw)

*Field director:* Dr. Agnieszka Pieńkowska

*Archaeologists:* Dominika Majchrzak (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences), Mateusz Iskra, Paweł Lech, Magdalena Nowakowski, Dr. Szymon Lenarczyk (Institute of Archaeology, University of Warsaw), Marek Truszkowski, Piotr Zakrzewski (Polish Center of Mediterranean Archaeology, University of Warsaw)

*Ceramologist:* Marta Mierzejewska (Polish Center of Mediterranean Archaeology, University of Warsaw)

*Student-trainees:* Anna Graczyk (Institute of Archaeology, University of Warsaw)

*Volunteers:* Joanna Reiche, Radosław Tusznió (both Warsaw, Poland)

#### **FAILAKA ISLAND: “Waterfront and Underwater Archaeology of Kuwait. Archeorisk on the Coastal Zone around Failaka Island, Kuwait” Project**

The project, which is part of the Kuwaiti–Polish Failaka Archaeological Mission and was launched in 2013, is the first archaeological research project concerning the underwater cultural heritage of Kuwait and Failaka Island. Altogether 33 littoral structures were located, most of them interpreted as stone tidal weirs (fish traps), of circular and long linear shape. A third harbor with breakwater was added to the two already recorded. In 2017, the Project documented features 1, 9, 10, and 13 in Kharaiib el-Desht Bay and the neighboring Quranyah Bay, mapping them in the KTM system and following standard project criteria of description. Bathymetric maps provided the base for a reconstruction of the historical natural shoreline. The team also documented the maritime landscape and maritime cultural heritage of Failaka Island, focusing on all human activity connected with the sea now and in the past.

*Dates of work:* 13 April–24 May 2017

*General Director:* Prof. Piotr Bieliński (Institute of Archaeology, University of Warsaw); Dr. Hamid Al-Mutairi (Department of Antiquities and Museums of the State of Kuwait)

*Project Leader:* Magdalena Nowakowska, archaeologist, scuba diver CMAS P2, Commercial Diver 2nd class (Institute of Archaeology, University of Warsaw)

*Archaeologist/surveyor:* Dr. Szymon Lenarczyk, archaeological graphics and geodesy measurement, scuba diver (“Wykop na Poziomie”)

*Conservator:* Radosław Tusznio, conservator of stone sculpture and architectural elements, graphic designer (Inter-Academy Institute of Conservation and Restoration of Works of Art, Academy of Fine Arts in Warsaw)

## OMAN

**QUMAYRAH VALLEY ARCHAEOLOGICAL PROJECT: QUMAYRAH-AYN 2 (QA 2)**, see in this volume.

### **QUMAYRAH VALLEY ARCHAEOLOGICAL PROJECT: QUMAYRAH-AYN 1 (QA 1) and QUMAYRAH-AYN 2 (QA 2)**

The team from the Polish Centre of Mediterranean Archaeology, University of Warsaw, continued research on sites QA 1 (Umm an-Nar cemetery), QA 2 (Neolithic encampment) and QA 3 (Bronze/Iron Age settlement), located in the vicinity of the village of Al-Ayn Bani Saida in the southern part of Qumayrah valley. An extensive survey of a spacious Iron Age rural settlement (site QA 21 south of QA 3) was initiated. Another prehistoric campsite (QA 12) was tested (the results of Neolithic site exploration, see in this volume).

At least three main phases of occupation were identified at the settlement of QA 3. The presence of Early Bronze Age (Umm an-Nar period) structures was recorded under Iron Age buildings in the middle of the site and a late Islamic hamlet of scattered stone cubicles. The Umm an-Nar period structures are apparently related to a huge stone tower that is still visible today on the northern fringes of the site. At the burial site, the team continued exploration of the northwestern quarter of tomb QA 1-1 (Locus 1), that is, one of the four chambers of the collective sepulcher, and started investigation of the southeastern quarter (Locus 3). This year a layer containing remains of human skeletons was reached and excavated in both chambers. The exploration of this burial layer yielded a fairly rich collection of vessels made of steatite/chlorite.

*Dates of work:* 4 November–16 December 2017

*Director:* Prof. Piotr Bieliński (Institute of Archaeology, University of Warsaw)

MHC representative: Sulaiman al-Jabri (Department of Excavations and Archaeological Studies, Ministry of Heritage and Culture, Sultanate of Oman)

*Sub-Project Director:* Dr. Marcin Białowarczuk (Institute of Archaeology, University of Warsaw)

*Archaeologists:* Dorota Bielińska (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences), Marta Momot, archaeologist (PCMA University of Warsaw), Aleksandra Oleksiak (independent), Dr. Agnieszka Pieńkowska (PCMA University of Warsaw), Andrzej Reiche (independent), Dr. Łukasz Rutkowski (PCMA University of Warsaw), Agnieszka Szymczak (PCMA University of Warsaw)

*Documentalist:* Marek PuszkarSKI (PCMA University of Warsaw)

*Photographer:* Adam Oleksiak (freelance)

*Surveyor:* Magdalena Antos and Otto Bagi (both freelance)

*Student-trainee:* Anna Graczyk (Institute of Archaeology, University of Warsaw)

## **UNITED ARAB EMIRATES, EMIRATE OF DUBAI**

### **SARUQ AL-HADID**

The PMSaruq Archaeological Research Project carried out a second season (and last) of excavations as part of an international effort organized by the Dubai Municipality (UAE) to study the site of Saruq al-Hadid. The area assigned to the team was extended in order to safely explore four squares (T7, T8, U8 and V8) down to bedrock level, thus establishing a complete stratigraphic record for the Area F sector. The team also took over three squares, U7, V7 and W7, from the German sector, exploring them down to bedrock level from a level left by the German team. A side outcome was the tracing of the extent of modern disturbance in the excavation area, both horizontally and vertically, recreating in a sense the modern archaeological history of the site.

Working with extensive orthophotographic documentation of top plans and sections through the sand fill column, the Project recorded seven phases:

1. first occupational phase corresponding to the Wadi Suq cultural horizon (2000–1800 BC);
2. sand layer blanketing the entire area, culturally sterile;
3. first industrial phase encompassing copper-smelting and potential copper-working (artifacts, half-products, ashes and waste) (1000–800 BC);
4. sand layer corresponding to the desertification of the climate, more varied dune landscape, tentative habitation or workshop location and a local episode of ditch-digging and ultimate ritual offering activity, including the first iron artifacts in the form of a sword and evidence of objects from distant regions, like Luristan across the Gulf (corresponding to the late Iron Age II);
5. first (older) slag coat, representing the second copper-smelting and copper-working industrial phase at the site: ingots, slag and crafts-related artifacts, but demonstrating the changed functionality of this part of the site, which was now used as a waste dump;
6. sand layer engulfing the first slag waste heap, leveling the area, rather sterile culturally, not dateable either in absolute dates or duration;

7. second (younger) slag coat and possible subsidiary layers of slag waste, the last episode of industrial copper-smelting and metal-working, evidencing extensive scavenging of the ancient mound for metal artifacts for remelting (100 BC–AD 800);

8. modern sand dune deposition and modern disturbance.

The results were presented in a paper at the 47th Arab Seminar conference in London in August 2018 (I. Zych, Z. Wygnańska, Ł. Rutkowski, Mansour Boraik, Yaaqoub Youssif Al Ali and J.K. Rądkowska “The site of Saruq al-Hadid (Dubai, UAE): reconstructing an anthropogenic landscape”).

See also in this volume: Ł. Zieliński and W. Weker, Conservation of metal artifacts from the Polish Mission excavation at Saruq al-Hadid, PAM 26/1: 465–481.

*Dates of work:* 11 November 2017–29 March 2018

*Co-directors:* Prof. Piotr Bieliński, archaeologist (Institute of Archaeology, University of Warsaw) (until 31 December 2017) and Iwona Zych, archaeologist (PCMA University of Warsaw)

*Field Directors:* Dr. Zuzanna Wygnańska (PCMA University of Warsaw), Dr. Łukasz Rutkowski (PCMA UW)

*Dubai Municipality representatives:* Dr. Mansour Boraik, Yaaqoub Yousif Al Ali and Mahra

*Archaeologists:* Björn Briewig (independent), Mariusz Kowalewski (Institute of Archaeology, University of Warsaw), Magdalena Ostrowska (PCMA University of Warsaw), Joanna K. Rądkowska (PCMA University of Warsaw), Sidney A. Rempel (independent), Marek Woźniak (PhD Candidate, PCMA University of Warsaw)

*Metal expert:* Łukasz Zieliński (PhD Candidate, Institute of Archaeology, University of Warsaw)

*Personal adornment expert:* Dr. Zuzanna Wygnańska, archaeologist (PCMA University of Warsaw)

*Lithics expert:* Mariusz Kowalewski (Institute of Archaeology, University of Warsaw)

*Surveyors/archaeologists:* Otto Bagi, 3D documentation (Institute of Archaeology, University of Warsaw), Bartosz Wojciechowski (Antiquity of Southeastern Europe Research Center, University of Warsaw)

*Metal conservator:* Władysław Weker (State Archaeological Museum, Warsaw)

*Registrar:* Marta Bajtler and Katarzyna Pawłowska, archaeologists (both independent)

*Photographers:* Mariusz Kowalewski, archaeologist (Institute of Archaeology, University of Warsaw), Jan Kurzawa (freelance)

*Documentalists:* Marta Momot and Magdalena Ostrowska (both PCMA University of Warsaw)

*Acknowledgments:* Gratefully acknowledged the CEOs, former and present, of the Architecture Heritage and Antiquities Department of the Dubai Municipality, Mr. Rashad Mohammed Rashad and Mr. Ahmed Mahmoud, for the opportunity to work at the site, and Dr. Mansour Boraik and Mr Yaaqoub Yousif Al Ali for smooth management of fieldwork and team accommodation.





# Alexandria Kom el-Dikka

## Season 2017



**Abstract:** The 2017 season saw the conclusion of the first phase of the Site Preservation Project at the Kom el-Dikka site. The new visitors' route was officially inaugurated by the Minister of Antiquities of Egypt, Dr. Khaled al-Anany. Archaeological excavations continued to be focused on a huge mound of ashes and urban refuse, located to the south of the Imperial Bath complex in the central part of the Kom el-Dikka site. The mound accumulated over the ages from the 4th to the 7th century AD, covering the ruins of early Roman dwelling houses. The report gives an overview of digging in this area, where a substantial part of a house was cleared. It includes also a summary of conservation work performed on mosaics and monuments of ancient architecture.

**Keywords:** late antique Alexandria, urban dump, mosaics, Roman houses, conservation

The 2017 season of fieldwork was filled as usual with multiple tasks, covering both archaeological and conservation work. The high point of the year came on 1 April with the official inauguration of the tourist itinerary, constituting the first stage of the Kom el-Dikka Site Presentation Project. Officiating at the well-attended opening ceremony were His Excellency Dr. Khaled al-Anany, Minister of Antiquities of Egypt, accompanied by their Excellencies Mohammed Sultan, Governor of Alexandria, Michał Murkociński, Ambassador of Poland and Prof. Marcin Pałys, Rector of the University of Warsaw (see above, page 30 in this volume). The new itinerary swelled the numbers of visitors over the early summer months, even as the team returned late in the season to a regular schedule of digging and conservation, running all the time a training course for a group of junior SCA staff members. The course focused on basic excavation and conservation techniques and methods including stratigraphic analyses, surveying, pottery processing and drawing.

**Grzegorz Majcherek**

Polish Centre of  
Mediterranean Archaeology  
University of Warsaw

## **Team**

*Dates of work:* 9 March–3 July 2017

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

*Deputy Director:* Renata Kucharczyk, glass specialist (PCMA UW)

*SCA representatives:* Omar Mahrous Mahmoud Doma, Nermine Sami Abdel Fatah Ahmed, Mohammed Abu Bakr, Mona Mustafa Kamel Ibrahim, Amira Hassan Mohammed Hassan and Karim Mohammed Mohammed Ghoneim

*Archaeologist:* Emanuela Kulicka (freelance)

*Numismatist:* Prof. Barbara Lichočka (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences)

*Conservators:* Ewa Parandowska and Zygmunt Nawrot (both freelance)

*Architects:* Justyna Romanowska and Szymon Popławski (students, Wrocław University of Science and Technology)

*Documentalist:* Katarzyna Popławska (freelance)

## **Acknowledgments**

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### EXCAVATIONS

Continued excavation of the central part of the site was the main focus of the archaeological part of the season, particular emphasis being placed on studying the early Roman domestic architecture [Fig. 1]. Previous work in this area had exposed substantial sections of at least four Roman houses (FA, FB, FC and FD) (Majcherek 1995: 14–20; 1996: 13–20; 1997: 19–30; 1998:

25–30; 1999: 35–39; 2010: 35–42; 2011: 38–46). The investigation then focused on their layout, decoration and functional arrangement on the assumption—based on a central location within the city and the sumptuous interior architectural decoration, including mosaic floors—that they represented a middle-class, if not elite status of their inhabitants.

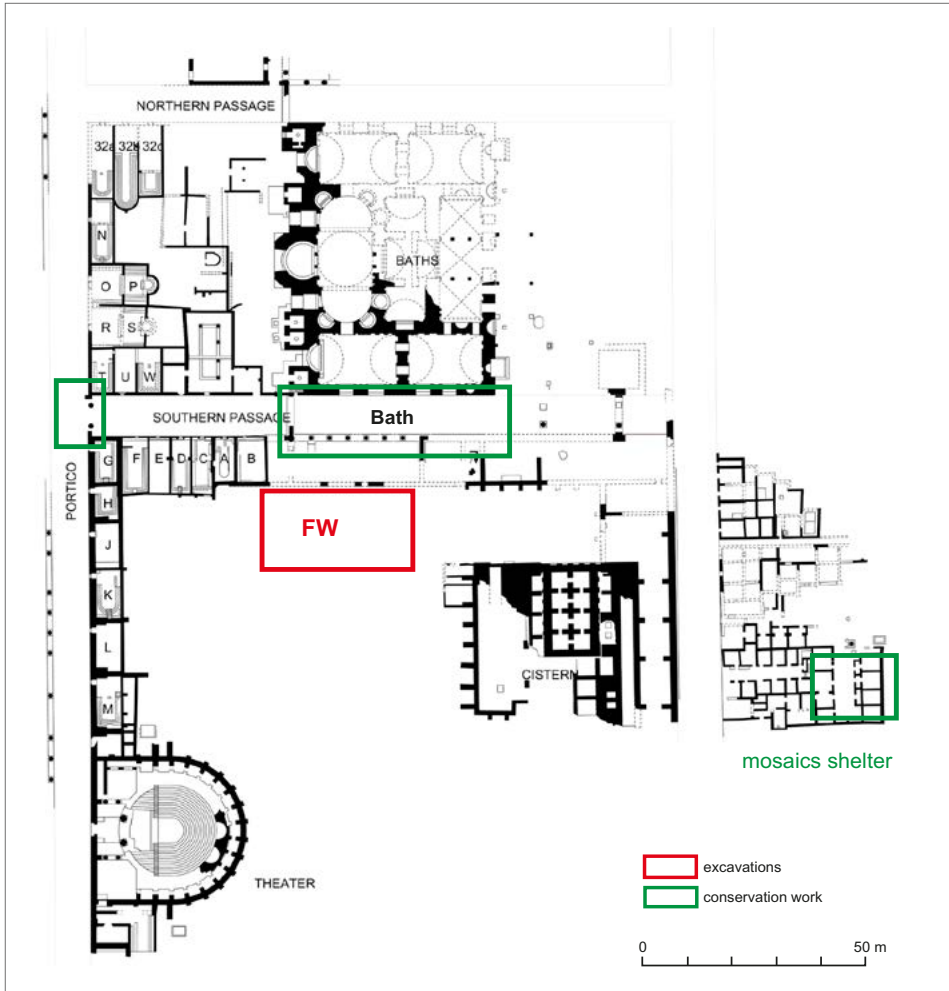


Fig. 1. Kom el-Dikka: areas of excavation and conservation work in the 2017 season (PCMA Alexandria Kom el-Dikka Project/drawing W. Kołataj, update D. Tarara)

This season work was limited to the western part of area F, where the trench, investigated first in 2009, was now extended west (FW). Given the time constraints and logistic obstacles (considerable distance from the current excavation dumps), exploration was limited to an approximately 10 m square trench.

**EARLY ROMAN PHASE**

The targeted early Roman phase in the trench comprised fairly well preserved structures, which may have formed a western extension of the early Roman house FB, partly uncovered already in 1998, or—more likely—were part of yet another house (Majcherek 1999). The two

long walls (w.760 and w.761) closing the excavated areas from the east have no doors linking this area with the previously excavated structures.

A cluster of contiguous rooms (21–27) of various dimensions was cleared, not all of them explored in their entirety [Figs 2–3]. Given their rather modest dimensions, they should be expected to serve purely domestic rather than official function.

This entire wing appears to have been accessible from a side street that is assumed to have run south of the excavated area. Such a street, approximately 4.80–5.00 m wide, was identified already in two trenches, located next to the north-

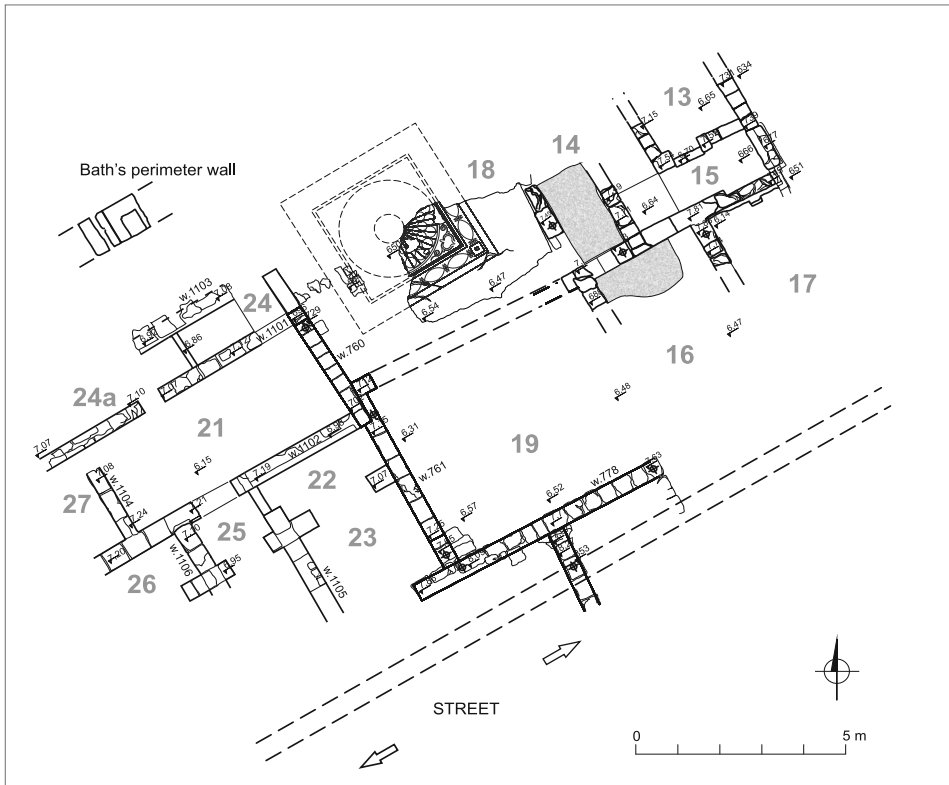


Fig. 2. Early Roman house in Area FW (PCMA Alexandria Kom el-Dikka Project/drawing M. Sołtys and G. Majcherek)

ern elevation of the late Roman cistern (Majcherek 2011: 46). In one of these trenches dug close to the northeastern corner of the cistern, a typical stepped entrance (*prothyron*) leading from the street to building FD was cleared (Majcherek 1998: 30–34).

The wing was accessed through a narrow corridor/vestibule (25, approximately 1.65 m wide) flanked by two pilasters. A wide doorway opened from it onto the largest transverse unit (21), measuring 6.00 m by 2.50 m. From there additional doors led to a chamber (24a) and to a small side room (27, unexcavated), located further west. An opening in the wall in the northeastern corner of 21 gave access to a staircase (unit 24), indicative of the existence of a second storey or at least a terraced roof. A basin almost square in shape occupied the adjacent

narrow and elongated room 24a, which was barely wide enough to accommodate its width of 0.95 m. A well-preserved *opus signinum* lining still covers the walls. The structure was obviously used as a waste bin; considerable amounts of food remains, fish bones, shells etc. were found in the fill.

Given its key role in organizing communication within the excavated part of the house, it is quite possible that unit 21 served as a small courtyard. This impression is further supported by a large channel cutting diagonally across the unit and emptying into a sewer noted in room 24.

Room 23 and its annex (22) located in the southeastern part of the trench were somehow separated from the rest of the house. The room acted most likely as a shop accessed directly from the street. Similarly located shops were previously



Fig. 3. Remains of the early Roman house in Area FW, looking south (PCMA Alexandria Kom el-Dikka Project/photo G. Majcherek)

identified in nearby house FA (Majcherek 1996: 16). Units 26–27 remained unexplored and their communication with other parts of the house has yet to be recognized.

Wall construction technique identified in sections explored this season was similar to previously excavated structures of Roman age. Walls, preserved sometimes 1.40–1.60 m above the floor level, were chiefly structured in regular isodomonic technique and did not exceed 0.40–0.45 m in thickness. Some of them showed clear signs of seismic-related deformations: shattered and displaced masonry, deep vertical cracks etc. However, there is no way to ascribe them to any particular earthquakes known from historical records. Floors varied considerably, from tamped earth surfaces in rooms 21 and 23, to remains of pavement in the *opus barbaricum* technique in room 25, the latter being a bichrome mosaic featuring white rhomboids inscribed within black



Fig. 4. Painted plastering in the early Roman house (PCMA Alexandria Kom el-Dikka Project/ photo G. Majcherek)

rectangles. Stone collapse, cleared in all the rooms, contained numerous pieces of lime/gypsum plaster with reed mat imprints apparently fallen from a ceiling, which is an indication of a flat roof. The fill produced also a large number of fragments of multicolored plastering, found practically all over the trench. Substantial stretches of plastering were found extant on the walls. In room 24a, decoration consisted of a horizontal black band, painted on white plaster. Another, more developed example of adornment was found on the western pillar in room 22; it featured large plain panels, delineated with alternating green, black and red lines [Fig. 4]. Interestingly, several broken fragments of small cups preserving varied dyes (green, yellow, blue and red) were discovered scattered through the debris. It is quite possible that they had found use in decorating the wall plaster.

At this stage of research the function of particular rooms cannot be identified properly. It is apparent nonetheless that the building was used for a prolonged period and witnessed subsequent transformations and reshaping. In a later period, it served industrial purposes with some rooms apparently turned into workshops. Stone moulds for glass beads were discovered in the fill; some additional furnishings of an industrial nature (stone anvils, benches, supports etc.) were also found in the presumed courtyard (21). In the final phase, the courtyard may have also been used as a kitchen, as evidenced by a thick deposit of soot and ashes, as well as a fair number of kitchen ware fragments, found in associated layers. Noted along a number of Egyptian and imported cooking pots and mortaria was a fine example of



an African large shallow bowl or lid with grey-fired rim (Hayes Form 196), dated to the mid 2nd–mid 3rd century AD [Fig. 6:8].

The most surprising and advanced transformation took place in room 23. A brick-made dome was obviously introduced there. A great number of flat Roman bricks (24 cm by 24 cm) and the keystone were found collapsed on the floor [Fig. 5]. The dome must have been part of the same modification that was previously witnessed in house FA, where two rooms were also found to be covered with well-preserved domes (Majcherek 1996: 19). The purpose of this alteration and of the effectively domed rooms continues to be subject to speculation.

Layers associated with the latest phase of settlement or the final abandonment of the house produced substantial quantities of pottery, some glass as well as lamp fragments, belonging mostly to the 2nd–4th century AD horizon. The repertoire included both Egyptian and imported pottery, and consisted mostly of amphorae and coarse wares, with only a small quantity of fine wares present. Early variants of LRA 4 (Gaza–Ashkelon) amphorae made up the overwhelming majority of the finds [Fig. 6:1]. Among other imported wares one should mention Cilician amphorae (early version of LRA 1 and “pinched-handle” amphorae; Fig. 6:2). Some oil and wine containers, originating from Byzacene (Africana I) and Tripolitania (Tripolitanian III) and Tunisia, were also recorded [Fig. 6:3,4] (Majcherek 2017). Aegean vessels make another distinct group, including among others examples of Cretan amphorae (mostly AC1) and quite a number of cooking pots. The latter, albeit widely traded throughout

the Mediterranean, were until now hardly ever reported from Alexandria and from other Egyptian sites. Globular *kakkabe* were the most common among the several noted shapes [Fig. 6:5,6]. Most vessels were made in standard “Lycian kaolinitic” fabric, although a few sherds of red “ferromagnetic” fabric were also identified (Lemaître et al. 2013). All in all, this is the first indication of large scale importation of Aegean kitchen ware to Egypt, in stark contrast to their extremely low frequency in the late antique period. Regional Egyptian pottery is represented mostly by early-mid Roman amphorae produced in the Nile Valley (Egloff 172 and Egloff 176–179, respectively) and various examples of common wares. There was a marked presence of two-handled water jugs on highly moulded foot as in previous seasons [Fig. 6:7]. The macroscopic characteristics of their Nile silt fabric point to production centers located most probably in the Delta.

Fine wares were definitely less numerous. A few examples of Egyptian imitations of ubiquitous Cypriot Sigil-

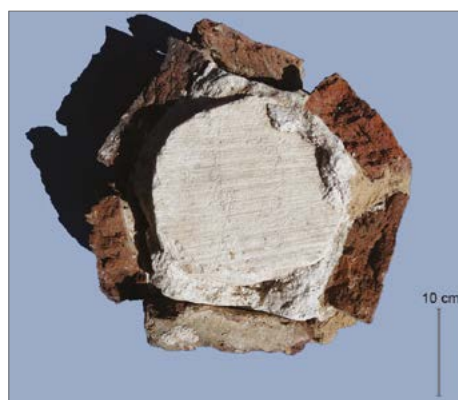


Fig. 5. Keystone from the collapsed brick dome (PCMA Alexandria Kom el-Dikka Project/photo G. Majcherek)



Fig. 6. Selection of early Roman pottery: 1 – Gazan amphora (LRA4); 2 – Cilician LRA 1 amphora (early version); 3 – Africana I amphora; 4 – Tripolitanian III amphora; 5, 6 – Aegean cooking pots; 7 – Egyptian (Nile silt fabric) water jug; 8 – African Red Slip bowl/lid, form 196; 9 – Egyptian imitation (Nile silt fabric) of Cypriot Sigillata form P40 (PCMA Alexandria Kom el-Dikka Project/drawing K. Pawłowska)



lata form P40 were recorded [Fig. 6:9].<sup>1</sup> Of note is a thin-walled cup imported from the Aegean, bearing a partly preserved painted inscription in Greek: *πεί[ν]ε εὐφραίν[ων]*, i.e., “drink with joy” (reading by A. Łukaszewicz) [Fig. 8]. Similar exhortations proliferated particularly in later antiquity, being found on glass vessels (Auth 1996), although never before attested in Alexandria. Several examples of 2nd century AD Egyptian-made lamps complete the repertory of ceramic objects, among them a couple of handles of the *Isis lactans* figurine type [Fig. 7].

The excavations produced also some glass fragments representing mostly tableware characteristic of the 1st to the 3rd century AD. Vessel shape and glass color and quality are paralleled by contemporary glass from earlier excavations in the area and also by material from Marina

el-Alamein (Kucharczyk 2005; 2010b: 125–127; 2016a: 88). The assemblage comprises bottles and flagons of various shape, often equipped with solid ring bases, shallow



Fig. 7. Egyptian oil-lamp handle (Inv. No. 1084.1.17) (PCMA Alexandria Kom el-Dikka Project/photo K. Pawłowska)

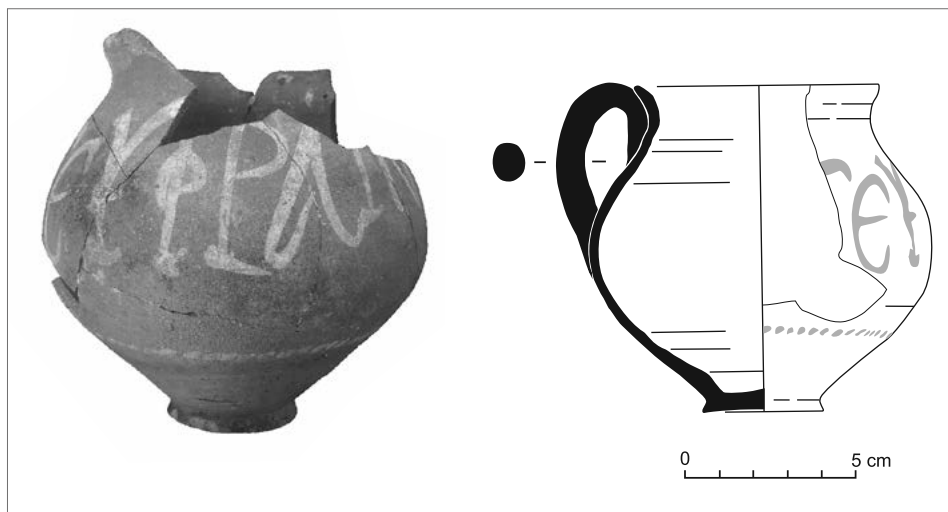


Fig. 8. Thin-walled cup, an Aegean import, with a painted Greek inscription “drink with joy” (PCMA Alexandria Kom el-Dikka Project/photo and drawing K. Pawłowska)

- 1 Egyptian imitations of this form were first identified in Alexandria in 1991 (Majcherek 1991: 2). They have been reported frequently from other Egyptian sites ever since (Ballet and von der Way 1993: 19–20).

plates, deep bowls, cups and beakers, including cylindrical specimens with thick bases decorated with thin, horizontally applied threads, as well as with irregularly spaced deep elongated indents, all made

of colorless free-blown glass [Fig. 9:1–7]. A limited number of vessels, including an unguentarium, was made of green glass. A small hemispherical cast mosaic bowl with a very fragmentary polychrome or-

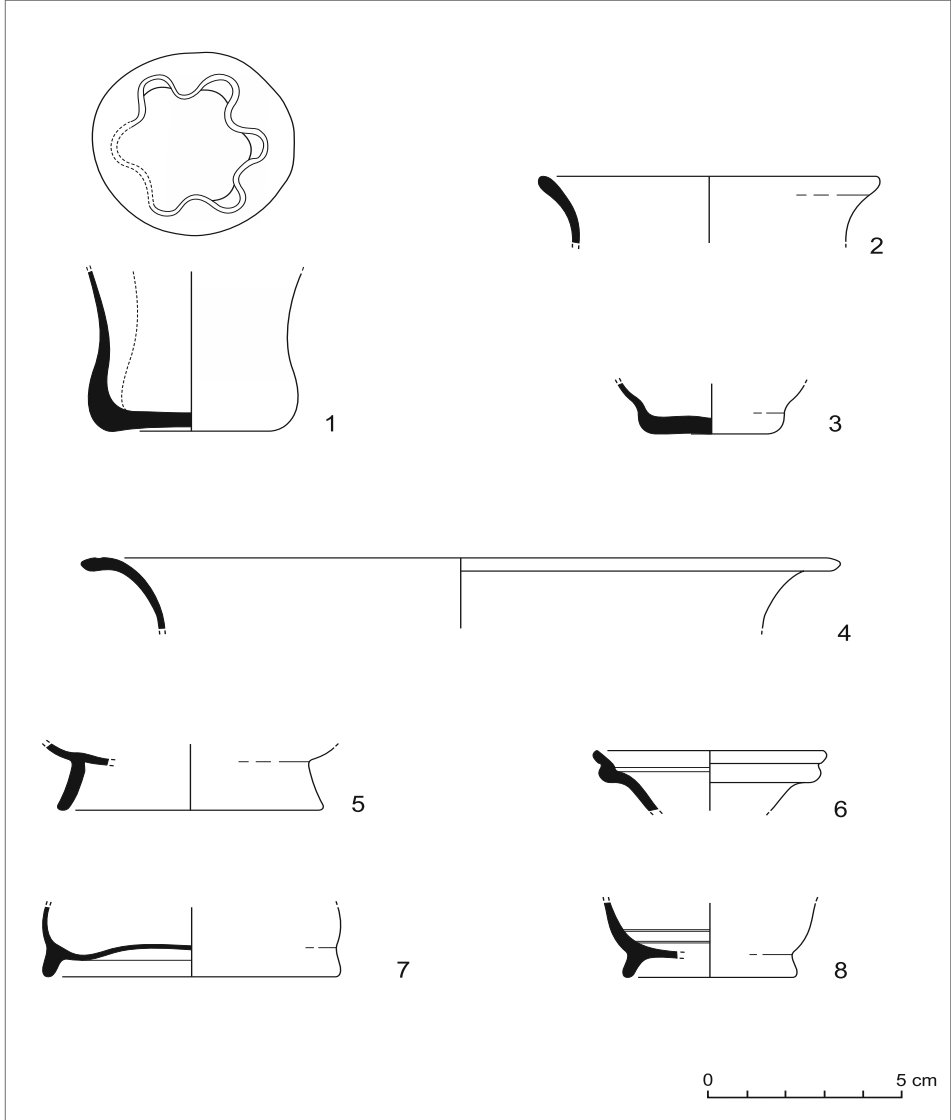


Fig. 9. Selection of early Roman glass: 1 – indented beaker; 2, 3 – beaker on solid base; 4 – deep bowl; 5 – high ring base of bottle or bowl; 6 – bottle neck with internal fold; 7 – base of cylindrical bottle; 8 – cast mosaic bowl base (PCMA Alexandria Kom el-Dikka Project/drawing E. Kulicka, M. Momot, K. Pawłowska)

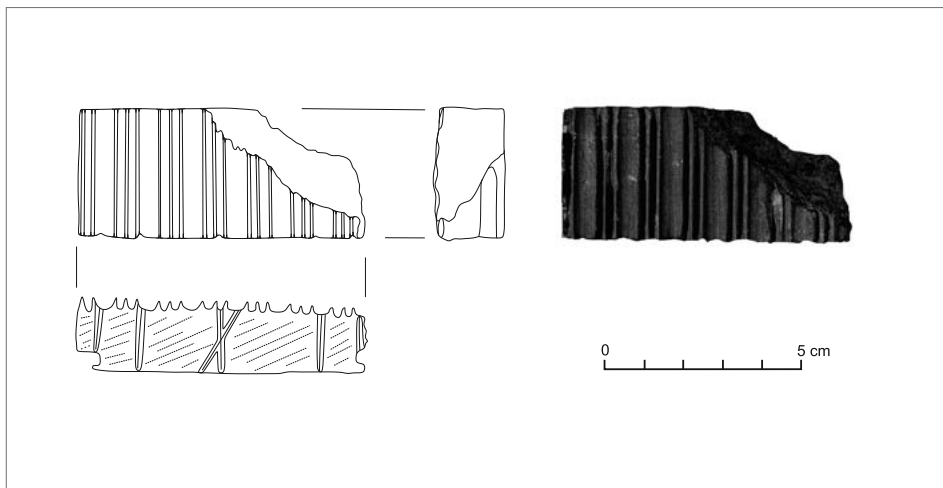


Fig. 10. Schist mould for shaping glass beads  
(PCMA Alexandria Kom el-Dikka Project/photo and drawing K. Pawłowska)



Fig. 11. Gold-in-glass beads and production wasters  
(PCMA Alexandria Kom el-Dikka Project/photo K. Pawłowska)

nament on the outside wall is noteworthy [Fig. 9:8], considering that the archaeological evidence for mosaic glass from regular excavations in Alexandria is still very limited and somewhat disappointing (Kucharczyk 2016b). Glass other than vessels is represented by game counters, small balls and a stirring rod.

One of the most surprising aspects of the glass assemblage coming from this area is the ample evidence of bead-making. Several stone moulds for shaping beads were recovered from the fill of room 26 [Fig. 10]. Similar moulds have already been reported from the area (Kucharczyk 2011: 64–65, Fig. 8:1). Proof of the manufacture of luxury gold-in-glass beads, in the form of not just the beads of different shape, but also colorless glass tubes and some wasters [Fig. 11], came from rooms 14 and 16, which had been investigated to some extent already in 2007 (Majcherek 2011: 44–45). The evidence as a whole is unique not only in Alexandria, but also in Egypt. It also corroborates the view, based on other archaeological material, that the final phase of occupation of the building was organized around an artisanal production.

A provisional chronology of the building indicates the 1st century AD as the most probable date of construction. The end of occupation should be linked most likely to the destruction of the city center, inflicted successively by Aurelian in AD 272 and by Diocletian a quarter of a century later. This preliminary assessment will be tested in the upcoming season.

#### LATE ROMAN PHASE

Thick layers of deposits related to lime-kiln operation covered the destruction

stratum. They consisted almost entirely of lime refuse, ashes and slag, with heavy concentrations of marble detritus, some of it partly burned or half-melted, apparently raw material for lime production. Prominent among them were broken elements of architectural decoration: pavement slabs, crustae, cornices, capital fragments etc. carved in decorative stones brought in from all over the Mediterranean. Apart from the omnipresent Proconessian marble, fragments of *cipollino verde* and *rosso, giallo antico, greco scritto, africano, breccia di settebasi* and *pavonazetto*, Egyptian alabaster, porphyry and other stones were also noted [Fig. 13].

The most spectacular, and given the material, the most unexpected find, was undoubtedly a well preserved, masterful portrait head, sculptured in red Aswan granite [Fig. 12]. The head, most probably of 2nd–1st century BC date, shares stylistic features with a large and well known group of sculptures of Ptolemaic age made of hard stone (Z. Kiss, personal communication). Remains of a back pillar leave no doubt as to its original form of a near to life-size standing statue. As such it is paralleled by other granodiorite or basalt heads previously found at the site (Kiss 1995; 2014), as well as other examples of the so-called “Greco-Egyptian” sculpture found in various museum collections (Adriani 1970; Kaiser 1999).

This thick accumulation, reaching 0.50 m in places and rising to the north, actually signaled extensive and prolonged building activity, most probably linked to the bath and/or cistern construction in the 4th century. It was turned into a huge dumping ground and gradually filled with urban refuse and ashes from the nearby

bathroom (Majcherek 2007: 16). Towards the end of antiquity, it had risen several meters above the pavement of the bath and the theater portico. Mounds of this kind were quite an ordinary phenomenon in urban landscapes of late antiquity (Liebeschuetz 2000; Ballet 2003), and the appearance of similar rubbish dumps (*kopriai*) was nothing strange in the topography of ancient Alexandria. More than a dozen have been identified, some located in close vicinity of the site (Rodziewicz 1984: 25–31, 252–256).

The ashes and urban refuse deposits yielded a particularly rich set of finds: above all ceramics, but also some glass fragments. This small assemblage comprised a limited range of vessel types, representing free-blown, simply shaped vessels: small bottles, wineglasses, hemispherical bowls and conical lamps with

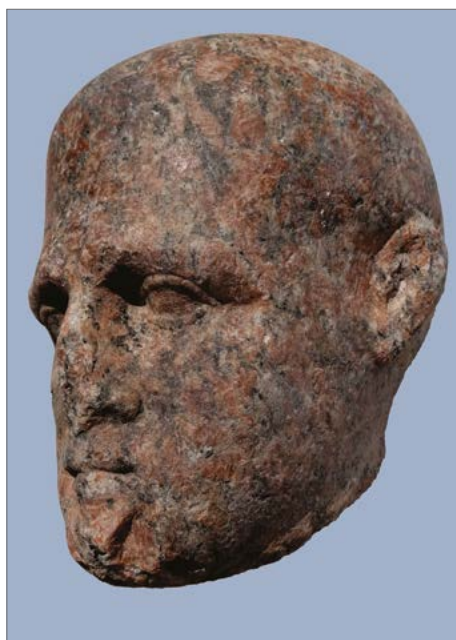


Fig. 12. Late Ptolemaic portrait head of Aswan red granite (Inv. No. 1055.1.17) (PCMA Alexandria Kom el-Dikka Project/photo G. Majcherek)



Fig. 13. Selection of decorative stone fragments: top row from left, *cipollino rosso*, porphyry and *giallo antico*; bottom row from left, *lapis basanites*, *breccia di settebasi*, *pavonazzetto* and Proconnessian marble (PCMA Alexandria Kom el-Dikka Project/photo G. Majcherek)



cracked-off rim (R. Kucharczyk, personal communication). There is no doubt that these entirely utilitarian objects, often carelessly manufactured, of yellowish-green and green glass, without any artistic aspirations, were made and used locally. Glass other than vessels is represented by fragments of mosaic plaques with sections of opaque yellow canes, randomly encased in a green matrix, a kind of decoration usually considered as an imitation of *serpentino verde*. In the light of the evidence from Kom el-Dikka, there is no doubt that not only plaques, but also vessels and small objects, like game counters and balls with this pattern, were manu-

factured in Alexandria during the early Roman and particularly during the late Roman period (Kucharczyk 2010a: 67, Fig. 7:2; 2011: 66–67, Fig. 9:3; 2016a: 94). Excavations have also produced tangible evidence of glass production, representing both primary and secondary glassmaking stages (large chunks of a dismantled glass furnace, glass production debris, raw glass, moulds, wasters and semi-products, including mosaic bars). Typical of late Roman contexts are several fragments of flat windowpanes made of yellowish-green glass in the cylinder-blown method.

Pottery presents an equally elaborate picture. Apart from the usual array of

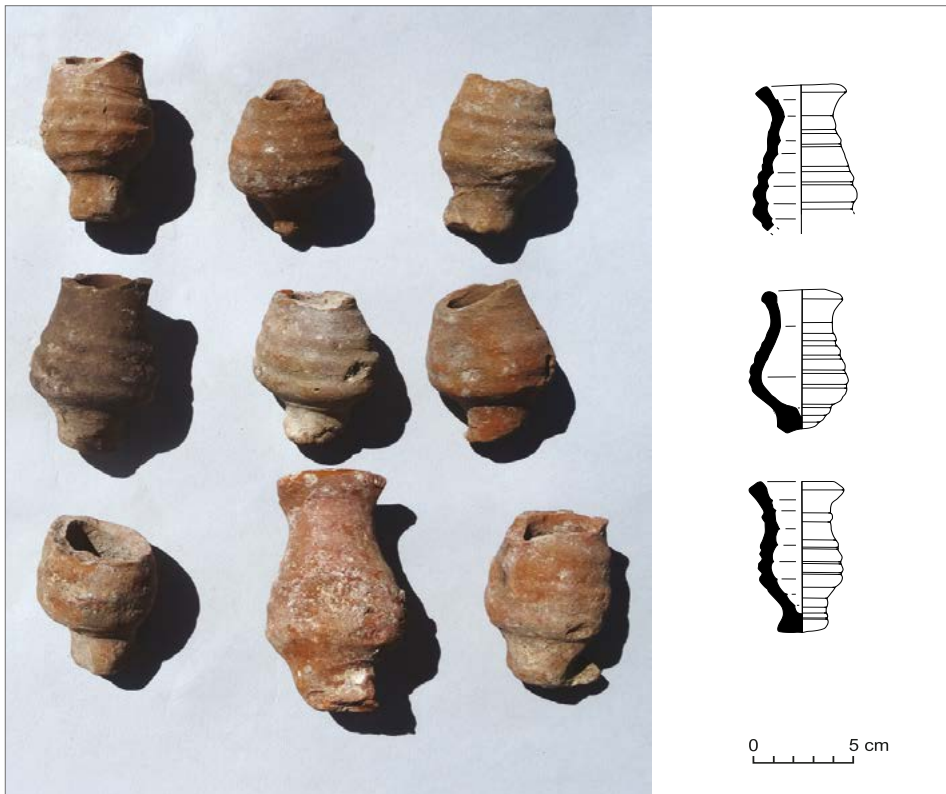


Fig. 14. Miniature flask-like vessels of Egyptian manufacture (PCMA Alexandria Kom el-Dikka Project/photo G. Majcherek; drawing K. Pawłowska)

vessels typical of the 4th–5th century AD horizon (early versions of the LRA1, LRA3, LRA4, and LRA7, a few examples of ARS forms 50 and 62, as well as kitchen wares, mostly locally made), the accumulation was marked by the presence of an extremely large deposit (over 7000 fragments!) of miniature flask-like vessels of Egyptian manufacture [Fig. 14]. They were all made of typical Nile silt fabric, medium coarse with considerable lime and organic inclusions, relatively soft and porous. All recorded vessels showed a tedious uniformity of shapes: actually only two basic forms were identified. The overwhelming majority featured a spindle-shaped, slightly bulging body tapering to a pinched base. The other and definitely less frequent form had a bulbous body with splayed rim and flat string-cut base. Both types were covered with deep, spiral wheel-ridging. The exact function of these vessels is still unclear. They were thought to be small oil containers used for bathing, but as the pinched pointed bases preclude standing, they may as well have been used as amphorae stoppers. Similar vessels referred to as *koilopoma* were supposed to serve as stoppers, while at the same time intended to contain a sample of wine, thus allowing a customer to inspect product quality without having to open an amphora (Denecker and Vandorpe 2007: Notes 21 and 93). Albeit plausible, this idea would do well to have further confirmation. While their function as amphorae stoppers has been suggested by some researchers (Rodríguez Almeida 1974),

it was rejected, or at least treated with reserve by others (Callender 1965: Fig. 19, Nos 25–27; Peacock and Williams 1986: 51). It should be emphasized, however, that the accompanying ceramic assemblages did not produce a corresponding number of amphorae finds to pair with. On the contrary, the amount of wine or oil containers recorded in the explored contexts was relatively meager, hardly justifying such an enormous quantity of assumed “stoppers”.

The excavated area was bordered on the north by a wide robber trench truncating the entire accumulation. It obviously resulted from the demolition of the huge southern perimeter wall of the nearby late Roman bath complex. It does appear, however, that the dismantling of this wall was a complicated and recurrent process. Evidence of rather late activity (Ayyubid Underglaze Painted and Mamluk Sgraff and Slip Painted pottery) has been found along parts of this feature, but in other sections (the 2017 trench included), the data have pointed to a much earlier date. One should admit the possibility that some sections of the original perimeter wall of the baths were dismantled already in the 6th century AD, and could be related to destruction resulting from earthquakes in the middle of that century (Badawy 1999; Guidoboni, Comastri, and Traina 1994: 337–338). It also appears that the wall was later rebuilt along the same line, but on much higher level, making use of some extant ruins and dislocated blocks as foundations.

## CONSERVATION

Conservation and landscaping work was prioritized in the first part of the season, focusing on areas essential to the conclusion of the present stage of the Site Presentation Project [see *Fig. 1*].

### BATHS

One of the major operations undertaken in the bath complex was routine repair and conservation of the southern elevation of the bath [*Fig. 15*]. Wall facing there was treated and thoroughly restored in the 2003 and 2004 seasons (Majcherek 2005: 27–29). Nevertheless, after more than a decade, inevitable damage and losses, caused either by environmental factors or

human activity (an undesired byproduct of the increasing number of tourist), called for a quick response to contain further degradation.

Some badly eroded modern and apparently substandard bricks used in the past restoration were now replaced with new ones. Decayed bricks were carefully extracted and new bricks cut to required size were mounted in place using a lime-based mortar, with a measured addition of crushed bricks in order to emulate original mortar and in accordance with the ancient formula. Such treatment was applied to all threatened areas identified along the 60 m of the elevation.



Fig. 15. Preservation work on the southern elevation of the late Roman Baths (PCMA Alexandria Kom el-Dikka Project/photo G. Majcherek)



Moreover, a brick-lined water channel running along the southern elevation was also repaired, removing marks of visitors trespassing in an effort to reach the out-of-bounds parts of the archaeological site. Large sections of the channel walls, crushed and trampled by unauthorized entry, had to be restored in modern brick.

In the southeastern corner of the baths (restored in 2003), there was need for replacing damaged bricks as well as securing large sections of original plastering with new edging. Sections of supporting walls, bordering the modern stairway (next to the southeastern corner of the bath), were also repaired. Losses in joints were completed with a new lime–cement mortar.

### THEATER PORTICO

The gate leading from the portico to the bath complex was subjected to limited conservation. Last year, restoration was completed of the large steps located in the entrance [Fig. 16]. This season, an additional drum was installed on the southern Doric style column (two drums preserved to a height of 1.05 m). The partly preserved drum (1/3 of the original circumference) was found in the debris, associated with the late antique dismantling of the northern section of the theater portico (Majcherek and Kucharczyk 2014: 25–26). It was decided to use it for restoration in order to cap and protect the existing drums as well as to make the gate more attractive visually.



Fig. 16. Restored western entrance to the bath complex (PCMA Alexandria Kom el-Dikka Project/ photo G. Majcherek)

### MOSAIC CONSERVATION

Beside maintenance work on the mosaic shelter, where broken windows had to be glazed and loose or damaged railings fixed, conservation of the Dionysus mosaic (MC-1) was the most important task. Ewa Paradowska and her team concluded the conservation of the mosaic which had been found next to the theater (Majcherek 2004: 33–34; Lis 2004), and transferred to the “Villa of the Birds” in 2016 [Fig. 17]. The mosaic was given a final protective coating of Paraloid B-72 diluted in acetone. Other mosaics exhibited in the “Villa of the Birds” underwent routine inspection. Wherever necessary, loose tesserae were reinforced and the protective edging was repaired.

A black-and-white *triclinium* mosaic featuring a shield of interchanging scales, excavated in 2009 in the Roman house FB (room 18) and temporarily protected by a thick layer of earth and a polyethylene sheet (Majcherek 2012: 30–32), was uncovered and cleaned. Loose tesserae were fixed and a new protective edging of lime–sand mortar (ratio 1:1) was introduced. Reburial is still commonly accepted as the simplest and most effective mosaic protection measure. In our case, it was enclosed in a wooden frame and covered with geotextile and sand. It was additionally enveloped in polyethylene sheets and backfilled.

Small extant patches of other mosaic pavements in rooms F9 and F17 of



Fig. 17. The Dionysus mosaic after conservation, on display in the “Villa of the Birds” Mosaic Shelter (PCMA Alexandria Kom el-Dikka Project/photo G. Majcherek)

house F, made of rather crude irregular tesserae, were cleaned mechanically and prepared for further treatment in

the upcoming season. Loose cubes were collected and protective edging introduced.

## LANDSCAPING AND SITE PRESENTATION

Routine site management consisted of the standard time-consuming operation of cleaning the site of growing plants following a wet rainy season in winter. Vegetation not only tends to obscure ancient architectural monuments from view, but it affects the integrity of the ancient architectural substance. Given the size of the site (4 hectares), weeding becomes a demanding operation: uprooting, stacking and ultimate removal. Collecting the rubbish of the past six months that had accumulated all over the site was another equally pressing matter before the planned inauguration of the Site Presentation Project.

The first stage of the Project was successfully concluded this year. The visitors' itinerary was specially designed to allow public access to the most important architectural monuments preserved on the site. The route follows gravel paths that start at the main gate with a large information panel including a situational plan of the Kom el-Dikka site, a brief note on the history and description of all the major monuments. The trail then winds around the entire central part of the site, secured with barriers at once protecting antiquities and minimizing any risk to the more inquisitive visitors. A less obtrusive form of steel cable railing

mounted on steel pipes was used, screening off the ancient fabric without eliminating direct contact. In other words, both a visual and physical contact with a large group of monuments was maintained.

Long-term preservation should be made not only sustainable but also meaningful (Mason and Avrami 2002: 13). Presentation and interpretation of the site are important components of the conservation process. In order to enable visitors to grasp the whole historical potential of a site, proper on-site signage is essential. Information panels were thus installed in chosen locations, next to all the key monuments: theater, auditoria, bath, cisterns, residential quarter and the mosaic shelter. These panels are large (0.70 m by 0.50 m) acrylic sheet boards on stands of welded steel pipes set in a concrete foundation. The information on the panels is in Arabic and English, and includes a short text describing the function and history of the monuments, complete with orientation maps and relevant plans [see *Fig. 18*]. The Project also produced a bilingual leaflet for distribution to visitors. The Embassy of Poland in Cairo provided funding for both the panels and leaflet as part of a state program to aid in safeguarding and promoting ancient cultural heritage.

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Fig. 18. The Site Presentation Project opening ceremony: top left, Alexandria Mission Director Dr. Grzegorz Majcherek with the Minister of Antiquities Dr. Khaled al-Anany on a tour of the newly designed visitor's trail; top right and bottom left, examples of bilingual information panels; bottom right, with the Rector of the University of Warsaw Prof. Marcin Pałys visiting one of the auditoria (PCMA UW Alexandria Kom el-Dikka Project/photos G. Majcherek, R. Kucharczyk)

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# Marina el-Alamein: newly discovered bath after the 2017 season



**Abstract:** Most of the activity during the 2017 season at the archaeological site of Marina el-Alamein was focused on two areas situated in the northern part of the town. Building H.40 was one of the main excavation targets: two rooms were cleared, originally part of a large, multi-roomed and most probably prosperous house. The other target was the structure H.39, already explored in earlier seasons, which was now confirmed as a small but richly decorated bath complex with traces of wall painting and geometric mosaic floors.

**Keywords:** Greek-Roman town, dwelling architecture, bathhouse, immersion tubs, mosaic floor decorations, wall paintings

The PCMA archaeological project in Marina el-Alamein, which restarted in May 2017, continued the excavation of two buildings situated in the northern part of the site: structure H.40 directly south of house H.41 and the H.39 complex (for earlier work, see Jakubiak 2016).

## HOUSE COMPLEXES H.40 AND H.41

Additional clearing work in the H.41 complex [Fig. 1] aimed to clarify the relations between the walls and features of the building. An earlier phase was recorded in a test trench in the eastern part of one of the rooms (H.41.6), dated by the ceramic material to the 1st century AD. Superimposed was a later, second phase from the 2nd century AD. Additional measurements and orthophotographic documentation helped to revise the previously established layout of the structure.

A new trench in the area of small shops or workshops located south of H.41 and examined already to some extent in previous seasons uncovered two new units belonging to a relatively large building (H.40) [Figs 1, 2]. The agglutinative form of building development, common in other housing districts of ancient Marina, was once

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**Acknowledgments**

I would like to express my cordial thanks to the employees of the SCA local branch, our inspector Muhammad El Awadi in particular, who was the good spirit of the archaeological site, helping out in all situations of need. Moreover, I would like to thank Director Nama Sanad Yakoub of the local SCA branch office for her endless support and help during the season.



again confirmed in this structure. On the whole the foundations of this building were found to be of good quality with stone ashlar providing a sound base for all the building walls. The surviving upper parts of the walls were built of regular, middle-sized stone blocks. In some places traces of white lime plaster on both the interior and the exterior wall faces have been preserved. The west wall of room 3 has no traces of original bonding with the walls it connects with. In other words, there is no way to determine how the building expanded over time. Unlike the

remaining walls, the north walls of rooms 3 and 4 were constructed of irregular stones of different size. This merits attention as the material could not match the stone blocks used in the other walls for soundness and stability. One could think that these were merely foundation walls were it not for the fact that the north wall faced the street running alongside the building. Despite the apparent incongruity of the building technique in these circumstances, the builders' decision may have been a rational one. The wall here was significantly thicker and wider than

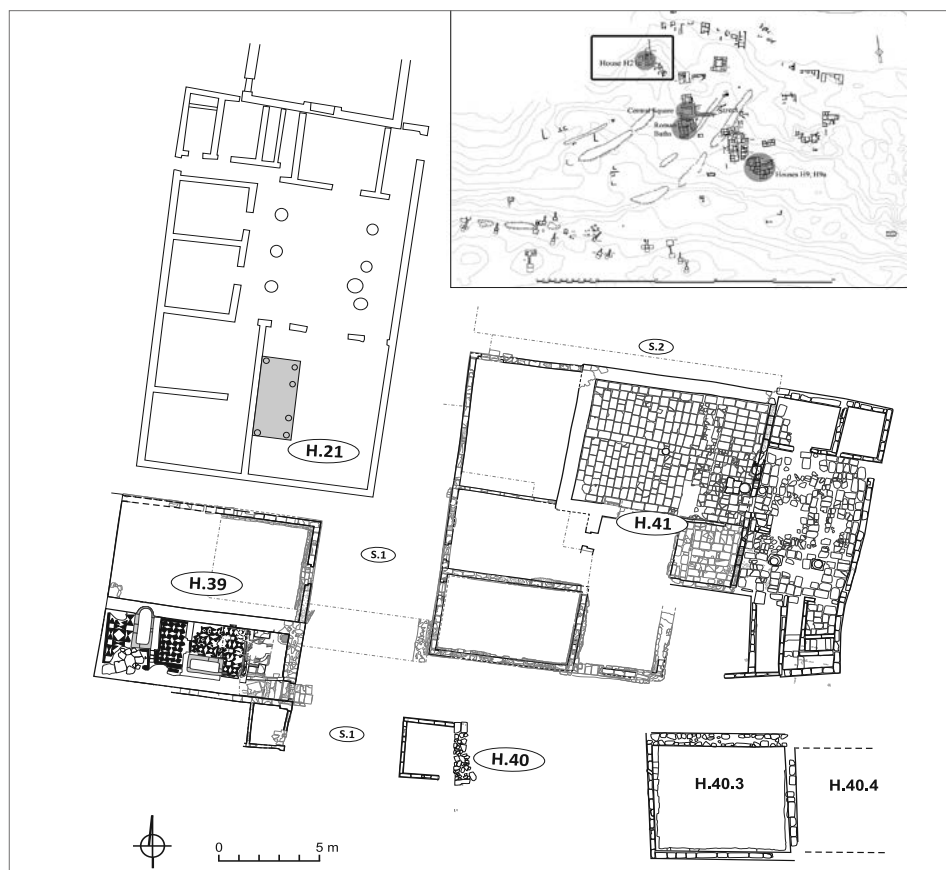


Fig. 1. Excavation area south of house H.21 in Marina el-Alamein (PCMA Marina el-Alamein Archaeological Project/drawing S. Maślak)

the other walls, sustaining structural stability despite the use of materials of lesser quality. No interpretation of this construction design is forthcoming and further excavation may yet contribute

to a better understanding of the reasons behind this architectural choice.

Taking into consideration the house layout, chambers 3 and 4 can be postulated to have been the biggest in the dwelling.



Fig. 2. House H.40: excavated rooms 3 and 4; top, view from the northeast, room 4 in the foreground; bottom, room 3, view from the northwest (PCMA Marina el-Alamein Project/photos K. Jakubiak)

However, the relation of these rooms to a small shop (or workshop) situated in the western part of the building is still not clear. That small structure was most certainly a part of house H.40. The intervening space was most likely a courtyard; these observations, based on ground surface finds, will have to be confirmed in excavation.

The pottery assemblage testifies to the extension or enlargement of house H.40 in the mid 1st century AD. The most characteristic ceramic types were transport amphorae of Benghazi Early Roman type 1.

Sherds of Cypriot sigillata confirm this dating for house H.40, at least for rooms 3 and 4, which were built as an extension of the building. The house appears to have been abandoned in the 3rd century AD. The uppermost layers, just below the surface, yielded a few locally manufactured Mareotic (Dressel 7) amphorae and several fragments of Cilician pinched-handle amphorae. Some local imitations of the latter vessel type from the last phase of house H.40 are dated to the 3rd or beginning of the 4th century AD.

### BATHHOUSE COMPLEX H.39

Work continued also inside structure H.39 [see *Fig. 1*], which was originally a small bathhouse, probably restricted to a limited number of users. The bath consisted of four rooms accessed via steps leading down from the entrance at street level in the southeastern part of the building [*Fig. 3*]. Three of these turned out to be bath chambers, each furnished with a different mosaic floor. Parts of the complex (the easternmost room entered from the street and a furnace and probable water boiler accessed via a door in the north wall), excavated earlier, had been backfilled for protection (see Jakubiak 2016: 129–133).

The bath complex consisted of three rooms entered through the central chamber, which opened onto a southern corridor leading from the steps [*Figs 3–6*]. The room was decorated with a geometric mosaic pavement and was devoid of any hydraulic or bath structures. Doorways in the east and west walls led to the two other chambers containing bathing installations. The chamber on the east was small and squarish, with

a geometric mosaic floor. An immersion bathtub, preserved in relatively good condition, stood at the southern end of the chamber. This bathtub was constructed of red brick, bonded and finished inside and out with hydraulic mortar. The western chamber (2.50 m by 3.00 m), which could be entered via a door in the southeastern corner, also had a mosaic floor. An immersion bathtub stood in the northeastern corner of the room, attached to the north wall and partly embedded in it, where a shallow niche or conch construction was profiled and plastered with hydraulic mortar. Traces of wall painting have survived on the plaster in the conch. The southern end of this chamber was remodeled at a later date when a water cistern was installed in place of the south wall that had separated it from the southern corridor. A water-supply channel ran off from this cistern. The bathhouse seems to have been disused or deserted by this time. Another doorway observed in the northwestern corner of the chamber indicates that the bathhouse clearly

continued to the north (to be explored further in future seasons).

From a technical point of view, the layout and internal arrangement of this bath complex is typical of Ptolemaic Egypt. Comparable buildings were re-

corded on archaeological sites in Karnak (Boraik 2009; Myśliwiec 2017), Schedia (Bergmann and Heinzelmann 2009), Krokodilopolis and Athribis (Trümper 2009), among others. Characteristic features recognized at all the sites men-



Fig. 3. Plan of the bath complex in building H.39; inset, location of the chamber within the bigger plan of the bathhouse (PCMA Marina el-Alamein Archaeological Project/drawing S. Maślak)

Fig. 4 (below and opposite page). Bath complex in building H.39: orthogonal view of the north wall, western and eastern sections (PCMA Marina el-Alamein Archaeological Project/orthophoto and processing M. Iskra)

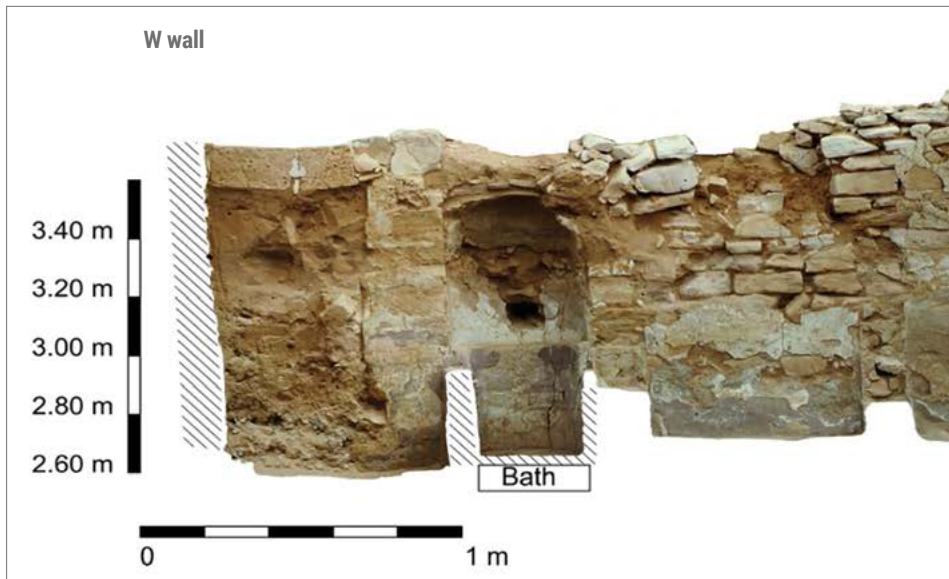






Fig. 5. Bath complex in building H.39, view looking east, from the direction of the entrance (PCMA Marina el-Alamein Archaeological Project/photo K. Jakubiak)



tioned here include the immersion bathtubs; these were significant elements of the interior organization of the baths. Bathtubs of similar construction were found in the so-called Southern Baths situated in the neighborhood of the Soknebtynis temple in Tebtynis in the Fayum Oasis (Hadji-Minaglou 2009). One of the tubs there was situated in a shallow niche, which technically required a kind of *arcosolium* to be constructed above the tub. This is similar in a way to the conch or niche recognized in the western chamber of H.39.

There are several secondary technical issues, which arise upon examination of the bath construction. One is how the tubs were emptied, this in the face of absolutely no evidence of any draining installations. It should be assumed that used water was removed manually with

buckets or other pots dedicated for the purpose. Another issue is the location of the tentative tholos bath or circular chamber with hip tubs around the walls. From an architectural point of view, one could expect its existence in the northwestern part of the building. The doorway leading north from the western chamber of the bathhouse could make this supposition feasible.

There was other painted decoration preserved on the wall plastering apart from the conch above the tub in the western chamber. It was executed in the *al secco* technique and was renovated and repainted at least three times. Most of the decoration formed multi-colored geometric patterns consisting of rectangular panels painted in dark colors within lighter-colored frames (in the western chamber). Several fragments from the



Fig. 6. Western section of the interior of the bathhouse complex, looking north (PCMA Marina el-Alamein Archaeological Project/photo K. Jakubiak)

debris, too small for reconstruction, bore traces of a floral or even anthropomorphic decoration. The original decoration program cannot be determined from these pieces.

The floors of the bathhouse were decorated with mosaic floors sporting geometric patterns. The floor of white and black stone pebbles bears a resemblance to the mosaic discovered in the tholos of the Ptolemaic baths located in front of the temple in Karnak (Boraik 2009). The pebble mosaic technique is in itself suggestive of a date in the Ptolemaic period, but the pottery assemblage from the excavation indicated a later date for the bathhouse, a suggestion further confirmed by a study of the stratigraphy, which revealed that the tub in the eastern room and the

floor it stood on had been constructed over a hypocaust built in the Roman tradition of bathroom heating. The room would have been either a tepidarium or a caldarium, with the central chamber to the west of it acting as an apodyterium. The archaeological evidence thus points to mixed Hellenistic and Roman bathing tradition being manifested in this structure.

The pottery assemblage from the excavated structure assigns a tentative date to its construction in the beginning of the 1st century AD; the building was deserted sometime in the 3rd century AD. Fragments of Dressel 43 (Cretoise 4) amphora handles (Crete, first half of the 3rd century AD) were among the most characteristic pottery found in the deposits accumulated above the ruined bathhouse.

## CONCLUSIONS

Taking into consideration the new discoveries of the 2017 season, complementary to the results of archaeological work in past years, it can be said that the residents of the northern part of the town near the harbor were a relatively wealthy community. This is strongly supported by the presence of a bathhouse in structure H.39, including the now uncovered internal decoration of the complex. The baths evidently emphasized the significant position and prestige of the town as a whole. The main rooms of the bath complex were decorated with pebble mosaic floors, which is very rare among buildings of this kind from Egypt. The location of the baths in the neighborhood of house H.21, where evidence of cult practices devoted to Commodus was identified, is interesting from an urban-

planning point of view. The buildings were certainly not contemporaneous, the bathhouse being dated provisionally to the 1st century AD and the H.21 complex to the reign of Commodus (AD 177–192). The latter building was on a level almost 2 m higher than the bath complex and was probably constructed on top of an older structure possibly associated with the same chronological horizon as the bathhouse. Nevertheless, the location of these structures near the sea shore and next to the harbor seems to have been of prominence within the town. This observation is supported by the character of house H.41, which is also apparently a substantial building in the ancient harbor. Moreover, structure H.40, which has just started to be investigated, looks like a large and wealthy house as well.

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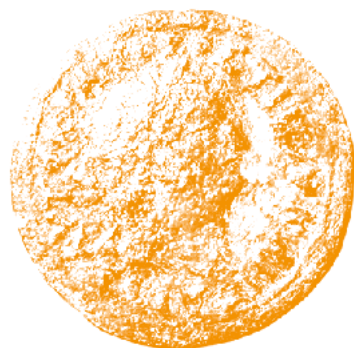
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# Research and architectural conservation in Marina el-Alamein in 2017

## (Polish–Egyptian Conservation Mission)



**Abstract:** Activities undertaken by the Polish–Egyptian Conservation Mission to Marina el-Alamein in 2017 comprised research and conservation in the public district of the ancient town as well as in private houses. Work focused foremost on research and exhibition of the remains of a street running east of the southeastern corner of the main town square and monuments in the area of the square itself. Research and conservation continued also in the area south of the square, concentrating on the remains of public Roman baths dating from the 1st to the 3rd century AD. Maintenance conservation was carried out in private houses and in the ancient town center.

**Keywords:** Marina el-Alamein, town center, east–west street, main square, southern baths, houses, research, preservation, conservation

In September 2017, the Polish–Egyptian Conservation Mission worked at the site of the Hellenistic and early Roman town of Marina el-Alamein for the twenty-second time.

The imminent opening of the archaeological excavation site in Marina el-Alamein for tourism demanded that the team undertake work first of all in the center of ancient town, that is in the area to be included in the visitors' itinerary. The scope of conservation and preservation work, especially current maintenance, was also determined to a large extent by the damages caused by unfavorable weather conditions in the autumn and winter seasons of 2015/2016 and 2016/2017.

Research and conservation were focused in four different areas of the site [Fig. 1] and encompassed several issues aimed primarily at preparing the site for presentation to visitors.

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*Painting conservator:* Anna Selerowicz (Inter-academy Institute of Conservation and Restoration of Works of Art, Academy of Fine Arts in Warsaw)

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*Numismatist:* Prof. Barbara Lichočka (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences)

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The areas in question comprised the main square of the ancient town (forum) and the areas east and south of it (continuation of work from past years), concentrating in 2017 on the street running east of the southeastern corner of the forum. Research and protection work were carried out also in the relics of a Roman bath south of the square. Maintenance conservation was required in the complex of houses H9/H9a, as well as in H21, where rains during the rainy season had

caused some damage to the architectural substance.

Objects, especially fragments of painted decoration conserved by the team in past seasons, underwent routine inspection of their condition in storage and interventions were undertaken where required (see Zambrzycki and Selerowicz 2018, in this volume). Conservation of bronze finds from this season was another task carried out by the team.

[RC]

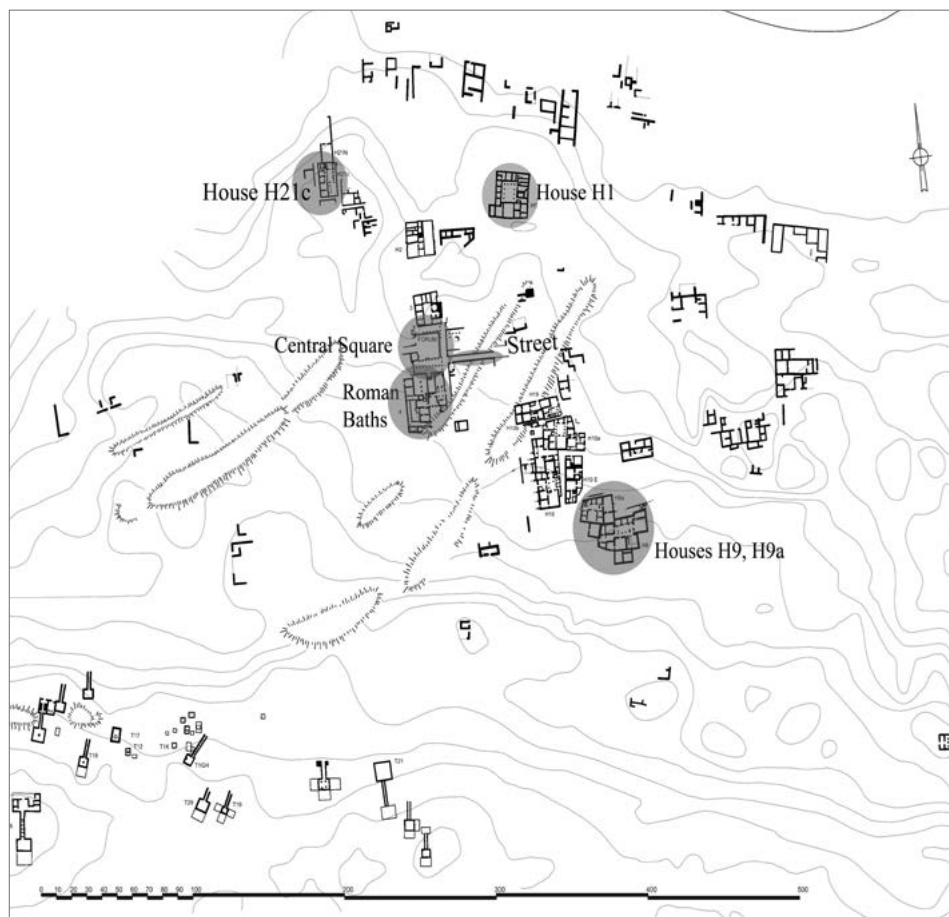


Fig. 1. Areas of research and conservation work in Marina el-Alamein in 2017 (Polish–Egyptian Conservation Mission Marina el-Alamein)

## ARCHITECTURAL CONSERVATION AND SITE PRESENTATION

### MAIN SQUARE (FORUM)

The square, together with the relics of buildings around it, was discovered by the Polish Archaeological Mission from the Polish Centre of Mediterranean Archaeology University of Warsaw in 2001–2005 (Daszewski 2002: 80–86; 2003: 59–65; 2011: 423–429; Daszewski et al. 2005: 86–89; 2007: 76–77) and is identified as a forum (or agora). Being a central point of the excavation site, surrounded by remains of public buildings, it should become an important feature of a future tourist visit, and can easily be included in the itinerary. For this reason, the research, conservation and exhibition activities of the Mission have been focused in this area since 2008 [Fig. 2]. In 2017, the team concentrated on the street leading east from the forum and continued work within the Roman baths south of the square. Complementary conservation activities were also carried out on the forum itself. [RC]

### STREET EAST OF THE FORUM

The excavations east of the main square, carried out by the PCMA Archaeological Mission in 2002, uncovered substantial relics of the western part of a peristyle adjacent to the square (Daszewski 2003: 59–61), as well as the western part of a street running east from the southeastern corner of the forum (Daszewski et al. 2005: 89–90). The eastern part of the street had been excavated by the Archaeological Mission in 2000 (Daszewski 2001: 58–61). The part of the street in between, which remained unexplored after

Daszewski's mission ceased to function in 2007, was finally excavated by the Conservation Mission in 2017 [Fig. 3 top].

The outcome is important for scientific as well as presentation reasons: another broad street opening from the stately square. Together with a neighboring one, uncovered and restored earlier (by the MASP/ARCE project) and running from the same corner of the square to the south, they give an idea of what the streets in the ancient town looked like. Open in its entirety, the street can be included in the itinerary, linking the forum with a well-exhibited group of residential houses located to the east.

The excavated section of the street is 20.72 m long and 3.44 m wide at its western end. Further to the east, the street narrows slightly to 3.24 m in the eastern part, where at a distance of 2.41 m from its eastern end (18.31 m from the western one) it regains its width of 3.44 m thanks to a 0.22 m setoff on the southern side. Still further to the east, the street widens considerably to the north turning into another square (see Daszewski 2001: 58–61). The street is paved with rectangular limestone slabs. The slabs along the walls of the buildings are laid lengthwise in two border strips; between them are transverse rows of slabs. The drop in the ground descending northwest in the vicinity of the forum resulted in a crack in the pavement displacing the outermost northern row of slabs in the western section.

Constructed using diverse techniques, the walls of the buildings situated along

the street stand to a maximum height of about 0.90 m [Fig. 3 bottom]. Relics of several entrances remain. On the southern side of the street, the wall is 0.58–0.60 m wide for most of its length. At a distance of 1.78 m from the western corner, a door 0.82 m wide opens in it, the jambs made of

limestone blocks. It leads to a corner room excavated already in 2004 (Daszewski et al. 2005: 90–92) and preserved by the Conservation Mission. East of this entrance, up to the offset mentioned above, the wall was built of rubble masonry with only the lowest foundation layer made of limestone



Fig. 2. Areas of research and conservation in the ancient town center of Marina el-Alamein in 2017 (Polish–Egyptian Conservation Mission Marina el-Alamein/drawing A. Błaszczuk, A. Brzozowska, R. Czermer, M. Grzegorek, M. Krawczyk-Szczerbińska, K. Majdzik, S. Popławski)

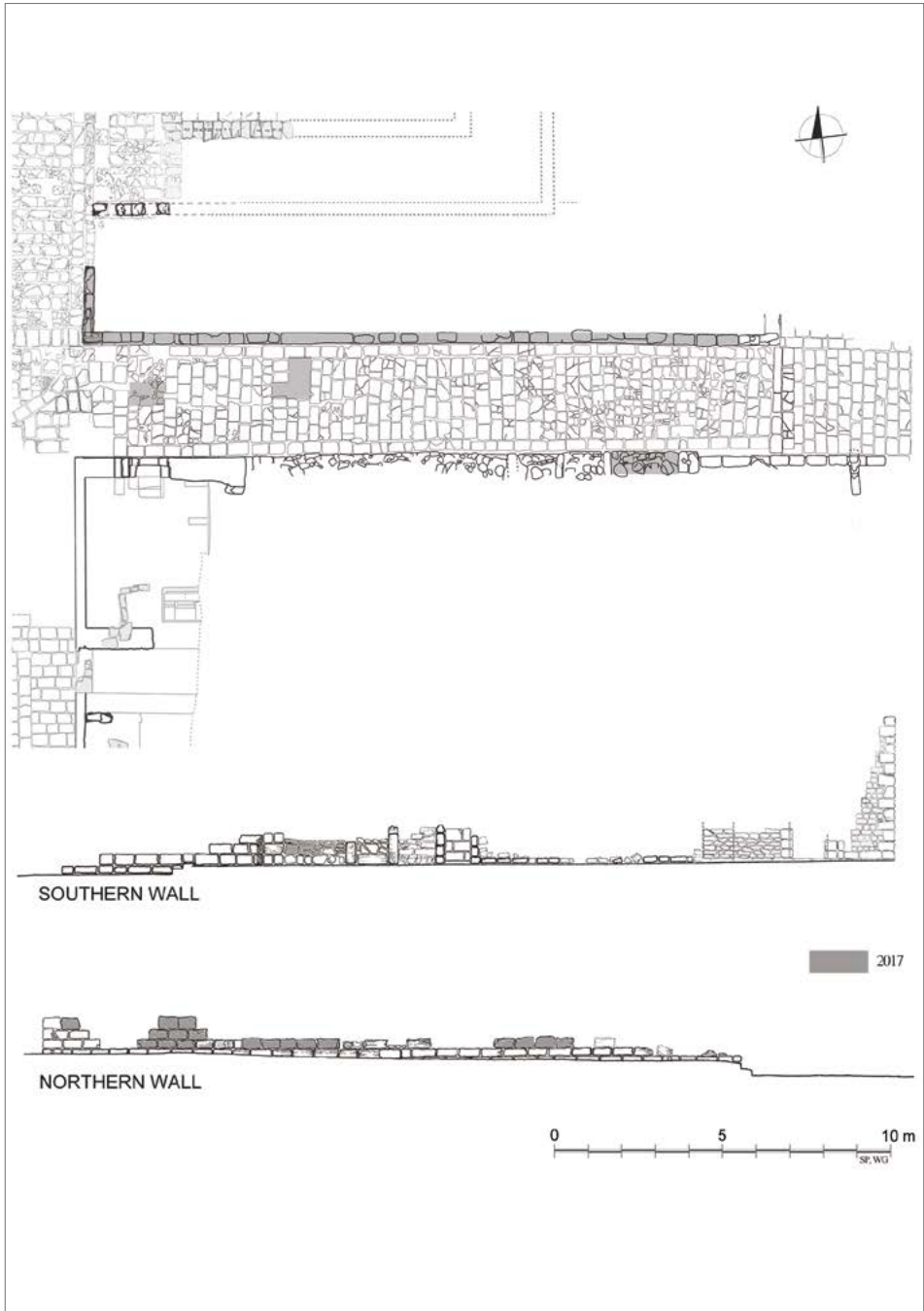


Fig. 3. Street running east from the forum: top, plan showing areas of conservation in 2017; bottom, façades of the street running east from forum, with areas of conservation in 2017 (Polish–Egyptian Conservation Mission Marina el-Alamein/drawing S. Popławski, W. Grzegorek)

blocks. Two entrances in this wall comprised a wider one (0.95 m) at a distance of 2.74 m west of the offset mentioned above and a narrower one (0.76 m wide) 1.71 m west of the first one. Both had jambs of huge limestone slabs: blocks that have survived are 0.60–0.90 m high, 0.60 m wide and about 0.30 m thick. The thresholds were also made of limestone blocks. At a later time, thin walls of reused, slightly smaller limestone blocks were laid in an irregular bond, blocking these entrances. The part of the wall by the offset was also built of big limestone blocks (averaging 0.30 x 0.30 x 0.57 m). Further east from the offset, the whole wall (now only 0.30 m wide) was built of such blocks.

The entire length of the north wall of the street, including its foundation, was made of similar limestone blocks. The upper edge of the foundation, which is

visible from the street level, is also made of limestone blocks 0.30 m wide. The only entrance in this wall opens in it 1.70 m from the western corner. It is 1.10 m wide and leads to a small room. Sockets for a wooden threshold can be observed in the lower part of the jambs on their southern sides.

Crossing the width of the street are two steps in the pavement, 2.41 m east of the said offset in the south wall and descending eastward, one 0.14 m and the other 0.12 m high. The lower one was made of slabs 0.34 m wide, the upper one of narrower stones (about 0.20 m). The steps and the widening of the street near them, as well as the sounder building technique of the walls in this part, come together to form a noticeable entrance zone to the area of the forum.

[RC]

## ARCHAEOLOGICAL RESEARCH IN THE STREET AREA

Covering the pavement was an accumulated fill of sand and randomly scattered stones, about 1.10–1.20 m thick in places. Irregular stones from the rubble masonry wall on the southern side of the



Fig. 4. Roman coin of Vespasian (AD 76/77) from east of the forum (Polish–Egyptian Conservation Mission Marina el-Alamein/ photo R. Czermer)

street were discovered at the western end, next to the forum. Most of them lay on a layer of sand 0.05–0.10 m thick. The situation looked similar on the eastern side, but there big, regular stone blocks were found, the majority of them coming also from the south wall. Rather random ceramics were found in the deposit, dated to the 2nd–4th century (G. Majcherek, personal communication). Small fragments of sherds in the layer directly above the floor were dated provisionally to the 2nd–3rd century.

A large well-preserved Roman bronze coin turned out to be an interesting surface find from the area east of the street [Fig. 4]. It is an Alexandrian



coin issued in year 9 of the reign of Vespasian (AD 76/77; B. Lichočka, personal communication). The reverse shows a laureate head of Titus right (*RPC II*: 326, No. 2456).

In 2016, conservation of the pavement next to the eastern side of the southern portico uncovered steps from an earlier phase, leading to the portico. A small test pit (about 1.20 m by 0.80 m) cut now next to the steps situated on the longer side of the southern portico [*Fig. 5*] revealed four slabs and then more slabs under a layer of soil, 0.13–0.15 m thick. The latter were placed at a slight angle compared to the slabbing in the forum and represent probably a fragment of pavement from an earlier phase. The test was dug to a depth of 0.40 m. Several animal bones (cattle, pig; U. Iwaszczuk, personal communica-

tion) were found there, as well as small fragments of pottery and glass vessels. The relics are dated provisionally to the 1st century, which concurs with earlier dating of the forum in general. [GB-C]

### RESTORATION AND EXHIBITION OF STREET REMAINS

The presentation of this part of the site has been greatly enhanced by opening the entire length of the street [*Fig. 6*]. The wall on the northern side of the street and part of the wall on the southern side were protected: first to a limited extent on both sides in the western section in 2015 (Czerner et al. 2016: 162–163) and now along the entire length of the street [see *Fig. 2*]. One to three layers of original limestone blocks tumbled from the north wall were replaced in position. The



Fig. 5. Test trench next to steps leading to the southern portico of the main square (Polish–Egyptian Conservation Mission Marina el-Alamein/photo R. Czerner)



jambes of the entrance were made more distinct. Some parts of the wall on the southern side were protected in similar manner. At the eastern end, the rubble

masonry wall was pointed after having been cleaned. The wall between the easternmost entrance and the setoff, of which barely one course above the street



Fig. 6. Street east of the forum, view from the east: top, before cleaning and preservation; bottom, after cleaning and preservation in 2017 (Polish–Egyptian Conservation Mission Marina el-Alamein/ photos R. Czermer)

paving was preserved, was reconstructed with original blocks to a height of about 0.65 m, matching the height of the blocking of the doorway. The missing slabs in the street pavement were replaced as well. [RC, WG]

### COMPLEMENTARY CONSERVATION IN THE FORUM AREA

Complementary conservation was carried out to a limited extent in the area of the forum in 2017. The plaster on the shaft of a column about 1.65 m high, located in the southeastern section of the square, was recreated. A lime-

cement mortar was used for this purpose (sand, lime and white cement in 6 : 3 : 1 parts), around the shaft circumference to a height of 0.50 m and locally in places. The plaster on the shafts of three full-height columns in the southwestern part of the square was also completed locally. Wherever rainwater had entered through the eroded fragments of paving slabs, flushing sand out from the underfloor part and lowering the ground level, the resulting hollow spaces under the pavement were filled in. Wherever the paving slabs had eroded (due to salt migrating from inside the stone in con-



Fig. 7. Room 17 of the Roman baths south of the main square; view from the south after excavation in 2017 (Polish–Egyptian Conservation Mission Marina el-Alamein/photo W. Grzegorek)

sequence of rainwater puddles forming on the surface and causing salt precipitation and, in effect, powdering of the stone and defects in slab thickness), the stone surface and the missing joints were repaired with mortar. [WG]

### ROMAN BATHS SOUTH OF THE FORUM

The public baths from the Roman period, dating from the 1st to the 3rd century AD, were discovered in 1987 by the Polish Archaeological Mission and explored further in 2005–2007 (Daszewski 1995: 19–20;

Daszewski et al. 2007: 79–82). Since 2007, the Conservation Mission has been continuing research and conservation work in this structure. In 2017, it completed the excavation, begun in 2015, of Room 17 in the southern part of the baths, east of the previously discovered latrines [Figs 7, 8]. Two floor levels were uncovered, both lower than in the corridor on the north, from which the room was accessible through a very narrow entrance, measuring only 0.80 m. Both floors were made sloppily, like the structures inside the room.

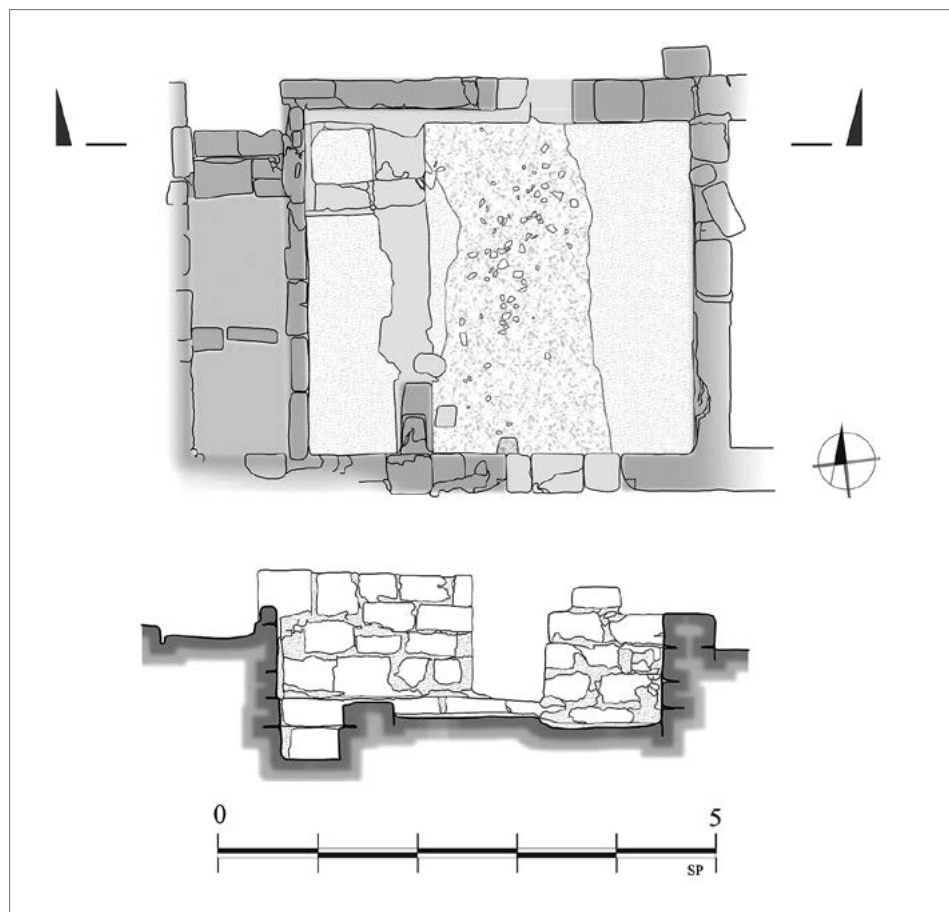


Fig. 8. Room 17 of the Roman baths south of the main square: plan and section (Polish–Egyptian Conservation Mission Marina el-Alamein/drawing S. Popławski)

Discovered in 2016, an inner wall, about 0.50 m wide, projecting north from the south wall, 0.91 m from the western corner, may have supported the landing of the stairs, the first flight of which was in the neighboring room. The foundation of this wall was examined in 2017 and was found to run as far as the north wall of the room. Another low wall, 0.27 m wide, built between the foundation and the west wall of the room, set off an almost square shaft in the northwestern corner. It measured 1.13 m by 0.99 m on the outside (inner dimensions 0.58–0.63 m) and was 0.63 m deep with a stone slab forming the bottom. [RC]

### ARCHAEOLOGICAL RESEARCH IN ROOM 17

Excavation of Room 17 started this year on the level of the threshold in a door opening in the north wall where it had halted the previous year (Czerner et al. 2017: 90–93).

On the threshold, fragments of bricks were preserved on either side. A layer of packed soil, 0.10–0.15 m thick, yielded potsherds, including fragments of a large mortarium, and a small, oblong vessel, which has survived almost complete.

Among several small fragments of lamps was a base with a signature in



Fig. 9. Finds from Room 17 of the Roman baths: (counterclockwise from top right) bone hairpin; bone game pawn; fragment of an oil lamp base with a producer's inscription; terracotta bust of Isis (Polish–Egyptian Conservation Mission Marina el-Alamein/photos R. Czerner)



Greek: ΜΑΡΚΟΥ [Fig. 9 bottom left]. Lamps with this kind of signature were discovered primarily on islands of the eastern Mediterranean (Katsioti 2014: 157–158). Researchers point to a Cypriot workshop. Dating is not certain; it seems that they were produced no later than in the 3rd century. The context of the Marina find is dated mainly to the 2nd century or the beginning of the 3rd century. Pottery coming from the eastern Mediterranean, including Cyprus, was also discovered in this context. It is not known, however, whether the lamp from Marina could have come from the same Cypriot workshop. Further research should bring more data to bear on the issue.

Other finds from this layer included a considerable number of fragments of glass vessels and of windowpanes. In the layer, there were also many animal bones (sheep/goat, cattle, pig, bird and fish). Several bronze objects were found by the east wall: a small bell, a nail, a thumbtack, and a coin from the Roman period, tentatively attributed to the Alexandrian mint, 1st–2nd century, but a precise identification due to heavy wear and corrosion is not possible (B. Lichočka, personal communication).

Bone objects from the context included a damaged pin, another intact one with a conical wider end [Fig. 9 top right]. Hairpins like this complete one, relatively thick compared with other types, served to fasten knots and were commonly used in the Roman Empire (Bìrò 1994: 31, 78–79, Nos 134–151; Bartus 2003: 23–24, Fig. 1.1). Such pins could have been made of bronze as well (Riha 1990: 182, Nos 2632–2644). They are dated mostly from the 2nd to the 3rd century. Three pins of

the type were found in Marina in house Η10Ε in 2003; similar specimens were also discovered in Alexandria (Rodziewicz 2007: 200–201, Nos 417–419). Another bone object is a board game pawn [Fig. 9 top left]. Of cylindrical shape, it is hollow inside, at the foot decorated with two rings and a groove between them. A similar pawn was found in Alexandria (see Rodziewicz 2007: 237, No. 542).

A fragment of an object made of lime mortar was also found. Traces of white color, and in some places of yellow, have survived on it. Perhaps it is a part of a figurine of a woman, the head of which had been found in the previous season (Czerner et al. 2017: 91–92, Fig. 1).

A partly preserved amphora was discovered lying in the southwestern corner of the room, whereas the northwestern corner contained a rectangular structure built of stone blocks in place of the hearth from the upper layer discovered in 2016 [see Figs 7, 8]. Traces of mortar were found on its bottom and, in the fill, fragments of pottery including among others amphorae and frying pans from the 2nd–3rd century AD (G. Majcherek, personal communication), and animal bones. This structure could have served to store food. Several centimeters under the floor of marble tiles, a low wall, 0.40 m wide and with traces of mortar on its surface, was discovered running from north to south.

A distinctive layer of packed, dark soil 0.12 m thick and about 1.00–0.90 m wide was observed in the eastern part of the room [see Figs 7, 8]. The lower sections of the east, north and south walls, up to 0.30 m, are blackened. The layer yielded fragments of pottery, identified as, among others, kitchenware, ampho-

rae and a Cypriot jug of terra sigillata, glass vessels and window panes, as well as a Ptolemaic bronze coin, most probably from 261–240 BC (B. Lichočka, personal communication), a big bronze hook, small pieces of lamps, a fragment of a flat iron object, a damaged bone pin and a small terracotta bust depicting Isis [Fig. 9 bottom right]. The goddess is wearing a chiton with a fringed shawl thrown over it, its ends tied over her breast in the so-called Knot of Isis. The goddess has a characteristic hairstyle: in front, the hair frames a triangular forehead, and at the back, eight long locks fall over the shoulders. The head was probably decorated with a basileion. The figurine is damaged; among other things the bottom part, that is a cylindrical base, is missing (Dunand 1990: 153, No. 408). Fragments of another terracotta statuette, possibly an animal, were found near the figurine of Isis.

The floor found under this layer was made of lime mortar with addition of ceramic filler. It is situated about 0.30 m below the level of the floor in the corridor (Room 11). A partly preserved flooring of marble tiles lies approximately 0.12 m above this floor.

A considerable number of irregular grey marble tiles was found in the fill of this room. The tiles probably came from the flooring, fragments of which have survived opposite the door opening, about 0.15 m below the threshold. Included among them were some distinctive ob-

long tiles (5/7 cm by 2/3 cm), worked on one longer side, which may have formed a trim finishing of the floor, a low base-board. Marble tiles of the upper flooring were set in mortar on a bedding of crushed brick; remains of this substructure could be observed on some of the tiles.

No plaster has survived on the walls of the room, but evidence from this and earlier seasons, in the form of small pieces of plaster colored yellow, black, brown, green and red, was found indicating that the walls had indeed been plastered. No reconstruction of the actual design is possible based on these fragments. The fragments may come from various periods or from different rooms nearby, just as fragments of windowpanes discovered here are no evidence that the windows in this particular room were provided with such. However, numerous windowpane pieces discovered in the area of the baths prove that windows in at least some of the chambers must have been paned with glass.

The room was restructured repeatedly and its function kept changing. The most recent phase consisted of several small hearths. Food was prepared in the room, as evidenced by large numbers of fragments of shells and animal bones.

Most of the finds date from the 2nd century, but there are objects from the 1st and 3rd centuries as well. The two floors indicate that the baths were rebuilt probably in the 2nd or at the beginning of the 3rd century. [GB-C]

## CONSERVATION WORK IN THE ROMAN BATHS

Current conservation and protection work in numerous places within the Roman baths was necessitated by the damage caused by progressing weathering of stone blocks in the walls, joints and plasters due to atmospheric factors. The edges of original plaster in Rooms 5–9 and 12–17 had become detached and had to be protected with bands of mortar based on sand, lime and white cement (6 : 3 : 1) with the addition of crushed ceramic filler. The plaster coating of the column shafts was patched where needed. Vestiges of polychrome decoration on the walls of several rooms in the southern section of the baths were conserved and protected. [RC]

### CURRENT CONSERVATION

Unfavorable atmospheric factors triggered processes of degradation and erosion in earlier restored and protected structures: weathering of stone and plaster surfaces, destruction of joints by wind and water. Current conservation is the result of annual monitoring by the team and in 2017 it concerned, beside the Roman baths area, also House H21c, where deteriorating elements of a commemorative monument to Commodus were protected, and the H9/H9A house complex, discovered in 1986 and protected in 1995–1997. At the time the mostly rubble masonry walls of the building were restored, faces and joints were filled in, and a coping was placed at the top of some of them for protection. Over the years, rain in particular has taken a toll on the ruins, washing out the lower parts

of the walls and causing them even to collapse. Interventional restoration and reconstruction undertaken in 2016 and 2017 concerned primarily the walls most damaged or in danger of collapsing: west wall (in the northern section) of the tavern situated between houses H9 and H9a, the neighboring outer wall of House H9a on the south side, and the middle and eastern parts of the southern outer wall of House H9. The wall aedicule in House H9 was also protected. [RC]

Winter rains were also responsible for washing out the pavement in some places inside House H1, necessitating some salvage archaeological operations in Room 20. An amphora was noted sunk into the ground below the paving slabs by the west wall. A similar find in 2002 in House H21c had brought a bronze incense burner and a statuette of Aphrodite (Medeksza et al. 2003: 95–96). The vessel in House H1 was filled with sand with some small potsherds mixed in. [GB-C]

### PROTECTING RESTORED WALLS

The unchecked flow of rainwater has repeatedly been demonstrated as the largest single cause of damage to the restored architectural substance, necessitating continuous repair work. It has also resulted in the inadvertent loss of dried mud brick walls, decorative architectural elements of limestone (cornices with dentils and modillions, architraves, friezes, column shafts, bases, capitals of columns and engaged columns, etc.) as well as casing elements and plain stone blocks which have



eroded away. The reconstruction effort in this case is hampered by the lack of good building stone.

In order to minimize in future the scope of restoration necessitated by the undue effect of unfavorable weather conditions, it is necessary to direct winter rainfall away from building walls to prevent leaching of the mortar from the joints and water saturation of limestone blocks and salt efflorescence in effect. The walls in question are of rubble masonry, bonded with lime mortar in the faces and clay mortar in the core. Another reason

for directing water away from the walls is to avoid undercutting of the structures, which has led to the collapse of large sections in several places in the past.

A tested procedure, applied by the team in recent years, consists of forming sandy escarpments a few meters in front of building walls, on the eastern, southern and western sides of the protected complexes, directing water around them without letting it penetrate. These escarpments are also part of the visual presentation of the site and as such play an aesthetic role. [WG]

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# Conservation in Marina el-Alamein in 2017

## (Polish–Egyptian Conservation Mission)

**Abstract:** The conservation program of the Polish–Egyptian Conservation Mission in Marina el-Alamein in 2017 included restoration of wall structures and architectural decoration elements damaged as a result of unfavorable climate conditions (Houses H9/H9a and H21, Rooms 10 and 11 in the Roman baths). Wall paintings exposed to weather conditions *in situ* were treated as part of another conservation project. Minor metal finds were also treated using both chemical and mechanical means in order to identify the objects.

**Keywords:** Marina el-Alamein, stone conservation, architectural decoration, wall paintings, House H9, House H21, Roman baths, restoration *in situ*, metal relics

An important task of the Conservation Mission in Marina el-Alamein (Egypt) is to continuously monitor the state of preservation of the architectural remains and to take up the required interventional conservation works. Standard conservation of archaeological finds is also carried out on a regular basis (for the current work at the site, see Czerner, Bąkowska-Czerner, and Grzegorek 2018, in this volume).

## ARCHITECTURAL CONSERVATION

As a rule, winter at the site escalates unfavorable climatic conditions resulting in damage to wall structures and architectural decoration elements. Consequently, progressive degradation of masonry bondwork was observed in 2017, due to the heterogeneity of the technical parameters of stone blocks used for wall building and the destructive effects of water and salt contained in the stone. Therefore, choosing materials of appropriate technical parameters, varying in accordance with location, ground and function, for the conservation of walls was a key issue in the whole procedure. Long-term observations made by the conservation team have shown that



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poorer quality mortar is easily eroded by water and wind action (Medeksza et al. 2010: 88; Czerner and Medeksza 2010:

109–112). There is a need for replacing mortar made of 3 parts sand to 1 part lime and 0.5 part white cement and vary-



Fig. 1. Small aedicule in House H9: top, before conservation; inset, detail before conservation; bottom, after conservation (Polish–Egyptian Conservation Mission Marina el-Alamein/photos P. Zambrzycki)

ing the strength of the bonding agent. Stronger mortar is necessary in the case of structurally bonded elements like column drums and capitals, but for bands protecting the edges of historical plaster, a weaker mortar is better suited to avoid the strong mortar detaching the weaker substrate.

In the 2017 season, joints were repaired in a small aedicule in House H9 [Fig. 1], capitals were remounted in the

commemorative monument in House H21 [Fig. 2], and bands were introduced to protect the edges of ancient plaster in Rooms 10 and 11 of the Roman baths south of the main square [Fig. 3].

The joints and losses of stone in the architectural elements in House H9 were filled with a mineral mortar: 3 parts sand to 1 part lime to 0.5 part cement. Mortar with relatively low durability was used, adjusted to the weakened structure of



Fig. 2. Capitals of the commemorative monument in House H21: top row, before conservation; bottom, after conservation (Polish–Egyptian Conservation Mission Marina el-Alamein/photos P. Zambrzycki)



the stone. The same mortar was used for the bands to protect the edges of plaster in the Roman baths. As for the architec-

tural elements repaired in House H21, a stronger mortar was used, 3 parts sand to 1 part lime to 1 part cement, this in



Fig. 3. Bands protecting ancient plaster edges in the Roman baths: top, before reconstruction; bottom, after reconstruction (Polish–Egyptian Conservation Mission Marina el-Alamein/ photos P. Zambrzycki)



view of the fact that the previous joint, being made of the weaker mortar, had been washed away, posing the danger

of losing the stability of the connection (Medeksza et al. 2011).

[PZ, AS]

## PAINTED WALL DECORATION CONSERVATION

Conservation of painted wall decoration, another regular team project, concerned painting discovered in Room 9 of the Roman baths. This was conservation of a salvage nature [Fig. 4], and it initiated research aiming to assess the odds of being able to preserve painted wall decoration *in situ*, exposed to the all-year weather conditions prevalent in Marina el-Alamein. The project will be implemented in coming seasons.

The painting, a fragment of which was discovered on the south wall of the room, decorated probably the whole interior. There was a dado in the bottom part, a frieze consisting of three colors above it, and presumably geometrized panels higher up. The preserved decoration is located a little above the floor level. The lowermost part is painted black, the upper part is in shades of red. The decoration was painted against the background of white plaster laid without any ground directly on the stone surface. The painting layer is characterized by good adhesion to the plaster with high cohesion and hardness. However, larger pockets are created in places where the edges of the plaster, impacted by strongly unfavorable climatic factors, are weakened and partly detached from the wall.

No evidence of salt precipitation was observed on the surface of the painting. The painting was cleaned of loose fragments of plaster and sand. Cracks were not deepened due to the high

degree of hardness of the plaster, this because vibrations during this procedure would have posed a danger for the



Fig. 4. Relics of painting in Room 9 of the Roman baths: top, before conservation; middle, during the consolidation of paint layers; bottom, after conservation (Polish–Egyptian Conservation Mission Marina el-Alamein/ photos P. Zambrzycki)

adhesion of the mortar to the ground. A lime–sand mortar with carefully chosen strength parameters was used for the bands and for filling cavities and larger cracks. This mortar was composed of lime, fine-grained sand, cement and a small amount of crushed brick sand, 1:3:0.5:0.08 parts respectively. To increase mortar flexibility, a 2% solution of Primal AC 33 in water was added (Chmielewski 2013: 206–207). The addition of crushed brick dust served to enhance the hydrophobic properties (making the mortar waterproof). The conserved surfaces were first moistened with water. A test was made on a part of the painting to see how reinforcing the painting layer with a 2% solution of Primal AC 33 in water, applied to the surface with a soft brush, would work (Jakubowski 2008: 130–131).

The team also undertook to assess the preservation condition of polychromed objects stored in the Marina el-Alamein

storeroom [Fig. 5]. The collection consists of paintings on an artificial substrate (transfer) and natural stone (limestone blocks). An essential factor, determining the preservation condition of the objects, is the high air humidity in the storeroom resulting from the proximity of the sea. In such conditions, mineral salts migration is possible, damaging the structure of objects.

The following objects were inspected: a) a polychromed column drum [Fig. 5 left]; b) a painting on a transfer ground: fragment showing a head, most probably a personification of Alexandria; c) a painting on a transfer ground: fragment of painting depicting three figures: personifications of Helios, Harpokrates and Serapis; d) a painting on a ground reinforced with mineral mortar: fragment showing the figure of a man: personification of Heron; e) a painting on a stone ground: fragment with a floral motif; f) a painting on a stone ground: fragment with floral and figurative decoration;

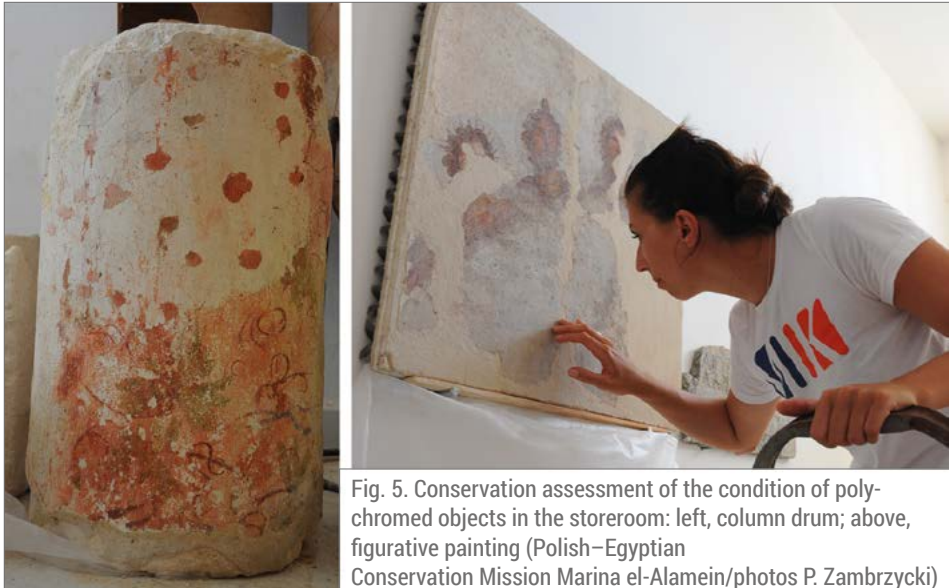


Fig. 5. Conservation assessment of the condition of polychromed objects in the storeroom: left, column drum; above, figurative painting (Polish–Egyptian Conservation Mission Marina el-Alamein/photos P. Zambrzycki)

g) a polychromed shell made using the technique of a floating coat.

The general preservation condition of the stored paintings is good. In most objects no loss of adhesion to the ground or the structural cohesion of technological layers was observed. Preventive work was deemed essential only in the case of the polychromed column drum shaft; the slightly powdering painting layer was reinforced with a 2% water solution of Primal AC 33 and a 5% analogous solution was applied to the uncovered stone, the protective mortar bands and mortar replacement

wherever salt precipitation and stone and mortar erosion had reappeared. Surfaces were first moistened with ethanol (1 : 1 with water) to lower surface tension and increase penetration of the adhesive binder.

The use of a lower concentration of the solution was aimed at avoiding possible gloss on the surface of the painting. In view of earlier ineffective applications of Paraloid B-72 (Ciabach 1998: 121–122), the present project tested Primal AC 33 in this application to observe the effectiveness of this resin in subsequent years. [AS]

## CONSERVATION OF ARCHAEOLOGICAL SMALL FINDS

Small finds of bronze discovered by the team included fragments of jewelry, coins and nails. Conservation essentially aimed at halting degradation of the material substance and restoring the original appearance to facilitate identification and classification of the find (Medeksza et al. 2010: 97).

Standard conservation procedure in these cases started with photographic documentation of the condition of a given object. Next, products of metal corrosion were removed in a bath of a 1% solution of

disodium EDTA in water. The process was carried out in an ultrasonic washer. Subsequently, the objects were desalinated in distilled water using the same ultrasonic washer. A glass fiber pencil was used to remove products of corrosion where necessary. Objects were then coated for protection with a 3% solution of Paraloid B-72 in toluene. The procedure was completed with a full final documentation of the conserved find.

PZ]

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# Tell el-Retaba

## Season 2017



**Abstract:** The 2017 season of archaeological excavation at the site of Tell el-Retaba in the Nile Delta in Egypt led to several interesting discoveries. Two of these concerned burials: a Hyksos tomb from the Second Intermediate Period, robbed but with some remains of the original furnishings, and pit burials from the early Eighteenth Dynasty, one of which was richly endowed with silver jewelry. Meriting note is the discovery of moats belonging to the defenses of the Nineteenth Dynasty fortress. Exploration of a crowded Third Intermediate Period settlement was continued.

**Keywords:** Hyksos, Second Intermediate Period, Eighteenth Dynasty, Nineteenth Dynasty, Third Intermediate Period, settlement, fortress, moats, cemetery

The Tell el-Retaba archaeological site, approximately 35 km west of Ismailiya, has been investigated by a Polish–Slovak Archaeological Mission since 2007. Fieldwork was continued for two months in 2017, the investigations being concentrated in two areas: 4 and 9, situated west and east of the modern road, respectively [Fig. 1].

In **Area 4**, work was concentrated in the northwestern part, where contested ownership of the land called for salvage operations to be carried out immediately. The Second Intermediate Period (SIP) settlement and cemetery went through three phases: the earliest, G<sub>3</sub>, characterized by well-built houses; G<sub>2</sub> when a burial ground replaced the deserted buildings and G<sub>1</sub>, which was a gravel deposit that covered the structures. The area continued in use mostly as a burial ground after the Second Intermediate Period (phase F<sub>5</sub>). Most of the early Eighteenth Dynasty structures from the area: the Green house (phase F<sub>4b</sub>) and the Black house 1 (phase F<sub>3</sub>), were investigated already in previous seasons. A double moat of the Nineteenth Dynasty fortress (phase E) was also discovered in Area 4 and some construction elements were recorded above it, on the inner side of Wall 2 (phase D<sub>4</sub>) of the Twentieth Dynasty.

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In **Area 9**, exploration of a Third Intermediate Period settlement continued over the course of the season. One of the houses yielded an unusually rich set of artifacts.

The main discoveries are presented below in chronological order; *Table 1* presents the chronology and phasing of archaeological remains in Tell el-Retaba based on the results of work carried out in 2007–2017.

Table 1. Phasing of site occupation at Tell el-Retaba (following the 2017 season)

Phase	Dating	Main features
G3	Second Intermediate Period (SIP)	Settlement and infant burials
G2	Second Intermediate Period	Cemetery
G1	Second Intermediate Period	Settlement and cemetery
F5	Early Eighteenth Dynasty	Cemetery
F4a–b	Early Eighteenth Dynasty	Settlement: Green houses
F3	Early Eighteenth Dynasty	Settlement: Black houses
F2	Early Eighteenth Dynasty	Scattered remains
F1	Late Eighteenth Dynasty	No archaeological record yet
E4	Nineteenth Dynasty	Earliest defense wall: core of Petrie's "wall 1"; infant burials
E3	Nineteenth Dynasty	Fortress of Ramesses II: extension of "wall 1"; moats; barracks/workshops
E2	Nineteenth Dynasty	Fortress
E1	Nineteenth–Twentieth Dynasty	Settlement and cemetery in the ruins of the fortress
D4	Twentieth Dynasty	Ruins of Nineteenth Dynasty fortress leveled; fortress of Ramesses III: Petrie's "wall 2"
D3	Twentieth Dynasty	Fortress: Petrie's "wall 3"
D2	Twentieth Dynasty	Fortress
D1	Twentieth Dynasty–Third Intermediate Period (TIP)	Fortifications abandoned and ruined
C4	Third Intermediate Period	Settlement
C3b	Third Intermediate Period	Settlement
C3a	Third Intermediate Period	Settlement
C2b	Third Intermediate Period	Settlement
C2a	Third Intermediate Period	Settlement
C1	Third Intermediate Period	Settlement
B	Late Period	Settlement with tower houses
A	Modern	Ottoman ovens and pipes, among others



## 1 SECOND INTERMEDIATE PERIOD: PHASE G

Parts of a settlement and cemetery from the Second Intermediate Period excavated in Area 4 presented three separate occupational phases, the younger ones suffering extensive damage due to later activity at the site, either younger settlement (especially during the construction of the moat of the Nineteenth Dynasty fortress) or modern intrusions.

### 1.1 OPEN SETTLEMENT: PHASE G3, AREA 4

Phase G3 was considered as the earliest occupational phase in Area 4 until

2017 when excavations revealed a stratigraphically older elongated sand-filled pit <2475> in the northern part of Area 4. The presence of this pit suggests earlier human activity, although it has yet to yield either datable pottery or other finds corroborating this interpretation. In phase G3, the area was occupied by at least two fairly well-built houses, which are described below [Fig. 2]. Three infant burials were identified in their immediate vicinity. These children were probably buried within the settlement, somewhat outside of the regular cemetery.

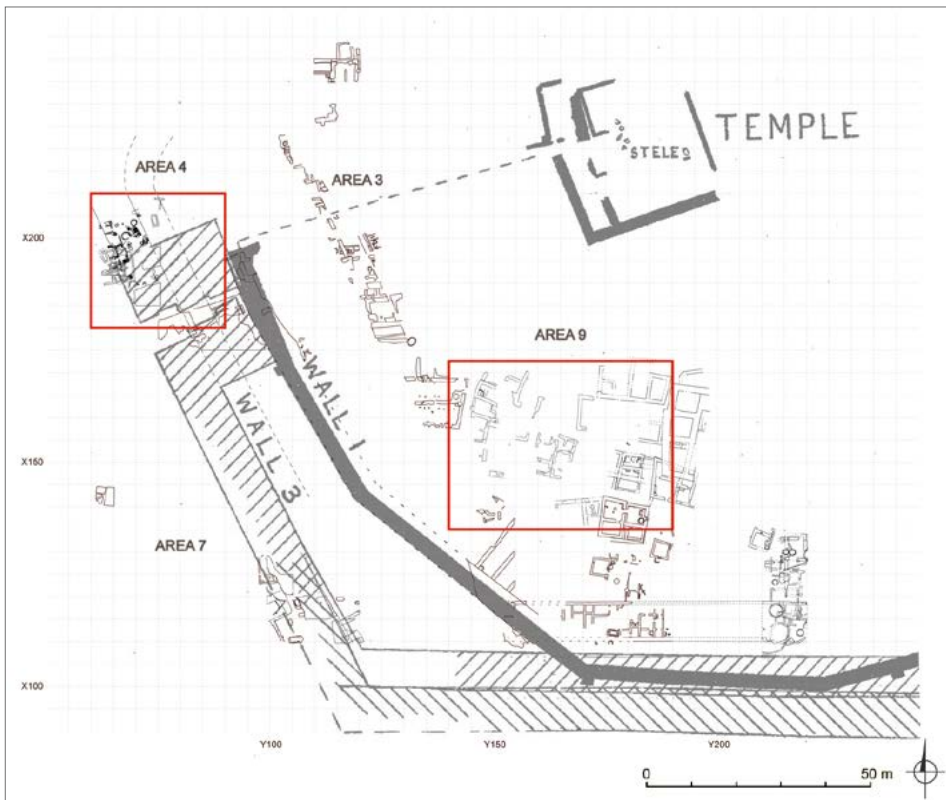


Fig. 1. Plan of the western part of the site; boxes in red mark areas investigated in 2017 (Tell el-Retaba Project/drawing Ł. Jarmużek)

**1.1.1 Building {2034}**

The better preserved building {2034}, already partly unearthed in 2016 (Rzepka, Hudec, Jarmużek, Dubcová, Hulková et al. 2017: 24–25), had lost its western part to a modern sewage pit. At least two rooms in the east were preserved in part with a suggestion of a third further east delineated by a wall [2355]. However, since this wall was truncated by later tombs, it cannot be said with certainty that it actually belonged to the building in question.

A deposit (2481) by the north wall of the northern room brought to light

a large quantity of broken or heavily used cubic/globular grinders (S2380, S2383, S2384, S2385 and S2386), as well as two querns (S3278 and S3287). In the southern room, fine laminated ashy deposits (2352) were observed between two muddy floors (2342) and (2364), one above the other. Several makeshift fireplaces identified on these floors appear to have been moved around the room. Grinder S2833 and a red ochre pigment lump S3181 were found in this room. The surface of the ashy deposit (2352) was pierced with peg holes, about 3 cm in diameter and about 5–10 cm deep. Their exact number

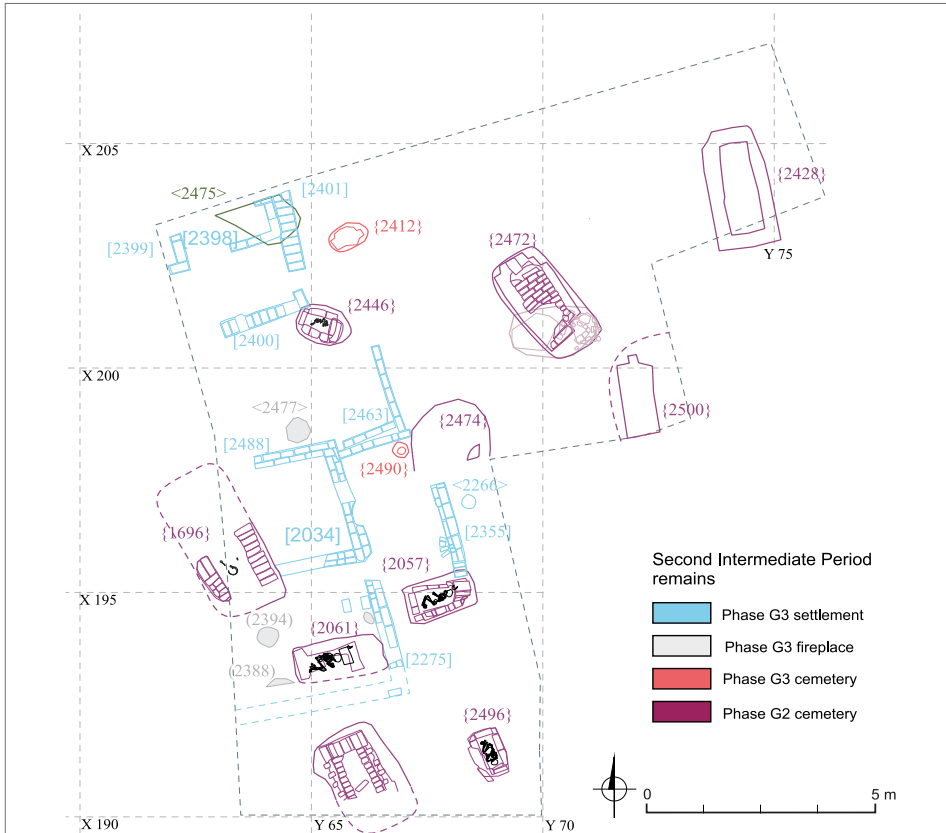


Fig. 2. Second Intermediate Period occupation in Area 4 (Tell el-Retaba Project/ spatial data E. Stopková; drawing L. Hulková)

and function is not clear, but a similar feature observed in building B in Tell el-Maskhuta was interpreted by the excavators as evidence of leather or metal production (Paice, Holladay Jr., and Brock 1996: 167–168).

The area north of the building {2034}, delineated by the walls [2463] and [2481], was probably open or roofed over only in part. The wall [2463] seems to have been built less carefully than other walls of the building {2034}, and its part running north–south is only half-a-brick thick. This indicates that it was probably only a perimeter wall dividing neighboring compounds or different areas of use around one building. The deposit (2462) here consisted of ashes mixed with sand and silt, and contained only pottery and animal bones. A fireplace in a rounded pit <2477> was also located here. A similar deposit (2464) containing a lot of burned sherds was found south of the wall [2463]. The infant tomb {2490} seems to be covered by this deposit. It would mean that the skeleton of a small child<sup>1</sup> was buried here in the immediate vicinity of the house, while this space was still used for domestic purposes.

### 1.1.2 Building {2400}

Two walls [2400] and [2401] belonging to another building were found in the northwestern corner of the excavated area. It is not entirely clear yet whether they delineated a room or were a part of a semi-open space that was used for fire-

related activities. Two small rectangular mud-brick structures [2398] and [2399], furnaces most probably, were found inside these walls, filled with ashy deposits (2397) and (2396) respectively. Without any small finds on the record, the function of these structures must remain tentative for now.

About half a meter east of wall [2401] was a simple mud-brick infant tomb {2412} containing a skeleton placed on its right side with the head to the east. Another infant mud-brick tomb {2446} was located immediately south of the wall [2400]. Its general orientation differs from that of the tomb {2412}, but the child was also interred with the head to the east.

## 1.2 CEMETERY: PHASE G2, AREA 4

The buildings of phase G3 were abandoned at some point and the area turned into a burial ground. All nine graves found here were rather substantial structures with a mud-brick burial chamber and a gabled or vaulted roof, depending on the size of the tomb. The orientation of the structures varied between north–south and east–west, but this is hardly unusual (Forstner-Müller 2008: 36–37).

Tomb {2061} was dug into the abandoned southern room of the building {2034}, other tombs like {2057}, {2009} and {2496} and possibly also {2474} (the latter's identification as a grave is not secure) were built in its immediate vicinity. Four further tombs were found in

1 Burials of infants in the vicinity of houses or other structures or in clusters are documented from other sites and this practice does not seem to be reserved only to the Second Intermediate Period. However, in most cases the infants are placed in a pottery vessel, often an amphora, for protection. See, for example, Paice, Holladay Jr., and Brock 1996: 164; Górka and Rzepka 2011; Thomas 1981: 21; Forstner-Müller 2008: 25–26.

the area east of the houses of phase G3. Their incorporation into phase G2 is not absolutely secure, because they are not directly connected with any of the buildings used as phase markers. Furthermore, all these graves suffered damage as they were robbed in antiquity and tomb {2428} was further damaged by the Ramesside moat.

### 1.2.1 Tomb {2061}

Tomb {2061} (discovered in 2016, but not explored then) is one of the smaller east-west oriented mud-brick tombs with a rectangular burial chamber covered by a gabled roof leaning on the western gable (inner dimensions: 1.06 × 0.54 × 0.54 m). The roof was in part collapsed. Inside the burial chamber was an individual lying on its left side with the head to the east and contracted feet. The head was rest-

ing against the side of a large mud brick. A pottery vase was found in the north-eastern corner and a scarab S3197 [Fig. 3] by the left arm, possibly worn on the left wrist or fallen out of the left hand.

### 1.2.2 Tomb {2428}

A substantial mud-brick structure with a rectangular burial chamber (inner dimensions 1.60+ × 0.67 × 0.75+ m), probably roofed with a vault, it was seriously damaged by the moat of the Nineteenth Dynasty fortress. Furthermore, it was probably looted even prior to this disturbance. Only disarticulated human bones were found scattered around the southern part of the burial chamber.

### 1.2.3 Tomb {2472}

The tomb was a rather large structure



Fig. 3. Grave goods from the SIP tombs: top left, faience scarab S3197 from tomb {2061}; top right and bottom, faience scarab S3302 and bronze toggle pin S3303 from tomb {2500} (Tell el-Retaba Project/photos R. Rábeková)

with a rectangular burial chamber (inner dimensions: 1.50 × 0.60 × 0.66 m), roofed with a barrel vault. It was heavily looted in antiquity, most probably during phase F4b, the robbers apparently knowing its position to judge by their pits which hit the south wall of the tomb directly (a similar observation of well-informed tomb robbing in this period was made at Tell el-Maskhuta, see Paice, Holladay Jr., and Brock 1996: 164). Mostly disarticulated human bones and a broken bone needle S3288 were scattered in the southern part of the tomb and in the robbery pit <2515>. An infant burial was found lying on its back with the head to the north in the northwestern corner of the burial chamber. It is not entirely clear whether this interment dated from the same time as the primary adult burial or post-dated the looting of the tomb.

#### 1.2.4 Tomb {2496}

A small north–south oriented mud-brick tomb with a gabled roof (inner dimensions: 0.74 × 0.36 × 0.30 m) with the skeleton in the burial chamber placed on its left side, in contracted position, its head to the south. This tomb did not contain any burial goods.

#### 1.2.5 Tomb {2500}

A mud-brick tomb built in a large burial pit together with tomb {2502}; the latter

was not explored this season. The rectangular burial chamber (inner dimensions: 0.95 × 0.38 × 0.50 m) was covered with a gabled roof. A circular hole in the southern part of the roof and a somewhat disturbed skeleton indicate that the burial was robbed in antiquity. The skeleton was found on its right side with the head to the south, but it may not be in position, having been dragged toward the robbers' pit in the southern part of the tomb. Despite this disturbance, a scarab S3302 and a bronze toggle pin S3303 [Fig. 3 top right and bottom] were recovered from the tomb fill along with two pottery vessels.

### 1.3 SETTLEMENT AND CEMETERY: PHASE G1, AREA 4

The remains of phase G1 are rather scant. Apart from a massive tomb {1696} known already from previous seasons, only a short fragment of undulating wall [2457], preserved as a single brick course, with an associated layer (2456) could be assigned to this phase. During this phase a relatively thick gravel deposit (2351) formed over the earlier structures indicating that this part of the settlement was not in use, although the reasons for this remain obscure. It is possible that some of the tomb robberies were carried out already during this phase.

## 2 EARLY EIGHTEENTH DYNASTY: PHASE F

Most of the early Eighteenth Dynasty structures from the excavated area: the Green house and the Black house 1, were already known from earlier work (see Rzepka et al. 2014: 55–64; Rzepka, Hudec,

Jarmužek, Dubcová, Hulková et al. 2017: 32–37). Their surroundings were now explored [Fig. 4]. Two ovens were discovered northeast of the houses. They post-date the abandonment of the Green house.

Probably the most important feature of the New Kingdom settlement predating the Green house, however, is a small cemetery with four pit tombs as the space continued to be used as a burial ground after the Second Intermediate Period. Some of the grave goods and the internment mode may be seen as a legacy of the previous age.

**2.1 EARLY EIGHTEENTH DYNASTY CEMETERY: PHASE F5, AREA 4**

The cemetery of the early Eighteenth Dynasty is the earliest feature of the early New Kingdom occupation at Tell el-Retaba. Three intact tombs were excavated so far. Pit <2441> containing a disarticulated human skeleton was either another tomb or constituted a case of secondary bone depo-



Fig. 4. New Kingdom occupation in Area 4 (Tell el-Retaba Project/spatial data E. Stopková; drawing L. Hulková)



sition. There seems to be a larger than usual variation in the position of the deceased in the tomb. The supine position is considered regular for New Kingdom burials, but skel-

etons were found also in contracted position. Furthermore, the grave goods found in tomb {2458} partly follow the Second Intermediate Period tradition. This small



Fig. 5. Early Eighteenth Dynasty burials in Area 4: top, tomb {2513}; bottom, tomb {2458} (Tell el-Retaba Project/photos L. Horáková)



cemetery in its mix of traditional customs and new impulses appears to reflect the transition from the Second Intermediate Period to the New Kingdom.

### 2.1.1 Tomb {2512}

The simple oval burial pit (dimensions: 1.30 × 1.05 × 0.60 m) was just long enough to accommodate the body. Its walls, dug into the gravel layer, are unstable. Lying on its back on the bottom was an individual (2507) with the head to the south and legs probably semi-contracted or even pulled up. This interment was rather poor: only one small tubular faience bead S3306 was found with the burial.

### 2.1.2 Tomb {2513}

The tomb, which was dug directly north of pit <2512>, was also a simple burial in a rectangular pit with rounded corners (dimensions: 1.00 × 0.80 × 0.75 m) and contained two strongly contracted skeletons (2509) and (2510), lying on the right side with the head to the south [Fig. 5 top]. A large pottery vessel was placed next to the face of skeleton (2510), the first from the east. This skeleton was also covered by some organic material, but it was so badly decomposed that it was impossible to say whether it was a reed mat, leather or wood. A button-like object S3307 cut from pottery sherd was found in the tomb fill (for a similar object found by the hand of a skeleton in Tell el-Dab<sup>a</sup> tomb A/II-m/10 No. 7 [str. E/1], see Bietak 1991: 215).

### 2.1.3 Tomb {2458}

A simple pit tomb (dimensions: 1.80 × 0.80 × 1.40 m), it proved to be the richest of the lot in terms of grave goods. The

skeleton was in supine position with the head to the east [Fig. 5 bottom]. Four pottery vessels were placed with the burial: a large jar by the north wall of the pit and smaller juglets by the head and next to the right shoulder of the deceased. All the vessels had been badly damaged by the roots of plants growing through them. Other grave goods were found on the body. They may have been part of the personal adornments used in life: a silver toggle-pin S3243 by the head and, on the body, a silver metal plate S3238 (possibly a diadem or some kind of dress ornament); a silver ring S3272 and an amethyst scarab with silver mounting S3240, still preserving the remains of a thread on which it had been hung, by the arms of the deceased [Fig. 6 top]. A string of 16 globular amethyst beads and three silver beads were placed around the neck. Two scarabs S3267 and S3239 and a rectangular bead (scaraboid) S3266 were found in the fill of the grave [Fig. 6 bottom]. Similar finds are well known from Second Intermediate Period tombs from Tell el-Maskhuta and Tell el-Dab<sup>a</sup> (see Redmount 1989: 904, 908.16, 912.9; for examples made of gold, see Forstner-Müller 2008: 169–170 No. 2593 [str. F], 278–279 No. 2185 [str. E/1]).

## 2.2 EIGHTEENTH DYNASTY SETTLEMENT (GREEN HOUSES): PHASE F4A–B, AREA 4

After a time the cemetery was abandoned in favor of domestic activity. The three round silos [2414], [2426] and the much damaged [2450] seem to be somewhat older than the Green house; therefore it is possible that they belonged to another house, which has yet to be discovered. The Green house is already known from

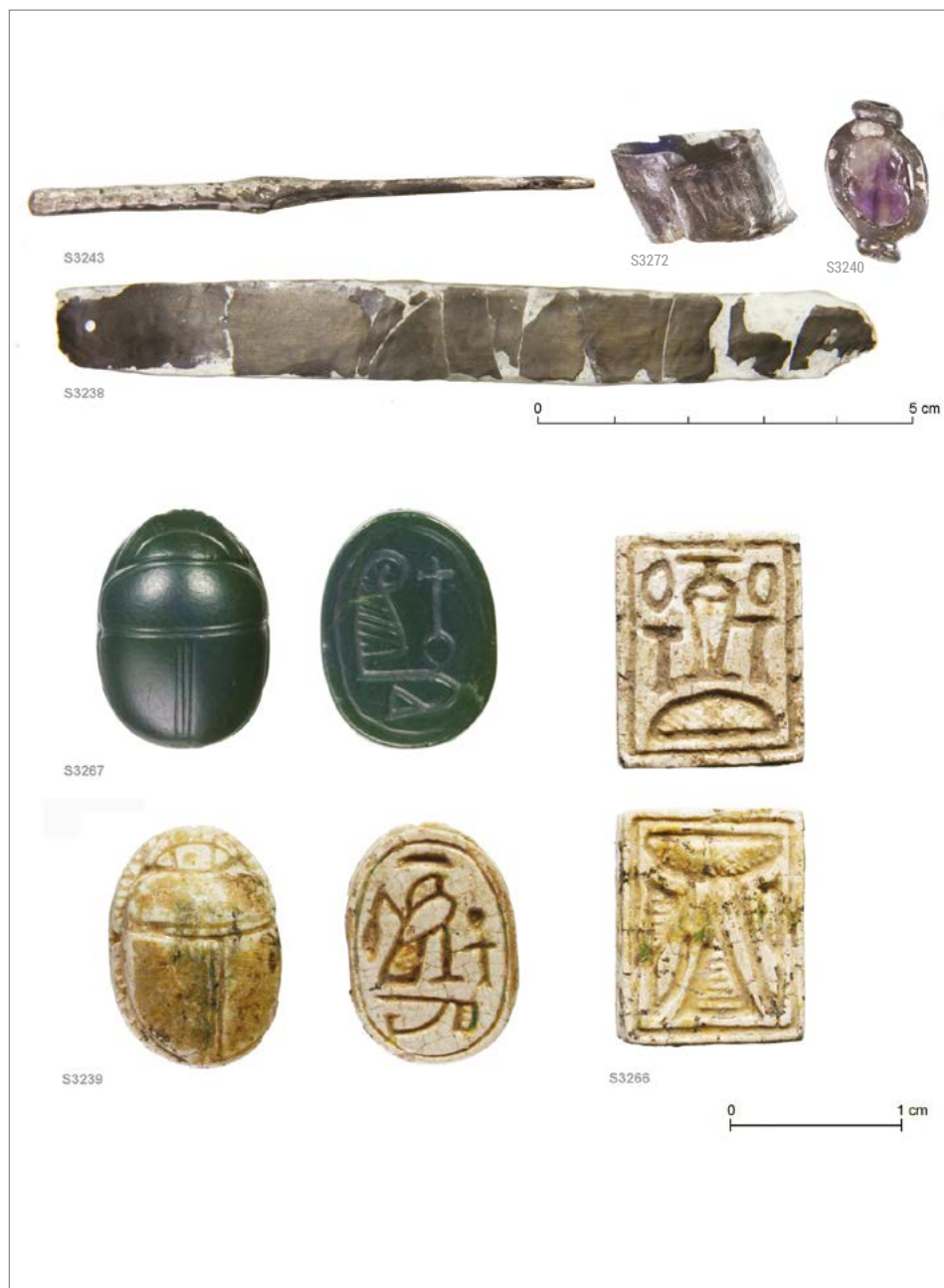


Fig. 6. Grave goods from burial {2458}: top, silver toggle pin S3243, silver metal plate S3238, silver ring S3272 and an amethyst scarab with silver mounting S3240; bottom, scarabs, faience S3267 and serpentine(?) S3239, and rectangular scaraboid bead, faience S3266 (Tell el-Retaba Project/photos R. Rábeková)

previous excavations (Rzepka, Hudec, Jarmużek, Dubcová, Hulková et al. 2017: 32–35), however, it was possible to establish in 2017 that the thickness of the walls of this house was one brick instead of the assumed half-brick brick. The poor quality of the greenish bricks makes them hard to distinguish from the fill.

### 2.3 EIGHTEENTH DYNASTY SETTLEMENT (BLACK HOUSES): PHASE F3, AREA 4

After the Green house had been abandoned, but before the Black house 1 was built over it, an oven [2409] with an inner diameter of about 0.50 m was set up some 3.50 m east of the Green house remains (the same type of ovens was uncovered in 2011 further south, see Rzepka et al. 2014: 58, 60). The walls of the oven were made of baked clay. It seems that a layer of mud

paste was smeared on the inside of the oven and burned hard as the oven was used. Another slightly larger oven [2374] of the same construction with an inner diameter of about 0.60 m was built just east of the previous one at a later time, although it is not entirely clear that the first oven was already out of use. Anyway, it was abandoned later, since the ashy layers associated with the younger oven cover remains of the older one [Fig. 7]. The stratigraphy of these deposits indicates that Black house 1 was already standing when the second oven was in use.<sup>2</sup> It would suggest some continuity in the use of the space despite the structural development of the settlement. Copper and copper-alloy prill found in the ashy layers around the ovens may be proof of their use for metal process-



Fig. 7. New Kingdom ovens (Tell el-Retaba Project/photo L. Horáková)

- 2 Ovens located east of a house were observed also in the early New Kingdom settlement in Tell el-Dab'a, see Jánosi 1996: 91.

ing, although the animal bones inside the oven indicate food preparation. It is possible that the ovens were multifunctional structures.

Remains of another building [2499] from the early Eighteenth Dynasty were located, but not explored this year, east of the Nineteenth Dynasty moat.

### 3 MOAT OF THE NINETEENTH-DYNASTY FORTRESS: PHASE E

A double moat (2413) of the Nineteenth-Dynasty fortress was discovered in 2017 in squares Y65–X200, Y65–X205, Y65–X210, Y70–X200, Y70–X205 and Y70–X210 of Area 4 [Fig. 8; also see Fig. 4] (Hudec et al. 2018). The uncovered part of the moat ran from NNW to SSE, alongside the western outer side of Wall 1. However, sections underneath the new asphalt road currently under construction indicate that it continued probably also around the northern and southern sides of the Nineteenth Dynasty fortress. The moat consists of two depressions: a shallower one further away from Wall 1 [Fig. 9], about 6 m wide and 0.30 m deep (0.95 m deep when measured from the base of the later Wall 2), and a deeper one [Fig. 10] located closer to the fortress,

about 5 m wide and 1.30 m deep (however, 1.95 m deep when measured from the base of Wall 2). The edges of the moat are slightly irregular.

The two parts of the moat were probably contemporary, as they are filled with the same fine yellow eolian sand. The deeper moat [see Fig. 10 bottom] cut at least one massive mud-brick tomb of Second Intermediate Period date and sliced also through cultural layers of the Eighteenth Dynasty when it was dug. These cultural layers of the early New Kingdom can be seen in the profile on both sides of the deeper moat. This stratigraphic situation further supports the dating of the moat to the Nineteenth Dynasty.

The deeper moat continued to the south uninterrupted (unlike the shall-

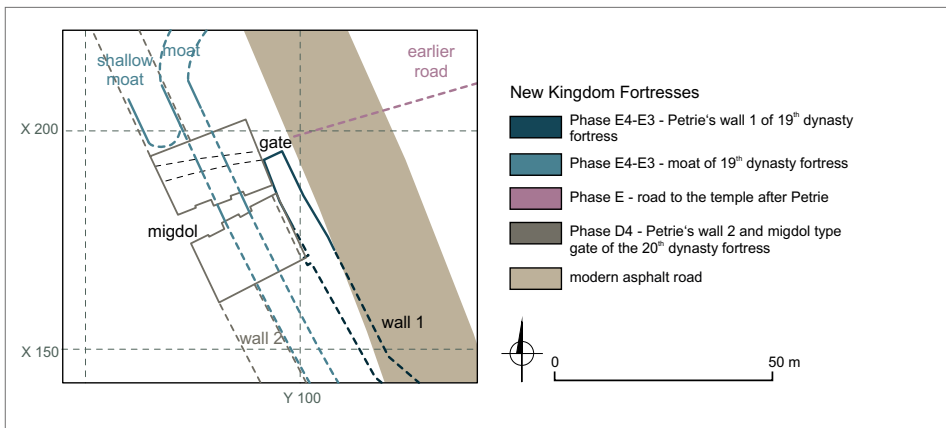


Fig. 8. Nineteenth-Dynasty moats in relation to Wall 1 and the *migdol* (Tell el-Retaba Project/spatial data E. Stopková; drawing L. Hulková)



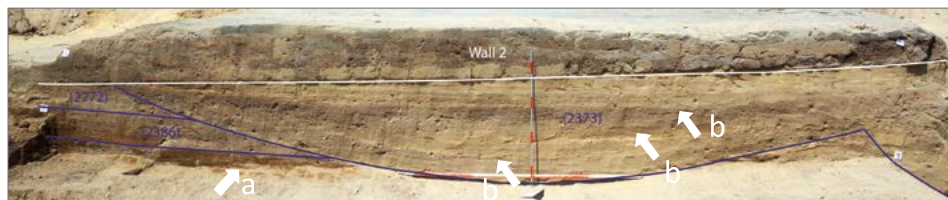


Fig. 9. Moat infilling with rusty weathered alluvial gravel of natural soil in its basement (arrow a) and sandy infilling with several grayish weakly developed surface humiferous soil horizons (arrows b) (Tell el-Retaba Project/photo and processing E. Fulajtár)



Fig. 10. Sections through the deeper moat in Area 4: top, southern section; bottom, northern section (Tell el-Retaba Project/photos L. Horáková)

lower moat), as shown previously by the Polish–Slovak team’s discoveries in the so called Naville’s trench (Rzepka et al. 2014: 50). The deeper moat was apparently intended to strengthen the defense of the Nineteenth Dynasty fortress gateway. It is also worth considering whether particularly the shallower moat could not have served as a source of silt for making the mud bricks used in the construction of the fortress walls.

The southern extent of the deeper moat will be determined in future excavations; however, the northern one is probably lost under buildings recently constructed over an area where the moat(s) probably turned eastwards.

### 3.1 FILL OF THE MOATS

The moats examined in Area 4 were more or less overbuilt by Wall 2 of the fortress of Ramesses III of the Twentieth Dynasty. The shallower part of the moat was mainly covered by Wall 2; however, the wall extended its eastern edge also over the deeper moat.

Two pedologic profiles were investigated at sections of these moats. The stratigraphy of the profiles indicates that they were filled to a large extent naturally, with wind-deposited sandy material, in some places locally redeposited by water. However, some coarse particles (fine gravel pebbles, stone fragments and artifacts like small potsherds) in both profiles indicate a settlement nearby during this



Fig. 11. Eolian sandy deposits with oblique oriented fine stratification (Tell el-Retaba Project/photo E. Fulajtár)



colian deposition with the deposited sand occasionally contaminated by material dropped by the inhabitants.

The profile in the deeper moat represents typical eolian sandy deposits with oblique oriented fine stratification [Fig. 11]. The layers are associated with the original bottom of the moat which was relatively steep in this place when the sand sedimentation began. The best view of the moat infilling is seen in the profile of the shallower moat. The rusty weathered alluvial gravel of natural soil can be seen at the base of the cultural layers [see Fig. 9 highlighted by arrow a]. The moat infillings comprise stratified eolian sand deposits with several layers of fresh yellowish sand and slightly humiferous greyish sand [see Fig. 9 highlighted by arrows b]. The sand layers here were most probably locally redeposited by water, because the oblique micro-stratification and cross-orientation of strata typical of wind deposits are not well pronounced here. The strata are very smooth and in the lowest part of the profile they copy the convex bottom of the moat. They become gradually horizontal in the upper part of the profile. This morphology also suggests the impact of local redeposition by water, either smooth flowing or stagnating. The moat represented a micro-relief surface depression that may have served as a seasonal collector of surface water runoff after rainfall. The moisture from rainfall and from lateral subsurface penetration from the surroundings accumulated in the moat and supported vegetation growth. This is indicated by the presence of slightly humiferous greyish sand layers mentioned above which

are a relic of weakly developed humiferous surface soil horizons resulting partly from the deposition of slightly humiferous sand, but partly also from organic matter accumulation created by the decay of vegetation growing on the moat infillings after the deposition of the sand. Several such humiferous horizons occurring in the moat infillings indicate that the infilling was progressing in several phases, separated by periods when the accumulation of material was interrupted. The lack of the redoximorphic features (rusty mottles) shows that the reduction conditions typical for waterlogged depressions did not develop. This suggests that water in the moat accumulated probably only for short periods and may have been circulating.

### 3.2 NINETEENTH DYNASTY FORTRESS GATEWAY: PHASE E, AREA 4

The gemination of the moat on the western side could be explained by the presence of a gateway to the Nineteenth Dynasty fortress. The presence of the gateway in Wall 1 and an earlier road was already indicated by Petrie on the eastern side of the northern *migdol* tower [see Figs 4 and 8] (Petrie and Duncan 1906: Pl. xxxv). The arrangement of the moats on the northern side of the *migdol* indicates the presence of a passage to the gateway from the western side. The passage was later covered by the *migdol*, but the termination of the shallower moat in squares Y65–X190 and Y65–X195, where the moat rises up southwards from Y65–X205 and Y65–X200, shows that it respected the passage. The shallower moat rises one meter over a distance of about 7 m.

**3.3 MOAT: PHASE E, AREAS 2 AND 9**

The moat around the north Wall 1 was detected also in the sections (eastern and western) of the Egyptian rescue excavations of Khaled Fareed and Mustafa Nour el-Din, which cut through the tell along the eastern side of the Salheya–Dawaweez road (Area 2). The moat is situated at

a distance of about 6–7 m from Wall 1 (Hudec et al. 2018). In similarity to the situation described in Area 4, Wall 2 in Area 2 was also constructed mainly over the moat. In Area 9, the moat was detected in the eastern section of the southeastern part of Wall 1, again covered partly by Wall 2.

**4 TWENTIETH DYNASTY FORTRESS: PHASE D**

**4.1 WALL 2: PHASE D4, AREA 4**

Some other elements recorded on the inner side of Wall 2 could be related to the

construction of the internal sand rampart/embankment (Černý and Hudec 2016: 125, Pls 17–19 [300]). A mud–stone



Fig. 12. Plan of the Third Intermediate Period (TIP) settlement in Area 4 in consecutive phases (Tell el-Retaba Project/drawing Ł. Jarmużek)

layer (2360), irregularly high and wide, was discovered running alongside the inside of Wall 2 [see *Fig. 10* bottom]. It

may have been connected either to the bottom rampart border or to washouts of Wall 2.

## 5 THIRD INTERMEDIATE PERIOD: PHASE C

The overall view of the settlement from phase C discovered in season 2016 in Area 9 changed considerably after season 2017 (Rzepka, Hudec, Jarmużek, Dubcová, and Hulková 2017: 120–129). The main changes concerned phases C3 and C2 in the area of building {2147} [*Figs 12 and 13*]. Fieldwork in 2017 showed frequent changes in the layout of structures in the area. Thus, it was necessary to distinguish subphases C3b, C3a, C2b, and C2a.

### 5.1 SETTLEMENT: PHASE C3A, AREA 9

#### 5.1.1 Buildings {2664} and {2637}

Buildings {2664} and {2637} were only partly excavated [see *Figs 12 and 13*]. Currently, both structures seem to originate from phase C4, but they were in use also in phase C3. The two buildings had abutting walls, but it is plausible that they were independent structures. The unearthed fragment of building {2664} was probably a room measuring 2.40 m by 1.40 m. The walls were 0.65 m thick and

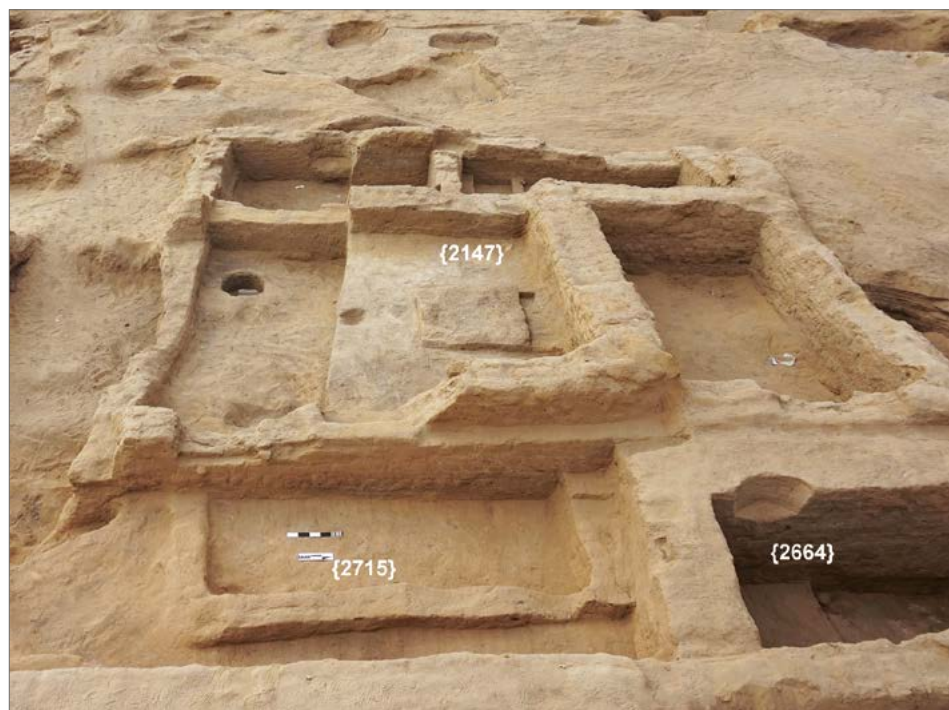


Fig. 13. Buildings {2147}, {2664} and {2715}, viewed from the east (Tell el-Retaba Project/ photo S. Rzepka)

were relatively well preserved. An entrance may have been located in the east wall of the room. In phase C3a, the room was used as a rubbish dump. The thick debris layer (2683) filling the room was covered with two layers of ashes (2674, 2681). In the case of building {2637}, only its west wall was traced; it was at least 5.30 m long and 0.60 m thick.

### 5.1.2 Building {2147}: phase C3a (first phase)

West of building {2664} was a 0.15 m gap and building {2147} commenced, turning out to be much bigger than previously assumed (Rzepka, Hudec, Jarmužek, Dubcová, and Hulková 2017: 120–123) [see *Figs 12* and *13*]. The ground plan was L-shaped and comprised three rooms and a small open courtyard in front of them. The part of the courtyard that was excavated was occupied in its eastern part by structure {2715} (see below). Two storage vessels were found *in situ* in the western part. The first one, 2649, was placed in a round cut <2650> in front of room 3. The diameter of the cut was much bigger than the diameter of the vessel. The second vessel, 2751, was placed in a round cut <2752> in front of the entrance to room 4.

Room 1 was partly excavated in 2016 (Rzepka, Hudec, Jarmužek, Dubcová, and Hulková 2017: 121–123) and the results can now be reassessed in the context of an investigation of the area as a whole. The entrance, which was roughly 0.80 m wide, was placed in the eastern part of the south wall. The room measured 3.70 m by 2.30 m. A single floor level (2220) was recorded inside the chamber. In the middle was an oval cut <2615> filled with a layer of ashes (2614). A semicircular bin [2221]

was constructed in the northeastern corner; in the course of time, the bin was partly destroyed by a round cut <2214>, which was executed as an emplacement for a large storage vessel. Remains of two storage vessels were found inside the cut: 2240 preserved only as the bottom part and 2213, which replaced it, completely preserved. The assemblage of finds from the floor constituted a relatively rich set: earlier work in 2016 had collected nine loom weights of unbaked silt, a limestone spindle whorl, three grinders, three fragments of querns, a slate palette, a fragment of a stone vessel and a faience scarab (see Rzepka, Hudec, Jarmužek, Dubcová, and Hulková 2017: 120–123). Exploration of the rest of this floor in 2017 yielded more small finds, including a particularly interesting bronze artifact S3414 of elongated shape [*Fig. 14* top]. It is composed of four parts: a hollow shaft socket, prongs with rounded points and a crossbar between them, and a vertical bar below. Objects of this kind have been identified as ceremonial staff endings or a practical butt end of a spear (Petrie 1917: 33), but also as an anti-snake weapon (Cherf 1982: 86–97). Another object of obscure function was discovered nearby: a pestle-type pounder S3415 made of basalt, its function suggested by traces on its surface [*Fig. 14* center]. However, considering that basalt is rare in Retaba, the very regular shape of the piece and the round, precisely drilled depression at one end suggest that it may be an unfinished stone vessel, finished on the outside but only started on the inside, which was evidently used as a pounder instead.

A set of small objects made of lead was found on the floor as well. They are

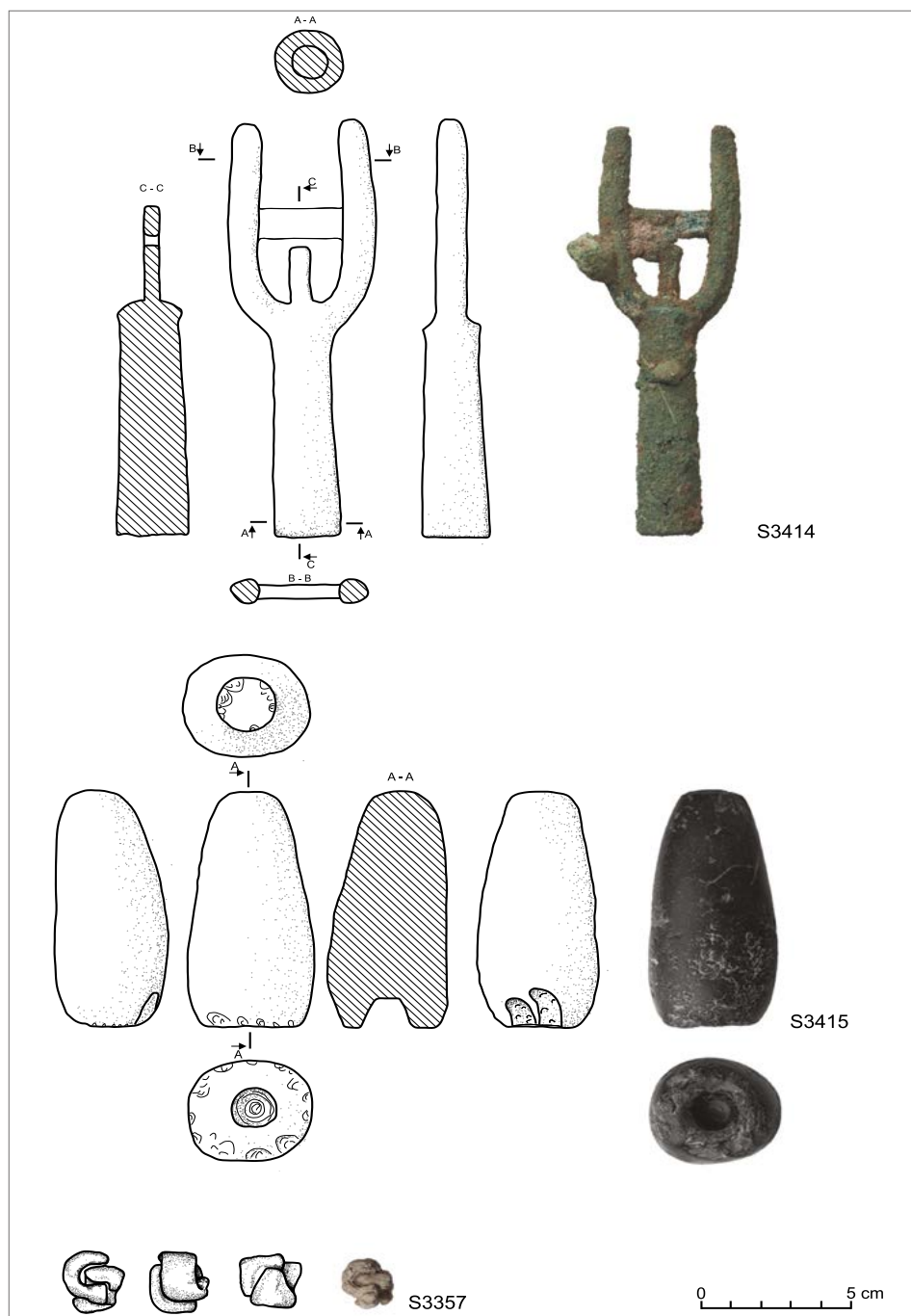


Fig. 14. Small finds from the floor of a Third Intermediate Period building {2664}: top, bronze ceremonial staff ending(?) S3414; center, basalt pestle pounder S3415; bottom, fused together lead net sinkers S3357 (Tell el-Retaba Project/photos O. Bagi, drawing A. Ryś)

badly corroded but at least in the case of S3357 [Fig. 14 bottom], S3372, S3373 and S3374, their shape and function is still recognizable. They were probably net weights, made of flat pieces of lead folded around a net cord (Wilkinson 1988: Fig. 426). As other small pieces of lead of various shapes were found nearby (S3375, S3393, S3413), it seems plausible that utensils made of lead were produced in this room, more likely than that it was simply a place for storing fishing nets.

All the features inside room 1 were covered with a relatively thick layer of debris (2216). The layer was significantly thicker in the eastern part of the room, suggesting that the destruction of the east wall was more considerable than of the other walls.

Room 4, which lay to the west of room 1, measured 3.54 m by 2.25 m. The entrance was in the southeastern corner; it was 0.80 m wide. Two floor levels were noted inside the room. There was a round cut <2611> for a storage vessel 2610 made in the surface in the middle of the first floor (2612). A limestone door-socket was found *in situ* built into the north wall of the doorway flush with the second floor (2594).

South of this chamber lay room 3, which measured 3.25 m by 2.40 m and was entered from the east via a doorway that was about 1 m wide. The floor (2595) inside the room consisted of thin silty laminas. A storage vessel, 2668, was found roughly in the middle of the room, but without being cut into the floor, as was the case of the other two rooms. It was standing on the surface. The successive accumulations on the floor covered it in the end.

### 5.1.3 Building {2715}

The eastern part of the courtyard was occupied by structure {2715} [see Figs 12 and 13]. The structure was only partly excavated, but the walls have turned out to be much thinner (0.36 m) than the walls of other buildings in the area. The excavated part of the structure was 3.90 m long and at least 1.80 m wide. Inside the room there were some thin walls that formed a kind of bin. It is currently thought that structure {2715} served some kind of industrial purpose.

## 5.2 SETTLEMENT: PHASE C2B, AREA 9

Phase C2b in Area 9 is marked by a building {1095}, which covered buildings {2664} and {2637} (Rzepka, Hudec, Jarmužek, Dubcová, and Hulková 2017: 123–125). The area west of building {1095} was still occupied by building {2147}, its layout however had changed considerably.

### 5.2.1 Building {2147}: phase C2b (second phase)

It has already been said that parts of the walls of room 1 of this building had collapsed at some point, putting the room out of use [see above and Fig. 13]. To compensate for this, a new room was added; this was room 2, which was fitted into the space left by the courtyard and building {2715} to the south of room 1. The new unit measured 4.35 m by 4.15 m. Its entrance was in the southern part of the east wall and was 0.75 m wide. Two floor levels were recorded. The first floor (2583) consisted of a series of thin whitish-grey laminas. An unusual structure was found on the surface of this floor: a square platform [2739] made of mud bricks, measuring 1.20 m to the



side [Fig. 15]. It was situated about 0.25 m from the north wall of the room. The second floor (2575) accumulated around this platform. The floor surface near the platform featured several shallow, round cuts, three of which were found east of the platform. The southern one <2743> was filled with ashes, two other cuts <2736, 2737> were filled with sand. Similar platforms with shallow cuts and fireplaces can be found in central rooms in Tell el-Amarna houses (Bomann 1995: 8–14). This kind of installation is connected with the head of the household (Spence 2015: 86–89). Some of the shallow cuts could have served as an emplacement for pottery vessels.

At the same time that room 2 was constructed (or shortly thereafter), an oven [2677] was built just east of this room, in the space between buildings {2147}, {2664}, and {1095} [see Figs 12 and 13]. The manner of construction of this

oven was quite usual: a ceramic body lined with baked silt [Fig. 16]. The external diameter was about 1.10 m. Three low walls next to the oven abutted the nearby buildings to form bins of a kind. These bins were filled with grey ashes. The fill of the oven consisted of grey ashes on top and white ashes on the bottom.

The doorway to room 4 remained in place unchanged. An ashy layer (2593) which covered only the eastern part of the room constitutes the only floor level from this phase that could date it. Two round cuts in this layer were found next to the entrance to the room. The bigger cut <2592> was filled with sand (2591) containing a lot of fish bones and several mud-weights. The smaller cut <2630> was filled with an ashy layer (2629) containing some fish bones.

The old entrance to room 3 was blocked and a new doorway made in the



Fig. 15. Platform in room 2 of building {2147} (Tell el-Retaba Project/photo S. Rzepka)

south wall of the room. In this way the room was separated from rooms 2 and 4. Inside it there were five floor levels, all very uniform in nature. They consisted of a series of thin laminas: whitish grey and yellowish brown. Three floor levels (2577, 2573, 2564) were connected with fireplaces surrounded by low mud walls [2648, 2572, 2628].

### 5.2.2 Building {2147}: phase C2b1 (third phase)

The ground level in the space between building {2147} and {1095} rose with time. Layer (2599), made up of thin grey laminas, gradually covered the oven [2677] and building {2644}. It was thought that a passage remained clear between build-

ings {2147} and {1095} (Rzepka, Hudec, Jarmužek, Dubcová, and Hulková 2017: 125), but the present fieldwork revealed that it was not the case. Layer (2599) abutted the southern face of wall [2230], proving that the wall was standing already when the layer started to accumulate. The higher level of the ground forced the inhabitants of building {2147} to modify the entrance to room 2. First, the threshold had to be raised. In order to do so, two steps made of fragments of large stone vessels were constructed [Fig. 17], the first vessel being put on the surface of floor (2575), the second one directly on the mud-brick threshold. A two-step limestone door socket was found in place next to this new threshold.



Fig. 16. Oven [2677] in building {2147} (Tell el-Retaba Project/photo S. Rzepka)

However, since the ground level outside was already higher, a shallow semicircular cut <2765> was made in layer (2599) just outside the entrance to lower the ground in accommodation of the lower-lying threshold. Four bricks were laid at the bottom of the cut, attached to the wall but projecting from its face, to serve as the third step. They also prevented sand from accumulating near the threshold.

After some time, the level of the floor inside room 2 was raised. The new floor (2723) covered platform [2739] and the stone steps in the entrance. It was the last floor in room 2 while it was part of building {2147}. Subsequently, the building was abandoned and partly destroyed, especially in its western part, in the area of rooms 3 and 4. Inside these rooms, a relatively thick layer of debris (2586)

formed. In the case of room 2, some of the walls were reused in building {2196}, which was built on the spot in the next phase (see below).

A badly corroded and only partly preserved perforated lead sheet S3595 from floor (2723) may have been part of a strainer from the end of a tube for

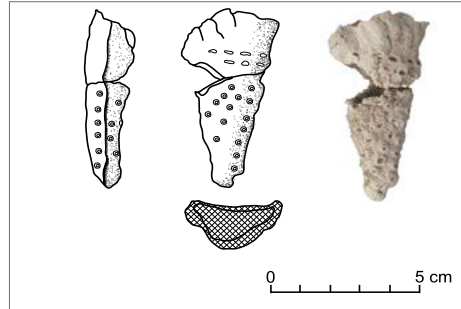


Fig. 18. Fragment of a lead strainer S3595 (Tell el-Retaba Project/photo O. Bagi, drawing A. Ryś)



Fig. 17. Threshold in the entrance to room 2 in building {2147}, made of fragments of large stone vessels (Tell el-Retaba Project/photo S. Rzepka)

drinking wine [Fig. 18]. Similar but much better preserved objects are known from Amarna (Kemp 2012: 210).

#### 5.4 SETTLEMENT: PHASE C2A, AREA 9

In this phase, building {1095} was still in use, but the area west of this building underwent a major change. Instead of building {2147}, which had fallen out of use, two new buildings {2227} and {2196} were raised there [see Fig. 12]. Building {2227} was built slightly before {2196}.

##### 5.4.1 Building {2227}

Building {2227} was discovered in season 2016, but only the tops of its walls were cleared during that time. Orientation of the walls of the building suggested that it could be contemporary with building {2147}. Thus, it was dated to phase C3 (Rzepka, Hudec, Jarmužek, Dubcová, and Hulková 2017: 120–121). Building {2227} was completely excavated during season 2017. New data showed that the building was built on the ruins of building {2147}. Thus, the building has to be assigned to phase C2a. Only the eastern part of the building was preserved, the western part being destroyed by modern cuts. The building was about 8.50 m long and at least 2 m wide, the thickness of walls being 0.60 m. Remains of any kind of activity inside the building were rather scarce. The first feature which filled the space between walls of the building was a layer of debris (2531). There was not any kind of floor level which can suggest that the building was used for a relatively short time. On the surface of layer (2531) two round cuts have been found. The first cut <2538> was placed in the northeastern corner of the building, its diameter being

0.90 m. It was filled with a layer of white (2537) and black (2539) ashes. All these data suggest that the cut was a lowermost part of an oven/kiln. However, no traces of a superstructure have been found. The second cut <2545> was placed in the middle of the preserved part of the building. It was slightly smaller than the previous one, being 0.70 m in diameter. Fill (2544) of this cut was different than in the previous case, it was a mix of sand and ashes. There were also some fish-bones found inside the unit. Smaller size and different features of the fill may suggest that this was a simple fireplace. Considering all data it seems probable that when the oven/kiln and the fireplace were used, the wall of building {2227} had already been ruined and the area was an open space. All the features mentioned above were covered with a layer of grey ashes (2530). The layer was poorly preserved but it seems that it also covered walls of the building. It proves that when this layer was formed the building had surely been out of use and probably served as a dumping place.

##### 5.4.2 Building {2196}

The greater part of building {2196} was excavated in 2016 (Rzepka, Hudec, Jarmužek, Dubcová, and Hulková 2017: 125–126) and current work did little to change the overall picture of the house layout. New data concerned the building walls. Building {2196} consisted of three rooms [see Fig. 12]. The standing north and west walls of room 1 from building {2147} were reused unchanged, but the south wall was rebuilt. The new wall was founded on the remains of the older wall, which was preserved to a height



of about 0.80 m. The east wall of the room was also reconstructed in much thinner form, just 0.30 m thick. It may have held an entrance to the room, but most of it is lost. The northeastern part of the room was destroyed by a later cut. Other remains inside the room suggest the presence of an oven: the room was filled with a 0.20–0.30-m-thick layer of ashes (mostly grey, but also black and white), in which fragments of fired mud bricks and ceramic oven body walls were found. Moreover, a fragmentarily preserved rounded cut <2211> in the middle of the room may be the lowermost section of an almost completely destroyed oven.

The west and south walls of room 2 originated from building {2147}. It is noteworthy that the doorway in the west wall, which once led to room 4 of building {2147}, was not blocked. It was already closed by the east wall of building {2227}, which was erected slightly earlier than building {2196}. The consequence of this was that a niche was formed in the southwestern corner of the room. In the case of the eastern limits of the room, a completely new wall was built on the remains of the old wall. The new wall [2695] was slightly thinner (0.60 m) than the older one. The entrance to room 2 used in building {2147}, placed in its east wall, was blocked by wall [2146], which was 0.30 m thick. The connection between walls [2146] and [2695] is rather puzzling, considering the different thickness of the two walls; the junction however was destroyed by later structures. At present, there is no clearly preserved entrance to room 2. It may have been placed in the south wall

of the room, but again, this wall was almost completely destroyed by a later cut. Room 2 measured 4.35 m by 4.15 m. Two floor levels were found inside the room. On the first floor (2549) there were five round and oval cuts, most of them in the middle of the room. Four of them were filled with black ashes, hence their probable use as fireplaces. The room changed function after some time with two or three roughly rectangular bins being built on its floor. Bin [2204] was located in the northeastern corner of the room, while bin [2548] was built next to the east wall [2146]. A single brick found *in situ* in the southeastern corner of the room may be witness to yet another bin, but this is highly uncertain. The second floor (2182) abutted the walls of the bins, proving that the bins were still in use. Another bin [2202] was added later by the north wall of the room. These three bins seem to have been used at the same time. A round shallow cut <2697> was made in the middle of the room, in the surface of floor (2182). It was filled with sand, hence it was most probably not a fireplace. The cut might have served as an emplacement for a storage jar.

Room 3 was created by adding wall [2224] between wall [2196] and the west wall of building {1095}. Wall [2224] probably abutted the older wall [2230] (see above). The two walls combined measured 0.80 m in width. The south wall of the room was not preserved. The room was 2.40 m wide and at least 2.24 m long. A fragmentarily preserved whitish-grey layer formed the floor (2195); it yielded a small amount of pottery and animal bones, but no small finds.

## SUMMARY

Excavations in Area 9 provided new data for understanding the Third Intermediate Period settlement. Building {2147}, which is now almost completely explored, yielded a set of small finds that is noticeably richer than the finds from earlier excavated parts of the settlement. A bronze “ceremonial staff”, a basalt pestle/vessel, a lead strainer, a large faience scarab, all these artifacts suggest that the dwellers of the house were quite wealthy. The square platform found in room 2 of this house is also so far the only example of such an installation in Tell el-Retaba. And yet the size of the house and the quality of its construction is very similar to other houses from this period known

from Tell el-Retaba. The richer than usual set of artifacts from this house may be explained in another way: three of the objects listed above (“staff”, pestle, scarab) were found on the floor of room 1. There are reasons to believe that this room was not abandoned in a planned way, but was destroyed in a catastrophic event, which covered its floor with a thick layer of rubble.

Work concentrated west of this house cleared several wall tops, confirming dense building in the whole area. The exploration of these buildings is at an early stage and will be continued in upcoming seasons, hence their description will appear in future reports.

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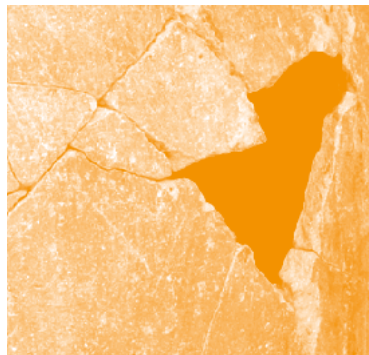
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# Tell el-Farkha

## Archaeological fieldwork 2016–2017



**Abstract:** The paper discusses archaeological investigations carried out on all three tells making up the site of Tell el-Farkha, expanding on the findings from earlier seasons. Phasing of the brewery discovered four years ago on the Western Kom gave a time range for the use of the installation from the first Southern Egyptian occupation (Naqada IID) to the Naqada IIIA1/2–IIIB phase, when a catastrophic fire destroyed the entire settlement. The big Naqada warehouse on the Central Kom was also phased (beginning in Naqada IIIA1) and further parts of an underlying building attributed to the Lower Egyptian culture were explored, including a wooden fence around the structure. The 11 graves explored on the Eastern Kom were dated to the Tell el-Farkha Phase 6 (Naqada IIIC2–IIID). They cut into a building (temple?) from an earlier phase.

**Keywords:** Lower Egyptian culture, Naqada culture, Protodynastic, Early Dynastic

Seasons 2016 and 2017 at the site of Tell el-Farkha, a pre-dynastic site in the Nile Delta excavated by a Polish team since 1998 (for an overview of research to date, see, e.g., Chłodnicki et al. 2012), were dedicated to continued exploration of trenches on all three tells forming the site: Western, Central and Eastern, and it is in this order that the fieldwork will be presented. The only extension of an existing trench occurred on the Eastern Kom, where also new squares 36a–b were opened. Post-processing work on site facilitated expert studies of the pottery, flint and other stone tools, as well as animal and botanical remains.

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## WESTERN KOM

The trench that was investigated during the two seasons in question had first been opened in 2006–2007, then excavated in 2008 and extended north in 2009. During these seasons work had concentrated on the Northern squares (63–64 and 53a–c; 54 a). The most important task was the exploration of two quarters of a brewery discovered four years ago. The first two quarters had been excavated earlier (Chłodnicki and Ciałowicz 2016: 228).

Three phases of use of the brewery had been distinguished. The oldest phase is tentatively connected with the first Southern Egyptian occupation. Ceramologists Magdalena Sobas and Magdalena Kazimierczak dated the pottery assemblage originating from this phase to the Naqada IID period. The brewery

was dug in a layer of mud covering earlier structures from a Lower Egyptian culture phase. It was composed of three round features forming a shape resembling a three-leaf clover, enlarged to the west and east by additional semicircular features [Fig. 1A]. The whole structure was surrounded by a rim of burnt mud bricks, which created a sort of low wall. Each of the three main parts of the construction was a kind of fireplace, in the center of which a vat (not preserved) was placed. The vats were supported on D-shaped bricks (partly preserved), placed obliquely toward the center.

The middle phase of the brewery (first half of Naqada IIIA<sub>1</sub>) was very badly preserved. The inner structures were completely destroyed. The bricks



Fig. 1A. Brewery on the Western Kom: older phase (Naqada IID) (Tell el-Farkha Archaeological Project/photo R. Słaboński)



were broken and scattered in a haphazard manner, covered by a layer up to 15 cm thick, composed of burnt soil and white

ashes (see Chłodnicki and Ciałowicz 2016: 229) [Fig. 1B top]. The overall appearance of these remains was that of intentional



Fig. 1B. Brewery on the Western Kom: top, middle phase (first half of Naqada IIIA1); bottom, younger Tell el-Farkha Phase 4 (Naqada IIIA1/2–IIIB) (Tell el-Farkha Archaeological Project/photos R. Słaboński)



levelling, which may have followed a catastrophic fire that destroyed much of the settlement on the tells (Ciałowicz 2018).

The younger phase was connected with Tell el-Farkha Phase 4 (Naqada IIIA<sub>1/2</sub>–IIIB). It came after the said disaster and should be associated with a second group of migrants from the south (Ciałowicz 2018: 13). New supports for the vats were installed on top of the destruction layer [Fig. 1B bottom]. Low walls of bricks of the same shape but in horizontal arrangement formed the enclosures.

Partly preserved remains of another brewery, contemporary with the older phase of the one described above, were discovered under a layer of Nile flood silt

in the western part of the trench [Fig. 2]. They were not explored further in the present season.

A few walls forming rectangular rooms were discovered in the northern part of the excavated area [Fig. 3]. They were erected on the said layer of mud and should be dated to a period contemporary with the beginning of Tell el-Farkha Phase 3 (Naqada IID<sub>2</sub>/IIIA<sub>1</sub>). They are undoubtedly connected with the oldest stage of the so-called Naqada residence. The eastern part of this complex was explored in the 2002–2003 seasons (Ciałowicz 2012: 163–171).

Layers beneath the Nile-flood mud yielded relics of Lower Egyptian culture



Fig. 2. Remains of a newly discovered brewery under a layer of mud (Tell el-Farkha Archaeological Project/photo G. Bąk-Pryc)



Fig. 3. Remains of rectangular rooms in the northern part of the excavated area, dated to Tell el-Farkha Phase 3 (Naqada IID2/IIIA1) (Tell el-Farkha Archaeological Project/photo G. Bąk-Pryc)



Fig. 4. Relics of Lower Egyptian culture (Tell el-Farkha Archaeological Project/photo G. Bąk-Pryc)

[Fig. 4] comprising a mud brick wall and compartments made of organic material with storage pits inside them.

The pottery assemblage consisted of 21 complete vessels as well as a large number of potsherds, mostly poorly preserved storage jars and much better preserved small globular jars. One should mention in particular a few painted potsherds

characteristic of Naqada culture and several fragments decorated with incised zigzags or semicircles, typical of Lower Egyptian culture. The dating of this collection assigned the upper explored layers to Tell el-Farkha Phase 3 (Naqada IID2/IIIA1) and the lower strata to Tell el-Farkha Phase 2 (Naqada IID1).

[KMC]

## CENTRAL KOM

The research on the Central Kom concentrated on three already open trenches located on the eastern slope of the mound (see Chłodnicki 2014: Fig. 23; Chłodnicki and Ciałowicz 2014: 123–124; 2015: 178–184; 2016: 232–242). The layers explored in individual trenches varied chronologically. The oldest were the strata explored in the biggest, central trench (squares C52–C63), those in the southern trench (square C42) were younger and the youngest were found in the northern trench (squares C84–C94).

### CENTRAL TRENCH

Investigations were the most intense in the central trench. The northern part of a big Naqada warehouse continued to be dismantled in 2016. This building, constructed at the beginning of the Naqada IIIA1 period, was explored in the 2012–2015 seasons (Chłodnicki 2014: 117–118; 2017: 50–53; Chłodnicki and Ciałowicz 2015: 179–182; 2016: 232–238; Chłodnicki and Mączyńska 2018: 81–86). It had to be removed in order to excavate the oldest monumental building on the Central Kom, the so-called Lower Egyptian residence. The southeastern part of this structure was found in 2008–2009

(Chłodnicki and Ciałowicz 2011: 157–160; 2012: 140–145; Chłodnicki 2011: 41–46; Chłodnicki and Gering 2012: 92–96) and in 2011 the trench was extended westward in order to search for the rest of the residence. The unexpected discovery of thick walls of large Naqada magazines delayed the clearing of the lowest strata for several years until, finally, the mud-brick walls of the Lower Egyptian residence were reached in the last two seasons. It was found that at least some walls of the northern part of the Naqada edifice (walls C.384, CW.118, CW.56, CW.39 northern part) rested directly on a Lower Egyptian wall and even incorporated it to some extent [Fig. 5].

The southern part of the Naqada storeroom, located in the central trench, was explored in 2017. First, the interior of room CW.94 and later the surrounding walls (CW.58, CW.65, CW.39 southern part) were excavated. The upper parts of rough ware vessels (type L.30; Petrie 1921: Pl. XLVI) were found in the corners of room CW.94. Sometimes one vessel was set on the top of another. Almost all the sherds collected from this context belonged to the same vessel type. The only other feature located inside the



room was a solid mud-hole, located in the north-central part of the chamber [Fig. 6]. Remains of a settlement of Lower Egyptian culture were found in the underlying strata.

An enclosure wall (C.486) running around the Lower Egyptian residence,

discovered in the old trench in 2008, was found to continue west to the corner room (C.1521; Chłodnicki and Geming 2012: Fig. 12) and in front of the southern building facade. No entrances were identified in the wall, which was 1.30 m thick [Fig. 7], but it should be kept in



Fig. 5. Remains of a Lower Egyptian wall reused in the Naqada storage facility on the Central Kom (Tell el-Farkha Archaeological Project/photo R. Słaboński)



Fig. 6. Interior of room CW.94 in the Naqadian storage facility on the Central Kom (Tell el-Farkha Archaeological Project/photo R. Słaboński)

mind that only the remains of the foot of the wall were discovered. In the western part, it was only two–three brick courses high. However, the remains of bricks imprinted in the sand of the *gezirah* are quite conspicuous [Fig. 8]. These bricks were quite large, 20 cm by 40 cm, bigger than the bricks used in the upper parts of the building (36 cm by 18 cm and 32 cm by 16 cm; Chłodnicki and Geming 2012: 95).

Having recorded no traces of door openings, one should assume that the entrance to the residence had led through a corner building located in the southwestern corner of the residence (room C.1521). This elongated room was about 5 m long and almost 2.50 m wide [Fig. 9] and it was the only mud-brick building constructed simultaneously with the surrounding wall. A similar building, interpreted as a gate, but much better

preserved, was discovered on the Eastern Kom. Entrances located opposite each other can be seen in this building. Although a bit younger (Naqada IID/IIIA1), the gate had similar dimensions and was placed directly on the *gezirah* sand (Ciałowicz and Dębowska-Ludwin 2013; Dębowska-Ludwin 2013: 129–130).

A building located in the southern part of the residence (C.1517) has been known since 2008, when the north and west walls were identified and found to be a little later than the external wall of the edifice (Chłodnicki and Geming 2012: Fig. 96). It was also assumed that once reconstructed, it reached all the way to the outer wall (Chłodnicki 2012: 130–131). Current research has noted a passage about a meter wide between the building and the wall. The room was actually a rectangle, 7.50 m by 3.50 m. This span



Fig. 7. Wall C.486 encircling the Lower Egyptian residence (in the middle), interior of the residence with remains of storage pits and room C.1517 (on the right) and Naqadian granary (on the left), all on the Central Kom (Tell el-Farkha Archaeological Project/photo R. Słaboński)



permitted a wooden ceiling without any need for internal supports, explaining the absence of postholes inside the building. The room width falls into the pattern for later mud-brick buildings from Tell el-Farkha, which are between 2.50 m and 3.50 m wide. Despite no new spectacular finds from the room, it is still believed to have been of official nature based on its size and the two pear-shaped mace heads discovered in 2008 (Chłodnicki and Geming 2012: Fig. 13).

Several storage pits were discovered east of this representative building

[Figs 7, 9]. Together with those discovered in previous seasons, they filled the entire space between the outer, east wall of the residence and the mentioned building. The pits contained rich organic material. An archaeobotanical analysis of the contents identified grains of wheat and barley, as well as small fish bones. Samples have been taken from the upper layers before further exploration in an upcoming season.

Two parallel lines of furrows [Figs 8, 11] were discovered under the mud-brick enclosure wall of the residence. In similarity to the earlier finds under other



Fig. 8. Traces of the lowermost layer of the mud bricks from wall C.486 (lower left corner) and remains of furrows below it (continued to the right) (Tell el-Farkha Archaeological Project/ photo R. Słaboński)



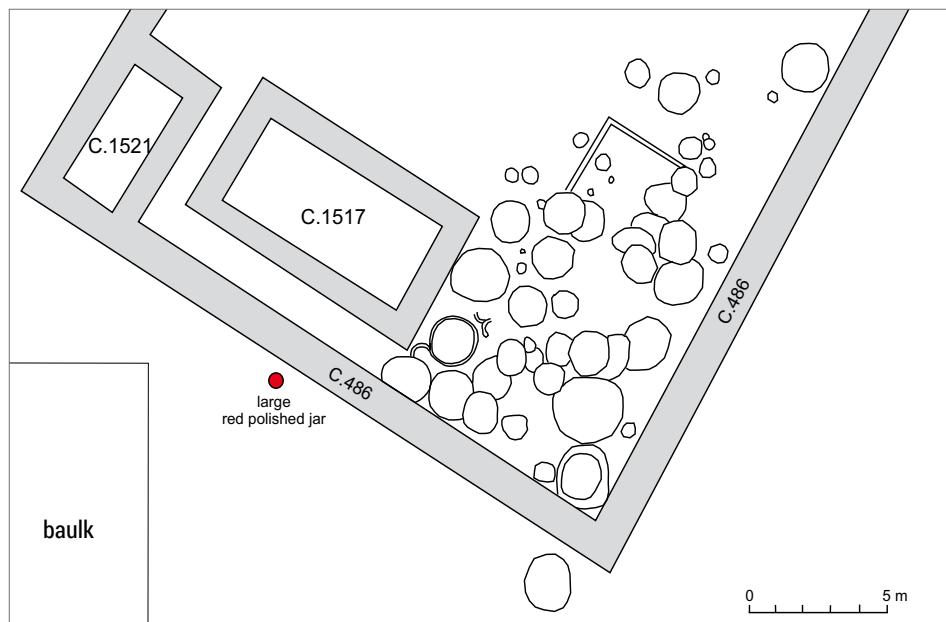


Fig. 9. Schematic plan of the Lower Egyptian residence on the Central Kom (Tell el-Farkha Archaeological Project/drawing M. Chłodnicki)



Fig. 10. Lowermost strata (level 46) explored in 2017 in the central trench on the Central Kom: remains of the Lower Egyptian residence and the settlement in front of it (Tell el-Farkha Archaeological Project/photo R. Słaboński)

parts of the walls, these furrows are interpreted as the remains of wooden fences delimiting the area of the older phase of the Lower Egyptian residence (Chłodnicki 2011: Fig. 3; 2012: 129–130).

The space in front of the residence may have been arranged in a special way. Traces of fences and remains of many mud pits and fire places were found there, but no dwelling structures [Fig. 11 top]. Mud



Fig. 11. Remains of mud pits and furrows in front of the Lower Egyptian residence on the Central Kom; bottom, mud pits at different stages of exploration (Tell el-Farkha Archaeological Project/ photos R. Słaboński)

pits often occurred in pairs, sometimes intersecting each other [Fig. 11 bottom]. The contents of the better preserved pits included grains of wheat. Furrows filled with darker soil confirmed that there had been some structures made of wood, but none of them actually belonged to typical Lower Egyptian houses discovered on the Central Kom in 2007–2008 (Chłodnicki and Geming 2012: 98, Figs 20–21).

A large complete jar standing in front of the residence is noteworthy (for its location, see Fig. 9). This marl clay,

red slipped jar (type P84b; Petrie 1921: Pl. XIV) is, undoubtedly, a southern Egyptian import [Fig. 12 left]. A typical lemon-shaped Lower Egyptian vessel [Fig. 12 right] was found nearby.

Fragments of pottery, some decorated with a characteristic zigzag pattern, and a few flint tools, among them knives, have been found south of the residence. Of interest are also fragments of spinning bowls, the oldest known from Tell el-Farkha [Fig. 13].



Fig. 12. Big red-polished jar and small lemon-shaped vessel found near the Lower Egyptian residence on the Central Kom (Tell el-Farkha Archaeological Project/photo R. Słaboński)



A mace head made of bone [Fig. 14] was found in front of the residence. It is similar to the one discovered in 2008 inside the residence, also made of the radial head of a femur bone (Chłodnicki and Ciałowicz 2012: Fig. 11), but much

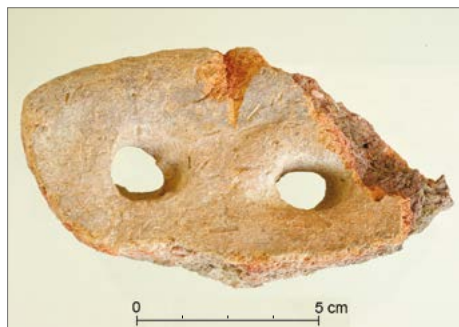


Fig. 13. Fragment of a spinning bowl (Tell el-Farkha Archaeological Project/photo R. Słaboński)

more flattened on top than the other one. Although differing in shape, both were made in the same way and were symbolic in nature. The porous bone surface in the upper part of the mace was filled with a white paste and the mace head was painted with black patches imitating a stone texture.

Excavations in the central trench were stopped on level 45 (2.85 m ASL). The collected finds were dated to Tell el-Farkha: Phase 3 (Naqada IIIA1: remains of the storehouse), Phase 2 (Naqada IID: second phase of the Lower Egyptian residence), and end of Phase 1 (Naqada IIC: first-phase Lower Egyptian residence and settlement).



Fig. 14. Bone mace-head, top, side and bottom views; bottom, microscopic images of some of the black-painted patches (Tell el-Farkha Archaeological Project/photos R. Słaboński and G. Bąk-Pryc)

### SOUTHERN TRENCH

The southern trench (C.42) was explored in 2017, starting with the dismantling of the outer wall of the Naqada storage edifice (CW.39) and clearing the area to the level 29/30 (4.40–4.30 m ASL) reached in the rest of the trench. This part of the Naqada edifice was heavily damaged in ancient times and only the outer east wall was better preserved, although in considerable disrepair at the southern end (Chłodnicki and Ciałowicz 2016: Fig. 10). Further excavation in this spot revealed the wall (CW.39) to be better preserved in the lower parts and although destroyed at the western end, continuing south toward the trench edge [Fig. 15]. It also seems that more of the west wall (CW.93) is preserved than in layers higher up. Although both

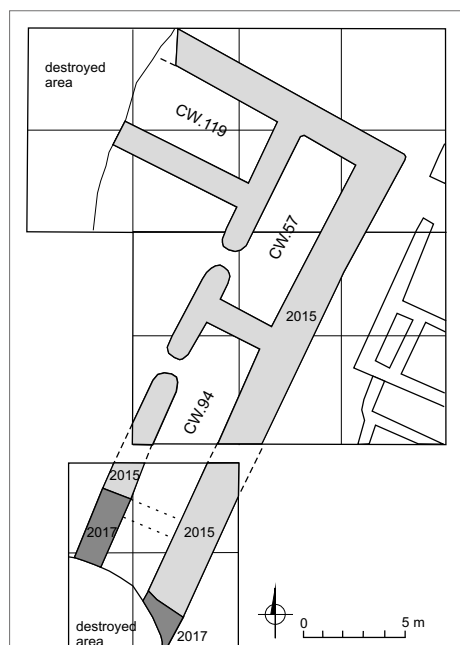


Fig. 15. Plan of the early phase of the Naqadian granary on the Central Kom, extended after the 2017 excavations (Tell el-Farkha Archaeological Project/drawing M. Chłodnicki)

walls were destroyed by the same big pit, it is clear that they continued to the south; they may be better preserved at a deeper level.

Excavations ceased at level 32 (4.20 m ASL), although, based on the central trench, the base of the walls of the Naqada storehouse should be found on level 37 (3.70 m ASL). The length of this storage building can now be established at 26 m at the least, to be confirmed once the excavation is extended in an upcoming season.

### NORTHERN TRENCH

The northern trench was excavated in the 2016 season, exploring layers below a rounded building excavated in 2011–2014 (Chłodnicki and Ciałowicz 2015: 183–184; 2016: 240–241; Chłodnicki 2017: 54–57). Remains of a settlement dated to Naqada IIIB times were discovered. It was a mud-brick structure (walls one-and-a-half brick thick) with remains of ovens and storage pits [Fig. 17].

The discovery of burials in the area came as a surprise, although human bones scattered in this trench had already been recorded earlier. The tombs were simple



Fig. 16. Calcite vessel found in a symbolic(?) grave in the northern trench on the Central Kom (Tell el-Farkha Archaeological Project/photo R. Słaboński)



Fig. 17. Remains of a settlement in the northern trench on the Central Kom (Tell el-Farkha Archaeological Project/photo R. Słaboński)



Fig. 18. Grave C1 in the northern trench on the Central Kom (Tell el-Farkha Archaeological Project/photo R. Słaboński)



pits. The skeletal remains (all identifications by A. Szczepanek) included an adult male buried in a contracted position without any grave goods [Fig. 18], fragments of two skulls, and some badly preserved bones of a child. In one case, a pit with sand on the bottom yielded remains of a mat and a stone vessel [Fig. 16], possibly a symbolic grave or

burial of a child or newborn whose bones were not preserved. The fill around the graves produced potsherds, some flint and stone implements, and animal bones. All the human burials and scattered human bones were found in an area located around, but not under the Early Dynastic rounded building (see Chłodnicki and Ciałowicz 2016: 240–242). [MC]

## EASTERN KOM

Excavation in both seasons was focused on squares 46, 47a,c, 56, 57c, extending the explored area into the adjacent square 36a,b to explore fragments of a big mud-brick edifice (No. 128) discovered earlier in squares 46 and 56 [Fig. 19]. This is the most interesting structure discovered recently on the Eastern Kom. It is dated to Tell el-Farkha Phase 5 (middle of Naqada IIIB to Naqada IIIC<sub>1</sub>), contemporary with the reign of Dynasty 0 (from Iry-Hor) and the beginning of Dynasty I (until the reign of Djer) (Ciałowicz, Czarnowicz, and Chłodnicki 2018: 7). The building measures at least 15 m by 10 m and comprises three rooms, severely damaged by several later graves (see below). All the walls (0.80–1.00 m wide) were covered inside and outside with a coat of pale mortar, 3–5 cm thick [Fig. 19 inset]. An identical mortar had been found on the walls of mastaba-grave 63 discovered a few years ago (Dębowska-Ludwin 2012: 65), dated to the same period [Fig. 20]. The northern room (A) of the building was separated from the outer north wall by a 1.50-m-wide corridor. A kind of step or bench, also of mud brick, adjoined the north wall of that room.

Two other rooms (B and C) occupied the southwestern part of the building. Both were very similar, almost square (approximately 4 m by 4 m) and in both some short walls joined the inner face of the west wall. Two wine jars and pot-stands with engraved decoration were placed side by side under the floor of room B (see Chłodnicki and Ciałowicz 2016: 243). Potsherds from a few jars, and a completely preserved bread-mould were discovered under the southern part of the floor of room C and beneath the north wall of the room respectively [see Fig. 21]. A collapsed wall lay in the eastern part of the room. An entrance was located in the southeastern corner.

A straightforward interpretation of this structure is not forthcoming at present. The method of construction, including walls coated with a pale mortar, complex layout and pots buried under the building, suggests that it was not an ordinary house. Its location is significant as well. It is still not known whether there are any earlier graves buried in the deepest layers of this part of the site. If not, it is possible that the edifice was erected on the eastern bor-

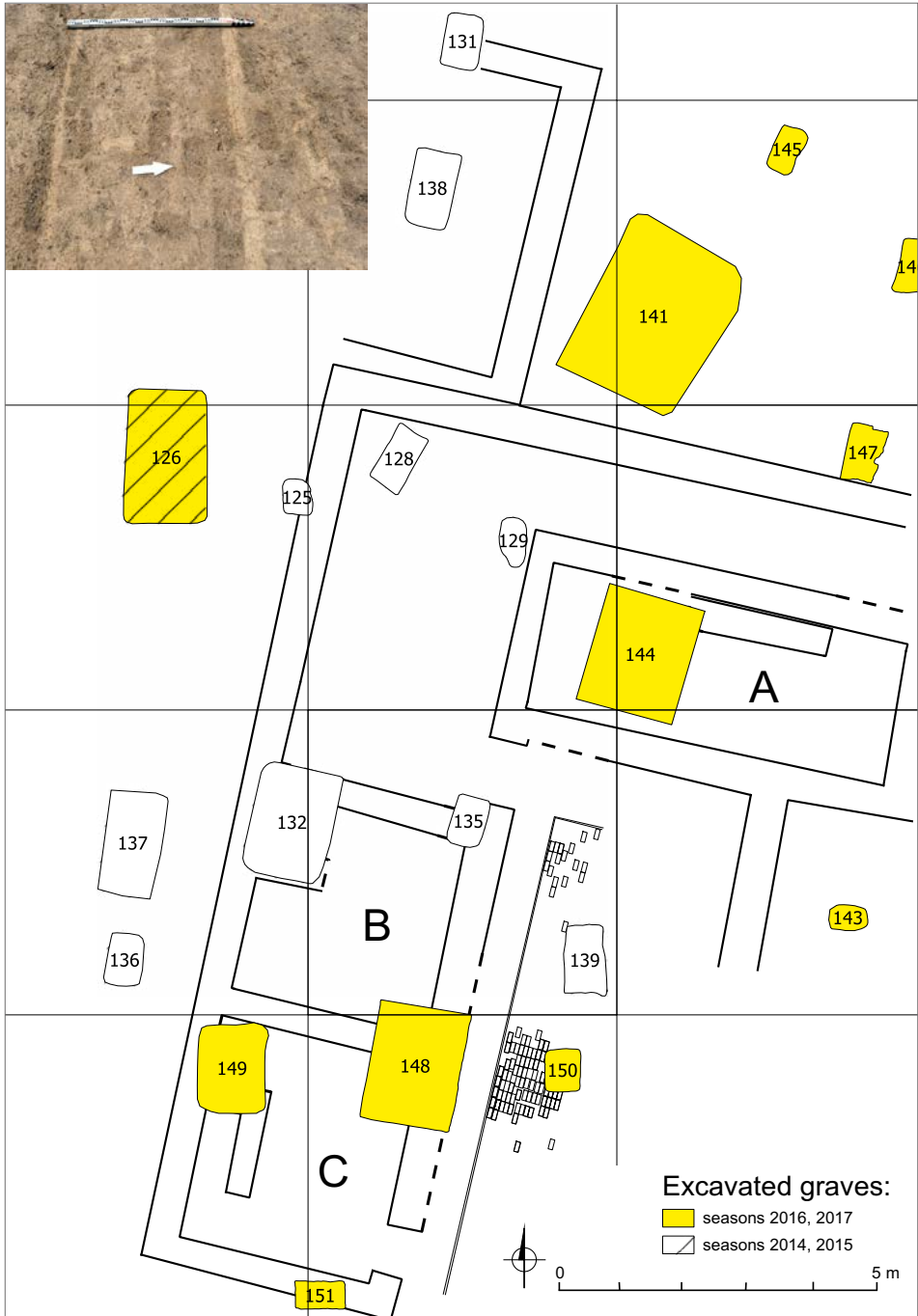


Fig. 19. Mud-brick edifice (No. 128) on the Eastern Kom; inset, fragment of the plastered north wall of this edifice (Tell el-Farkha Archaeological Project/drawing M. Czarnowicz and J. Karmowski, photo R. Słaboński)

der of the Naqada IIIB–IIIC<sub>1</sub> cemetery (Dębowska-Ludwin 2012: 55). It should also be taken into consideration that the edifice might have been connected with an important grave situated in the southern part of the Eastern Kom. Traces of some big structures can be observed in the results of geophysical prospection (Herbich 2012: 388–390). Nevertheless, the edifice on the Eastern Kom may have been connected, in one way or another, with a posthumous cult.

Eleven graves were discovered during the two field seasons [see *Fig. 19* and *Table 1*]. Six of them were dug into edifice No. 128. Age and sex were determined only provisionally owing to the poor condition of the bones. Four of the graves contained very poorly preserved burials oriented with the



Fig. 20. Mastaba-grave 63 on the Eastern Kom (Tell el-Farkha Archaeological Project/photo R. Słaboński)



Fig. 21. Room C of the mud-brick edifice (No. 128) on the Eastern Kom (Tell el-Farkha Archaeological Project/photo G. Bąk-Pryc)



head to the north, e.g., Grave 147 [Fig. 22]. The burials were devoid of any equipment, therefore their dating needs to be based on their stratigraphical position and similarities to graves

Fig. 22. Simple burial in Grave 147 (Tell el-Farkha Archaeological Project/photo R. Słaboński)



Fig. 23. Grave 141: successive stages of exploration, in rows from top left to bottom right (Tell el-Farkha Archaeological Project/photos R. Słaboński)



discovered during previous seasons. They may be connected with Tell el-Farkha Phase 6, i.e., the second half of the First Dynasty and the beginning of the Second. Six of the graves yielded richer grave furnishings in the form of pottery vessels and stone pots. Grave 141 [Fig. 23] was that of a woman, about 30–40 years old, accompanied by 12 beer-jars [Fig. 24A] and eight stone pots: seven of travertine and one of sandstone [Fig. 24B]. Grave 144 belonged to a man (40–50 years old) and was equipped with five pottery beer-jars and three stone ves-



Fig. 24A. Beer-jar from Grave 141 (Tell el-Farkha Archaeological Project/photo R. Słaboński)



Fig. 24B. Grave furnishings from Grave 141: selected stone vessels (Tell el-Farkha Archaeological Project/photo R. Słaboński)



sels: two of travertine and one of basalt [Fig. 25]. The skeleton of an adult individual in Grave 148 [Fig. 27] was only partly preserved. The grave goods were composed of five beer-jars, one wine jar [Fig. 26] and a small cylindrical jar, as well as part of a basalt bowl. The male buried in Grave 149 [Fig. 28 top] was equipped with six beer-jars,



Fig. 25. Basalt vessel from Grave 144 (Tell el-Farkha Project/photo R. Słaboński)



Fig. 26. Wine-jar from Grave 148 (Tell el-Farkha Archaeological Project/photo R. Słaboński)



Fig. 27. Grave 148: excavated burial (Tell el-Farkha Archaeological Project/photo R. Słaboński)

a bowl and two travertine pots [Fig. 28 bottom]. Similar stone vessels were the only goods in Grave 146, the burial of a probable male, 30–35 years old. Grave 150 of a child, 5–6 years old, yielded a small cylindrical vessel and a jug.

In all the graves, the deceased were laid on the left side with the head to the north and in contracted position. These graves were from the turn of the First Dynasty. [KMC]



Fig. 28. Grave 149: top, excavated burial; bottom, clay bowl and travertine pots (Tell el-Farkha Archaeological Project/photos R. Słaboński)

Table 1. Burials from the Eastern Kom: identification of age and sex (anthropological analysis A. Szczepanek) and grave furnishings

Grave	Sex and age	Grave furnishings
Grave 141 [Fig. 23]	Female about 30–40 years	12 beer-jars, 8 stone pots: seven of travertine and one of sandstone [Fig. 24A, B]
Grave 142(?) (scattered in the northeastern part of the trench)	Young individual 14–18 years old, possibly destroyed burial	–
Grave 143	Child one year old	–
Grave 144	Male 40–50 years	Five beer-jars and three stone vessels: two of traver- tine and one of basalt [Fig. 25]
Grave 145	Juvenile 11–13 years	–
Grave 146	Male(?) 30–35 years	Stone vessels similar to those from Grave 149
Grave 147 [Fig. 22]	Adult, probably male, 30–40 years	–
Grave 148 [Fig. 27]	Adult	Five beer-jars, one wine jar [Fig. 26] and a small cylindrical jar, part of a basalt bowl
Grave 149 [Fig. 28 top]	Male 35–45 years	Six beer-jars and a bowl, two travertine pots [Fig. 28 bottom]
Grave 150	Child 5–6 years	Two small pottery vessels: cylinder and jug
Grave 151	Male 40–50 years	–

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# Tell el-Murra (Northeastern Nile Delta Survey): research in 2016–2017



**Abstract:** The paper deals with the results of excavation in 2016 and 2017 at the site of Tell el-Murra in the northeastern part of the Nile Delta. The investigation focused on Trench T5, where settlement remains dated mostly from the Early Dynastic period were explored in its northern part, and early Old Kingdom structures in the southern part. Settlement remains of Lower Egyptian culture were also excavated in Trench S3B. Continued research on the Early Dynastic cemetery in Trench S3 yielded eight more graves, both pit burials and chambered tombs. In one case, the body was placed additionally in a pottery coffin. The results contribute new data on Early Dynastic settlement architecture and burial customs, as well as the oldest habitation associated with Lower Egyptian culture.

**Keywords:** Tell el-Murra, Egypt, Nile Delta, Predynastic, Lower Egyptian culture, Early Dynastic, cemetery, settlement

Two seasons of excavation, in 2016 and 2017, were carried out at Tell el-Murra in the northeastern part of the Nile Delta, excavated since 2008 (Jucha and Buszek 2011; Jucha et al. 2013; Jucha, Bąk-Pryc, and Czarnowicz 2014; Jucha, Bąk-Pryc, and Małecka-Drozd 2015; Jucha et al. 2017). The team explored Trenches S3 and S3B in the southwestern and T5 in the northeastern part of the tell. Remains of the oldest settlement of the Lower Egyptian Culture were excavated in Trench S3B. Early Dynastic graves were found in Trench S3. The settlement remains exposed in trench T5 were mostly of Early Dynastic date.

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## EXPLORATION IN TRENCHES S3 AND S3B

Investigations in the 2016 season concentrated on Trench S3 in the southwestern part of the tell, where an Early Dynastic cemetery has been explored since 2011 (Jucha, Bąk-Pryc, and Czarnowicz 2014: 141–146; Jucha, Bąk-Pryc, and Małecka-Drozd 2015: 200–208; Jucha et al. 2016: 88–100; Jucha and Bąk-Pryc 2017: 189–195; Jucha et al. 2017: 148–154). In Trench S3B, Naqada III structures explored in previous years (Jucha, Bąk-Pryc, and Małecka-Drozd 2015: 208; Jucha et al. 2016: 100–101; 2017: 154–155) continued to be excavated in the 2016 and 2017 seasons.

### TRENCH S3B

Work in Trench S3B, located east of Trench S3, focused on Levels 39 (altitude 2.40 m) to 45 (altitude 1.80 m). Structures explored there were associated with Lower Egyptian culture, the oldest phase of habitation discovered so far at Tell el-Murra. These were found below a relatively thick alluvial layer formed as a result of flooding. The layer leads to the assumption that a large Nile flood most likely destroyed the settlement at the end of the said period, leaving the site unavailable for habitation until at least



Fig. 1. Trench S3B. Structures of the Lower Egyptian Culture settlement (Tell el-Murra Expedition Archive/photo E. Kuciewicz)

the Protodynastic period, that is, Naqada IIIB (Jucha et al. 2017: 158). Such an event could have also affected other Delta settlements, giving Lower Egyptian culture a crushing blow and causing a collapse of its settlement network, which simultaneously facilitated the movement of Naqadians to the north (Jucha 2017). The remains in the described trench include, among others, furrows filled with mud as a result of later flooding. Traces of a lightweight construction, supported on four thin poles, were uncovered in the northwestern part. One should note a completely preserved donkey's jaw found next to it. Fragments of lemon-shaped jars, potsherds decorated with zigzags, as well as numerous fragments of animal bones were found.

A significant concentration of architectural structures was observed from Level 42 (altitude 2.10 m) onwards [Fig. 1]. These include furrows as well as smaller and larger round pits. Some of them were interconnected, creating the outlines of a regular structure. Most of



Fig. 2. Lemon-shaped pottery jar of Lower Egyptian Culture (Tell el-Murra Expedition Archive/ photo E. Kuciewicz)

finds were fragments of pottery vessels as well as small flints and animal bones. Fragments of ceramic vessels were also found *in situ* embedded in pits. These had probably served a stabilising function. In 2016, a rising ground water table resulting from the flooding of farmlands in the vicinity made excavation at Level 44 (altitude 1.90 m) impossible. Work was continued in 2017. A *gezirah* was visible in the eastern part of the examined trench. The remaining area was covered by an irregular layer of grey silt filling in the central section, and poorly legible outlines of features in the western part of the trench. Meriting particular attention is a large, rectangular structure in the northwestern part, continuing north and west beyond the explored area. It was filled with fragments of pottery, fired clay and ashes with numerous traces of incineration. A large-sized round pit was excavated in the southwestern part; its outlines were visible at higher levels. Another fragmentary structure comprised furrows, along with small, circular cavities and post-holes(?). One should also note a small pit with black fill, located close to the northeastern section of the trench. In the course of its exploration, fragments of animal bones were uncovered, as well as one bead. The finds from the described levels include numerous fragments of ceramic vessels typical of the Lower Egyptian Culture, among them small lemon-shaped jars [Fig. 2], potsherds decorated with zigzags, as well as fragments of large vats.

### TRENCH S3

Work on the necropolis focused in the southwestern-part of Trench S3: are J22,

squares J23A, J23B (from Level 17; altitude 5.60 m), and the eastern end of square I23B (from Level 14; altitude 4.90 m). Eight burials (Graves 33 to 40) were discovered and examined. Two of them were considered to belong to the second part of the First Dynasty=Naqada III C2 (Graves 34 and 40; although the latter could be slightly older). The chronology of two others (Graves 38 and 39) is uncertain due to modest representation of grave goods, but they may have been from the First Dynasty=Naqada III C period. Two graves (33 and 35) could be from the second half of the First Dynasty/first half of the Second Dynasty=Naqada III C2/D, however their inclusion here is not certain. Two other graves are difficult to date for lack of an assemblage (Graves 36 and 37). Of interest are the mutual stratigraphic relations of Graves 39 and 40. The southwestern corner of the former was cut into the northeastern corner of the latter [Fig. 3].

The chronological distance between them does not seem to be too long. It is quite possible that the location of the older grave was known and such relations were intended.

The burials were represented by both pit graves (Nos 34, 36, 38, 39) and chambered ones (Nos 33, 35, 40). Traces of the decomposition of organic material (matting) lead to the assumption that the interred bodies were usually laid upon and covered with matting. The matting could have also covered the grave goods as well as the internal faces of the walls or sides of the pit, the crowns of walls and the bottom of the grave. Most of burials share similar characteristics regarding grave and body orientation. The body was placed in a strongly contracted position, lying on its left side. The prevailing burial alignment was NE–SW, the N–S orientation being noted only twice (Graves 33 and 35). In one case (Grave 37), a human



Fig. 3. Trench S3: Early Dynastic Graves 39 and 40 (Tell el-Murra Expedition Archive/photo E. Kuciewicz)



skull as well as several individual bones were located along an E–W axis, but the lack of a clear outline of the burial pit is significant here. It cannot be resolved beyond all doubt whether the remains rep-



Fig. 4. Cylindrical jar of travertine from Early Dynastic Grave 40 (Tell el-Murra Expedition Archive/photo E. Kuciewicz)

resent primary deposition or a secondary displacement of the body resulting from the destruction of a nearby grave.

Skeleton bones were very poorly preserved on the whole. In one case, the deceased had been placed in a pottery coffin (Grave 40) [Fig. 5]. Pottery vessels were the most numerous group among the burial goods. Slender wine jars with a rope band (Graves 40 [Fig. 6:d] and 34 [Fig. 6:e]) and beer-jars (Graves 40 [Fig. 6:a], 34 [Fig. 6:c], and 33 [Fig. 6:b]), belonging to later types of such jars, date some graves more precisely. The same can be said of cylindrical jars with or without decoration (Grave 40). Other forms include bowls, a plate, a pot-stand and different types of small jars. The presence of a relatively large vessel, imitating basketwork on a foot with an internal ledge supporting the lid, as well as broken bread moulds



Fig. 5. Trench S3. Early Dynastic Grave 40, close-up view (Tell el-Murra Expedition Archive/photo E. Kuciewicz)

placed intentionally into one of the jars (Grave 40) is also worth mentioning. Stone vessels occurred quite frequently, cylindrical jars of travertine like this one

[Fig. 4] being the most typical (Graves 34 and 40). Other forms include bowls made of travertine or greywacke and barrel-shaped or slender jars made of travertine.



Fig. 6. Early Dynastic pottery grave goods: top row, beer-jars: a – Grave 40; b – Grave 33; c – Grave 34; bottom row, wine jars: d – Grave 40; e – Grave 34 (Tell el-Murra Expedition Archive/photos E. Kuciewicz)

### EXPLORATION IN TRENCH T5

During the 2016–2017 seasons work continued in Trench T5 in the north-eastern part of the tell. Research was determined by the division of the trench into the northern and southern part, made already in 2015. Most of the work was in the northern part

of the trench (are R7, squares S7A,C, southern ends of squares R6C,D and S6C), where settlement remains from Level 25 (altitude 5.20 m) to Level 32 (altitude 4.50 m) were excavated. The archaeological material confirmed the Early Dynastic chronology of the

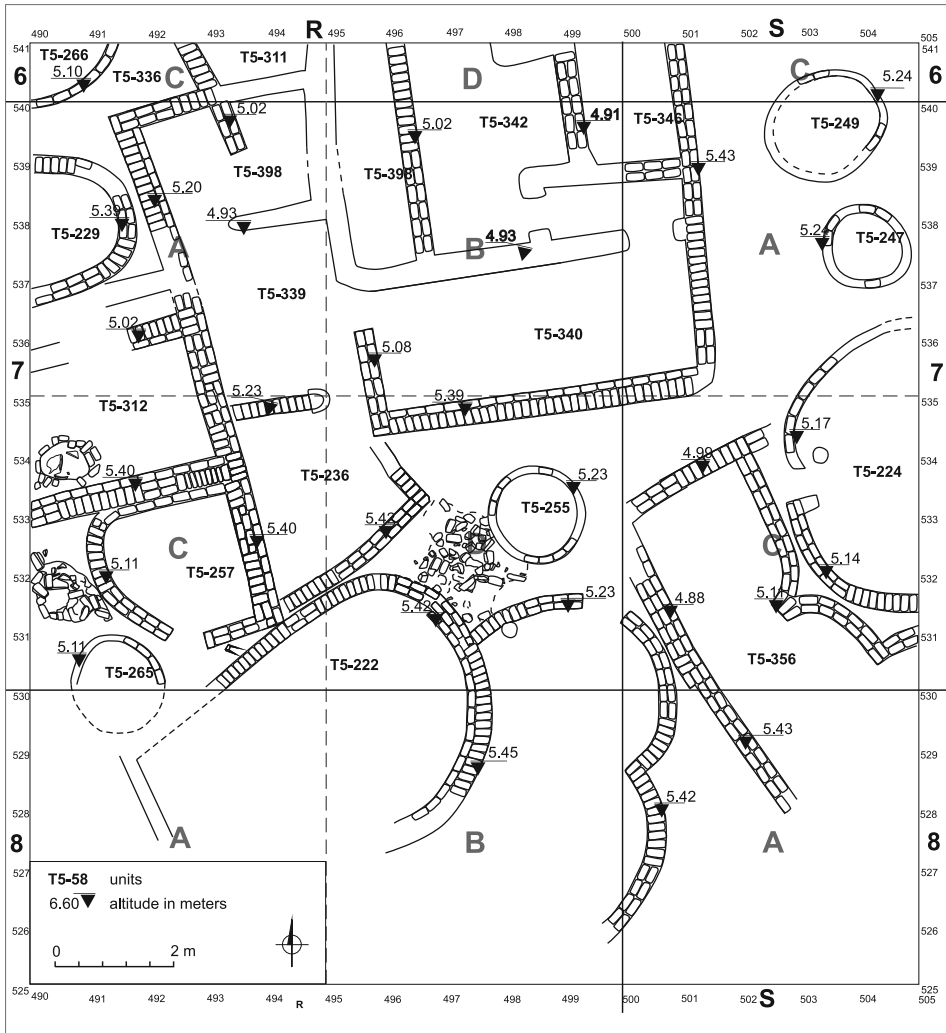


Fig. 7. Schematic plan of structures in Trench T5. Early Dynastic Levels 23–28 (Tell el-Murra Expedition Archive/drawing N. Małecka-Drozd)

structures revealed there, most possibly the later part of the period, that is, Naqada III C2–D (Jucha et al. 2017: 136–140; see below). The southern part of the trench (are R8, squares S8A,C) was explored to a more limited extent, from Level 17 (altitude 6.00 m) to Level 23 (altitude 5.40 m). Excavations yielded archaeological material dated to the early Old Kingdom, confirming a chronology established for this part of the trench during previous research (Jucha et al. 2017: 140–147; see below). Moreover, at least some of the walls revealed at the lowest levels explored in the southern part of the trench during the 2017 season might be related to the Early Dynastic structures exposed in its northern part during seasons 2015 and 2016. These were not excavated to any

significant extent before the end of the 2017 season.

### EARLY DYNASTIC Architecture

The oldest settlement remains found so far in Trench T5 were located in its northern part. The first traces of walls, which might be related to structures dated to the Early Dynastic period, were recognized already at Level 20 (altitude 5.70 m) during season 2015 (Małecka-Drozd 2016: 112–113; Jucha et al. 2017: 137). Two seasons later, the general layout of the late Early Dynastic buildings has been established.

One may distinguish several partly interconnected zones [Fig. 7]. Most of the buildings stood throughout the period in question, although some alterations



Fig. 8. Early Dynastic brick installation and silos filled with charred grain in Trench T5 (Tell el-Murra Expedition Archive/photo E. Kuciewicz)



occurred (i.e., deliberate filling of rooms with brick rubble in order to level the floor or, possibly, dismantling inner walls to create a uniform space). Structures on the western side of the trench, apparently extending beyond the trench to the west and north, may have formed a single building (Małecka-Drozd 2016: 112; Jucha et al. 2017: 137–138). Some of the rooms of the building were occupied by brick silos, part of them still filled with charred grain. In the southernmost room, burnt soil, along with accumulations of burnt bricks and fragments of pottery, was recognized in between two silos. It appeared to be an intentionally arranged installation with a well-preserved Early Dynastic beer-jar found next to it [Fig. 8]. One could associate it with some household activities, cooking or brewing, although the specific purpose remains uncertain

at the moment (see Małecka-Drozd and Kazimierczak forthcoming).

A big building in the middle continues north beyond the trench borders and is partly connected to the structures found to the west [see Figs 7, 9]. The upper parts of the outer walls were already exposed in 2015, but no constructions were found inside it (Małecka-Drozd 2016: 112–113; Jucha et al. 2017: 138–139). In the 2016 and 2017 seasons, the inner plan of the building was recognized: a large room located in its southern part and a set of smaller rooms situated further north, all interconnected by doorways with brick thresholds. There was nothing among the finds to identify the purpose of individual rooms as well as the building as a whole.

South and east of the big central building is a partly open space, occupied



Fig. 9. Early Dynastic mud-brick building in the northern part of Trench T5 (Tell el-Murra Expedition Archive/photo E. Kuciewicz)



by several walls of circular and arched outline. In a previous report (Małecka-Drozd 2016: 113; Jucha et al. 2017: 139), this part of the trench was described as an area with silos. After two more seasons of work, the nature of this space appears more complex. Of greatest interest are two adjacent buildings exposed in the eastern–southeastern part of the area. There is a circular structure (approximately 4 m in diameter), which is continued to the east, below the eastern side of the trench. To the west of the circular structure, there is an irregularly shaped room, the northeastern wall of which consists of two interconnected arches [see *Figs 7, 10*]. The remaining walls are straight; it should be noted, however, that the structure stretches into the southern

part of the trench and is not yet fully excavated. In an earlier stage, the circular building was divided into two compartments, filled with spots of burnt, dark earth. Communication between the rooms and the external area was ensured by three doorways: one in the north wall, another between the compartments and a third leading to an irregularly shaped structure to the west [see *Fig. 10*]. At some point, there were changes in the organization of the two adjacent buildings. The northern entrance of the circular structure was abandoned, as well as probably its division into two compartments. Only one doorway remained in use in the last phase; it was the one connecting the circular building with the irregular structure to the west.



Fig. 10. Circular building in the eastern part of Trench T5. Communication through doorways leading north, west and between rooms. Early Dynastic Level 32 (Tell el-Murra Expedition Archive/ photo E. Kuciewicz)



Fig. 11. Early Dynastic mud-brick silo with traces of repair in Trench T5 (Tell el-Murra Expedition Archive/photo E. Kuciewicz)

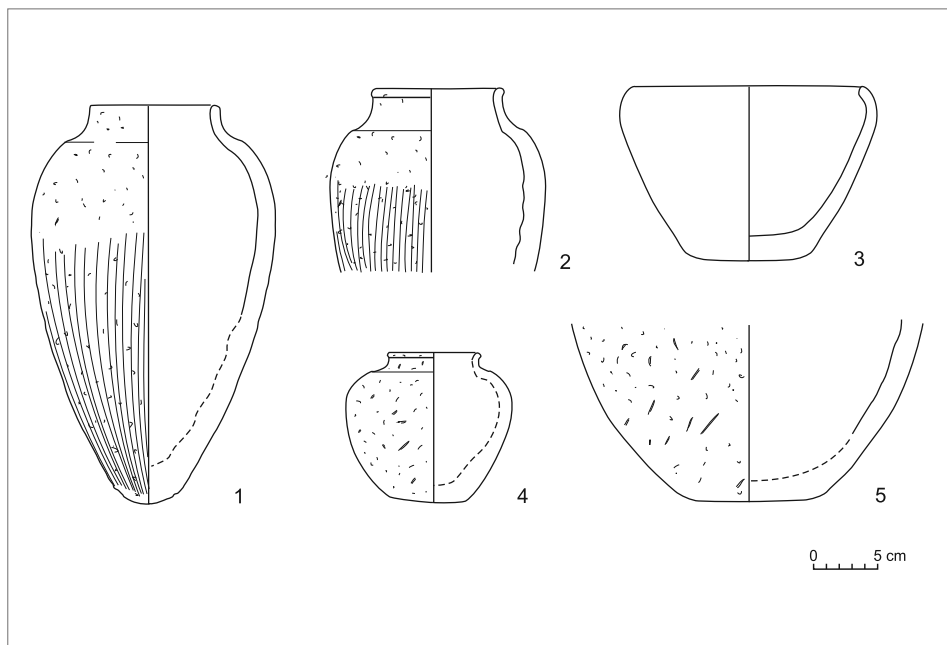


Fig. 12. Early Dynastic pottery from the area with burnt bricks in the northern part of Trench T5 (square R7b) (Tell el-Murra Expedition Archive/digitizing U. Bąk)

The space between the building located to the west, the central building and two structures located southeast of it was subject to more frequent changes. It was an area of intense economic activity and the oval and semicircular structures located in it were repaired and rebuilt several times [Fig. 11]. There were large amounts of burnt earth, including cavities filled with ashes, next to the arched walls. In the last stage of use [see Fig. 7], the space consisted of a set of small silos (about 1 m in diameter), scattered in between the larger structures. In the southern part of the area, there are two buildings or compartments of irregular shape. Their north and east walls run a curved course. Both structures are continued into the southern part of Trench T5 (squares R8A,B and S8A), where the top parts of their walls were exposed during the 2017 season. A probably random accumulation of burnt bricks and large quantities of pottery fragments was attested between the arched walls and one of the silos. Among the ceramic material from

the last mentioned layers were two Early Dynastic beer-jars, a red-polished bowl with angular inner edge of the rim and convex sides, a small rough ware squat jar and the base of a big bowl [Fig. 12]

### Pottery

The pottery material collected from the northern part of Trench T5 is not hugely diverse. The domination of vessels related to household activities is evident. The most numerous are bread moulds [Fig. 13A:1], many with thickened internal part of the rim, slightly shallower and wider (diameter between 25 and 30 cm) in shape than later Old Kingdom examples. Together with a few examples of flat trays [Fig. 13A:2, 3] and vats and big bowls [Fig. 13B:4], they show that bread was baked in this area. Fragments as well as complete examples of beer-jars typical of the Early Dynastic period (broad shoulder, simple or slightly thickened rim, flat or rounded base and scraped outer surface) [Fig. 13B:5–8], occurring in large quantities in the northern part of the trench, suggest

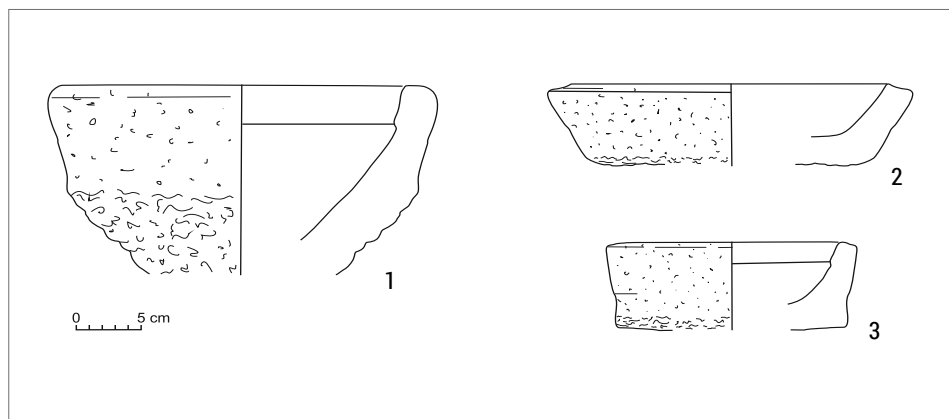


Fig. 13A. Early Dynastic pottery from the settlement in the northern part of Trench T5: 1 – bread mould ; 2, 3– flat trays (Tell el-Murra Expedition Archive/digitizing U. Bąk)

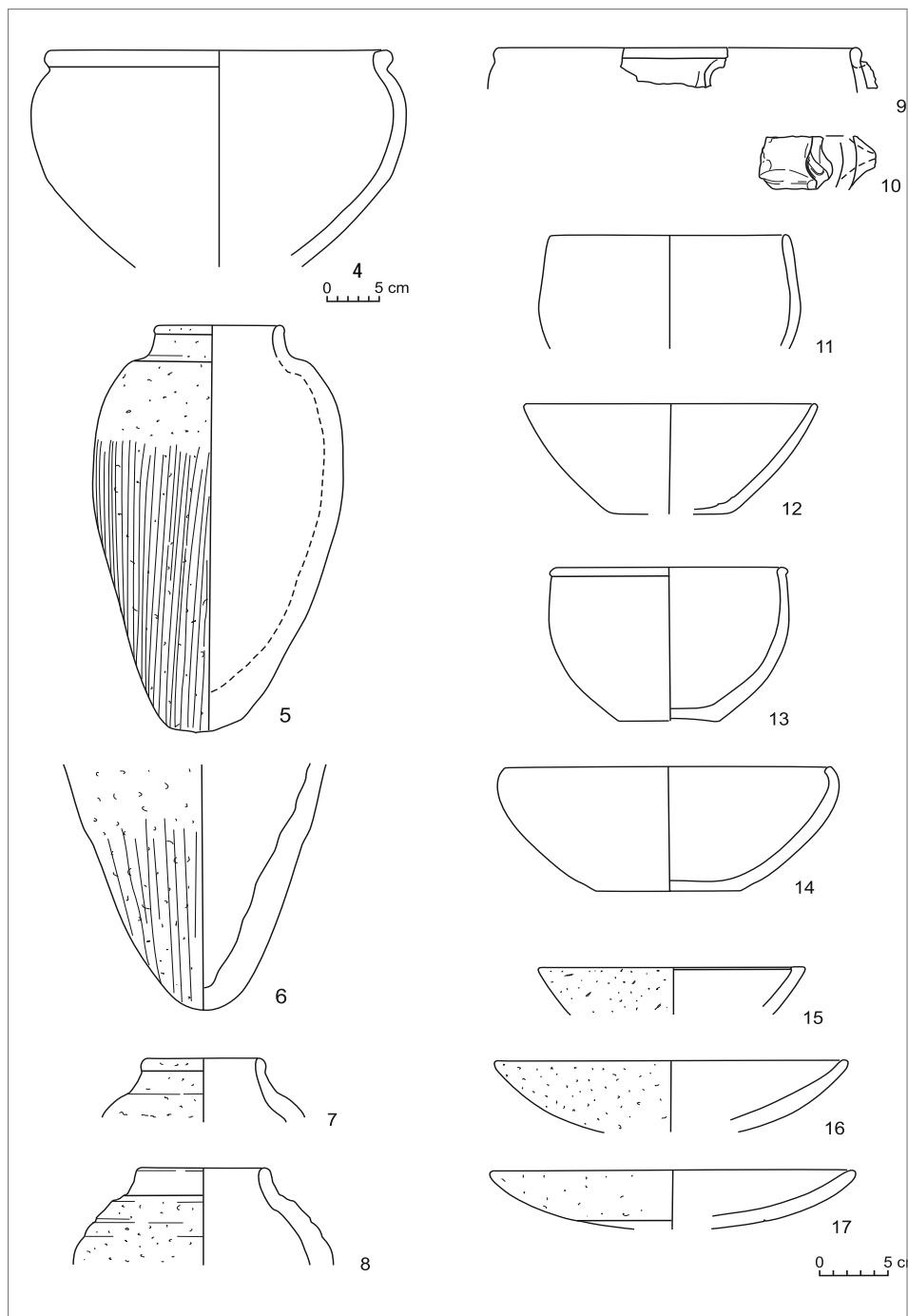


Fig. 13B. Early Dynastic pottery from the settlement in the northern part of Trench T5: 4 – big bowl; 5–8 – beer-jars; 9, 10 – spouted bowls; 11–14 – polished bowls; 15 – lightly smoothed bowl; 16, 17 – red-coated plates (Tell el-Murra Expedition Archive/digitizing U. Bąk)

that beer production may have taken place there as well. Spouted bowls and fragments of spouts [Fig. 13B:9, 10] were probably also connected with the said activities. Thin-walled pottery was also in abundance, among them polished bowls with convex walls and simple rim [Fig. 13B:11, 12], thickened rounded rim [Fig. 13B:13] or angular inner edge of the rim [Fig. 13B:14], lightly smoothed bowls with flattened top of the rim [Fig. 13B:15], as well as red-coated plates [Fig. 13B:16, 17] and a few pieces of plates with ribbed inner surface covered with a light cream slip. All were intended probably for serving and consuming food.

This assemblage suggests a strictly economic profile for the area which could have had some kind of storage and distribution role. The forms are not very symptomatic; they could occur equally well at the end of Early Dynastic period as at the beginning of the Old Kingdom. However, the lack of Meidum bowls, bowls with internal ledge, beer-jars with collars typical of the Old Kingdom period is significant. Keeping this in mind, the presence of bread moulds with thickened internal part of the rim and beer-jar types characteristic of the Early Dynastic period leads to the assumption that this set should be dated to the second part of the Early Dynastic period (not earlier than the second part of the First Dynasty and the Second Dynasty=Naqada III C2–D). It corresponds to phase 6 at neighboring Tell el-Farkha (Kazimierczak and Doros 2018; Jucha 2011: 957–967).

### **EARLY OLD KINGDOM Architecture**

The southern part of Trench T5 at Levels 17–23 was occupied by structures dated

roughly to the early Old Kingdom. They correspond to layers related to the bakery from the northern part of the trench (Małecka-Drozd 2016: 110–112; Jucha et al. 2017: 139). The layers located there are relatively not very legible. There are bottom parts of walls making up a building complex of the Third–Fourth Dynasties, studied earlier (Jucha, Bąk-Pryc, and Małecka-Drozd 2015; Jucha et al. 2017; Małecka-Drozd 2018), as well as some older structures, preserved very fragmentarily, up to a maximum height of only 0.10–0.20 m. A complex of rooms occupying the eastern and the central part of the discussed area may be recognized conclusively, limited on the west by a rather undeveloped space, a kind of courtyard. Finds from the southern part of the trench are complementary to those excavated in 2015 in the corresponding levels in the northern part (Małecka-Drozd 2016: 110–112; Jucha et al. 2017: 138) and supply evidence of an economic nature characterizing the function of this area at the very beginning of the Old Kingdom. Numerous vessels, such as bowls, plates and so-called beer-jars, are typical of this phase. Bread moulds recognized in a layer of ash and burning in one of the rooms point to a bakery, an interpretation further corroborated by the find of a grinder nearby. Of greatest interest is a series of several round structures with edges formed of mud and interiors filled with dark earth, discovered under a layer of burning. Similar structures could have been used as vessel supports. Burn marks and the type of dishes found in their immediate surroundings may indicate some kind of kitchen activity in this space.

In addition, at the lowest Level 23 (altitude 5.40 m) explored in 2017, a network of walls (squares R8A,B, S8A) can be



associated with the Early Dynastic period and structures exposed in the northern part of the trench at Level 32 (altitude 4.50 m) [see Fig. 7].

### Pottery

Pottery from the southern part of Trench T5 is again suggestive of the economic nature of this part of the settlement. A rela-

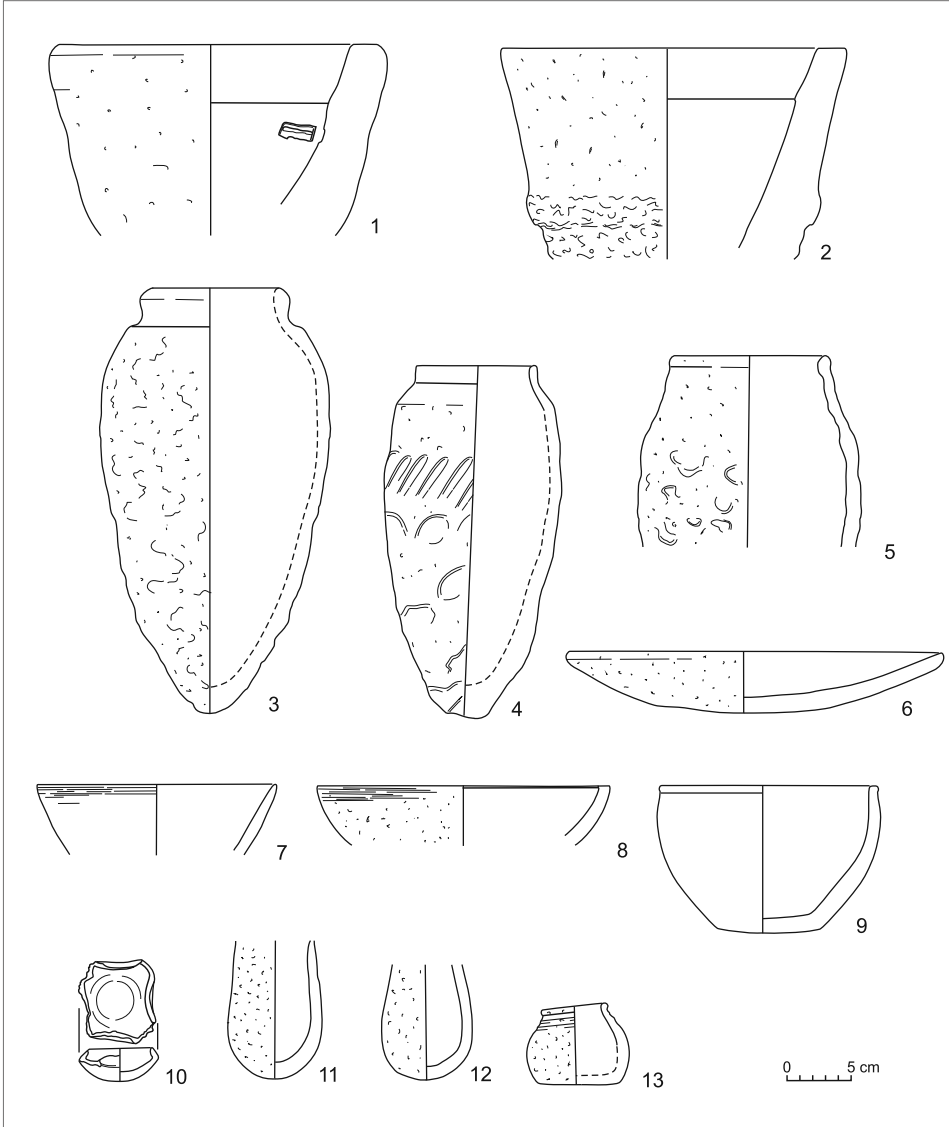


Fig. 14. Old Kingdom pottery from the settlement in the southern part of Trench T5: 1, 2 – bread moulds; 3–5 – beer-jars; 6 – plate; 7–9 – polished bowls; 10 – miniature polished bowl with spouted rim; 11–13 – small rough-ware jars (Tell el-Murra Expedition Archive/digitizing U. Bąk)

tively large quantity of bread moulds [Fig. 14:1,2], as well as large vats and big bowls indicate that bread production was probably continued there in the Old Kingdom period. The occurrence of numerous pieces and a few complete examples of beer-jars [Fig. 14:3–5] of an Old Kingdom type (slender, with narrow shoulders, pointed or rounded base and fingerprints on the surface) is also significant here. Accompanying the rough ware pottery were fineware vessels, including plates [Fig. 14:6] and polished bowls [Fig. 14:7–9] of different shapes, serving probably as

tableware. Moreover, a few miniature vessels were discovered. These include a small polished bowl with spout-rim [Fig. 14:10], two small rough ware jars with rounded bases [Fig. 14:11,12] and a rough ware jar with broad body and flat base [Fig. 14:13]. The assemblage includes also fragments of a fineware vessel made of marl clay. The pottery types from this part of the trench show a close affinity with pottery from structures dated to the beginning of the Old Kingdom (Kazimierczak 2016: 113–121; Jucha et al. 2017: 146–149).

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# Saqqara: season 2017

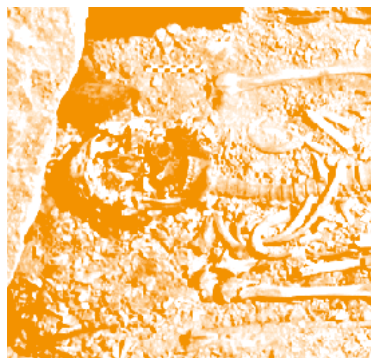
**Abstract:** The western bank of the Dry Moat continued to be the main target of investigations in the 2017 field season, uncovering another section of the Upper Necropolis in front of Chapel 13 and exploring the burial chamber of Chapel 32 situated below that of Ikhi/Mery. The latter work resulted in the discovery of an intact burial of an anonymous Fifth Dynasty official. Conservation work remained an important part of the program.

**Keywords:** West Saqqara, Old Kingdom, Upper Necropolis, Dry Moat, Step Pyramid, Ikhi/Mery, rock-hewn tombs, burial shafts, Fifth Dynasty

The scientific program of the 2017 season was a continuation of earlier research (Myśliwiec 2015), focused on the western channel of the Dry Moat. It was constrained, in terms of scope of work and number of team members, by unexpected delays in opening the fieldwork. However, the results were significant in confirming that the space within the Dry Moat itself was used for funerary purposes already during the Fifth Dynasty and indicated directions for future research.

## ARCHAEOLOGICAL WORK

The excavation was concentrated on the area at the western bank of the Dry Moat, in grid squares 1714 and 1814 [Fig. 1]. The aim of this work was to study the sequence of strata in the fill of the Dry Moat as part of a multidisciplinary investigation aiming to establish a diachronic view of Saqqara's development over the millennia. Another goal was to prepare for future research. Work also continued on the exploration of the deeper parts of an anonymous rock-cut tomb (Chapel 32) that had started to be investigated in the previous campaign (Myśliwiec 2015: 217–224; Kuraszkiewicz 2014; 2016).



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**Appendix**

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**Team**

*Dates of work:* 23 April–18 May 2017

*Director:* Dr. Kamil O. Kuraszkiewicz (Department of Egyptology, Faculty of Oriental Studies, University of Warsaw)

*SCA representative:* Tamer Ragab Abdallah Abd El-Motaleb

*Archaeologists:* Prof. Dr. Karol Myśliwiec, Małgorzata Radomska, Dr. Teodozja Rzeuska, ceramologist (all Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences), Agnieszka Kowalska (independent), Dr. Iwona Kozieradzka-Ogunmakin, bioarchaeologist (University of Manchester)

*Architect:* Beata Błaszczuk (freelance)

*Conservators/restorers:* Iwona Ciszewska-Woźniak (freelance), Ahmad Abd al-Azim Ahmad (Ministry of Antiquities, Saqqara)

*Photographer:* Jarosław Dąbrowski (freelance)

*SCA inspector trainees:* Amira Hamdi Mortaga and Galal Fathi

**Acknowledgments**

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The program was successfully implemented thanks to the good will and wise decisions of the Direction of the Inspectorate of Antiquities at Saqqara. Our gratitude goes in particular to Mr. Sabri Farag, General Director of Saqqara, as well as Mr. Mohammed Youssef, Director of Saqqara, and Chief Inspectors Mr. Mohammed Hussein Mohamed Hendawi and Mr. Hamdi Amin.

The Chief *Rais* of the mission, Mr. Said Kereti, extremely helpful as usual, was accompanied by a *rais* in charge, Mr. Imad Guburi.

**UPPER NECROPOLIS**

Exploration of the fill of the Dry Moat in square 1714, that is, in front of Chapel 13, resulted in the discovery of an extension of the Upper Necropolis as expected (Ra-

domska et al. 2008; Myśliwiec 2017). The 2-m-thick layer of sand reaching down from the present ground surface yielded 13 burials (Nos 689–701) belonging to the Upper Necropolis phase [Fig. 1]. All the

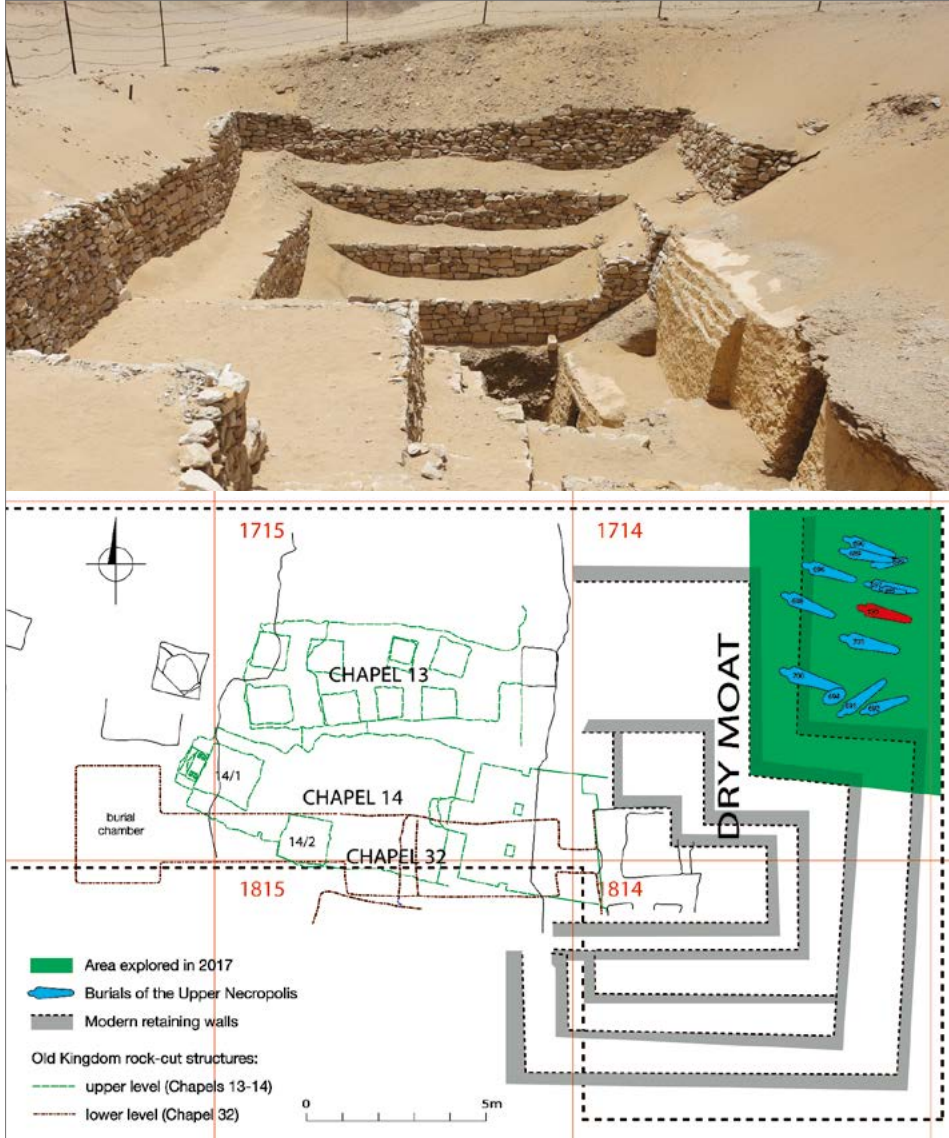


Fig. 1. Plan of the area explored in 2017; top, view of the western bank of the Dry Moat, grid squares 1714–1814, with Chapels 13, 14 and 32, looking south (PCMA UW Saqqara Project/drawing K.O. Kuraszkiewicz, photo J. Dąbrowski)

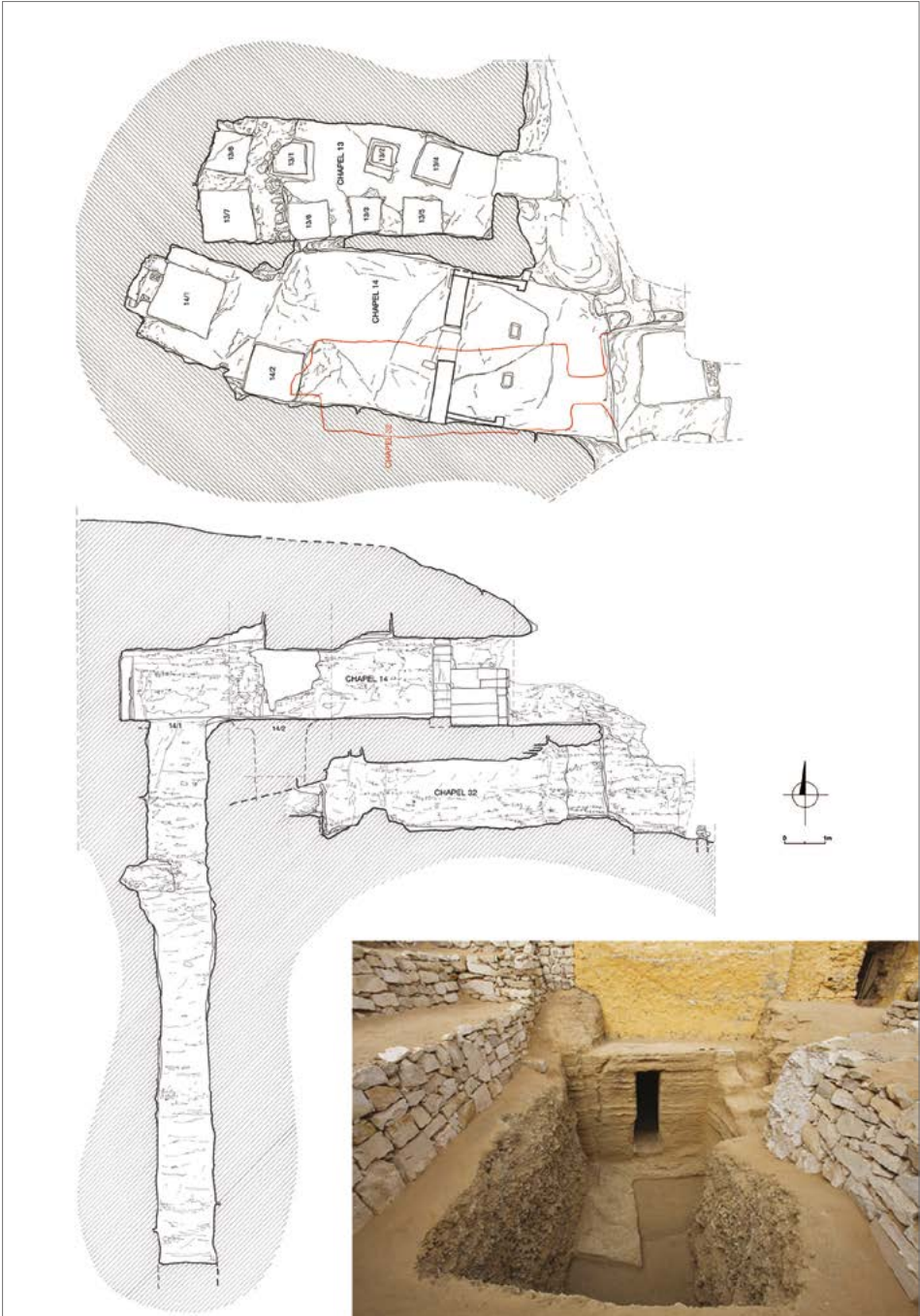
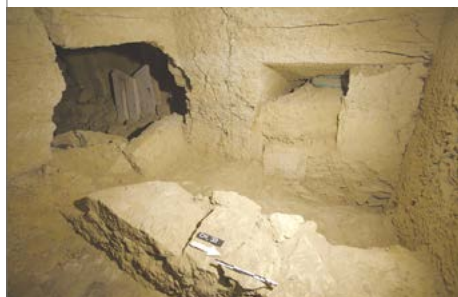


Fig. 2. Chapels 13 and 14, plan with position of Chapel 32 marked in red; east–west section through chapels 14 and 32; inset, façade of Chapel 32 (PCMA UW Saqqara Project/drawing B. Błaszczuk, photo J. Dąbrowski)



burials were rather modest, poorly preserved and without any funerary equipment. Scant remains of plaster found on



one burial (No. 693) indicate that it was originally buried with a cartonnage cover or plaques (almost completely destroyed in antiquity) and in a container, most probably formed of mortar, traces of which were visible around the body. All the burials were explored and fully documented in drawings, photographs and descriptions, and an anthropological examination of the skeletons was carried out.

#### LOWER NECROPOLIS

Chapel 32 was first located in 2012 and explored in 2015 [Fig. 2]. It is cut in the west wall of the Dry Moat, its ceiling approximately 0.50 m below the floor of the chapel of Ikhi/Mery [Figs 1–3]. The façade (2.30 m wide and 2.40 m high), with a high and narrow entrance situated approximately in its middle, is severely eroded. It had no decoration except for a 0.50-m

Fig. 3. Chapel 32: top left, state before exploration in 2015; center left, west wall with partly preserved blocking of the sloping corridor; bottom, steel and wooden supports in Chapel 32 and the sloping corridor leading to the burial chamber (PCMA UW Saqqara Project/photos J. Dąbrowski)



high lintel decorated in relief. Hardly any trace of this decoration survives due to weathering processes of the stone surface. There are some remains of the offering formula, at least two horizontal lines, spanning almost the entire width of the lintel, and two standing human figures (male and female) at the left (southern) end. However, neither the name nor titles of the owner have been preserved.

Inside the chapel, the roof had to be supported on a construction of steel and wooden beams because of the condition of the rock, which is extremely soft and brittle, with numerous deep intercrossing tectonic fractures [Fig. 3 top left]. The chapel, measuring 6.00 m (E–W) by 2.00 m (N–S), is shifted slightly (approximately 10° south of west) in relation to the tomb of Ikhi/Mery [see Fig. 2]. The walls are carefully hewn, but void of any decoration. An entrance to a sloping corridor in the west wall of the chapel leads to the burial chamber. The entrance retained remains of the original blocking made of stones, bricks and *tafl*-mortar [Fig. 3 center left]. The chapel itself was secured and documented in 2015, but the exploration of the sloping corridor and of the burial chamber required a similar supporting construction in the corridor because of the condition of the bedrock here [Fig. 3 bottom].

The fill of the sloping corridor was disturbed during the construction of the tomb of Ikhi (dating from the reign of Pepy I), as its subsidiary shaft (No. 14/2) cuts through the corridor in its frontal part, and also during subsequent robbers' intrusion. During the exploration of the sloping corridor, two large limestone anepigraphic offering tables (Inv. Nos S/17/6

and S/17/7, Fig. 4) were found in the fill, along with a small offering basin inscribed probably for a man named Seneb (Inv. No. S/17/5). These objects are evidently part of the secondary fill of the corridor.

The corridor, 5.10 m long and descending at an angle of roughly 20°, leads to a rectangular burial chamber, measuring about 3.20 m (N–S) by 2.30 m (E–W), and approximately 2.20 m high. The burial chamber was robbed in ancient times; the only item of the funerary equipment found in it was the base of a wooden statuette of a striding man (Inv. No. S/17/9). A rectangular pit was hewn in the floor approximately in the middle of the burial chamber and covered with a roughly cut limestone slab [Fig. 5]. In the north wall of the burial chamber there is a hole, explored in 2002, leading to the burial chamber of Shaft 54 (Myśliwiec 2003: 121–124, Fig. 13).

Burial 702 (Kowalska and Kurasz-kiewicz forthcoming) inside the pit was found in a rectangular coffin constructed of wooden planks [Fig. 6]. Apparently, the



Fig. 4. Limestone offering table from the fill of the sloping corridor, Inv. No. S/17/7 (PCMA UW Saqqara Project/photo J. Dąbrowski)



Fig. 5. Northern part of the burial chamber of Chapel 32 with the limestone slab covering the burial pit still in place; the breach in the north wall leads to the burial chamber of Shaft 54 (PCMA UW Saqqara Project/photo J. Dąbrowski)



Fig. 6. Burial 702 in a wooden coffin deposited in a pit inside the burial chamber of Chapel 32 (PCMA UW Saqqara Project/photo J. Dąbrowski)

burial has not been disturbed by robbers, but it suffered significant damage as a result of falling stones and stagnant water. The coffin contained remains of a body of a young man, about 20–30 years old at death, bearing traces of having been wrapped in numerous layers of linen, with a plaster cover on the head and upper body. The few objects found next to the body inside the coffin included a wooden headrest (Inv. No. S/17/13), a small calcite

vessel (Inv. No. S/17/11) and a carnelian bead (Inv. No. S/17/16) [Fig. 7].

The tomb can be dated to the late Fifth Dynasty and thus it represents the earliest post-Third Dynasty phase of regular use of the area west of the Step Pyramid enclosure, and of the Dry Moat in particular, as a non-royal cemetery (Myśliwiec 2012; Kuraszkiewicz 2013: 2–23, 274–276).



Fig. 7. Grave goods from Burial 702 (PCMA UW Saqqara Project/photo J. Dąbrowski)

## APPENDIX

## CONSERVATION WORK IN SAQQARA

Each season at Saqqara commences with a detailed inspection of the state of preservation of the monuments, including the funerary chapels of Merefnebef, Nyankhnefertem and Ikhi/Mery (Godziejewski 2013; Godziejewski and Dąbrowska 2015). The interval between successive conservation inspections, which should be yearly, was unexpectedly prolonged due to delays with reopening the Project's work after the 2015 season.

**OLD KINGDOM FUNERARY CHAPELS**

Standard procedure calls for the conservator to inspect the interior walls of funerary chapels for damage to the rock surface, plaster and painted decoration caused by the process of salt crystallization in restricted capillary space. The pressure generated during this process blows up the rock allowing salt penetration. It is of paramount importance to clear the salt efflorescence off the walls on an annual basis, and to monitor the humidity and temperature in the funerary chapels to prevent the damaging action of soluble salts. Despite regular efforts, this remains a major conservation problem.

Salt efflorescence was observed in the funerary chapels of Merefnebef and Nyankhnefertem. In the latter chapel, the concentration of salt crystals appeared on the east wall and approximately 0.30 m down from the ceiling, with some small concentrations on the west wall and on the walls near the northeastern corner of the chapel. In the chapel of Merefnebef, salt efflorescence appeared in small, ir-

regular concentrations on the east and west walls. In both funerary chapels, the painted decoration was peeling off because of salt crystallization occurring underneath the paint; such damage is notoriously difficult to repair as the paint is almost entirely detached from the surface. All areas similarly affected were treated and cleared off salt efflorescence. Brushes of various thickness and hardness were used to remove the salt deposits without causing damage to the painting layer. Salt crystals were removed using a scalpel. The peeling painted decoration was treated and mounted using a water dispersion of Primal AC 33. A water solution of ethyl alcohol (1:1) was used to reduce the surface tension and to facilitate treatment penetration.

In the funerary chapel of Ikhi/Mery, the white limestone blocks on which the reliefs and painted decoration were made are less susceptible to salt migration but prone to damage due to the rock's fragility. Multiple rock cracks and ceiling decay damaged the blocks, which fell apart under pressure and shifted from their original places. Some of the blocks needed to be stabilized and disintegrated fragments were mounted, using an acetone solution of Mowilith 50. To monitor rock movement, gypsum seals were installed in Chapels 32 and 13 [Fig. 8].

The shelter over the funerary chapel of Merefnebef required attention and treatment. Heat had melted the roof felt isolation round the skylights, which subsequently penetrated into the shelter



interior near the entrance without causing any damage to the monument. No such technological problems with roof felt melting had been observed before. Repairs included clearing sand from the roof and removing the felt material from the small roofs over the skylights. A lime-cement mortar mixed with sand was then used to seal the holes in the roof. To minimize heat effects in the future, the small roofs were covered with aluminum foil to absorb the heat, and the roof was covered with a layer of sand. The melted felt that seeped through the holes around the skylights was cleared mechanically.

#### **CLIMATE CONDITIONS INSIDE THE FUNERARY CHAPELS**

A Rotronic device to monitor and register the temperature and humidity inside the chapels was installed in 2015. Readings in the chapels of Merefnebef and

Nyankhnefertem were registered every two hours between 26 March 2015 and 18 April 2016, in the chapel of Ikhi/Meri between 27 March 2015 and 15 February 2016 [Fig. 9]. The devices can be programmed to take the readings for approximately a year, which is sufficient to monitor the climatic conditions between two successive seasons. Delays with opening the mission led to no information being available on climate conditions between February 2016 and April 2017 when no fieldwork was conducted at the site. Despite efforts to minimize the impact of external factors on the conditions inside the funerary chapels, humidity and changing temperatures continue to take a toll.

#### **SMALL OBJECTS**

Small finds conservation in 2017 was focused on the finds from Chapel 32. These included a wooden figurine base with two



Fig. 8. Gypsum seals installed on the ceiling of the burial chamber of Chapel 32 (PCMA UW Saqqara Project/photo J. Dąbrowski)



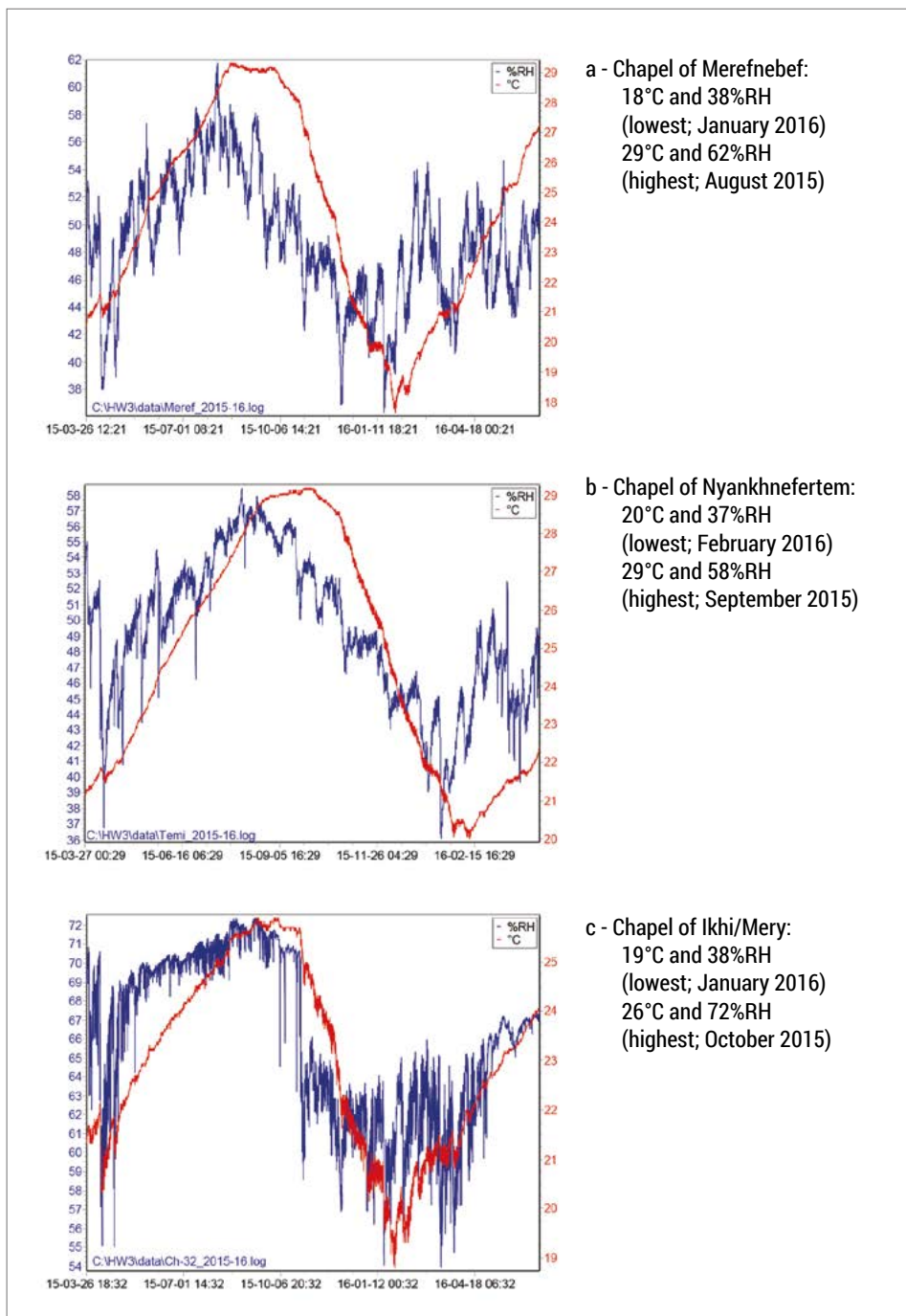


Fig. 9. Temperature (red) and humidity (blue) levels registered by thermohygrograph in the funerary chapels of, from top, Merefnebef, Nyankhneferem, and Ikhi/Mery (Rotronic data for the period from March 2015 to April 2016)

sockets for a figure stepping forward, uncovered in the southwestern corner of the burial chamber and next to a wooden coffin. Remnants of the left foot of this figure lay next to one of the sockets. The surface of the figurine base was white-washed, in some areas the base was covered with vegetable black and red ochre. The wood was almost entirely degraded and needed immediate treatment. Sand and debris particles were removed and the wood was treated with an acetone solution of Paraloid B-72 and a low-percentage glue. All peelings were mounted with a water dispersion of Primal AC 33. To

reduce surface tension, a solution of water and ethyl alcohol (1:1) was used. The glue applied was more effective due to deeper surface penetration, which ensured better impregnation. In some instances, where the vegetable black had penetrated deep into the cracks, as well as underneath the peeling whitewash, it proved impossible to clear it away completely.

A plaster mask that covered the skull of a skeleton uncovered in Chapel 32 (Burial 702) was found fragmented. The mask fragments were treated with an acetone solution (3–5%) of Paraloid B-72.

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# Middle Kingdom tombs of Asasif: archaeological fieldwork in 2017



**Abstract:** The recent works in the 2017 season at the North Asasif Necropolis have led to the discovery of Middle Kingdom burial assemblages, as well as funerary equipment dated to the Third Intermediate Period. Besides, the cleaning work conducted in the funerary complex of Meru revealed more materials from the Late Roman Era, which proves the existence of the Coptic hermitage inside the tomb. This new archaeological evidence provides an important insight into the development of the North Asasif Necropolis during the Pharaonic era and in later periods. The fourth season of the archaeological fieldwork at the site focused on seven Middle Kingdom funerary complexes: tomb of Khety (TT 311), MMA 509, MMA 511, MMA 512, MMA 514, MMA 515 and tomb of Meru (TT 240).

**Key words:** Theban Necropolis, North Asasif, Middle Kingdom, rock-cut tombs, Khety, Meru

The 2017 archaeological season of the Asasif Project under the auspices of the Polish Centre of Mediterranean Archaeology University of Warsaw focused on seven Middle Kingdom funerary complexes from the North Asasif necropolis: TT 311 (tomb of Khety), MMA 509 and MMA 511, MMA 512, MMA 514, MMA 515 and TT 240 (tomb of Meru) [Fig. 1]. The main research objectives of this campaign involved an investigation into the origins of the non-royal Middle Kingdom tomb architecture and funerary equipment, and a study of the intrusive burials from later periods at the site. The work in funerary complexes MMA 509 and 511 was concentrated on documenting tomb architecture and studies of finds from the previous campaigns and will not be reported here.

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## **Team**

*Dates of work:* 11 October–21 December 2017

*Director:* Dr. Patryk Chudzik, egyptologist (PCMA UW)

*SCA representative:* el-Azab Ragab Ahmed Abd Rabu

*Egyptologists:* Dr. Aleksandra Hallman (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences), Filip Taterka (PhD candidate, Adam Mickiewicz University, Poznań, Université Paris-Sorbonne, Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences)

*Physical anthropologist:* Roselyn A. Campbell (PhD candidate, Cotsen Institute of Archaeology at UCLA)

*Archaeologist and 3D specialist:* Maksym Mackiewicz (PhD candidate, Institute of Archaeology, University of Wrocław)

*Architects:* Katarzyna Andraka, Ewelina Russjan (Faculty of Architecture, Wrocław University of Technology)

*Photographer:* Maciej Jawornicki (freelance)

*Documentalists:* Dariusz Flajszer (freelance), Katarzyna Molga (Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences)

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### TOMB OF KHETY (TT 311)

In the 1922/1923 season Herbert E. Winlock, working on behalf of the Metropolitan Museum of Art in New York, discovered the resting place of the Treasurer Khety, a high court official of the king Nebhepetre Mentuhotep II (Winlock 1923: 14–19, Figs 1, 4, 6–12; 1942: 68–71, Fig. 7, Pls 15–16). The funerary complex of the Eleventh Dynasty noble was one of the richest tombs constructed in the Theban Necropolis during the Middle Kingdom.

Behind a doorway opened a high and lofty corridor, walled with fine white limestone, carved with scenes from Khety’s life. Originally, the walls were decorated with hunting, funeral and agricultural motifs (Winlock 1923: 16–18). In ancient times the walls were destroyed and the stones reworked into bowls by those salvaging the stone. After four thousand years Winlock found hundreds of decorated fragments from the wall decoration in the debris inside the tomb.



Fig. 1. The North Asasif Necropolis; inset, general plan of Deir el-Bahari with the location of the Middle Kingdom tombs and general view of the tombs in the cliff with the Temple of Nebhepetre Mentuhotep II in the foreground (PCMA UW Asasif Project/drawing K. Andraka, photo P. Chudzik)

Winlock's workers left a large dump extending along the east side of the courtyard, near the doorway to the tomb. Recent clearing of the funerary complex of Khety, which included this dump, uncovered several finely decorated limestone fragments: scenes of everyday life and funeral scenes, limestone fragments with representations of Khety seated on a chair in front of the offering tables and offering lists. New fragments of limestone door jambs and a lintel came to light. The surface of these architectural elements were painted red with black streaks imitating granite. The owner of the tomb with his name and titles was depicted on the door jambs.

The disturbed remains of Eleventh Dynasty grave goods were also found in the debris overlying the east side of the tomb courtyard. Winlock's dump contained a number of pottery vessels and wooden models. Retrieved model fragments included, among others, fragments of offering bearers, that is, mostly arms painted red and yellow, miniature models of offerings, like the foreleg of an ox [Fig. 2 right] and a jar with lid, as well as fragments of oars constituting model boat equipment [Fig. 2 left].

Museum excavations in 1922/1923 led to the discovery of fragments of a wooden statue (Winlock 1942: Pl. 36; Hayes 1953: 164, 210).<sup>1</sup> Winlock identified a wooden



Fig. 2. Fragmentary wooden artifacts from the Tomb of Khety: parts of boat equipment on the left, model of an ox foreleg on the right (PCMA UW Asasif Project/photo M. Jawornicki)

<sup>1</sup> Two fragments of a wooden statue found by Winlock are now in the collection of the Metropolitan Museum of Art in New York: a wooden head (MMA 26.3.104a) and an arm of a female figure (MMA 26.3.104b).

head as the image of the tomb owner, but it is more likely that it represents the head of a female figure (Arnold 1991: 28–29, Figs 39–41). More fragments of wooden statues were recovered this season from the dump, making it clear that the cult chapel had contained not one but two figures. The first statue, life-sized, belonged to Khety [Fig. 4], the second, which was much smaller, was presumably his wife.

A mud seal impression discovered this season in the debris of the courtyard [Fig. 3] reveals an oval-shaped image on the surface, partly damaged in the corners. The impression was also damaged in part. It presents a tripartite design with crosswise scroll design and two identical scroll and spiral motifs on the two ends. The latter may well be a schematic representation of



Fig. 3. Mud seal impression from the tomb of Khety (PCMA UW Asasif Project/photo M. Jawornicki)



Fig. 4. Fragments of a wooden statue of Khety: from left, left ear, nose and mouth, and thumb of left hand (PCMA UW Asasif Project/photo M. Jawornicki)

the Hathor fetish. This decorative motif is attested in material dated from the late Old Kingdom to the Eleventh Dynasty (see Brunton 1937: Pl. LXIX(7); Ward 1978: Pl. XI, Nos 287–288; Shubert 1998: 78, No. 33). In pressing down the seal, the mud was held between the fingers to press down the seal, leaving fingerprints of the seal's owner. The reverse of the sealing suggests that it was once applied to the door of the tomb or the wooden box brought by the offering bearers during the funeral. There are only a few examples of early Middle Kingdom Theban sealings, coming from tomb MMA 509 (Winlock 1923: 15) and the tomb of Meketre (TT 1101) (Winlock 1955: 35, Pl. 69), as well as seal impressions on Hekanakhte's letters (Winlock 1922: 34, 38, Fig. 38; James 1962: 45, Pl. 9).



Fig. 5. Fragmentary mummy plaque representing falcon-headed Qebehseneuf (Asasif Project/photo: M. Jawornicki)

Apart from Middle Kingdom tomb equipment, Winlock's dump contained a large number of burial assemblages from later periods. Third Intermediate Period material is represented by clay shabtis, fragments of wooden chests or coffins(?) and cartonnages. One of the most interesting objects from this time, however, is an unusual fragment of an amulet of one of the Sons of Horus. The falcon-headed Qebehseneuf amulet is made of a small piece of linen and coated with gesso on both sides [Fig. 5], indicating consequently that it is not a fragment of cartonnage decoration. It resembles other known glazed composition amulets of Sons of Horus (see Petrie 1914: 39–40; Andrews 1994: 45–46; Aston 2009: 389, 394). The newly discovered small plaque is shown in typical mummiform profile without the arms. The pierced side holes reveal that the amulet was incorporated into the bead netting or, more likely, stitched on to the bandages over the torso of the mummy. Cartonnage figurines replaced the wax Sons of Horus by about 750 BC.

## TOMB MMA 512

The tomb was discovered by Winlock between 1920 and 1923.<sup>2</sup> During his excavations only the upper layers of the tomb fill were removed and left in the courtyard. Current fieldwork focusing on funerary complex MMA 512 started in 2013 (Chudzik 2015: 241–243) and was now continued with the aim being to clear accumulated rock debris from the entrance corridor and the chambers inside the tomb.

2 Some of the objects from this tomb were moved to the Metropolitan Museum of Art, e.g., stela of Nebeni (26.3.237), builder's seal and cord (22.3.72) and sections of a broad collar (27.3.150a-b).





Fig. 6. Cult chapel, niche and entrance dromos of tomb MMA 512 (PCMA UW Asasif Project/photo P. Chudzik)



Fig. 7. Limestone altar from tomb MMA 512 (PCMA UW Asasif Project/photo M. Mackiewicz)

A long entrance corridor led to a squarish rock-cut chamber that had originally acted probably as a funerary cult chapel [Fig. 6]. The entrance to the chamber was carved near the southeastern corner of the room. Opening in front of the chapel entrance was a short, unfinished corridor, possibly intended as a niche. The entrance dromos was cut through the thin layers of limestone rock in the western side of the cult chapel. The burial chamber was cut at the bottom of the dromos. There is no doubt that the tomb was left unfinished, presumably because of death of the owner (see Chudzik 2015: 243 and note 3).

Removal of rock debris from the main corridor revealed vessel pottery sherds, textiles, fragments of a bull skull, remains of wooden models as well as a limestone



Fig. 8. Finds from shaft tomb 514-3: left, clay shabti figurine; right, the Sons of Horus scene represented on a cartonnage (PCMA UW Asasif Project/photo M. Jawornicki)

altar [Fig. 7]. The altar is decorated with three small basins: two on both sides of the *Htp*-sign and a bigger one crosswise. The newly discovered altar is similar to that from Kom el-Akhdar, which is dated to the late Eleventh or early Twelfth Dynasty (Fischer 1976: 12–14, Figs 5, 6) and to the Eleventh Dynasty altar from Karlsruhe Museum (H416) (Wiedemann 1886: 98–

99). Artifacts from the cult chapel and burial crypt included wooden fragments of chests and sticks, vessel pottery sherds, textiles, mud stoppers, animal bones and fragments of wooden models. The assemblage can be dated to the Middle Kingdom. Cleaning work was undertaken also in the courtyard, yielding further fragments of Middle Kingdom grave goods.

## TOMB MMA 514

Work in the entrance corridor of funerary complex MMA 514 resulted in the clearing of five shaft tombs. The main tomb was constructed for one of the Middle Kingdom court officials (Chudzik 2015: 244–245; 2017: 189). In consequence of the cleaning, it became evident that the entrance passage had been modified (shaft tombs 514-1–514-4) first during the New Kingdom and then again during the Third Intermediate Period.

Plundered remains of early Eighteenth Dynasty burials were found in MMA 514, mostly in the shaft at the end of the main passage. Limestone canopic jar fragments, remains of a black painted coffin with yellow decoration and a small fragment of faience bowl with Nile motifs were discovered in the debris.

Intrusive remains of burial assemblages from the Third Intermediate Period (mostly Twenty-second and Twenty-third Dynasties) were found in all the shafts of the main tomb corridor. These included various faience and clay shabtis, pieces of broken coffins and cartonnages [Fig. 8], as well as fragments of pottery vessels

(see Aston 2009: 269ff). A large quantity of funerary textiles of different sizes and in varying condition came from the fill of the shaft tombs. Inscriptions have been observed on some of the studied textiles.<sup>3</sup> One of these contains the name of Khonsu-ir-aa, which is attested, according to Aleksandra Hallman and Filip Taterka, on two statues, one in the Museum of Fine Arts in Boston (Bothmer 1960: 10–11, Pl. 9; Freed, Berman, and Doxey 2003: 178) and the other in the Walters Art Museum in Baltimore (Steindorff 1946: 14, 54, Pls 29, 114). Both objects are dated to the Twenty-fifth Dynasty and were discovered in Karnak (for some other examples of Twenty-fifth Dynasty inscribed linen, see Strudwick 2000: 255–256; Hallmann 2015a: 250–252, Fig. 4; 2015b: 130–131, Fig. 17).

Funerary complex MMA 514 also yielded a large number of human remains, both skeletonized and mummified, which were studied this season by Roselyn A. Campbell. A preliminary count gives the minimum number of individuals at nine (Campbell 2018, in this volume).

3 Textiles from the Asasif Project are being examined by Dr. Aleksandra Hallmann; she and Dr. Filip Taterka (both Institute of Mediterranean and Oriental Cultures, Polish Academy of Sciences) are also studying the inscriptions found on these textiles.

## TOMB MMA 515

Work in funerary complex MMA 515 was concentrated on completing the architectural documentation of the inside of the tomb and the courtyard. Test trenches in the courtyard outside the tomb were aimed at uncovering the original Middle Kingdom surface. The first trench (1.50 m by 7.00 m) was aligned with the main doorway axis, shifted to the west. The second (2.20 m by 15.00 m) was cleaned along the west wall of the courtyard. In both trenches remains of mud mortar were discovered 10–15

cm below the current ground surface. Similar mud mortar covered the surface of the courtyard in tomb MMA 509. Further research will show whether this mortar was found in the entire courtyard or just in the section between the walls and the avenue.

Studies of grave goods collected in the previous season, mostly various decorated coffin and cartonnages fragments, indicated the presence of intrusive burials from the Third Intermediate Period in this complex.

## TOMB OF MERU (TT 240)

The burial crypt and sarcophagus decoration in the Eleventh Dynasty tomb of Meru was recorded and studied. Examination of the assemblage of finds coming from the Middle Kingdom cult chapel and the small niches in the main passage revealed a later occupation of the tomb.

Relics of plaster and painted images of crosses, as well as late Roman pottery recovered from the recent cleaning activities, made it reasonable to assume that the tomb was turned into a Coptic hermitage at one point.

## RECAPITULATION

In the light of the latest discoveries, the four main phases of the Middle Kingdom North Asasif funerary complexes can be identified. This part of the Theban necropolis, comprising tombs constructed in the Eleventh and Twelfth Dynasties, appears to have been reused once in the early Eighteenth Dynasty (tomb MMA 514), and again in the Third Intermedi-

ate Period and early Late Period. The last phase was connected with the activities of Coptic monks, who appropriated some of the chambers for living purposes (Chudzik 2016: 298). The only tomb not to be usurped in later times was the early Middle Kingdom funerary complex MMA 512, which was left unfinished.

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# Human remains from Tomb MMA 514 in North Asasif: preliminary assessment



**Abstract:** Since 2013 the Asasif Project has conducted excavations of several Middle Kingdom tombs in the North Asasif Necropolis under the direction of Patryk Chudzik. Located adjacent to the New Kingdom temple of Hatshepsut at Deir el Bahri in southern Egypt, these tombs were originally excavated in the early 20th century by H.E. Winlock. This article describes the results of a preliminary inventory of the human remains left behind from Winlock's excavations of one of these tombs, MMA 514, and its associated funerary complex. This tomb was reused at least twice in antiquity after the original interment, and Winlock's sometimes cursory (by modern standards) excavation methods have produced a highly mixed archaeological assemblage of human and faunal remains as well as archaeological artifacts from various time periods. In 2017, this author joined the Asasif Project for a very brief part of the excavation season to assess the condition and distribution of human remains from Tomb MMA 514. Although the human remains are in various stages of preservation and are highly fragmented, it is possible to identify at least nine separate individuals, ranging in age from infancy to adulthood.

**Keywords:** physical anthropology; Asasif; Middle Kingdom; Third Intermediate Period; rock-cut tomb

Since 2013, the tombs of the North Asasif Necropolis, adjacent to the well-known Temple of Hatshepsut at Deir el-Bahari (southern Egypt), have been targeted for renewed clearing by the Asasif Project of Patryk Chudzik. The primary focus of this work has been Tomb MMA 514, the excavation of which has yielded numerous fragmentary human remains, both skeletonized and mummified. These human remains were left behind with other archaeological debris after the tomb was excavated by H.E. Winlock in the early 20th century (Winlock 1922; 1923).

In December of 2017, this author joined the Asasif Project as the Head Physical Anthropologist and con-

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ducted a very preliminary inventory of the human remains from MMA 514. Due to severe time constraints, work focused on sorting the human remains from the faunal remains and briefly assessing broad patterns of age and sex distribu-

tion, in order to provide directions for more focused and productive future research. This article presents the findings of this inventory, as well as the contextual information about this tomb and the directions for research in the future.

## ARCHAEOLOGICAL CONTEXT

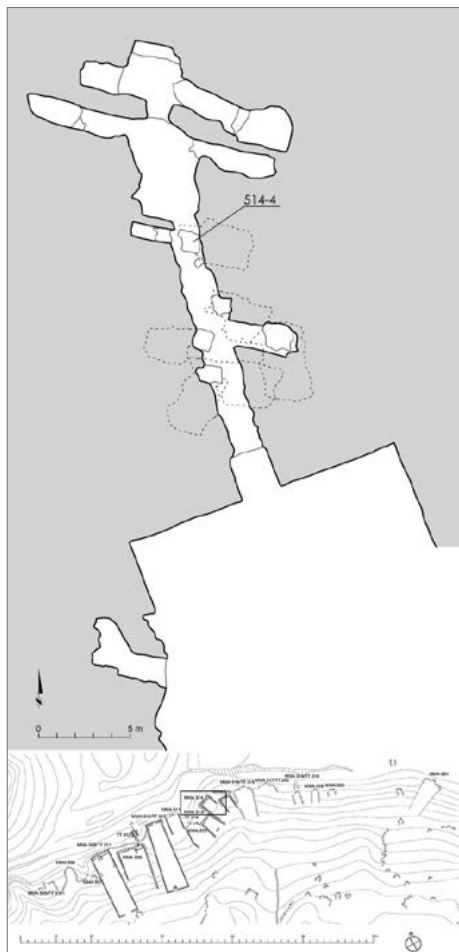


Fig. 1. Plan of MMA 514; inset, location of the tomb in the North Asasif Necropolis (PCMA UW Asasif Project/drawing K. Andraka)

For two decades in the early 20th century, Herbert E. Winlock conducted extensive excavations around Deir el-Bahari and Asasif on behalf of the Metropolitan Museum of Art in New York City. During the 1920s, Winlock excavated in the North Asasif Necropolis, discovering many tombs dating to the Middle Kingdom (about 2055–1650 BC)<sup>1</sup> [Fig. 1 inset; see also Fig. 1 on page 185]. While the discovery of MMA 514 is not explicitly mentioned in Winlock's reports or publications, it seems most likely that this tomb was discovered between 1921 and 1923 when Winlock was working in the area of North Asasif (Winlock 1922; 1923). Several objects from MMA 514 now in the collection of the Metropolitan Museum of Art, including Roman-period gilded leaves (Accession Number 26.3.264a-c), a ceramic vessel from the Middle or New Kingdom (Accession Number 26.3.265), and a string of beads from the Middle Kingdom (Accession Number 26.3.262) list the discovery date as 1921–1922, suggesting that the original discovery and initial clearance of the tomb occurred during this time.<sup>2</sup>

Architecturally, MMA 514 fits the Type IIa of corridor tombs, a typical style for the tombs of officials in the North Asasif

<sup>1</sup> All dates from Shaw 2003.

<sup>2</sup> See Metropolitan Museum of Art: <https://www.metmuseum.org/art/collection/search/556640> and 556041.

Necropolis during the Middle Kingdom (Arnold 1971: 43–46; Soliman 2009: 95–108, 191–192) [see *Fig. 1*]. The typical architectural form of these tombs is a complex that includes a relatively flat outdoor courtyard, often bounded by a low wall, a vertical tomb entrance cut into the cliff face, a squared-off room (likely used as a chapel for the funerary cult of the deceased), and a long descending corridor, often with multiple rooms opening off the central corridor (Winlock 1922; 1923). MMA 514 is no exception; the tomb complex is composed of an outer courtyard, from which the tomb entrance opens to an irregular chamber (likely intended as a chapel) and a long, high-ceilinged corridor, with several shafts off the main corridor and an irregularly-shaped burial chamber (Chudzik 2017). Though a precise date is still being determined based on ongoing ceramic analysis, fragments of Middle Kingdom funerary equipment suggest that the original complex was constructed during this period (Chudzik 2017). The tomb was reused several times, first in the early Eighteenth Dynasty (about 1550–1295 BC) for a single burial (one of the tomb shafts may also have been cut into the rock

for this reuse), and again for several burials during the Third Intermediate Period (about 1069–664 BC) (P. Chudzik, personal communication, 2018).

Excavations of the courtyard of MMA 514 were conducted by the Asasif Project during the 2013/2014 season, and excavations of the tomb itself were completed in 2016. Another associated tomb (MMA 514a), cut into the courtyard of MMA 514, was also excavated during this time (Chudzik 2018, in this volume). Human remains were recovered from MMA 514 and the associated courtyard, as well as from MMA 514a. They were stored inside the main corridor of MMA 514 (where they were well-preserved by the arid environment) until 2017, when a preliminary inventory of the remains was conducted by this author. Work focused mainly on sorting the human remains from the faunal material [*Fig. 2*] and determining general demographic information (e.g., minimum number of individuals, as well as age and sex when possible). In 2017, the human remains from all contexts except for the tomb shafts were identified and catalogued. The latter will be sorted and analyzed in a future season.



Fig. 2. Sorting the human and faunal remains from MMA 514 (Photo R.A. Campbell)

## HUMAN REMAINS

The human remains from MMA 514 and 514a are in various stages of preservation, ranging from badly weathered skeletal remains to well-preserved portions of mummified individuals, with soft tissue, linen, and resinous material intact. Some of the remains, human as well as animal, show evidence of burning.

All of the remains were commingled, not only with other human remains but with faunal remains, mummification materials (e.g., fragments of linen and resinous material), and fragments of wood. Because the tomb had been reused several times, and had also seemingly been looted, it is likely that the human remains are from various different time periods and phases of use.

### DISTRIBUTION OF REMAINS

By far the greatest number of human remains were recovered from within and in front of the accompanying tomb MMA 514a. However, it should be noted that due to the multiple reuses and disturbances of the tomb complex, the find-spot for these elements may have little or no relationship to their original deposition. The remains from the main tomb (MMA 514) could have been brought to the courtyard during the reuse, possible looting, or earlier excavation of the tomb (in other excavations, Winlock was known to dump his excavation debris just outside the entrance of the tomb being excavated, P. Chudzick, personal communication, 2018).

It is not yet clear whether the fragmented individuals from the MMA 514 complex are from the same time period (presumably the last use of the tomb) or

from earlier or different time periods. Winlock noted that the nearby tomb of Ipy (now termed Theban Tomb 315) had smaller rock-cut chambers around it for family members and “vassals” (Winlock 1922: 33). It maybe that some of the individuals found in and around this tomb may have been members of a family group. However, given the multiple reuses of the tomb, such relationships must remain the stuff of speculation at present.

### METHODS

In cases of commingled remains, the standard bioarchaeological practice is to calculate the minimum number of individuals (MNI) that are represented in an archaeological assemblage (Adams and Byrd 2014; Osterholtz, Baustian, and Martin 2014). Though there are some variations in the methods for calculating MNI (Buikstra and Ubelaker 1994; Knüsel and Outram 2004; Osterholtz forthcoming), this number is broadly calculated by assessing specific portions of a skeletal element that bear identifiable, unique features that are not duplicated in a single element (Adams and Byrd 2008; Osterholtz, Baustian, and Martin 2014). This precludes the possibility of counting one individual more than once. It should be noted, however, that MNI tends to underestimate the actual number of individuals that were originally present, since it cannot account for unmatched bones, but only yields the minimum number of bodies that could have produced the observed skeletal material (Adams and Byrd 2008; Osterholtz, Baustian, and Martin 2014).



Age and sex were noted when possible, but a detailed assessment of age and sex was not possible within the brief study season. Age was broadly assessed (i.e., adult versus subadult) based on standard osteological methods for observing epiphyseal closure of long bones and dental eruption (Buikstra and Ubelaker 1994). While such standards are very useful for providing general age estimates, more precise age estimates should rely on population-specific standards whenever possible, particularly in cases of commingled or pathological remains (Buikstra and Ubelaker 1994).

Sex was assessed based on standard osteological methods for assessing sex-specific morphological features of the *os coxa* (Buikstra and Ubelaker 1994). In many commingled or highly fragmented assemblages where sex-specific morphological features of the *os coxa* are unobservable, metric methods may be used to assess biological sex with a moderate

degree of accuracy (Marlow 2016; Marlow and Kozieradzka-Ogunmakin 2016).

**RESULTS**

Based on the identification of unique elements (in this case, the distal right femur), a minimum of at least nine individuals is present (MNI = 9). Preliminary assessment of age at death indicates that most of the individuals were adults. At least one of the nine individuals was a subadult at the time of death, likely in his or her mid- to late teens, as indicated by the completely unfused distal epiphyseal surface of a right femur discovered in the entrance corridor of MMA 514a (Buikstra and Ubelaker 1994). A subadult left distal femur from Sector A4, of approximately the same size and shape and also with an unfused distal epiphyseal surface, may belong to the same individual. Other elements from a similarly-aged subadult (e.g., vertebrae, fragments of the *os coxae*) may also derive from the same



Fig. 3. Fragments of an infant cranium, as well as the occipital portion of four different adult crania (Photo R.A. Campbell)

individual, as there are no duplicated elements. An infant is represented only by cranial fragments found in front of Tomb 514a [Fig. 3]

Morphological assessment of *os coxa* fragments indicates that at least one individual was likely a male (Buikstra and Ubelaker 1994). The fragmentary nature

of the remains and the short study season precluded more specific analysis, but future work will assess the possibility of using metric analysis for sex estimation in cases where the morphology of the *os coxa* cannot be evaluated due to taphonomic damage or fragmentation (Marlow 2016; Marlow and Kozieradzka-Ogunmakin 2016).

## DISCUSSION

The layered and multi-faceted history of MMA 514 complicates attempts to understand the depositional sequence of the human remains that have been found in and around this tomb. While it is clear from other artifacts that the tomb was used for burial at least three different times in antiquity, it is not yet clear which individuals were interred in which time period. It may also be that none of the original Middle Kingdom inhabitants are present, having been removed from the tomb during reuse, looting, or excavation, an explanation that could also apply to the interred from the second reuse of the tomb during the Eighteenth Dynasty (Chudzik 2015; 2017; 2018; Winlock 1922). It is also possible, however, that the original human remains were simply moved aside to make way for the new burials, and that over time the original occupants were mixed with all of the subsequent tomb usurpers.

The range of taphonomic changes observed in the human remains, ranging from highly weathered skeletal elements to very well-preserved fragments of mummies still retaining soft tissue, may correlate with the various stages of the tomb complex's reuse and excavation. If the human remains were removed from

the tomb before it was reused, as Winlock (1922) suggests, the newly interred remains would display less weathering than their older counterparts. Alternatively, the wide variation in preservation as well as the high degree of fragmentation could be at least partly attributed to Winlock's excavation practices (that is, the remains that were dumped outside the tomb and then covered by more excavation debris throughout the work season would be better preserved than those remains left exposed to Egypt's hot sun). Evidence for burning on some of the remains is almost certainly a mark of looting, as grave robbers were known to burn human remains as they attempted to remove the resin or any jewelry attached to the mummy (Winlock 1922).

The age range observed in the human remains from MMA 514 could support the interpretation of similar Middle Kingdom (especially Eleventh Dynasty) tombs as family burial places, a practice that was adopted at least during the Third Intermediate Period and likely earlier (Winlock 1922). Because DNA analysis of the remains is not currently possible, however, such relationships must remain in the realm of conjecture at this stage of the research.

## CONCLUSIONS AND FUTURE WORK

The heterogenous, commingled nature of the archaeological deposits from MMA 514 requires a thorough understanding of the various phases of use and excavation of this tomb, as well as its broader place in the North Asasif Necropolis. This information cannot (and should not) be divorced from the analysis of the human remains themselves, as such contextual information yields information about how, why, and when these remains were placed within the tomb.

The 2017 study season was brief, and thus focused on an inventory and general understanding of the human remains from MMA 514 in order to provide directions for future research. A primary focus in future seasons will be completion of the inventory of human remains, using methods such as those outlined by Osterholtz (forthcoming). Age and sex will be assessed in more detail, and a complete study of pathology and trauma will be conducted. Plans are underway to also use radiographic analysis to gain additional information about the remains, particularly since so many of the elements are still encased in mummified tissue and linen. Examination of the stylistic elements of mummification techniques

used (e.g., method of wrapping, general quantity of resin applied, etc.) in some of the well-preserved individuals may provide a better indication of the relative dates that the remains were placed in the tomb (Ikram 2015; Ikram and Dodson 1998).

Although the work presented here is only preliminary, it offers tantalizing clues about the use of the tomb MMA 514 and the Asasif Necropolis as a whole. If the human remains date from the same or similar time periods, the presence of individuals of varying ages may suggest that tombs were used by families or kin groups. If, however, the human remains date from different time periods, this suggests that tombs were not necessarily emptied when they were reused, but rather that the new burials were simply placed into the tomb while the original occupants were still present. On a broader level, this study also demonstrates the value of analyzing remains that are not only fragmentary and commingled, but that were discarded or ignored by previous researchers. Even in another excavator's trash, much may be learned about the funerary practices, lives, and deaths of the ancient Egyptians.

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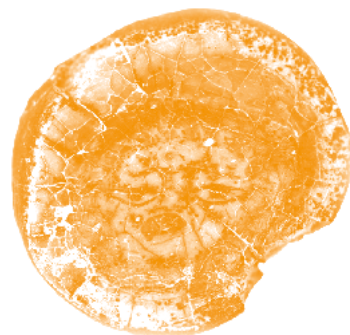
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# Beads and pendants from the Hellenistic to early Byzantine Red Sea port of Berenike, Egypt Seasons 2014 and 2015



**Abstract:** Almost 650 beads and pendants, most of them of glass and faience, were excavated over two seasons in 2014 and 2015 at Berenike on the Red Sea coast of Egypt. This material, coming from 19 trenches variously located within the Hellenistic to early Byzantine site, has contributed some new data, enhancing the Berenike bead typology. Highlights included a Bes pendant of glass from a Hellenistic context and early Roman mosaic glass beads with face patterns. Other materials of which the ornaments were made included marine mollusk shells, ostrich eggshell, and a variety of stone and minerals. Of greatest interest were beads coming from early Roman graves, of an older man (the order of the threaded beads could be traced) and of animals (neck collars). Beads threaded on fragments of string, most probably of Indo-Pacific make, came from the early Roman rubbish dump.

**Keywords:** Berenike, Red Sea port, Red Sea trade, Indian Ocean trade, Ptolemaic, early Roman, late antiquity, Roman, Bes amulet, face beads

Glass beads have become increasingly useful in reconstructing trends in material culture as well as changing exchange network patterns. In recent years, the study of glass beads using a combination of observation and compositional analyses has expanded tremendously (e.g., Then-Obluska and Dussubieux 2016; Then-Obluska and Wagner 2017; Pion and Gratuze 2016). Compositional analysis of the glass of the Berenike beads is not possible at present, hence this paper provides an overview of almost 650 beads and pendants from two seasons of archaeological fieldwork in 2014 and 2015 at this harbor site on the Red Sea coast of Egypt based on macroscopic studies.

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All photos and arrangements in Figs 2 to 13 by Joanna Then-Obluska and the Berenike Project. The beads are presented in the figures arranged first by archaeological areas excavated in the 2014–2015 seasons:

Hellenistic trash dump (BE14-95) – Figs 2 and 3A–B

Early Roman burial area (BE15-104) – Fig. 4

Early Roman trash dump (BE14-96) – Fig. 5

Early Roman animal cemetery (BE15-107) – Fig. 6A–B

Early Roman harbor (BE14-98, BE14-100, BE14-101, BE14/15-102, BE15-108, BE15-109) – Fig. 7

Late harbor temenos (BE14/15-61, BE14-99, BE15-103) – Fig. 8

Great Temple of Berenike (BE15-111 and BE15-112) – Figs 9A–B and 10A–B

Western complex (BE15-105) – Fig. 11

Northern architectural complex (BE15-110) – Fig. 12A–B

Late trash dump – surface find (BE10-59) – Fig. 13

Within each area/trench, beads are presented in the order of their register numbers, which code the locus first and subsequently the order of excavation.

Scale is 5 mm throughout the presentation.

Table 1. Number of bead and pendant finds, whole and fragmentary, by season and trench

Trench	Season	Season
	2014	2015
	N=264	N=383
BE10/15-59		1
BE14/15-61	2	4
BE14-80	12	
BE14-95	109	
BE14-96	109	
BE14-97	2	
BE14-98	7	
BE14-99	6	
BE14-100	7	
BE14/15-102	10	2
BE15-103		19
BE15-104		88
BE15-105		1
BE15-107		38
BE15-108		1
BE15-109		19
BE15-110		55
BE15-111		93
BE15-112		62

Beads were found in the following areas [Fig. 1]: Hellenistic trash dump (BE14-95) and urban fortifications (BE14-97), early Roman burials (BE15-104), early Roman rubbish dump and animal cemetery (BE14-96, BE14-80, BE15-107), early Roman western complex (BE15-105), early Roman harbor (BE14-98 and BE15-109, BE14-100, BE14/15-102, BE15-108), late harbor temenos (BE14/15-61, BE14-99, BE15-103), the Great Temple (BE15-111, BE15-112), the late phase of the northern architectural complex (BE15-110), and the late trash dump (BE10/15-59) (Zych et al. 2016). Table 1 gives an overview of bead quantities by trenches.

The following overview of Berenike beads and pendants is presented following a division into the main archaeological areas as indicated above, making use of the established site stratigraphy and current chronological attributions. The beads are described below in detail, and a vast majority has been illustrated in the plates.

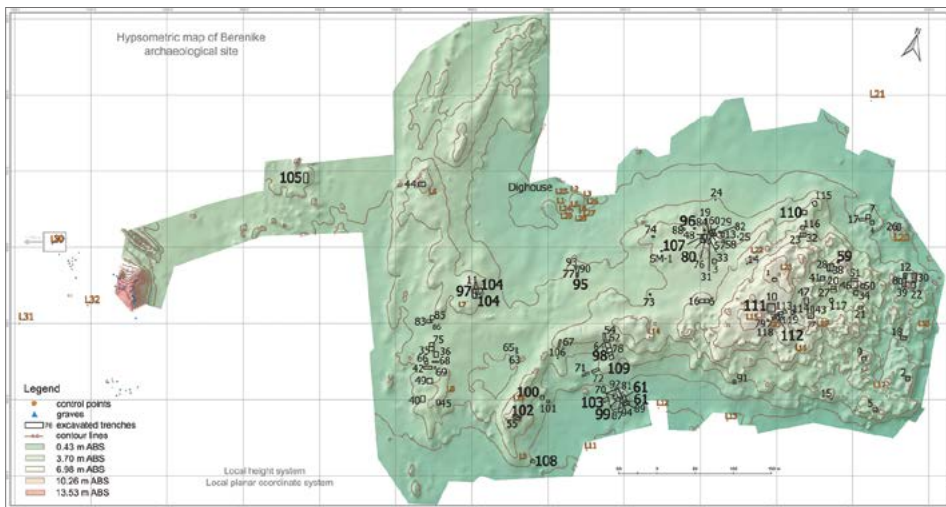


Fig. 1. Site of Berenike showing locations of archaeological areas and trenches. All trenches with bead finds from the 2014 and 2015 seasons in bold type (PCMA UW Berenike Project/map A. Szeszko)

## HELLENISTIC TRASH DUMP

The location of the Hellenistic trash dump identified in an earlier season (BE11-77) was explored further in a directly adjacent trench **BE14-95**. Pottery was found in abundance, as were all categories of finds expected from a domestic refuse dump. The ceramics, including a few stamped amphora handles, were dated to the 3rd–2nd century BC (R. Tomber, in Zych et al. 2016: 326).

The Hellenistic rubbish yielded some perforated mollusk shell beads. A hole

was cut in two *Cypraea annulus* sp. [Fig. 3B:32, 33] and in nine *Marginella* sp. [Fig. 3B:36–38]. The latter specimens have been found in Meroitic tomb 192 at Sedeinga, Nubia (Then-Obluska 2015a: Fig. 2:c4/b).<sup>1</sup> Additionally, in two *Conus textile neovicarius* sp. [Fig. 3B:34, 35], and in one *Malea* sp. [Fig. 3A:20], a hole was drilled through the place where the apex had been removed. A small ostrich-eggshell bead is unusual in its square disk shape [Fig. 3B:39]. Usually ostrich-eggshell beads



Fig. 2. Glass Bes pendant (BE14-95/999/034) from the Hellenistic trash dump

<sup>1</sup> In Berenike's late trash dump from the 4th–6th centuries AD, shells of *Marginella* sp. were perforated at the place where the apex was removed (Then-Obluska 2015b: Fig. 1.6; 2017a).



Fig. 3A. Beads from the Hellenistic trash dump (BE14-95)

1-17	BE14-95/001/PB 01	21-22	BE14-95/004/PB 08
18	BE14-95/002/PB 03	23-24	BE14-95/005/PB 07
19	BE14-95/999/PB 37	25-27	BE14-95/010/PB 13
20	BE14-95/004/PB 06	28-30	BE14-95/013/PB 16

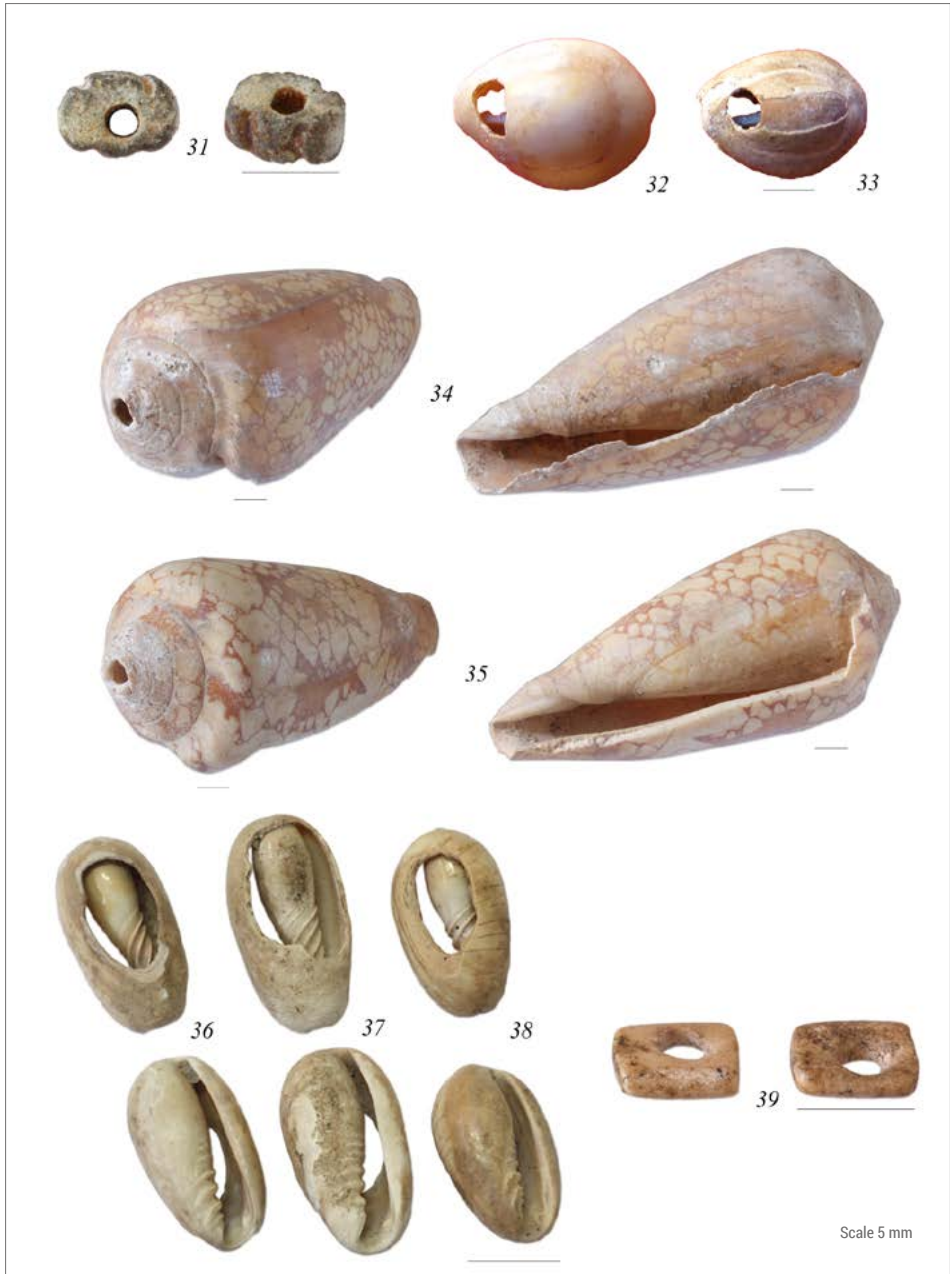


Fig. 3B. Beads from the Hellenistic trash dump (BE14-95 continued)

- 31-33 BE14-95/013/PB 16
- 34 BE14-95/015/PB 18
- 35 BE14-95/017/PB 22
- 36-39 BE14-95/019/PB 24



are found in late Roman/post-Meroitic contexts and are shaped into round disks (e.g., Then-Obluska 2015b; 2017a).

Roughly shaped tiny light red quartz and agate oblates are among the beads made of stone. Traces of saw marks can be observed across the larger hole opening, where the groove facilitated setting the drill [Fig. 3A:1–3, 23–27]. This is a technique that continues into the early Byzantine/post-Meroitic period in Egypt and Nubia (Then-Obluska 2015b) and these tiny stone types are already known from other Hellenistic contexts at Berenike (Then-Obluska 2015b; 2017a). Moreover, two bicones were drilled from both ends and their sides were polished [Fig. 3A:21, 22].

Faience beads dominated the bead assemblage in BE14-95. 78 short cylinders and rings are blue, green and red in color

[Fig. 3A:7–17, 28–30]. One of them was additionally shaped [see Fig. 3B:31].

Drawn-glass beads are dark blue or colorless [Fig. 3A:6, 18], and green (not illustrated). Opaque green oblates [Fig. 3A:4, 5] and a translucent purple bicone [Fig. 3A:19] are rod-formed beads.

A small pendant of blue glass was shaped into a Bes figure [Fig. 2]. The pendant is flat with details impressed on both sides. A lateral perforation runs through the neck. The feather crown is at the top. The sketchiness of the Berenike specimen differs from molded glass examples from Graeco-Roman Egypt (Arveiller-Dulong and Nenna 2011: 295, Cat. 474) and it has some local traits which look similar to bone and stone Bes amulets found in Nubia and dated to the Third Intermediate and Napatian Periods (Petacchi 2014; Then-Obluska 2016).

## HELLENISTIC URBAN FORTIFICATIONS

The Ptolemaic urban defenses encompass the rock-cut shaft water collection system that dates to the 3rd century BC and the gatehouses that formed part of the Hellenistic fortifications (trench BE14-97). In early Roman times, as indicated by the stratigraphy of the remains, these features were deserted (Zych et al. 2016).

The few beads picked up in trench BE14-97 are carnelian oblates with traces

of the use of a saw across the larger hole opening, a blue faience ring, and a triple-segment of colorless drawn glass (not illustrated).

A marine mollusk shell of *Malea* sp. (BE15-104/97/045/PB 71, not illustrated here) has its apex removed and a hole drilled through it (compare above for *Malea* sp. from Hellenistic trench BE14-95).

## EARLY ROMAN BURIALS

The ruins of the Hellenistic urban fortifications in trench BE15-104 offered a good location for early Roman burials (Zych et al. 2016: 325). While a green bead found in locus 2 is a modern specimen [Fig. 4:1], a long agate bead from locus 5 might be an early Roman specimen [Fig. 4:2].

The burials were made in the early 1st century AD, as indicated by the trench stratigraphy (Zych et al. 2016: 326). One of them, a burial of an older male, preserved traces of a long robe or shroud in which he had been buried, with several dozen beads which appeared to form two



Fig. 4. Beads from the early Roman burial area (BE15-104)

- 1 BE15-104/002/PB 03
- 2 BE15-104/005/PB 07
- 3-32 BE15-104/036/PB 63 (=Grave 38)

long strings around his neck. An iron ring with a key was suspended on one of these strings. The beads were made of stone, glass and gold-in-glass. Among the stone beads, truncated bicones of amethyst [Fig. 4:3–6] and long barrels of onyx were both perforated from both ends [Fig. 4:24–28]. Red agates were shaped into globular beads [Fig. 4:7–9]. Smaller agates were irregularly shaped [Fig. 4:10–15]. Both agate types bore traces of sawing across the larger hole opening, where the notch facilitated setting the drill. The same feature can also be observed on red agate short bicones [Fig. 4:16–23]. These agate beads were perforated using the Egyptian or Nubian technique (compare above). Among the glass specimens, a mosaic glass cane section was folded into a banded bead [Fig. 4:29], and

a drawn bead was decorated with mosaic eyes [Fig. 4:30]. The color of many drawn and rod-formed glass beads cannot be estimated due to their erosion [Fig. 4:31]. Although heavily eroded, some beads can be identified as segments of metal-in-glass tubes thanks to their visible layered structure [Fig. 4:32]. Production of mosaic glass, drawn and segmented glass beads, including gold-in-glass ones, has been documented from Alexandria, Egypt (Kucharczyk 2011a; 2011b).

A general pattern in bead arrangement could be discerned. Large beads made of onyx were found alternating with many small ones. The composition of small beads consists of amethyst or agate bicones alternated with a few beads made of glass or gold-in-glass beads.

## EARLY ROMAN TRASH DUMP

The early Roman rubbish dump, trench **BE14-96**, yielded several dozens of beads and pendants of various materials. A Red Sea mollusk shell belongs to *Engina mendicaria* sp. (BE14-96/014/PB 22, not illustrated). In contrast to the late Roman specimen, which was perforated in the area of the removed apex (Then-Obluska 2015b: Fig. 1.5; 2017a), it has a hole in the whorl.

The faience beads, 29 in all, are tiny, blue and black short to standard cylinders [Fig. 5:9, 10, 14, 19] and larger black short bicones [Fig. 5:15–17]. Both shapes, in many colors, have been documented in early Roman contexts in the Berenike and Marsa Nakari assemblages (Then-Obluska 2015b; forthcoming). A Bes pendant fragment made of faience was green-glazed and decorated with yellow

spots [Fig. 5:18]. Green-glazed Bes pendants with yellow decoration are also well known early Roman amulets, although often reused in later contexts (Then-Obluska 2017b; 2017c: Fig. 10:6).

Moreover, the excavations of the early Roman rubbish dump have brought to light two outstanding finds in the form of threaded drawn-glass beads. These were red beads still on their string [Fig. 5:3], as well as yellow and dark purple to black beads on a string fragment [Fig. 5:1]. Based on the technique of production, drawn and rounded glass beads have been associated with South Asian/Indian workshops. Francis (2002) called all such beads ‘Indo-Pacific’ and argued that they were produced only at Indian and Sri Lankan sites. South Asian glass beads constitute about 50% of the late 4th–6th century AD

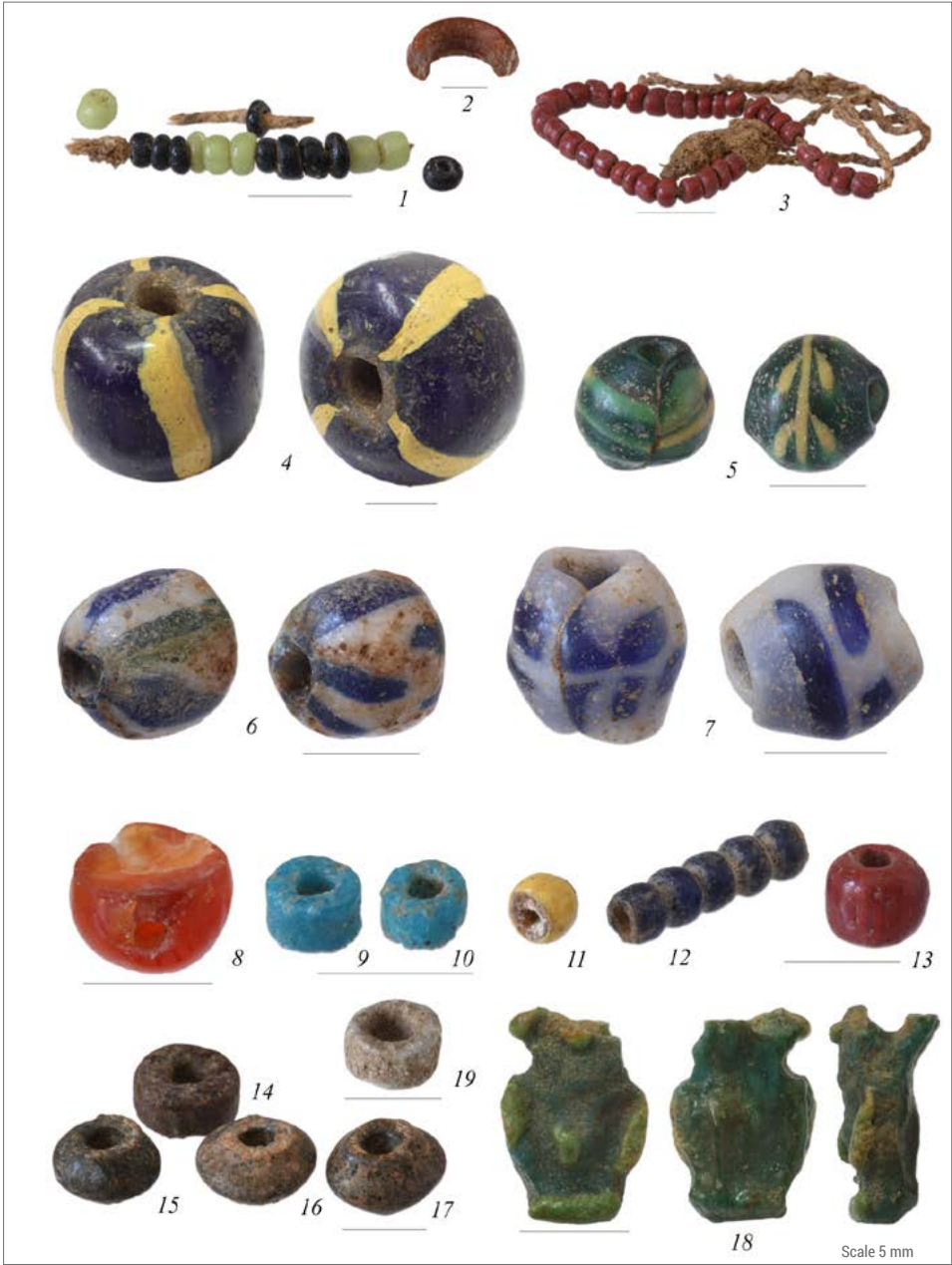


Fig. 5. Beads from the early Roman trash dump (BE14-96)

1	BE14-96/005/PB 07	14-17	BE14-96/010/PB 17
2-3	BE14-96/006/PB 08	18	BE14-96/013/PB 20
4-10	BE14-96/006/PB 10	19	BE14-96/999/PB 29
11-13	BE14-96/006/PB 11		

bead assemblages at Berenike and Marsa Nakari. While blue/green and orange colors make up the bulk of beads on Sri Lanka, dark blue, red, black, and violet colors dominate the Arikamedu bead assemblages (Francis 2002). A more specific provenance of the objects must remain uncertain as these beads have not been analyzed in the laboratory. In contrast to the late period (late 4th–6th centuries AD), when Indo-Pacific glass beads constituted a large share of the Berenike bead assemblage, only a dozen Indo-Pacific specimens have been recorded so far in the early Roman trenches (Francis 2002; Then-Obluska 2017a).

Some monochrome glass beads were made by segmenting drawn-glass tubes into single- or multiple-segments [Fig. 5:13, 12 respectively]. Compound drawn-glass beads are made of drawn and segmented tubes that consist of two glass layers: inner and outer. The inner layer is usually colorless. The outer layer can be monochrome, monochrome with applied longitudinal trails, or it can be striped. A tiny bead has a colorless core covered with a yellow layer [Fig. 5:11]. Another bead is made of a translucent greenish core covered with a white and blue striped layer [Fig. 5:6]. A large com-

pound bead has four yellow stripes on a black layer, which then covered an inner layer of colorless glass [Fig. 5:4]. In general, compound beads have already been recorded from early Roman contexts at Berenike and elsewhere (Then-Obluska 2015b; 2017a).

One bead was made of a folded mosaic yellow strip with a pattern of a green bay leaf branch [Fig. 5:5]. A similar pattern is known from other Roman sites (Arveiller-Dulong and Nenna 2011: 205, Cat. 277.17 yellow, with a green branch; Mandruzzato 2008: 158, Type 3; Alekseeva 1982: Fig. 48: 18, Type 417 dated to the 1st century AD; Berlev and Hodjash 1998: Pl. 175: XIV.151 Roman Period). A mosaic green band with a yellow branch was applied to a red ball bead, which was found in a 1st century AD tomb at Meroe (Dunham 1957: 133, Fig. 89. B8, Pl. LXVIIB =MFA 24.770). Imported mosaic glass beads decorated with vegetal pattern were also found in Tomb 6 at Ona Enda Aboy Zewge, Bieta Giyorgis, Aksum (about 50 BC–AD 150) (<http://193.205.136.29/metarchive2/content/indagini-archeologiche-nellarea-di-aksum-ethiopia>). Another bead is made of a folded mosaic glass strip. The strip is white with blue strokes [Fig. 5:7].

## EARLY ROMAN ANIMAL CEMETERY

The animal cemetery, located in and around trench BE12-80, continued to be explored in the 2014 season (BE14-80) and was extended northward in 2015 (BE15-107) (Zych et al. 2016: 316ff.; Sidebotham and Zych 2012: 38 and Fig. 23). Most of the burials were felines of a fairly young age or they were mother cats with kit-

tens. Dogs, mostly young, had a fair representation as well. The burials of a baboon and a few vervet monkeys were also found, two with iron collars around their necks (Zych et al. 2016), one even furnished with gold-in-glass beads [Fig. 6A:4].

Trench BE14-80 also contained two Red Sea mollusk shells of *Marginella* sp.



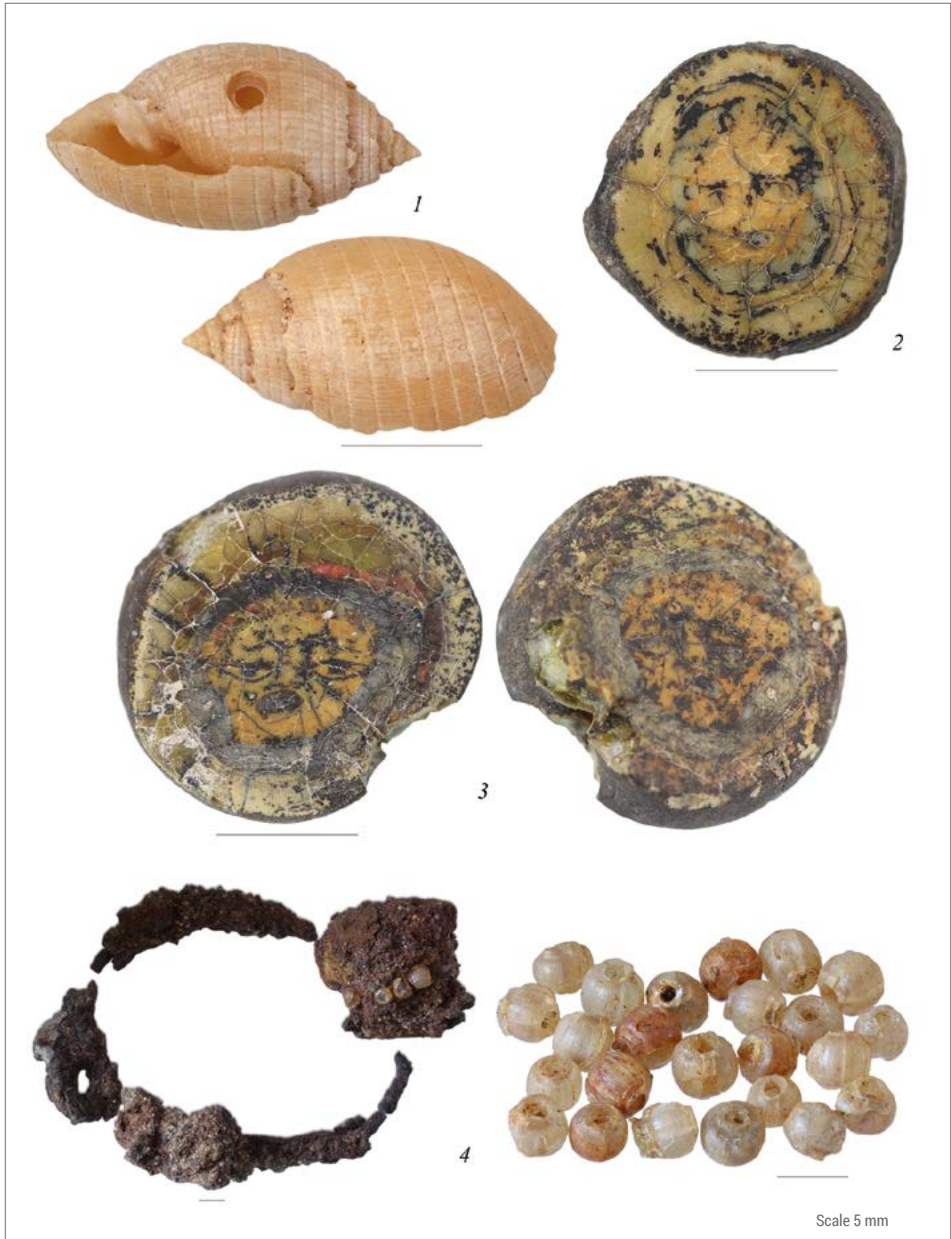


Fig. 6A. Beads from the early Roman animal cemetery (BE15-107)

- 1-3 BE15-107/001/PB 01
- 4 BE15-107/003/PB 06



Fig. 6B. Beads from the early Roman animal cemetery (BE15-107 continued)

5-11

BE15-107/033/PB 48

with their whorl perforated (BE14-80/018/PB 01, not illustrated), one truncated conical bead made by perforating the apex of a *Conus* sp. (BE14-80/018/PB 03, not illustrated), one agate bead with traces of a saw across the hole opening (BE14-80/013/PB 02, not illustrated), and eight faience disk beads (BE14-80/013/PB 02, BE14-80/018/PB 05, BE14-80/023/PB 13, not illustrated).

Trench BE15-107 provided a perforated Red Sea mollusk shell of a *Pupa* sp. [Fig. 6A:1]. The hole on the last whorl of the spire was actually made by another gastropod, but it is not certain that the shell was used for beadwork.

Next to two monochrome drawn-glass beads [Fig. 6B:10, 11] there were also seven

beads made of rod-pierced mosaic glass cane sections with a face pattern [Figs 6A:2, 3, 6B:5–9]. They were found completely obscured by blackish grime and their coloring is indiscernible despite some cleaning. Two round tabular beads, such as these, were found nearby in the 2012 season (Then-Obluska 2015b: Fig. 5.40–41). Tabular face beads are known from early Roman sites in Europe, Northeast Africa, the Levant, Arabia and Asia (Then-Obluska 2015b with references). According to Robert K. Liu (2014), the face belonged to Medusa, which could also be seen as representing either a woman or a Gorgon.

## EARLY ROMAN HARBOR

In the early Roman harbor area, inside the southwestern bay, work continued in the eastern (trenches BE14-98 and BE15-109) and southern (trenches BE14-100, BE14-101 (no bead finds), BE14/15-102 and BE15-108) parts of the bay.

A sectioned area in the northwestern corner of BE15-109 revealed large bivalve shells, very likely one of the pearl oysters of *Pinctada radiata*. The archaeological remains suggest that the shelters built on this side of the Berenike bay were perhaps used by merchants or ship agents (possibly of Indo-Pacific origin), rather than by simple sailors and harbor workers (Zych et al. 2016). Deep excavations in BE15-109 recorded no activity in this part of the harbor prior to the early Roman period (1st–2nd centuries AD). In addition, excavations in this trench, and in adjacent ones in previous seasons, recorded no activity in this part of the harbor after

the 2nd century AD (Zych et al. 2016).

Five drawn blue short bicones [Fig. 7:2–6] and a large double-segment made of gold-in-glass [Fig. 7:1] were found in trench BE14-98. An orange bead is a modern intrusion into this area [Fig. 7:7].

Among the beads from trench BE15-109 there is a piece made of a worked and pierced apex of *Conus* sp. [Fig. 7:17]. This type has already been recognized from other contexts at early Roman Berenike and Marsa Nakari (Then-Obluska 2015b: Fig. 1.1; forthcoming: Fig. 2.3). The organic material of one specimen has not been identified [Fig. 7:32]. Seven small short cylinder blue and red beads are made of faience [Fig. 7:14, 18, 24, 25, 29–31]. A few beads are made of drawn glass. Rounded ends can be observed on a yellow and a blue one [Fig. 7:15, 21], and a translucent dark green one is a single-segment bead [Fig. 7:33]. A larger example of a drawn



Fig. 7. Beads from the early Roman harbor (BE14-98, BE14-100, BE14-102, BE15-108, BE15-109)

1	BE14-98/002/PB 10	19-20	BE15-109/004/PB 35
2-5	BE14-98/004/PB 06	21	BE15-109/005/PB 32
6-7	BE14-98/014/PB 25	22	BE15-109/006/PB 73
8	BE14-100/001/PB 01	23	BE15-109/014/PB 50
9	BE14-100/015/PB 19	24	BE15-109/014/PB 78
10-12	BE14-102/015/PB 16	25	BE15-109/017/PB 37
13	BE15-108/999/PB 19	26-27	BE15-109/017/PB 55
14-15	BE15-109/001/PB 01	28	BE15-109/020/PB 67
16	BE15-109/002/PB 02	29	BE15-109/022/PB 83
17	BE15-109/004/PB 01	30-31	BE15-109/027/PB 87
18	BE15-109/004/PB 24	32	BE15-109/029/PB 05
		33	BE15-109/999/PB 71

opaque green bead was decorated with three (two preserved) mosaic eyes in black and yellow [Fig. 7:20]. Three beads, a blue, a cobalt blue, and a red one, also come from this locus [Fig. 7:19, 22, 27]. Among four drawn gold-in-glass beads is a large globular single-segment, a long tubular single-segment, and two beads with barely finished ends [Fig. 7:16, 23, 26, 28 respectively].

Some walls preserved in **BE14-100** (and **BE14-101**) were of unknown function, probably related to administrative buildings within the harbor. Beryls and pieces of what appeared to be peridot were also recorded from this area (Zych et al. 2016). In addition to a cowry shell with a cut hole (BE14-100/015/PB 19, not illustrated), two faience short-cylinder beads (BE14-100/003/PB 04, BE14-100/009/PB 08, not illustrated), two biconical whitish glass (BE14-100/001/PB 02, not illustrated) and a long pentagonal purple glass bead [Fig. 7:8] were found in the trench. One bead appears to be a modern intrusion [Fig. 7:9].

Trench **BE14/15-102** was located directly next to trench BE09-55 and yielded two finely carved ring intaglios of the turn of the 1st century BC and 1st century AD, their dating based on stylistic features (Zych et al. 2016). Four faience ring beads, a small faience melon bead [Fig. 7:10], and an agate bead with traces of sawing were found in addition to two double-segments of gold-in-glass [Fig. 7:12]. A globular glass fragment might be a decorative element rather than a bead [Fig. 7:11].

Excavations in trench **BE15-108**, at the extreme southwestern portion of the southwestern harbor, documented many long iron nails and fixtures in a spot of heavy burning, which could have been a large wooden chest (I. Zych, personal communication). A hearth was located nearby, but there was no evidence of production of any kind. A single bead out of context in this area was made of drawn green glass [Fig. 7:13].

## LATE HARBOR TEMENOS

Clearing of the general area of the apparently semi-insular harbor temenos, located in the entrance to the southwestern bay, revealed an oil-lamp fragment confirming occupation in the 4th–6th century AD (trench **BE14/15-61**).

A small faience ring [Fig. 8:6] and a fragment of a large faience melon bead [Fig. 8:1] were found in loci 169 and 135, respectively. The latter type is usually dated to the early Roman period (Arveiller-Dulong and Nenna 2011; Lankton 2003: Pl. C2.583; Berlev and Hodjash 1998: Pls 195–197, 1st–2nd centuries AD; Then-Obluska

forthcoming; Fig. 2.15 Marsa Nakari), although alleged earlier specimens have been published (Arveiller-Dulong and Nenna 2011: Cat. 295, 4th–2nd centuries BC). Small carnelian beads of an irregular oblate shape and highly polished sides, as well as a white chalcedony short bicone bead featuring traces of sawing, are early Roman types [Fig. 8:2–4]. A short cylinder bead was made of a marine mollusk shell [Fig. 8:5]. A small blue-green bead was made of drawn glass [Fig. 8:7] and it is late Roman in date unlike the rest of the beads from this context.



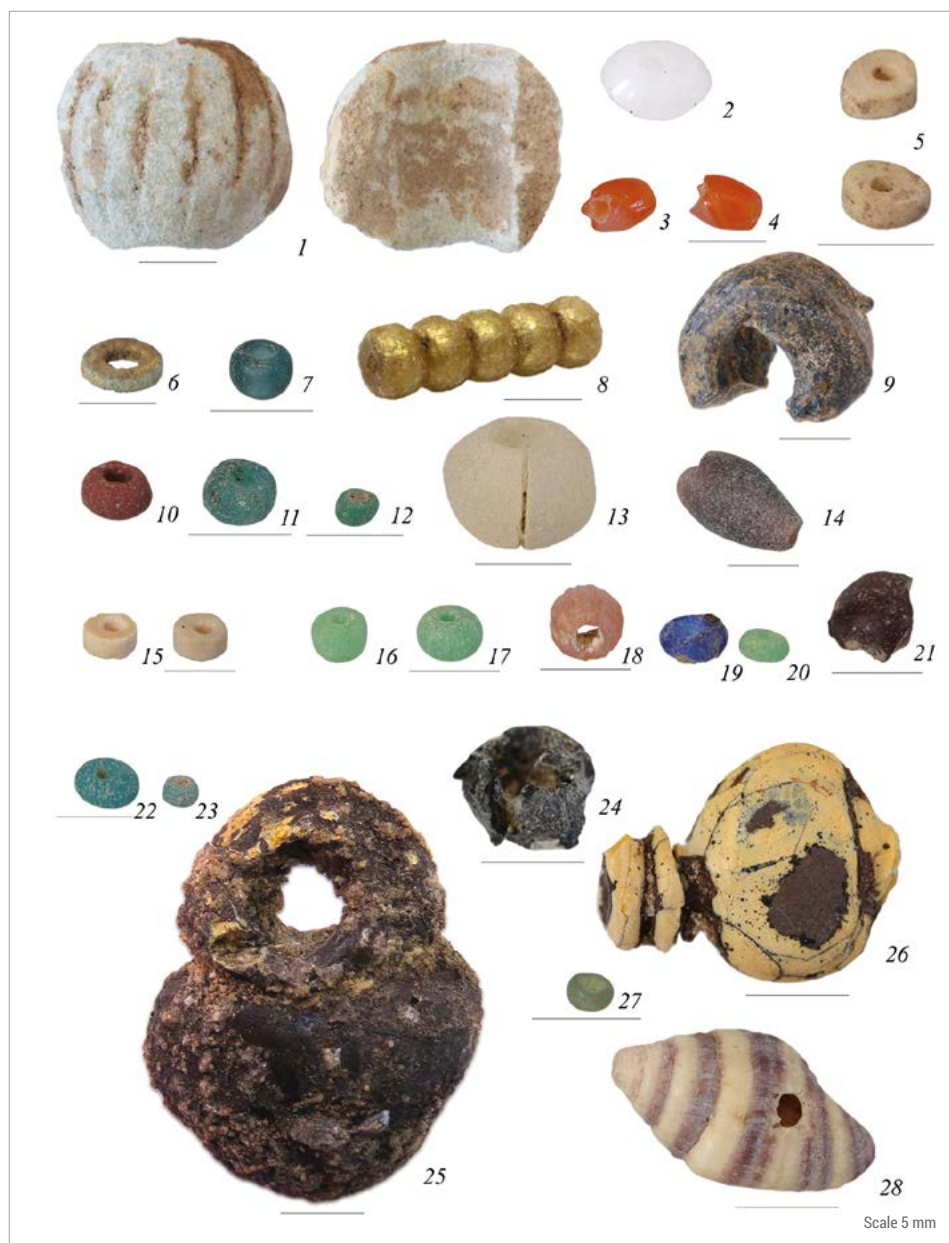


Fig. 8. Beads from the late Berenike harbor temenos (BE14/15-61, BE14-99, BE15-103)

1	BE14-61/135/PB 01	15	BE15-103/012/PB 10
2	BE14-61/139/PB 17	16-17	BE15-103/012/PB 14
3-4	BE15-61/168/PB 14	18	BE15-103/013/PB 11
5	BE15-61/168/PB 31	19-21	BE15-103/014/PB 12
6	BE15-61/169/PB 26	22-23	BE15-103/015/PB 15
7	BE15-61/169/PB 28	24	BE15-103/027/PB 27
8	BE14-99/004/PB 02	25	BE15-103/030/PB 43
9	BE14-99/012/PB 11	26	BE15-103/034/PB 38
10-11	BE15-103/001/PB 01	27	BE15-103/035/PB 39
12-14	BE15-103/002/PB 03	28	BE15-103/036/PB 40

The excavation in the Square Feature area concentrated at the front of the complex (trench **BE14-99**), where the collapsed blocks on either side of a central open space corresponding to a doorway were cleared. A few beads were picked up from trench **BE14-99**. These included two faience rings, two glass and one gold-in-glass bead. The quintuple-segment gold-in-glass bead [Fig. 8:8] is an early Roman type, accompanied by a fragment of a glass loop belonging to a large globular pendant [Fig. 8:9] (compare below).

Of particular interest was the find of 40 raw garnets in subsidiary buildings around this area in trench **BE15-103** (Zych et al. 2016). Otherwise the trench yielded types characteristic of late 4th–6th century assemblages: an ostrich-eggshell [Fig. 8:15], drawn and rounded green and blue glass beads [Fig. 8:12, 16, 17, 20, 22, 23], in

addition to drawn and segmented red, green, purple, and dark blue ones [Fig. 8:10, 11, 18, 19]. A large white bead was made of folded glass [Fig. 8:13].

A large pendant with a conical base and attached loop [Fig. 8:25] is a type already documented at Berenike (Then-Obluska 2015b: Fig. 5.1; 2017a: Fig. 14.19; 2017b: Fig. 1.23, 25–28, 31, 35, 36). A large gold-in-glass tabular bead with preserved double collar was found in locus 34 [Fig. 8:26]. Similar bead is illustrated from one of the Enda Semon excavation trench (ES) at Aksum (Morrison 1989: 173–174, Type XXII, Fig. 11-73), from the phase most probably dated to early 5th century at the earliest (Munro-Hay 1989: 127). A Red Sea mollusk shell *Engina mendicaria* has a hole cut in its last whorl and was found in locus 36 [Fig. 8:28].

## THE GREAT TEMPLE

Trenches **BE15-111** and **BE15-112** were placed in and at the eastern entrance to the Great Temple, the so-called Serapis Temple, now renamed the Berenike Isis temple on scholarly grounds. As can be observed in other Berenike trenches, the upper layers of trench **BE15-111** contained a mix of late and early Roman specimens.

A white globular bead, found in trench **BE15-111**, was made of a marine mollusk shell [Fig. 9A:1]. Such beads have already been recognized from late Roman assemblages at Red Sea and Eastern Desert sites (Then-Obluska 2017a: Fig. 13-3:12, 13 Berenike; 2017c: Fig. 7:20 Shenshef; forthcoming: Fig. 3.2 Marsa Nakari). Green, blue-green, blue, yellow, and black drawn and rounded glass beads are late

Roman types [Fig. 9A:17, 18, 33] (Then-Obluska 2015b; 2017a). The following glass beads have been noted: dark blue beads of drawn and segmented glass [Fig. 9A:2–4], rod-formed bicones [Fig. 9A:5, 6], globular beads made of opaque red wound glass [Fig. 9A:8] or translucent blue glass [Fig. 9B:85], and a “date” bead made of a rod-pierced green cone with a yellow upper portion, a cap [Fig. 9A:9].

Trench **BE15-111** is, however, dominated by early Roman specimens made of faience and gold-in-glass. Small white, red, black and blue-green rings (altogether 59) [Figs 9A:10, 14–16, 21–23, 26–28, 35–39; 9B:40–43, 46–56, 58–84, 90, 91] and a large melon bead were made of faience [Fig. 9A:11] (compare above).

A large collared bead with a tabular body and a double collar discerned at one end is made of gold-in-glass [Fig. 9A:7]. Other gold-in-glass beads are a small multiple-segment [Fig. 9B:89], large single-segments [Figs 9A:30; 9B:57, 88] and double-segments [Fig. 9B:86, 87]. An exceptional gold-in-glass type, a so-called granular bead, has a pattern of three rows of three bosses [Fig. 9A:29] and has been dated to the period between the 1st century BC to 1st century AD (Arveiller-Dulong and Nenna 2011: Cat. 196, 298.19) or the 2nd century AD (Spaer 2001: 137, Cat. 236a–b; Alekseeva 1978: Type 20, Pl. 26:59–61). These beads could have been of Persian, East Mediterranean or Black Sea littoral production (Spaer 2001: 137; Arveiller-Dulong and Nenna 2011: 151, 218).

The upper layers of trench BE15-112 (loculi 1 and 7) yielded many drawn-glass beads. The dark blue and some yellow ones are made of drawn and segmented glass [Fig. 10A:8, 16–23, 30, 31, 35]. Green, blue, blue-green, yellow and black beads are made of drawn and rounded glass [Fig. 10A:10–15, 32, 33, 46]. Both types and all colors have been confirmed from late, 4th to 6th century AD contexts (compare above). They were, however, found mixed with eroded faience ring beads of Ptolemaic/early Roman origin [Figs 10A:1–6, 28, 29, 40–45; 10B:47, 50–53, 57].

Additionally, beads made of folded glass were found: a green and yellow “date” bead and a green bicone [Fig. 10A:24, 25], as well as tiny dark blue and green cornerless cuboids [Fig. 10A:9, 36] also belong to late Roman types.

Late Roman types encompass a perforated oblate bead cut from a marine

mollusk shell [Fig. 10A:26] and a Red Sea *Conus taeniatus* sp. shell with its apex ground down [Fig. 10B:49]. Similar specimens are recorded from late assemblages at Berenike (Then-Obluska 2015b: Fig. 1.13; 2017a). A truncated hexagonal bicone is made of carnelian [Fig. 10A:27].

A small black faience ring [Fig. 10B:57], a small biconical gold-in-glass bead [Fig. 10B:60], and a fragment of a large collared bead with a tabular body [Fig. 10B:59] were found together with a long hexagonal cylinder of green glass [Fig. 10B:54]. The latter is a type usually found in early Roman contexts (e.g., Then-Obluska and Dusubieux 2016).

A fragment of a blue faience bead with dotted-circle decoration of an impressed eye was picked up out of context [Fig. 10B:62]. A similar bead fragment was found at Marsa Nakari (Then-Obluska forthcoming: Fig. 2.16), and such beads have been observed at Ptolemaic and early Roman Egyptian sites (Brunton 1930: 27, Pls xlv–xlvi, 177, Ptolemaic or a little later – Qau; Brunton 1937: 140, Tomb 1102 – Mostagedda; Xia 2014: Type PD 53), in Meroitic graves (Griffith 1924: 115–125, 141–180, Pl. LXIII:10, 13, tombs 394 and 829, 1st century BC–1st century AD; Williams 1991: 115, Fig. 471 = Oriental Institute Museum, OIM E20523) and Blemmyan graves (OIM E20523), and the Nubian royal tombs of post-Meroitic period (Emery and Kirwan 1938: Pl. 48A [Cat. No. 163], Pl. 46D [Cat. No. 157], bead corpus No. 32 on Pls 43–44), and Blemmyan graves (OIM E42033, personal observation; it could be a reused Meroitic item).

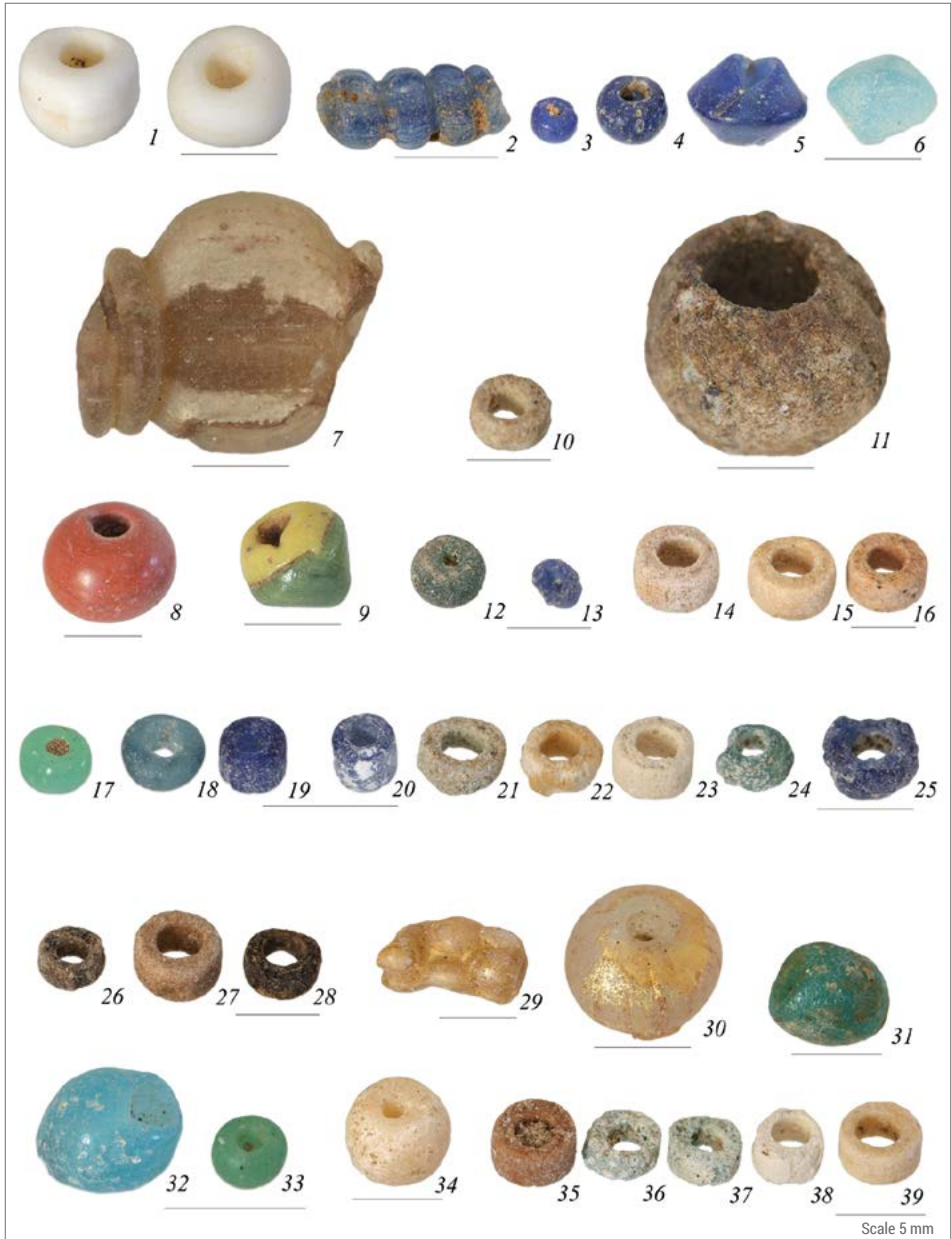


Fig. 9A. Beads from the Great Temple of Berenike (BE15-111)

1-9	BE15-111/001/PB 01	17-25	BE15-111/004/PB 05
10-11	BE15-111/002/PB 02	26-34	BE15-111/005/PB 06
12-13	BE15-111/002/PB 03	35-39	BE15-111/005/PB 07
14-16	BE15-111/003/PB 04		

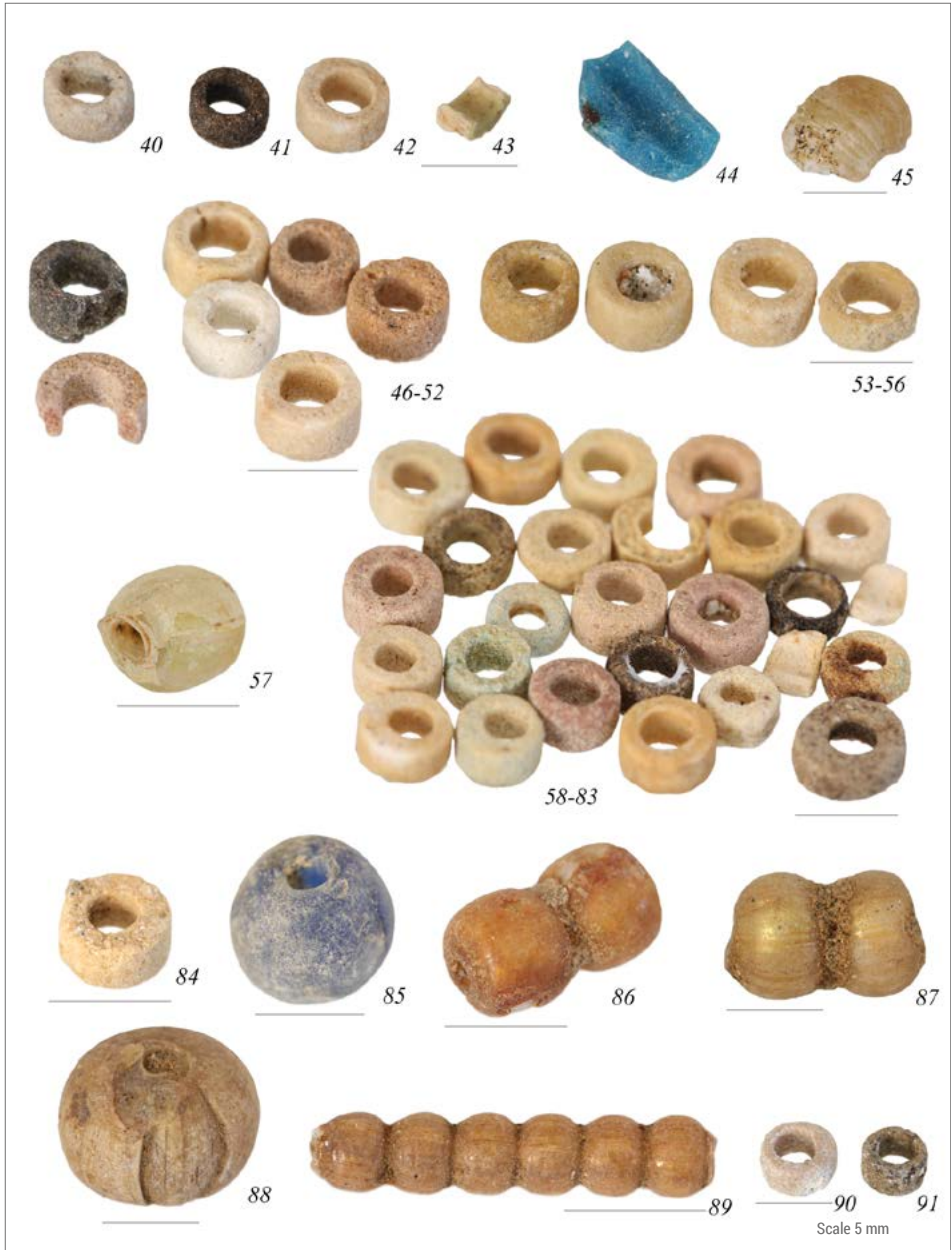


Fig. 9b. Beads from the Great Temple of Berenike (BE15-111 continued)

40-45	BE15-111/008/PB 11	85	BE15-111/011/PB 18
46-52	BE15-111/008/PB 13	86	BE15-111/014/PB 20
53-56	BE15-111/009/PB 08	87	BE15-111/015/PB 39
57-83	BE15-111/011/PB 14	88-89	BE15-111/999/PB 30
84	BE15-111/011/PB 15	90-91	BE15-111/999/PB 12





Fig. 10A. Beads from the Great Temple of Berenike (BE15-112)

1-25	BE15-112/001/PB 01	40-41	BE15-112/007/PB 09
26-38	BE15-112/001/PB 02	42-46	BE15-112/007/PB 06
39	BE15-112/005/PB 04		



Fig. 10b. Beads from the Great Temple of Berenike (BE15-112 continued)

47-48	BE15-112/008/PB 07	60	BE15-112/010/PB 27
49	BE15-112/009/PB 19	61	BE15-112/014/PB 22
50-59	BE15-112/010/PB 14	62	BE15-112/999/PB 11

## WESTERN COMPLEX

Excavation of the foundations of a long, narrow building with three internal rectangular shaped podia (trench **BE15-105** and extensions) at the northwestern edge of the site revealed nothing of its function, since it had been cleared almost completely of any finds by heavy surface

erosion. The paltry few finds from the foundations did indicate, however, that its latest use was in the Augustan age (Sidebotham 2016). A perforated shell of a Red Sea bivalve mollusk was picked up in locus 31 [Fig. 11].

## NORTHERN ARCHITECTURAL COMPLEX

Excavation of trench **BE15-110** was aimed at testing a large northern architectural complex at the northeastern edge of the town. The results clearly indicated architectural and urban planning continuity between the late period remains on top and the early Roman (and possibly Ptolemaic) houses found underneath. The later 5th and 6th century layers were examined inside a chamber with a niche found in part of this complex (Zych et al. 2016).

Green and yellow drawn and rounded glass beads were found in loci 1 and 2 [Fig. 12A:2, 3, 8]. Green Indo-Pacific beads are usually found at late Roman coastal and desert sites, as well as at post-Meroitic

Nubian Nile Valley sites (Then-Obluska 2015a; 2017c; Then-Obluska and Wagner 2016). The mosaic glass of one green and yellow striped bead with red center [Fig. 12A:1], as well as a green fragment of what probably was a “date” bead [Fig. 12A:4], are documented from other late Roman/post-Meroitic assemblages (Then-Obluska 2017b: Fig. 1:44 and references for the striped one).

Other glass beads are early Roman in date. These are drawn beads, both large [Fig. 12A:11] and small, the latter including monochrome blue examples [Figs 12A:17; 12B:31], single- and multiple-segments of gold-in-glass [Figs 12A:5, 13; 12B:23], as well



Fig. 11. Bead from the early Roman western complex (BE15-105)

BE15-105/031/PB 47

as one of folded blue and white mosaic glass [Fig. 12B:29]. Additionally, a fragment of a dark blue wound bead was found [Fig. 12A:19] and a rod-formed yellow one [Fig. 12B:30].

Surprisingly, a bead made of ostrich eggshell was found in locus 14 [Fig. 12B:36]. Ostrich-eggshell beads are usually found in late Roman and later contexts at the Red Sea coastal and Eastern Desert sites, and at post-Meroitic Nubian Nile Valley ones. Further along, some similar beads appear at Meroitic sites (e.g., Then-Obluska 2016).

One fragment of a tusk shell, *Dentalium* sp., and two with nine ribs, *Dentalium reevei*, have been found in loci 3, 5 and 8 [e.g., Figs 12A:18, 12B:24, 32]. There has been confusion about whether the fragments found at the Red Sea coastal and the Eastern Desert sites were intended to be threaded (Then-Obluska forthcoming; Fig. 2.1 Marsa Nakari; Berenike BE95-001-080#147, personal observation; Then-Obluska 2017c: Fig. 6:11 Shenshef; Hamilton-Dyer 2007: 348–349, Fig. 14.8.51 [*Dentalium reevei*], 14.8.52 [*Dentalium* sp.] Mons Porphyrites; 2001: 363, Fig. 11.5: 96 Mons Claudianus). Fortunately, a speci-

men from trench BE15-110 has been found with a string fragment and provides evidence that *Dentalium* was actually used in early Roman beadwork. Fragments of similar shell species were also commonly recorded in graves at el-Dur (Haerinck 2001: Pls 47.67–68, 140.217, 146.20, 156.3, 160.6, 245.9, 247.5, 265.9, 274.8, 305.8). That site, situated on the west coast of the Oman peninsula, declined in the first half of the 2nd century AD.

A fragment of a once large sheet pendant was made of mica, i.e., gypsum selenite [Fig. 12A:16]. A long tabular chalcedony bead was shaped into a cabochon style and drilled from both ends [Fig. 12B:44].

Short cylinder faience beads and their fragments, 32 in all, are very eroded, their cores often exposed [Figs 12A:9, 10, 12, 14, 15, 20; 12B:21, 22, 25–28, 33–35, 37–43, 45]. Traces of glaze preserved are blue, green, white, red, and black in color. As it has been said elsewhere, these small ring and short cylinder faience beads characterize Ptolemaic and early Roman assemblages (e.g., Then-Obluska 2015b). Faience ceased to be produced in Egypt in the 3rd century AD.

## LATE TRASH DUMP

Past excavation at trench BE10-59 had provided about 1400 beads and pendants (Then-Obluska 2015b; 2017a). One bead picked up as a surface find next to the said trench in 2015 is made of black glass wound around a mandrel and decorated

with a blue trail [Fig. 13]. Trail-decorated large black beads are well known in late Roman bead assemblages (e.g., Arveiller-Dulong and Nenna 2011; Then-Obluska 2017c: Fig. 1:3).



Fig. 12A. Beads from the late phase of the Northern architectural complex (BE15-110)

1-4	BE15-110/001/PB 01	12	BE15-110/002/PB 10
5-8	BE15-110/002/PB 05	13-16	BE15-110/003/PB 48
9	BE15-110/002/PB 07	17-18	BE15-110/003/PB 60
10-11	BE15-110/002/PB 09	19	BE15-110/004/PB 11
		20	BE15-110/004/PB 12



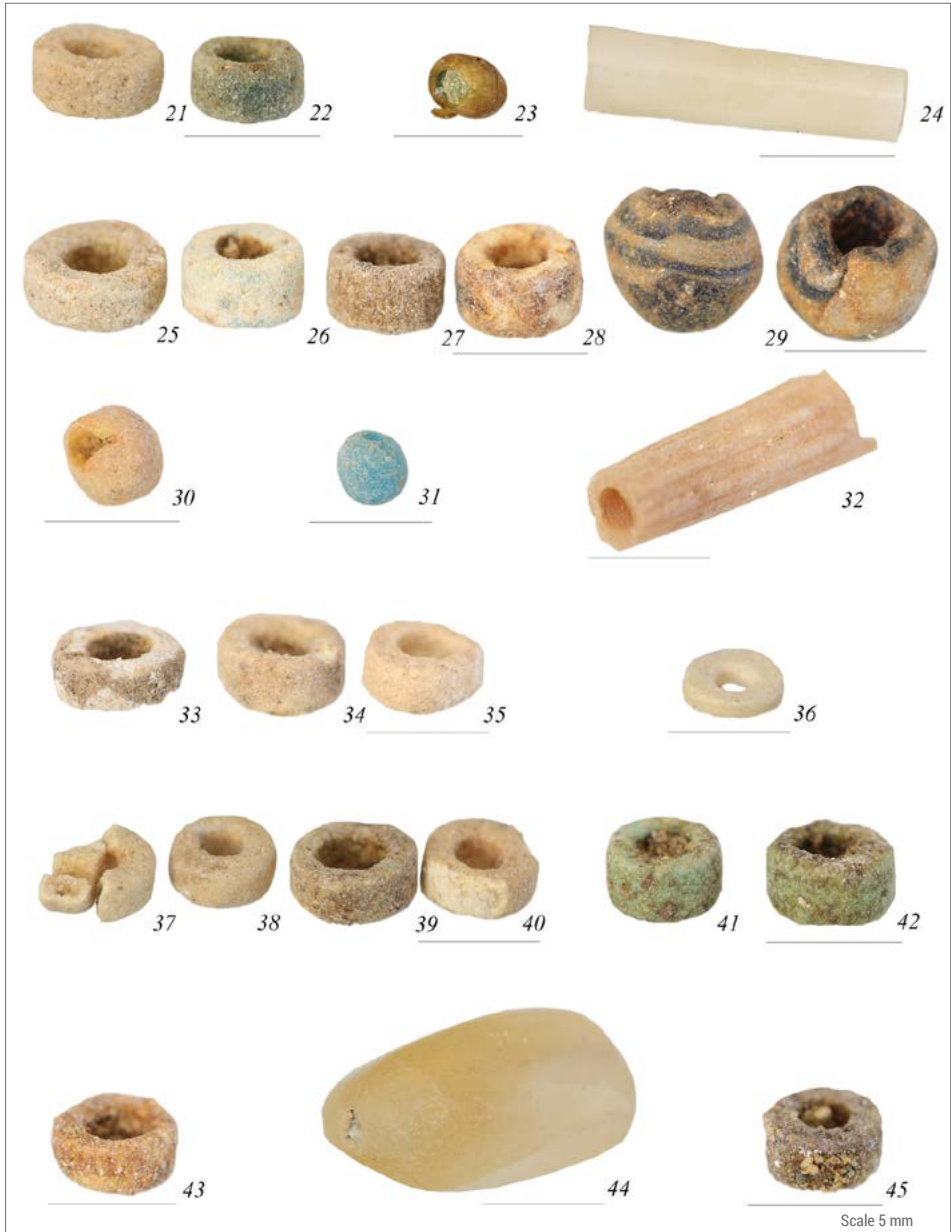


Fig. 12b. Beads from the late phase of the Northern architectural complex (BE15-110 continued)

21-22	BE15-110/005/PB 14	33-35	BE15-110/014/PB 20
23-29	BE15-110/005/PB 17	36-40	BE15-110/014/PB 21
30	BE15-110/005/PB 19	41-42	BE15-110/014/PB 31
31	BE15-110/006/PB 29	43	BE15-110/014/PB 32
32	BE15-110/008/PB 61	44	BE15-110/015/PB 22
		45	BE15-110/015/PB 24

## SUMMARY

During the 2014 and 2015 excavation seasons at Berenike almost 650 beads and pendants were recorded. They come from Hellenistic and early Roman trenches, as well as from layers dated to later occupational phases at Berenike in the late 4th through early 6th centuries AD. As mentioned above, the late Berenike types, however, were mixed with early Roman specimens. Beads and pendants were made of organic materials (marine mollusk shells, ostrich eggshell), stones (agate, carnelian, quartz, amethyst, onyx), faience, glass and gold-in-glass.

A diversity of mollusk shells has been recorded in Hellenistic layers. Among the perforated gastropod mollusk shells are large species, like *Malea* sp. and *Conus textile neovicarius* sp. They were perforated in the area of the removed apex. Cowries of *Cypraea annulus* sp. and shells of *Marginella* sp. have holes cut into the shell body. A small square bead was cut from ostrich eggshell. Beads made of red quartz and agate feature sawing traces across the larger hole opening at the truncated bead

end, pointing to the Egyptian and Nubian beadmaking tradition. Small ring and short cylinder faience beads in diverse colors dominated Hellenistic bead assemblages. Glass beads were made of monochrome glass, using drawing and winding glass as manufacturing techniques. The glass Bes amulet found associated with a Hellenistic trench is one of the most outstanding finds of the 2014–2015 seasons at Berenike.

During the early Roman period, the whorls of *Marginella* sp. continued to be perforated. Additionally, a *Conus* sp. apex was perforated. A few *Dentallium* sp. specimens, including one on a string, were also found in early Roman layers. Small faience beads also continued to be used in Berenike beadwork. Additionally, biconical, melon, and “eye” bead types, as well as a Bes amulet, were made of faience and belong to the early Roman repertoire. Traces of a sawmark that facilitated bead drilling can be discerned in stone beadmaking. A few beads, onyx and amethyst ones found in grave 36, lack



Fig. 13. Bead from the late Berenike trash dump (BE10/15-59 surface)

this feature and these beads could be imports from India. Also, monochrome, yellow, black and red glass beads made of drawn and rounded glass, and found on their original string fragments, can be Indian imports. Next to monochrome and compound drawn and segmented beads, objects made of gold-in-glass, including a granular type, appeared. Small gold-in-glass beads were found with the iron collar of a vervet monkey from the animal cemetery. Moreover, beads made of folded mosaic glass and rod-pierced ones, including specimens with face patterns, as well as mosaic eyes applied to drawn beads have been recorded. In general, production of mosaic glass, as well as drawn and segmented glass beads, including gold-in-glass ones, has been confirmed for early Roman contexts from Alexandria, Egypt.

The late Berenike bead assemblages are characterized by oblate beads made of marine mollusk shells, a Red Sea *Conus taeniatus* sp. shell with its apex ground down, and a perforated shell of bivalve marine mollusk. The red-centered green and yellow mosaic bead is a characteristic late Roman type. The same can be said of some beads made of drawn and segmented glass of Egyptian origin, and drawn and rounded glass of Indian origin. The latter are blue, blue-green, green, yellow, and black beads.

A few monochrome beads found in Berenike during the 2014 and 2015 seasons are modern intrusions, exemplifying the continued penchant for beadwork among the 'Ababda Bedouin inhabiting the region.

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# Gebelein Archaeological Project 2018: temple and fortress area on the Eastern Mountain



**Abstract:** The report outlines fieldwork conducted on the Eastern Mountain of Gebelein (ancient town of Per-Hathor/Pathyris) in the 2018 season. Despite extensive exploration in the past, the publication record for this area is poor. Current epigraphic research and archaeological field survey, as well as an analysis of published and unpublished archival materials have yielded new data concerning the topography and history of the area, which is presented in this paper.

**Keywords:** Gebelein, Pathyris, Per-Hathor, archaeological survey, epigraphic survey, archival materials, temple

The area in the northern part of Rock II on the Eastern Mountain of Gebelein (for the nomenclature in the documentation, see Ejsmond et al. 2017: 241–242) was the main focus of this year's investigations. This was the place where the pharaonic town of Per-Hathor, known also as Pathyris during the Ptolemaic period, was located. Fieldwork was limited due to time constraints. The survey of the temple and fortress area was continued, as was the epigraphic documentation of the inscriptions on the rock-shelf and documentation of the material from the 2016 season (see also Ejsmond et al. 2017).

## TEMPLE AND FORTRESS AREA

The area where the temple of Hathor and fortress were located was researched by a number of scholars in the past (for the most important work, see Fraser 1893 and Schiaparelli 1921; for the history of the town, see Bergamini 2003; Vandorpe and Waebens 2009; for the temple, see Morenz 2009 and Fiore Marochetti 2010). None of the previous excavators published satisfying accounts

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of their work, thus the sacred precinct is practically unknown from scholarly publications despite yielding important finds, e.g., early dynastic decorated blocks (Morenz 1994), elements of a chapel erected by Mentuhotep II (Fiore Marochetti 2010), blocks with names of the Hyksos kings (Polz 2006), foundation and votive deposits (Donadoni Roveri, D'Amicone, and Leospo 1994: 65; Trapani 2017 respectively) dated to the New Kingdom, to name several well-known discoveries.

Mud-brick walls in this area were mentioned by previous scholars (e.g., Fraser 1893; Schiaparelli 1921; see also Bergamini 2003), but the documentation of the structures is insufficient. They were excavated and partly dismantled, but the results were never published to a satisfying extent. Some structures are visible in archival images from Italian excavations at Gebelein (see, e.g., Bergamini 2003: Figs 2, 3, 12; Fiore Marochetti 2010: 2, 4–5), but their nature is obscure. Ernesto Schiaparelli, who was excavating this area

in 1910 and 1920, wrote that there was a fortress and temple built by the High Priest of Amun Menkheperra (Twenty-first Dynasty), but he published merely interpretations, not the details regarding location and the state of the structures (Schiaparelli 1921: 126). An unpublished sketch of unknown date made by Norman de Garis Davies, kept at the Griffith Institute (Davies n.d.), is the only documentation of the now almost completely destroyed structures. The sketch shows the layout of some rectangular mud-brick structures that may be identified with the temenos wall and/or fortress. Somers Clarke (1902) wrote, in an unpublished report, that some walls made of stamped bricks were being dismantled by *sebakh* diggers without proper supervision in 1902. It is very possible that the aforementioned thick walls were that of the temenos or presumed fortress. Pieces of sandstone and granite blocks (see below) are mentioned inside the rectangular structure in de Garis Davies's sketch.

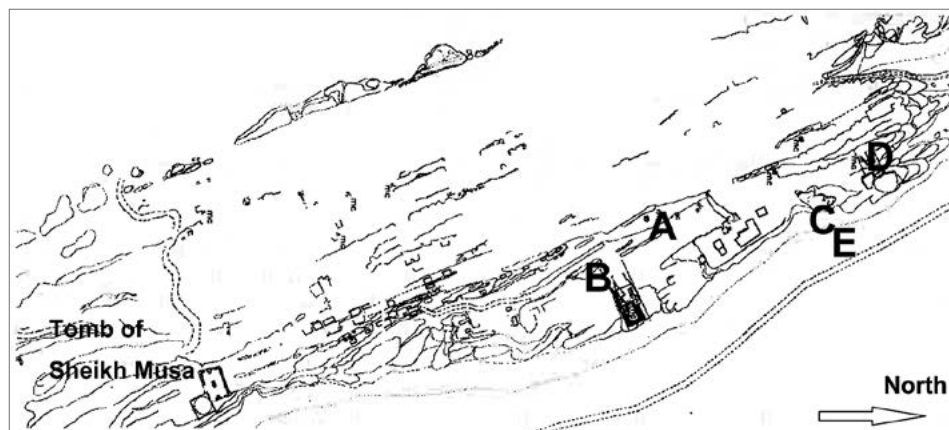


Fig. 1. Location of places and archaeological features on Rock II mentioned in the text: A – granite blocks, sandstone and limestone fragments of decorated blocks, B – south wall, C – rock-shelf, D – north wall, E – Hathor's rock-cut chapel (Adaptation of Fiore Marochetti 2010: 4, Fig. 4)

These can be seen today as well, and it is tempting to think that they indicate the location of the temple, although this may be misleading (see below).

There is a concentration of mud bricks in the northern part of Rock II of the Eastern Mountain [D in *Fig. 1*]. Three types of stamp impressions were found on the mudbricks: two with cartouches of the High Priest Menkheperra and one with his name alongside the name of his wife Isetemkheb, both in a cartouche [*Fig. 2*]. The bricks have never been properly published before,<sup>1</sup> therefore they were documented during this season and will be the subject of further studies and publication.

Some remains of a wall, north from the concentration of stamped bricks, are still preserved [*Fig. 3*]. The foundation of the northern part of the wall is exposed,

revealing raw limestone chunks. Layers of reed matting were inserted every four brick courses. No stamped bricks were observed there, hence the structure made with stamped bricks may represent a different building phase than the wall with reed-matting between the courses of bricks. Neither can one exclude reuse of stamped bricks. It is also important to note that a wall constructed in the same technique as the northern one, that is, with a mat placed every four courses of bricks, was found in the southern part of the researched area (Ejsmond et al. 2017: *Fig. 20*). Therefore, it seems that the massive north and south walls may have been part of one building complex, probably the bulky rectangular wall sketched by de Garis Davies, enclosing the whole structure. It is hard to say, however, whether



*Fig. 2.* Three types of cartouches stamped on bricks (Gebelein Archaeological Project/ photo D.F. Wiczorek)

<sup>1</sup> Some bricks from Gebelein are stored in the Egyptian Museum in Cairo (JE 32812), Egyptian Museum in Turin (Donadoni Roveri, D'Amicone, and Leospo 1994: 66) as well as the Metropolitan Museum of Art in New York (25.3.328). Some of the types of the inscriptions from the bricks were published insufficiently (Fraser 1893: 498, Pl. XXI; Spencer 1979: Pls 34–35).



or not it was constructed at one time and what was the relation between the stamped and unstamped brickworks.

The eastern hill was subject to rock quarrying (Lane 2000: 393), using dynamite to clear space for a local village (Vandorpe and Waebens 2009: 18). Thus, changes in the morphology of the hill would not be surprising. Comparison of archival images and the current state of preservation of the area<sup>2</sup> led to the conclusion that at the time of the Italian excavations in 1910 and 1920, the eastern part of Rock II had extended further east. This is also suggested by comparing de Garis Davies's plan with that published by Giovanni Bergamini (2003: Pl. 5).

Further analysis of walls in the area is necessary to understand the relations between them and the clustering of stamped bricks. Bricks from the times of the Twenty-first Dynasty may have been part of a different construction<sup>3</sup> than the aforementioned wall surrounding the complex or they could have been reused in later periods.<sup>4</sup> It is not clear why Schiaparelli interpreted the walls at the top of the Eastern Mountain as the remains of a fortress. Further research is needed to explain the nature of the complex. It is possible that the wall surrounding the temple was misinterpreted as fortifications.

Granite blocks located on the top of the Eastern Mountain, south of the con-



Fig. 3. Brick-wall (D in Fig. 1): left – looking west; right – looking south (Gebelein Archaeological Project/photo D.F. Wiczorek)

- 2 Archival image CO1834 from the Soprintendenza Archeologia, belle arti e paesaggio per la città metropolitana di Torino; the authors would like to thank Dr. Marcella Trapani for access to the images.
- 3 Possibly a watchtower built by Menkheperra. The authors would like to thank Huub Pragt for this idea. According to José Lull (2006: 225), the stamped bricks could have been part of a project to strengthen the external wall of the temple.
- 4 A garrison was functioning in Pathyris during Ptolemaic times and some documents refer to fortifications at an unknown location within the town area (Pestman 1965: 54–55, 73–74, 101; Vleeming 1987: 156–160).

centration of the stamped bricks, were photographed and drawn. The blocks may have been door sockets in a portal of the local temple. Structures surrounding them can be seen in archival images of the area (Fiore Marochetti 2010: 2). Comparison of the old and current images of the area [Fig. 4] shows that there was a big accumulation of layers on the western slope of the mountain (west of the gran-

ite blocks), which may be equated with the walls of the temenos or the presumed fortress.

A fragment of a limestone libation bowl was found this season in the immediate vicinity of the granite blocks, along with small fragments of decorated limestone and sandstone blocks. Based on stone-dressing technology and the stylistic features of the fragmentary relief



Fig. 4. Location of granite blocks and other structures on top of the Eastern Mountain: top, in an image from 1910 or 1920; bottom, in 2018, looking west (Archival image after Fiore Marochetti 2010: 4, Fig. 3; modern image, Gebelein Archaeological Project/photo W. Ejsmond)

decoration on the blocks, the fragments can be dated to the Middle Kingdom; thus, this may have been where the chapel of Mentuhotep II from the Eleventh Dynasty had stood. One needs to keep in mind that the temple was rebuilt repeatedly since its construction (Daressy

1893: 26), thus the walls of the temenos could have been reused as a fortress in post-pharaonic times and strengthened by reusing the stone elements of the temple. Therefore, the decorated as well as the granite blocks may not be in their primary locations.

## EPIGRAPHIC WORK

There is a rock-shelf on the eastern face of the Eastern Mountain of Gebelein directly above the rock-cut chapel of Hathor [C in Fig. 1] (for the chapel, see Takács et al. 2015). Some inscriptions were observed there previously (Morenz 2010: 143), but they have never been recorded nor published. The epigraphic documentation of the remains on the rock-shelf started in the 2016 season (Ejsmond et al. 2017: 260–261) and was continued this season. To

date, five natural rock-panels have been recognised (Graffiti Panel [=GP.] 1–5a and 5b). Four of them, namely GP.1, 2, 5a and 5b, have been documented completely. GP.4 is extremely hard to access, hence its provisional recording; it still requires further work with the use of specialist climbing equipment. Altogether 33 graffiti, both textual and figural in type, have been recognized on these panels. They were executed with a sharply pointed implement, possibly a flint chip. The inscriptions were scratched or scratched and painted red, written in hieroglyphs with elements of the hieratic script. The epigraphic material is to be dated overall from the late Middle Kingdom (Thirteenth Dynasty) to the early New Kingdom (Eighteenth Dynasty).

Most of these inscriptions are poorly preserved, mainly those on the lower rock panels, whereas those on the higher-lying rock panels are clearly in better condition. Mainly digital technology (that is, RTI, photogrammetry and 3D modelling) was utilised in the documentation process. It was especially convenient during documentation work on the higher rock panels, located about 3 m above the present walking level of the rock-shelf, which are extremely hard to access. The technology turned out also very useful,

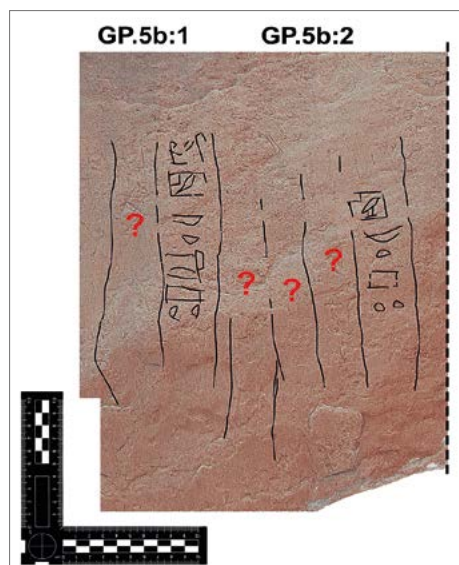


Fig. 5. Fragment of rock panel 5b: example of documented inscriptions (Gebelein Archaeological Project/ drawing D.F. Wiczorek and P. Witkowski)

in contrast to traditional methods, during post-processing, giving unexpectedly good results in detecting hardly noticeable textual graffiti (for the method, see Ejsmond et al. 2017: 242–243 and Witkowski, Chyla, and Ejsmond 2016). This year's reexamination of the graffiti on site, after the initial study of the material recorded in the 2016 season, provided many new epigraphic details which enabled some corrections in the preliminary facsimile

drawings and epigraphic interpretations.

The textual graffiti are related to the local temple of Hathor. They are primarily short religious inscriptions, in which local priests and scribes expressed their worship of Hathor Lady of Gebelein. The texts also mention other local gods, such as Anubis and Sobek (Wieczorek and Ejsmond 2018) [Fig. 5]. Documentation of the graffiti will be continued in the upcoming season.

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# Qatar–Sudan Archaeological Project Excavations at the Ghazali monastery from 2014 to 2016



**Abstract:** The excavation report covers eight months of fieldwork at the site of Ghazali, which resulted in the clearing of the entire monastery and the discovery of three annexes located on the north and west of the complex. The spiritual part of the monastery included two churches located in the southeastern corner of the complex, a household compound on the west side and a refectory and dormitory in between. Conservation work focused on the reconstruction and restoration of water storage installations in Room Y, as well as north of the North Church. Excavation outside the monastic walls brought the discovery of an iron smelting area with several well-preserved furnaces. Exploration of the monks' cemetery uncovered regular box superstructures and an intriguing variety of substructures from simple vertical pit tombs to elaborate vaulted chambers.

**Keywords:** monasticism, Nubia, el-Ghazali, archaeology of religion, iron smelting, Sudan, medieval Africa

The first of the reported seasons, 2014/2015, which was the third season at the site, concerned an area of approximately 2200 m<sup>2</sup> between the north and west enclosure walls of the monastery and the North Church and Rooms Y, T, R and AA on the south, and the dormitory and rooms attached to it on the east side. The excavations, generously funded from a Qatar–Sudan Archaeological Project grant, lasted altogether four months. In the following season, which lasted four months as well, the remaining parts of the monastery were cleared off debris and piles of stones left from the excavations in the 1950s. The task was undertaken to complement the general view of the site. Despite funding problems, we

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Dates of work: 18 October 2014–28 February 2015; 28 October 2015–29 February 2016

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were able to complete the excavations of the interior of the monastery and the four annexes. The excavated area lies between the dormitory on the north and the North Church on the east, and the west and south monastery enclosure walls. The annexes are located along the west wall

of the monastery and the western part of the north wall.

The following is a brief overview of the work undertaken over the course of the two seasons, presented building by building, discussing the most important results.

## THE MONASTIC COMPLEX

### BUILDING 5

Building 5 consisted of ten rooms [Fig. 1]. The walls are preserved no higher than 0.70 m above the walking level and are cut almost at the same height. This area was most probably badly damaged by people digging Nile mud to fertilize fields in Wadi Abu Dom. The fill of the rooms consisted of windblown sand and pottery finds were scarce. In the last phase of occupation, the building was entered through an entrance leading into Room 48, aligned with the north entrance to the monastery. Room 48 was a big hall with benches along the walls, which brings to mind a guest room or a waiting hall. The room could be exited through a passage in the east wall via a short corridor connecting it with Room 38 and the rest of the building. Room 38 was furnished with two mastabas: one along the south wall and the other, twice as wide, in the north-eastern corner. The latter was filled with sand containing some animal bones and pottery. A doorway in the southeastern corner led to Room 35/35A, a big room with a central pillar bringing to mind the main monastic refectory. This room preserved a terracotta tile flooring. The rest of the rooms in Building 5 probably had similar paved floors as no traces of pug floors were found (apart from Room 37,

see below). It is less likely that there was no flooring at all. Being the chamber in the center, Room 35/35A gave onto four other rooms: 62 and 63 on the west, 34 on the east and 33 on the south. The passage to Room 62 was blocked at some point. Room 33 was an elongated rectangle with mastabas running along the walls. Rooms 62 and 63 were small spaces connected by a passage (subsequently blocked) in the western part of the wall that divided them. Room 62 also retained a terracotta tile flooring. An entrance in the south-western corner (later blocked) led to Room 56; another doorway in the west wall led to a passage that ended in Room 61, cutting through the east wall of the dormitory.

East of Room 35/35A was another big hall divided into two spaces: a smaller Room 34 and a larger Room 36. The south part of Room 34 was partitioned off from the rest of the chamber and benches were built against the east, south and west walls. In Room 36, which lacks such benches, remains of an earlier structure lined the east wall: evidence of a wall made of fired brick was traced, lining the west side of a flat, lime plaster surface. In the southwestern corner of Room 36, in its west wall, there was an entrance to Room 37. No furnishings were found in

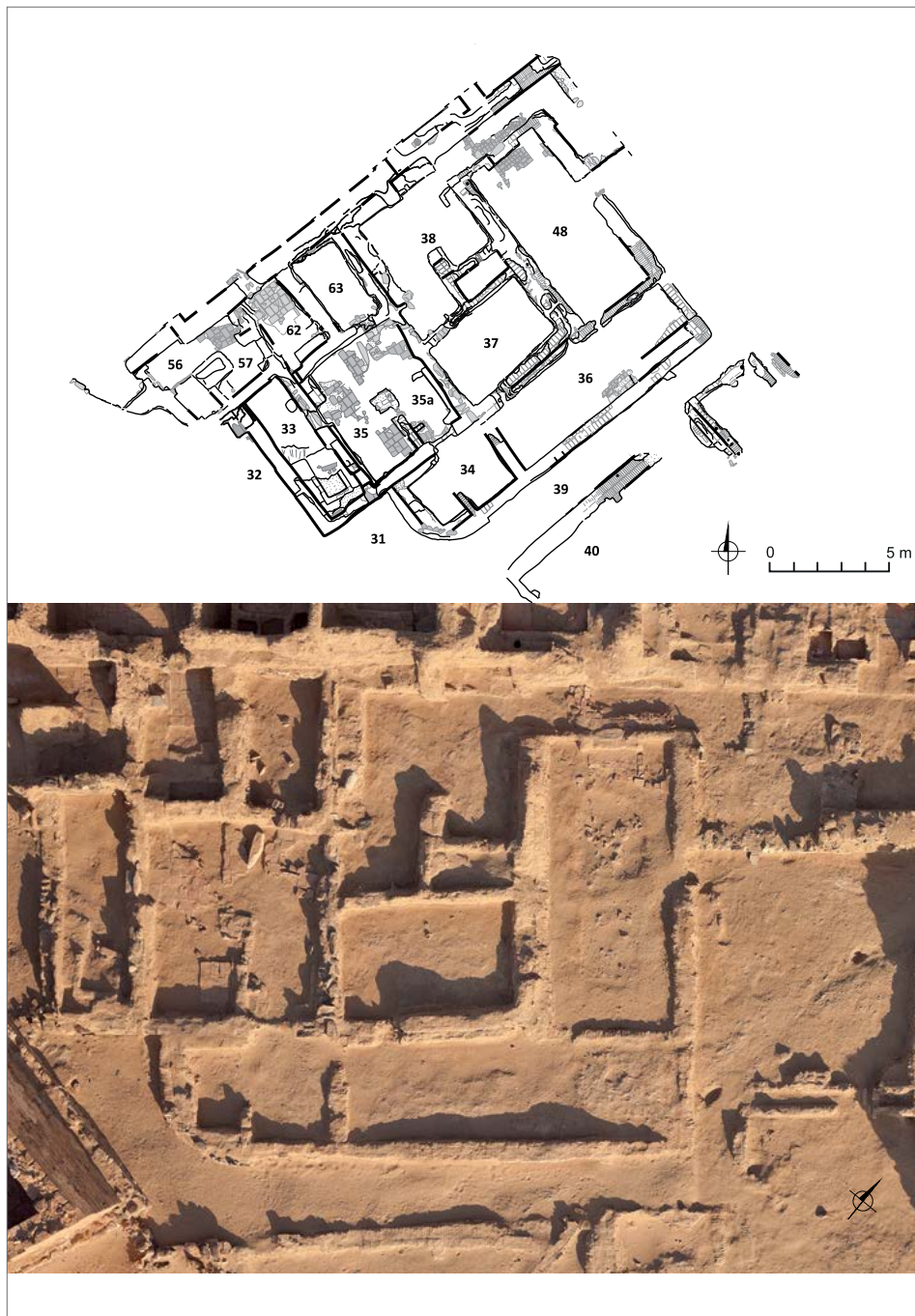


Fig. 1. Building 5, top view and plan (G.A.S.P./photo M. Bogacki, drawing S. Maślak)



this chamber and it is the only one with preserved parts of a pug floor. These features as well as the location—the hardest room to reach in the building—implies its function as storage.

Building 5 apparently adjoined the dormitory (see below) and was subsequently enlarged by the addition of consecutive chambers. The earliest part consisted of Rooms 56, 57, 62, 63, 33 and 35/35A. The lower parts of the walls were built of stone, a technique abandoned in the later additions. In Phase 2, Rooms 37 and 38 were added and in that phase they were just a single, undivided space. In Phase 3, Room 48 was built at the northern end and in Phase 4, the latest eastern extension (Rooms 34 and 36) was constructed. Organic samples were collected from the walls and floors for radiocarbon analyses to establish the chronology of occupation of the monastery. Based on the architectural sequence, Building 5 should be dated not earlier than the late period of occupation.

#### **BUILDING 1: CHAMBERS A AND C**

Re-excavated Rooms A and C flank the entrance to the monastery [Figs 2, 3]. The original excavator Peter Shinnie suggested a waiting or guest function for both of them (Shinnie and Chittick 1961: 21–22). The first, which he partly excavated, turned out to be a monastery storeroom for liquids. Almost all the sherds found there were of big bottles, but, intriguingly, no amphorae. Room C proved to be a grain storeroom. Remnants of three containers made of unfired clay were found there, as well as the bottoms of four other ceramic containers. Both of the rooms were plastered with

mud. Room C was divided in two by an arcade supporting the east–west vaults in the middle of the width of the chamber. In turn, Room A was roofed with a fairly wide vault running north–south. West of Room A was a space, Room 84, sectioned off from a corridor (Room 82) by three pillars; an east–west vault, now destroyed, covered this chamber [Figs 2, 3]. Two entrances from Corridor 82 led to the northwestern part of the monastery.

#### **BUILDING 4: DORMITORY**

The monastic dormitory was located south of Corridor 82 [Fig. 4]. It was a big building consisting of Rooms 59, 61, 64–70, 75 and 76. In the first phase, this building had six rooms, three on each side of a central corridor. The building was subsequently enlarged to 12 rooms, six on each side of the corridor. At this time a perpendicular corridor (Room 55) and a staircase (Room 53) were added to the dormitory. The latter suggests that the dormitory could have been a two-storey building in Phase 2. No tumbled walls, vaults or roofs were found on the spot of Building 4. These remains could have been taken to be used elsewhere, as was the case with fired bricks which were salvaged to construct the upper parts of the North Church. The absence of dried brick rubble in some of the cells indicates intensive *sebakh* digging activity, perhaps even dismantling of the still standing walls. The dormitory walls were preserved not higher than approximately 1.50 m above the ground. In the third phase, Building 4 shrank to eight cells on the south side and the north side of the building was converted into a storage

facility with at least three big ceramic containers; the room in the northwest corner (Room 79) was turned into storage with a set of 14 containers made of

sun-dried brick lining the walls of the room. Complementary furnishings in this chamber included two grinding stones.



Fig. 2. Building 1: top, top view of Chambers A and C; bottom, top view of the adjoining Rooms 82 and 84 (G.A.S.P./photos M. Bogacki)

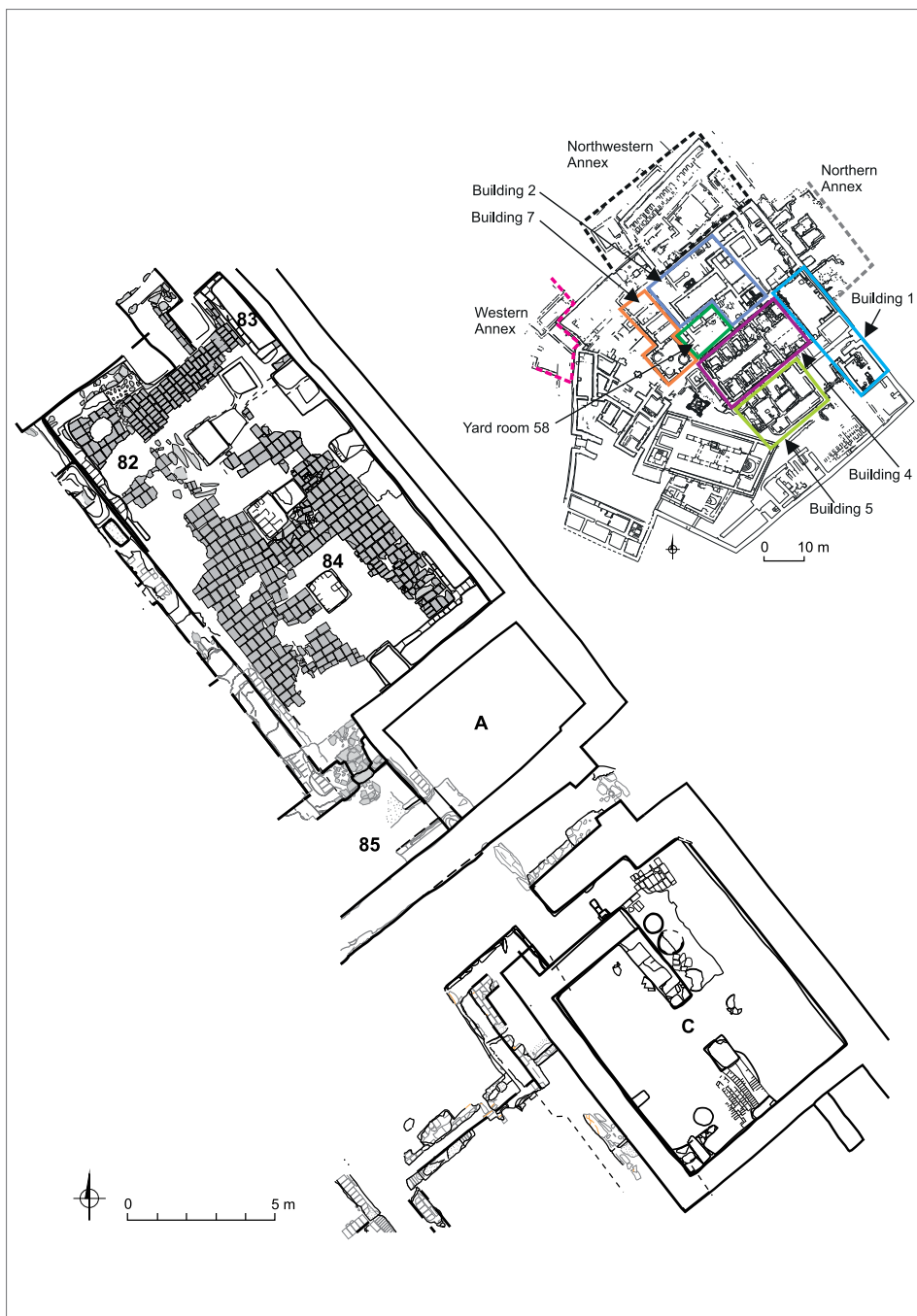


Fig. 3. Building 1; inset, plan of the Ghazali monastery with the location of all buildings discussed in the text (G.A.S.P./drawing S. Maślak, A. Misiurny)





Fig. 4. Building 4: dormitory (G.A.S.P./photo M. Bogacki)



Fig. 5. Building 7: dining compound (G.A.S.P./photo M. Bogacki)

A typical monks' cell at Ghazali was small, approximately 20 m<sup>2</sup> in size, furnished with three benches with bed-heads built against the walls of the room and a set of niches above. The benches were well made and coated with lime plaster. The floors of the rooms and also the corridor were paved with terracotta tiles of different sizes, from brick-size tiles approximately 35 cm by 17 cm to huge square tiles about 70 cm to the side. The cells must have been cleared of everything before being deserted as very little finds were recorded. Nonetheless, a string of beads was found in a hole in the mastaba in Room 70 and two almost complete pots remained in Room 64 (Then-Obluska and Wagner 2018).

#### **BUILDING 7: DINING COMPOUND**

Building 7 consisted of four rooms excavated formerly by Shinnie and Chittick (Rooms J, K, L, M) (Shinnie and Chittick 1961: 21) [Fig. 5]. Two of them were refectories: the primary one in Room K and the secondary one in Room L. Room K was one of the finest in the entire monastery. It had four domes or sail vaults spanning arches running along the walls of the room and springing between a central cross-shaped pillar and engaged pilasters in the walls. Monks dined sitting on circular benches around tables mounted in the center. Room K was paved with terracotta tiles. A passage in the northwestern corner led to Room L. Initially, it was a narrow arched entrance (0.57 m wide); in Phase 2, it was turned into a large archway (2.08 m wide). This change plausibly marks the heyday of the monastery when a second refectory was arranged in Room L.

Room L may have served as a monastic kitchen at first. When the number of monks increased considerably, it was converted into a dining room. It was roofed with two vaults running north-south springing between the east and west walls, and a double-arch arcade in the middle of the room (similar to the one in Room C). There was another exit from the room, located in its northeastern corner, leading to a corridor between Buildings 2 and 7. Ceramic tiles were used for the floor of Room L. Traces of four circular benches that once stood in this refectory are still visible in the pattern of the floor tiling, although Peter Shinnie found them already destroyed. Demolition of the benches marks the moment when the number of monks shrank, the second dining room became redundant and its function changed once again.

Room M does not stand out from the other rooms of the monastery and its function remains obscure. Traces of the stone pavement were preserved scattered around the room. There was a cuboid structure (1.10 m by 1.16 m) made of sun-dried brick, entirely lime-plastered, attached to the east wall not far from the southeastern corner. The walls of the room were mud-plastered. The west wall is almost completely destroyed and only traces of an entrance, which was a secondary cut in this wall approximately a meter wide, were found 1.48 m from the northwestern corner.

#### **BUILDING 8 AND YARD (ROOM 58)**

Room Y in Building 8 was cleared of accumulated sand and debris. A water-pot (*zir*) stand was reconstructed in Room Y [Fig. 6]. A food-processing yard (Room





Fig. 6. Building 8: Room Y, water-pot stand: top, before restoration; bottom, after restoration (G.A.S.P./ photos A. Obłuski, M. Żelechowski-Stoń)

58) west of the dormitories was excavated, yielding an oil press as well as a grinding stone, which must have been mounted there [Fig. 7].

## BUILDING 2

A household quarter was discovered in the western part of the monastery. It consisted of five rooms with various installations [Fig. 8]. The complex had two separate entries: one in the east wall of Room H and the other in the southwestern corner of Room E. Room H contained a rare find in late antique and medieval archaeology in the Nile Valley: a mill and silos for storing grain. Only a small part of the stone pavement in the southwestern corner of the room was preserved. An arched doorway in the southeastern corner of the chamber led to Room I, which was a small space probably used for

storage. Benches ran against the east and west walls of the room, but not for the entire length. Three silos stood in Room H: a huge one in the southern part, associated with two big millstones, and two smaller ones in the middle and in the northern part of the room. A pseudo-Pompeian millstone was found next to the latter. An entry in the north wall gave way to Room E, where two shallow basins were located in the northwestern corner. Their walls were covered with hydraulic plaster. Subsequently, the basins were divided by a partition made of sun-dried brick into four containers and the east part of the room was cut off from the rest of it by a wall also made of sun-dried brick. On Shinnie's plan it is marked as F. It was probably contemporary with changes made in Room G. Room G was initially furnished with three basins for



Fig. 7. Food-processing yard (Room 58), looking northeast (G.A.S.P./photo A. Obluski)





Fig. 8. Building 2 (G.A.S.P./photo M. Bogacki)

liquids, two huge ones on both sides of the entrance, filling up about 80% of the room space. The last was a lime-plastered ceramic container that was placed against the east wall, opposite the entrance to the room, in the space left by the big basins. All the basins were about 0.40 m high. When the eastern part of Room E was separated from the rest of it, an entrance was opened in the northeastern corner of Room G. At the same time the function of the space changed from activities requiring large quantities of liquids to a storage facility furnished with at least one huge vat. The vat was found shattered into pieces by stones tumbled from the walls in the northwestern corner [Fig. 9].

#### ANNEXES

Three annexes associated with the mon-

astery have also been excavated [Figs 10–12]. Two of them, the Northwestern and Western, were manifested on the ground surface before the excavation of the Northern one. The relation of the Western and Northern Annexes with the monastic community has yet to be determined as there is no direct communication between them and the interior of the monastery.

The Northwestern Annex is the largest of all the extensions of the monastery [see Fig. 10]. It was a huge sanitary complex, constructed at the end of the 10th or the beginning of the 11th century. Its main feature is a row of 18 toilets and several associated rooms with vats probably used for washing. The toilet compartment was divided into two parts, the northern one consisting of 12 and the southern



Fig. 9. Room 77-80, looking north (G.A.S.P./photo A. Obluski)





Fig. 10. Northwestern Annex (G.A.S.P./photo M. Bogacki)





Fig. 11. Northern Annex (G.A.S.P./photo M. Bogacki)



Fig. 12. Western Annex (G.A.S.P./photo M. Bogacki)

one of six facilities. These compartments point to the annex users being separated into two groups. The proximity and easy communication with the refectory and dormitory spaces suggest that the monks used the southern part, while visitors, monastic servants, or to put it simply anyone not wearing a monastic habit, used the northern part.

An interesting find from the very end of the field season consisted of a cubic statue from the Twenty-fifth/Twenty-sixth Dynasty reused by the monastic community, the inscription on the back very worn.

#### **DOCUMENTATION AND VIRTUAL TOUR**

Topographical measurements taken at the site of the Christian monastery in Ghazali followed the coordinate reference system WGS 84/UTM 36N, EPSG: 32636. The instrument used was a Leica TS06 FlexLine plus model total station/laser tachymeter. The recorded points were used primarily for sketch drawings with accurate coordinates, rendering a base plan for detailed archaeological documentation, such as drafts, sections, plans and leveling (error not exceeding 2 cm). Once the various areas were cleared of sand, the architecture was measured anew, leveled and the general site plan updated. The end result was a terrain model (including the cemeteries and slag heaps), based on the interpolation method. The photogrammetry technique, which calls for creating three-dimensional models based on two-dimensional photographic images, was widely used for the documentation of individual monuments, graves and furnaces, as well as entire rooms. During the two seasons in question, 386 walls in the mon-

astery were recorded. The number shows the sheer scale of the work. The results will be presented in catalogue form, with every wall separate with a rectified photo, scale and basic information including dimensions, data on structural features, etc. The technique was also useful for recording the pavements, allowing drawings of the features to be fitted precisely in the general plan of the monastery.

A virtual tour of the monastery was created by Tomasz Tymiąski using Easy-Pano software (i.e., Panoweaver and Tourweaver). Over 150 points were picked up in the monastery to serve as the stepping-stones in the virtual tour. Twelve photos were taken in each spot and then stitched into 360° panoramas. These images were strung together to create a walk through the monastery. The virtual tour may be accessed online at <http://nubianmonasteries.uw.edu.pl/virtual-tour/>.

#### **RESTORATION**

The main cause of damage to the monastic structures is weather. Heavy rains happening on a seasonal basis wash out grain filler and adhesive particles, thereby reducing the strength of the adhesive and causing the disintegration of particular layers. Winds, carrying abrasive sand particles, accelerate the process of destruction, creating micro-fractures facilitating rainwater penetration. Further destruction resulted from inappropriate technology used during the reconstruction carried out in Room Y. The use of cement had a negative impact on the condition of the neighboring fragments of the structure (plaster, red brick, sandstone). Rainwater triggered the process of crystallization, causing migration

of molecules within the layers. During this process salt particles significantly increased their volume resulting in the deterioration of the original layers.

The aim of the work in the North Church and water tank was to protect the wall plaster from falling off and to reduce the destruction process caused by adverse weather conditions. The actions listed below were designed to increase internal cohesion of the plaster and stabilize its adhesion to the surface. These were:

- ▶ supplementary injections on the outside of the south wall of the church (injections of Primal AC-33, Ledan Z1),
- ▶ consolidation of plaster layers inside the church in its northeastern part (injections of Primal AC-33, border),
- ▶ consolidation of plaster covering the floors, steps and walls of the staircase in the southwestern part of the church (casein for consolidation, injections of Primal AC-33, border),
- ▶ consolidation of plaster in the central part of the west wall inside the church (injections of Primal AC-33, border),
- ▶ consolidation of surviving fragments of paint layers inside the church (KSE 300),
- ▶ consolidation of plaster inside the water tank (casein for consolidation, injections of Primal AC-33, border),

- ▶ consolidation of plaster in the monks' cells (casein for consolidation, injections of Primal AC-33, Paraloid B72, border)

In Room Y, the following steps were taken to secure the remaining parts of the monument:

- ▶ removal of the previously reconstructed structures in Room Y,
- ▶ strengthening the burnt bricks (casein and ash, Primal AC-33, Paraloid B72 in acetone),
- ▶ filling the gaps and voids in order to support the brick wall (lime mortar, fragments of pottery, fired bricks),
- ▶ cleaning and consolidating the original plaster layers (water, Contrad 2000, Primal AC-33 injections, casein),
- ▶ filling the gaps and voids in the lime mortar, as well as surface treatment of the plaster (lime mortar, Primal AC-33),
- ▶ increasing the cohesion of fragments of the sandstone water tank foundations preserved in Room Y (KSE 300, Primal AC-33, Paraloid B72),
- ▶ reconstruction of the central stone supporting the water tanks (lime mortar, Primal AC-33, fragments of pottery),
- ▶ reconstruction, filling the voids and making a protective band,
- ▶ aestheticizing with mineral pigments in a water dispersion of Primal AC-33.

## IRON SMELTING AREA

Excavation of an iron smelting area located south of the settlement at Ghazali was carried out in November 2015. A trench approximately 8 m by 5 m was opened in the central part of the hollow between the slag heaps. Remains of furnaces were found during the removal of the first arbitrary layer. Furnaces 1 and 2 were located

about 4 m apart and were connected by a rectangular stone structure [Fig. 13 top] with a purple-colored powder and pieces of iron ore. Another two sets of two furnaces, connected by a container in each case, were found. All of the containers, made of rough stones, were rectangular in plan, being approximately 1.20 m long



and about 0.40–0.50 m wide. Remains of purple/dark brown dust and pieces of iron ore were found inside the furnaces.

All the furnaces were built structures with consecutive layers assembled onion-like around the hearth. These were made of stone, fragments of bricks, terracotta tiles and mud. The innermost part was intentionally made of stone to achieve the highest possible firing temperature

and high temperature resistance, while clay and mud and products made of them formed the external surfaces. The furnaces are preserved to a height of approximately 0.40–0.50 m, except for furnace 3, of which only the bottom part has survived. The air intake openings, approximately 3 cm in diameter, were located at a height of about 0.23 m [Fig. 13 bottom left]. The location of the openings is quite surpris-



Fig. 13. Iron smelting furnaces: top, stone structure between furnaces 1 and 2; bottom left, air intake openings in the furnace structure; bottom right, furnace 5 with remains of a grate (G.A.S.P./ photos A. Misiurny)

ing as they are usually reconstructed in the lower part of the furnace body. The air intake pipes were probably clogged with slag, pieces of which of a cylindrical shape were found in the excavation. The most intriguing aspect of the entire con-

struction are the terracotta tiles placed horizontally in the furnace structure [Fig. 13 bottom right]. Ash deposits were found under them. Samples of ore, slag and charcoal, collected at the site, are being analyzed by Jane Humphris.

## CEMETERIES

The archaeological site of Ghazali consists of multiple components of varying purposes and nature. While the monastery itself is the core, thorough research into the other parts of the site has enabled a fuller reconstruction of the everyday life of Christian communities in medieval Nubia. In the course of the initial investigations, the burial grounds accompanying the monastic structures and a small settlement were recorded and mapped (Obluski 2014). Three distinctive cemeteries were demarcated: two (Cemeteries 1 and 3) possibly containing burials of members of the lay community inhabiting the area of Ghazali, and one (Cemetery 2) reserved for the local monastic community. The latter covers the area directly to the south of the monastery. Shinnie's figure of 2000 burials may be an overestimate (Shinnie and Chittick 1961: 23) considering that earlier aerial photographs showed no more than 100 tombs, but the density of tombs currently uncovered permits extrapolation of the original number of burials in excess of 800–1000 [Fig. 14]. Cemetery 1, containing approximately 150 burials, is located about 50 m west of the monastery buildings, on an elevation separated from the monastery by the bed of a small *wadi*. Cemetery 3 encompasses over 300 tombs, covering an area close

to a small village a few hundred meters east of the monastery.

No extensive study of the cemeteries at Ghazali has preceded the excavation under the current G.A.S.P. project. Working in the 1950s, Shinnie concentrated on the monastic enclosure, excavating only one tomb in Cemetery 2; the published data, however, does not clearly identify this tomb (Shinnie and Chittick 1961: 23–24). Following initial exploratory excavation of two tombs in Cemetery 2 in the 2013/2014 and 2014/2015 seasons, large-scale investigation of the Ghazali cemeteries was started in the fall of 2015. Over four months of fieldwork, 81 tombs were excavated, mostly in Cemetery 2; a small sample of tombs was also excavated in Cemetery 1 (Ciesielska, Obluski, and Stark 2018).

### CEMETERY 1

Five tombs were excavated: three in the southern part of the cemetery and two in its northwestern part. Clearly organized in regular rows of grave shafts, Cemetery 1 is characterized by rather low box-grave structures, not exceeding about 0.40 m in height, constructed of small stones and gravel [Fig. 15:A]. Single burials in simple pits were the norm, although in one instance two individuals were buried together. A tomb in the western part of Cemetery 1 contained the remains of



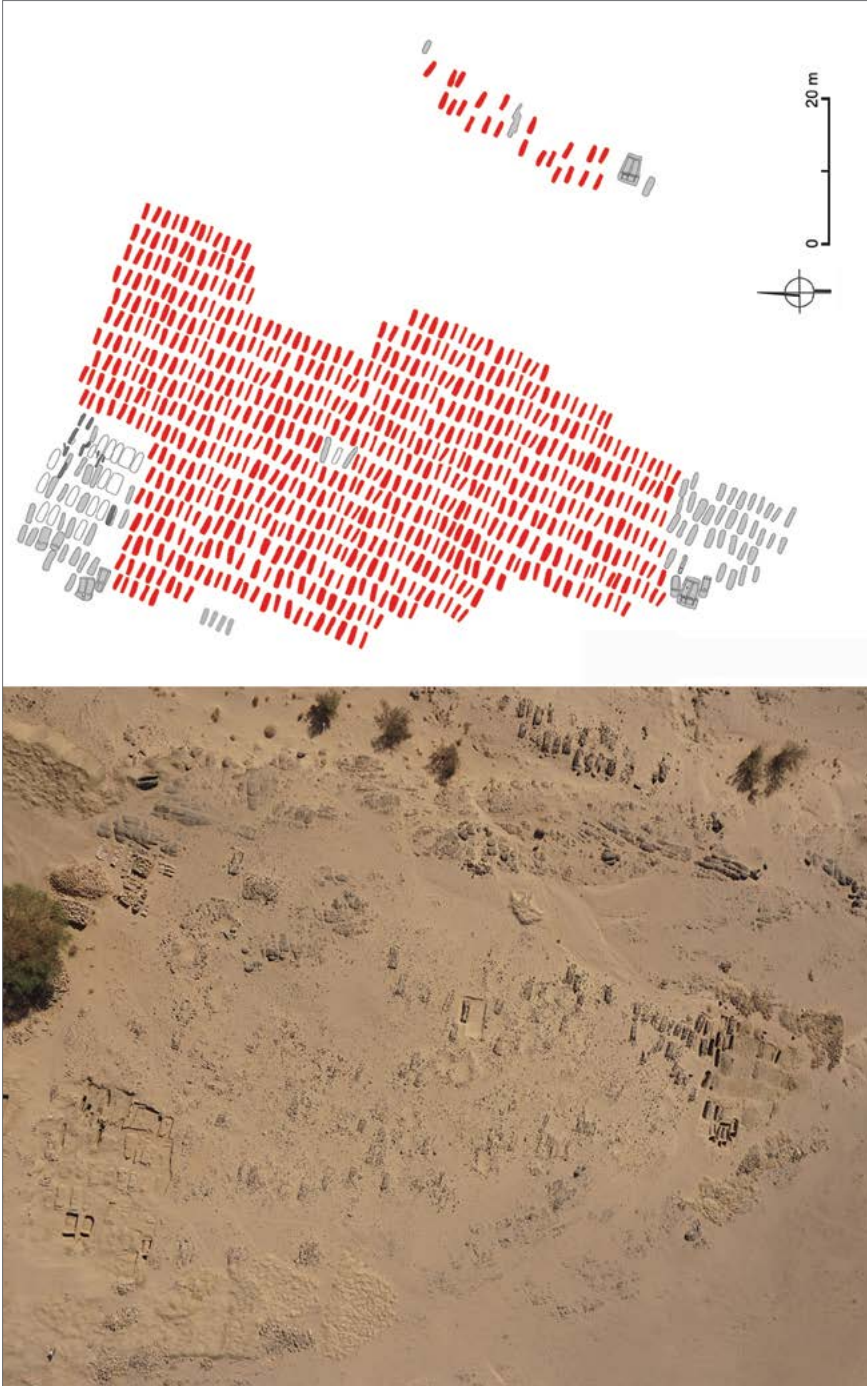


Fig. 14. Aerial view of Cemetery 2 next to the monastery compared with a plan of Cemetery 2 showing the excavated tombs indicated in grey and the unexcavated area tentatively filled with graves (in red) (G.A.S.P./photo S. Lenarczyk, drawing J. Ciesielska)

two adult males interred side by side in the same burial shaft [Fig. 15:B]. No use of mud brick was observed in any of the tombs excavated thus far in Cemetery 1. Flat pieces of local stone were employed to protect the head of the deceased. In accordance with Christian tradition, bodies were oriented roughly E–W, in extended position, with heads toward the west and hands on the pelvis or beside the hips. As Cemetery 1 is situated on a small elevation where rain water swiftly drains from the surface, human remains are very well preserved, including soft tissues and large pieces of textiles. The remains of a child, identified in burial Ghz-1-003, were wrapped in several pieces of textile sewn together using colorful purple and orange thread and then bound by black-

and-yellow cord (probably of mixed plant and animal origin), tied in a diamond pattern [Fig. 15:C].

## CEMETERY 2

Due to its apparent connection to the monastery, Cemetery 2 was subjected to the most intense research. Located directly to the south of the monastic walls, it had from the start been alleged to hold the remains of monks from the monastery.

Most of the burials excavated in the northern and southern parts of the cemetery, which were chosen for testing in the 2015/2016 season, were provided with a superstructure covering the subterranean part of the tomb. The same NW–SE alignment was featured by both parts. However, some funerary monuments



Fig. 15. Cemetery 1 burials: A – stone box-grave type superstructure of tomb Ghz-1-007; B – double burial of two adult male individuals in tomb Ghz-1-004; C – burial of a child Ghz-1-003 with preserved pattern of cords binding the burial shrouds (G.A.S.P./photos J. Ciesielska and A. Obłuski)

were practically unrecognizable on the ground level. So-called box-graves [Fig. 16:A], taking the shape of a rectangular box of dry stones, dominate the southern part of Cemetery 2. Widespread all over Lower Nubia, they were also quite common in the Fourth Cataract region, classified by Borcowski and Welsby (2012) as types FF03c and FF03d. A large number of poorly preserved, flat mud-brick frame-like arrangements and pavements was also uncovered [Fig. 16:B]. In the northern part of Cemetery 2, these were replaced by mud-brick and red-brick mastabas, being significantly taller and provided with a niche in the western section for a funerary stela commemorating the deceased [Fig. 16:C]. Amongst

the superstructures uncovered in the northern part of the cemetery, 17 were left untouched due to their good state of preservation and the presence of funerary steles, which were at risk of being completely destroyed, if extraction was to be attempted.

Research conducted at Ghazali as well as multiple chance finds have yielded the second largest corpus of funerary inscriptions in medieval Nubia (see Van der Vliet 2003: 105–172; Łajtar 2003: 129–155, 158–167; Lepsius 1849/IV: Pls 99, 103; Donadoni 1986). Greek and Coptic inscriptions on the stelae are currently under study (Ochala 2014; 2016; Obłuski and Ochala 2016). Most of the fragments were found in secondary contexts, either

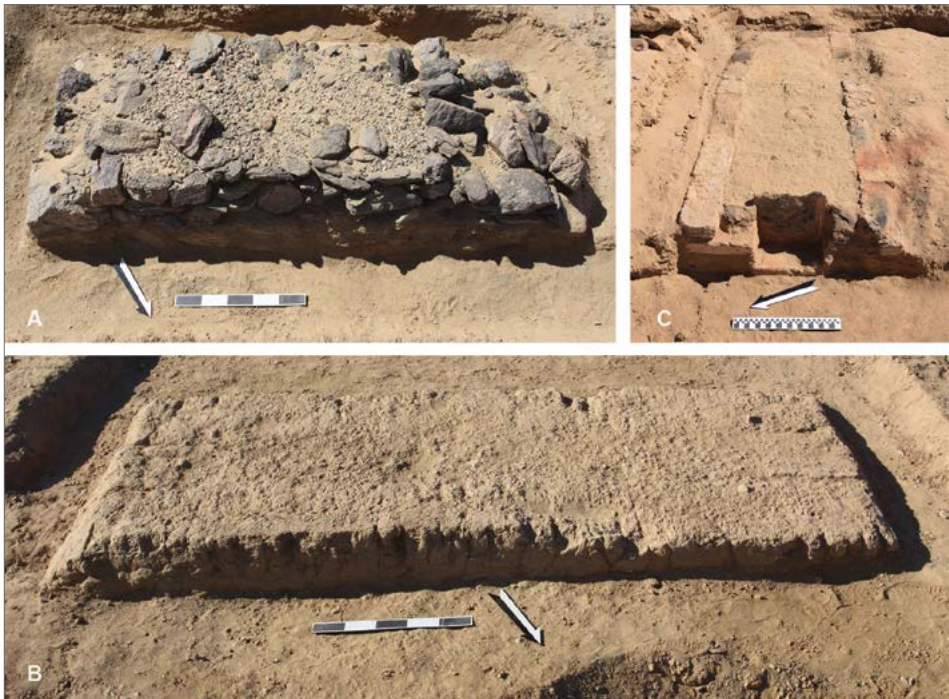


Fig. 16. Types of superstructures recorded in Cemetery 2: A – stone-box grave of tomb Ghz-2-012; B – mud-brick frame of tomb Ghz-2-016; C – red-brick mastaba of tomb Ghz-2-137 (G.A.S.P./photos J. Ciesielska)



reused by the monks themselves, removed by robbers, or destroyed by natural causes. However, one fragment from the northern part of Cemetery 2, dated to the second half of the 8th century AD, suggested an early use for this part of the necropolis. The excavation in February 2015 of a tomb in the eastern, slightly isolated part of the cemetery yielded a date from the turn of the 7th century AD, suggesting an even earlier *terminus post quem*.

Underneath the superstructures, interments were usually in simple rectangular pits. In a select few graves, large stone slabs were set onto a ledge carved into the bedrock at the top of the grave shaft, effectively covering the body of the deceased. This type of body protection has also been documented at other contemporaneous cemeteries in the Fourth Cat-

aract region (El-Tayeb and Kolosowska 2005: 71; Baker 2014: 850). Along the northwestern edge of Cemetery 2 several so-called vaulted tombs [Fig. 17] were found, where burials were placed under a barrel-style, and in one case peaked, vault built of mud brick at the bottom of the shaft. Three single, and three double tombs of this type have been identified thus far. The architecture of such chamber-like installations, constructed to better cover and protect the bodily remains of the deceased, provides insights into burial style variation, and perhaps into elements of social position within the monastic community, although, as yet, no firm evidence of social variability in burial has been established for the monastic cemetery at Ghazali. Among these vaulted tombs only one structure, exca-



Fig. 17. Double-vaulted tomb Ghz-2-009/010 from Cemetery 2 (G.A.S.P./photo J. Ciesielska)

vated in February 2015, has been firmly dated based on the results of  $^{14}\text{C}$  analysis, which yielded a date from the turn of the 7th century.<sup>1</sup>

An arrangement of three bricks around the skull, two set on edge on either side of the skull and a third (or in several cases two) laid flat across to cover the face, was observed in most of the burials [Fig. 18]. Occasionally, bricks were replaced with similarly sized pieces of stone or, much less often, pottery sherds. No use of coffins was observed, although one

individual appears to have been placed on a wooden bier. The bodies of adults and children alike were wrapped in textiles (for comparison, see Geus, Lecoite, and Maureille 1995: 121), fragments of which were found in multiple burials in Cemetery 2. The state of preservation of organic remains was highly variable between burials, being largely determined by the location of a given burial within the cemetery. The northern part of Cemetery 2 is situated in a slight depression compared to the ground around it, rendering it more

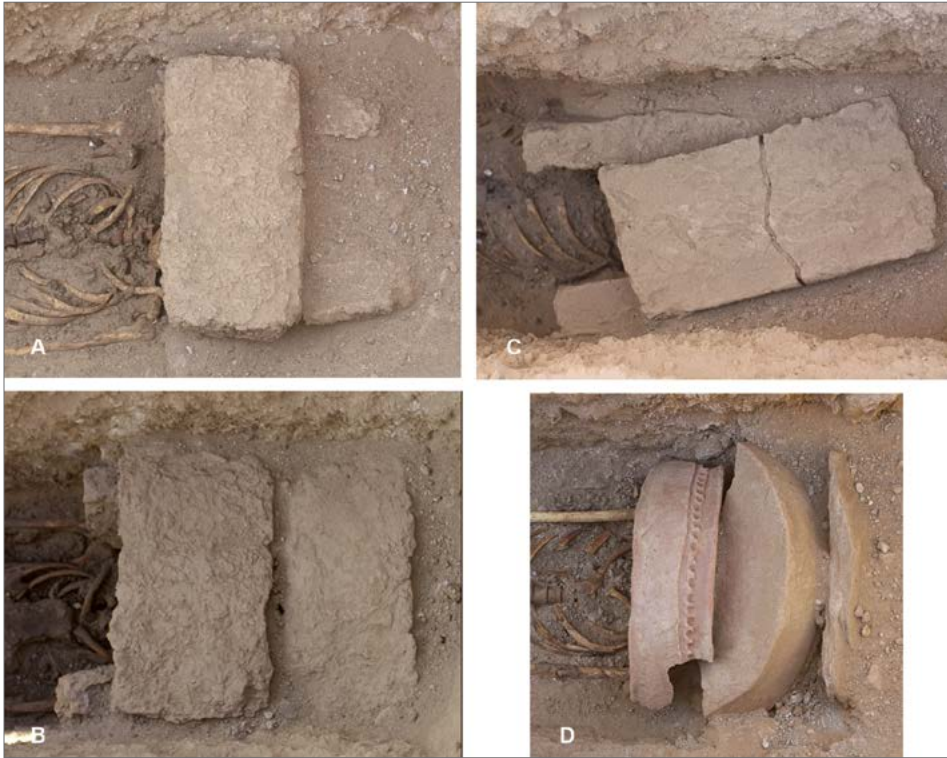


Fig. 18. Various types of head coverage: A – single perpendicular mud brick; B – two perpendicular mud bricks; C – single parallel mud brick; D – fragments of a large ceramic vessel (G.A.S.P./photos J. Ciesielska and R. Stark)

1 The sample was taken from the southern chamber of Ghz-2-001 and examined by the Gliwice Radiocarbon Laboratory, Institute of Physics, Silesian University of Technology.



susceptible to moisture inundation and retention during the rainy season. This results in poorer overall preservation. In the more elevated sections of Cemetery 2, preservation of skin, hair, fabric, and in one instance leather, was common.

The vast majority of burials excavated

in Cemetery 2 belonged to adult males, with an average age at death between 35 and 50. Overall, the skeletal remains appear generally healthful. Arthritic changes in the vertebral column, mostly connected with age, are the most consistently present pathological condition.

## DISCUSSION AND CONCLUSIONS

Research to date has identified five areas of everyday activities of the monastic community. The latrines, and probably the entire sanitary complex, were located in the eastern part of the monastery. The storage area was situated next to the main entrance to the monastery from the wadi in Room A (liquids) and Room C (grain) and also in Rooms 79 and 84. The kitchen was located next to the refectory, to the west of the open courtyard (Room 58). The refectories were excavated in the 1950s (Room K and Room L), but the present work has resulted in a more detailed occupation chronology, reflecting fluctuation of the monastic population during the three periods of use of these rooms. The dormitory at Ghazali first consisted of six cells and was located next to the kitchen area, refectories and the North Church. The dormitory was subsequently made twice as large so as to consist of 12 cells in total. Assuming the dormitory was a single-storey structure, the number of monks at the peak of the monastery's development can be estimated at between 24 and 36 monks.

Subjected to the most intense research, Cemetery 2 is believed to be the burial place of the monks inhabiting the Ghazali monastery. The data collected thus far seems to confirm this hypothesis.

This particular burial field is located in the immediate vicinity of the monastic edifices, having a separate doorway leading to the cemetery through the south wall and overwhelmingly contains the burials of adult male individuals. Meanwhile, Cemetery 3 was probably used by the community inhabiting the nearby village. The role of Cemetery 1 remains somewhat unclear, although the presence of regularly arranged rows of box graves belonging to both adults and children would suggest that it was a lay population. Since the residents of the village nearby were provided with their own burial field, it seems quite likely that Cemetery 1 belonged to members of communities inhabiting small villages along the Wadi Abu Dom, or settlements in the Nile Valley, who wanted to be buried *ad sanctos* near the monastery and its church.

The question of such high diversity in the architectural design of the tombs in Cemetery 2 remains unresolved. In contrast to Cemetery 1, where all funerary monuments are of the same type, in all of the excavated areas of Cemetery 2 various types of tombs, from the simplest pits without any superstructures to very elaborate vaulted mud-brick tombs, are located next to one another. Tombs of similar construction are not grouped to-

gether in any way, which would seemingly exclude their common dating. Another reason for the unusual diversity of forms might have been the different financial situation of the monks themselves.

Of course, the form of the tomb could have also depended on the individual's position within the monastic or church hierarchy.

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# Early Makuria Research Project Excavations at Tanqasi: first season in 2018



**Abstract:** Tanqasi village lies on the left side of the river Nile, about 17 km downstream from Merowe city. A large tumuli field is located some kilometers southeast of the village toward the edge of the Bayuda Desert. It contains no less than 250 tumuli of various size and form of superstructure, varying from very large to very small, but only four of these have been excavated so far (three in 1953 and one in 2006). A new study program, starting in 2018 within the frame of the Early Makuria Research Project, has now explored five more tombs located in different parts of the cemetery, providing a broad chronological sequence from late to terminal Meroitic.

**Keywords:** Tanqasi, tumulus, cemetery, mound, late Meroe, post-Meroe, terminal Meroe, Early Makuria

The first to explore the site in 1953 was Peter Shinnie, who explored three tumuli (Shinnie 1954). This was followed by a preliminary test within the framework of the Early Makuria Research Project in 2006, when Włodzimierz Godlewski excavated one burial (Godlewski 2008). In January–February 2018, the Early Makuria Research Project launched the first season of regular excavations at Tanqasi cemetery. The objective was to study tumuli near the northern and eastern boundaries of the site to determine site chronology and possible patterns of development. Hence four tumuli (Nos 16, 23, 46 and 52) were selected in the northern part of the cemetery and one tumulus (No. 179) at the southeastern extreme of the site [Fig. 10].

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## TUMULUS 16

Situated in the northern part of the site, about 200 m from the modern settlement, tumulus 16 was a rounded mound with a flat top, originally conical in shape, but disturbed by robbing. The preserved height was 0.80 m with a diameter from 17.60 m to 23 m. A ramp in the shape of a dromos was 5.70 m long and from 1.85 m wide on the east to 3.30 m on the west [Fig. 1]. This was cut into the alluvium. A fireplace was recorded at surface level on the northern side of the ramp. The depth of the descending ramp, oriented east–west, did not exceed 2.60 m [see Fig. 1]. The L-shaped chamber located on the western/southwestern side of the shaft was blocked by an L-shaped wall constructed of alternating layers of mud bricks and flat stones. The total length of the blocking wall was 2.50 m on the west and 2.10 m on the south, and part of the originally preserved wall was 1.30 m high. The wall was constructed of several rows of mud bricks and stones bonded in thick layers of mud. The chamber cut into the alluvium was approximately 2.00 m

long on the south and 4.00 m on the west, 1.10 m deep and 0.50 m high.

A robbers' hole led directly from the top of the tumulus to the blocking wall, which had been dismantled in the south-western corner. This provided access to the chamber. The fill of the chamber presented evidence of heavy plundering, as attested by a single bead being found in the fill. A complete cup was found in the robbers' hole. Exploration of this chamber was hindered by a hard earth fill in the robbers' hole. It appears that the fill accumulated when the ramp and chamber were left uncovered. Human bones were located in the southern part of the chamber in the immediate vicinity of the blocking wall. These bones were badly preserved and, due to the structure of the fill, were excavated in chunks of alluvium that were water-sieved and analysed. A skull was located in the northern part of the concentration of bones, but due to heavy fragmentation and dispersion, this was most likely not the original position.

## TUMULUS 23

Tumulus 23, situated in the northern part of the site, was a rounded mound with a flat top, originally conical in shape, but disturbed by robbing. Its height did not exceed 0.35 m, with a diameter from 17.40 m to 18.30 m. A ramp in the shape of a dromos with heavily eroded steps was 2.50 m long and from 1.10 m wide on the south-east to 1.90 m on the northwest [Fig. 2]. This ramp was cut into the alluvium. The depth of the descending ramp, oriented

east–west, did not exceed 1.25 m. On the north side of the ramp, a fireplace was recorded at surface level. The kidney-shaped chamber located on the northwestern side of the shaft was closed with a blocking wall constructed of 11 layers of mud bricks. The dimensions of the blocking wall were 1.90 m by 0.75 m [Fig. 3]. The chamber was cut into the alluvium. Its dimensions are difficult to assess due to the poor state of preservation. It measured approximately

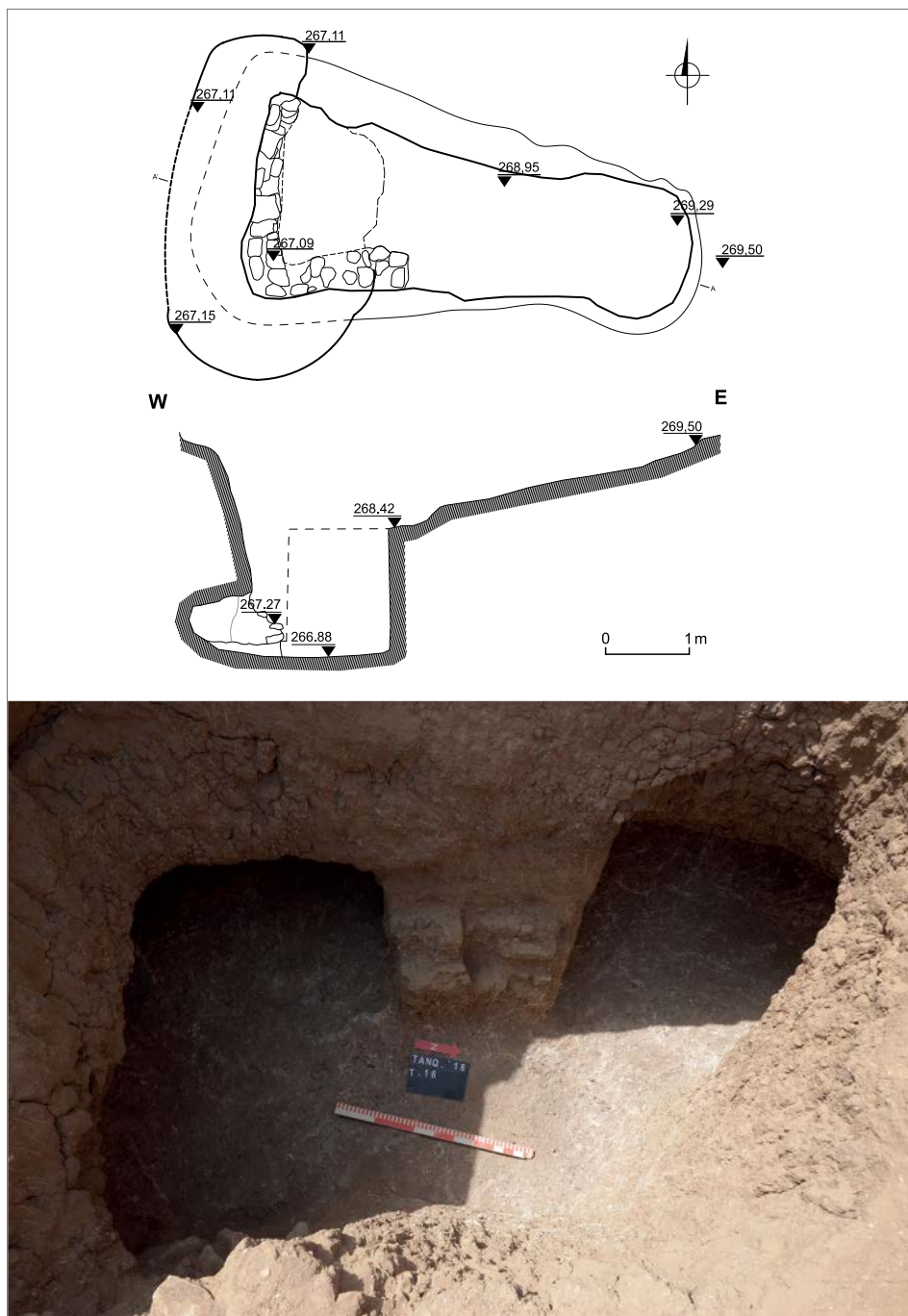


Fig. 1. Tumulus 16: top, plan at ground level and at the bottom of the shaft and E–W section looking north; bottom, entrance to the chamber (EMRP PCMA UW/drawing M. Antos, E. Czyżewska-Zalewska, photo M. Wyżgoł)

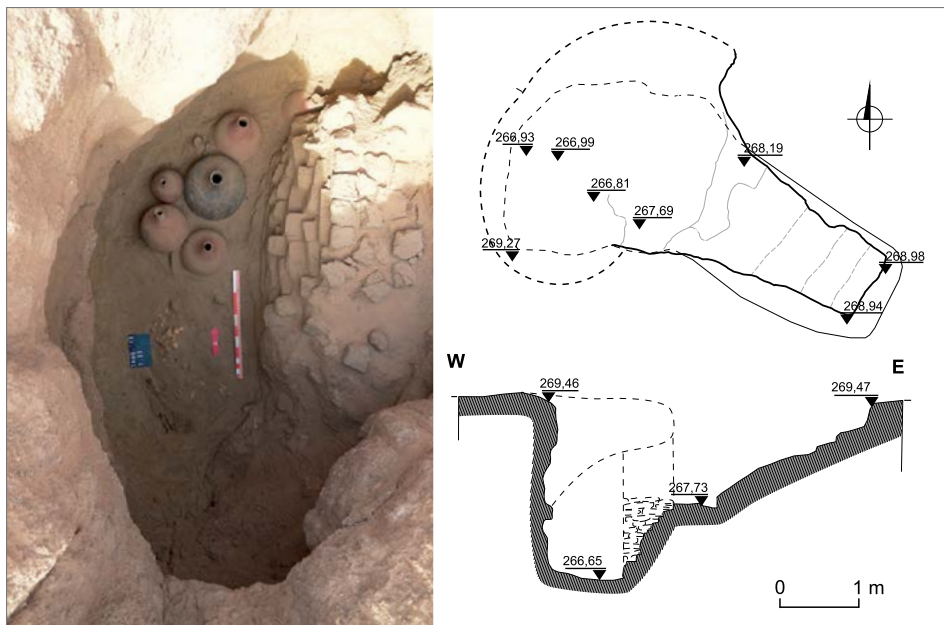


Fig. 2. Tumulus 23: left, top view of the burial in the chamber; right, plan at ground level and at the bottom of the shaft and E–W section looking north (EMRP PCMA UW/drawing M. Antos, E. Czyżewska-Zalewska, photo M. Wyżgoł)



Fig. 3. Tumulus 23: blocking wall, view from the west (EMRP PCMA UW/photo M. Wyżgoł)



Fig. 4. Tumulus 23: grave goods in the burial chamber; findspot of the metal artifacts circled in white (EMRP PCMA UW/photo M. Wyżgoł)

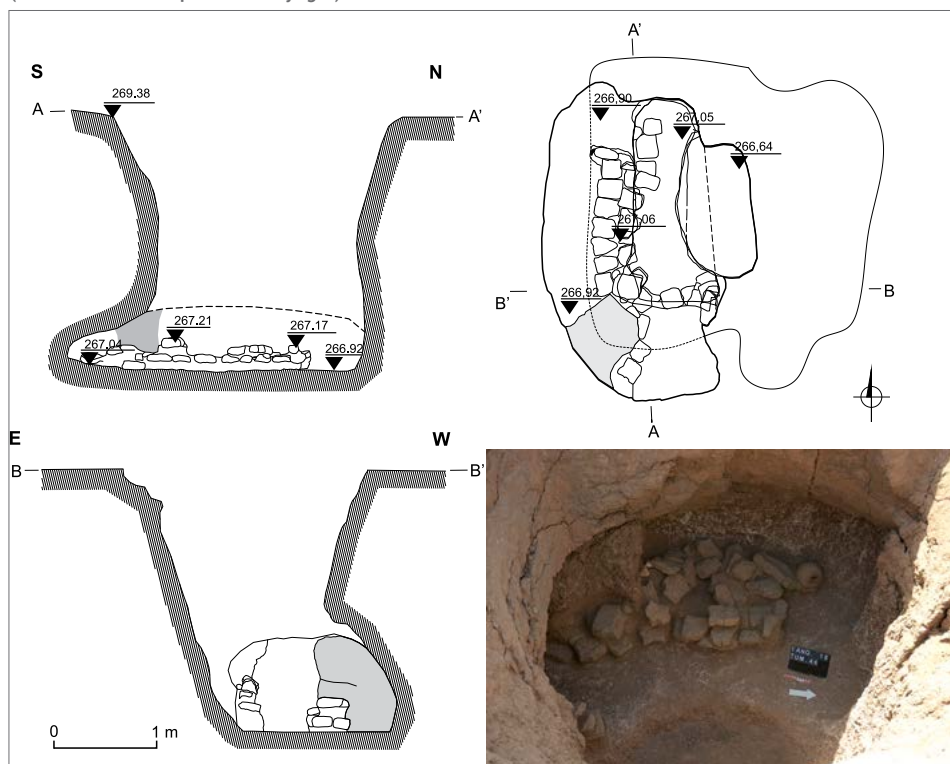


Fig. 5. Tumulus 46: top right, plan at bottom level; top left, N-S section looking west onto the burial chamber; bottom left, E-W section looking south onto the southern part of the burial chamber; bottom right, west blocking wall and burial chamber (EMRP PCMA UW/drawing M. Antos, E. Czyżewska-Zalewska, photo M. Wyżgoł)



2.50 m in length on the SE–NW axis and 4.00 m on the NE–SW axis.

A robbers' hole led directly from the top of the tumulus to the chamber, breaching the chamber and part of the blocking wall. Although the chamber had been penetrated by robbers, a significant amount of grave goods remained intact. In the northeastern part of the chamber, seven vessels, including bottles and beer jars, were recorded [Fig. 4]. These vessels were most probably placed on an organic mat, which is evidenced by the coloration of the ground. In the southwestern part of the chamber, disarticulated human bones were also record-

ed on an organic mat. A skull was found in the southern part of the chamber pointing south. Sex was preliminarily estimated in the field before extraction of the pelvis and the morphological features suggest a male. North–south oriented iron arrowheads and a spearhead [marked location in Fig. 4] were placed along the scattered bones on their southwestern side, and traces of decayed shafts were also observed. A copper-alloy bowl was found to the east of the skeleton and adjacent to another beer jar and a bottle. Over 300 beads were found in the fill covering the bones, originally having adorned the deceased.

## TUMULUS 46

Situated in the northern part of the site, tumulus 46 was a rounded mound with a flat top, originally conical in shape but also disturbed by robbers' activity. The preserved height was 0.60 m with a diameter

of approximately 15 m. A rectangular vertical shaft measured approximately 2.80 m by 2.50 m, narrowing towards the bottom reached at a depth of 2.60 m [Fig. 5 left]. The L-shaped chamber located in the western/



Fig. 6. Tumulus 46: articulated skeletal remains *in situ* (EMRP PCMA UW/photo M. Wyżgoł)

southern side of the tomb was blocked by an L-shaped blocking wall constructed of layers of mud bricks [Fig. 5 bottom right]. The chamber was cut into the alluvium and was 2.10 m long on the western side and 1.00 m on the southern side, with a height of approximately 0.60 m.

A robbers' hole led directly through the original shaft to the blocking wall, which had been partly dismantled and the bricks were thrown along the eastern edge of this hole. The dismantled western and southern part of the blocking wall suggests that both parts were penetrated by robbers. Despite having been plundered, some of

the original grave goods were preserved, mainly a jar and almost 200 beads, as well as copper-alloy jewellery, e.g., a ring was found on a finger-bone. The human bones were well preserved but disarticulated. The skeleton was partly covered with a collapsed blocking wall, and part of the bones were intermixed with bricks. The upper limbs and the head oriented south were most probably preserved in anatomical order [Fig. 6]. Discarded limbs, the bones still articulated, suggest that the burial had been plundered soon after the funeral, before the soft tissues had decayed.

## TUMULUS 52

Situated in the northern part of the site, tumulus 52 was a circular mound with a flat top. The diameter ranged from 19 to 21 m, the preserved height being about 0.50 m (the diameter of the stone circle on top was 11.70 m). A shaft cut into the alluvium was most probably vertical and

rectangular. However, it was in a poor state of preservation due to robbing as well as rainwater and wind erosion. Only the east wall was recorded during the excavation. The burial chamber appears to have been robbed and/or destroyed by natural factors.



Fig. 7. Tumulus 179: view of the shaft with human bones and a bowl (EMRP PCMA UW/photo M. Wyżgoł)

# TUMULUS 179

Tumulus 179, located in the southeastern part of the site, is a rounded mound with a flat top. It was apparently conical in shape, but was flattened on top as a result of plundering. The mound is from 13.00 m to 15.80 m in diameter and preserved to no more than 0.70 m in height.

A roughly circular vertical shaft was dug about 1.40 m into the sandy geological structure; it measures from 1.16 m on the SW-NE axis to 1.66 m on the NW-SE axis [Fig. 8]. A fireplace was recorded at surface level on the northern side of the shaft. A lateral niche was cut in the

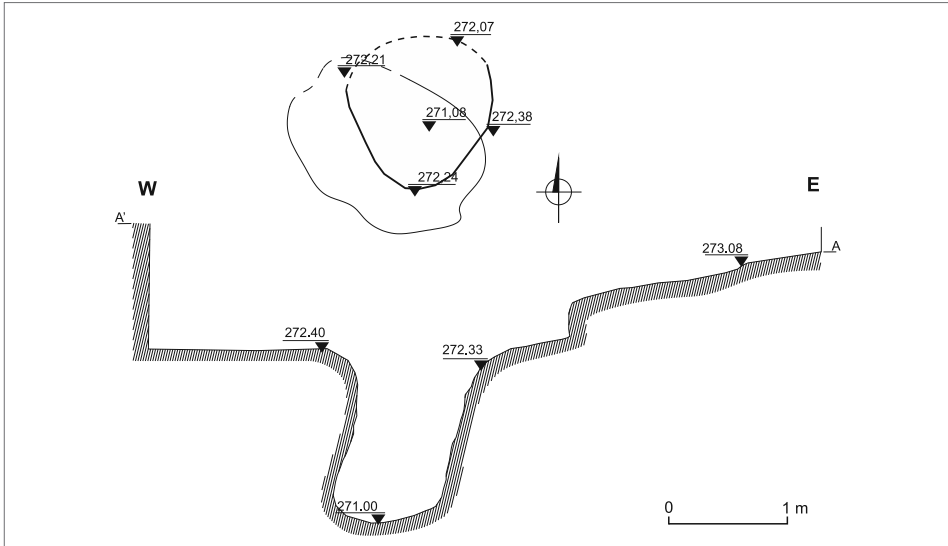


Fig. 8. Tumulus 179: top, plan showing shaft opening in outline superimposed on the plan of the bottom; bottom, E-W section looking north (EMRP PCMA UW/drawing M. Antos, E. Czyżewska-Zalewska)



Fig. 9. Tumulus 179: skeletal remains (EMRP PCMA UW/photo M. Wyżoł)

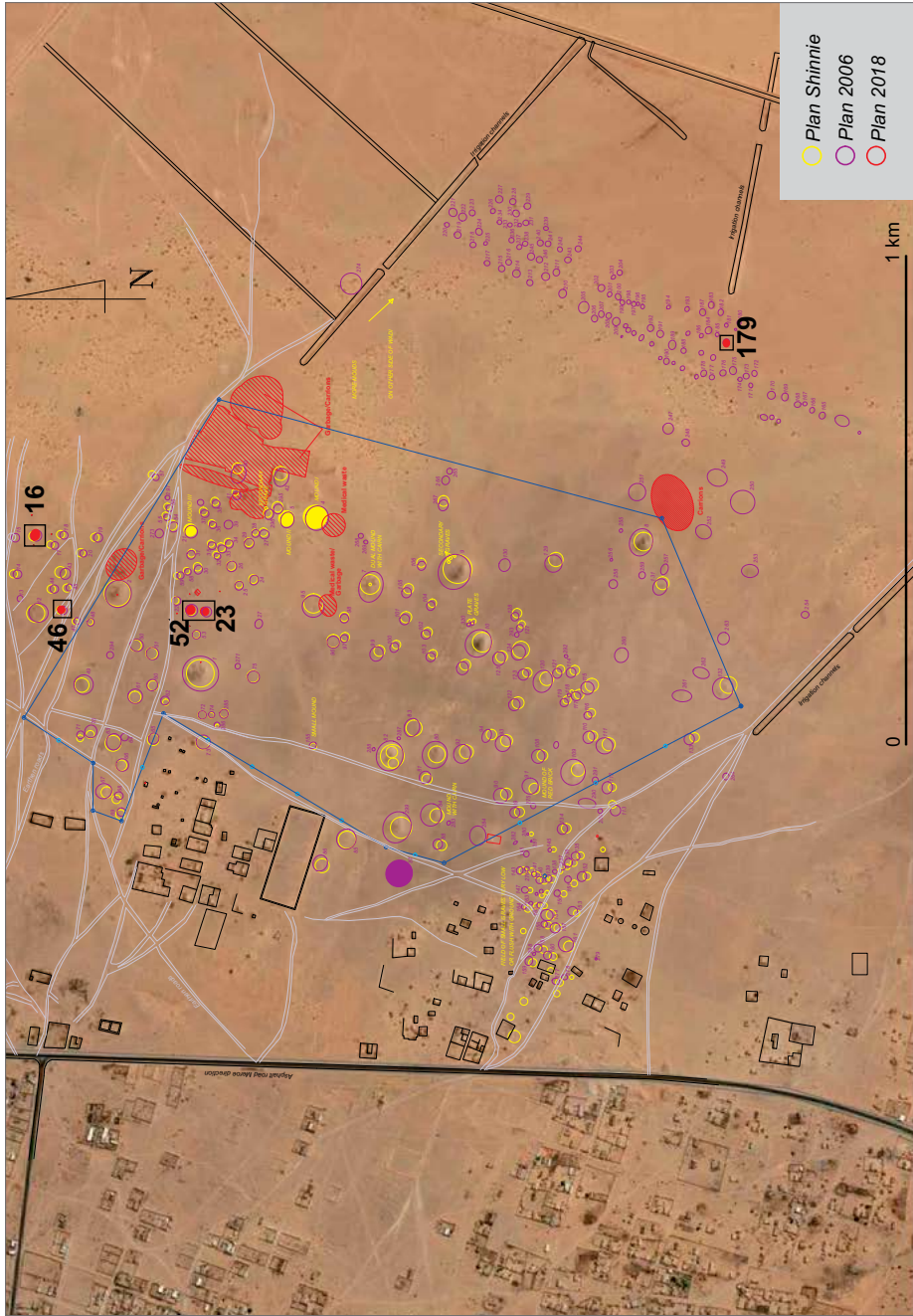


Fig. 10. Plan of the Tanqasi site (EMRP PCMA UW/drawing M. Antos)



southwestern side of the shaft and was 0.45 m deep.

A robbers' hole led directly through the original shaft to the niche. The grave goods including a bowl and beads were scattered within the fill of the shaft, suggesting heavy plundering [Fig. 7]. The recorded human remains were not in anatomical order and were spread out on the bottom of the burial shaft including the

niche. A concentrated bone assemblage appeared on the southernmost side, the bones here lying aligned E–W [Fig. 9]. The state of preservation was very good. The skull was intact and was located to the west of the concentrated bone assemblage. A preliminary examination of the morphological features of the pelvis before extracting it from the ground suggested a female individual.

## REMARKS AND COMMENTS

As said above, prior to 2018 there were two excavation seasons: in 1953 and in 2006. Yet the first explorations of this site go back to the first half of the 19th century and the first two decades of the 20th century. Shinnie (1954: 66) states that “the group of mounds at Tanqasi, wrongly placed and wrongly described ‘pyramids’ on map sheet 45-F of the 1/250,000 series of the Sudan, have given rise to much speculation. They have been accepted as burial mounds by visitors but their date has never been satisfactorily determined. First mentioned by Lepsius who made a plan of them [Denkmäler I, 124 and Text V: 255–256], they were visited by Budge [Egyptian Sudan, Vol. I: 122] and Reisner [JEA V: 67]. The latter made a cut into one of them, apparently without results. It was Reisner who pointed out that these mounds were not pyramids, but circular grave-tumuli composed of earth held in place by an outer layer of small rough stones. He believed them to be of a late Meroitic date at the earliest”.

Having in mind Shinnie's points therefore, a comprehensive study program for this long-forgotten tumuli field

has been planned. In 2018, the Early Makuria Research Program launched its first season of fieldwork, choosing five burials located in different parts of the cemetery [Fig. 10]. The results of this limited exploration test revealed that these burials fell into three different groups, based mainly on the construction of their substructures.

Tumuli 16 and 23 represent the first group [see Figs 1–4]. The substructures of this group are of conical shape, descending ramp, oriented east–west, with a burial chamber cut perpendicularly to it on the west side of the ramp. Note that this method of burial construction was known in the Central Nile Valley as early as the Meroitic period. It was also practiced in the region of the Fourth Nile Cataract during the second phase of the “Terminal Meroe” period (post-Meroe, about AD 450–550), although occasionally with some modifications (see Lenoble 1987: Pls I, VIII, IX, X, XI, XII; El-Tayeb and Kołosowska 2007). Burial arrangement in the Central Nile Region seems to be organized according to a well-established burial practice. The body was



always buried in a contracted or flexed position, aligned north–south or east–west. Head orientation and face direction do not seem to follow a strict rule, for the head was sometimes oriented north or south. Differences in body orientation might have stemmed from the regional peculiarity of each population group. Moreover, the body lay either on its left or right side, often on an arrangement of a mat, pure sand or even just mud signifying a bed (Geus 1982: 181, Fig. 4; El-Tayeb and Gar El-Nabi 1998). A few inhumations were laid on an actual bed, or a wooden bench or frame (Lenoble et al. 1994: Pls 7, 9, 10; Mallinson 1994: 21; El-Tayeb 1994: 66, 69, 70; Edwards 1998: 11–60).

The second group of burials comprised tumuli 46 and 52 [see *Figs 5, 6*]. The principal rule for this type of burials is that they were usually composed of a rectangular vertical shaft provided with a single chamber hewn into one of the shaft walls, thus designated as a lateral burial. Lateral burials are the dominant type across the Dongola Reach, where this type was first discovered at the Jebel Gaddar southern cemetery and was noted thereafter in various versions. It was also recorded in some cases in the Lower Nubia region. However, until today it has never been observed above the Fifth Nile Cataract (see El-Tayeb 1994: 65–67, 69, Fig. 1, Pl. 2, Fig. 3; 2002: 70–72). It is worth mentioning that Tumulus 46 is provided with an L-shaped burial chamber, a version which appeared in this region in the late phase of the “Terminal Meroe” period about AD 350–450 and was first discovered at the cemetery of el-Kassinger Bah-

ry in the Fourth Nile Cataract Region (see Kolosowska and El-Tayeb 2007). As noted above, the burial was disturbed in the past and as a result the human skeleton was found detached into two parts, upper and lower. Nonetheless, it seems that initially the occupant was located on the southern side of the burial chamber, following the canon of burial customs practiced in the Dongola Reach.

It should be mentioned that these four burials are located on a vast paleo-flood plain. In consequence of natural climatic factors and the activity of robbers, the geological structure of the Nile silt became a very solid tenacious mass. This made the exploration of these burials a truly difficult task. The best example of this was the work in tumulus 52, which was found totally devastated by robbers and by falling rains, to the extent that even its real shape was impossible to determine with absolute certainty.

The last group (so far) is represented by a single burial, tumulus 179 [see *Figs 7–9*], which is located in the far north-eastern part of the cemetery, at the edge of the Bayuda semi-desert. Its superstructure has a rounded shape, with a diameter ranging from 13 m to 15 m and a preserved height of about 0.70 m. The substructure consists of a rounded vertical shaft, with a maximum depth of 1.66 m. Remains of disarticulated human skeleton were noted at the bottom of the shaft, scattered on the southwestern side. Tumulus 179 is the earliest burial among the five graves excavated this season, dated to the late Meroitic period about AD 250–350. Generally it is designated as a beehive burial, or a flask-shaped variant, a type which was found in various modified

forms. It is characteristic of the southern zone of Upper Nubia, namely the Gezira region between the Blue and White Niles, but is not that common in the regions north of Khartoum and downstream as far as Lower Nubia. However, the beehive burial type persisted in continuous use until the early phase of the “Terminal Meroitic” period about AD 350–450 (see El-Tayeb 2012: 49–52).

### **FIREPLACES**

Fireplaces (or hearths) are rare, one reason for the rarity being possibly because such remains were easily destroyed either by grave robbers or during the course of the original burial excavation. Alternatively, they may have simply been overlooked or ignored by the excavators. Consequently, until the early 1980s no records concerning hearth burial practice had ever been made in Nubia as a whole. Even so, a fireplace was first noted at the el-Kadada cemetery in the Shendi Reach, where it was observed on the surface of the natural ground, near the edge of the descending ramp of the burial (Lenoble 1994: 95–96). Later on, with the progress of research, fireplaces were documented in the Dongola Reach in various cemetery fields such as Jebel Gaddar Southern Cemetery, el-Kassinger Bahry and Umm Gibier Island in the Fourth Nile Cataract region. A fireplace was also recently observed at the el-Zuma tumuli field (see Kołosowska and El-Tayeb 2007: 18; El-Tayeb 2012: 83–84).

During the excavations at the Tanqasi cemetery, fireplaces were recorded near three tumuli, 16, 23 and 179. In all these cases, a fireplace was noted on the ground surface level, usually near the edge of the

burial shaft, analogous to the abovementioned practice at other sites excavated in the Shendi and Dongola Reaches.

To date, the function of the fireplace is not clear and still remains a matter of conjecture. Lenoble suggests that the fireplace practice is part of what he called the “Funerary Banquet”. According to his assumption, meat was cooked and consumed during the inhumation ceremony (Lenoble 1994: 95–96). Yet the existence of fireplaces was noted adjacent to the burial chamber entrance at the bottom of the burial shaft, a practice which was first registered at T.2 in the Jebel Ghaddar Southern Cemetery as well as HP45/T.2 at el-Kassinger Bahry (El-Tayeb 1994: 66–70, Fig. 4; Kołosowska and El-Tayeb 2007: 18). At the el-Zuma cemetery, traces of fireplaces were noted in T.5 at two different locations. Firstly, on the top surface of the pier in the shaft, almost facing the southern main burial chamber, and secondly, at the bottom of the external shaft, near the entrance to the underground tunnel that leads to the main burial chamber (El-Tayeb 2010: 201). Unlike the el-Kadada find, no animal bones were found on or near the fireplace. Hence, in this case one would assume that a fire may have been lit to purify the burial chamber before depositing a dead body within. Burial purification seems to be the most feasible interpretation for the existence of hearths near or at the bottom of the shaft. It can be understood as part of the burial rite connected to the Isis libation cult, with the aim of purifying the dead and the grave as well, protecting in this way the dead and the burial from evil spirits.

### GRAVE GOODS

Although all the five burials appeared to have been plundered, probably repeatedly in some cases, a number of objects in different state of preservation, which the robbers had left behind, were found. These objects comprise mainly pottery vessels (for a detailed analysis of the pottery assemblage, see Czyżewska-Zalewska 2018, in this volume), metal artifacts (see Zieliński 2018, in this volume) and collections of beads made of various natural materials (see Then-Obluska 2018, in this volume).

Tumulus 23 yielded six large intact beer jars and one small pot found on the northeastern side of the burial chamber. Five of these vessels (Tnq23/24, 25, 27, 28, 29) have a red-slipped neck and shoulder, and a globular body covered with a faded textile impression. All seem to have been produced in one workshop (see also Shinnie 1954: 75–80, Figs 8–12). Tnq23/36 is distinguished by a very characteristic type of decoration in the form of a red-slipped neck and shoulder. The globular body is covered with a textile pattern and two parallel horizontal red stripes applied just below the shoulder. A decorative rhombic shape with red-slipped sides is applied on the upper part of the body, below the red stripes, a modification which is rarely observed in this period (for the nearest parallel in date and manufacture, see Lenoble 1992: 80–90, Pls I–IV).

Another interesting jar, Tnq23/26, is a large black-ware vessel with a long neck. Its decoration is characterized by eight long vertical rows of short notches extending from under the rim downwards to the broad neck base. The handmade

black ware pottery is generally agreed to have appeared already during the early Meroitic period, especially in the Middle and Southern regions, and is presumed to have existed until the end of Meroe (about AD 550–600). It is characterized by decoration of geometrical and non-geometrical incised lines, sometimes filled with a red or white substance. Large, brown to light brown globular beer jars, decorated with a red slip and polished upper part, and the body covered with a mat-impressed or textile pattern, are dated to the first phase of “Terminal Meroe”, about AD 350–450; they underwent a long evolutionary process thereafter.

Although all the five burials were rifled to various degrees, metal artifacts, namely weaponry, were found in abundance, especially in tumulus 23. Two objects should be discussed in greater detail: a copper alloy bowl Tnq23/23 and an iron spear head Tnq23/37. Metal hemispherical bowls started to be produced in the Meroitic period, ranging from simple to more exclusive and richly decorated forms lasting through the terminal phase of Meroitic culture. It is worth mentioning that metal bowls were mainly recorded in the Middle Nile Valley and Northern province to Lower Nubia (see Lenoble et al. 1994: 53–82, Pls 12–14).

Iron spears, apparently as effective weapons, were recorded as items usually accompanying in quantity the royal dead or members of the high class elite on their last journey. Apart from their military character, they may also have been seen as royal insignia. This is best represented by the royal tumuli at Ballaña and Qustul in Northern Nubia, as well as Tumuli III and VI at el-Hobagi in the Shendi Reach

(Emery and Kirwan 1938; Lenoble et al. 1994: 51–88, Pls 8–10, 16, 20). Yet it should be mentioned that burials of common individuals also sometimes contained not much more than one spear, which was usually characterised by low quality of manufacture.

To conclude, the huge tumuli field of Tanqasi contains no less than 250 burials that are still visible on the surface, but only a small number of them have been excavated archaeologically. The results

of the burials excavated from 1953 to the present day, although quite modest (only nine tombs) have demonstrated a broad chronological range of the cemetery, beginning from the late Meroitic, around the end of the 3rd century AD, until the second phase of the “Terminal Meroe” period about AD 500–550. The progress of work on this significant necropolis in the future is expected to shed more light on its nature, precise date and history.

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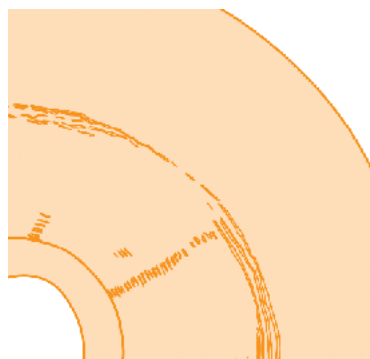
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# Early Makuria Research Project

## The vessel assemblage from Tanqasi



**Abstract:** The first archaeological season of the Early Makuria Research Project at Tanqasi, which encompassed the exploration of five tombs in different parts of the extensive tumulus field (16, 23, 46, 52, and 179), yielded an assemblage of pottery vessels, as well as a metal bowl. The material dates from the late Meroitic, post-Meroitic and early Makurian periods.

**Keywords:** Tanqasi, tumuli, pottery, metal vessel, post-Meroitic, late Meroitic, early Makurian

The explored tumuli: 16, 23, 46, 52, 179, have not been abundant in vessels, possibly as a result, among others, of robbery of the tumuli in ancient times (see Wyzgól and El-Tayeb 2018, in this volume). Tumulus 23 was the best equipped tomb, its 13 registered almost completely preserved vessels including nine jars/bottles, one cup, and a metal bowl. As for the other tumuli, only a few complete pottery vessels were found: 16 – one complete cup among 15 registered pottery artifacts, 46 – one bottle and two cups among 13 registered pottery artifacts, 179 – one complete bowl among four registered pottery artifacts, and 52 – no complete vessels. The fragmented pottery assemblage included non-diagnostic fragments and sherds used as “digging” tools. The article presents some examples of vessels derived from the tumuli.

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### VESSEL REPERTOIRE AND CATALOGUE

#### CUPS [FIG. 1]

Tnq16/13  
Wheel-made cup; rim diameter 9.8 cm, height 8.8 cm. Slip on both surfaces (10R 5/8 red). Decoration below the rim is composed of a band of punctuated circles placed between two grooves.

Tnq23/21  
Wheel-made cup; rim diameter 14 cm, height 13.1 cm. Both surfaces slipped (7.5R 5/6 red) and burnished.

Tnq46/7  
Wheel-made cup; rim diameter 10.7 cm, height 11.2 cm. Both surfaces slipped (10R 4/6 red) and burnished.

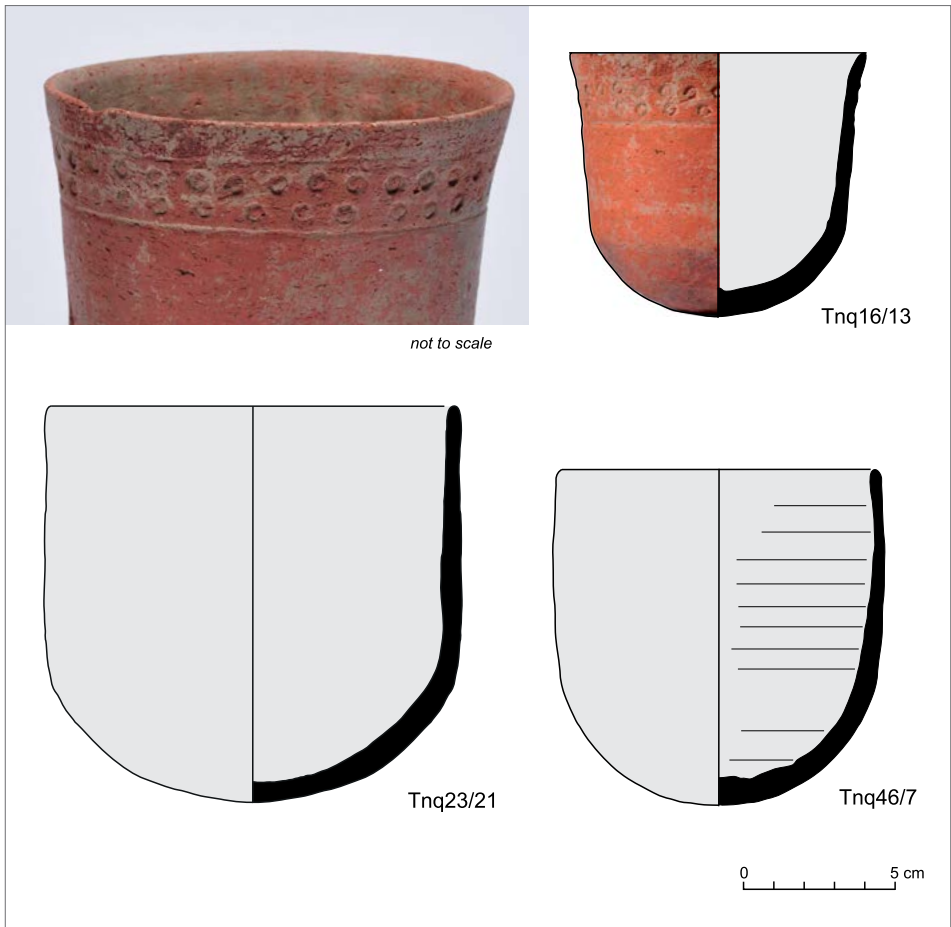


Fig. 1. Cups from different tumuli (EMRP PCMA UW/drawing J. Górecka, digitizing J. Górecka, E. Czyżewska-Zalewska, photo A. Kamrowski)

**BOWLS [FIG. 2]**

Tnq179/3

Handmade bowl; rim diameter 26.5 cm, height 14.4 cm. Both surfaces white slipped (10YR 8/2 very pale brown).

Tnq23/23

Metal (copper-based alloy) bowl; rim diameter 13.7 cm, height 6.8 cm; very thin walls (1–1.5 mm). Decorated with two grooves below the rim (for the production technology, see Zieliński 2018, in this volume).

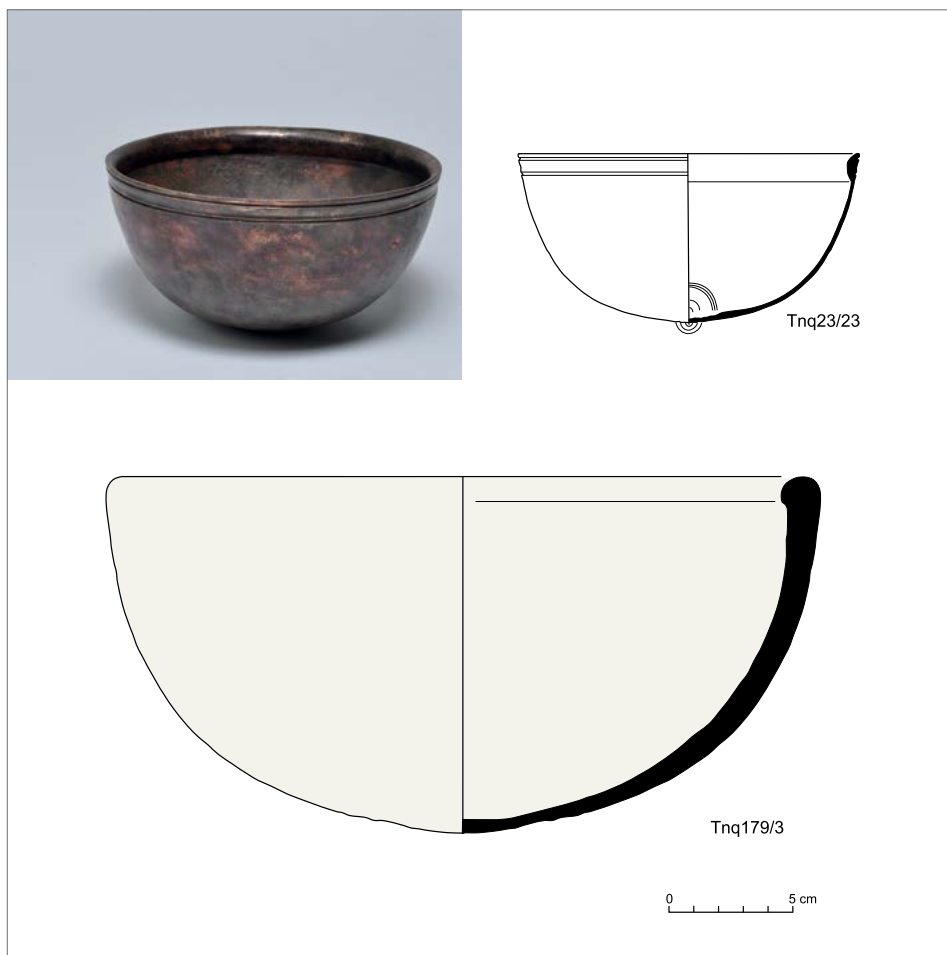


Fig. 2. Bowls from tumuli 23 and 179 (EMRP PCMA UW/drawing and digitizing E. Czyżewska-Zalewska, photo A. Kamrowski)

## BOTTLES AND JARS

All bottles/jars are handmade and come in three sizes: small, medium and large. In this article, the differences between the sizes and the distinction between jars and bottles is based on the characteristics established by the author for the el-Zuma pottery material, although with a slight modification for the large-sized jars<sup>1</sup> (Czyżewska-Zalewska 2016: 730–732).

### SMALL JARS

Tnq46/12 [Fig. 3]

Small jar; rim diameter 6.4 cm, height 23 cm, maximum diameter 20 cm. External surface slipped (10R 4/6 red). Slip matt and thick, fragmentary because of rubbing of the external surface. The attached neck does not develop gradually into a globular lower body as in typical jars, but runs straight down and the angle between the belly and the neck is distinct.

Tnq23/28 [Fig. 3]

Small jar; rim diameter 7.4–7.8 cm, height 23.6 cm, maximum diameter 23.2 cm. External surface decorated. The broad neck attached to the body develops gradually into a globular lower body. Neck slipped (7.5R 4/8 red) and burnished. Additional two bands of slip and mat impression on the body make for the decoration of this vessel. Poor execution of the slip and mat impression.

### MIDDLE-SIZED BOTTLES

Tnq23/27 [Fig. 4]

Bottle; rim diameter 6 cm, height 34.8 cm, maximum diameter 31.6 cm. Neck narrow and long. Outside surface slipped and burnished. Slip clearly visible, shiny, well preserved and quite well made.

Tnq23/36 [Fig. 4]

Bottle; rim diameter 5.2 cm, height 34 cm, maximum diameter 30 cm. Neck narrow and long, slipped (10R 4/6 red) and burnished. Body covered with a mat impression. Shoulders and upper part of body decorated with two bands and four slipped rhombic patterns. Slip lustrous, burnished with precision.

### LARGE JARS AND BOTTLES

Tnq23/22 [Fig. 5]

Bottle; rim diameter 10 cm, vessel height 59 cm, maximum diameter 45 cm. Long neck. Outside surface red-slipped and burnished. On the neck, burnish was clearly executed in vertical lines, but on the globular body was poorly executed in all directions. A decoration of four sets of three small bosses was applied on the shoulders. Scratched decoration made after firing on the neck and shoulders.

Tnq23/24 [Fig. 5]

Bottle; rim diameter 7.8 cm, height 54 cm, maximum diameter 42 cm. The neck is long, slender and was only burnished

1 Mahmoud El-Tayeb proposed to classify the bottles as small and middle-sized, whereas “jars” came in three size groups, including small, medium and large. However, the structure of the narrow rim and the slender and tall neck in some large-sized vessels are typical of bottles, while some “jars” have a broad rim and a short and broad neck as well (Czyżewska-Zalewska 2016: 730; El-Tayeb 2013: 89, 91).

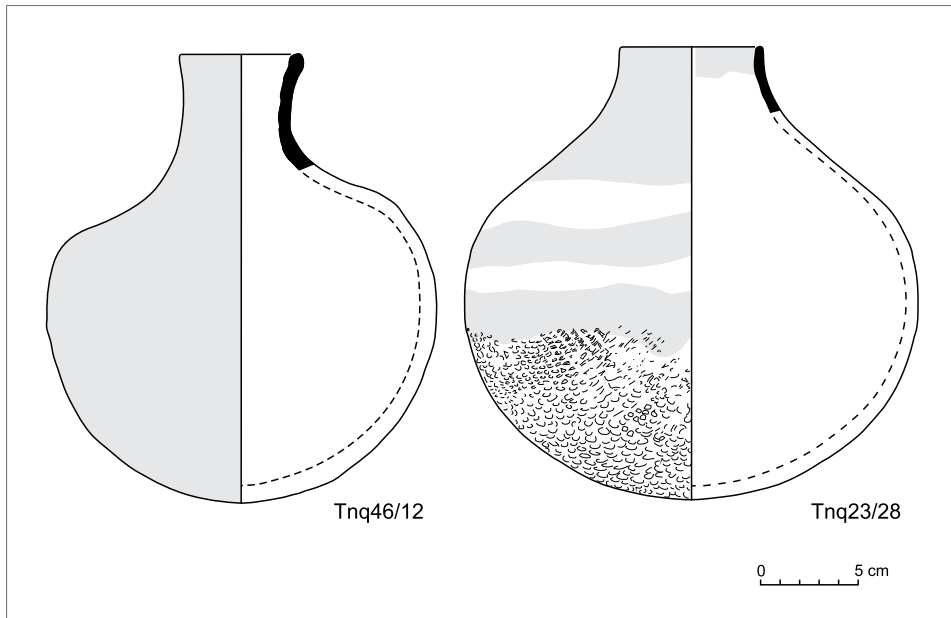


Fig. 3. Small-sized jars with slip and slipped decoration, from tumuli 23 and 46 (EMRP PCMA UW/ drawing J. Górecka, digitizing E. Czyżewska-Zalewska)

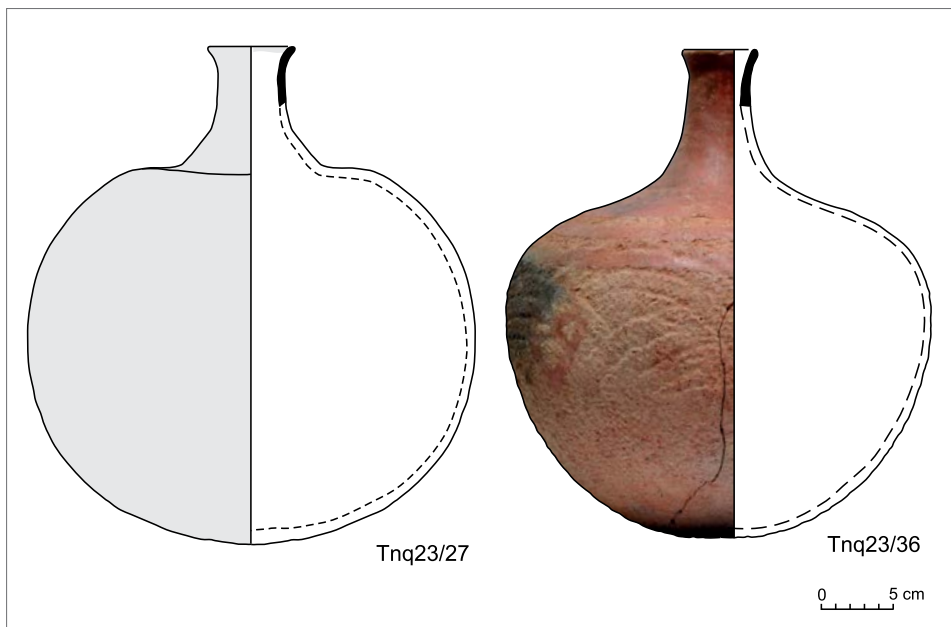


Fig. 4. Middle-sized bottles with slip and slipped decoration, from tumulus 23 (EMRP PCMA UW/ drawing J. Górecka, digitizing E. Czyżewska-Zalewska, photo A. Kamrowski)



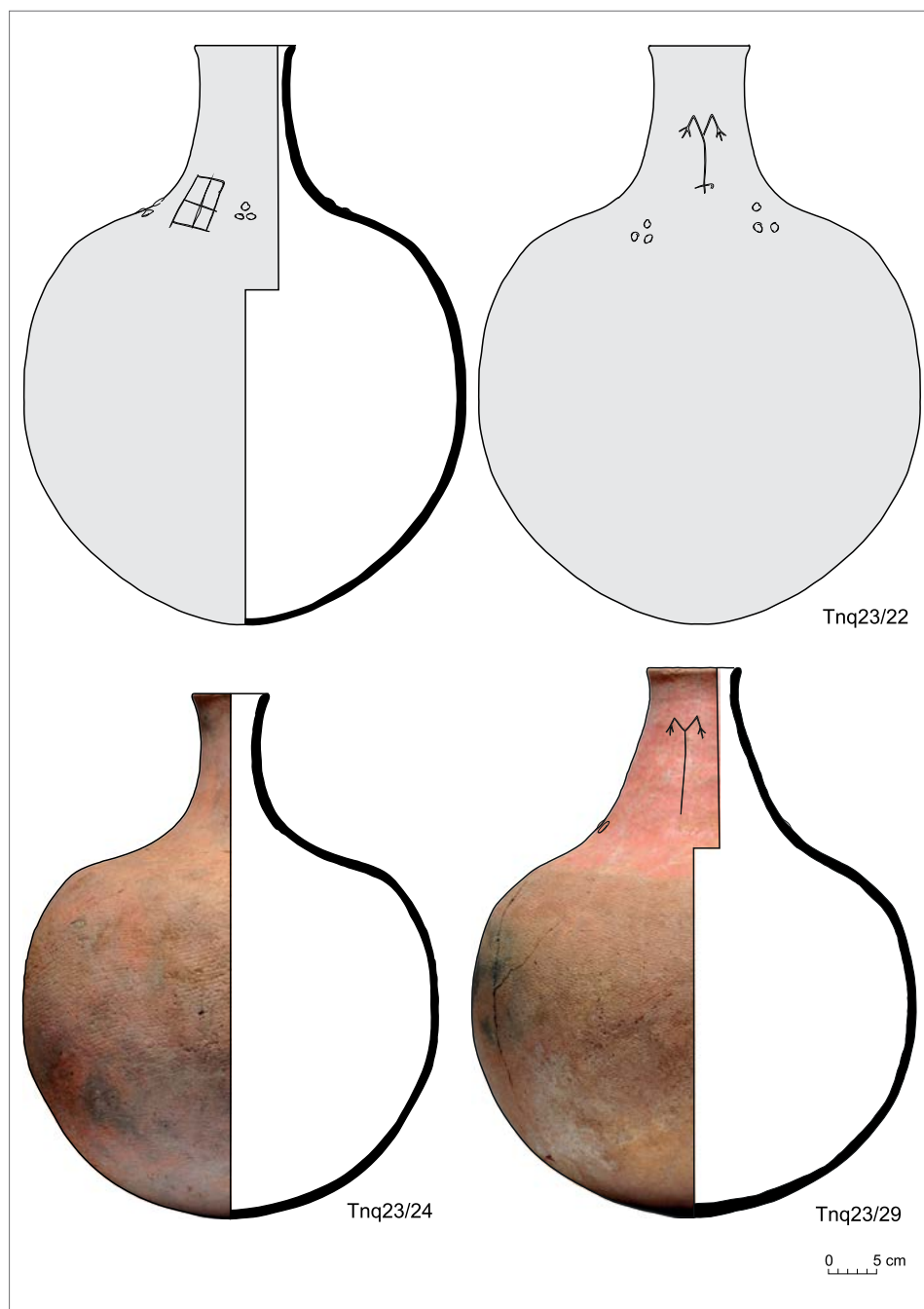


Fig. 5. Large-sized bottles and jar: Tnq23/22 – slipped bottle with bosses and scratched decoration; Tnq23/24 – bottle with mat impression on the body; Tnq23/29 – jar slipped in upper part and mat-impression decoration on the body, bosses and scratched pattern (EMRP PCMA UW/ drawing J. Górecka, digitizing E. Czyżewska-Zalewska, photos A. Kamrowski)

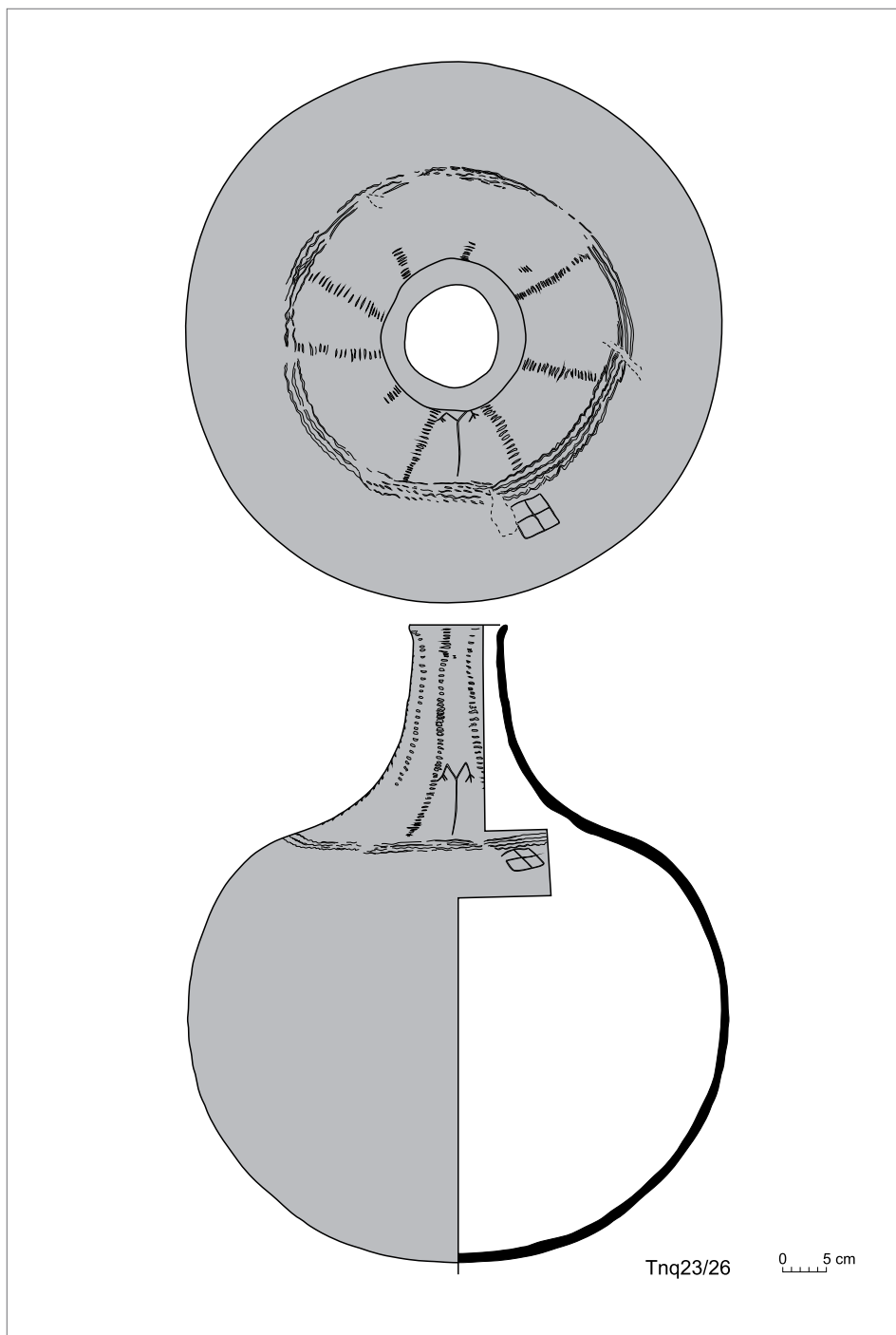


Fig. 6. Large-sized black-fired bottle from tumulus 23 (EMRP PCMA UW/drawing J. Górecka, digitizing E. Czyżewska-Zalewska)

(without slip). The globular body is covered with a delicate mat impression.

#### Tnq23/29 [Fig. 5]

Jar; rim diameter 9.8 cm, height 56.5 cm, maximum diameter 47 cm. Broad neck, gradually develops into the globular body, red slipped and burnished. Mat impression covers the whole belly. A decoration of four sets of two bosses each was applied on the shoulders. Scratched decoration made after firing on the neck.

#### Tnq23/26 [Fig. 6]

Largest bottle; rim diameter 11 cm, height 72 cm, maximum diameter 61 cm. Long neck. Outside surface slipped and burnished. Slip fired to black. Incised decoration on the neck and shoulders: nine vertical rows of horizontally arranged strokes on the neck, and a spirally running wavy line arranged in 3–4 rows on the shoulder. Scratched decoration made after firing on the neck and shoulders.

## DISCUSSION

### CUPS

Cups Tnq23/21 and Tnq46/7 are slipped and burnished on both surfaces. They represent Adams's groups A10 and A12 (Adams 1986: 108, 109). Cups of this type were found earlier in Tanqasi tomb T.87, dated by Włodzimierz Godlewski to AD 250–390 (late- to post-Meroitic period) (Godlewski 2008: 474; Klimaszewska-Drabot 2008: 485, Fig. 11, 488–489). Cups are known from other sites of the late-, post-Meroitic and early Makurian periods in the Dongola Reach. Cups at el-Kassinger have been dated to AD 330–540 (El-Tayeb and Kolosowska 2007: 39, Fig. 11; Kolosowska and El-Tayeb 2007: 16–17). Cups found at Safi Island cemetery 56 and at el-Haraz are dated to the post-Meroitic period (Żurawski 2007: 193, 195, Pl. 13; Ali Mohammed and Hussein 1999: 67–68). In the Early Makuria period, vessels from the el-Zuma site, from tumuli types II and III, were dated to AD 450–550 (Early Makuria phase II) (El-Tayeb 2013: 61; Klimaszewska-Drabot 2010b: 480, 481, Fig. 1).

The slipped cup, Tnq16/13, is a very interesting example. Stamped decorative

motifs, placed below the rim, are known from Meroitic times, as for example at Hamadab (Wolf 2002: 92, 99, Color Pl. 8). Similar cups at el-Kassinger were dated to the Transitional Period (from late Meroitic to early post-Meroitic), about AD 300–350 (El-Tayeb 2013: 87–89, Fig. 30). The closest analogy to the Tanqasi cup was found in Abu Geili, in Upper Nubia, and described by the author as an “import from the north”, and dated to the Meroitic period (Crawford and Addison 1951: 51, 63, 64, 66, Pl. XL:10, 11, 19, Pl. XLIII:2). North, at Karanóg in Lower Nubia, fragments of similar cups were found as well (Woolley and Randall-MacIver 1910: 1–6, Pl. 100:9039).

### BOWLS

Metal bowls produced with a cast and turning technique, as observed on bowl Tnq23/23 (see Zieliński 2018, in this volume) are known from the Meroitic period. In tomb 91 from Deffufa site a bronze bowl, not decorated, although produced with the same technique, was dated to the 1st century BC–2nd century AD (Bon-

net and El-Tayeb 1991: 31, 32, 34, Fig. 3:3; El-Tayeb 2013: 87–89, Fig. 30). Two bronze bowls were found at al-Ahmada, a Meroitic cemetery in the Sixth Cataract region; according to the excavators, bowls of this type were widespread over a territory from Jebel Moya in the south to Faras in the north (El-Tayeb and Gar El-Nabi 1998: 45–46, Fig. 11). In the north, in Lower Nubia, a similar bowl, probably made with the same technique, with a decoration in one groove below the rim has been found in Sedeinga and dated to the Meroitic period (Francigny and David 2013: 103, Fig. 3 [I.To87 C18], 110). Bronze bowls with grooved decoration below the rim almost identical to Tnq23/23 were discovered at Ballaña and dated to the 4th–6th centuries AD (Emery and Kirwan 1938: 295–296, Pl. 73:B10–30, B10–2).

Bowl Tnq179/3 is the only complete vessel from tomb 179. It is handmade, carelessly executed, covered with white slip on both surfaces. This kind of surface treatment with white slip is known from other sites, like el-Zuma, but there the bowls were wheel-made and have a different shape (Klimaszewska-Drabot and Czyżewska 2012: 369, 371, Fig. 7, Z11/34). The closest analogy is from Usli, where a hemispherical bowl of similar shape, dated to the Meroitic period, was described as a regional variation in the Fourth Cataract and Dongola Reach region. The difference is in the finishing of the rim and surface treatment. Bowl Tnq179/3 has a rounded rim, while the Usli bowl has a plain rim and both surfaces unslipped (Phillips 2003: 402, 407, Pl. 30:b). With regard to the typology established by Adams, bowl Tnq179/3 is similar in shape to a bowl of class C 15 handmade pottery of family D

dated to the Meroitic period: bowls with burnished and slipped surfaces with red, black and sometimes white slip in (Adams 1986: 47, 117, Fig. 27.15). What differentiates bowl Tnq179/93 from the Adams' category is the surface treatment: the Tanqasi bowl was not burnished, and the shape of the rim – that of Adams' was flat not rounded. Tumulus 179 has been dated by Mahmoud El-Tayeb to the late Meroitic period, roughly AD 250–350 (see Wyźgół and El-Tayeb 2018, in this volume).

### BOTTLES AND JARS

Bottles and jars of the kind presented in this article are known from other sites of the late-Meroitic to early Makurian periods (El-Tayeb 2013: 87–93). They correspond to typological groups W 16 for jars with short neck and low shoulders, W 31 for jars with extra long neck and W 36 for jars with narrow neck (Adams 1986: 170–171).

Bottles and jars, such as Tnq46/12 or Tnq23/27, slipped on the external surface, have been found earlier in Tanqasi tomb 87 and dated by Godlewski to the 3rd–4th century AD (Klimaszewska-Drabot 2010a: 221, 222, Fig. 3). Such vessels are known from other sites. Bottles/jars from Usli are dated to the post-Meroitic period (Żurawski 2002: 83–84), from el-Zuma (Czyżewska-Zalewska 2016: 730–732) to AD 450–550 (El-Tayeb 2013: 61–73), and from el-Detti to the same period as at el-Zuma (El-Tayeb et al. 2016: 417–419).

Bottle Tnq23/22, fully slipped on the outside, bears a decoration of four sets of three bosses each, applied on the shoulders. Similar decoration, with four pairs of applied bosses, was found on Tnq23/29. Applied bosses are present

on jars and bottles from the Meroitic to Early Makuria periods. The place of application sometimes changed, but in most cases the decoration occurs on the shoulders and neck of the vessel. Bosses were placed on plain vessels (without slip), slipped vessels (slipped on the external surface) or partly slipped vessels with mat-impressed decoration. A jar with applied decoration arranged around the lower part of the neck, dated to late/post-Meroitic period, came from Hagar el-Beida (Lemiesz 2007: 372–373). A large jar from Usli, with a band of small bosses arranged vertically on the neck, was dated to the late Meroitic/very early post-Meroitic period (Phillips 2003: 403–404, 406 and Pl. 28). In Hammur, a vessel with added decoration on the shoulders was dated to the post-Meroitic period (Phillips and El-Tayeb 2003: 461, 462 and Pl. 10). In the Early Makuria period, the variety of applied bosses diminished on pottery from el-Zuma and el-Detti. A composition of two bosses on the shoulders in two sizes, smaller and bigger, can be found on a jar from the el-Zuma assemblage (Czyżewska-Zalewska 2016: 730, 732, Fig. 5).

Handmade jars with a mat-impressed pattern appeared in the late Meroitic period (El-Tayeb 2010: 10–11; Phillips 2003: 403). Examples like Tnq23/24 with smoothed, sometimes burnished neck and mat-impressed pattern on the body appeared on other sites and dated from the late Meroitic to post-Meroitic period, like the examples from Usli (Phillips 2003: 403–404, 406, Pl. 23) and Hammur (Phillips and El-Tayeb 2003: 460, 461, Pl. 5). Vessels from el-Kassinger tomb HP47.3.48 (El-Tayeb and Kołosowska

2007: 48–49) are dated to AD 388 +/- 95 (Daszkiewicz and Goedicke 2007).

Vessels Tnq23/28, Tnq23/29, Tnq23/36 have a mat-impression on the body and slipped and burnished neck and shoulder. Small jar Tnq23/28 has also two slipped horizontal bands as decoration in the upper part of the vessel. Bottle Tnq23/36, like Tnq23/28, has slipped horizontal bands, but also decoration in the form of a slipped rhombic pattern executed on the body with a mat impression. Decoration with slip, sometimes red-slipped bands or slipped zigzag patterns on the shoulders and body, were characteristic in early post-Meroitic times and evolved, both in form and decoration, throughout the late post-Meroitic period (El-Tayeb 2010: 10–11). Mat-impressed decoration and slipped neck are known, for example, from the post-Meroitic period at site 3-Q33 near Timmeriya (Wolf and Nowotnick 2006: 21, 23–24, Color Pl. XVII). Vessels with slipped zigzag decoration on a mat-impressed body originated from the post-Meroitic sites of el-Sada (Osypiński 2007: 350, 353, Fig. 6.8) and Hagar el-Beida 1 (Chłodnicki and Stępnik 2013: 314–315, Fig. 6). Vessels with slipped horizontal bands on the shoulder, like jar Tnq23/28, are known from the Early Makuria period at el-Zuma, where they were dated to AD 450–550 (El-Tayeb 2013: 92 and Figs 32, 93–94). Such decoration, horizontal bands as well as zigzag patterns, can be observed also on vessels from Kadada and Sheiteb between the Fifth and Sixth Cataracts, where they have been connected with the Meroitic and post-Meroitic tradition (Lenoble 1992: 83, 84, Pls I,85, II,86) Decoration of slipped ver-



tical bands on the shoulders and slipped zigzag pattern on the belly was less frequent, but was observed at other sites as said above. The decoration of slipped diamonds, as on bottle Tnq23/36, was very rare and the closest parallel is a jar from Tumulus III at el-Hobagi between the Fifth and Sixth Cataracts, dated to the 4th–5th centuries AD (Lenoble 2004; Lenoble et al. 1994: 53, 65–66, 85, Pl. 17).

A black-fired bottle represented by Tnq23/26 is the largest vessel discovered in the 2018 season. Handmade black vessels were known from the Neolithic period. Production of handmade black ware was more common in late Meroitic

to early post-Meroitic times (El-Tayeb 2010: 9–10). A similar blackened jar, with a wavy decoration in the upper part of the shoulders and incised vertical decoration on the neck, was found at site SH5 at Shemkhiya and dated to the Meroitic period (Żurawski 2008: 435–436). Black-fired pottery, but without such decoration as on Tnq23/26, are known from later periods, for example from the post-Meroitic cemetery 3-Q33 near Timmeriya (Wolf and Nowotnick 2005: 30, Color Pl. XIX), and from Early Makuria contexts at el-Detti (D2/14, not published yet) and el-Zuma (for example, tumuli T.12, T.21, see Czyżewska-Zalewska 2016: 726, Fig. 1).

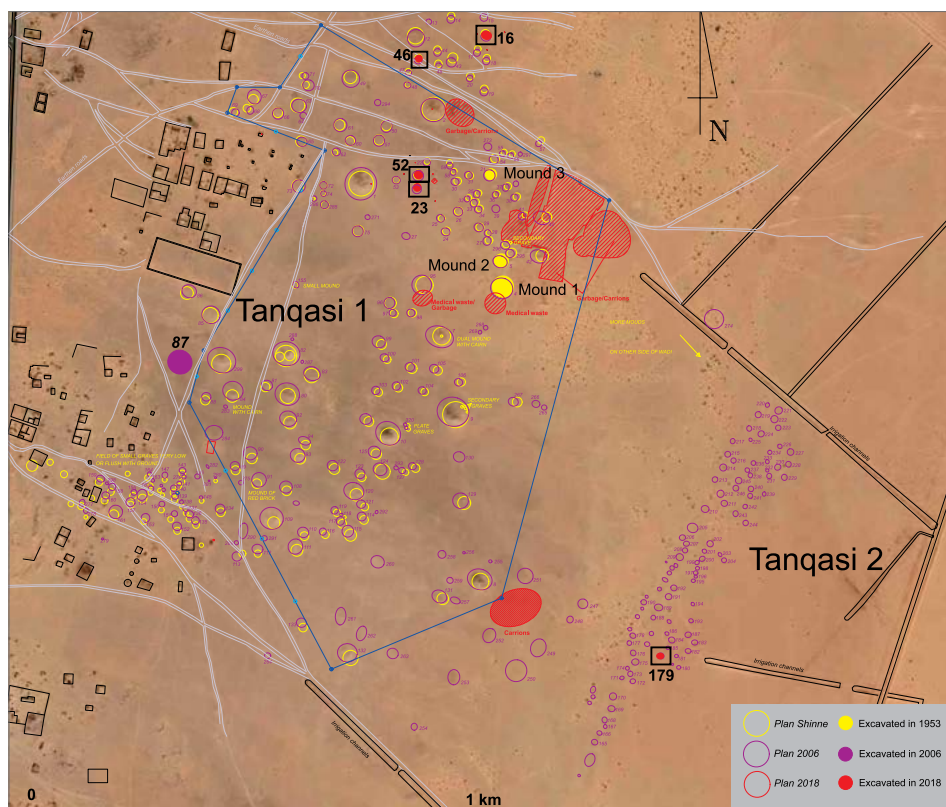


Fig. 7. Map of the Tanqasi cemetery with all the excavated tumuli (EMRP PCMA uW/plan M. Antos, amended)

Scratched decoration, executed after firing, also deserves mention here. In the presented pottery assemblage, such decoration was executed on jars Tnq23/22, Tnq23/29, Tnq23/26. All vessels come from the same tumulus. They have similar pattern of decoration [see Figs 5, 6], which may be interpreted as a mark of ownership. Scratched decoration occurs at other sites from the post-Meroitic to Early Makuria periods, such as el-Kassinger (El-Tayeb and Kołosowska 2007: 41–42, 48, Fig. 2f) and el-Zuma, where the decoration consists of a simple geometrical pattern or floral motifs (Czyżewska-Zalewska 2016: 738; Klimaszewska-Drabot and Czyżewska 2012: 362–363).

## SUMMARY

The Tanqasi cemetery was divided by Godlewski into two parts: Tanqasi 1 covers the central part and Tanqasi 2 its southeastern part (Godlewski 2008:

469). Shinnie explored three tumuli: T.4 (Mound I), T.5 (Mound II) and T.21 (Mound III) (Shinnie 1954), all at Godlewski's Tanqasi 1 [Fig. 7], and dated the pottery to the late Meroitic and post-Meroitic periods. Tumulus T.87, excavated by Godlewski, is dated to the same period. Pottery excavated in the 2018 season falls within the same timeframe. A glance at the site plan suggests that the tumuli with late- and post-Meroitic pottery are located in Tanqasi 1. Bowl Tnq179/3, lacking good parallels, originated from a tumulus in the other part of the burial ground (Tanqasi 2).

The Tanqasi cemetery contains more than 250 burials, but only nine have been excavated so far. The chronological range represented by these tumuli is broad, but the material studied is still insufficient to provide a detailed site chronology. Studies of the pottery and artifacts from forthcoming seasons should throw more light on this issue.

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# Early Makuria Research Project Beads and pendants from the tumulus cemetery in Nubian Tanqasi, Sudan



**Abstract:** An assemblage of 1687 beads and pendants was recovered from the excavation of five tumuli (16, 23, 46, 52, 179) in the cemetery of Tanqasi in Sudan. The assemblage is dominated by faience beads (n=920). The remaining beads and pendants are made of glass (n=422), stone (n=241), ostrich eggshell (n=102), and metal-in-glass (n=2). Morphological estimation based on material, technique of manufacture and shape provides a preliminary overview of types that are encountered at Tanqasi cemetery. In addition to beads made of locally available materials (ostrich eggshell, quartz and faience), glass beads of Mediterranean and Indo-Pacific provenance were found. In general, the assemblage is dated to the period between the late Meroitic and post-Meroitic. A few bead types: small faience, bichrome glass and gold-in-glass, are late Meroitic in date. One stone bead may be Napatan in origin.

**Keywords:** beads, pendants, ostrich eggshell, stone pendants, Meroitic beads, Indo-Pacific glass beads, Nubia, Sudan

Tanqasi lies in the Dongola Reach on the left bank of the Nile River, approximately opposite the tumulus cemetery at el-Zuma and the el-Kurru Royal Cemetery. The group of mounds at Tanqasi was published previously as late Meroitic or post-Meroitic in date (Shinnie 1954 and references). Some burial mounds were excavated in the past and some bead types were mentioned in the published reports (Shinnie 1954: Fig. 13 drawing of bead and pendant types from Tnq4/Mound I and Tnq5/Mound II; Godlewski 2008: Figs 12 pendants from Tnq87, 13 pendants found by Shinnie in Tnq4).

In the 2018 season five tumuli were excavated by the Polish Centre of Mediterranean Archaeology University of Warsaw and National Corporation of Antiquities and

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All photos A. Kamrowski, arrangements J. Then-Obłuska and the PCMA UW Early Makuria Research Project. Figures are arranged by tumulus number and then by find number.

Museums (NCAM) as part of the Early Makuria Research Project, sponsored by the Qatar–Sudan Archaeological Project (Wyźgoł and El-Tayeb 2018, in this volume: Fig. 10 for a map with the localization of the tumuli). The tumuli are dated to Early Makuria Phases I and II, otherwise referred to as the post-Meroitic period, about AD 350–550 (Wyźgoł and El-Tayeb 2018, in this volume).

Almost 1700 (1687, to be precise) beads and pendants were found in five tumuli (16, 23, 46, 52, and 179). The vast majority was picked up from robbed contexts. In Tnq46, bead finds were associated with various parts of the body. They were found in the chamber fill near the skeleton's right hand (Tnq46/27–30 and Tnq46/46–48) and chest (Tnq46/37–45). In the latter case, the position suggests a necklace of beads among the funerary items.

Although heavily plundered, the tumuli provided a wide range of bead and pendant types that are paralleled by types found at other Nubian sites and are most probably locally made. These are ostrich eggshell beads (n=102), stone beads and

pendants (n=241), and faience tubular beads. The latter dominate the Tanqasi bead assemblage (n=920). The remaining beads are made of glass (n=422) and metal-in-glass (n=2) and they appear to be imported items. One green bead is made of drawn and rounded glass, hinting at its South Asian provenance. Red, blue, dark green and turquoise glass beads are made of drawn and segmented glass, a technique known from bead workshops at Alexandria in Egypt. Additionally, a few Meroitic types have been collected from Tumulus 179. These are a white-banded blue cornerless cuboid, a large gold-in-glass bead and small rings of blue faience.

#### BEAD AND PENDANT TYPOLOGICAL ESTIMATION

The material is presented below by tumulus number and then by material, both organic and non-organic. These are: ostrich eggshell, stone, faience, and glass. The subsequent division is by production technique and shape. The illustrations, presenting most of the types discussed, follow a division by tumuli [*Figs 1–5*].

## TUMULUS 16

Three beads were recorded from this tumulus. They are made of agate, faience, and metal-in-glass.

#### AGATE

A large globular red agate bead, Tnq16/19 [*Fig. 1*], is drilled from one end without any traces of sawing across the hole opening (compare below). While one end of the bead is rounded, the other is trun-

cated and slightly depressed, most probably to facilitate the drilling process. Both ends and sides are polished. It measures about 7 mm in diameter and 6 mm in thickness. Agate beads produced with a similar technique are recorded from a late Napatan tomb at Sedeinga (Then-Obluska 2015: Fig. 3:c4/a). The Tanqasi specimen may be a reused late Napatan or early Meroitic bead.

**FAIENCE**

A long tubular faience bead bearing traces of a blue-green glaze, Tnq16/9 [see Fig. 1]. Similar beads are also found in Tumulus 23 and Tumulus 46 at Tanqasi (compare below). In general, long tubular beads with coarse cores characterize bead assemblages in the Fourth Cataract region, where they are recorded in both the late Meroitic and post-Meroitic periods (e.g., Then-Obluska 2014: Pl. 2.144).

**METAL-IN-GLASS**

A heavily eroded metal-in-glass (two glass layers with a gold or silver foil sandwiched in between) bead, most probably silver-in-glass, Tnq16/18 [see Fig. 1], measures about 4 mm in diameter. Unlike gold-in-glass, silver-in-glass is a more common find between the Third and Fifth Nile Cataracts in the late Meroitic period and later (e.g., Then-Obluska 2014: Pl. 2.169; 2016a: Fig. 3: J, L.6; 2017: Fig. 2:Z4/50.2)

**TUMULUS 23**

The tumulus yielded 985 beads: 95 made of ostrich eggshell, 213 of stone, 663 of faience, and 14 of glass.

semblages in the Fourth Cataract region (e.g., Then-Obluska 2014: Pl. 2).

**OSTRICH EGGSHELL**

The ostrich-eggshell beads are disk cylinders, e.g., Tnq23/12 [Fig. 2A], approximately 5 mm in diameter. Both disk cylinders and disks with retouched ends are present in Meroitic and post-Meroitic as-

**STONE**

The stone beads and pendants from Tanqasi are characterized by traces of a groove across the larger hole opening, a technique used to facilitate setting the drill. The objects are drilled from one end and they are left unpolished, most

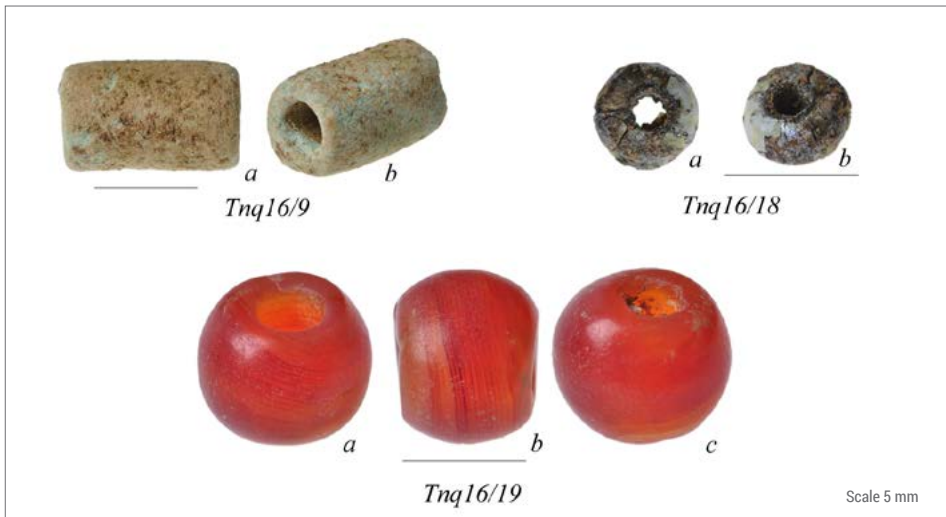


Fig. 1. Beads from Tumulus 16



Fig. 2A. Beads and pendants from Tumulus 23 (Tnq23/1 to Tnq23/12)

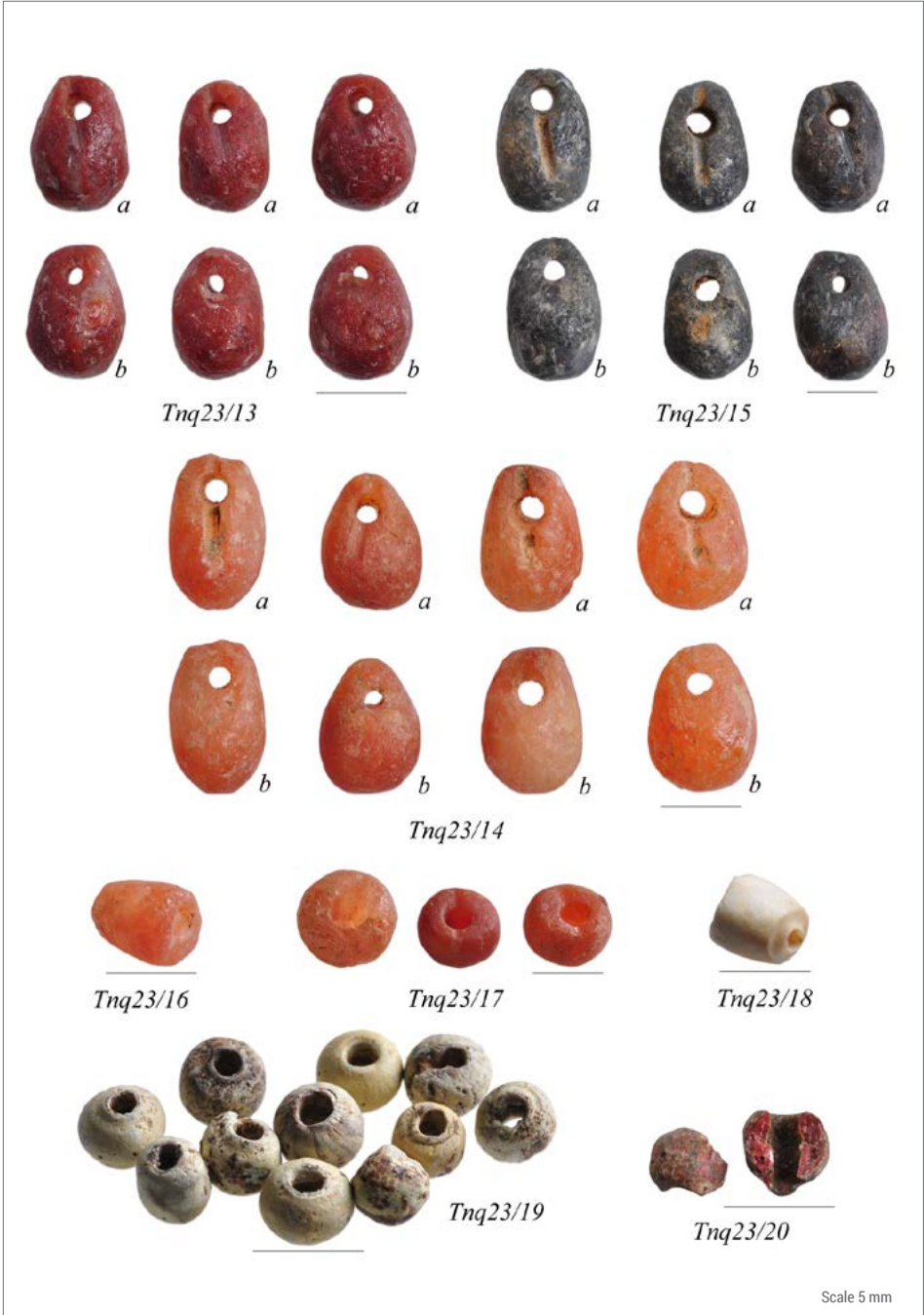


Fig. 2B. Beads and pendants from Tumulus 23, continued (Tnq23/13 to Tnq23/20)



probably using combination of pecking and grinding. Unpolished stone specimens with traces of saw marks appeared already in the late Meroitic period in the region between the Third and the Fifth Nile Cataracts (e.g., Then-Obluska 2014).

A few types of quartz beads were recorded in Tumulus 23. These are truncated cone beads, ellipsoid beads, and globular beads. Also a few types of tear-drop pendants are distinguished in the assemblage. These are large, small and very small pendants with rounded bases, as well as pendants with pointed bases.

● **Truncated cone** beads, about 5 mm in length, made of white quartz (Tnq23/7) and light orange quartz (Tnq23/16) [Fig. 2B]. The white specimen may be of quartz as well (Tnq23/18 [see Fig. 2B]).

● **Truncated ellipsoid** beads, about 10 mm in length, made of white quartz (Tnq23/8). Similar beads are observed at other post-Meroitic sites in the region (e.g., Then-Obluska 2014: Pl. 2.225; 2016a: Fig. 3.B1; 2016c: Fig. 3:Z17/7).

● **Globular** beads, less than 7 mm, made of light red stone (Tnq23/17) [see Fig. 2B]. Such quartz red, white and black beads are recorded already in late Meroitic assemblages and the type continued into the post-Meroitic period (e.g., Then-Obluska 2014: Pl. 2.148, 150, 151).

● **Large tear-drop pendants with rounded bases** measuring more than 10 mm in length, made of white quartz (Tnq23/11.1).

● **Small tear-drop pendants with rounded bases**, about 10 mm in length, made of white quartz (Tnq23/2.1) (Then-Obluska 2014: Fig. 2.171; Gammai, Cemetery E, Grave 85=Peabody Number: 24-24-50/B4054.1), light orange to red carnelian

or ferruginous quartz (Tnq23/4 [Fig. 2A], Tnq23/5.1) (Then-Obluska 2014: Fig. 2.173), and black granite (Tnq23/3 [see Fig. 2A], Tnq23/15.1).

● **Very small tear-drop pendants with rounded bases**, less than 10 mm in length. They are made of white quartz (Tnq23/2.2, Tnq23/11.2), these being about 7 mm in length, red (Tnq23/13 [see Fig. 2B]) and light orange quartz (Tnq23/5.2, Tnq23/14 [see Fig. 2B]), and black granite (Tnq23/15 [see Fig. 2B]).

● **Some tear-drop pendants feature pointed bases**. They are large and measure about 20 mm in length. They are made of white quartz (Tnq23/6 and Tnq23/9 [see Fig. 2A]). Similar pendants, also small, are among the remains from Tnq.87 (Godlewski 2008: Fig. 12, no scale given) and T4 (Mound 1) (Shinnie 1954: Fig. 13.14).

## FAIENCE

Faience beads are made of tubular quartzite cores segmented into single- and double-segments that were subsequently glazed (Tnq23/1 [see Fig. 2B], Tnq23/10). As noted above, long faience beads with coarse cores are known from late Meroitic to post-Meroitic assemblages in the Fourth Cataract region.

## GLASS

Glass beads are segments of drawn opaque red tubes. They are covered with a whitish patina (Tnq23/19 and Tnq23/20 [Fig. 2B]). Such beads, also blue in color (compare below), are the most common finds in post-Meroitic bead assemblages (e.g., Then-Obluska 2014: Fig. 2, Cat. 203; 2016a; 2016c).

## TUMULUS 46

The collection from Tumulus 46 consists of 694 beads and pendants, as well as four finger rings. Six beads are made of ostrich eggshell, 27 of stone, 254 of faience, and 407 of glass.

### OSTRICH EGGSHELL

Ostrich-eggshell beads, about 5 mm in diameter, are all shaped into disk cylinders (e.g., Tnq46/31 [Fig. 3A]).

### STONE

Small tear-drop pendants have rounded bases and almost tapered tops. The type measures about 12 mm in length or less and comes usually in white quartz (Tnq46/17 [see Fig. 3A], Tnq46/19, Tnq46/25, Tnq46/41), red quartz/carnelian (Tnq46/21, Tnq46/26 [see Fig. 3A], Tnq46/43) and black granite (Tnq46/20 [see Fig. 3A], Tnq46/42).

Tabular tear-drop pendants with pointed bases, about 10 mm long. The type could be made of white (Tnq46/39 [Fig. 3B]) and red quartz (Tnq46/38 [see Fig. 3B]) and black granite (Tnq46/37 [see Fig. 3B]). Similar tabular pendants are recorded from graves in the Fourth Cataract region and dated to the Transitional late Meroitic/post-Meroitic period (Then-Obluska 2014; Fig. 2.172 white quartz).

### FAIENCE

Two small faience beads, about 3 mm in diameter (Tnq46/40 [see Fig. 3B], Tnq46/47), are most probably Meroitic types (compare beads from Tumulus 179 below).

Long tubular faience beads have a faded turquoise color. Some might be the glazed parts of a cut up tubular core. Other beads bear traces of segmenting and they appear as single-segments (Tnq46/15, Tnq46/16, Tnq46/18 [see Fig. 3A], Tnq46/30, Tnq46/32 [see Fig. 3A], Tnq46/45, Tnq46/46) and double-segments (Tnq46/36).

Some double- and multiple-segmented beads are characterized by short intervals (Tnq46/33, Tnq46/35 [see Fig. 3A]).

### GLASS

Single- and double-segments of drawn glass were found in the following colors: red (Tnq46/27.1, Tnq46/29.1, Tnq46/44.1, Tnq46/48.1), green (Tnq46/27.2), blue (Tnq46/27.3, Tnq46/29.2, Tnq46/44.2, Tnq46/48.2), and turquoise (Tnq46/44.3) [see Figs 3A, 3B].

One bead was made of drawn and rounded green glass (Tnq46/28 [see Fig. 3A]). While the production of beads made of drawn and segmented glass tubes has been attested in early Roman and early Byzantine contexts from Alexandria, Egypt (Rodziewicz 1984; Kucharczyk 2011), production of beads made of drawn, cut and heat-rounded glass tube sections is known from South Asia (Francis 2002). Recently, chemical compositional studies confirmed the South Indian/Sri Lankan origin of the glass of which the green glass beads from late antique Nubia were made (Then-Obluska and Wagner 2017). Similar beads were identified at the early Makurian sites of el-Zuma and el-Detti (Then-Obluska 2016a; 2016c).

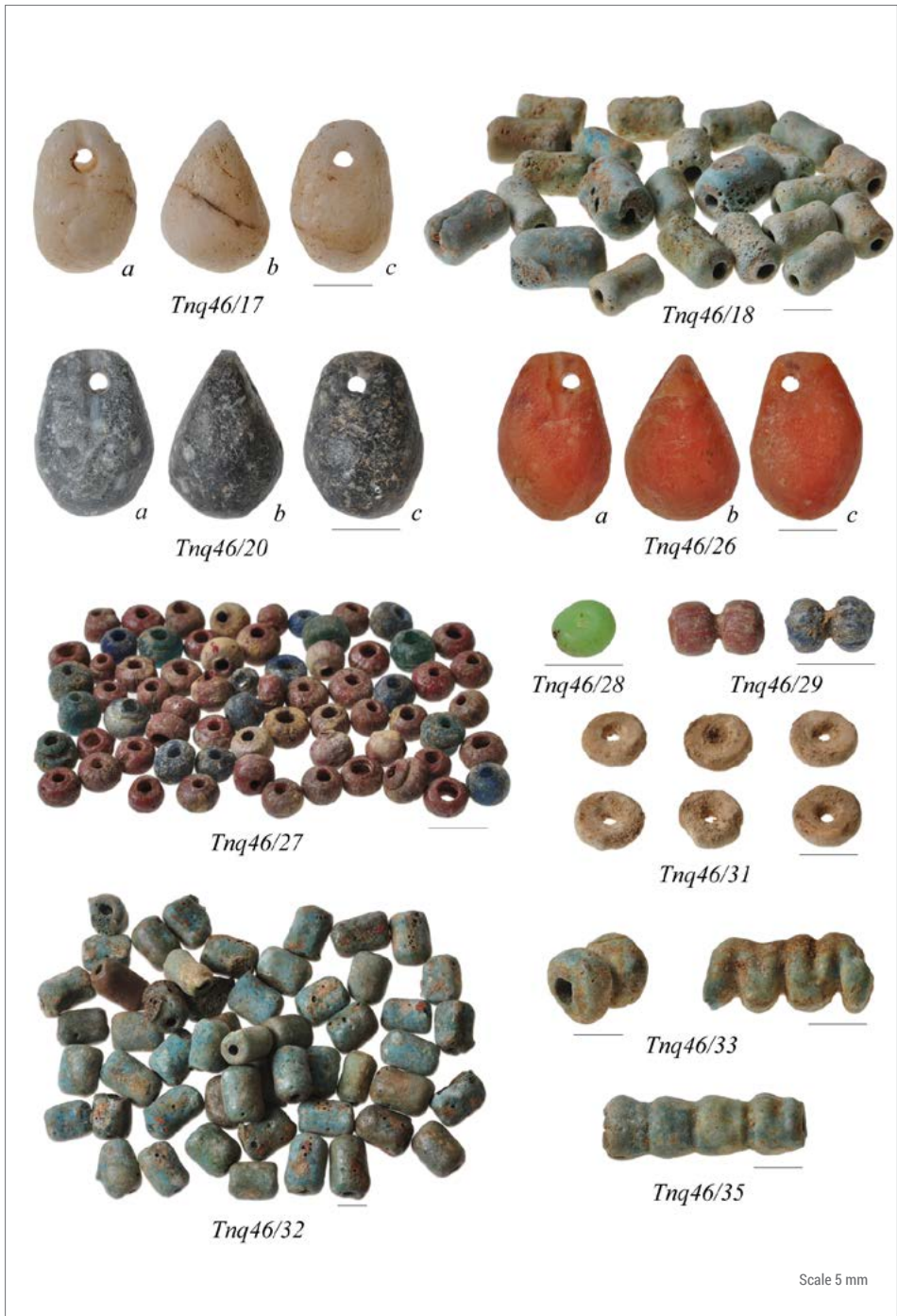


Fig. 3A. Beads and pendants from Tumulul 46 (Tnq46/17 to Tnq46/35)

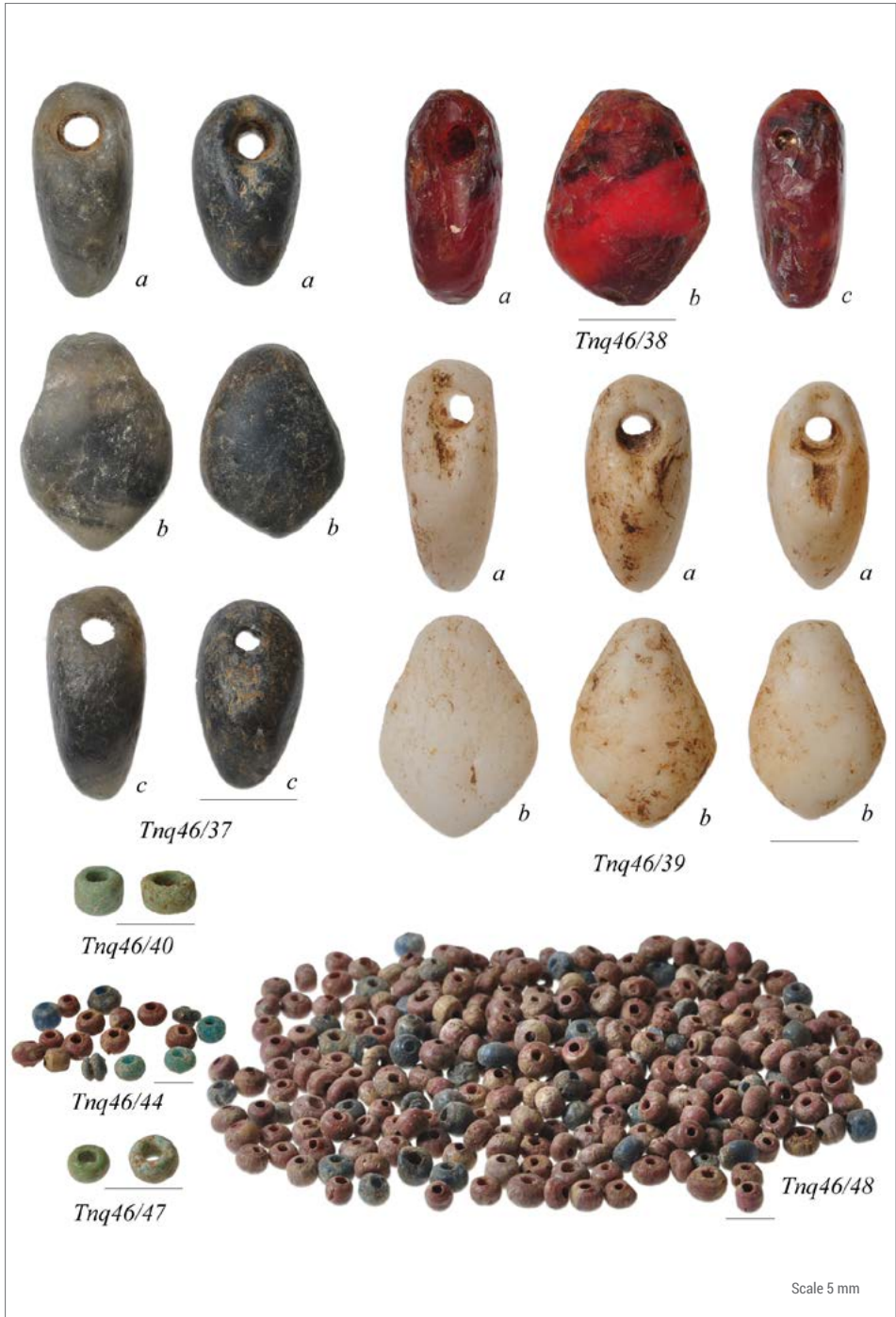


Fig. 3B. Beads and pendants from Tumulus 46, continued (Tnq46/38 to Tnq46/48)

### TUMULI 52 AND 179

One bead, made of ostrich eggshell, was collected from Tumulus 52. It measures about 7 mm in diameter. The shell was perforated from one end (Tnq52/10 [Fig. 4]).

Four beads were collected from Tumulus 179. Two are made of faience, one is gold-in-glass, and one bichrome glass.

#### FAIENCE

Faience beads are very small, about 3 mm in diameter (e.g., Tnq179/5 [Fig. 5]). Similar beads have been observed at Meroitic cemeteries (e.g., Then-Obluska 2016a; 2016c; 2018).

#### GOLD-IN-GLASS

A large gold-in-glass bead measures about



Fig. 4. Ostrich-eggshell bead from Tumulus 52

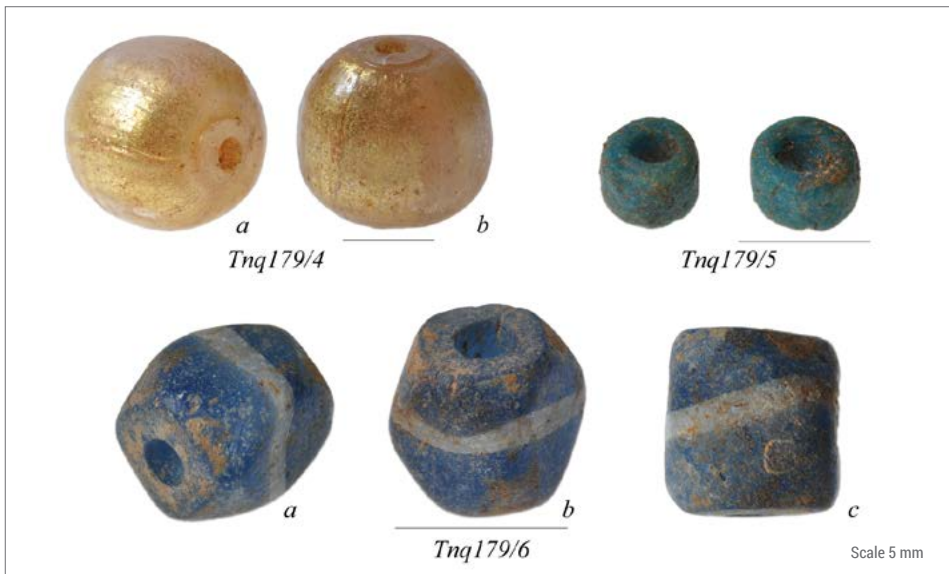


Fig. 5. Beads from Tumulus 179: gold-in-glass, faience and bichrome glass



10 mm in diameter (Tnq179/4 [see *Fig. 5*]). It belongs to a type commonly found at Meroitic sites, e.g., Saï and Berber (Then-Obluska 2016b: Fig. 9.10; 2018). Such beads were also used in early Roman jewelry from Egypt. Earrings with large gold-in-glass bead pendants were in fashion in the 1st century AD (MET 10.130.1521).

### GLASS

A blue bead with a white band, shaped like a cornerless cuboid, is also known

from Meroitic sites downstream from the Third Nile Cataract (Tnq179/6 [see *Fig. 5*]). A faceted bead of translucent dark blue with a white central band was discovered in tomb T34 at the Meroitic cemetery 8-B-52. Bat Saï (Then-Obluska 2016b: Fig. 8:7–8). Parallels are known from a private cemetery at Ballaña, a cemetery starting in the second half of the 2nd century AD (Williams 1991/I: 137–138, Phase IIIB, OIM 22665; OIM 22753, personal observation).

## SUMMARY

Almost 1700 beads and pendants were recovered during the excavation of five tumuli: 16, 23, 46, 52, and 179, at the cemetery in Tanqasi, Sudan, in the 2018 season. The materials represented include ostrich eggshell, stone, faience, glass, and metal-in-glass. Arranging the beads and pendants by material, technique and shape gives a preliminary typological estimation of the ornaments from the five tumuli graves.

Large tubular faience beads dominate the Tanqasi assemblage. However, the white, red and black unpolished stone beads and pendants in the collection demonstrate the largest variety. Traces of sawing across a larger hole opening characterizes most of them. The groove facilitated setting the drill and it typifies the Egyptian and Nubian technique of beadmaking in Meroitic and post-Meroitic times.

Pendants with both rounded and pointed bases have also been distinguished next to the globular, truncated cone and ellipsoid beads. Tabular pendants with pointed bases are also found. Ostrich-eggshell beads are shaped into disk cylinders. They all have parallels in late Meroitic and later assemblages from the Fourth Cataract region.

One stone bead is apparently late Napatan in date and must be a reused item in Tumulus 16. Small faience beads, beads made of bichrome glass and gold-in-glass are late Meroitic specimens in Tumulus 179 and are recognized at Nubian sites downstream from the Third and upstream from the Fifth cataracts. Moreover, drawn glass beads of Mediterranean and Indo-Pacific origin are present as well.

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# Early Makuria Research Project Metal artifacts from the Tanqasi cemetery



**Abstract:** The article documents and discusses metal artifacts discovered in tombs explored by a joint Polish–Sudanese project from the PCMA UW and the NCAM in the tumuli field at Tanqasi in Sudan (Fourth Nile Cataract region). Metal finds from the first season in 2018 were in various states of preservation, allowing however the identification and interpretation of most of the objects through a thorough analysis that involves also metallographic studies and complex conservation. The results contribute to how the site is perceived from a social and cultural point of view.

**Keywords:** Tanqasi, Nubia, Nubiology, weaponry, iron, copper, conservation

The Tanqasi cemetery, which had been excavated once before in 2006, was now excavated by a Polish–Sudanese team from the Early Makuria Research Project (Godlewski 2008; for the current season report, see Wyzgoł and El-Tayeb 2018, in this volume). Of the five tumuli investigated in the first season, two—23 and 46—contained metal artifacts: a relatively rich set of iron weaponry and a copper bowl in Tumulus 23, and jewelry in the form of rings in Tumulus 46 [Table 1]. The present review of the assemblage, preliminary pending its full cleaning, documentation and study, contributes to how the site is perceived in a social and cultural sense.

In the following catalog, the broad categories are described in succession, including in each case a tabular listing of individual finds. Abbreviations used in the catalog: L. – length, W. – width, Th. – thickness, Dia. – diameter.

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**WEAPONRY**

The set from Tumulus 23 consisted mostly of iron arrowheads (19 complete examples and 48 fragments), found in the burial chamber, in a single clump of rusted objects on the southwestern side. The arrowheads are all leaf-shaped and represent two types: 1b – single-barbed and 6 – barbless [examples of both types are shown in *Fig. 1*]. They are typical of the post-Meroitic period. The documentation of the fragmentary artifacts still needs to be completed.

Found in a cluster together with the arrowheads was an iron knife broken into pieces, forged in layers that are clearly visible on the fractured surfaces in microscopic view. Its structure resembles a rolled-up pancake, in which all layers are of a similar thickness. It is heavily corroded and, although eight quite large fragments have been preserved, incomplete and its length cannot be reconstructed [see *Fig. 1*].

Table 1. Metal finds from Tumuli 23 and 46

Tumulus	Metal artifact: material, quantity, state of preservation
23	Arrowheads, iron – type 1b, 14, complete – type 6, 5, complete – types 6 and 1b, 48, fragmentary
	Javelin, iron, broken in two
	Long combat knife, iron, 8, fragmentary
	Bowl, copper, complete
46	Rings, copper, 4, complete

The fill of the burial chamber also yielded a javelin head, which was preserved in two parts that put together restituted the complete shape. The iron head is leaf-shaped, elongated, reinforced with a forged rib on both sides on the axis of symmetry, smoothly passing into a spindle for embedding in a shaft pole [see *Fig. 1*].

Below is a list of relevant finds.

- 
- Cat. 1. Arrowhead, leaf-shaped, single-barbed = Type 1b (Inv. No. Tnq23/34)  
Iron, heavily corroded  
L. 54.50 mm, W. 11.50 mm, Th. 3.14 mm; fixing spike 3.74 x 3.45 mm; barb length 9.58 mm; weight 2.10 g  
Tumulus 23, southwestern part of burial chamber, 2.70 m below ground level  
Parallels from el-Zuma (Zieliński 2014: 377) and el-Detti (Zieliński 2016: 420)
- 
- Cat. 2. Arrowheads, six fragments; at least two leaf-shaped, single-barbed = Type 1b (Inv. No. Tnq23/35)  
Iron, heavily corroded  
Dimensions: one rear part of arrowhead type 1b (L. 32.04 mm; barb 8.33 mm); arrowhead blade fragment of type 1b (L. 37.10 mm, W. 12.82 mm); two points and one fixing spike fragments (L. 21.15 mm), one barb fragment (L. 15.13 mm). Weight of the set: 5.40 g  
Tumulus 23, southwestern part of burial chamber, 2.70 m below ground level  
Parallels from el-Zuma (Zieliński 2014: 377) and el-Detti (Zieliński 2016: 420)
- 
- Cat. 3. Arrowheads, five complete, leaf-shaped, barbless = Type 6 (Inv. No. Tnq23/38)  
Iron, heavily corroded  
Dimensions not given  
Tumulus 23, burial chamber, 2.50 m below ground level  
Parallels from el-Zuma (Zieliński 2014: 377) and el-Detti (Zieliński 2016: 420)
-



Cat. 4. Arrowheads, 13, some leaf-shaped, single-barbed = Type 1b (Inv. No. Tnq23/39)  
 Iron, heavily corroded  
 Dimensions not given  
 Tumulus 23, burial chamber, 2.50 m below ground level  
 Parallels from el-Zuma (Zieliński 2014: 377) and el-Detti (Zieliński 2016: 420)

Cat. 5. Arrowheads, 42 fragments, some leaf-shaped, single-barbed and barbless = Types 1b and 6  
 (Inv. No. Tnq23/40)  
 Iron, heavily corroded  
 Dimensions not given  
 Tumulus 23, burial chamber, 2.50 m below ground level  
 Parallels from el-Zuma (Zieliński 2014: 377) and el-Detti (Zieliński 2016: 420)

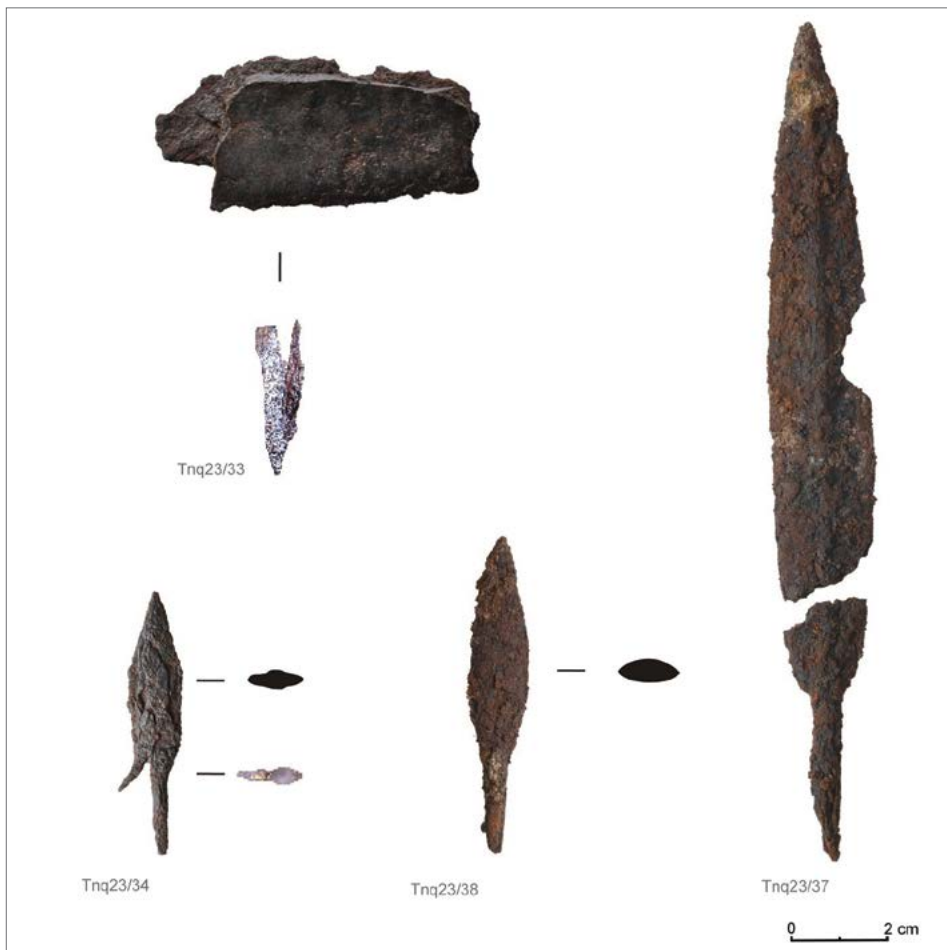


Fig. 1. Iron projectiles and weapons: from bottom left, arrowheads types 1b and 6, and javelin blade; top left, fragment of long combat knife with cross-section in microscopic view (EMRP PCMA UW/ photo A. Kamrowski, microscopic photo and drawing Ł. Zieliński)

- Cat. 6. Knife, eight fragments of a long combat knife (Inv. No. Tnq23/33)  
 Iron, heavily corroded and broken  
 Biggest fragment: L. 65.85 mm, W. 30.54 mm, Th. 8.72 mm; weight 21.20 g;  
 other fragments no bigger than 10 mm  
 Tumulus 23, southwestern part of burial chamber, 2.70 m below ground level  
 Parallels from Missimina (Török 1988: 188), el-Zuma (Zieliński 2014: 376),  
 Ballaña (Török 1988: 117)
- Cat. 7. Javelin head, complete in two pieces (Inv. No. Tnq23/37)  
 Iron, heavily corroded and broken  
 L. estimated 17 cm (exact dimensions to be given)  
 Tumulus 23, burial chamber, 2.50 m below ground level  
 Parallels from el-Zuma (Zieliński 2014: 377), el-Detti (Zieliński 2016: 420),  
 and El-Hobagi (Lenoble 2018: 116–117)

### BOWL

A bowl [Fig. 2] was found in the burial chamber of Tumulus 23 near the blocking wall. It has numerous parallels among metal artifacts from the Ballaña cemetery (e.g., Emery and Kirwan 1938: 283–312,

Fig. 100), while its form is modeled on similar ceramic bowls (see Czyżewska-Zalewska 2018: 291, 296–297 and Fig. 2 top, in this volume). Its excellent state of preservation facilitated a thorough microscopic examination revealing nu-



Fig. 2. Copper bowl Tnq23/23, after conservation; letter markings indicate the location of the microscopic images in Fig. 3 (EMRP PCMA UW/photo A. Kamrowski)



Fig. 3. Microscopic images of details of the copper bowl Tnq23/23: A, B – micro-bubbles and traces in the negative of the mold; C, D – centers of symmetry with dents attesting the fixing of a hand lathe; E, F – horizontal scratches on the outer rim molding; G – undercutting groove of the rim part on the inside; H – grooving on the underside of the outer rim molding section (EMRP PCMA UW/microscopic images Ł. Zieliński)

merous traces of processing. One of them are micro-bubbles visible on the surface of its body. Dents were left on the axis of symmetry on the vessel floor and the underside [see *Fig. 3:C, D*]. A double deep

groove under the molding has longitudinal scratches. There are also longitudinal scratches perfectly preserved under the rim of the vessel from the inside (see the discussion below).

- 
- Cat. 8. Bowl, complete; microscopic traces of casting and a hand lathe (Inv. No. Tnq23/23)  
 Copper alloy, very good state of preservation  
 H. 68.70 mm, Dia. outer 136.80–135.96 mm, Dia. inner 126.86–126.57 mm;  
 depth 65.95 mm; weight 335.4 g  
 Tumulus 23, eastern side of the burial chamber at the southern end, next to  
 mud-brick blocking wall, 2.70 m below ground level  
 Parallels from Ballaña, Qustul (Emery and Kirwan 1938: 283–312, *Fig. 100*) and  
 el-Hobagi (Lenoble 2018: 161–177)
- 

### FINGER RINGS

Four open rings were found on a finger of the right hand of the skeleton in the burial chamber of Tumulus 46. This would not be the first such find from Tanqasi, as in 1953, two rings *in situ* on a big toe of one of the skeletons were excavated in the Mound II tomb (Shinnie 1954: 73).

The rings from Tumulus 46 are made of copper-based wire (probably alloy with tin). Three are alike while the fourth clearly stands out [*Fig. 4* right]. All are open for easy adjustment to the finger by folding or bending of the ends, however the one ring that is different (Tnq46/1=Cat. 9 below) is made of tape with flat sides and rounded edges [*Fig. 4* top left]. Both ends were hammered and are wider than the middle section. One of the ends was clearly damaged during the hammering (longitudinal fracture well visible under the microscope). It may indicate cold-forging, the technique being more conducive to causing damage

than hot-forging. The ring was apparently polished and chiseled (rounded edges and endings), although the poor state of preservation and corrosion of the original surface of the object make the traces of processing difficult to interpret.

The other three rings were made of forged wire, based on a regular polygon, round in cross-section and narrowing toward one end, and represent a completely different technique of production [*Fig. 4* bottom]. Both ends were cut with a chisel and the cutting marks are perfectly visible under a microscope [see *Fig. 4* bottom left]. However, no major traces of further processing were recorded. The wire was not polished further, because the original angles of the polygonal section are preserved on the surface, and the ends were also not polished in any way and remained sharply cut. They could have been chiseled delicately, but the degree of corrosion on all three rings does not allow this to be verified.



- Cat. 9. Ring, open, thicker on both ends, ends overlapping, edges of the ring ovate (Inv. No. Tnq46/1)  
Copper-based, alloy probably with tin, poor state of preservation and surface corrosion  
Dia. outer 17.73–20.32 mm, inner 16.50–17.93 mm, Th. 0.97–0.76 mm, W. 1.70 mm, weight 0.60 g  
Tumulus 46, burial chamber, on a finger of the right hand of the skeleton  
Parallels from el-Zuma (Then-Obłuska 2016: 752) and Tanqasi itself (Shinnie 1954: 73)
- Cat. 10. Ring, open, thicker at both ends, edges of the ring ovate (Inv. No. Tnq46/22)  
Copper-based, alloy probably with tin  
Dia. outer 23.65 mm, inner 19.36 mm, Th. 2.50–2.00 mm, weight 1.50 g  
Tumulus 46, burial chamber, on a finger of the right hand of the skeleton  
Parallels from el-Zuma (Then-Obłuska 2016: 752) and Tanqasi itself (Shinnie 1954: 73)



Fig. 4. Copper finger rings: right, four open rings from the burial in Tumulus 46, after conservation; left (from top), ring Tnq46/1 of copper tape, microscopic image of the hammered ends; rings Tnq46/23 and Tnq46/24 of copper wire, microscopic views of cut ends on left and polygonal surfaces on right (EMRP PCMA UW/photos A. Kamrowski, microscopic images and drawing Ł. Zieliński)



- 
- Cat. 11. Ring, open, one end cut, other end hammered and intentionally broken; wire hexagonal in diameter (Inv. No. Tnq46/23)  
Copper-based, alloy probably with tin  
Dia. outer 22.84–22.47 mm, inner 19.45–18.79 mm, Th. 1.62–1.95 x 1.64–1.97 mm, weight 1.55 g  
Tumulus 46, burial chamber, on a finger of the right hand of the skeleton  
Parallels from el-Zuma (Then-Obłuska 2016: 752) and Tanqasi itself (Shinnie 1954: 73)
- 
- Cat. 12. Ring, open, one end cut, other end hammered and intentionally broken; wire hexagonal in diameter (Inv. No. Tnq46/24)  
Copper-based, alloy probably with tin  
Dia. outer 23.09–22.70 mm, inner 19.54–19.31 mm, Th. 1.71–2.01 x 1.69–2.01 mm, weight 1.60 g  
Tumulus 46, burial chamber, on a finger of the right hand of the skeleton  
Parallels from el-Zuma (Then-Obłuska 2016: 752) and Tanqasi itself (Shinnie 1954: 73)
- 

## DISCUSSION

Weapons are the most numerous category of metal artifacts from the tombs excavated at Tanqasi in 2018, paralleling thus the makeup of finds from other cemetery sites, like el-Zuma, a site located just a couple of kilometers away, on the other side of the Nile, studied by the author (e.g., Zieliński 2014). The group is formed of the following: a set of leaf-shaped arrowheads of two types, single-barbed and barbless, a javelin head and a long knife. The arrowheads are clearly utilitarian pieces, used for hunting and fighting, and the circumstances of their discovery point to their deposition as a single assemblage in a quiver, the latter presumably of leather as signified by a specific kind of corrosion occurring when an iron object is in contact with skin and leather products. Regrettably no impression remains of the leather of which the quiver was made. A quiverful of arrows was found also in Tumulus 16 in el-Zuma (Zieliński 2014: 377).

The arrowheads from Tanqasi represent type 1b with an average length of over 5 cm, width of over 1 cm and thickness roughly 3–4 mm. The barbs are about 1 cm long and 3.5 mm thick at the base. The average weight (as measured in this case, see above, *Cat. 1* on page 318) of 2.10 g is not the original weight of an iron arrowhead; judging by their dimensions, they should be twice as heavy (corrosion has eaten away some of the metal). Although not standard in shape, these arrowheads represent multifunctional types that were simple to produce, resembling the types discovered to date at el-Zuma (Zieliński 2014: 377) and el-Detti (Zieliński 2016: 420). No specialized types, such as open-work igniting or multi-barbed poisoning points, have been recorded so far, although new finds may yet change the overall picture.

The fragmentary knife from Tumulus 23 apparently resembles the knife found in Missimina (Török 1988: 188) and the

nearest parallels are two similarly preserved combat knives from el-Zuma (Zieliński 2014: 376). The knife is single-edged, with a triangular cross-section blade, over 3 cm wide and 0.87 cm thick at the spine. From a user's perspective, it would qualify as a cleaver, far more suitable for chopping than for thrusting. Being fairly short (less than 50 cm) and quite heavy, it was ideal for fighting in crowded conditions and for being used as a machete for fieldwork. The surviving fragments of the blade indicate the center of gravity of the weapon placed slightly forward, toward its point, a solution commonly applied in machetes to increase their impact. Interestingly, Emery found a knife of this type with an asymmetrical shape of the blade and slightly curved hilt in a princely grave B6 in Ballaña (Török 1988: 117). Other knives like this were found also in other tombs in Ballaña. The shape typifies the well-known weapons, such as *makhaira* or *falcata*, and is intended to increase the cutting force. The Nubian long knife, however, has a simple blade compared to these weapons and does not seem to have been inspired by them.

The javelin head from the same burial has the shape of an elongated leaf with a forged rib on both sides on the axis of symmetry smoothly passing into a spindle for shafting, unlike parallels from el-Zuma (Zieliński 2014: 377) and el-Detti (Zieliński 2016: 420) which made use of other structural solutions, that is, a diamond or spindle cross-section instead of a rib. The rib solution made the Tanqasi javelin bulkier and more resistant to compression and bending when hitting a target. The javelin from el-Detti with no reinforcement in the

middle (spindle cross-section) had obviously bent sideways and was broken when hit. Forging symmetrical ribs on both sides required somewhat greater skill from the blacksmith. Nevertheless, it is a typical post-Meroitic weapon and the two-sided rib is a common feature of sword spears found in the territory of Nubia from Ballaña to el-Hobagi (Emery and Kirwan 1938; Lenoble et al. 1994). The rib could increase injuries due to both additional weight (reflected in the force transmitted during impact), and the tip's geometry. An enlarged cross-section increases the surface of the inlet wound, be it a hunted animal or a man in armed conflict.

The copper bowl was carefully crafted with an almost perfect top-down diameter. The casting model must have been very well made. The slight waviness of the rim could suggest a two-part mold with the joining just around the rim, subsequently masked by not very precise processing. Nevertheless, the casting seams were removed by grinding and the surfaces around the rim were smoothed and rounded. The bowl was cast of a copper-based alloy of undetermined composition. The technique of casting is attested by micro-bubbles (places where air was not displaced by metal poured into the mold) [see Fig. 3:A, B] and negative traces of the mold (which was probably ceramic). The casting bubbles are undoubtedly a technological flaw, yet the vessel itself was thin-walled with a large surface area, a shape difficult for casting. Flaws of this sort usually result from a combination of factors: a defective mold, the material from which it was made, or the conditions in which the process was carried out. Other than casting bubbles, the

traces included marks left behind by fixing round pins along the axis of symmetry on the vessel floor and the underside [see *Fig. 3:C, D*]. The marks are thought by the present author to represent the clamps of a hand lathe, while the longitudinal traces, perfectly preserved under the rim of the vessel from the inside, could point to cutting with a lathe knife. Still, what is most striking about the bowl is the rim with a double deep groove under the molding, which maintains perfect dimensions around the perimeter, suggesting the use of a spatial marking tool with the possibility of turning at the same time. The molding also has longitudinal scratches from the use of a turning tool. This type of machining indicates

a highly-qualified production workshop employing more than one specialist in the field. Metal vessels have been reported from other sites from the period, but have not been studied for evidence of production techniques. Thus, the bowl found by the Early Makuria Research Project opens up new avenues for the re-examination and analysis of these processes.

All the rings from Tumulus 46 were made in a rather primitive way, without decoration and of material that hardly added to their aesthetic value. It seems that three of them could even have come from the same producer, while the fourth one represents a different technique, which may indicate another workshop.

## CONSERVATION

Conservation included not only artifacts found this season at Tanqasi, but also objects discovered in 2015 in the el-Detti tombs and in 2016 in tumuli 1 and 4 at el-Zuma [*Table 2*].

In the case of this year's finds, the treatment was of an immediate nature, while with regard to the other artifacts salvage conservation was undertaken since the condition of the objects kept in the store had deteriorated considerably. A detailed logbook documented the conservation process on a daily basis. The following comments and the catalog are based on this documentation, which is an integral part of the Project's field records.

The current condition of the artifacts selected for conservation was documented before taking any action. Then, the objects were subjected to mechanical and chemical cleaning, the methodology ap-

propriate to the identified metal, whether iron, copper or gold. Mechanical cleaning was accomplished using a prosthetic micromotor with different tips (milling cutters, brushes and corundum disks of different diameters) as well as hand tools (scalpels, dental tools, brushes and glass fiber brushes). Chemical cleaning consisted of scarifying corrosion products (mainly oxides) with solutions with a slight acidic reaction in distilled water. Usually, a 10% citric acid solution in distilled water or acetic acid solution was used. Both solutions have a weak and slow effect on oxides, therefore the process can be adequately controlled, which makes the method quite safe for heavily corroded artifacts. In extreme cases, when the object was in a very poor state of preservation, compresses of cotton wool or gauze, saturated with a solu-

Table 2. Finds studied and treated during the season (8 February–6 March 2018). Site coding: Tnq=Tanqasi, Z=el-Zuma, D=el-Detti

No.	Artifact studied	Microscopic image	Cleaning/conservation
1.	Tnq23/23	✓	✓/-
2.	Tnq23/33	✓	✓/partial
3.	Tnq23/34	✓	✓/partial
4.	Tnq23/35	✓	✓/partial
5.	Tnq46/1	✓	✓/partial
6.	Tnq46/22	partial	✓/-
7.	Tnq46/23	✓	✓/partial
8.	Tnq46/24	✓	✓/partial
9.	Z1/29	-	✓/-
10.	Z1/32	✓	✓/partial
11.	Z1/33	✓	✓/partial
12.	Z1/34	-	✓/-
13.	Z1/35	-	✓/-
14.	Z1/36	-	✓/-
15.	Z1/37	-	✓/-
16.	Z1/38	-	✓/-
17.	Z4/81	✓	✓/-
18.	Z4/82	✓	✓/partial
19.	Z4/84	✓	✓/-
20.	Z4/87	✓	✓/partial
21.	D4/20	✓	✓/partial
22.	D4/28	✓	✓/-
23.	D4/29	✓	✓/-
Total	23	16	23/11 (partial)

tion, were used instead of bathing; these acted mainly on the surface of the artifact without penetrating deeply into the corroded structure. Details of the conservation treatment undertaken in each case are presented below [Table 3].

Standard procedure called for conducting an active corrosion test on copper artifacts. When traces of corrosion were found, objects were subjected to corrosion neutralization using the Rosenberg method. Iron artifacts were boiled in distilled water to reduce salinity, which is at the root of corrosion. It was the only method of stabilizing iron available in the field. Artifacts were stabilized and secured, using sodium carbonate as a stabilizer and benzotriazole (BTA) as a corrosion inhibitor in the case of copper-based artifacts. Surfaces were ultimately protected with Paraloid B44. In the case of iron artifacts, stabilization was achieved in a sulfite alkaline bath and the object was protected with Paraloid B44, like the copper artifacts.

Objects selected for a metallographic research program in Poland, encompassing metallographic tests and, above all, XRF spectrometry, were not subjected to further conservation in the field as any kind of treatment would have disrupted the results. Conservation of these particular artifacts was planned to be completed in proper laboratory conditions after testing in Poland. Unexpected policy changes on the ground in Sudan made this part of the project impossible for the present.

Table 3. Catalogue of objects treated giving conservation treatment steps

No.	ITEM, state of preservation	Metal	Photographic record Inv. No. before and after conservation
	Conservation treatment steps: 1) mechanical cleaning 2) chemical cleaning 3) active corrosion test [+] [-] 4) neutralizing focus of active corrosion 5) stabilizing products of corrosion 6) applying corrosion inhibitor 7) recomposition (adhesive) 8) surface protection		<i>Before conservation</i>          <i>After conservation</i>
1.	BOWL	Copper	Tnq23/23
Conservation treatment: 1), 2), 3) [+], 8) PARALOID B44			

*Before conservation*



*After partial conservation*





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2. EARRING, fragments Gold, copper Z1/32

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Conservation treatment:  
1), 7) further recombination where necessary  
in Poland, 8) PARALOID B44

---

*Before conservation*

*After partial conservation*




---

3. BELL, broken Iron Z1/33

---

Conservation treatment:  
1), 2), 3) [+], 4) Rosenberg's method,  
5) sodium sesquicarbonate

---

*Before conservation*

*After partial conservation*




---

4. BELL Iron Z4/82

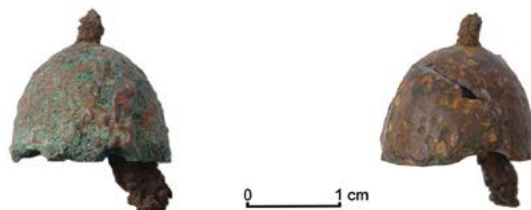
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Conservation treatment:  
1), 2), 3) [+], 4) Rosenberg's method,  
5) sodium sesquicarbonate

---

*Before conservation*

*After conservation*



---

5. BUCKLE Iron Z4/81

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Conservation treatment:  
 1), 2), 3) [+], 4) Rosenberg's method; further  
 treatment in Poland: 5) sodium sesquicarbonate, 6), 8) PARALOID B44

---

*Before conservation*



*After conservation*



0 2 cm

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6. RING Copper alloy Z4/84

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Conservation treatment:  
 1), 2), 3) [+], 4) Rosenberg's method; further  
 treatment in Poland: 5) sodium sesquicarbonate, 6) BTA inhibitor, 8) PARALOID B44

---

*Before conservation*



*After partial conservation*



0 2 cm

---

7.	RING	Copper alloy	Tnq46/1
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Conservation treatment:  
1), 2), 3) [+], 4) Rosenberg's method,  
5) sodium sesquicarbonate

---

*Before conservation*



0 2 cm

*After conservation*



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8.	RING	Copper alloy	Tnq46/23
----	------	--------------	----------

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Conservation treatment:  
1), 2), 3), 4) Rosenberg's method,  
5) sodium sesquicarbonate, 6), 8)

---

*Before conservation*



0 2 cm

*After conservation*



---

9.	RING	Copper alloy	Tnq46/24
----	------	--------------	----------

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Conservation treatment:  
1), 2), 3), 4) Rosenberg's method,  
5) sodium sesquicarbonate

---

*Before conservation*



0 2 cm

*After conservation*



---

10. ARROWHEAD Iron Tnq23/34

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Conservation treatment:  
1), 2), 3) [+], 4) boiling in H<sub>2</sub>O, 5) boiling in H<sub>2</sub>O

---



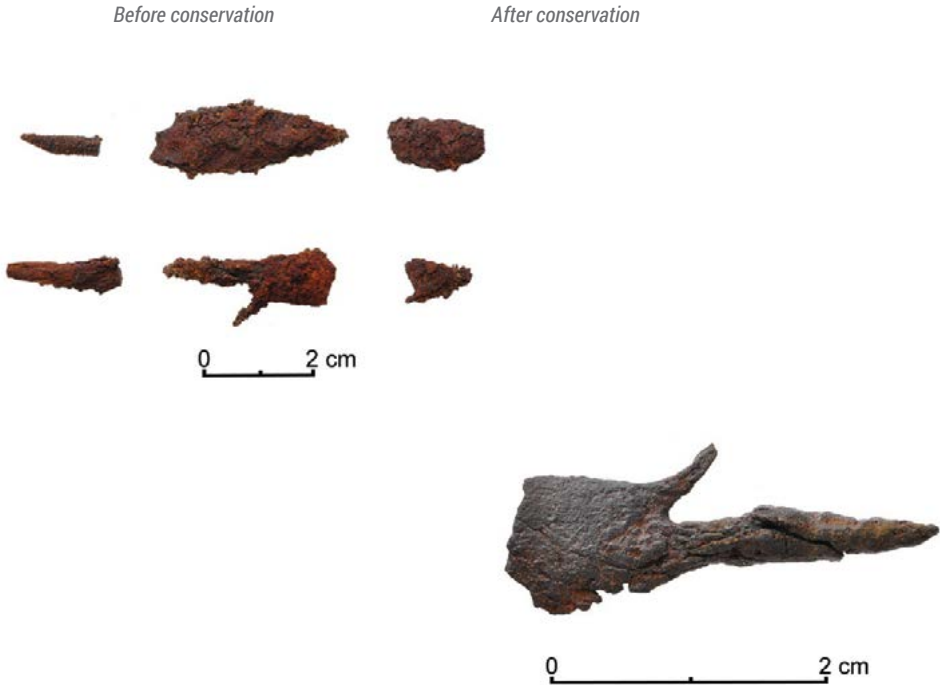
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11. ARROWHEADS, Iron Tnq23/35  
fragments

---

Conservation treatment:  
1), 2), 3) [+], 4) boiling in H<sub>2</sub>O, 5) boiling in H<sub>2</sub>O

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12.	ARROWHEAD	Iron	Z4/87
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Conservation treatment:  
1), 2), 3), 4) boiling in H<sub>2</sub>O, 5) boiling in H<sub>2</sub>O

*Before conservation*

*After conservation*



13.	ARROWHEAD, broken	Iron	D4/20
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Conservation treatment:  
1), 2), 3), 4) boiling in H<sub>2</sub>O, 5) boiling in H<sub>2</sub>O

*Before conservation*

*After conservation*

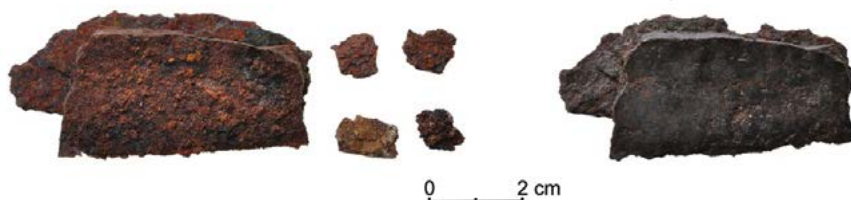


14.	KNIFE, fragments	Iron	Tnq23/33
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Conservation treatment:  
1), 2), 3) [+], 4) boiling in H<sub>2</sub>O, 5) boiling in H<sub>2</sub>O

*Before conservation*

*After conservation*





15.	TOOL: ADZE	Iron	D4/29
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Conservation treatment:  
1), 2), 3) [+], 4) boiling in H<sub>2</sub>O, 5) boiling  
in H<sub>2</sub>O; further conservation treatment in  
Poland: 6), 8) PARALOID B44

*After partial conservation*

*Before conservation*

*After partial conservation*



0 5 cm

16.	TOOL: CHISEL	Iron	D4/28
-----	--------------	------	-------

Conservation treatment:  
1), 2), 3) [+], 4) boiling in H<sub>2</sub>O, 5) boiling  
in H<sub>2</sub>O; further conservation treatment in  
Poland: 6), 8) PARALOID B44

*After partial conservation*

*Before conservation*

*After partial conservation*



0 5 cm

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17.	FITTING, fragments	Iron	Z1/37
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Conservation treatment:  
1), 2), 7)

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*After conservation*



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18.	FITTING, fragment	Iron	Z1/34
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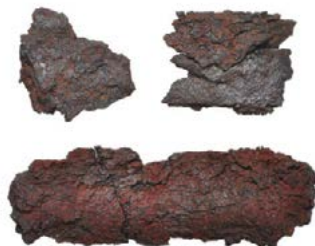
Conservation treatment:  
1), 2), 7)

---

*Before conservation*



*After conservation*



0 2 cm

---

19. ROD & FITTING, Iron Z1/29  
fragments

---

Conservation treatment:  
1), 2), 7)

---

*After conservation*



---

20. NAIL & FITTING, Iron Z1/36  
fragments

---

Conservation treatment:  
1), 2), 7)

---

*Before conservation*



*After conservation*



0 2 cm

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21.	NAIL, fragment	Iron	Z1/38
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Conservation treatment:  
1), 2)

---

*After conservation*



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22.	NAIL	Iron	Z1/35
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---

Conservation treatment:  
1), 2)

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*Before conservation*

*After conservation*



## SUMMARY

The assemblages of metal finds from tumuli 23 and 46 at Tanqasi are complementary in a way. The former burial yielded a relatively rich set of weaponry and a bowl for everyday use, the latter some personal adornments still on the skeleton. In graves from el-Zuma such jewelry occurred together with weaponry and other utilitarian equipment. Moreover, weapons of the same type appeared there usually in sets of more than one piece, a phenomenon observed even more prominently in el-Hobagi (Lenoble et al. 1994). In the case of the Tanqasi burial, weapons were represented with a single

piece per type (arrowheads should be counted as the content of a single quiver) and were present in only one of five excavated tombs. This precludes more far-reaching conclusions at this stage of research. Interestingly, so far none of the excavated tombs in Tanqasi, either now or in the past, have yielded any bed frames with fittings of a kind prevalent in the tumuli at el-Zuma (Zieliński 2014) and it was not because of the size of the burial chambers in Tanqasi which could have accommodated such furnishings with ease.

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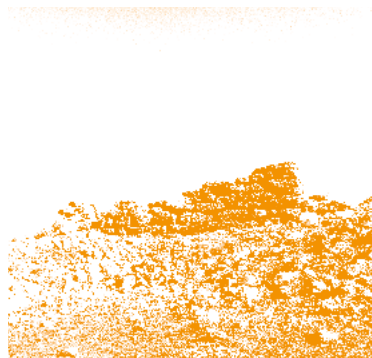
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# Archaeological and geophysical survey at the site of Khirbat as-Sar (Sara), Jordan



**Abstract:** Archaeological and geophysical prospection of the site of Khirbat as-Sar (Sara) in Jordan, carried out by a team from the Polish Centre of the Mediterranean Archaeology (PCMA), University of Warsaw, has resulted in a comprehensive plan mapping all visible architectural remains. A Roman-period sacred compound appears to be a central feature of this site. Pottery collected from the surface has given a time range for the settlement from the late Iron Age through the Mamluk period. The electrical resistivity method using a probe array that allowed ground penetration to a maximum depth of approximately 1.50 m revealed meaningful information on the spatial organization of the site. Numerous high-resistance anomalies were interpreted as a reflection of building remains.

**Keywords:** Khirbat as-Sar, archaeological and geophysical survey, mapping, architecture, Roman compound, pottery, resistivity survey

Khirbat as-Sar is situated on the western outskirts of Amman, in the modern neighborhood of Bayader (31°56'39"N, 35°49'48"E; PG east 228.600, PG north 150.400), at 972 m ASL. The site, which has never been excavated, is coded JADIS 2215017 and MEGA-Jordan 3007 in the Jordanian antiquities databases.

The first reference to the site as “Khurbet Sar” was made in 1877 by Selah Merrill (1881: 404–405). Soon after that, in 1881, it was visited by Claude R. Conder, who described it as a large site, situated on “the ancient west road from Amman” (Conder 1889: 153). According to him, “six sarcophagi were found lying in a square enclosure” by the northern side of this road. One should understand this information as a reference to a built tomb

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Appendices

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**Team**

*Dates of work:* 8–28 March 2018

*Director:* Prof. Jolanta Młynarczyk (Institute of Archaeology, University of Warsaw)

*DOA representative:* Hanadi al-Taher

*Archaeologists:* Dr. Mariusz Burdajewicz (Institute of Archaeology, University of Warsaw),

Marcin Gostkowski (PhD candidate, Institute of History, Polish Academy of Sciences)

*Geophysicist:* Robert Ryndziewicz (Institute of Archaeology and Ethnology, Polish Academy of Sciences)

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(a “mausoleum”) which, logically, would be outside the limits of the settlement. Conder describes the tower as built “of great blocks of chert or flint”, and to the east of it, he notes “remains of a building with two parallel rows of arches”, remarking that “the piers beneath the arches are covered up”. This information, alongside the statement that the tower was situated in the “north-west angle of the site” (as it is today), prove that the state of preservation of the ruins has not changed substantially since the 19th century. Strangely enough, Conder states that “there are four arches in each row”, while there are more to be seen clearly even today (see below). He mentions also “a large pool or Birkeh in the ruins” and “masonry of Roman appearance”, and concludes with assigning a Roman date to the site.

The site was visited again in 1905 by Howard C. Butler (1919: 33, Fig. 21) who focused on the square structure (“qasr”) “surrounded by a mass of broken and half buried walls of rude workmanship and of various ages, from the period of considerable antiquity to a comparatively late Mohammedan date”. He noted the dimensions of the central structure which, in his opinion, would be a sanctuary “of great antiquity” renovated by the Romans, as well as the presence of a courtyard to the east of it, flanked by two rows of arcades (*arcosolia*), seven arches in each row. Butler mentions puzzling “sarcophagi under the arches”(!).

In 1937, the site was visited by Nelson Glueck (1939: 153–156, survey site No. 207) who knew it by the name of “Qasr es-Sar”. Glueck’s description of the main compound, consisting of the square “qasr” and the arcaded courtyard, sounds

fairly detailed; moreover, he compared the state of architectural remains in his time with what was reported by Butler 30 years earlier. In Glueck’s opinion, the square structure was initially a fortress, which was transformed by the Romans into (presumably) a temple by adding a “platform” on its eastern side, preceded by the courtyard with two rows of arches. Other site elements mentioned by Glueck were “numerous large, now filled-up cisterns and cave cisterns around the site”, as well as “remains of considerable settlement on the s.e. side of the *qasr*, and also on the n.e. side, where there are also the remains of the small reservoir”.

A short note on the site, called “Sareh (Kh. Sar)” by Lankester Harding lies in the archives of the Jordanian Department of Antiquities (vol. S: p. 20 [unpublished]). He mentioned only the “Kusr”, attributed by him to the “Late Bronze and Archaic Iron ages”, and “eight semi-circular arches (four on each side of a ruined building) ... obviously the handiwork of a later epoch, probably Roman and Byzantine”. The mention of eight(!) arches (while one can still see more today as said above) proves that Lankester Harding simply quoted information supplied by Conder years before him.

Finally, in 2000, the site (identified as Khirbat as-Sar, Site 210) was revisited by Chang-ho C. Ji of the La Sierra University, California, surveying the Iraq al-Amir and Wadi al-Kafrayn region (Ji 2000, unpublished report in the archives of the DOA). His report focused, again, on the “qasr” and courtyard east of it, but without any effort to understand the layout of the compound. He also mentioned “at least two to three



large building complexes on the eastern and southern areas of the site”, and identified the potsherds found on the

surface as pertaining to the Hellenistic–Roman, Byzantine, early Islamic and mid Islamic periods.

## SURVEY METHODOLOGY

The survey was conducted within the fenced area belonging to the Department of Antiquities, which covers 16,000 m<sup>2</sup> (it should be noted, however, that a part of the ancient site lies outside the fence). The aim of the survey was to:

- a) map visible architectural remains;
- b) test the area by means of non-invasive geophysical methods (electric resistivity);
- c) collect surface finds for the purpose of establishing a site occupation time range.

All features on the ground that could be identified with high probability as remains of walls were mapped with a Leica TCR 407 tacheometer, whereas the electric resistivity survey (see below, *Appendix 2*) revealed the presence of architectural features concealed under

the ground. The compound situated in the highest spot of the site constituted the focal point; it was composed of a square building, commonly described as a “qasr” or “Ammonite tower” [*Fig. 1*], and a courtyard with two rows of arches on the northern and southern sides [*Fig. 3*]. This architectural complex has been identified provisionally as a temple compound. Several walls were recognized and mapped in the other parts of the site, an especially dense concentration occurring in the southeastern and southern sectors. Combining data from the mapping and the electric resistivity prospection has given a more complete picture [*Fig. 2*]. It is to be noted, however, that there are several large and deep hollows in the ground, filled with stone blocks of different sizes, situated in the



Fig. 1. The “qasr” seen from the south (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)



Fig. 2. General plan of the site of Khirbat as-Sar: combined results of archaeological and electric resistivity surveys (PCMA UW Khirbat as-Sar Project/drawing M. Burdajewicz, M. Gostkowski and R. Ryndziejewicz)



Fig. 3. Arcaded courtyard looking east from the "qasr" (PCMA UW Khirbat as-Sar Project/photo M. Gostkowski)

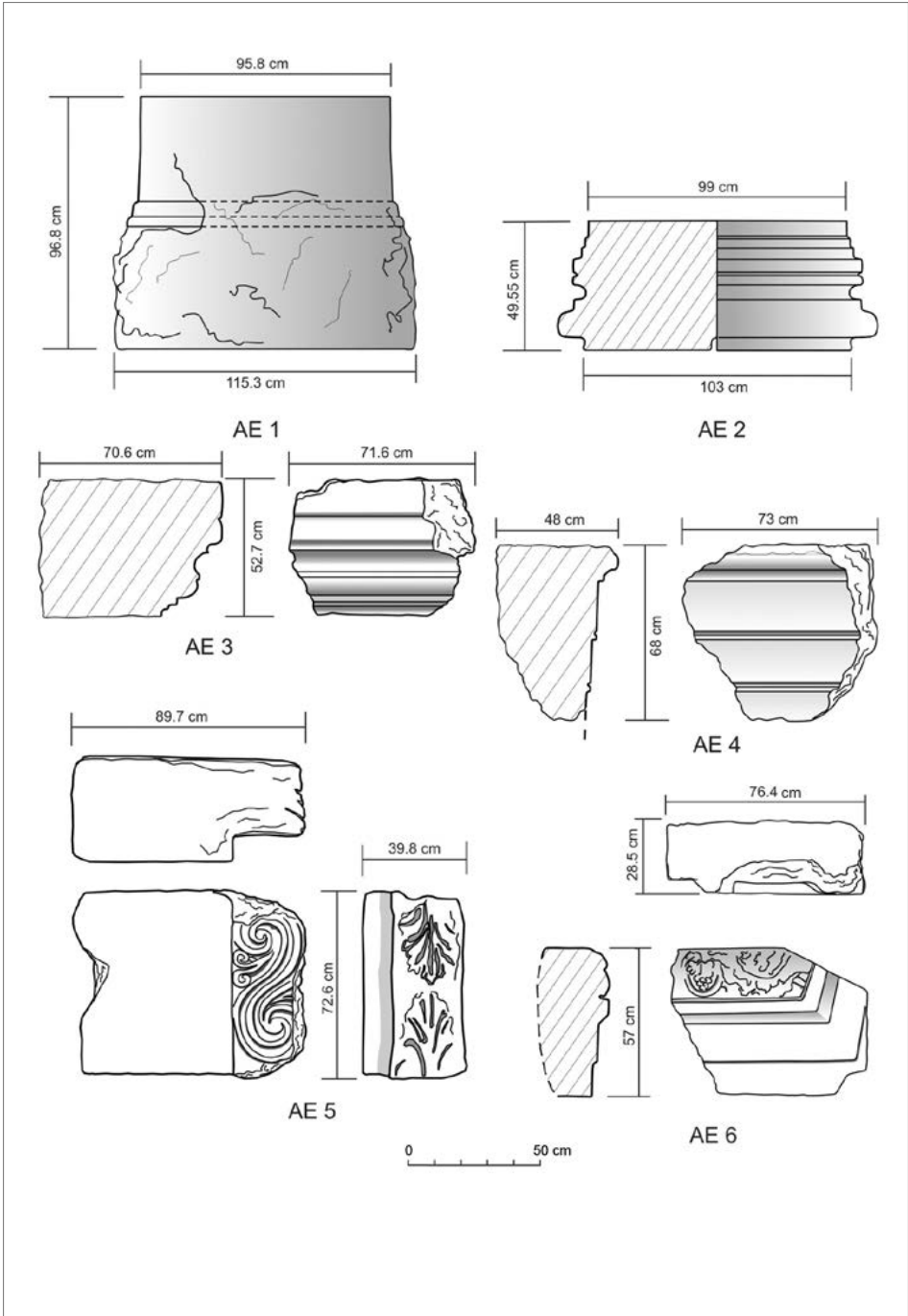


Fig. 4. Selected architectural fragments in limestone (PCMA UW Khirbat as-Sar Project/drawing and digitizing M. Burdajewicz)

eastern and southeastern parts of the site; these depressions appear as blank spots on the survey maps.

The data were subsequently compared with information from the past reports of Claude R. Conder, Howard C. Butler, Nelson Glueck, and Chang-ho C. Ji. Single elements of architectural decoration, pertaining mostly to the temple compound, were measured, drawn and photographed (for a selection, see *Fig. 4*). The surface collection of artifacts

followed a site division introduced in relation to the central structure (“temple compound”), specifically, areas east, southeast, south, west, and north of this complex. Most of the finds were pottery sherds (for a selection, see *Appendix 1*), but other items were noted as well: a few fragments of stone vessels, stone tools(?) and an iron “cake” of undetermined date, as well as a Late Roman bronze coin and pieces of painted wall plaster.

## RESULTS

The PCMA survey verified to a significant extent the data from earlier reports. The most important results refer to the layout of the temple compound (the “qasr” with its courtyard), of which the only, and, as it turned out, inexact plan published so far was that by Butler. In reality, the com-

pound consists of the “qasr”, a vestibule and courtyard with two side aisles sectioned off by rows of arcades. The “qasr” was square, built of semi-dressed blocks of flint conglomerate, from big to huge in size [*Fig. 5*]. Its dimensions as measured by the survey, 19.37 m (north–south)



Fig. 5. Interior of the “qasr” looking northeast (PCMA UW Khirbat as-Sar Project/photo M. Gostkowski)





Fig. 6. Fragment of column (AE 1 in Fig. 4) in the entrance to the “qasr”, view looking south (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)



Fig. 7. East wall of the vestibule looking north (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)



Fig. 8. Sunken area of the vestibule looking west (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)



by 19.34 m (east–west), corresponded to the measurements given by Glueck (20 m by 19.80 m) and Butler (19.50 m by 19 m), while differing substantially from those reported by Chang-ho C. Ji (16 m north–south by 17 m east–west). Two displaced column bases were found inside the “qasr” [see *Fig. 4:AE 2*] along with a monolithic base carved together with the column drum [*Fig. 6*; see *Fig. 4:AE 1*], standing perhaps *in situ* in the eastern entrance to the “qasr”. Unlike the walls of the “qasr”, these elements were made of limestone. It should be noted that more than one hundred years ago Butler saw, inside the building, as many as four large column bases “not *in situ*”, while Glueck mentioned only three.

The eastern side of the “qasr” is preceded by a vestibule (or *pronaos*). This feature was described by Glueck as a “platform” 6.80 m deep (from east to west), including its east wall, which is 1.80 m wide [*Fig. 7*]. According to survey measurements, the depth of the vestibule (that is, the space inside the parallel north–south walls) amounts to 4.50 m. The walls of the vestibule are constructed of mixed material: huge blocks of flint conglomerate completed with smaller dressed blocks of limestone. It was never noted before that the vestibule is sunk well below the floor level of the “qasr” [*Fig. 8*] and it is not possible to determine how the latter was accessed.

The most problematic part of the compound is the courtyard flanked by arcades on the north and south [*Fig. 9*], entirely built of limestone blocks, their faces bearing elaborate molding. This courtyard was mentioned in all the previous accounts of the site, none of

which was sufficiently precise. Conder reported “four arches in each row”, noting that their piers had been covered up with earth. Butler saw as many as seven arcades on each side of the courtyard, sketching their location on the plan of the compound, but without accurate dimensions. Judging by the third arcade in the southern row (counting from the east, *Fig. 10*), the one best exposed nowadays, the maximum width of an arcade is 1.80 m and not 1.60 m; the width/depth of the voussoir blocks (seven in each arcade) is 1.25 m (1.34–1.35 m at the molding) and not 1.15 m [*Fig. 10* top]. The arches rest on piers consisting of pairs of large dressed blocks.

Butler’s mention of “sarcophagi under the arches” does not seem to be reliable; indeed, the presence of sarcophagi was earlier noted by Conder, but with reference to an “enclosure” he had seen by the road and not to the arches which by then had been covered with earth up to the level of the piers (as they are today). Indeed, in Glueck’s report from 1937, the “sarcophagi under the arches which Butler saw” were not visible anymore.

As for the number of arches, Chang-ho C. Ji (2000) counted six arches on the south and five arches on the north of the courtyard. Our survey ascertained that originally there were seven arches in each row, as first noted by Butler. Today, the westernmost arcade in the northern row is missing, while the easternmost one apparently sank; in the southern row, the second arcade from the east is missing.

In Butler’s account, the information on the extent of the courtyard is misleading. He states that “toward the east the side walls of the building [by which he meant the “qasr”] are prolonged in ma-



Fig. 9. Arcades: top, northern row looking west; bottom, southern row looking west (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)

sonry of a wholly different character, to form a sort of courtyard, the east end of which is buried in soil and debris. These side walls are about two meters thick, are constructed of highly finished quadrated masonry, and contain a row of arcosolia". Indeed, in an accompanying drawing (Butler 1919: Fig. 21), the east–west walls close the rows of the arcades on their outer side. This seems to be Butler’s invention, hence it is no wonder that 30 years later Glueck could not see them and concluded that “since then, these walls have completely disappeared”.

The present survey definitely resolved the question of the layout of the courtyard. Two massive east–west walls were now recorded as the outer courtyard

walls on the outer side of each row of the arcades [Fig. 11 top left, see Fig. 2]. This design formed side aisles, of which the southern one was about 6 m wide,

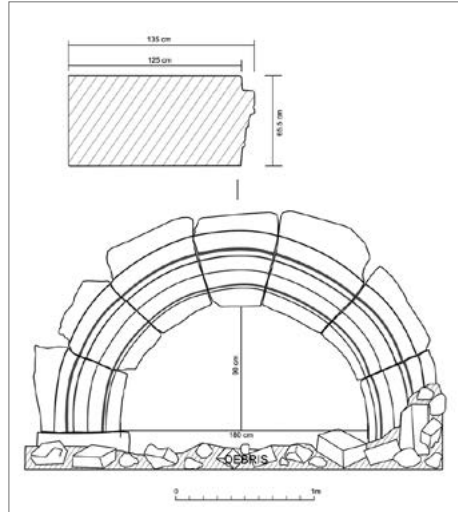


Fig. 10. Third arcade (counting from the east) in the southern row, looking southeast; top, view and section (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk, drawing and digitizing M. Burdajewicz)



and the northern one only about 5 m. These aisles, accessed from the courtyard through the arcades, must have been roofed, as attested by a fragment of roof-tile found by the southern aisle [Appendix 1: No. 18]. At their western end, the east–west walls turn at right angle to meet the outer corners of the “qasr” vestibule; this is particularly evident in the southwestern part of the compound [Fig. 11 bottom left]. At their opposite, eastern ends, the walls in question still feature well-defined corners, southeastern [Fig. 11 bottom right] and northeastern [Fig. 11 top right], of the “basilical courtyard”. The southeastern and northeastern corners of the “qasr” vestibule were also defined

[Fig. 12]. Measurements during the survey indicated that the “basilical courtyard” was planned as a perfect square, approximately 31.50 m to the side [see Fig. 2]; it was entered from the east, doubtlessly on the long axis of the compound. To reach the level of the vestibule from that of the courtyard (which in antiquity must have been about 3(?) m below the present-day ground level), there must have existed a stairway, as Glueck pointed out already, its location still visible today [Fig. 13].

The courtyard was built entirely of limestone, which was also the material used for the elements of architectural decoration. Butler mentions “fragments of column-drums, capitals and other de-



Fig. 11. Temple courtyard: top left, south wall looking northwest; top right, east wall near its northeastern end, looking northwest; bottom left, southwestern corner looking north; bottom right, southeastern corner looking north (PCMA UW Khirbat as-Sar Project/photos J. Młynarczyk)



Fig. 12. Temple vestibule: northeastern corner looking west (PCMA UW Khirbat as-Sar Project/ photo J. Młynarczyk)



Fig. 13. Remains of a stairway from the level of the courtyard to the vestibule, view looking west (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)



tails” without specifying their position on the site. After him, Glueck presumed that the entrance to the “qasr” “was probably under a massive entablature supported by limestone columns”; he mentioned also “column drums, voussoirs and other architectural elements ... both inside and outside the building”. Indeed, the PCMA survey recorded several architectural elements in various parts of the temple compound [for a selection, see *Fig. 4*]. However, the limestone used in Khirbat as-Sar seems to have been highly prone to weathering, which often rendered a proper identification of the architectural elements very difficult. Thus, while we have a few column bases and a part of a column drum associated with the “qasr” interior, the search for column capitals gave negative results with

one possible exception: a very weathered Corinthian capital(?) found upside down in the sunken vestibule to the “qasr” [*Fig. 15* top]. In the same spot there is a molded cornice block [*Fig. 15* bottom left, see *Fig. 4:AE 3*], probably coming from the monumental entrance to the “qasr” (either to the vestibule or the temple cella), and in the westernmost part of the courtyard, right in front of the vestibule, a long block which might belong to the framing of the monumental entrance to the vestibule [*Fig. 14*]. A decorated bracket [see *Fig. 4:AE 5*], found on the surface in the eastern part of the courtyard, must have supported a lintel of a very big doorway.

Single “rusticated” blocks with drafted margins and protruding central bosses can be seen in a few places of the ruined outer walls of the courtyard. This



*Fig. 14.* Door jamb(?) in front of the vestibule, looking northwest (PCMA UW Khirbat as-Sar Project/ photo J. Młynarczyk)



Fig. 15. Architectural elements: top, badly weathered Corinthian capital from a column in the sunken vestibule, view looking south; bottom left, fragment of a cornice (AE 3 in Fig. 4) and column (AE 1 in Fig. 4), view looking west; bottom right, displaced "rusticated" block (probably Hellenistic) found by the southeastern corner of the temple courtyard, view looking west (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)





Fig. 16. Remains of a north–south wall(?) added to the northern row of arcades in the courtyard, view looking west (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)



Fig. 17. Doorway preserved north of the courtyard, view looking north (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)



is a feature characteristic of Hellenistic masonry, especially of a defensive nature [Fig. 15 bottom right]. Since only a few examples have been noted, it should be assumed that such blocks come from an earlier (Hellenistic?!) architectural phase and were reused in the walls of the courtyard from the Roman period.

Walls mapped outside the “temple compound” cannot be interpreted prior to regular excavation. There is a doorway (1.00 m wide) north of the compound, apparently *in situ* [Fig. 17]; the same can be said of a north–south wall perpendicular to the third arch from the west, undoubtedly added at a later date [Fig. 16]. Of the remains of a “considerable settlement” mentioned by Glueck in 1937 the part southeast of the “qasr” [Fig. 18] was identified and mapped, while the section northeast of the “qasr” is probably already



Fig. 18. Fragments of undated walls: top, in the southern part of the site, view looking north; bottom, in the south/southeastern part of the site, view looking northeast (PCMA UW Khirbat as-Sar Project/ photos J. Młynarczyk)



outside the modern fence, either on cultivated land or even under modern buildings. The same applies to the “remains of the small reservoir” mentioned by Glueck and to the “Birkeh” of Conder’s account, as nothing corresponding to these features was recorded during the survey. Chang-ho C. Ji’s reported not being able

to see Glueck’s “small reservoir” anymore. Other site elements mentioned by Glueck and not located during the present survey are “numerous large, now filled-up cisterns and cave cisterns around the site”, including one assumed cistern inside the “qasr” proper, its mouth allegedly covered by a fallen column base.

## SITE CHRONOLOGY

To sum up the opinions of previous visitors to the site, which were based on the appearance of the architectural remains, it should be said that Conder assigned a general date in the Roman period, while Butler proposed a chronological sequence. He considered the square building to be “a structure of great antiquity, probably a shrine, which was renovated or restored by builders of the Roman period, by the introduction of classic columns and an entablature on the interior. The *arcosolia* are manifestly late, judging by the profile of their moldings, yet not Christian, if the absence of Christian symbols may be regarded as evidence”. Glueck developed this sequence in more detail, identifying the square structure as a fortress and dating it to the Iron Age (“EA I–II”). In his opinion, the “character of the ‘qasr’ was altered from that of a fortress to that of a temple (?)” in Roman times, which is when a “platform” (vestibule) and a courtyard with two parallel rows of *arcosolia* were constructed. Except for the architectural elements of limestone, which he rightly considered as being of Roman date, Glueck also mentioned numerous(!) Roman sherds, “as well as Byzantine and mediaeval Arabic sherds”. Probably it was the presence of the Byzantine sherds that led him to conclude that

the Roman temple(?) “may have been transformed into a church”. He also referred to a small quantity of worn Iron Age sherds and concluded that the very construction of the fortress points to its dating in the Iron Age I, continuing into Iron Age II.

Examination of the surface pottery collection (see below, *Appendix 1*) indicated an abundance of painted pottery types (mostly Mamluk, amounting to some 80%) in the eastern and southeastern areas of the site, with much fewer examples of medieval glazed wares, and extremely rare examples



Fig. 19. Pieces of wall plaster apparently of Roman date, found north of the “qasr” (PCMA UW Khirbat as-Sar Project/photo J. Młynarczyk)



of earlier pottery (Roman through Early Islamic). A different picture emerges with regard to the southern, western and northern areas, where Mamluk pottery sherds were definitely fewer, while Roman and Byzantine wares were prevalent. The area to the north of the “temple compound” yielded some small sherds of Hellenistic and early Roman date, as well as a few fragments of high quality wall plaster, both white and painted red, green and black, found outside the northern wall of the “qasr” [Fig. 19].

A small number of pottery sherds have been tentatively identified as pertaining to the Iron Age II (e.g., *Appendix 1: Nos 1–3*); this identification, however, will need further confirmation.

The analysis of the layout of the “temple compound” shows that it consisted of three distinct parts: a square “qasr” (probably the temple cella), a rectangular vestibule (*pronaos*) added to the “qasr”, and a courtyard designed as a perfect square. However, in view of the distance between the arches and the outer east–west walls of the compound differing in the southern and the northern aisle respectively, and the northern row of arcades being not exactly parallel to the southern one [see Fig. 3], it may be that the arcades were in-

serted into the courtyard at a later phase. There is no evidence coming from the survey to suggest a reuse of the compound as a church.

In general, the chronology of the site can be presented as follows:

- 1) Iron Age: the “qasr” and presumably some potsherds found on the surface (e.g., *Appendix: Nos 1–3*);
- 2) Persian period: no remains or artifacts were identified;
- 3) Hellenistic period: possibly “rusticated” blocks reused in the Roman structure, and some potsherds found on the surface (e.g., *Appendix 1: Nos 4–7*);
- 4) Roman period: extending the “qasr” to include a vestibule and square courtyard, with two rows of arcades added at a later period (pottery, e.g., *Appendix 1: Nos 12–13, 16–17*);
- 5) Late Roman/Byzantine and/or Umayyad to Abbasid(?) period: some changes and additions in the area north of the courtyard; many walls and potsherds all around the site (e.g., *Appendix 1: Nos 8–11, 14–15, 19–25*);
- 6) Medieval period: abundant pottery finds proving continued inhabitation during the Mamluk period (13th through early 16th century) (e.g., *Appendix 1: Nos 26–36*).

## SITE IDENTIFICATION

In terms of ancient topography, Khirbat as-Sar is situated in a region that can be identified as south Gilead, bordering on the land of Ammon. However, despite its apparent importance, the site remains anonymous. Merrill, who first recorded a visit to it, believed that it was located in the region of the Biblical Jazer. Conder

accepted this view, considering the site to be the same probably as Azor in the 4th century AD *Onomastikon* of Eusebius: s.v. Azōr (Iazer): “Boundary of the children of Ammon’ (border city of Ammon) which is called Philadelphia now. ... There is eight miles (about) from Philadelphia to a village Azer (Iazer) remaining to-

day”.<sup>1</sup> Other visitors to the site did not propose any specific identification; however, Glueck’s topographical description emphasized the natural strategic properties: “it nears the w. edge of the plateau overlooking the descent to the Jordan River valley ... it occupies the highest point in the vicinity and commands an excellent view over much of the surrounding country-side”. From this, it is clear that the site of Khirbat as-Sar must have been a station on the ancient road leading from the Jordan Valley via Wadi el-Kufrein (Kafrein) and Wadi Sir (Wadi el-Seer) to Rabbat Ammon (Amman). Therefore, we may propose a plausible identification of Khirbat as-Sar with “Birta of the Ammanitis”, mentioned in one of the letters in the Zeno archive (P. Cairo Zen. 1.59003, dated to 259 BC) in the context of Zeno’s business travel in the Transjordan (e.g., Gatier 2006). It has traditionally been believed that

this “Birta” (which means “fortress”) was, in fact, identical with Amman (Gatier 2006: 288). However, Amman appears in Zeno’s archive, as Rabbat Amon (*Rabbatamma*): letter PSI VI 616, dated to 258/256 BC). Neither can “Birta of the Ammanitis” be identical with Iraq el-Amir, because the latter was known in the Hellenistic period by the name of Tyros. Since for topographical reasons it is almost certain that Khirbat as-Sar was on the route of Zeno’s business trip in Transjordan, its identification with Birta of the Ammanitis (i.e., in the region of Amman) seems fairly acceptable. Yet the fact that the name of Birta would be current in the Hellenistic period does not preclude the identity of the site with the village of Azer (Iazer) mentioned by Eusebius a few centuries later. This issue may yet be clarified by the results of future excavations.

1 Translated by C. Umhau Wolf (1971), <http://www.tertullian.org/fathers#onomasticon> [accessed: 3.07.2018].

## APPENDIX 1

## SELECTED POTTERY FROM THE SURFACE SURVEY, 2018

[Figs 20:1–13; 21:14–18; 22:19–28; 23:29–36]

**a) Iron Age II(?)**

1 (E/9): rim of large bowl. Fabric yellowish beige with partial grayish core, small white and fewer larger pale grey and brown grits; pale red wash (self-slip?); many white eruptions. Iron Age II(?).

2 (E/10): rim of large bowl. The same fabric (and ware) as previous, the surface wash fired pale brown on exterior. Iron Age II(?).

3 (E/11): fragment of horizontal handle(?) of very large (cooking?) vessel. Fabric extremely hard, dark grey, abundant quartz(?) grits; surface (thin wash or self slip?) brownish grey to light brown. Iron Age II(?).

**b) Plain wares, Hellenistic and Roman**

4 (N/6): rim of table amphora(?). Fabric light brown with dark grey core and occasional white grit eruptions, pale brown wash. Hellenistic.

5 (N/10): rim of jug. Fabric light reddish brown, some fine white grits, pale brown wash (as that of N/6 [No. 4]). Hellenistic (Roman?).

6 (N/14): stem of goblet (incense burner?). Fabric hard, pale red, some tiny grits; smooth surface, fired pinkish beige. Hellenistic(?).

7 (N/15): rim of table amphora(?). Fabric pale pinkish beige, some voids and small white grits; surface porous, very pale brown. Hellenistic.

**c) Fine wares, Roman and Byzantine**

8 (E/8): rim of dish. Fabric hard baked pale red; slip orange-red, glossy. LRC form 3, 6th century AD.

9 (S/6): rim of dish/platter. Fabric pale orange/pink, with light brownish red self(?)slip. Roman (Byzantine?).

10 (N/9): rim of bowl. Fabric as that of S/6 (No. 9), light brownish red self(?) slip; upper exterior part fired yellowish beige, fine white grit eruptions. Roman (Byzantine?).

11 (N/8): rim of bowl/dish. Fabric yellowish pink, some small white grits and minute black ones (or voids?); slip brownish red and matt outside, light red and semi-glossy inside. Roman or Byzantine.

12 (N/12): rim of mug or cup, thin-walled with rouletting on the exterior. Fabric very hard light brown; slip very dark brown matt outside, reddish brown (with some gloss) inside. Early Roman.

13 (N/13): rim of bowl, grooved outside. Fabric as that of N/8 (see above, No. 11); slip light red, semi-glossy outside, matt inside. Roman or Byzantine.

**d) Cooking vessels: Roman and Byzantine**

14 (SE/2): rim of cooking pot. Fabric hard orange-beige, dark grey “skin” on exterior and orange inner surface. Byzantine?

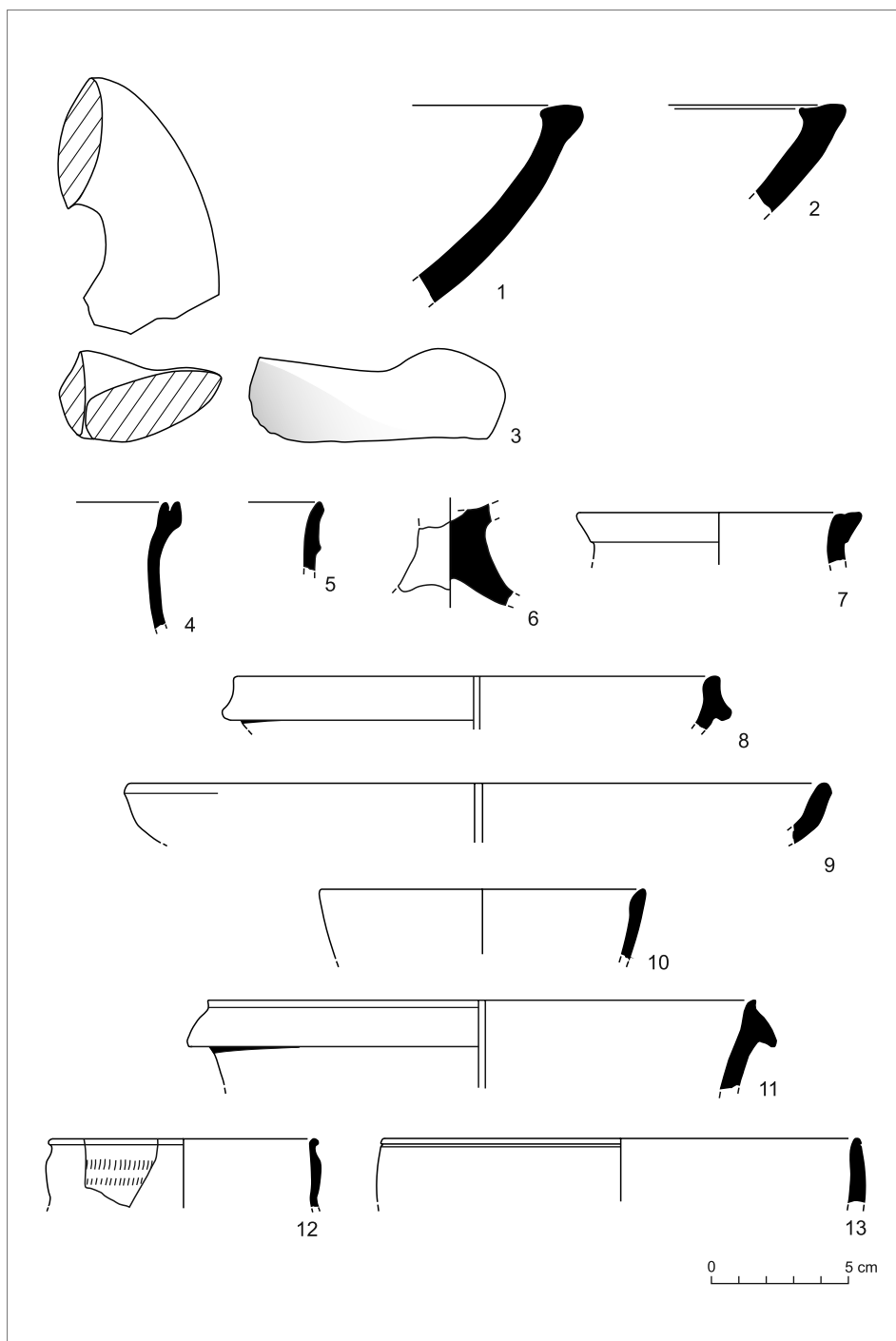


Fig. 20. Iron Age pottery (1–3); plain wares: Roman and Hellenistic (4–7), fine wares: Roman and Byzantine (8–13) (PCMA UW Khirbat as-Sar Project/drawing and digitizing M. Burdajewicz)

15 (N/4): handle and rim of cooking pot(?). Fabric very hard light orange, surface with reddish brown self-slip. Roman-Byzantine.

16 (N/7): rim of casserole (or of casserole lid). Fabric very porous dark reddish brown, some glossy particles and white grits. Roman period.

17 (N/11): rim of open(?) cooking pot. Fabric with “sandwich” firing (reddish brown outside to dark grey inside), fine white grits; surface “metallic” hard, fired reddish brown outside, brownish red inside. Roman period.

**e) Roof tile fragment**

18 Fragment of terracotta roof tile, found by the southern row of arcades in the courtyard.

**f) Late Roman/Byzantine to Umayyad(?)**

19 (E/6): rim of jar. Fabric very hard, light red with broad ash grey core; very pale brown thick wash. Late Roman-Byzantine.

20 (N/3): rim of jar. Fabric with “sandwich” section (pale orange to very pale brown); thin very pale brown wash on surface. Late Roman-Byzantine.

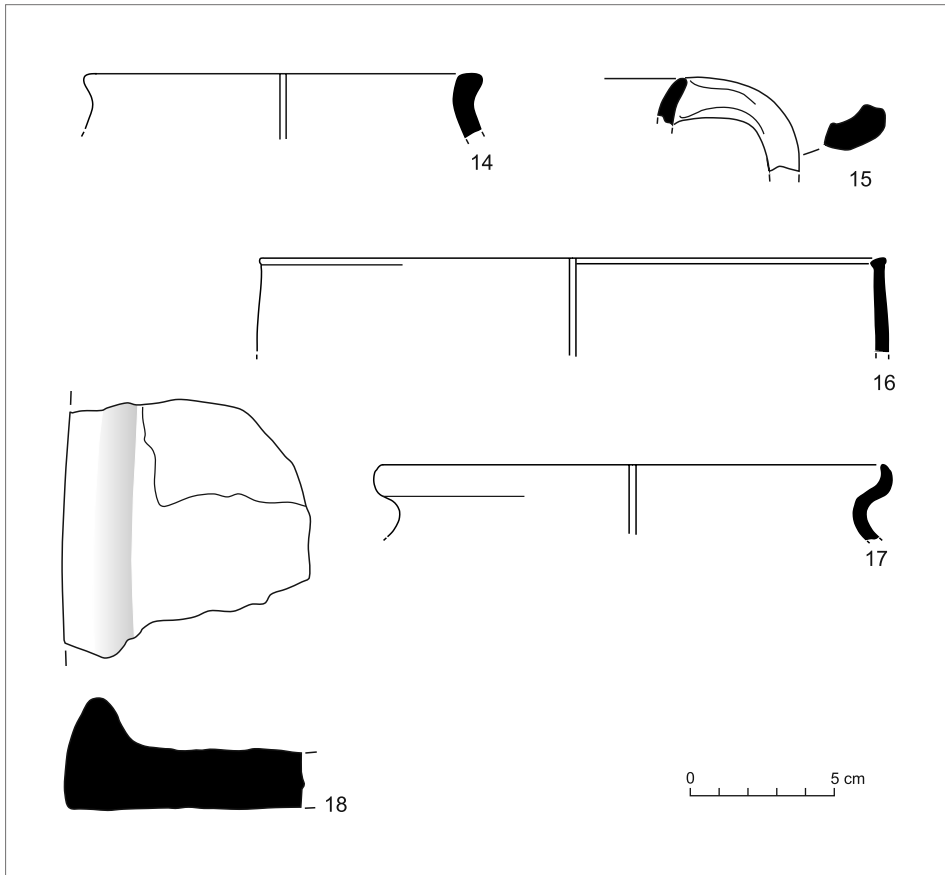


Fig. 21. Cooking vessels of Roman and Byzantine date (14–17); fragment of Roman roof tile (18) (PCMA UW Khirbat as-Sar Project/drawing and digitizing M. Burdajewicz)



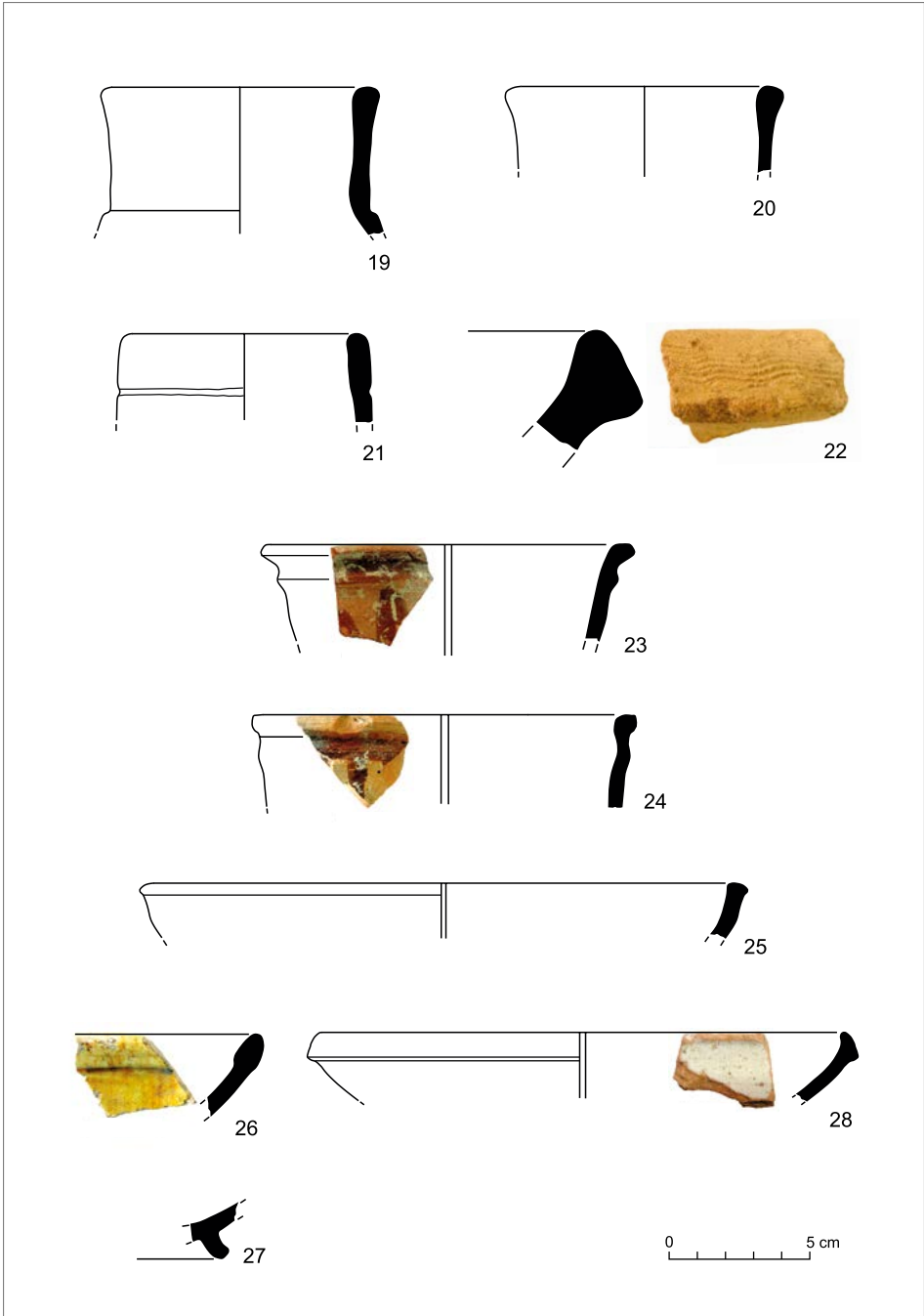


Fig. 22. Late Roman/Byzantine to Umayyad(?) (19–22); Umayyad (into Abbasid?) painted pottery (23–25); medieval glazed pottery (26–28) (PCMA UW Khirbat as-Sar Project/drawing and digitizing M. Burdajewicz)

21 (N/5): rim of jar. Fabric pale pink, dense, minute dark grey grits(?); whitish wash on exterior. Late Roman-Byzantine.

22 (N/2): rim of basin. Fabric dense, pinkish beige, rare small white eruptions; surface very pale brown outside, pale brown inside. Byzantine or Umayyad.

**g) Umayyad (into Abbasid?) painted pottery**

23 (N/1): rim of amphora or big jug. Fabric hard, pink, dark red ornaments against a pink surface.

24 (E/7): rim of amphora or big jug. Fabric as that of N/1 (No. 23); dark red ornaments against a light brown surface.

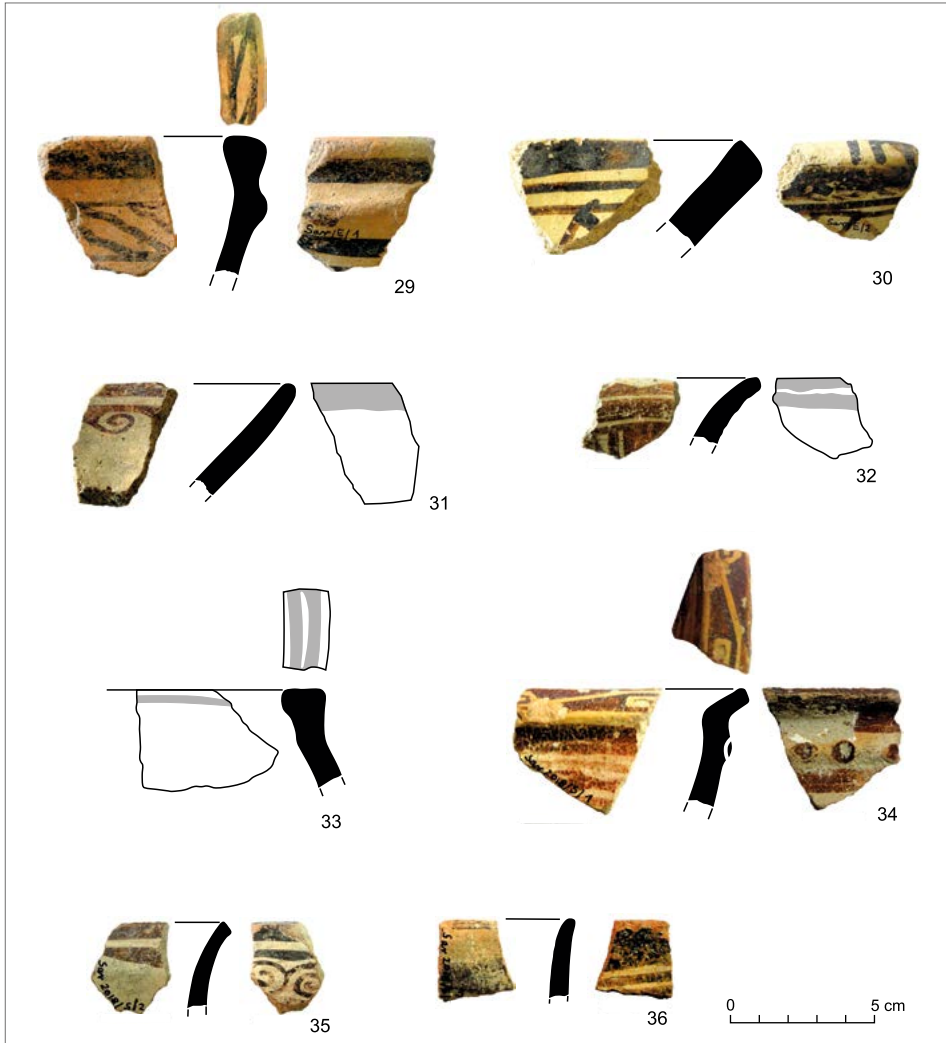


Fig. 23. Painted pottery (Mamluk) (29–36) (PCMA UW Khirbat as-Sar Project/drawing and digitizing M. Burdajewicz)

25 (SE/3): rim of bowl/dish(?). Fabric as that of N/1 (No. 23); pinkish white wash and a band of pale red paint outside.

### **h) Medieval glazed pottery**

26 (E/5): rim of bowl or plate. Fabric pale red, yellow glaze.

27 (S/4): base of bowl. Fabric hard orange-red with voids and some black grits; on the interior traces of dark green glaze against a milky white wash.

28 (S/5): rim of dish. Fabric hard pink, occasional small white grits; white wash on interior and rim; no remains of glaze preserved.

### **i) Painted pottery (Mamluk)**

29 (E/1): rim of deep bowl. Fabric very pale brown, porous; surface pink inside, very pale brown outside, ornament painted in dark brown; lightly burnished.

30 (E/2): rim of dish. Fabric very pale brown, porous; ornament in dark brown paint against a very pale brown surface, lightly burnished.

31 (E/3): rim of bowl. Fabric as that of E/2 (No. 30), with ornament in dark reddish brown, burnished.

32 (E/4): rim of bowl. Fabric as that of E/2 (No. 30), with ornament in orange-brown, burnished.

33 (SE/1): rim of crater(?). Fabric slightly porous, with "sandwich" section (grey inside, pink outside), some white and black grits; surface dark pink, burnished inside and on rim; black band painted on rim.

34 (S/1): rim of deep bowl. Fabric very pale brown, rather porous; surface very pale brown, ornament in dark red-brown and a row of circlets impressed outside; lightly burnished inside and on rim (Mamluk or perhaps Abbasid?).

35 (S/2): rim of bowl. Fabric as that of S/1 (No. 34); surface "white", very dark brown ornaments; burnished.

36 (S/3): rim of bowl. Fabric light red, gritty; surface pink to pale brown, lightly burnished; ornaments in very dark brown paint. [JM]

APPENDIX 2

PRELIMINARY RESULTS OF THE GEOPHYSICAL SURVEY

The geophysical survey at Khirbat as-Sar, undertaken on 10–28 March 2018, concentrated on procuring data for a study of the site layout and the location of remains of stone architecture where they were not visible on the ground surface. The results will be instrumental in planning future excavations.

The resistivity method employed in this case has as its general assumption the observation of changes of the electrical field, generated in the ground, by a system of electrodes (Herbich 2011). In archaeological research, the method is useful for non-invasive location of features characterized by electrical resistance different from that of the surrounding ground [Fig. 24]; it is used in the investigation of sites where buildings and other architectural remains are expected (Schmidt et al. 2015: 68). Features visible on the ground surface implicate the possibility of more features being revealed underground. The conditions at the site

make other geophysical methods, widely used in archaeological research (like GPR or magnetometry), practically impossible to apply owing to the extensive stone debris lying on the surface. Indeed, the accumulation of stone debris was such in some places (mainly the southeastern corner), that even this method could not be applied.

METHOD

The measurements were taken with an Elmes ADA-05 R resistivity meter. The survey was carried out in profiling mode, using a twin-probe array with traversing probes AM=1.0 m apart, and remote probes BN=6.0 m apart. This probe configuration allowed changes of apparent resistivity to be observed to a depth of approximately 1.50 m, but without the possibility of differentiating the depth of particular structures recorded within a prospected layer. Measurements were collected in 20 m by 20 m grids, at one-

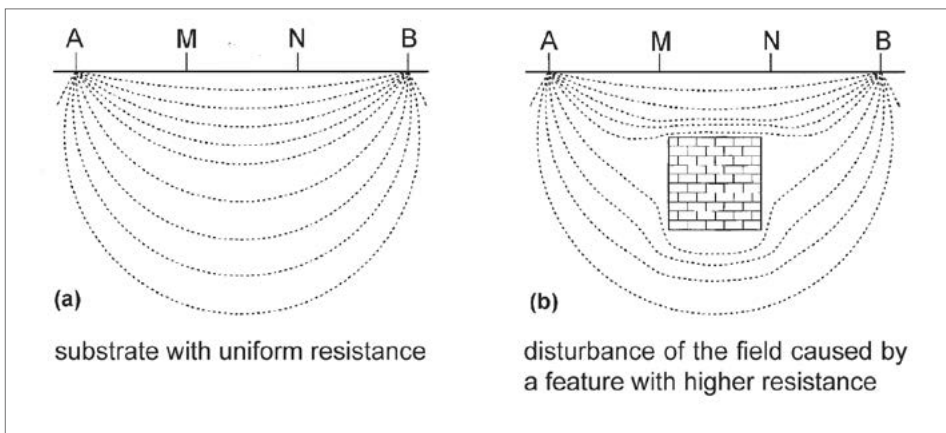


Fig. 24. Model of the distribution of the electric field in the ground (After Herbich 2011: Fig. 1)

meter intervals, along lines (traverses) one meter apart. The survey results are presented as maps of changes in ground resistivity values. The data were processed and analyzed with Surfer 8.0 software, producing gray-tone maps. The geophysical maps were first integrated with other data categories (satellite imagery, results of topographical survey) using a GIS environment and then interpreted.

**RESULTS**

The area surveyed, approximately 0.86 ha, comprised the surroundings of the temple compound (“qasr”) and was extended to available areas south and east of the “qasr”. The survey was divided into three separate areas, marked A, B and C, each covered with a grid network to facilitate the identification of anomalies (with let-

ters in rows and digits in columns, e.g., A1, C3 etc.) [Figs 25–26].

Area A [Fig. 26:a] is located in the southwestern part of the site. The resistivity map of this area shows numerous distinct linear high-resistivity anomalies, running parallel and perpendicular to one another. A clear and detailed image of rectangular anomalies, visible in B2 and C2, corresponds to the remains of walls on the surface and to structures concealed under the debris. The eastern edge of B2 and the northeastern corner of C4 could not be surveyed due to the large amount of debris and the surface relief. A large, rectangular anomaly (approximately 19 m by 15 m), aligned roughly southeast–northwest and recorded in B1 and the western part of B2, may reflect a large structure, partly visible on the



Fig. 25. Location of surveyed areas (PCMA UW Khirbat as-Sar Project/processing R. Ryndziewicz, satellite imaging Google Earth)



surface as a network of ridges. A linear anomaly in C1 and two parallel linear anomalies in C2 may be connected with this structure; it probably reflects a mas-

sive wall. The anomalies recorded in C3 and C4 reflect the remains of walls visible on the surface, complemented by data on structures underground. A low resistivity area visible in squares A3, A4, B3 and B4 is connected with a small mound devoid of stones rising above the surface. In square B4, the survey recorded a large linear anomaly, probably reflecting a large wall that was not to be seen on the ground.

Area B [Fig. 26:b] is located in the northeastern part of the site, east of the “qasr” and the two rows of arches. The area comprised a slope falling to the northeast and a small hill located on the eastern edge of the site. The resistivity map of this area shows numerous structures invisible on the surface. A linear anomaly in C1 is located along the same line as the southern row of arcades and probably reflects a structure connected with this row. The resistivity response in the northwestern part of area B, located on the higher part of the slope, reflects regular rectangular structures, although the image of this part is interrupted by an overabundance of stone debris. The anomalies recorded in the central part of the area (B2 and B3) have no equivalent on the surface and reflect regular structures, which can be interpreted as wall remains. A high-resistance area in the southern part of C3 corresponds to the remains of walls and stone debris on the surface.

Area C [Fig. 26:c] is located in the northwestern part of the site and adjoins the north and west walls of the “qasr”. The resistivity map of this area shows numerous structures aligned with the “qasr”. The anomalies registered in A3 may represent

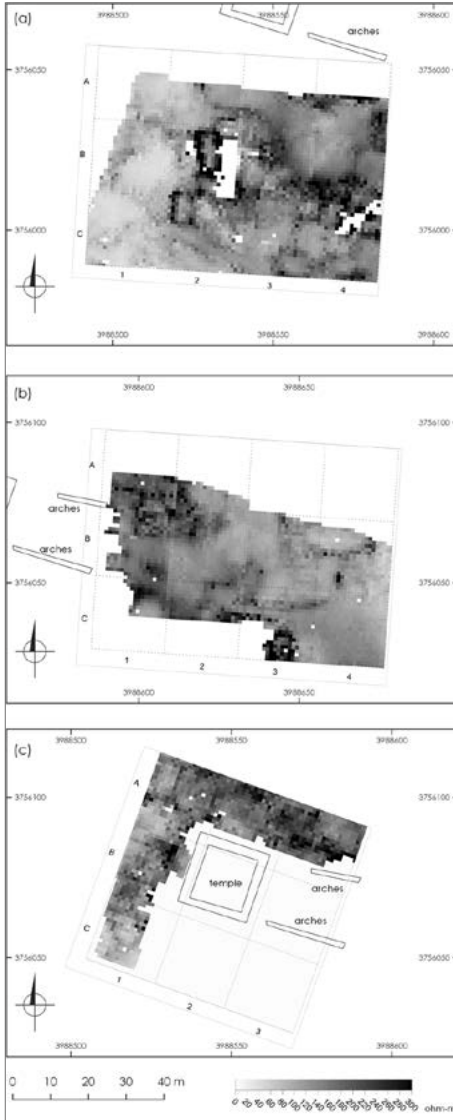


Fig. 26. Resistivity maps of the site. Grayscale plot – 0–300 ohm-m: a – Area A; b – Area B; c – Area C. Coordinate system: WGS84/Pseudo Mercator (PCMA UW Khirbat as-Sar Project/processing R. Ryndziejewicz)

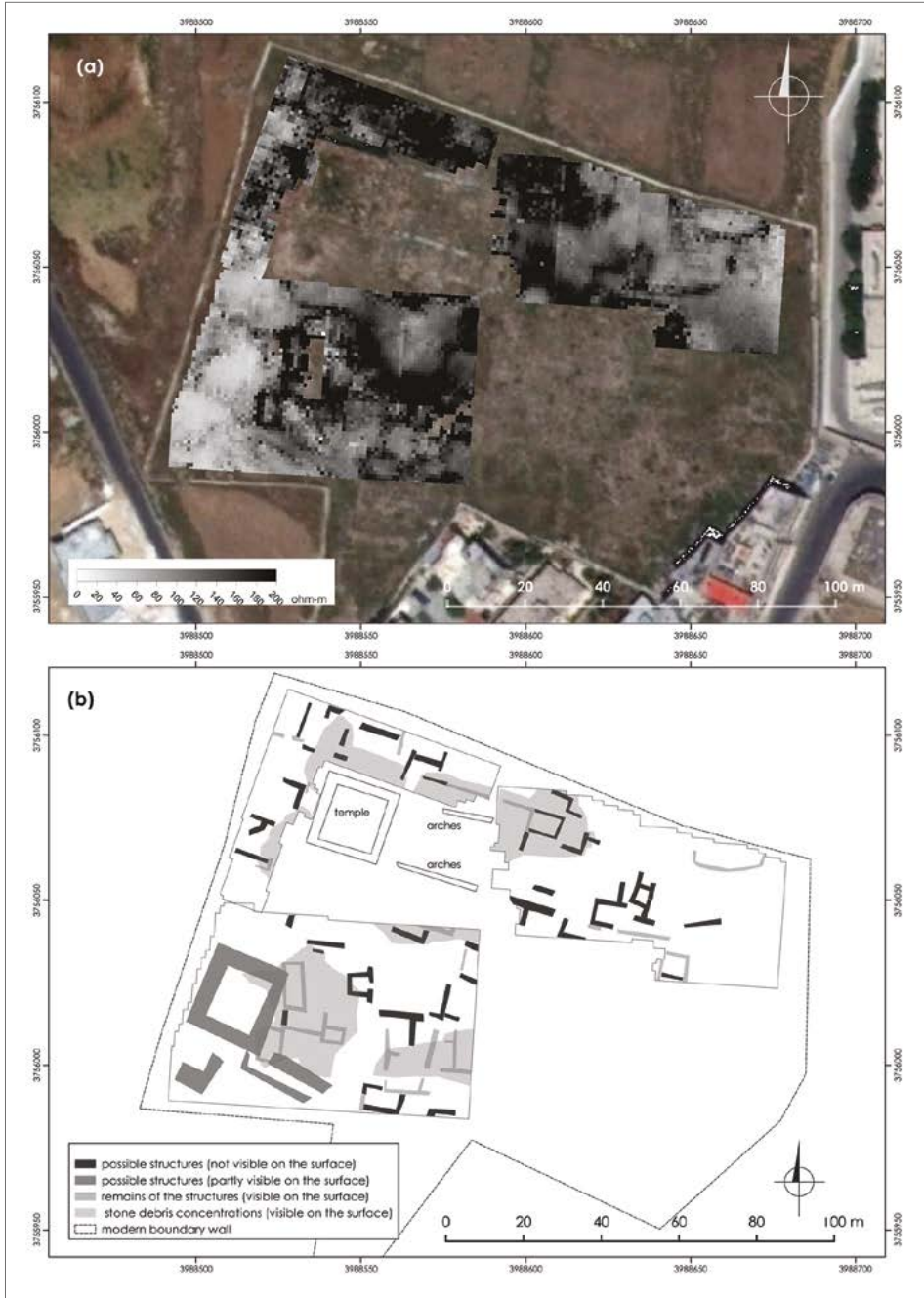


Fig. 27. Resistivity map of the site superimposed on a satellite map. Grayscale plot – 0–200 ohm-m; below, archaeological interpretation of the result. Coordinate system: WGS84/Pseudo Mercator (PCMA UW Khirbat as-Sar Project/processing R. Ryndziewicz, satellite imaging Google Earth)

a structure parallel to the northern row of arcades. Some anomalies recorded in A<sub>1</sub>–C<sub>1</sub> could reflect the remains of walls.

### CONCLUSIONS

The result of the geophysical survey [Fig. 27:a] provided data on the overall layout of the site, complementing observations of the remains on the surface with images of numerous structures concealed underground. Numerous high-resistance linear anomalies can be interpreted as a reflection of building remains. Structures surrounding the temple compound follow the same alignment as the temple. South of the temple, the walls have a more “random” orientation; they may

be associated with a different phase of site occupation. A large regular anomaly recorded in the southwestern part of the site may be interpreted as the remains of an unknown big structure or part of an enclosure wall. This interpretation [Fig. 27:b] is based both on the shape and values amplitude of the anomalies and a comparison with structures still to be seen on the surface. Integration of geophysical data with a detailed mapping of structures preserved aboveground has yielded a comprehensive site plan [see above, Fig. 2]. The archaeological interpretation of the results should be verified by testing to determine the kind of structure and its alignment. [RR]

### APPENDIX 3

## PETROGRAPHIC ANALYSIS OF THREE SAMPLES OF PAINTED PLASTER

Several fragments of painted plaster were found on the surface during a survey conducted at the site of Khirbat as-Sar (Sara). The fragments were scattered over an area of about 4 m<sup>2</sup>. Three samples were collected for preliminary petrographic examination (KHS 001, KHS 002, KHS 003) [Fig. 28].

All samples consist of a single layer of plaster; no remains of preparatory mortar have been noted. The plasters appear to have been spread evenly, as they measure 7–9 mm. The samples are compact and hard. The sections of samples KHS 001 and KHS 002 show very fine, densely packed aggregates which can hardly be discerned with the naked eye [see Fig. 28]. Sporadic larger mineral inclusions and

small pores appear throughout the section. Sample KHS 001 is covered with opaque dark red paint, whereas sample KHS 002 is painted black. In both cases, the paint is applied evenly and thickly, its surface is matt, but smooth. The paint is in good condition, shows no powdering.

Sample KHS 003 is slightly different. Its section contains gray, beige, and dark brown stone-like grains the size of which ranges from a fraction of a millimeter to 3 mm [see Fig. 28]. The plaster surface is not as smooth as in the two former cases. The fragment of a red design painted against white background seems abraded, although the remains of the paint suggest that it was once thickly applied.

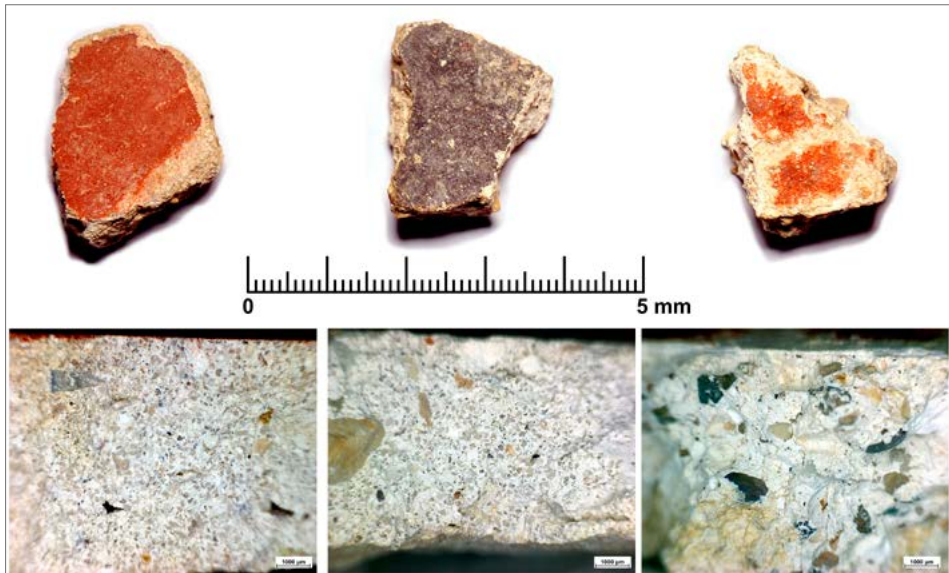


Fig. 28. Three fragments of plaster and corresponding photographs of their sections taken under a portable digital microscope (TPL 1,3MPix 1x-40x/200x) connected to a laptop computer. From left to right: sample KHS 001, KHS 002, KHS 003 (Photos J. Burdajewicz)



Examination of petrographic thin sections revealed that calcium carbonate acts as a binder of all three samples (61.5% by volume in sample KHS 001, 58% in sample KHS 002, and 63% in sample KHS 003)

[Fig. 29].<sup>2</sup> The micrite matrix is heterogeneous, showing distinctive clusters of micrite and aggregates of sparite, possibly from incomplete calcination of the limestone rock in lime kiln. The matrix

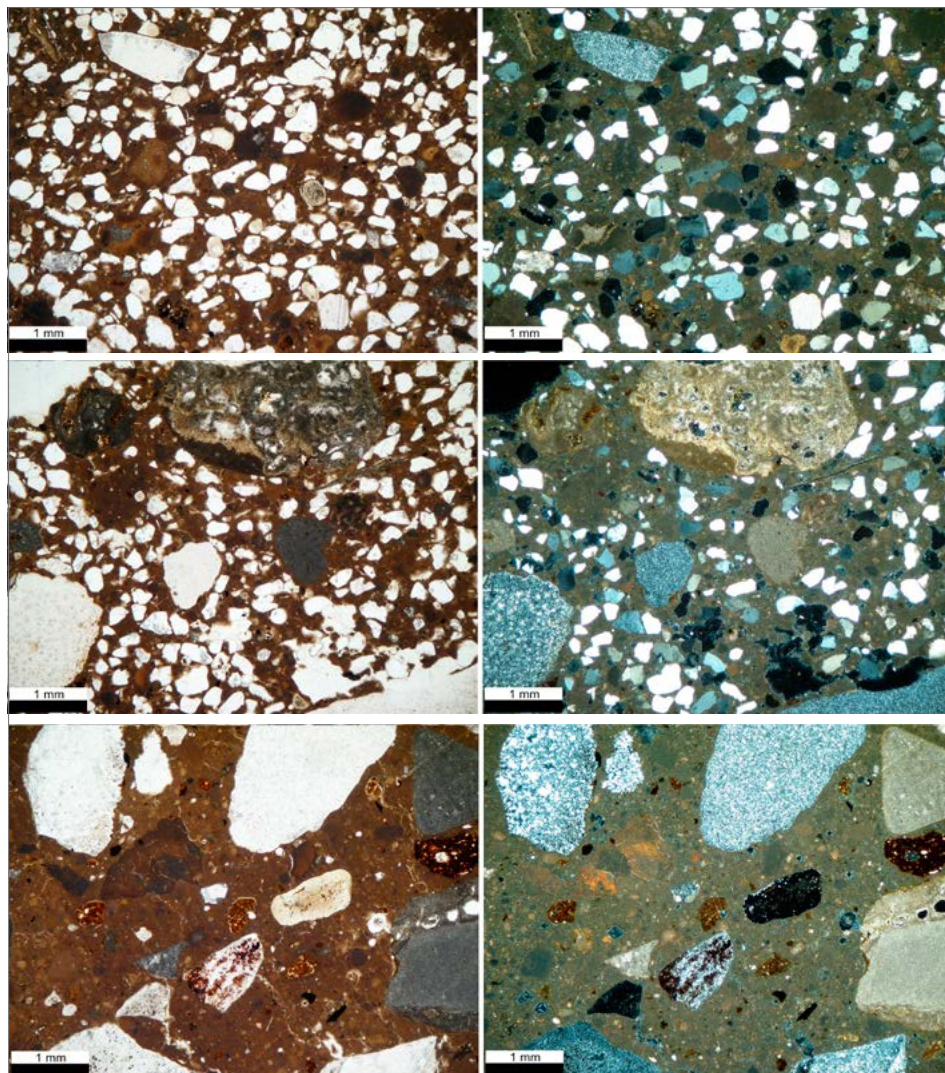


Fig. 29. Microphotographs of samples, from top, KHS 001, KHS 002 and KHS 003, viewed under one polarizer (left) and two crossed polarizes (right) (Photos W. Bartz)

- 2 The analyses were handled by Laboratorium Konserwacji Sylwia Svorová Pawelkovicz. Examination and interpretation of petrographic thin sections was carried out by Dr. Wojciech Bartz (Institute of Geological Sciences, University of Wrocław).



of samples KHS 001 and KHS 002 has some microcracks.

There is a noticeable difference in composition of fillers used in plasters represented by samples KHS 001 and KHS 002 on the one hand, and sample KHS 003 on the other. The principal kind of filler in the former pair of samples is quartz (29.5% in KHS 001 and 22.5% in KHS 002). The grain size of quartz is very uniform as it fits within the 0.4–0.5 mm range [see *Fig. 29* top and center]. Most of the grains are monocrystalline; polycrystalline specimens consisting of two or three crystals are seldom seen. The grains are almost spherical, rarely slightly elongated; they are generally subrounded and rounded, rarely angular and subangular.

The second type of filler which occurs in samples KHS 001 and KHS 002 are rock fragments (7.5% for KHS 001 and 18.5% for KHS 002). They are represented by silica rocks (chalcedony) or microcrystalline gypsum rock, micro-sparite or oosparite limestone, as well as orange-brown claystone. The grain size is not uniform as it ranges from 0.5 mm (most typical for the claystone particles) up to 1.5 mm (observed in the case of limestone). The particles, except for the claystone which has rounded grains, tend to be angular and subangular. Occasionally, small fragments of foraminifera may be seen. The samples contain also some accessory amount of fine charcoal particles (up to 0.2 mm) in the form of needles, which may have come from the combustion processes in the lime kiln. The very similar composition of samples KHS 001 and KHS 002 suggests that they are contemporaneous and come from one structure.

Sample KHS 003 differs from the first two samples described primarily because it lacks quartz [see *Fig. 29* bottom]. The only type of filler used in this render are rock fragments (36%). They comprise the same types of rocks as in the case of the two former samples: there are fragments of silica rocks (chalcedony) or gypsum rock, micro-sparite limestone with ooids, as well as numerous orange-brown particles of what appears to be claystone. As already noted during the macroscopic examination, the sizes of these aggregates vary. The largest are the fragments of silica or gypsum rock (1–2 mm), followed by limestone fragments (approx. 1 mm), and claystone particles (approx. 0.5 mm). The latter aggregate has rounded grains, whereas the former two tend to be angular.

## Discussion

While to draw conclusions on the basis of a preliminary analysis of three samples of plaster is far-fetched, a few observations are forthcoming that could be of interest for an interpretation of the survey results as they may be indicative of the period of execution of the plasters.

Firstly, all samples are characterized by a relatively high participation of filler (roughly 40%), a feature characteristic of Roman-period renders. Vitruvius recommends even three parts of sand to one part of lime in case of quarried sand, and two parts of sand to one part of lime in case of riverbed or beach sand (Vitr. II.5.1). However, these proportions could be applied only in the case of a high-quality slaked lime and archaeometric studies tend to demonstrate that the participation of fillers was usually somewhat lower. The preparatory mortars and painted

plasters from the Roman sanctuary at Chhîm (Lebanon) contained 40–60% of fillers (Burdajewicz forthcoming), while samples of mortars and painted plasters from various Roman structures in Caesarea Maritima (Hippodrome, Vault 8 of the warehouse, Roman villa) were closer to Vitruvius' guidelines as they showed filler content between 50% and 75% (Linn 1996: 36–48).<sup>3</sup>

These results stand in contrast with mortars and plasters from late antiquity which tend to have very little filler. Plasters from the early Christian basilica at Chhîm contained 27–32% of fillers (Burdajewicz forthcoming); samples of mortars and painted plasters from various late antique structures in Caesarea Maritima (bath-house, Vault 9 and 11 of the warehouse, area KK) contained very little or no aggregates (Linn 1996: 49–54); similarly, plasters from an early Christian church at Hippos-Sussita showed no evidence of mineral filler except for one sample, which contained 10% of mineral aggregates (Michniewicz and Michalska-Nawrocka 2005: 83, 91).

Secondly, the presence of two types of aggregates (quartz and rock fragments) in samples KHS 001 and KHS 002 suggests that the craftsmen preparing them probably followed some pre-established guidelines, since the type of aggregates, alongside their amount, influences the properties of the render (Pavía and Toomey 2008; Scannell, Lawrence, and Walker 2014; Stefanidou, Papayianni, and Pachtá 2012). Alternatively, it is also pos-

sible that quartz was not easily available in the area and craftsmen preparing the render represented by KHS 001 and KHS 002 saved it by adding some rock fragments. The lack of quartz in sample KHS 003 could support the idea that quartz was not readily available. Nevertheless, further investigations on the source of the mineral aggregates are necessary for such determinations.

The third observation concerns the fraction of quartz which fits within a 0.4–0.5 mm range. Such a uniform grain size may suggest that this aggregate was sifted. This, again, suggests careful preparation of the material, a characteristic feature of many Roman-period mortars and plasters, which accounts for their high quality and durability. For example, the uniformity of grain sizes is one of the factors that decreases the porosity of a mortar and increases its strength (Gutman et al. 2016: 305–307; Stefanidou 2016). If the aggregates are uniform in grain size, they will mix well with the binder, will be well-packed in the mortar and will increase its strength. Meanwhile, aggregates of varying sizes will not be as evenly distributed and tightly arranged inside the mortar, which, as a result, will be more porous and prone to mechanical damage. Despite some addition of rock fragments of varying size, samples KHS 001 and KHS 002 appear to be very firm and compact.

Lastly, the good condition of the paint layer preserved on samples KHS 001 and KHS 002 is suggestive of fresco painting,

3 Most archaeometric studies of Roman and late antique wall painting from the Roman provinces of *Syria*, *Palaestina*, and *Arabia* focus unfortunately on the qualitative composition of the renders and omit the question of the binder–aggregate ratio, hence there is little comparative material.

the most common painting technique in the Roman period.<sup>4</sup> This technique produces wall paintings characterized by durability and permanence of colors because the pigments become sealed under a surface veil of calcium carbonate.

As noted above, sample KHS 003 has a somewhat simpler composition than the other two samples as it lacks quartz. Furthermore, the paint layer preserved on this sample is abraded and appears of overall poorer quality than the paint on KHS 001 and KHS 002. Nevertheless, these differences do not necessarily indicate a different time of execution. They could be explained by the expertise of

another team of craftsmen or a different (and likely, less prominent) function of the building in which the painting was executed.

To sum up, the three investigated fragments betray characteristics of a Roman-period workshop. Furthermore, the level of the workmanship appears decent, especially in the case of samples KHS 001 and KHS 002. Should further fragments of wall paintings be recovered, especially if they are found in connection to a particular building, it would be worthwhile to extend the technical investigations to a greater number of samples and include an analysis of the paint layers. [JB]

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4 In the *fresco* technique, dry pigments are mixed with water and applied to damp (fresh) lime-based plaster. Calcium carbonate, which forms from calcium hydroxide ( $\text{Ca}(\text{OH})_2$ ) from the plaster during the carbonation process, fixes the pigments to the support and renders the paint layers permanent and insoluble.

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# HLC Project 2017: Jagiellonian University excavations in southern Jordan



**Abstract:** The HLC (Heritage–Landscape–Community) archaeological metaproject, carried out since 2016 by the Jagiellonian University in cooperation with the Department of Antiquities, Ministry of Antiquities and Tourism, Hashemite Kingdom of Jordan, targets the archaeological heritage of southern Jordan (Tafila region), focusing currently on remains of the Early Bronze Age and earlier cultures that were found in the region. The project has already identified and verified several previously undocumented or poorly documented sites. Its main objective is to establish chronological phasing of human activity in this microregion, particularly during the Early Bronze Age, and to assess the scale and nature of human presence in that period. Two sites, Faysaliyya and Munqata'a, were excavated within the frame of the project. The article presents the preliminary results of this work. An important side issue is the protection of Jordanian heritage in the Tafila region through the identification of natural and human agents that may damage or destroy it.

**Keywords:** Jordan, Neolithic, Early Bronze Age, late prehistory, Jordan, Levantine archaeology, protection of cultural heritage

## 1 INTRODUCTION

The HLC (Heritage–Landscape–Community) metaproject of the Institute of Archeology of the Jagiellonian University in Kraków (Poland), working in cooperation with the Department of Antiquities of the Ministry of Tourism and Antiquities of the Hashemite Kingdom of Jordan, began in September 2014 to explore the late prehistory of southern Jordan in the region of the city of al-Tafila [Fig. 1]. Following a reconnaissance in 2014–2016 (Kołodziejczyk et al. 2018), in 2017 the Project embarked on excavation of two sites: Munqata'a and Faysaliyya. The main objective was to establish the nature of human

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occupation at both sites and to determine their chronological phasing.

The driving idea behind the current research is a comprehensive review of the region in the Early Bronze Age, establishing the nature and dynamics of human occupation from a case study concentrating on the microregion of al-Tafila and its association within the context of neighboring areas. Key research issues include settlement patterns, social structure and organization, external relations and cultural influences within the Levant and possibly as far as Egypt, two regions known to have witnessed important events during that age. In addition, evidence of architectural and funerary traditions was observed in the archaeological record.

The picture of the Early Bronze Age of the region derived from the fieldwork

of the HLC Project will be considered against the backdrop of earlier cultural units and phases, from the Palaeolithic through the Chalcolithic periods, in order to present the path of development of the prehistoric and early historic communities in the region.

Detailed studies will focus on pottery and chipped stone working traditions, as well as the question of production technologies and foreign and local trade networks. Survey results encompassed into the study have highlighted the significant impact of environmental factors on the functioning of those early societies. There is evidence frequently of conditions, in particular due to fluctuation of annual precipitation, that may include semiarid and much wetter conditions resulting, for example, in a rising water table.

## 2 GEOLOGY, HYDROLOGY, GEOMORPHOLOGY AND PEDOLOGY

The archaeological site of Munqata'a is located about 3 km northwest of the modern town of al-Tafila, on the northern slope of a wadi, below 520 m ASL [see *Fig. 1*]. The wadi begins in the town and descends westward toward the Dead Sea Rift. The survey team documented high concentrations of loose artifacts along with remnants of stone walls in several places on the surface, suggesting substantial settlement in the area. Munqata'a is located in the lower part of the valley and could be reached only by a small path descending down the steep slope. Robbers' pits pockmark the site and chert, stone and ceramic artifacts from various periods scattered prolifically over the surface attest to recent plundering.

Faysaliyya lies about 5 km southeast of the town of Shawbak [see *Fig. 1*], on a plateau situated about 1200–1300 m ASL, in the northern part of the historical and geographical highland region of Edom. The Arabian Desert begins to the east and the Dead Sea Rift to the west; to the north, there is the Moab highland starting from Wadi Hasa. The area is also called the Eastern Highland or Jabal al-Adhiriyāt. It is actually the locale for a cluster of prehistoric sites, with at least two discovered in 2016 by the Jordanian Department of Antiquities surveying the area in connection with the planned construction of a wind farm. The sites were dated tentatively from the Stone

Age to the Bronze Age on the grounds of a huge flint assemblage on the surface and some presumed architectural remains of stone.

## 2.1 FAYSALIYYA

The site is located in an area of low, rolling hills, which are a dominant element in the landscape. They are formed on the Nubo-Arabian Shield tableland (Bandel and Salameh 2013; Bender 1975; Migoń 2009: 250–254) and cut with contemporarily episodic river beds forming several, almost parallel, V-shaped valleys that head eastward, to the desert, some as long as 50 km. The area under investigation is located in the upper and middle parts of these valleys.

River channels are 5–10 m wide and 1–5 m deep. The youngest, Holocene

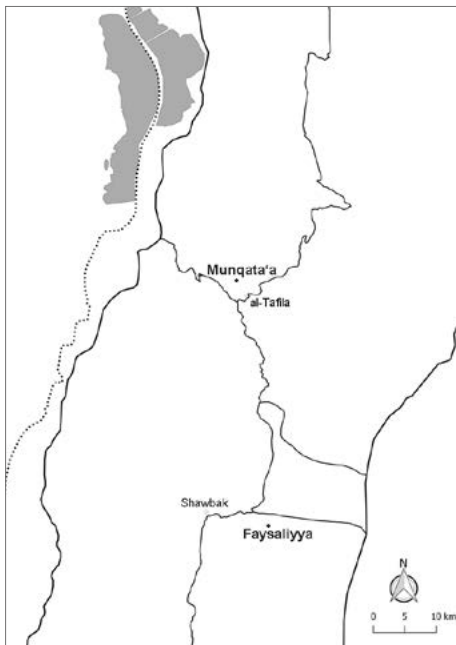


Fig. 1. Sites Munqata'a in the al-Tafila directorate and Faysaliyya in the Shawbak directorate (HLC Project/drawing J. Karmowski)

banks are built of gravel–sand–silt material. The gravel have up to 1 m in diameter, with an average of 0.50–0.60 m. Modern river dynamics have caused intensive downward erosion with very intensive cutting.

The archaeological site lies on Quaternary sediments of Pleistocene-Holocene date, covering Tertiary- and Cretaceous-age rocks, which were observed in several locations (mostly in the river beds), small outcrops in the form of rock walls (up to 20 m) and valley steps. This is the upper part of the parallel horizontal layers of the Arabian–Nubian shield. The Tertiary sediments are referred to as the Dana Conglomerate (DC – Oligocene/Pliocene) and the Umm Rijam Chert-Limestone (URC – Paleocene/Eocene). The lowermost formations visible in the outcrops are the Cretaceous rocks of Muwaqqar Chalk Marl (MCM – Maastrichtian; see also Barjous 1988; Bandel and Salameh 2013). The MCM formation is interbedded with numerous (at least six) chert levels. They form widely extended nodular and tabular deposits of 10–30 cm in thickness. Several good quality chert outcrops are located in the vicinity of the site, their good to excellent mechanical properties enabling tool production on the spot. The cherts are very easily accessible in large quantities, both in primary and secondary deposits. As for the Tertiary URC and DC formations, they are observed in the river valley slopes as relics of old (Tertiary) river terraces. They were cut and severely eroded during the Quaternary and form rock walls or steps. These rocks contain several sorts of gravels (up to 60 cm in diameter but usually no more than 40 cm), sand and silt. Chert

and limestone with minor admixture of sandstone (sandstone was supplied from further west, that is, the Shawbak area, which was the river headwater) are the dominant types of primary rocks.

Seasonal rivers are active from October through March/April, but precipitation usually does not exceed 50 mm/month. However, as stated by numerous authors (e.g., Rahn 1967; for a summary, see Thomas 2011), even this low precipitation significantly affects the geomorphology. The region is frequently soaked by torrential rains, which have gained in frequency since the 1990s, but earlier episodes are known, too. Sheet floods caused by this type of rainfall have significant impact on slope morphology and on the character of sediments and soils. The area is deprived of permanent water flow or water sources. Modern agricultural activity is based on deep-drilled wells.

Typical dry-zone Aridisols (for soil taxonomy, see Mocek 2015: 384–385) developed mostly on hill-tops and ridges. In the area of the archaeological excavations on the hill slopes, the Aridisols are primitive and poorly developed owing to the sheet floods, surface runoff and slope erosion. However, typical E and B Aridisols horizons were described in the deeper test trenches. The second factor affecting soil formation are intensive eolian processes. The area under investigation is covered with a desert pavement built mostly of chert with limestone mixed in. Intensive eolian erosion is caused by June–to–August winds of 20–30 km/h (50–80%) and by February–to–June winds of 30–50 km/h (10–15%). It is interesting to note from this perspective the scarce or absent varnish and the high degree

of roundness. This could be explained by intensive rains and subsequent sheet floods. The factor has a big eroding and transporting potential.

The finer sediments (silt layers) present in the test trenches might indicate climatic change in modern times. This idea, however, needs a more detailed study.

## 2.2 MUNQATA'A

The modern geomorphology of the site area is very steep and erosional processes are very intensive, mostly in consequence of increased winter–spring precipitation and the influence of pastoral activity on the plant cover. The V-shaped stream beds are very deep and tortuous and cut through older colluvia. Several rocky shelves formed on harder geological strata are visible in the valley geomorphology, alternating with cliffs and steep slopes. In the flatter parts of the valley, screes and alluvial fans were formed. Not only is the local morphology marked by animal paths; it was in fact the paths that determined its formation. To this day, the area is crossed several times a day by herds of sheep and goats. Although potentially insignificant, this influence may produce visible changes in the geomorphology.

The upper parts of the valley (Tarawneh 1987; 1988; Bandel and Salameh 2013) are formed in Cretaceous limestones, sandstones, marls and clays (ASL – Amman Silicified Limestone formation of Campanian age, WUG – Wadi Umm Ghudran of Campanian-Santonian age and WAS – Wadi As Sir of Turonian age). There are chert levels in these formations. Beneath the ASL/WUG/WAS, the valley cuts through limestone and marl of the Cenomanian Shuelb-Hummar-Fuheis



and Naur formations (SHF/N). The profile continues downwards with Early Cretaceous–Late Paleozoic sandstone (Kurnub formation).

The rock shelves and boulders on the valley slopes originate from basaltic magma that formed a Pleistocene intrusion cutting across the ASL/WUG/WAS. All the geological layers described above are part of the Arabian–Nubian plate, with a slight incline to the west in the area analyzed. They form a typical cuesta morphology (e.g., Migoń 2009: 252) on the eastern border of the Dead Sea Rift.

The archaeological site lies on one of the rock shelves around 80–100 m above the modern river bed, in Kurnub sandstone layers. The shelf is flat or slightly inclined and is 200–400 m wide. The bedrock is covered with a very thin (0.30–3.00 m) colluvium layer. The modern location is completely deprived of water (stream or springs). The main water-bearing layer should be identified with the WAS rocks. The water sources in the al-Tafilah region are located within the WAS/SHF geological contact zone (e.g., Kołodziejczyk et al. 2018), with their presence having also been documented 100–200 m upstream in the valley. However, water from these sources does not reach the Munqata'a site, at least not in the summer season.

On-site sediment and observations of the surrounding rock walls and slopes confirm that winter and spring rains affect substantially the hill slope processes. Beside this, very intensive particle falls, rock falls, avalanches and topples are reported all year round. In the vicinity of the archaeological site, hill slope erosion has been additionally enhanced by a newly-built road.

Settlement in the area and its use by humans is very difficult. However, it must be remembered that the Holocene brought about major changes in geomorphology (such as the river incision). Also the raw material (chert) is not well distributed within the site, but again, secondary deposits or intentional transport from the upper parts of the valley are very probable.

The Holocene stratigraphy of the Munqata'a archaeological site starts with a 0.30–0.50-m-thick layer of modern colluvium. It is formed of rock fragments, gravel, sand and silt, superimposed on the archaeological layers bearing artifacts mixed with colluvial material. At the bottom of the sequence is a thick (at least 1.50 m) layer of sand with some limestone blocks. Underlying it is the regolith level, but solid rock was not reached this season. The soil in the area of excavations is very primitive and could be classified as Lithosols, Regosols and Calcaric Regosols (Mocek 2015: 311).

### 3 EXCAVATIONS IN THE 2017 SEASON

#### 3.1 FIELDWORK METHODOLOGY

The sites were tested archaeologically in two areas (A and B) on Faysaliyya and in only one area at the Munqata'a site. Site grids derived from earlier prospection with GIS software. TS and GPS handheld

devices (Garmin Etrex 20 and Garmin GPS map 62s) were used to mark out the trenches and benchmarks. Trenches (henceforth squares) at Faysaliyya were sized 5 x 5 m and identified by a unique number preceded by the letter assigned

to a specific area. At Munqata'a, one small test trench, 2.50 m square, later extended 1 m to the east (squares A and B), was dug, reaching 1.50 m at the deepest point.

An adapted version of the Wheeler–Kenyon fieldwork method was used and the documentation was prepared using Nest Forms, a mobile application for taking notes and pictures on site in real time,<sup>1</sup> processed after uploading onto a server to prepare the final documentation of the season. Several forms were created in the application, and a strategy was developed for filling them out to suit the purposes of the Project. Forms included Locus (henceforth L) and Wall (henceforth W) cards, recording specific characteristics and stratigraphical relations, as well as daily log cards and inventories.

In 2017, 66 such cards were generated for Faysaliyya and 19 for Munqata'a. All feature pictures, details of work progress, archaeological features and their stratigraphic relationships. Artifacts were collected from individual loci and assigned to dedicated cards with catalogued basket numbers. A GeoMax Zoom30 Total Station, Quantum GIS software ver. 2.18 and Agisoft PhotoScan Professional software ver. 1.2.6 were used to document archaeological features, prepare site plans and generate 3D photogrammetrical models.

All the squares were regularly secured with bags filled with earth placed around the perimeter to prevent baulk collapse.

### 3.2 FAYSALIYYA

Archaeological artifacts were collected from an area of the desert stretching for kilometers, hence while limiting the loca-

tion of the 2017 excavation to just about 3 ha, the Project implemented a vastly extended virtual grid, covering 50 ha and encompassing features recorded earlier in a field survey, to facilitate future work in the more remote areas of the site. Two areas of equal size were set out: Area A, located to the east, characterized by a denser concentration of stone cairns (145 out of 229 identified sites during the survey), and Area B, located to the west, featuring only a few concentrations of stone architecture. Stone remains included walls visible on the surface and clusters of rocks tentatively considered as rubble from walls.

Five squares were excavated in different parts of areas A and B [Fig. 2]. Two of the squares (A4052 and A3554) were located in Area A and were primarily intended to investigate cairns. The remaining three, all in Area B (squares B4213, B4314 and B5212), explored stone clusters in search of possible architectural remains. The distance between the two outermost squares excavated in areas A and B during the 2017 season was 300 m.

#### 3.2.1 AREA A

Two stone cairns set 36 m apart were explored in two squares. The smaller of the two was in Square A4052 and the other in Square A3554. Surface material was collected and an arbitrary level (L1) of topsoil 0.15 m thick was removed. No traces of human activity could be observed around the cairn. The cairn itself (L2) was composed of middle-sized field stones of average dimensions, 15 cm by 10 cm. The largest stone measured approximately 30 x 20 x 10 cm and several stones were as small as 2–4 cm

<sup>1</sup> A service that allows to track, create and manage paperless forms and surveys under dedicated accounts and uses the forms from computer desktop and mobile devices.

in diameter. The roughly oval-shaped cairn measures 1.56 m on its longer and 1.31 m on its shorter axis. Its height at its center is 0.36 m from base to top. Although several chert artifacts were found within this pile, the stones were loose and exposed to external factors like erosion and its original aspect may have been different. Nothing like a substructure could be observed below the cairn. The square was subsequently dug deeper and used as a geological test trench (for the results, see above).

The cairn (L4) in Square A3554 was also of irregular oval shape, but larger, measuring 4.90 m on the longer and 2.48 m on its shorter axis; its height at the center was 0.59 m. Like the first cairn, the second one was built of mostly middle-sized field stones (average 15 x 10 x 5 cm), but with larger examples averaging about 30 x 20 x 10 cm, while the biggest were

between 30 and 45 cm in length, 25 cm in width and 12 cm deep. The size of the pile allowed us to excavate it in quarters. Some chert artifacts were found among the stones of the southwest quarter with fewer anthropogenic features found as the depth of excavation increased. No artifacts were found below the cairn.

**3.2.2 AREA B**

The three squares in Area B were intended to check for remains of stone architecture. Concentrations of stones were explored in adjoining trenches B4213/B4314 on the northern fringes of the site and in Square B5212, located 64 m to the southwest on the opposite side of the said area.

Squares B4213/B4314 were located on a slope descending southward with about a meter of difference in elevations between the northern and the southern

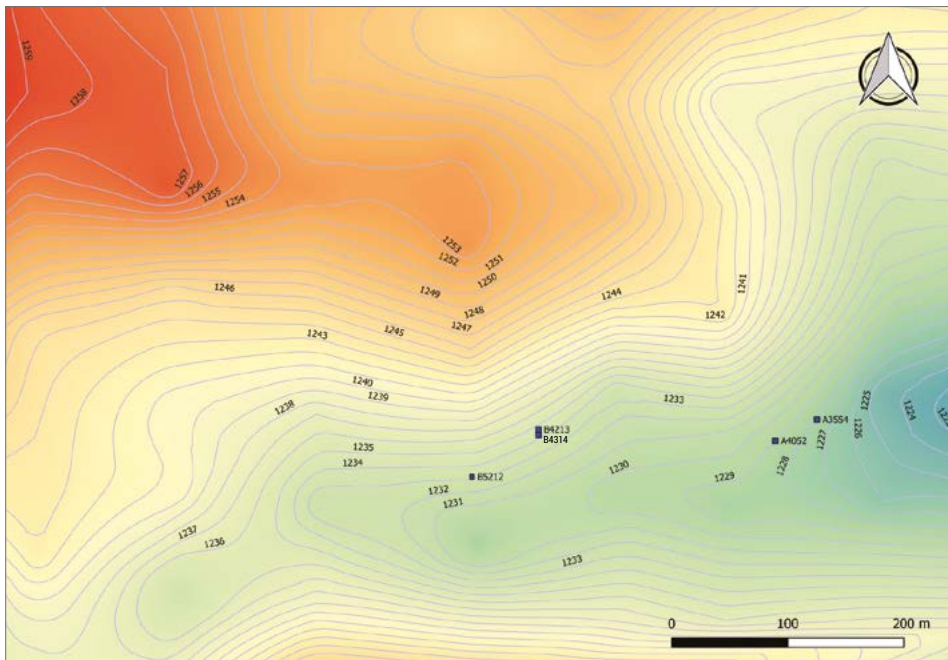


Fig. 2. Faysaliyya site: trenches excavated in 2017 (HLC Project/drawing J. Karmowski)

part of the trench. It had an unevenly scattered concentration of stones of different sizes (L102). Clearing 5 cm of the topsoil around the stones clarified their arrangement. One is a grinding stone (SF [= Special Find] 110). Several walls and different loci, primarily in Square B4213, were noted. Excavation reached 0.35 m below the modern surface in the northern part of the trench. Exposure to water and wind left little doubt as to the secondary position of the artifacts from the top levels. Walls W106, W108 and W109, clearly contemporary structures, were located under the first layer of loose rocks and two stone circles (L111 and L114) were found below the levels of the walls [Figs 3 and 4]. The different top levels of walls W106, W108 and W109 (1234.70, 1234.50 and 1234.30 m ASL, respectively) reflect sloping to the south. Wall W106 was built of 11 large stones [see Fig. 3], seven on the eastern side and four on the western side with a gap of 0.60 m between the two parts (tentative entrance). The stones differed in size, the smallest measuring 23 x 30 x 7 cm, the biggest 35 x 47 x 19 cm. The general orientation of the 5.12-m-long wall was from east to west with a slight curve from southeast to southwest. Below this feature were only randomly distributed rocks of different sizes (L105).

All walls consisted of a single course of stones. Another wall (W108), 1.54 m long, oriented north to south, abutted W106 from the south at its easternmost end. Wall W108 was composed of six irregularly laid stones of different sizes, the smallest one measuring 30 x 12 x 15 cm, the biggest 67 x 28 x 9 cm. The latter stone at the southern end of the wall was partly cov-

ered with densely compacted soil (L107). Wall W109 was discovered 0.95 m south of the empty space between the eastern and western segments of the 1.26-m-long wall W106, which was composed of three aligned stones, measuring respectively: 42 x 36 x 6 cm (northernmost), 27 x 32 x 12 cm (centrally placed) and 45 x 34 x 13 cm (southernmost). Densely compacted soil (L107) was found here and there beneath the walls and around the rocks. The texture of the soil in this locus was significantly harder than the soil around it, although both had a similar, light yellow color. It may have been a kind of mortar, that is, soil mixed with water, intended to bond the stones of the wall together, stabilizing and reinforcing the structure.

Two oval stone structures, L112 and L113, from the level beneath the walls are associated with two small pits, loci 111 and 114, located to their south. Their elevations indicate their contemporaneity to the constructed features and they appear not to have been disturbed by erosion. The two oval structures were composed of middle-sized stones: Locus L113 on the east, measuring 1.88 m x 1.45 m at least, covered 0.70 m<sup>2</sup> [Fig. 4] and Locus L112, slightly larger, measured 0.80 m<sup>2</sup>. The two pits: L114 near Locus 112 and L111 adjacent to L113 were both oval in plan with an area of 0.10 m<sup>2</sup> (L111) and a depth of 6 cm, and an area of 0.011 m<sup>2</sup> (L114) and a depth of 5 cm, respectively. The fill of these pits was of a darker, almost gray color and of significantly looser texture.

The wall (W11) revealed in Square B5212 separated a concentration of middle-sized and large stones (L13, L22), located east of a gravel layer (L16, L17, L20) [Fig. 5]. The construction was vis-





Fig. 3. Faysaliyya. Stone wall W106 in Square B4213: top, view from the north; bottom, top plan (HLC Project/orthophoto processing J. Karmowski, photo P. Kołodziejczyk)





Fig. 4. Faysaliyya. Stone structure L113 under wall W106 in Square B4213: top, top view; bottom, top plan (HLC Project/orthophoto processing J. Karmowski, photo P. Kołodziejczyk)

ible in part on the surface prior to excavation. The bigger stones on the eastern side could be rubble from the wall, but the nature of the gravel to the west requires further investigation. The wall was oriented north to south with a slight NW–SE curve; its uncovered length is approximately 4.70 m, but it may continue beyond the trench borders. Making up the construction are 13 stones of different sizes, the biggest measuring 64 x 25 x 8 cm, the smallest 21 x 23 x 16 cm. At present, it is not known whether there are more courses of stones beneath the documented remains. One of the stones is notched, giving it an hourglass form; parallels from other sites in the region (Fuji et al. 2017: 571, 572, 575–576) suggest that it may have served to anchor the tie ropes of tents. The stone appears to be in secondary use in this wall.

### 3.3 MUNQATA'Á

The site is scattered with archaeological material even in the steepest locations (probably redeposited from the top). The reconnaissance in 2015 and observations in 2017, coupled with a survey of hilltops and wadis around al-Tafila (Kołodziejczyk et al. 2018; Karmowski 2017), indicated a size of around 2.5 ha. Despite an out-of-the-way location, it seems to have been disturbed regularly by looters.

The mountainous area of the site was divided into various sub-areas located on the slopes. The trench in Squares A and B measured 2.5 m by 3.5 m after extension. It was located in the northeastern part of the site, 10 m south of one of the straight walls of the wadi that enclose the area on the north, on a slope dropping about 0.75 m from its northeastern

corner to its southwestern corner. One of the recently dug pits, where the dumped ash and potsherds suggested a disturbed archaeological feature, was intentionally included in the trench located in Square A. Four stratigraphic units were recorded, including 12 different loci and a wall segment.

A surface survey was conducted in a second area (S1) that was distinguished as a reference zone for the excavated portion of the site. The area was located 95 m to the northwest of the excavation trench and covered 1120 m<sup>2</sup>. It yielded some 300 chert artifacts, representing Paleolithic, Neolithic and later periods (see below).

#### 3.3.1 Stratum 4

One locus, L10, can be assigned to the lowermost stratum reached this season, observed between 531.23 m and 531.75 m ASL in the western part of Square A [Fig. 6 top]. The layer was bright yellow in color, with a sandy texture that looked almost natural. Nonetheless, it yielded archaeological artifacts including chert arrowheads. At 1.51 m below the surface (the deepest level of the locus reached during this season) there was no archaeological material present. Locus 10 may be the first layer above bedrock with evidence of human activity (to be confirmed in future fieldwork).

#### 3.3.2 Stratum 3

The stratum reached on the western side of the trench consisted of loci L5, L6 and L7 presenting traces of burning and loci L8 and L9, pits containing a dark, almost black fill of ashes [Fig. 6 bottom]. Locus L6 in the eastern part of Square A was a layer of brown and loose soil with significant amounts of pottery and a spindle



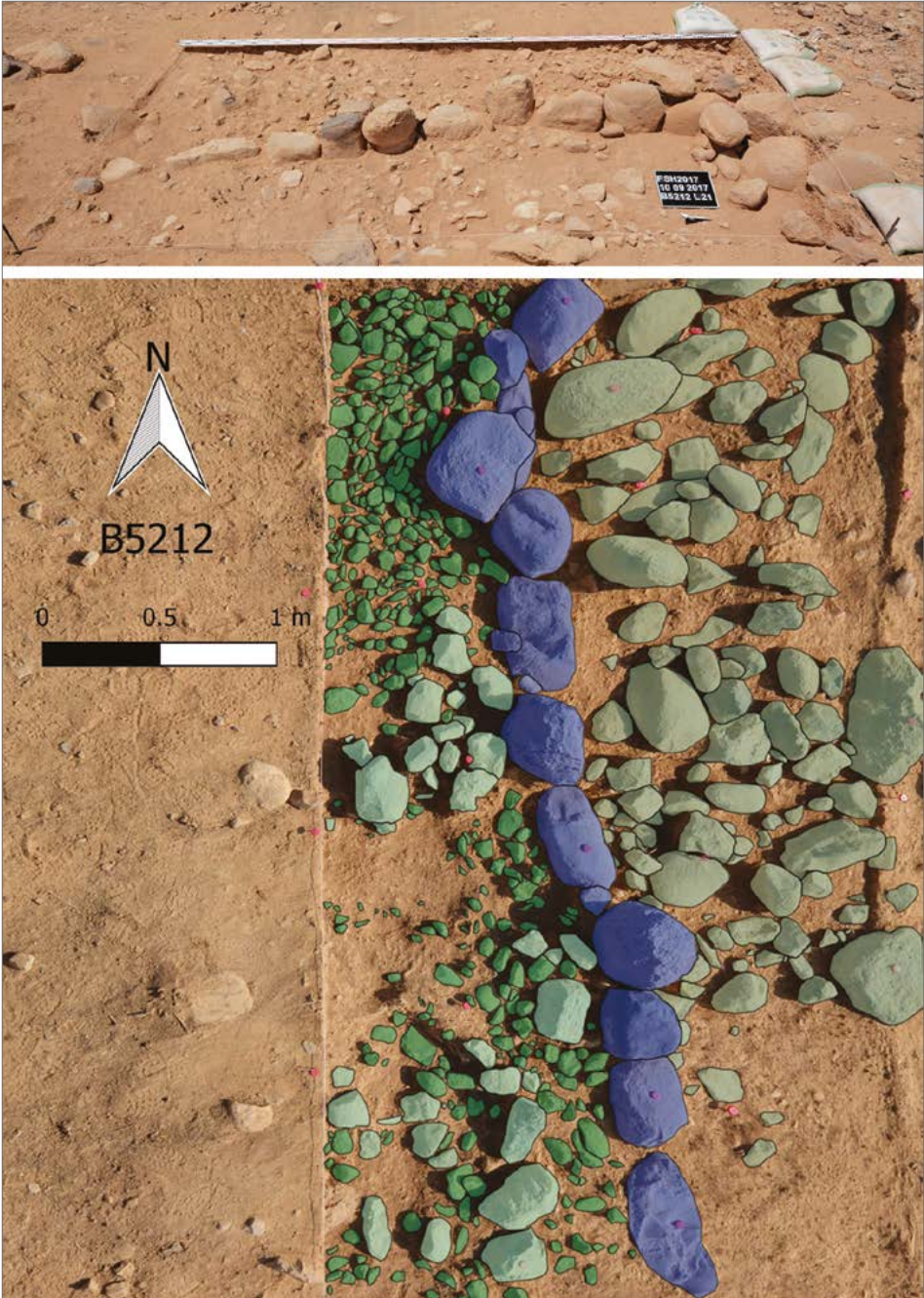


Fig. 5. Faysaliyya. Partly excavated stone structure W11 in Square B5212: top, view from the east; bottom, top view (HLC Project/orthophoto processing J. Karmowski, photo P. Kołodziejczyk)



Fig. 6. Munqata'a. Early Neolithic layers and associated features in Square A: top, stratum 4; bottom, stratum 3 (HLC Project/photos M. Czarnowicz)



whorl found *in situ* (SF 19). The pottery fragments found there tended to fall apart upon discovery, as if they had been made of clay that was either unfired or poorly fired. The context contained charcoal, but the layer overall did not show evidence of burning. Locus L5, however, located west of L6, was almost black/dark gray in color and presented significant traces of burning. It contained a great deal of small and middle-sized rocks in its central part and was separated from L6 by a number of middle-sized rocks aligned in a row. This locus was evident in the northern trench section. The rocks found here were burned. The assemblage from this locus consisted of pottery fragments and some chert artifacts. Locus 7 in the western part corresponded to L5 and may be equivalent to it, but no evident links between the two could be seen in the trench. It, too, was very well visible in the northern trench section and yielded dark soil with traces of burning as well as pottery and chert artifacts.

One of two ash-filled pits, L8, was located in the southeastern corner of Square A. It had been disturbed by looters. The fill was a mixed gray, brown and dark gray color and contained chert and pottery artifacts. The pit measured 0.53 m<sup>2</sup> in area and reached a depth of 0.31 m. The second pit, L9, was located at the westernmost edge of the trench. Its fill, composed of very dark, almost black soil, made it eminently visible on the surface and in section. The feature might have originally been a hearth or a fire pit. It contained a great deal of pottery and chert material (mostly in the upper parts of the feature), as well as burned rocks, mostly on the bottom. A large part of the

locus remains beyond the western border of the trench; the semicircular part seen inside the trench was 0.22 m deep at its center.

### 3.3.3 Stratum 2

This stratum featured a stone wall (W<sub>11</sub>) in the eastern part of the trench [Fig. 7]. The need to uncover the eastern face of this wall necessitated the extension of the trench into Square B. The wall was fairly straight. The uncovered length is currently 1.52 m, the width varying between 0.75 m in the north, through 0.61 m in the center, to 0.44 m in the south. The excessive width of the wall in the northern part may be due to stone collapse. The stones were arranged in parallel rows, forming two faces (an additional course was found below the first one), the space between them filled with small rocks. None of the stones seems to have been worked, but their prevalent rectilinear shapes suggest careful selection. Stone sizes in both faces vary from 24 x 11 x 15 cm to 41 x 28 x 24 cm. The southern end of the wall was damaged by a robbers' pit, but the evidence of the southern trench section shows that it probably continued in this direction, as it does also northwards, beyond the excavated area. The structure stood on a thin layer of brown soil, spread under the wall in a foundation trench, which cut through an earlier feature (pit L8, see above). The height of the uncovered part of wall W<sub>11</sub> was about 0.40 m.

Layers with significant numbers of artifacts were found on either side of this wall. L3, a brown and light brown layer on the western side, yielded pottery and flint fragments, as well as





Fig. 7. Munqata'a. Fragment of stone wall W11 in trench A: top, top view; bottom, view looking east (HLC Project/photos M. Czarnowicz, P. Kołodziejczyk)

a grinding stone (SF 12) right against the wall. A pit (L4) with loose dark gray fill, perhaps ashes, contained burned sandstone (small-sized rocks), but no artifacts. It was 0.044 m<sup>2</sup> in area and 0.15 m deep. Loci L12 and L13 on the eastern side of the wall yielded pottery and chert artifacts; they corresponded to the brown color of L3, but without the light spots. Further exploration should indicate whether this was an external or internal wall of a larger structure.

### 3.3.4 Stratum 1

The topmost stratum (loci L1 and L2) was most likely a natural formation, composed of layers of sand with powdered sandstone. The recovered assemblage, mostly chert artifacts, also contained several pieces of limestone, which is not typically found at this level of the valley. These stones turned out to be, at least in part, rubble from the wall found in the second stratum.

## 4 COLLECTION OF CHERT ARTIFACTS

### 4.1 FAYSALIYYA

Of the assemblage of over 5,000 stone artifacts from Faysaliyya, approximately 60% came from the excavation and the rest was collected from the surface in various parts of the site. The artifacts are of local raw materials, mostly chert of a brown-beige color, but a steely grey chert of better quality is also in evidence. Many artifacts have white-grey patina and are characterized by numerous post-depositional bruises and edge damage, as well as traces of aeolian abrasion. On the whole, the Faysaliyya inventory is not very distinctive chronologically and culturally, but there are diagnostic forms attributable to different chronological horizons.

The oldest are Acheulian handaxes (21 pieces). Almost all were collected from the surface in the western part of the site. Several types identified in the typology of François Bordes (1961) are represented: cordiform, subcordiform, amygdaloid [Fig. 8A:1,2], ovate [Fig. 8A:3], discoidal [Fig. 8B:4] and ficron [Fig. 8B:5]. They are quite diverse in size, but most of them do not exceed 10 cm in length. Some have traces

of a soft-hammer finishing of the edges. In two cases, hand axes were used secondarily as flake cores. The exact chronology of the inventory under consideration cannot be specified, but morphological features indicate the most likely date either in Middle and Late Acheulean or exclusively Late Acheulean (Shea 2013: 73–76). Handaxes from Faysaliyya demonstrate a significant similarity to collections from other sites in southwestern Jordan, such as Fjaje and Wadi Qalkha (Al-Nahar and Clark 2009).

Numerous artifacts from all over the site, especially Square A4052, may be associated with the Middle Paleolithic horizon on the grounds of characteristic typological and technological features. Specimens associated with the use of the Levallois technique form a distinctive group. Levallois cores merit particular attention. They include both preferential and recurrent specimens; single-platform and multi-platform ones [Fig. 9]. Most of the Levallois cores should be considered as flake specimens, although irregular blade cores were also recorded. Levallois debitage is quite abundant. It is represented by flakes [Fig. 10:1],

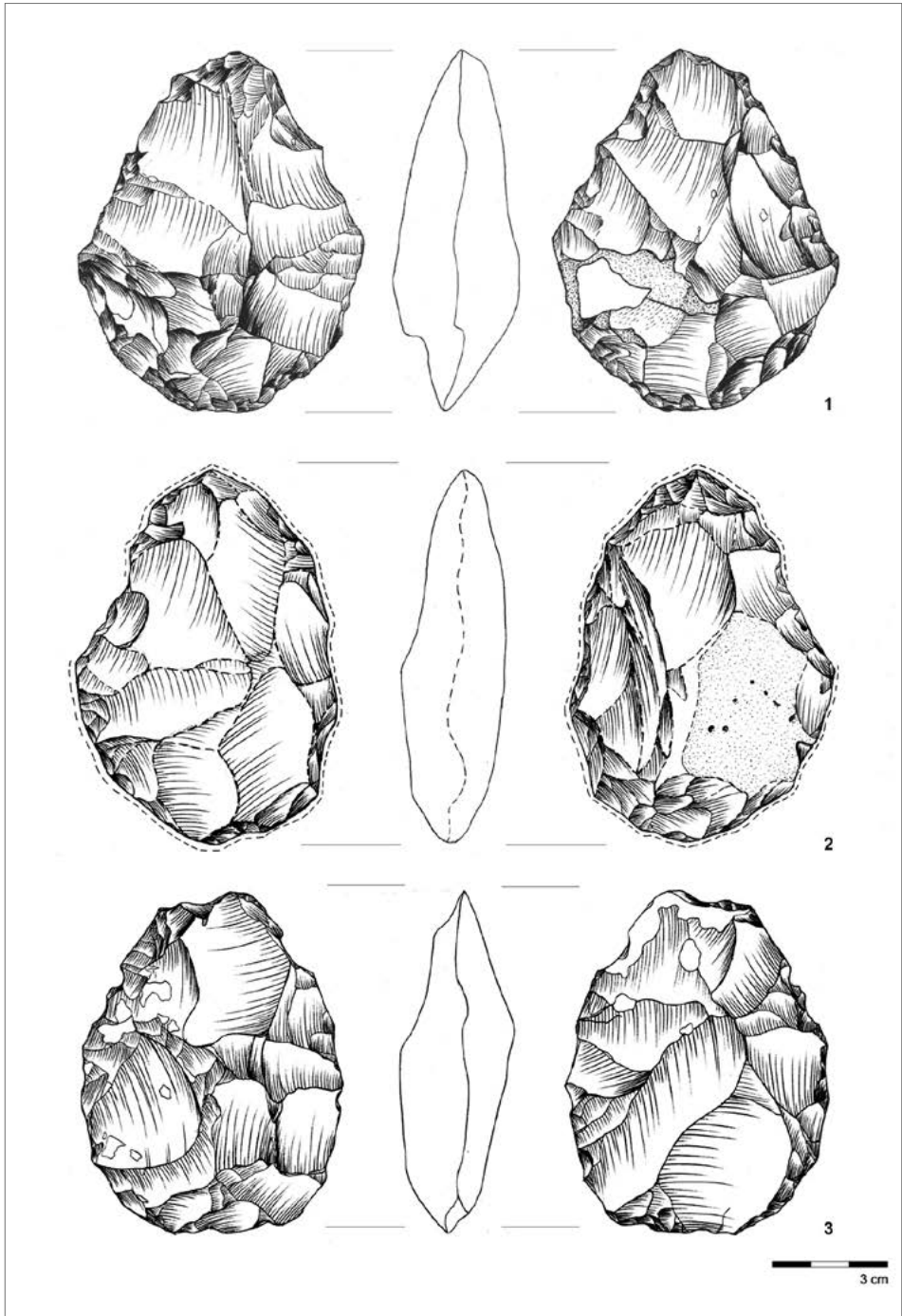


Fig. 8A. Faysaliyya. Lower Paleolithic chert artifacts: Acheulian handaxes: 1, 2 – amygdaloid; 3 – ovate (HLC Project/drawing and digitizing B. Witkowska)



points [Fig. 10:2,3] and trimming elements. Most of the discoidal cores and some flake, single-platform cores should also be dated to the Middle Paleolithic. In addition, a large number of scrapers was recovered. They are diverse, but most often they occur as side scrapers [Fig. 11:1,2], canted scrapers [Fig. 11:3] and convergent scrapers [Fig. 11:4]. Some of the latter may be considered as points. Very numerous notched and dentic-

ulated tools can also be associated with the Middle Paleolithic component. The joint occurrence of the Levallois and discoidal core techniques, as well as the presence of tools, such as scrapers, points and notched/denticulated specimens, suggest that the Paleolithic in Faysaliyya can be associated with the Levantine Mousterian. A more detailed chronology cannot be established at the current stage of research.

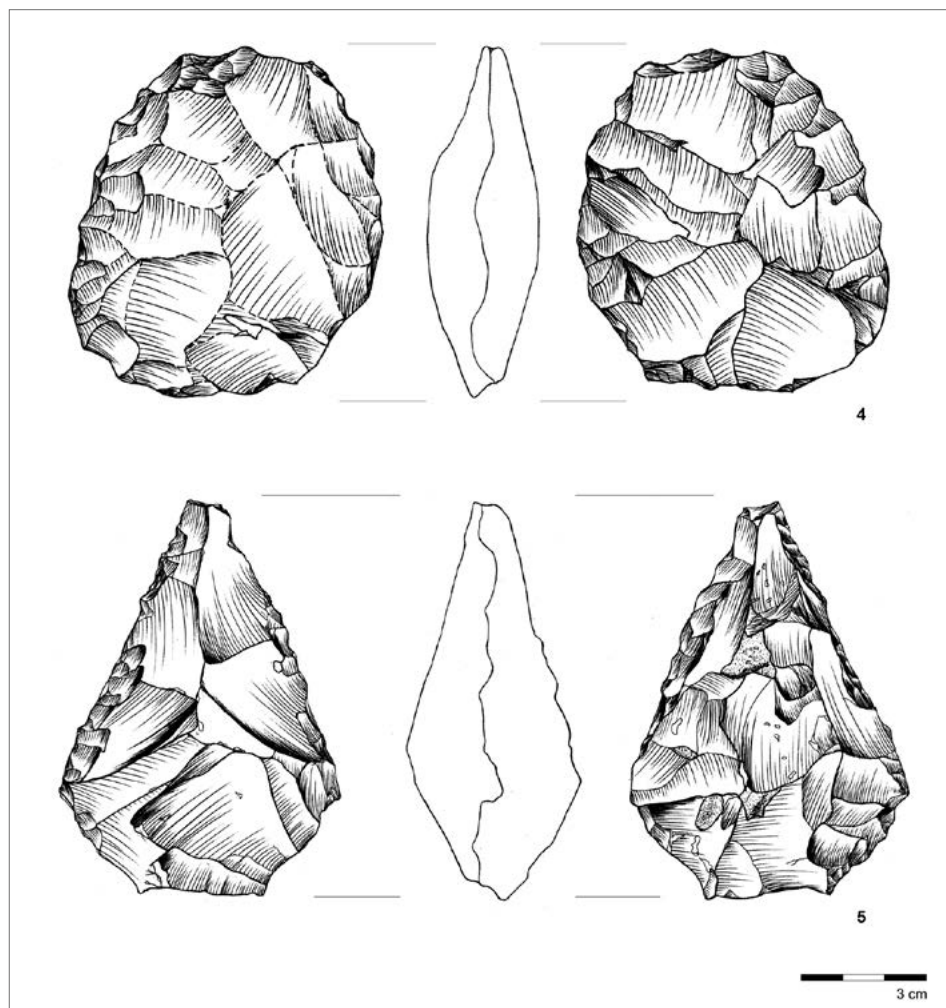


Fig. 8B. Faysaliyya. Lower Paleolithic chert artifacts: Acheulian handaxes (continued): 4 – discoidal; 5 – ficron (HLC Project/drawing and digitizing B. Witkowska)

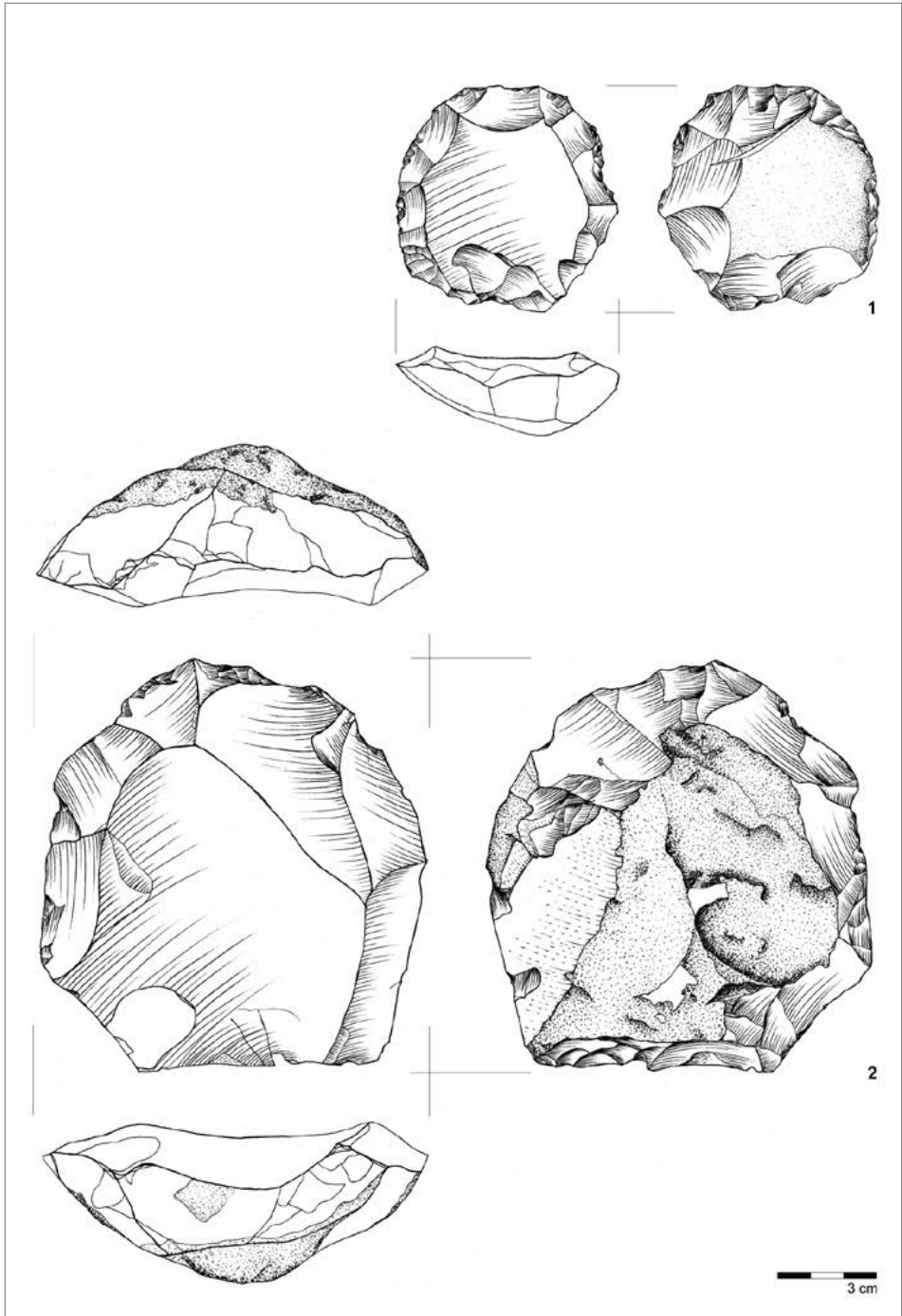


Fig. 9. Faysaliyya. Middle Paleolithic chert artifacts: 1, 2 – Levallois cores (HLC Project/drawing and digitizing B. Witkowska)



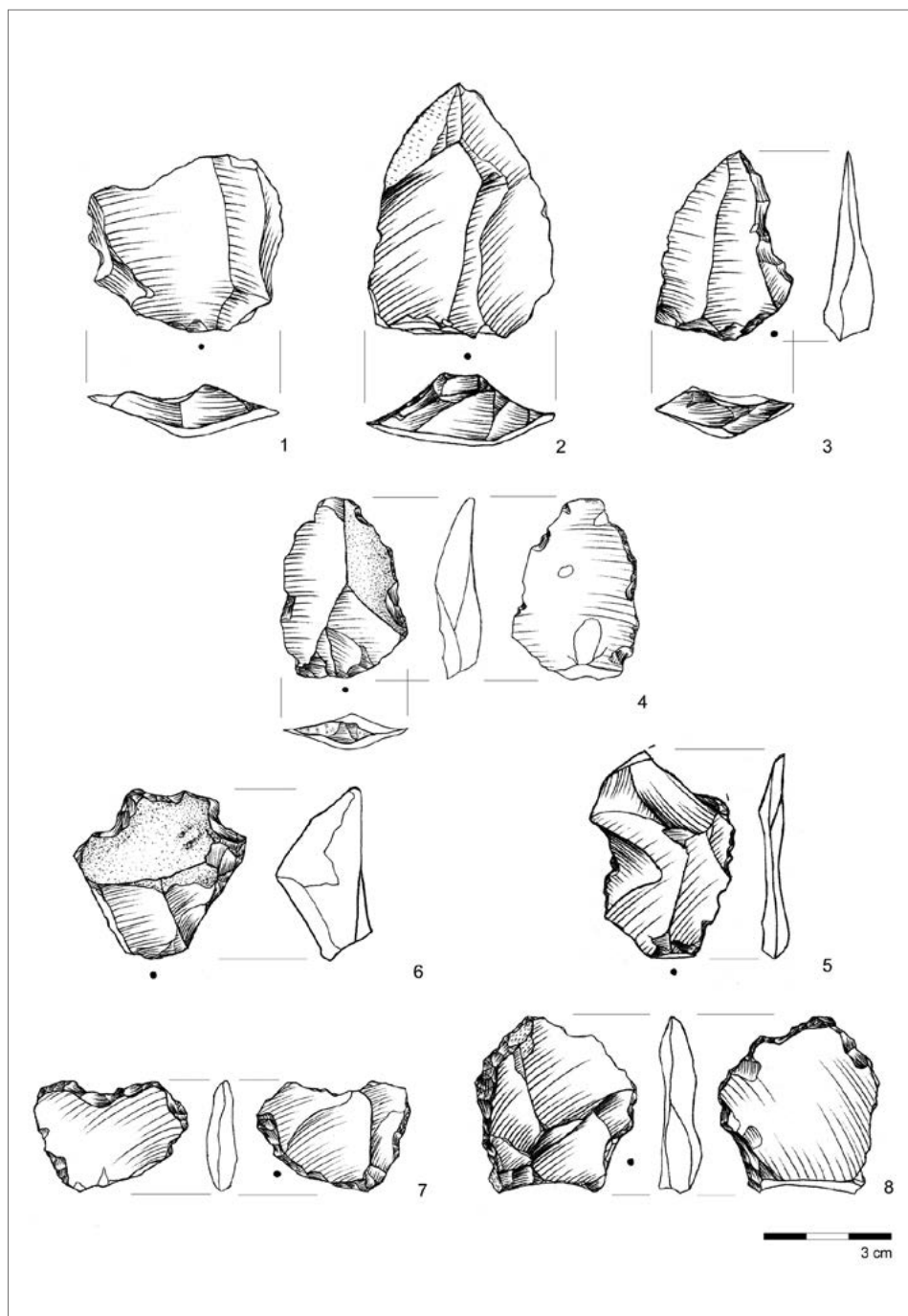


Fig. 10. Faysaliyya. Middle Paleolithic chert artifacts: 1 – Levallois flake; 2, 3 – Levallois point; 4–8 – notched and denticulated tools (4 – made on Levallois flake) (HLC Project/drawing and digitizing B. Witkowska)

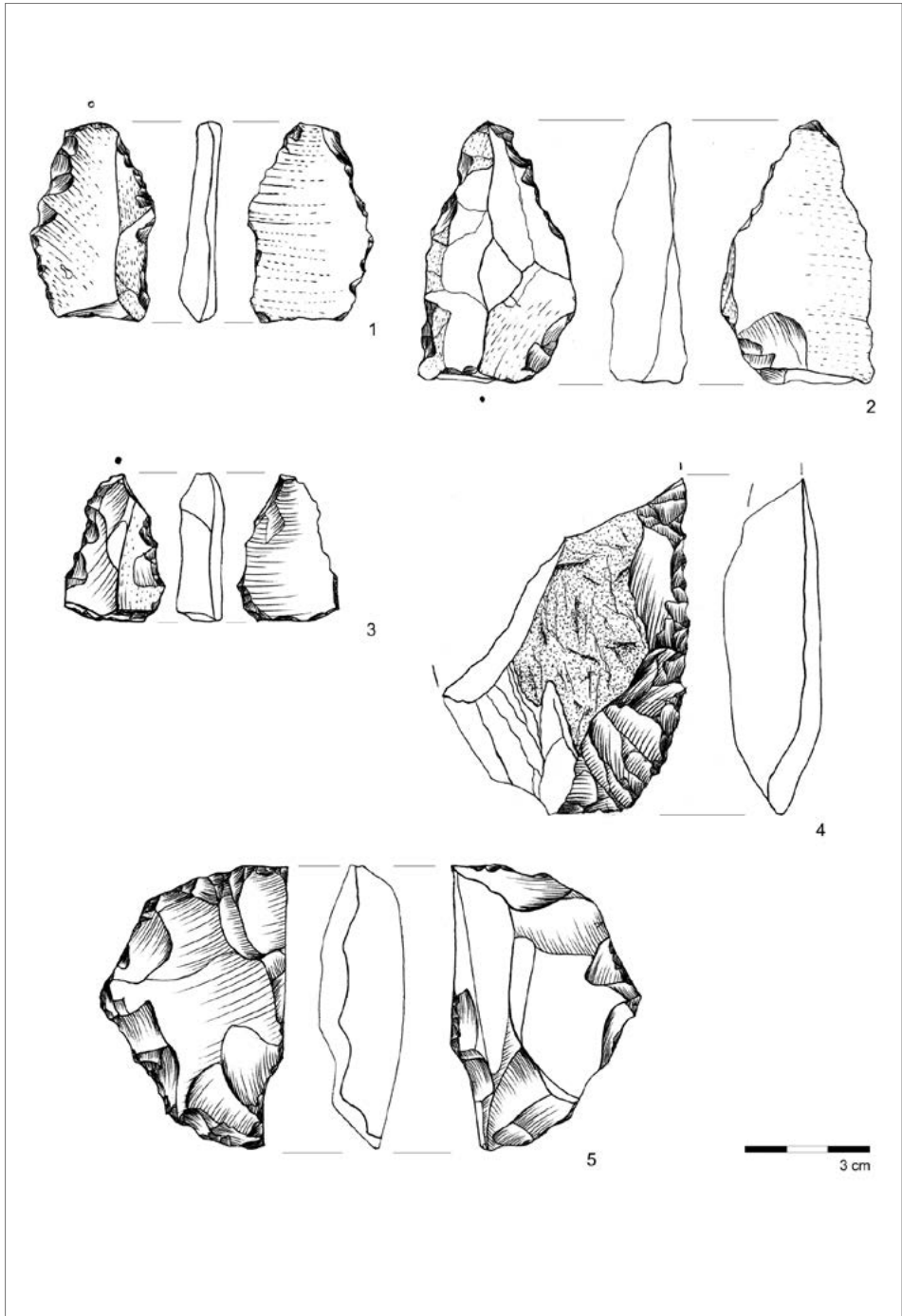


Fig. 11. Faysaliyya. Middle Paleolithic chert artifacts: 1, 2 – side scrapers; 3 – canted scraper; 4 – convergent scraper; 5 – Tayac point (HLC Project/drawing and digitizing B. Witkowska)

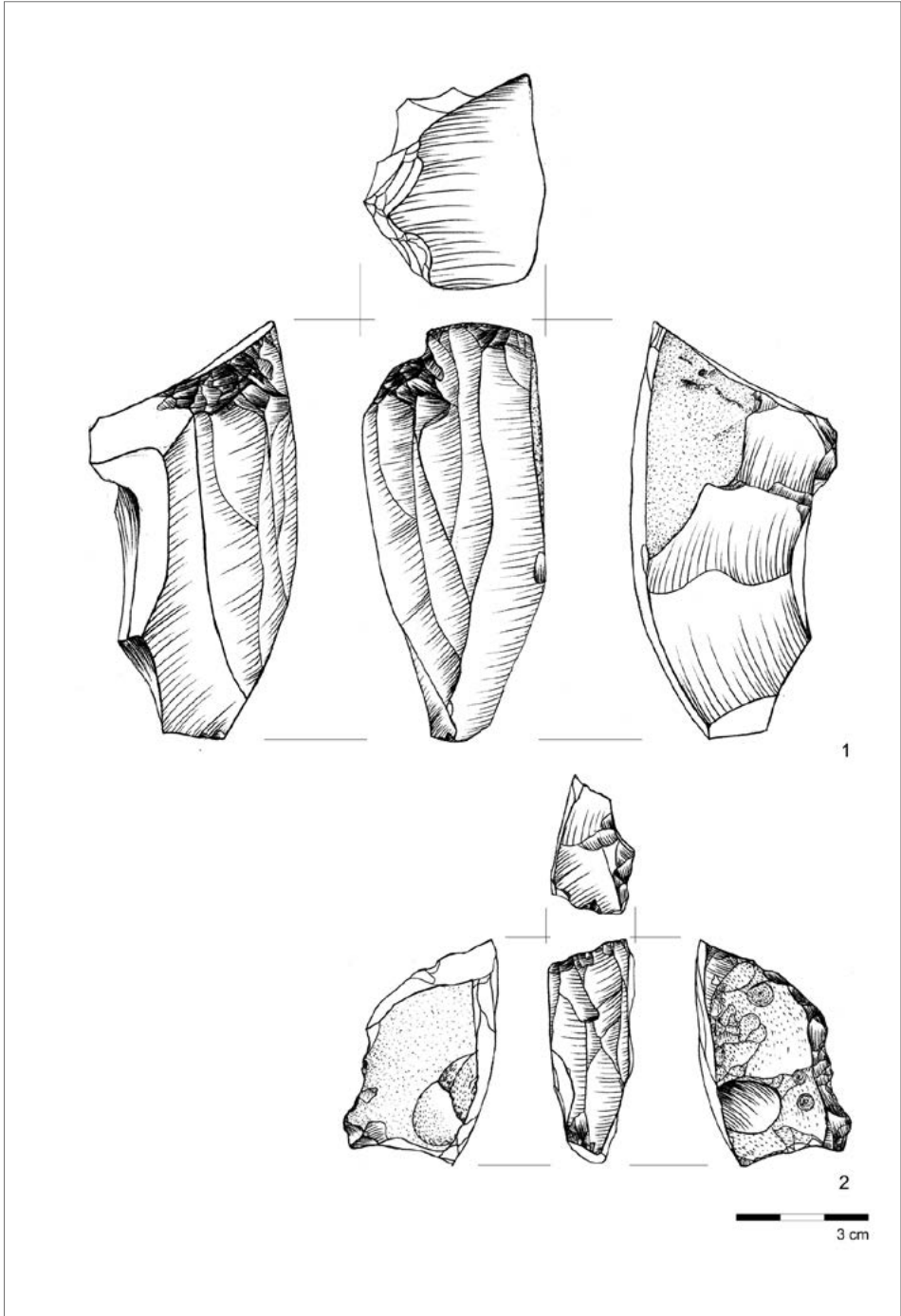


Fig. 12. Faysaliyya. Epipaleolithic chert artifacts: 1, 2 – single-platform bladelet cores (HLC Project/ drawing and digitizing B. Witkowska)

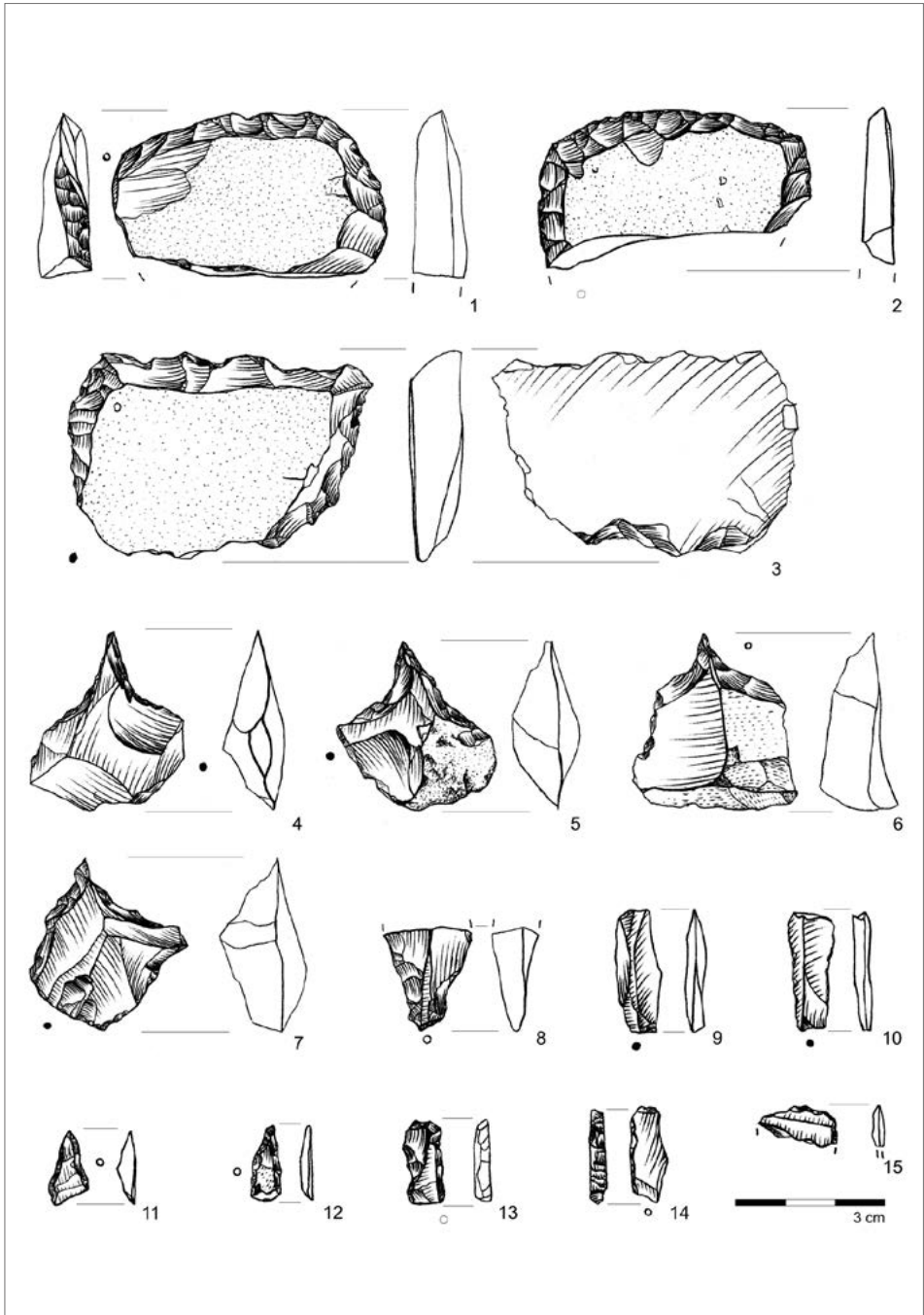


Fig. 13. Faysaliyya. Epipaleolithic, Neolithic and Early Bronze Age chert artifacts: 1–3 – tabular scrapers; 4–7 – flake perforators; 8 – blade point tang; 9, 10 – bladelets, blades of medium size; 11–15 – microliths: backed bladelets or rectangles (HLC Project/drawing and digitizing B. Witkowska)

There is another category of artifacts that could be linked to the Middle Paleolithic. They were mostly discovered in Square A4052 and correspond to the typological characteristics of the Tayac points (Debénath and Dibble 1993) [Fig. 11:5]. It cannot be ruled out, however, that they are older and come from the late phase of the Lower Paleolithic (Shea 2013: 76).

Some of the lithics can be dated with fair conviction to the Epipaleolithic, although their cultural affiliation is difficult to determine beyond doubt. They occurred mainly in the western part of the site, on the surface and in Squares B4212/4314 and B5212. Among them, single-platform bladelet cores, conical, very slender with careful preparation, and pyramidal, stocky, with preparation limited only to the striking platform [Fig. 12] were noted. One should also mention a few fragments of microliths, probably backed bladelets or rectangles, formed with very fine, high, abrupt retouch [Fig. 13:11–15], as well as bladelets [Fig. 13:9,10], whose width does not exceed 1 cm.

The youngest chert artifacts discovered this season are related to the Neolithic and Bronze Ages. They are much less numerous than artifacts in the Paleolithic assemblage and were concentrated in the western part of the site. One can associate with the Neolithic a part of the tang of a blade point [Fig. 13:8], which was found in unit B5212, and perhaps part of not very regular blades of medium size. A dozen or so tabular scrapers made of flat cortical flakes [Fig. 13:1–3], and a group of standardized flake perforators [Fig. 13:4–7] can probably be dated to the Early Bronze Age (Rosen 1997: 68–69, 71–79). However, it must be admitted that the former category of tools

was quite commonly found in Neolithic assemblages (Shea 2013).

## 4.2 MUNQATA'A

The Munqata'a site yielded this season a total of 554 chipped lithics, of which about half (282 pieces) were collected from the surface; 18 of the surface finds were from the trench area and they should be considered together with the 81 artifacts from loci L1 and L2 of stratum 1. Loci related to earlier stages provided a total of 49 artifacts for stratum 2, 76 for stratum 3, and 66 for stratum 4 (Locus L10).

Locus L10 with its lack of architectural remains (see above) may represent the earliest human activity on site, and the fact that this inventory is not coupled with any pottery finds, in contrast to the assemblage from higher-lying layers, leads to the assumption that it is characteristic of occupation preceding the Pottery Neolithic period, that is, earlier than the mid-7th millennium BC. The artifacts fall into types typical of PPN B or C, or, to use the terminology proposed by John J. Shea (2013), the Middle Neolithic.

First to be discussed are projectile points. One of them, made on a regular blade, of a maximal width of approximately 2 cm, is preserved only in its proximal part [Figs 14:3; 15 center]. It has a narrow tang (not fully preserved) and proximally projecting 'wings' formed by corner-notches, made of semi-abrupt, two-sided retouch. Above, about 7–8 mm from the bottom edge of the 'wings', there is a pair of bilateral, (almost) symmetrical notches that were made with the same retouching. These traits indicate that the specimen is an



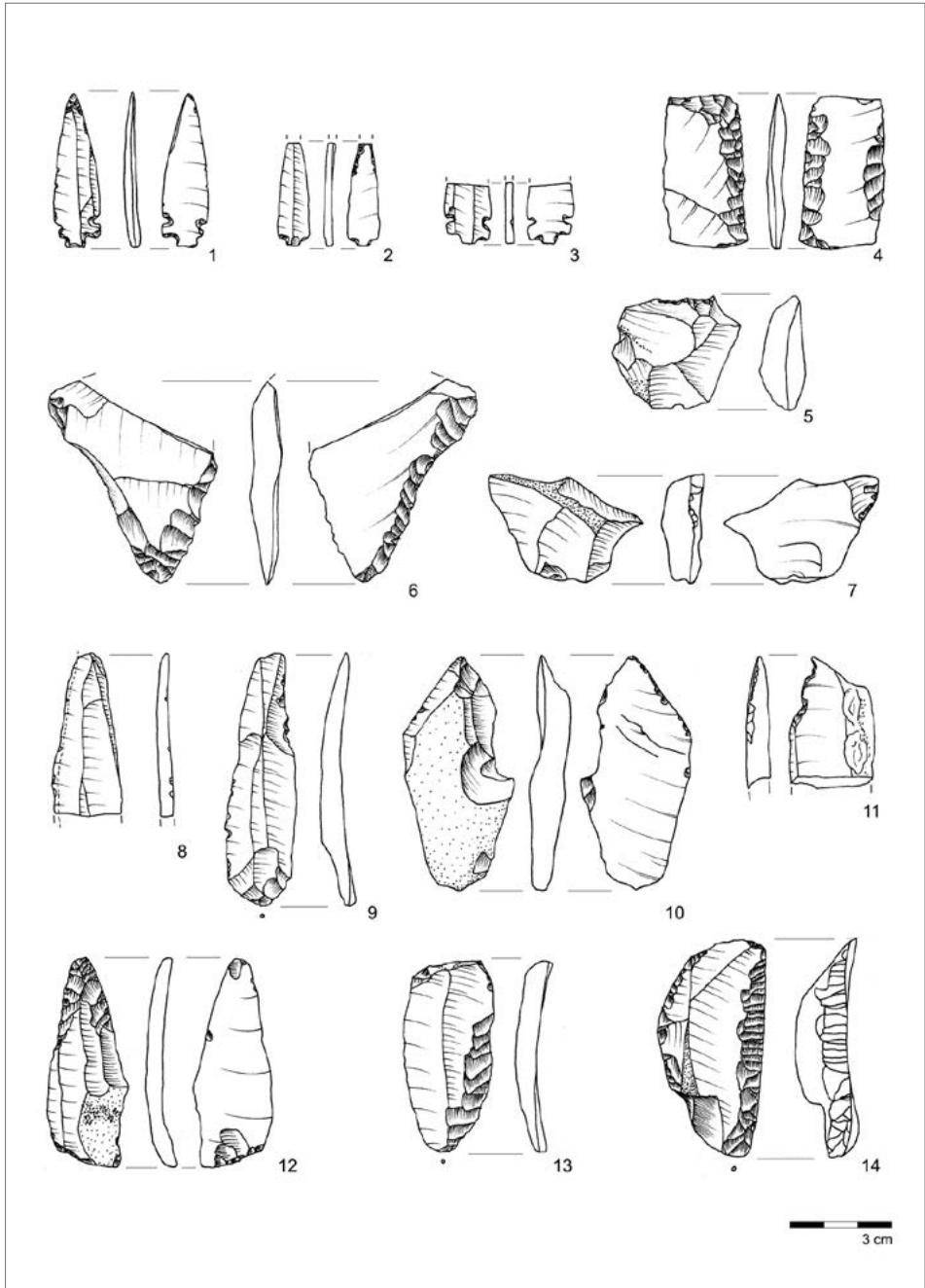


Fig. 14. Munqata'a. Middle Neolithic chert artifacts: 1–3 – Helwan projectile points (1, 3 – Abu Salem points, 2 – Sheikh Hassan point?) (see Fig. 16); 4 – regular blade with invasive retouch (sickle insert); 5 – awl(?); 6, 7, 11 – flakes; 8, 9 – bladelets; 10 – notched tool; 12 – perforator; 13, 14 – knives (HLC Project/drawing and digitizing J. Kościuk and B. Witkowska)

Abu Salem point, which is considered a subtype of Helwan points (Shea 2013: 244, Figs 7.12, 7.27). A complete triangular point with almost identical features was picked up from the surface in the square. It was made on a regular blade, knapped from the single-platform core [Figs 14:1; 15 left]. On the distal tip there is irregular, mainly obverse retouch. This find suggests that Locus L10 must have been exposed to denudation processes somewhere on the site (upper layers included) or/and looting activity.

The second, more complete specimen from L10 was made on a blade of a maximum width of 13 mm [Figs 14:2; 15 right]. It is a projectile point with a narrow tang made by corner notches, which were shaped by semi-abrupt, double-sided retouch. The tang has not been preserved in its entirety. The specimen does not have any other notches, but it is semi-abruptly, inversely retouched in the distal part, along both sides. The said lack of notches on the lateral edges is somewhat unusual for a Middle Neolithic piece and it finds no straight-

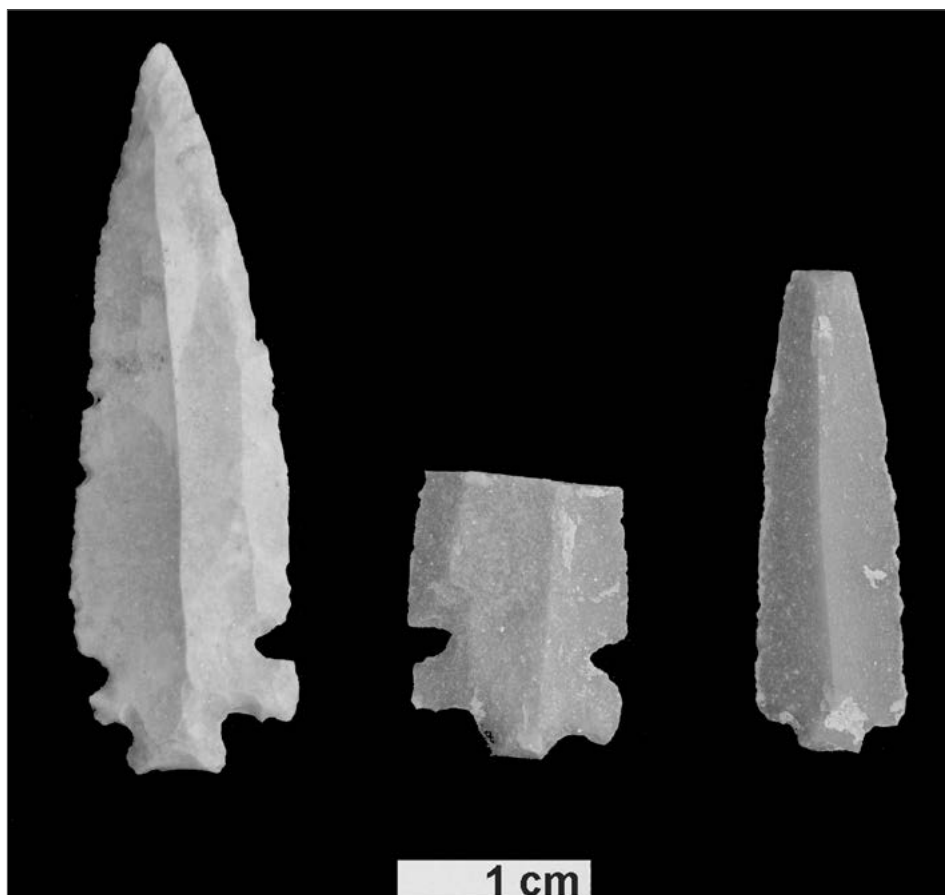


Fig. 15. Munqata'a. Middle Neolithic chert Helwan points (see Fig. 14:1–3) (HLC Project/ photo P. Kołodziejczyk)

forward parallels. However, some Helwan points of the Sheikh Hassan type do not have notches either, being characterized by retouching in their distal parts (Shea 2013: Fig. 7.12:d). They are, therefore, the nearest parallel for the Munqata'a piece.

Fragments of regular blades and bladelets, often presumably long and narrow, make for an important component (30 pieces) of the remaining part of the inventory found in stratum 4 (Locus L10). They were obtained from either unidirectional or bidirectional (including bipolar) prismatic blade cores. Generally, they are classified as central blades; they have roughly triangular or trapezoidal cross-sections. About half of them were laterally retouched. Some also have retouches on the proximal edges, forming weakly visible tangs. This may indicate the presence of some elongated points, but a specific type cannot be indicated due to their incompleteness. Nonetheless, the described type of blades corresponds to characteristics that are considered typical of the Middle Neolithic (Shea 2013: 223–228).

The remaining elements of the lithic inventory from Locus L10 are irregular, angular flakes, some with use-related 'retouching'. They give the impression of having been knapped from multiple-platform flake cores. Perhaps they were used as *ad hoc* tools.

Accumulations denoted as loci L5, L6, L7 and the pits L8 and L9 were combined into one stratigraphic complex called stratum 3. The 76 chert artifacts from this complex should obviously be considered as younger than those described above, but some secondary displacement from the earlier stratum to the later one cannot be ruled out entirely. The group consists of not very regular blades and bladelets,

obtained from single-platform cores and irregular flakes. They were obtained mainly from double-platform and multi-platform flake cores. The material is highly fragmented, hence it is difficult to precisely determine the numerical relation of blades/bladelets to flakes. The former, however, remain a minority; 16 specimens can be clearly classified in this category. Approximately one third of all artifacts have retouched edges, but in most cases it seems to be the effect of being used. There may be one typological awl, made on a flake [Fig. 14:5]. In addition, burin negatives appear on two flakes and on two blades. Locus L7 is the only unit to have yielded a more regular prismatic blade, from a single-platform core. It has a lateral cortical surface, as exploitation of the core led to widening of the flake-release surface. One wonders whether this blade may have migrated from the lower layer (Locus L10). Three fragments of more regular bladelets were also found in unit L7 and it should be added that the frequency of blades here is the highest (9 pieces out of 21).

The loci of stratum 3 have all yielded significant quantities (140 pieces) of ceramic fragments associated with the Late Neolithic Jericho IX culture (see below), contributing to the dating of the stratum under consideration and to most of the chert inventory. However, from the chipped lithic perspective, the Jericho IX culture is not well understood. As Shea points out, "our picture of Jericho IX lithic technology is informed mainly by the Jericho excavations and surface collections/test excavations at sites with Jericho IX pottery" (Shea 2013: 283). Thus, for example, it is no wonder that no extensively retouched

projectile points or sickle inserts that are considered determinants of the Late Neolithic have come from this stratum. It is a recognized fact that the further south one moves in the Levant, the fewer such points are found; in units such as Qatifi-an or Besorian, known from Sinai, Negev and southern Jordan, they are extremely rare. One way or another, an increasingly prominent flake-based industry is a Late Neolithic trait, including excavated collections of the Jericho IX culture (Shea 2013: 280–283).

The chronological and cultural affiliation of the chert finds from the next stratum 2, which encompasses loci L3, L12 and L13 (49 pieces), is affected again by pottery of Jericho IX culture (81 pieces), which characterized this horizon (for a discussion of the pottery, see below). As before, the inventory was a mixed one consisting of both blade/bladelet group [Fig. 14:8,9] and a group of not very regular flakes [Fig. 14:6,7,11]. The first one contains at least 13 pieces, which is a slightly higher percentage than in stratum 3; yet none of them has been completely preserved. More importantly, the identified blades (10–12 mm width) and bladelets (5–8 mm width) are more regular, mostly coming from single-platform prismatic blade cores. An arched endscraper was made on one of these blades. Silica gloss is present on the dorsal side of another blade, of a width of about 1–2 mm, along the entire remaining left edge, thus including the specimen in the Neolithic group of sickle inserts on blades (Shea 2013: Fig. 7.18). A third of the flakes have formal retouches on different edges, usually either use-related or *ad hoc*. The latter group probably includes three awls. All things considered, the stratum yielded no

artifacts that are considered to be evident determinants of the Pottery Neolithic, but, somewhat paradoxically, all the specimens found here could potentially be found in inventories of this provenance.

Stratum 1 comprised near-surface sediments, probably non-anthropogenic, associated with local erosion processes. The 81 chipped lithics recorded from the loci identified with this stratum are most probably a secondary mix. This inventory consists of irregular flakes and chunks, and a few not very regular blades. Only one specimen is a more regular bladelet. One of the cortical flakes can be formally classified as a notched tool [Fig. 14:10]. None of the forms from this inventory can be said to be typical of specific archaeological phenomena.

Finds from the surface constitute the largest group. Few specimens apart from the Abu Salem-type projectile point discussed above could be tentatively associated with specific cultural and chronological units. Several specimens with regular, ‘laminar’, invasive retouch on the dorsal face should be mentioned first. The parallel scars of this retouch presumably resulted from pressure-flaking. These specimens can be described as knives [Fig. 14:13,14] or perforators [Fig. 14:12]. The retouch, although it may have originated in the beginning of the Middle Neolithic, is considered a distinctive feature of PPN C. The high frequency of such retouch in the Late Neolithic period, including the Jericho IX culture (Shea 2013: 278, 280, 283), represents a continuation of this trend. Several of the specimens are fragments of regular blades, unifacial or bifacial, with backed or invasive retouches that resemble geometric sickle inserts, although no signs of silica gloss were found. One of

them is characterized by a flat invasive retouch [Fig. 14:4], which may suggest a Late Neolithic provenance (Shea 2013: Table 7.7, Fig. 7.28). However, a much later chronology cannot be ruled out in view of the geometrical outline of the specimen (see Rosen 1997: 55, Figs 3.15, 3.16), extending from the Middle Bronze

until the beginning of the Iron Age (Rosen 1997: Fig. 3.19). The two specimens of small, carefully made borers could in turn have a Neolithic provenance (Shea 2013: Fig. 7.20:k,l). Generally speaking, it seems that the surface material contains components associated with the Neolithic and the Bronze Age.

## 5 POTTERY

### 5.1 FAYSALIYYA

Only a handful of sherds was found in Area B of the site at Faysaliyya. Sherds were picked up from the surface and collected from layers (loci L101, L103, L104, L105, L106 and L112) accumulated around the stone structures excavated in Square B4213.

From a chronological point of view, the pottery assemblage can be divided into two separate groups. The first one consists of sherds found in the upper layers, that is, the surface and topsoil. A few small sherds apparently from this group came from the lower strata and their presence there is explained by the phenomenon of bioturbation. The pottery was made from well developed clay and turned on a potter's wheel. The horizon described is connected generally with later periods, most probably the Nabataean/Roman (see Hendrix, Drey, and Storfjell 1997: 227–250), but without a more precise designation for lack of well-dated fragments.

The second group consists of poorly fired, handmade pottery, with remains of coiling visible on various fragments. Surface color ranges from dark brown and red-brown to dark gray, very often

with dark gray sections. The clay was mixed with fine to coarse mineral temper. No traces of surface treatment were observed. The sole diagnostic sherd was a rim fragment of a hole-mouth jar; the remaining sherds probably represent few, at least four, jars of this kind. Such pottery occurred from the Neolithic times onwards, to become a hallmark of the Early Bronze Age. Vessels of this type were used as cooking pots or for storage (Amiran 1969: 55). Although one generic rim is not enough to date the whole assemblage, judging by the technology of production, surface treatment and temper, the pottery is likely to date back to the late prehistoric periods, presumably the Early Bronze Age.

The pottery from the Nabataean/Roman periods may be connected with temporary residence of a population occupied with agricultural work in the valley. The hole-mouth cooking pots from the older group are clear evidence of settlement practices that probably developed at the site during the Early Bronze Age (EBA). The limited number of pottery types is suggestive of temporary occupation (see Sidel 2011), perhaps by a nomadic tribe which used to spend part of the year in



the area in connection with some form of economic or agricultural activities.

## 5.2 MUNQATA'A

The pottery from the site was collected from the surface and from two stratigraphical units, 2 and 3 (297 pieces), and with the exception of three surface finds, they all represent the same chronological horizon. The three exceptions are Roman-type pottery fragments, probably washed out from elsewhere, most likely from the top of the wadi banks. On the methodological side, the pottery (and other finds) were collected daily, separately from every locus and sifting was limited to places where fragile microlithic chert tools were found.

In stratum 3, pottery was found in layers connected with fire pits (L7, L8, L9) and in the ashy layer covering the area (L6). Pottery from stratum 2 was connected with a stone structure (W11), most probably part of a house or stone fence. It was found on both sides of the wall and there is no chronological difference between the sherds from the hypothetical inside (L13 on the eastern side of the wall, see above) and outside of the building, but it should be noted that the assemblage is relatively small.

The most distinctive features of the pottery from Munqata'a are: poor firing, color ranging from buff orange to reddish, mineral temper of different size and a smoothed surface achieved by burnishing with grass or straw. A large number of the sherds bear distinctive geometric decoration executed over a light-colored slip. No traces of plastic decoration or incisions were observed in the assemblage [Fig. 16A, B].

The quality of production, decoration and surface treatment suggest a rather early origin of the finds. A similar decoration pattern, that is, lines of thin reddish-brown paint over a light background, is known from the EB 1B sites with basketry or Line Group Painted Ware (LGPW) (see Braun 2012: 13–15, Figs 5–6). A closer examination of the painting shows that the surface covered with color was later burnished, which was not typical of EB 1. Beyond doubt, the pottery excavated at Munqata'a belongs to the Pottery Neolithic Period, bearing decoration typical of the Jericho IX horizon (see Garfinkel 1999: 68).

It is too early for statistical analyses considering the small size of the assemblage and it is uncertain as to how well the sample collected may represent the entire site. Most sherds are body fragments with few diagnostic elements to allow for the reconstruction of vessel types. Two main groups are recognizable. The first group consists of wide, large or middle-sized bowls with straight walls and a simple rim. Most of the fragments belonging to this category are painted. In Yosef Garfinkel's terminology, they represent Types C1 (Garfinkel 1999: Fig. 45) and C6 (Garfinkel 1999: Fig. 48). Additionally, the presence of Type C7 (Garfinkel 1999: Fig. 49), that is, hemispherical bowls, was also noted. One such bowl that could be reconstructed was decorated with thick lines starting a little bit below the rim and running diagonally towards the bottom of the vessel [Fig. 16B:1]. The closest parallels to the bowl come from Jericho for example (Kenyon and Holland 1983: Fig. 5:4). Next to bowls with thick lines, there are vari-

ous examples decorated with a series of thin parallel lines. Less frequent is a geometric, triangular decoration, similar to an example from Ghрубba (Mellaart 1956: Fig. 5:89).

The second group comprises decorated and undecorated closed vessels. Fragments belonging to the Jericho IX jars were noted. Other fragments represented necked pithoi, group F4 (see Garfinkel 1999: Fig. 61) and, probably, hole-mouth pithoi, group E4 (see Garfinkel 1999: Fig. 52).

Approximately 20% of all vessels were decorated. The fragmentation of the material excluded in many cases a reconstruction of the patterns. Parallel longitudinal or diagonal lines or wavy patterns

with sharp corners were observed. This decoration is repeated at other Jericho IX sites, except for one fragment with diagonal crossing lines painted in a light shade of reddish brown forming a lozenge pattern with the lozenges, uniquely, filled with dark brown paint [Fig. 16A–B:4].

Undecorated sherds were often burnished with straw or grass. Other examples were left unworked. Traces of a light-colored slip are in evidence on some sherds, but it is not clear whether the whole pot was slipped or the sherd was part of a vessel that had painted decoration on the now lost parts.

The pottery was fired at low temperatures. It is soft and powdery to the touch,

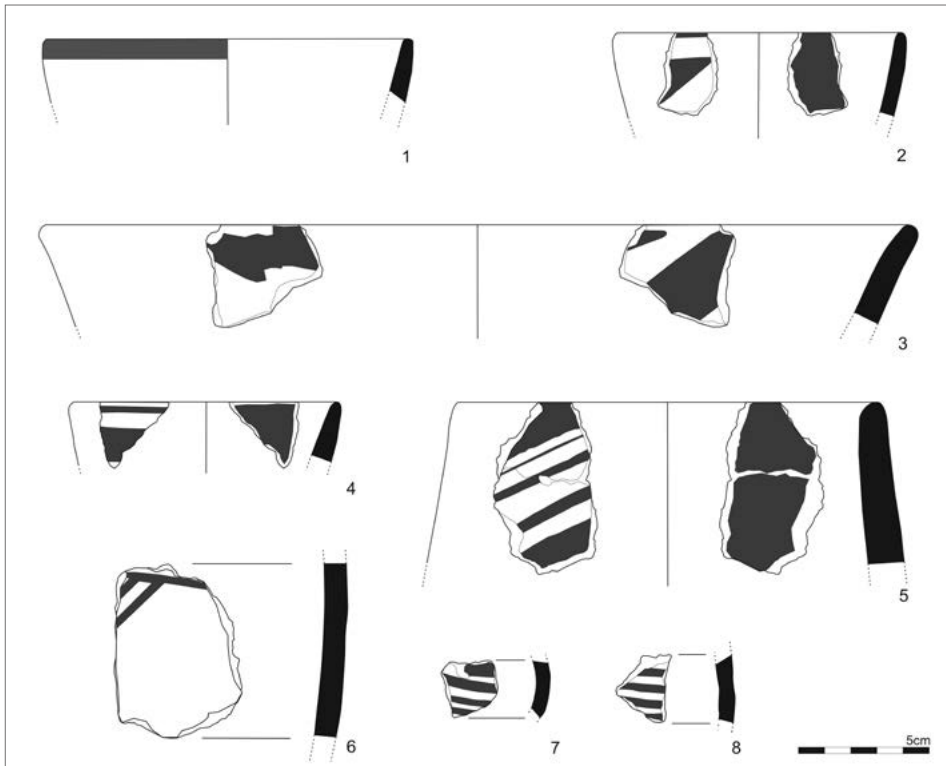


Fig. 16A. Munqata'a. Painted pottery of the Jericho IX Neolithic horizon (HLC Project/drawing A. Świtlicka, J. Ledwoń)

with the slip or decoration oftentimes peeling. In most cases, the section has the same color as the outer and inner faces.

The clays used in production had mineral tempers. Middle-sized grits of raw calcite were observed, featuring fresh breaks and sharp edges. The mineral inclusions in the clay of larger vessels were

of different sizes with larger pieces of calcite among the middle-sized grits.

The pottery from the probe excavated in 2017 at Munqata'a represents the Jericho IX horizon with good parallels at other Jericho sites such as: Jericho (see Kenyon and Holland 1982; 1983), Lod (Van den Brink et al. 2015: 174–177,



Fig. 16B. Munqata'a. Painted pottery of the Jericho IX Neolithic horizon (HLC Project/ photo M. Czarnowicz)

Figs 30–31) and Teluliyot Batash (Kaplan 1958). The nearest sites with similar pottery are Khirbet el-Darih (Bossut, Kafafi, and Dollfus 1988) and ‘Dhra (Ben-

nett 1980). Excavations at ‘Dhra in the 1990s uncovered Jericho IX mistakenly dated by the excavators to EB 1 (Kuijt and Mahasneh 1998: Fig. 3).

## 6 SOCIOLOGICAL STUDIES AND HERITAGE PROTECTION

A sociological study aimed at local community awareness of the archaeological heritage is part of the HLC Project. The Project is also looking at the impact of the archaeological heritage protection and restoration on emerging tourism and infrastructure in the region. Research in the 2017 season was carried out in cooperation with the al-Tafila branch of the Jordanian Department of Antiquities.

Research covered the inhabitants of four towns in southern Jordan: Dana, Gharandal, Buseira and al-Tafila where excavations had already been conducted. This includes archaeological sites, as well as the tourist area of Dana and the largest city in the area, al-Tafila. The research was conducted in Arabic, with translation into English. The sample included 146 men aged 15–70 (73% of the respondents) and 54 women aged 16–60 (27% of the respondents).

The survey questionnaire consisted of three parts, devoted respectively to archaeology, tourism and demography. In the archaeological part of the survey respondents were asked about their interest in the archaeological work con-

ducted in the al-Tafila region and how the local community benefitted from this work. The second part, devoted to tourism, focused on the benefits coming from archaeology in tourism and the related impact on improving living conditions and infrastructure development. In the third, sociological part, demographic data was elicited, including gender, age, education and property status of the respondents.

A preliminary analysis of the results demonstrated a significantly positive attitude toward archaeological excavations in the region and its invaluable role in shaping cultural tourism, which is seen as having the potential to enhance regional economic development to the benefit of local inhabitants. Even so, there is a group of residents expressing dissatisfaction and fears connected with archaeological presence in the region.

The pilot study will be continued under the HLC Project, introducing in the course of time educational and promotional activities in the field of protection and promotion of the local archaeological heritage and the use of these sources to shape new values in the field of cultural tourism.

## 7 PRELIMINARY CONCLUSIONS

The first excavation season brought interesting information on two sites located in southern Jordan and an assessment of the selected locations for the inference

about the late prehistory and a specially Early Bronze Age period. It also allowed for better planning of subsequent works and defining research needs, like the ne-

cessity of conducting laboratory analysis (OSL and  $^{14}\text{C}$  dating), permitting precise dating of poorly preserved archaeological layers on both sites. It is also possible to make the first chronological observations for examined sites.

At Faysaliyya, the two zones with traces of prehistoric occupation that were observed can be interpreted as settlement and farming, judging by the distribution of the artifacts and based on comparison of the archaeological evidence with geological observations. Stone structures consisted of walls, circles and cairns. The huge number of chert tools, smaller amounts of pottery and a stone pendant [Fig. 17] indicate heavy use of the area especially during the Paleolithic and Neolithic periods with some artifacts from the Chalcolithic and Early Bronze Age periods. The horizon of the pastoral



Fig. 17. Faysaliyya. Stone pendant from trench B4213 (HLC Project/photo M. Czarnowicz)

cultures, already recognized by scholars in the nearby Jarf area (see, e.g., Fuji et al. 2017), is visible at the site and may be at this moment roughly linked with the period between Neolithic and Early Bronze Age.

Meriting special note is a carved stone from one of the stone structures at Faysaliyya, which is known from sites dated to the pastoral Neolithic/Chalcolithic cultures (Fuji et al. 2017: 571, 572, 575–576). It was used here in wall construction, probably to protect against water flow. This assumption is based on parallels (e.g., Fuji et al. 2012: 143, Fig. 20) known from the Jarf Basin and several sites located about 100 km to the east of Faysaliyya. They are often described as barrages (flood gates), securing important pastoral areas, or directing water to other areas (Fuji et al. 2012; 2017). The structure may be a harbinger of a system of similar structures at the site, as they are usually known to occur in clusters over an area of considerable size.

Testing of the stone mounds found at the site did not bring any results concerning their date or function. However, similar mounds are present in many places in southern Jordan and wider studies on the phenomenon are necessary.

Relics of a settlement were discovered in the probe dug by the project at the extensive Munqata'a site, which covers most of the valley there. The finds suggest a sequence of Middle and Late Neolithic settlement phases with some indications of a Chalcolithic and Early Bronze Age presence. The huge number of chert tools and the relatively high amount of pottery (also with traces of paint), both from



the excavated probe and the survey zone, reflect intense exploitation in late pre-history, specifically during the Neolithic period. The characteristic pottery finds are probably related to the Pottery Neolithic (PN), which is very commonly represented in this area and can be linked tentatively to the Jericho IX culture, which represents the first stage of farming Neolithic communities in this area. Munqata'a would thus be the southernmost known site of this chronological horizon.

The results of the season also show the need for a model of environmental changes for both sites, focusing primarily on flood activity and erosion processes, as these factors played a significant role not only in the past, when the site was actively used, but also during post-depositional processes. It is also evident that the Project will be useful specifically to curb the illicit digging that has been going on especially in the Munqata'a area.

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# Newcomers and autochthons

## The 2016–2017 UGZAR survey in the Kurdistan Autonomous Region, Iraq. Settlement pattern in the Ninevite 5 period (2012–2017)



**Abstract:** The paper presents the results of the last two field campaigns (autumn seasons of 2016 and 2017) of the “Newcomers and autochthons” project, conducted since 2013 within the framework of the UGZAR (Upper Greater Zab Archaeological Reconnaissance) project in the Upper Greater Zab area of the Kurdistan Autonomous Region of Iraq. A short preliminary account on the sites found during this period is followed by an overview of the Ninevite 5 settlement pattern based on data gathered over the course of six seasons of prospection within the research area.

**Keywords:** Late Chalcolithic, Ninevite 5 period, Kurdistan Autonomous Region, archaeological survey, settlement pattern

The present article is the third in a series of preliminary assessments of the fieldwork results in the “Newcomers and autochthons” project supported by the Polish Centre of Mediterranean Archaeology, University of Warsaw, conducted since 2013 within the frame of the “Upper Greater Zab Archaeological Reconnaissance” (UGZAR) project directed by Assist. Prof. Rafał Koliński (Adam Mickiewicz University, Poznań; for the first and second report in this series, see Ławecka 2015; 2016). The main goal of the project is a study of archaeological remains belonging to the Late Chalcolithic (LC) and Ninevite 5 periods (approximately 4500–2550 BC) found on sites located during field prospection undertaken in the UGZAR region.

During two field campaigns in 2016 and 2017, the remaining, southeastern part of the project area was

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*Dates of work:* 25 August–21 October 2016; 24 August–20 October 2017

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*Archaeologist:* Assist. Prof. Dariusz Szelaąg (Institute of Archaeology, University of Warsaw; 2016)

*Documentalist:* Romuald Jeziorowski (2017)



explored [Fig. 1]. As in previous seasons, several selected regions were thoroughly and systematically investigated, while the identification of other sites was based mainly on a non-systematic survey, interviews with local inhabitants and analysis of satellite imagery. A considerable part of the landscape was hilly or mountainous, especially in the southern part, but it also consisted of the relatively flat southern bank of the Greater Zab and the large Harīr plain region (Dašt-ī Harīr).

Despite a seemingly favorable environment, Late Chalcolithic settlements

were extremely rare in the region. Minor collections of pottery were identified on five sites [see Fig. 1].<sup>1</sup> LC1–2 material was found on sites S207, S245, S248 and S258. These assemblages included inwardly beveled-rim bowls, which are diagnostic of the LC2 period, but were still in use in the LC3 period (Peyronel and Vacca 2015: 113), but also, among others, a few neckless flaring-rim jars and early internally hollowed jars. Perhaps the most interesting site is S248, which yielded pottery showing a clear continuity between late Ubaid and LC1, including two bottom

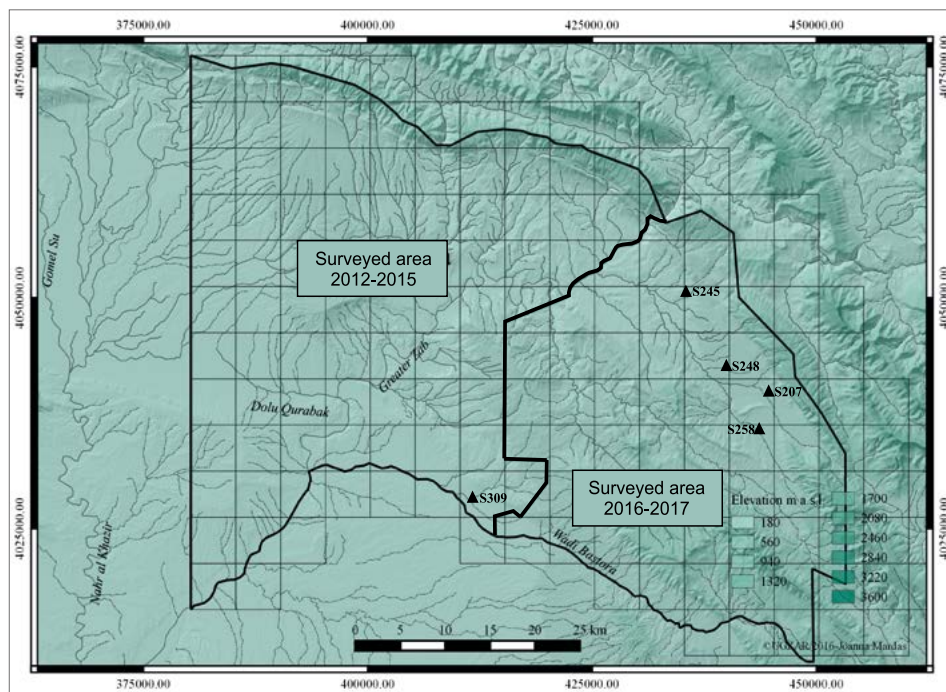


Fig. 1. Map of the UGAR area with Late Chalcolithic sites found in the 2016–2017 seasons (© UGAR/digitizing J. Mardas, D. Ławecka)

- 1 After a detailed study of the pottery, a few Late Chalcolithic sites were redated compared to the preliminary assessment (Ławecka 2015; 2016). Although most identifications and the overall picture and conclusions have stayed the same, for detailed information on particular sites readers are requested to consult respective chapters on Late Chalcolithic settlement in the final publication of the UGAR project (in preparation).

fragments of a northern variety of Coba bowls typical of Tepe Gawra XII (Rothman 2002: 55 and Pl. 5, two upper rows). No key diagnostic LC3–5 sherds were found, but the pottery analysis is still in progress. A fragment which looks very much like an Uruk beveled-rim bowl, found on S309, was quite astonishing. This is a solitary Late Chalcolithic sherd found on a site, which otherwise did not yield any pottery earlier than the Late Assyrian period.

The last century of the 4th millennium BC in northern Mesopotamia was a short, post-LC period referred to as Terminal Uruk [Fig. 2]. It is characterized by pottery still related to or derived from the

typical Late Uruk assemblages, but with some new, distinctive traits prefiguring later developments (Roaf 2000: 435–436; Rova 2014). Only one sherd found on So26 may be tentatively ascribed to this period, which is otherwise absent from our collections.

Several sites yielding Ninevite 5 were found in the recent two seasons, primarily in the Harir plain, and since preliminary reports from the survey so far have failed to present anything with regard to the period, the following reviews in brief all of the Ninevite 5 period sites discovered in the survey region to date.

Most of the first half of the 3rd millennium BC in northern Mesopotamia is referred to as the Ninevite 5 period (about 3000–2250 BC, see Fig. 2), after the fifth stratum in a deep test trench at Kuyunjik (one of the tells located within the ancient city of Niniveh), where Max Mallowan found characteristic painted pottery. A distinctive, local cluster of Ninevite 5 pottery styles evolved from the Terminal Uruk background, through the Transitional and Intermediate phases. After a period of coexistence of painted and incised ware, painted decoration disappeared, replaced by the late incised and excised variety of pottery (for an overview of the Ninevite 5 period, see Roaf 2000; Rova 1988; forthcoming; Rova and Weiss 2003, all with further reference; for the pottery, see recently Grossman 2014 and Arrivabeni forthcoming).

The survey assemblage of Ninevite 5 pottery consists of nearly 300 sherds. The only intact vessel [Fig. 3:16] was shown by villagers at the very first site we came across at the beginning of the 2012 campaign. It was found digging a cesspit, and

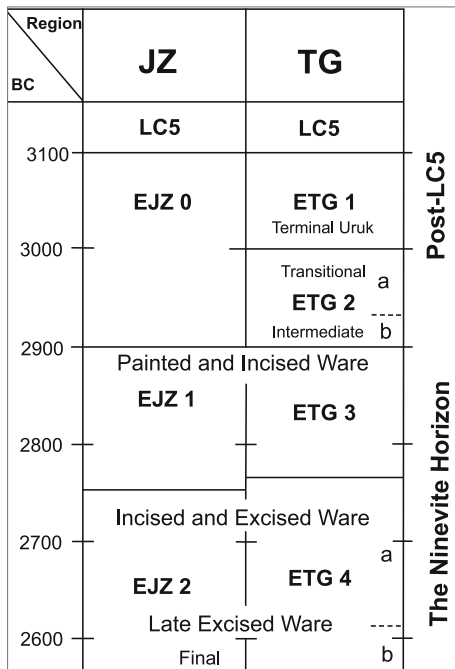


Fig. 2. Chronological chart of the post-LC5 and Ninevite 5 periods; ETG – Early Tigridian, JZ – Jezirah, according to ARCANE terminology (based on Grossman 2014: 89, Fig. 2 and Arrivabeni forthcoming)

might attest to the presence of a Ninevite 5 cemetery. No other vessel shapes could be reconstructed from the fragments that were collected.

The dating of the period was based solely on the most distinctive sherds:

Painted ones, usually fragments of bowls on pedestal bases (wherever the attribution to a particular kind of vessel was possible), and body sherds, as well as fine wares with ribbed, incised/impressed or excised decoration [see Fig. 3]. In this



Fig. 3. Ninevite 5 pottery from sites S001 (16), S029 (14), S033 (2, 9), S037 (18), S079 (13), S120 (4, 11, 12), S142 (10), S151 (15), S218 (1, 7, 8, 17), S248 (5) and S253 (3, 6) © UGZAR/photos D. Piasecki, M. Szablowski [14, 16] and S. Tlili [6]

last group, early incised decoration predominated and excised specimens were altogether rare. Among the undecorated pottery fragments of pedestal bases, fine ware cups (especially those with ribbed walls and/or in Grey Ware fabric), as well as Cooking Ware pots with crescentic lugs proved to be useful. Undecorated Common Ware vessels both from Ninevite 5 and the subsequent mid-to-late 3rd millennium BC are still rather poorly known, therefore no attempt was made to use such specimens as chronological markers.

On 16 sites, located mainly on the Harīr plain in the southeastern part of the survey area, a specific, previously unknown local kind of fine ware pottery was found, dubbed “Harīr Purple Painted Ware” after the area of its concentration.

This assemblage consists mainly of high quality, thin-walled small footed cups and probably also small jars, usually with a simple purple or plum painted banded decoration against an orange or creamy background [Fig. 4:1,3,5,7–9]. In some cases the surface of the whole fragment is painted or the pattern is slightly more elaborate; a few examples show geometric decoration in the form of hatched areas and curved bands [Fig. 4:2,4,6]. The fragments collected were for the most part small body or rim parts, hence no shapes were fully restorable. Even so, few footed bottoms seem to belong to this class of pottery.

Although the age of this particular kind of pottery cannot be established without excavation, its coexistence with

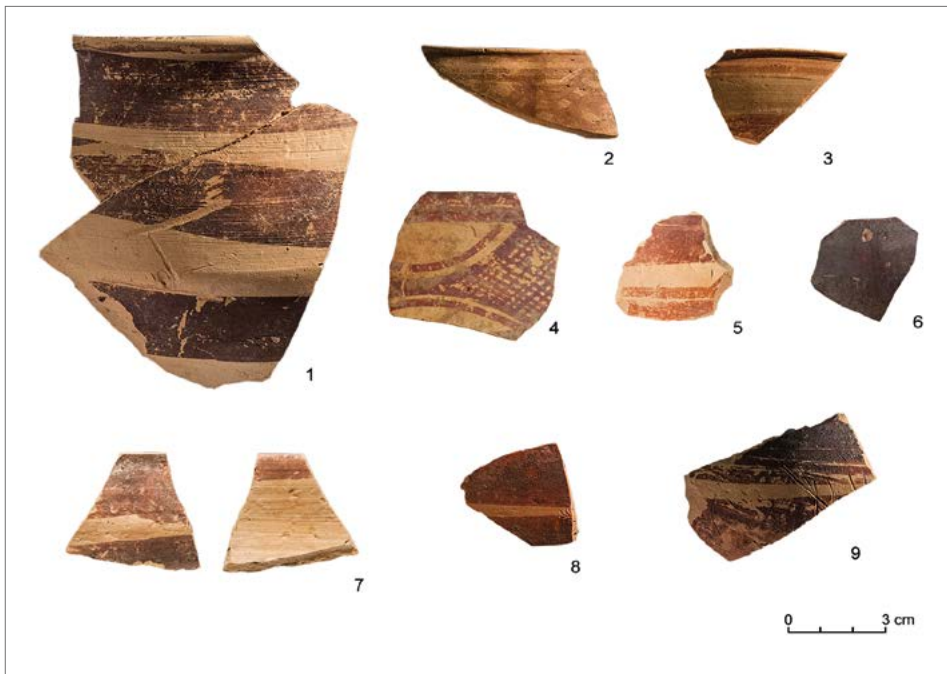


Fig. 4. Harīr Purple Painted Ware from sites S218 (5, 7), S245 (6), S252 (8), S253 (1, 2, 3, 9) and S304 (4) © UGZAR/photos D. Piasecki [5,7], A. Stefanski [4] and S. Tlili



Ninevite 5 sherds on 13 sites (including S253, where the only other identified kind of pottery belonged to the Ninevite 5 period, and S218, a site which apart from a large collection of Ninevite 5 sherds yielded only LC<sub>1</sub>–2 and late Sasanian/early Islamic pottery) may suggest the contemporaneity of these two types. Their coexistence would further be corroborated by the appearance side by side of specimens displaying features of both Ninevite and “Harīr Purple Painted Ware”. In a few cases it is even difficult to assign a sherd to a particular category, because the shape and/or decoration is typical Ninevite 5, but the orange sur-

face color of the sherd is atypical for the overwhelming majority of the Ninevite 5 assemblage, or the other way round, the decoration is a Ninevite 5 pattern but executed in purple paint, which is otherwise extremely rare in our repertoire. There is also a standard fine Grey Ware sherd with impressed decoration bearing traces of purple paint, a feature clearly in contrast to Ninevite canons of decorating vessels with either painted or incised/excised patterns. These examples point to the Early Painted and Incised Ninevite 5 as the most plausible period for the occurrence of the “Harīr Purple Painted Ware” pottery style.

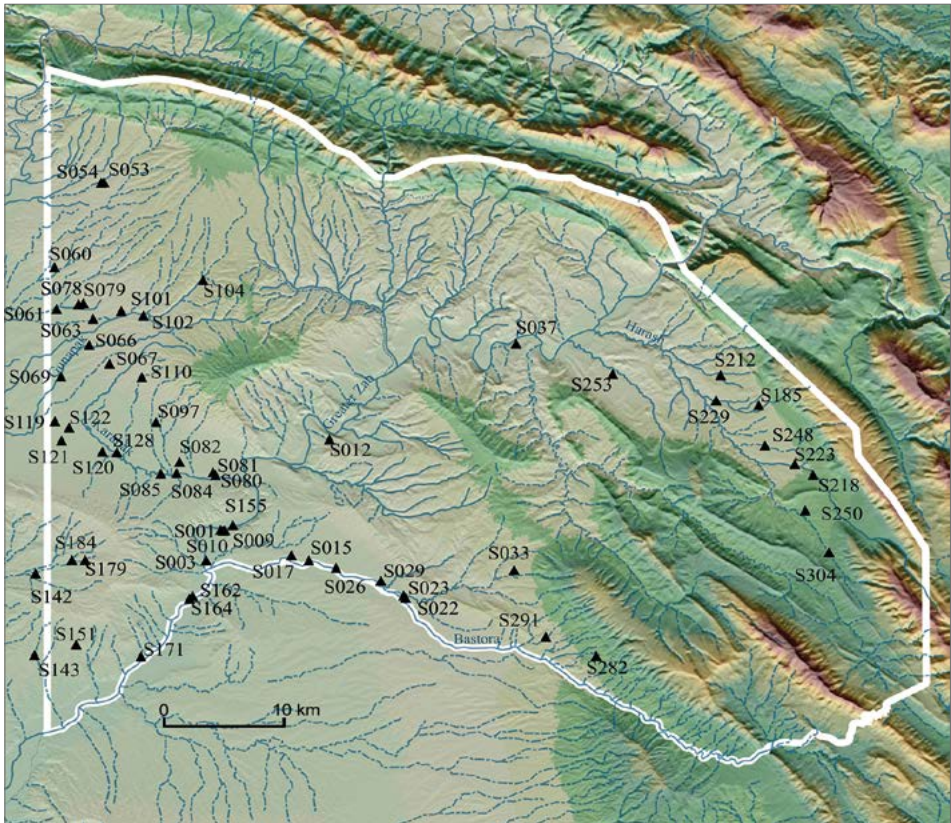


Fig. 5. Ninevite 5 sites in the UGAR survey area (© UGAR/digitizing J. Mardas)



Ninevite 5 pottery came from 58 sites [Fig. 5], most of them in the western (especially in the environs of the Navkur plain) and the southwestern part of the survey area, along the Greater Zab river and the Bastora Çay Valley, which constitute the southern limit of the concession. Several Ninevite 5 sites were found in the east, mostly in the region of the Harîr plain. On the contrary, the northern and central parts (including most of the Greater Zab valley) were almost devoid of Ninevite 5 settlements, but this area was largely empty or only sparsely populated also in prehistory and throughout the Bronze Age. In general, the Ninevite 5 settlements are located on the plains, in the vicinity of perennial or seasonal streams, and on the shores of the Greater Zab river. Eighteen sites yielded each a single, even if typical Ninevite 5 potsherd, making the period assignment rather weak. A more or less equal number of settlements produced assemblages comprising more than three fragments, including 12 which yielded between 10 and 22 Ninevite 5 sherds.

A finer phasing of painted pottery proved to be difficult. Some motifs characteristic of the mature phase were present already in the Transitional phase. A crucial difference lies in the way in which simple patterns are arranged into complex ones on the surface of a vessel, a characteristic that is difficult, if not impossible, to recognize on small sherds with a fragmentarily preserved pattern. Incised decoration shows more variability in time, but some types of incised designs are present in more than one phase (Rova 1988: 107–109). In her study of Ninevite 5 ceramics, Kathryn Grossman wrote

pointedly: “The successive phases are presented here as clearly bounded units, but their borders are actually relatively porous and indistinct. It is important, therefore, to look at Ninevite 5 ceramic assemblages in aggregate; a single type seldom provides a definite indication of a particular phase” (Grossman 2014: 88).

The density of Ninevite 5 sites in comparison to the LC3–5 period increased greatly. Only 11 sites were occupied in both periods. Few of them were multi-period tells, possibly local centers thriving for a long time, e.g., So63 (Grd-î Rovîa), So80 (Grd-î Çemê Gaûrê) and So33 (Qala-î Dêrê), but since only one site (So26) yielded a Terminal Uruk sherd and very little material may be tentatively ascribed to the beginning of the Ninevite 5 (Transitional period), the continuity of settlement is problematic and cannot be proved. Of the Ninevite sites, 47 (81%)—all but S248 found in the Harîr plain area—were newly established settlements, with no LC3–5 pottery attested. This veritable expansion appears to have taken place in the earlier Ninevite 5 phase, in a period when ribbed, painted and/or painted and early incised vessels were in use.

As shown by the results of the “North Jazira” survey in the area of Tell al-Hawa in northwestern Iraq, signs of a three-tiered settlement hierarchy are recognizable already in the Ninevite 5 period (perhaps later than the early phase, since incised Grey Ware was frequent, but painted sherds rare), the largest town being Tell al-Hawa (at least 24 ha), one-to-three small town-like secondary centers being next in line and numerous hamlets at the lowest level (Wilkinson

and Tucker 1995: 49–50). Although in the earlier part of the Ninevite 5 period, most of the excavated sites (particularly in the Eski Mosul Dam Salvage Project, where several Ninevite 5 sites in the Tigris Valley were briefly examined) were of village size, larger settlements were also in existence. Fragments of painted pottery were found all over the site of Tell Jikan in the Eski Mosul Dam project region, suggesting that by the painted and incised pottery phase, it had already become a town covering an area of at least 20 ha. A few other Ninevite 5 sites might have grown to comparable size, including Nineveh itself. A fourth tier was added to this settlement hierarchy at the very end of the period when sites of truly city size appeared in the Upper Khabur drainage basin (Hamoukar, Tell Leilan, Tell Brak, see Ławecka forthcoming; for Niniveh, see Rova 2017).

Survey pottery collections were made from selected sectors of different sites, hence the impossibility of establishing the area of Ninevite settlement on multi-period sites. Nevertheless, most of them seem to have been rather small villages and hamlets, 37 sites not exceeding 4 ha in area, and the actual settled area in the Ninevite 5 period being probably considerably smaller. On the other sites, Ninevite 5 pottery is confirmed only in very restricted areas (on other large sites, consisting of a tell and a lower town, the sherds occur in exceedingly limited numbers only on the mound), certainly not exceeding 4 ha. There is no obvious candidate for a local town center and the settlement pattern seems to be uniform and simple.

The heartland area of the Ninevite 5 pottery styles encompasses most of

northern Iraq and northeastern Syria, but its borders, as well as an extension of the peripheral zones, are still to be precisely defined. Grossman (2014: 87) defines the core of the Ninevite 5 region as a “... fairly restricted area situated between the Wadi Jaghjagh to the west, the middle reaches of the Habur to the south, the east bank of the Tigris to the east and the Tur Abdin to the north. A few Ninevite 5 sites have also been identified further north in the Ilisu Dam region”. According to this definition the region under discussion here would have rather occupied a peripheral zone. However, the relatively high number of Ninivite 5 sites in the UGZAR area, as revealed by the survey, implies that an extension of the core Ninevite 5 area to the northeast is in order. The results of the “Eastern Habur Archaeological Survey” also indicate the need “to extend the eastern limit of the core region beyond the eastern bank of the Tigris river and its hinterland, and possibly even further north across the Ġebel Biḥair barrier, as far as the second foothills of the Zagros mountains” (Pfälzner and Sconzo 2016: 36).

Daniele Morandi-Bonacossi’s “Land of Niniveh Archaeological Project” (LoNAP, University of Udine), abutting UGZAR on the northwest, during its first two years of survey in the field (2012–2013), found Ninevite 5 pottery on just 29 sites out of 287 from which pottery was collected. In their case, however, the sites were scattered throughout the region, with a stronger concentration in the Navkur plain. Almost all were apparently in existence already in the Late Chalcolithic period (for a synopsis of the Ninevite 5 period in the LoNAP area, see Gav-

agnin 2016: 75–79; Gavagnin, Iamoni, and Palermo 2016: 132–134; Morandi Bonacossi and Iamoni 2015: 20, Figs 8, 23), which stands contrary to the UGZAR results showing a significant number of Ninevite 5 sites, either newly located or uninhabited in the LC3–5 period.

Ninevite 5 sites were listed also in Jason Ur's "Erbil Plain Archaeological Project" (EPAS, Harvard University), abutting the UGZAR area on the south: 24 sites yielding LC3–5/Uruk pottery within the limits of a prospected enclave around Baqrta and Shemamok in the southwestern part of the EPAS area (approximately 400 km<sup>2</sup>) (J. Ur, paper read at the conference "Current Research on

Assyrian Landscapes", Poznań, May 2017). In the Ninevite 5 period, the number of sites increased to 35. Most of them were small (under 3 ha), with only two larger centers being identified, one in the range of 3–5 ha and the other 5–10 ha.

Intensive prospection work is currently carried out in virtually all parts of Iraqi Kurdistan. Many projects are still under way and only early tentative results are currently available. Although the data referred to above might point to a local variance of development, a broader overall picture of Ninevite settlement patterns must await a detailed publication of the information on all the Ninevite 5 sites surveyed within the Kurdistan region.

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### Abbreviations

ARCANE Associated Regional Chronologies for the Ancient Near East and the Eastern Mediterranean (<http://www.arcane.uni-tuebingen.de>)

Arrivabeni, M. (forthcoming). Pottery. In E. Rova (ed.), *Associated regional chronologies for the ancient Near East and the Eastern Mediterranean. Tigridian region* [=ARCANE 5].

Turnhout: Brepols

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# Metsamor (Armenia) after five seasons of excavations



**Abstract:** The Metsamor site in the 2017 season was excavated in two areas. The main area was the so-called town area where several dwellings from the Early Iron Age were cleared. Evidence of violent site destruction included two human skeletons belonging most probably to victims of a sudden attack, left unburied after the town had been destroyed. The cemetery was the second investigated area. Exploration of kurgan XIX demonstrated that it had been looted. Nevertheless, some human remains and several artifacts in the form of bronze snake head bracelets were recorded inside the burial chamber.

**Keywords:** Early Iron Age, dwelling structures, graves, storage jars, stamp seal, Urartian fibula, snake head bracelet

The fifth season of archaeological fieldwork in the northern part of the hill at Metsamor, in the area of the so-called lower town, was a continuation of earlier research on this archaeological site situated around 37 km west of Yerevan, the capital city of the Republic of Armenia. The western part of the already excavated area (see Jakubiak et al. 2016; 2017) was not extended significantly, the main target being confirmation of the stratigraphic sequence and interpretation of the architectural structures, fragments of which had been brought to light in preceding seasons. Investigations were conducted also in the cemetery.

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*Volunteers:* Jakub Gronowski, Małgorzata Reszka (both University of Wrocław)

## SETTLEMENT

In the western part of the excavated lower town, the work focused on two smaller, practically adjoining sectors [Fig. 1]. The first trench was situated against the northwest wall (context 1003) of structure S2;<sup>1</sup> it extended toward the stone walls that made up architectural structures S6 (context 1023) and S4 (context 1005). A relatively large rectangular chamber (S11), 5.80 m by 2.70 m in size, was uncovered [Fig. 2]. The chamber had a clay

floor initially. Sunk halfway into the floor, about 0.65 m, in the eastern corner of the structure was a large storage jar.

This part of the building was abandoned in an equally dramatic way as the neighboring S2. A skeleton (No. 7) was found against one of the walls excavated this season, adding to skeletons Nos 2 and 3 discovered here earlier (Jakubiak et al. 2016: 560–561). The body had evidently not been buried in any formal manner,



Fig. 1. Structures S11 (in the foreground) and S2, aerial view from the northwest (PCMA UW Metsamor Project/photo M. Truskowski)

1 A new system for designating architectural structures was introduced to ensure better identification of units forming part of larger structures, like pit houses for example. Under the new system each structure is classified separately without defining any mutual connections. So far, 11 architectural features have been given a new number: S (=structure) 1 to 11; the following is a concordance list for the NSB numbers from previous reports: NSB 1.1 = S1, NSB 1.2 = S7, NSB 1.3 = S8, NSB 2 = S2, NSB 3 = S3, NSB 4 = S4, NSB 5 = S5, NSB 6 = S6.

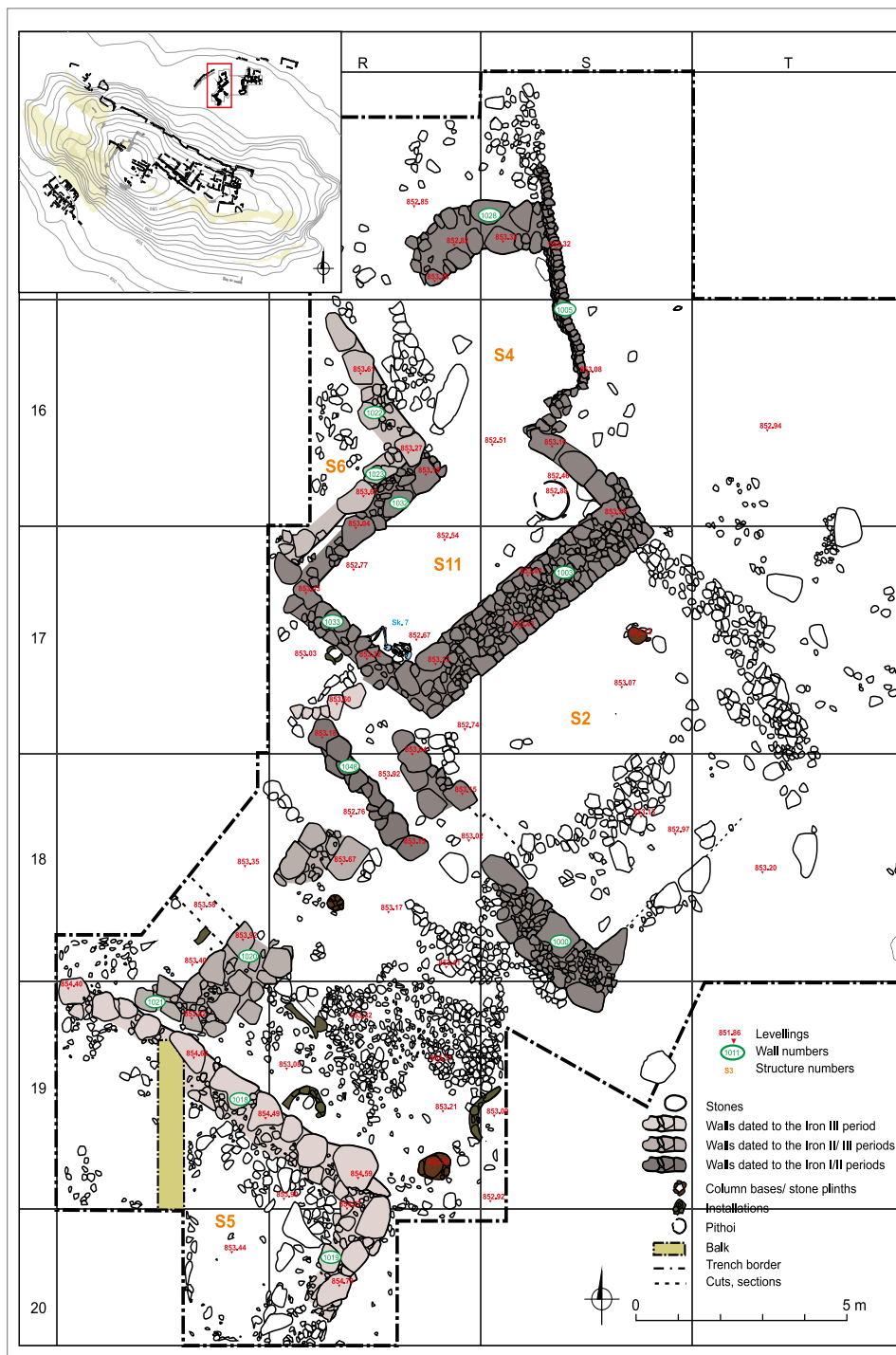


Fig. 2. Western part of the excavation area (sector VIII) (PCMA UW Metsamor Project/ drawing M. Iskra)

the skeleton lying in a foetal position, but with the bones of both hands unnaturally twisted and bent backwards, still gripping iron knives which the man had used to defend himself. Another skeleton (No. 6)

was found in square C15. The deceased was a young male lying supine with bent legs [Fig. 3]. The upper parts of his skull as well as the feet bones were missing. The finds near the skeleton included two



Fig. 3. Skeleton No. 6: top, the skeleton *in situ* in square C15; bottom, two Urartian fibulae, fragmentary ring, knife blade; on right, “Scythian” arrowhead found among the bones, all objects of bronze (PCMA UW Metsamor Project/photos T. Adamowska, M. Iskra and T. Zakyán)



bronze fibulae, iron forceps, a knife and a sickle. The fibulae, U-shaped in form with straight needles, can be classified as Urartian jewelry. Similar artifacts were found also in an Urartian grave (No. 4) in the Metsamor cemetery (Khazadzyan, Mkrtch'yan, and Parsamyan 1973: XL. 4,5).

The space between structures S5 and S2, south of S11 (squares R18/R19) turned out to be a partly stone-paved, open courtyard or square between buildings, evidently constructed on top of the Iron Age I settlement and dated by the assemblage, e.g., red-polished Toprakale Ware from the mid-7th century BC, to the Urartian period. This material was discovered together with a local pottery assemblage that could be linked to an earlier production associated with the Lcheshen-Metsamor 5 and 6 pottery horizon. These ties with an earlier tradition widespread across the Ararat plain (Avetisyan 2009: 62–65) indicate

a cultural and technical production continuity of the potter's craft at Metsamor. The paved floor was still in use, in spite of some damage to its substance, when structure S5 was constructed. The latter structure, not fully recognized yet, can be dated to the Iron Age II period or Urartian times as attested by radiocarbon dates for a carbonized wooden beam found close to the pavement (<sup>14</sup>C age of 2450 ± 60 BP calibrated against the IntCal13 atmospheric curve produced a calibrated age of 764–409 BC [2 sigma range]) [Fig. 4].

Most of the effort in the 2017 season was focused on the eastern part of the settlement in squares A17, B15–B16, C15–C17, D15–D17 [Fig. 5]. Structures S1, S7, S8 and S9 were tested to fill out and verify the chronological sequence, concentrating for the most part on structure S1, which was identified earlier as a kind of pit house, that is, a dwelling

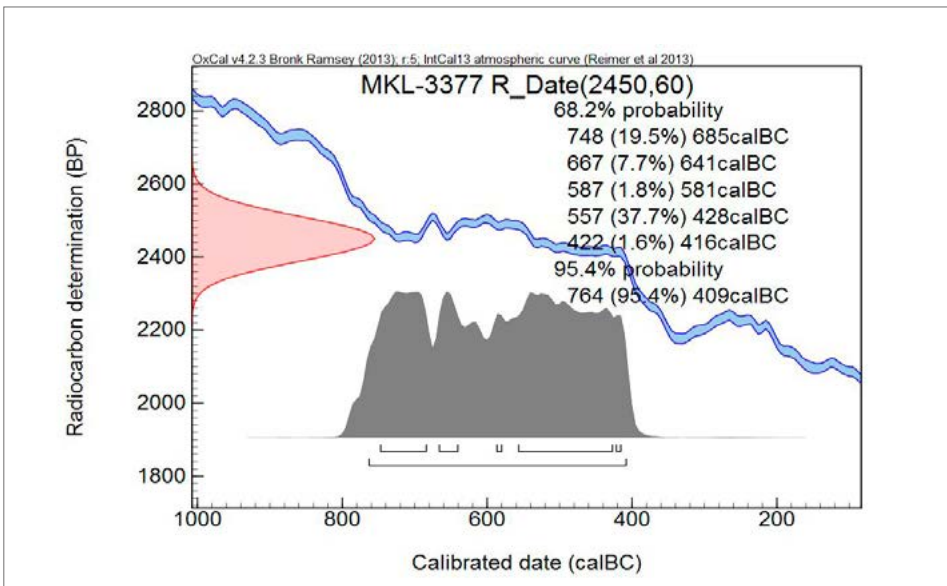


Fig. 4. Radiocarbon dating chart for a carbonized wooden beam from structure S5

structure partly sunk in the ground, for storing goods.<sup>2</sup> Two clay floor levels were recorded inside the structure. The upper floor level, which was already unearthed during the 2013 and 2014 seasons (Jakubiak et al. 2016: 564, 565), corresponded to a stone installation situated against the south wall (context 1004) of the structure, consisting of four pumice mortars and two large basalt breadboards. Four

pumice plinths were found in the center of the excavated room; they must have supported the wooden beams holding up the roof of the building. Scattered around the installation were numerous broken vessels and fragments of burnt beams, attesting to a violent destruction.

An earlier floor level was found approximately 20–30 cm below the above-described floor [Fig. 6]. A large pithos,

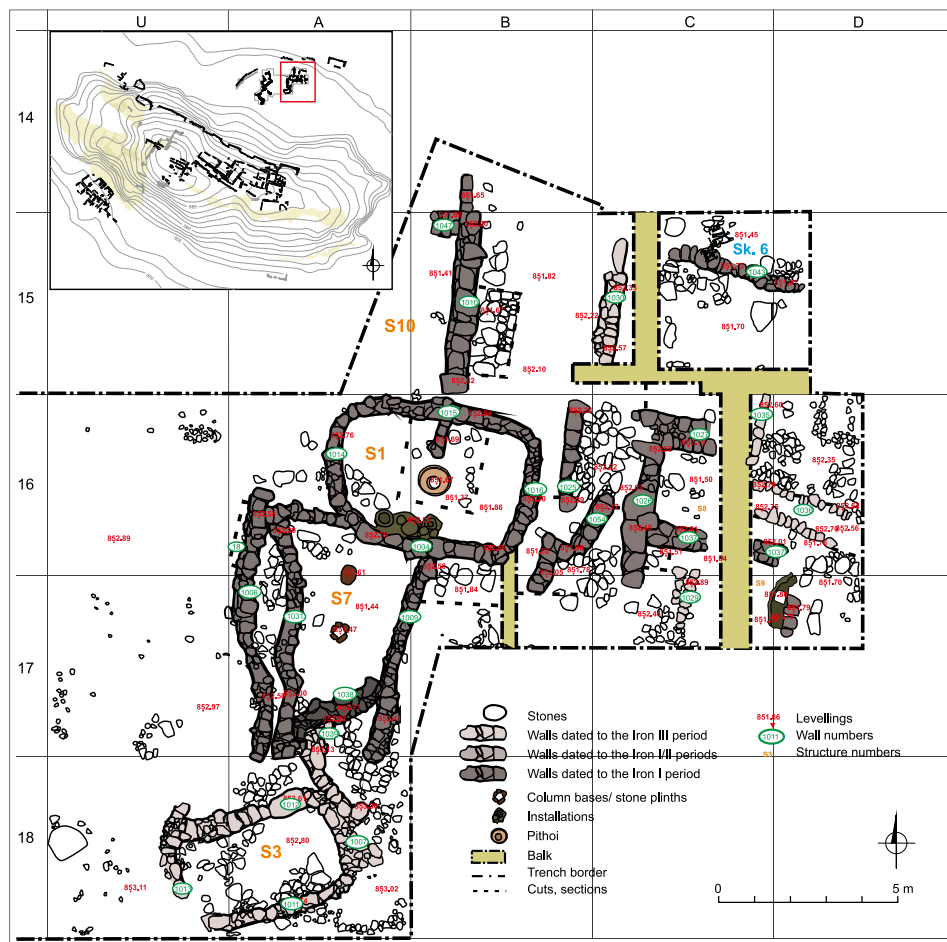


Fig. 5. Eastern part of the excavation area (sector IX) (PCMA UW Metsamor Project/drawing M. Iskra)

2

These types of structures were widespread across the southern Caucasus starting from the Bronze Age; Late Bronze/Iron I and II examples include Khanlar (Baxseliyev 2007: 192), Azatan (Mauermann 2015: 14), Keti (Petrosyan 1989: 28–31), Tsaghkahovit and Gegharot (Badalyan, Smith, and Khatchadourian 2010: 268), Karmir Blur (Sorokin 1958).

measuring 83 cm in diameter, occupied the center of the room, directly under the pumice plinths. It was sunk into the floor with only the uppermost part, decorated by a wide band of wavy lines at the top, visible above the ground. The pithos is a characteristic form of the so-called Lchashen-Metsamor phases 5 and 6. Other forms of table and cooking ware vessels from the area are paralleled by

finds from the Iron Age settlements of Dvin (Kušnareva 1977: Pls IX.1,2 XXIX.1), Elar (Khanzadyan 1979: Pl. XX), and Shirakavan (Torosyan, Khnkikyan, and Petrosyan 2002: Pls LIX–LXVIII), as well as mortuary contexts from the same period, e.g., Talin (Avetisyan and Avetisyan 2006: Pls 40–55). Fragments typical of pottery produced in the Urartian period (early 8th/mid-7th century BC) in the Van re-

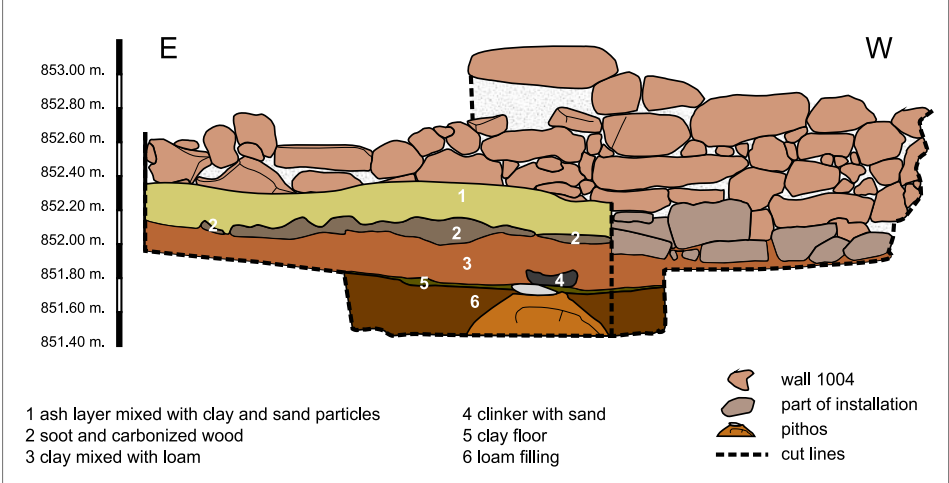


Fig. 6. Large pithos inside structure S1: top, view from the north; bottom, section through the room and the pithos feature (PCMA UW Metsamor Project/photo and drawing M. Iskra)

gion merit special attention among the locally made wares [Fig. 7].

A longitudinal stone structure, S7, was attached to the south wall of building S1 (context 1004) [Fig. 8]. It was slightly trap-ezoid in plan, 5.70 m by 3.10 m, built of small and middle-sized irregular stones. Considering its character, it would have been sunk partly into the ground. Its relatively large size required at least two wooden pillars to support the roof. The only surviving evidence of the wooden posts are the circular stone structures that reinforced the beams at the base.

A kind of ramp built of stones, uncovered in the southern part of the chamber, led down into the building interior. This ramp presumably took advantage of standing ruins, conveniently using them as an entrance to the pit house located upon earlier architectural remains, which were most likely

too difficult to remove. The ramp could have been plastered with clay, which would have made the way in quite comfortable. It could have also been used by the animals kept in the building. The construction was most probably similar to the pit houses from Armenia known from Xenophon's account in *Anabasis* (IV,5).

The accumulated deposits inside the structure indicated at least two exploitation phases in S7 (chronologically corresponding with the two floor levels unearthed in S1). The building was probably a dwelling house at first and became a dump site after it was deserted. The pottery material from both levels was similar, but the sherds found on the upper floor level inside S7 resembled the tableware fragments recorded on the lower floor level of structure S1. It is likely that units S1 and S7 once formed a relatively large dwelling complex compared

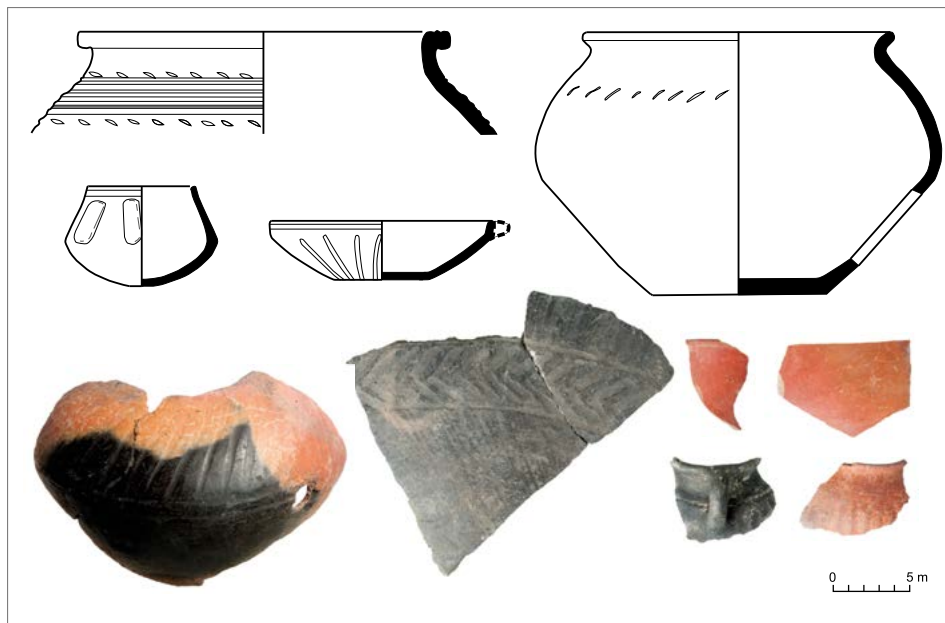


Fig. 7. Pottery from Iron I and Iron II Ages from the eastern part of the excavation area (PCMA UW Metsamor Project/photos E. Bastien, drawing D. Gawlikowska)





Fig. 8. Structure S7, view from the south (PCMA UW Metsamor Project/photo O. Bagi)



to the other structures of the settlement. The organic waste that accumulated inside the abandoned structure comprised a large number of animal bones, mostly of cattle and small domestic ruminants, that is, sheep and goat. Considering the anatomical and species distribution, as well as attested chopping, cutting and generally dismembering marks, it should be assumed that the deposit was the result of a relatively long process of accumulation of meat consumption waste.

Structures S8 and S9 were uncovered in an extension of the trench dug east of the S1 and S7 complex (squares C16/C17, D16/D17). These were apparently chambers belonging to a single building constructed on the other side of a narrow street separating it from the S1/S7 complex. The building technique in the case of these two units dif-

fered from that of the architectural structures discovered so far in Metsamor. It was a casemate-like wall (e.g., context 1027), the space between the stone faces being filled with highly compacted clay, sometimes mixed with small pebbles. The structure should probably be associated with an apparent stone pavement (context 1025) by the west wall of the building (Jakubiak et al. 2017: 560). The S8/S9 building is intriguing not only because of the unusual wall construction. The assemblage of artifacts discovered inside is also interesting in view of the relatively thick deposit of intensively burned ashes accumulated mostly on the floor in S9 and in the upper layer of S8. Some fragments of small fineware jars were brought to light near this deposit. Moreover, a crescent-shaped installation of clay was discovered inside chamber S9



Fig. 9. Clay installation in structure S9: left, view from the south; right, clay stamp seal, underside and side view (PCMA UW Metsamor Project/photos K. Kasperkiewicz, T. Zakyán)

[Fig. 9]. Its shape suggests use as an andiron or quern basin (Badalyan et al. 2014: 182, Fig. 18). A flat longitudinal object made of basalt with semicircular endings found inside the installation was a quern stone or grinder usually used for bread-making. The bakery idea was further supported by the discovery of a flat circular stamp seal made of clay with a cross motif as decoration. Other contexts where similar stamp seals were discovered (Khanzadyan, Mkrtch'yan, and Parsamyan 1973: Figs 134, 135; Badalyan et al. 2014: Fig. 22, 8–9) indicate that these objects were used in all likelihood for marking sacral bread. Thus, the object from S9 may have been used in cultic practices performed in Metsamor; consequently, the partly excavated chamber S9 could be interpreted provisionally as a place of some religious meaning: a sanctuary or shrine of some kind. An extension of the trench to the southeast should resolve this issue.

The northern part of the alleged shrine was overlain by a large stone structure, which was preserved at the wall foundation level, directly under the ground surface in this part of the site. It should be associated with the last occupation phase in this part of the settlement. Remains of the walls and pavements from this phase, dated to Iron Age III, have already been discussed in earlier reports (Jakubiak et al. 2016; 2017).

Two other stone structures (separated by wall 1010) were uncovered north of the described remains (squares B15, C15). An analysis of the stratigraphy indicated that this architecture, which was better built and more solid, was earlier in date than the structures described above. It is also evident that these early structures were reused in a later period. At least

five stone walls from this early phase of site occupation have been recorded at Metsamor so far and the pottery finds show that they could have been constructed during the Early Iron I period. The regularity of these remains suggests that the settlement from before the Urartian invasion was well organized and even better planned than in later times when the Urartian Kingdom incorporated the Ararat plain into its dominion.

The apparent regress in architectural sophistication at Metsamor during the Urartian period is surprising in view of the conviction that the Urartians were bearers of civilization and progress to the proto-state societies that were believed to be less civilized. In this context, the roughly constructed pit houses of Metsamor are entirely unexpected. Perhaps simply the Urartians did not settle Metsamor.

Similarities of architectural tradition can be observed with the numerous small settlements from the Early Iron Age I in the Aragats massif. At Gegaroth, which is earlier than Metsamor, similar structures were dated to the Late Bronze Age. At other sites, like Argatsi-Berd and Keti, the architectural remains, including similar pit houses, were most probably contemporaneous with the Urartian-period structures from Metsamor. The evolution of building strategies and structures between the Iron Age I and II periods may be interpreted as a consequence of a shifting population, with people migrating from small villages like those in the Aragats area to the valley of the Aras, bringing with them their own architectural traditions and building skills. In effect, the earlier proto-urban Metsamor was downgraded in the period of Urartian

dominance into a village with numerous pit houses representing an architectural regress. Separating the two phases was a settlement hiatus, which ceased with the arrival of human groups coming from

the Aragats area or from the Shamiram plateau. Another possibility is that the Urartians dislocated local communities and settled people from the mountain region in the fertile land of the Aras valley.

## CEMETERY

Continued work in the cemetery area comprised exploration of another kurgan. The burial structure was recorded as kurgan XIX (following Khanzadyan's numbering system, see Khanzadyan 1995: 1). The stone chamber was oriented NE–SW. It was of a trapezoid shape, measuring 4.30 m by 2.40 m [Fig. 10]. An earthen mound of soil mixed with small stones and pebbles, approximately 8 m in diameter, once covered the chamber, but virtually nothing remains of this structure apart from a partly preserved stone circle. Inside the chamber there were two burial levels separated by a 20-cm-thick layer of small stones and pebbles. This layer was probably same with the fill of the kurgan mound. The lower deposit was 20 cm thick and is associated with the initial phase of tomb construction, while the upper deposit, recognized more than dozen centimeters higher, was formed after the mound had been destroyed and should subsequently be associated with a re-arrangement of the original chamber. During the second phase of the tomb usage, a large basalt stone slab divided the chamber into two parts, forming two smaller cist graves (1.95 m by 2.40 m and 1.70 m by 2.40 m respectively).

Both burial levels were considerably affected by the long usage of the chamber and the post-depositional processes. It is almost impossible to reconstruct the ar-

range of particular burials and to estimate the number of buried individuals. The upper level revealed a huge quantity of fragmented human bones, including skull parts, collected in two spots close to the northeastern and southwestern corners of the chamber. Interspersed among the bones were seven bronze bracelets, various stone beads, a bronze earring and pottery sherds. Three bracelets with serpent-headed terminals, which are frequent in graves from the Urartian/Iron II periods (Khanzadyan, Mkrtch'yan, and Parsamyan 1973: Pl. XL,1–3; Esayan and Kalantaryan 1988: Pls LXIX,1,2 and XCI-II,3), supply a date for the upper burial level.

The lower deposit, which can be roughly dated to the LBA III/Iron I period (13th–9th century BC), yielded the remains of human and animal bones, as well as personal ornaments scattered mostly in the center of the chamber. It may be postulated on the grounds of this evidence that the burial in this level was less collective. The presence of horse skulls with bronze harness parts and, especially, five golden beads and a golden pendant indicate that the chamber was built for a rich member of the town elite. No larger artifacts were found, hence it is likely that the burial was robbed in antiquity previous to the installation of the Iron II interments. A pendant made of

golden sheet with an embossed ornament in the shape of four spirals is worth noting from this earlier level. Golden pendants having four spirals made of golden wire were found in Shirakavan (Toros-

yan, Khnkikyan, and Petrosyan 2002: Pl. XXXII,18), Lori Berd (Devedjyan 2006: Pl. IV,4) and in Lchashen (Kalantaryan 2007: Pl. 36).

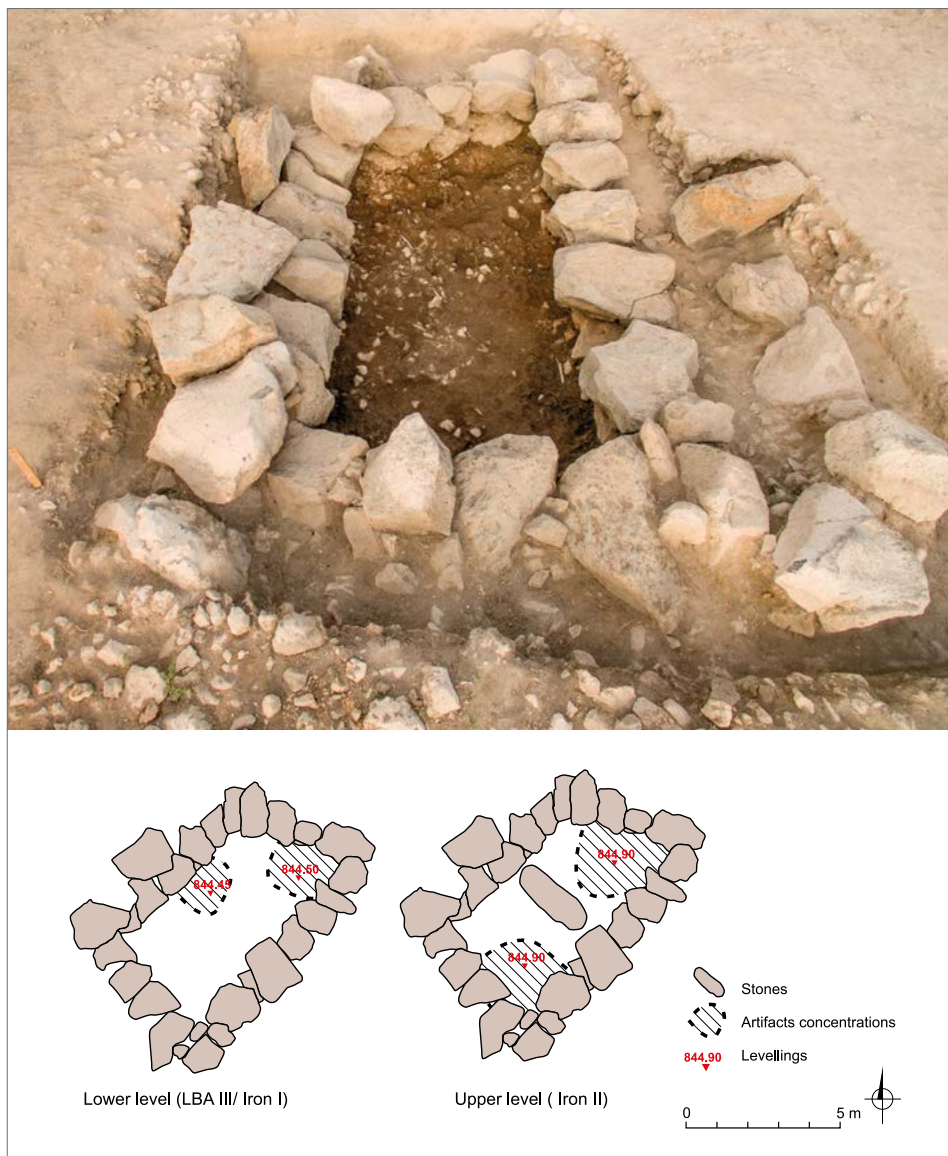


Fig. 10. Chamber of kurgan XIX: top, view from the southwest, during exploration; bottom, plans of the lower and upper burial levels (PCMA UW Metsamor Project/photo M. Truszkowski, drawing M. Iskra)

## CONCLUSIONS

Concluding upon the results of the latest season in the field, the most important finding undoubtedly is the changed layout and character of the settlement at the beginning of the 1st millennium BC. It is now clear how the earlier proto-urban arrangement of the city was destroyed and then resettled by newcomers. These may have been hypothetically people from

the mountain regions, who would have brought with them the pit houses previously unknown at Metsamor that now occupied the central part of the site. This village-like settlement arrangement functioned most probably during the Urartian period. It cannot be excluded, of course, that for whatever reason the pit houses were built only in a part of the site.

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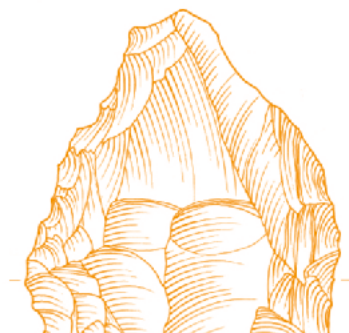
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# Second season of prehistoric investigations in the Qumayrah Valley, Oman



**Abstract:** In the second field season of the Omani–Polish Qumayrah Archaeological Project, the prehistoric leg of the team conducted investigations of previously discovered lithic sites in the vicinity of Al-Ayn village. This paper summarizes the results of archaeological testing at three open campsites codenamed Qumayrah-Ayn (QA) 2, QA 6 and QA 12. The investigations provided new evidence of intensive Stone Age settlement of the Qumayrah Valley (also known as Wadi Fajj). The data, comprising lithic tools and some shell and stone beads, indicate that the occupation of these sites should be dated to various stages of the Neolithic period.

**Keywords:** new prehistoric sites, Neolithic, Qumayrah Archaeological Project, Oman

Prehistoric investigations in the region of Qumayrah, located in the Hajjar Mountains in inland northern Oman (Al-Dhahirah Governorate, Wilayat Dank), figure as part of a broader University of Warsaw Omani–Polish archaeological project initiated in 2015 headed by Prof. Piotr Bieliński. The project is a joint undertaking of the Polish Centre of Mediterranean Archaeology, University of Warsaw and the Department of Archaeology and Excavations, Ministry of Heritage and Culture, Sultanate of Oman.

A few dozen new archaeological sites located in, and around, the wide, southern entrance to the Qumayrah Valley were discovered in the course of the field surveys carried out in previous seasons. Seven of these sites hail from the Stone Age. Restricted testing at one of them, QA 2, in 2016 confirmed it to be a site that was

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### **Team**

The prehistoric sub-project is part of the Omani-Polish Qumayrah Valley Project directed by Prof. Piotr Bieliński (Institute of Archaeology, University of Warsaw).

*Dates of work:* 4 November–16 December 2017

*Sub-project Director:* Dr. Marcin Białowarczuk, prehistorian/archaeologist (Institute of Archaeology, University of Warsaw)

*Omani representative:* Sulaiman Al-Jabri (Department of Archaeology and Excavations [Bat office], Ministry of Heritage and Culture, Sultanate of Oman)

*Archaeologist/documentalist:* Agnieszka Szymczak (PCMA University of Warsaw)

*Archaeologist/surveyor:* Magdalena Antos (freelance)

*Documentalists:* Marek Puzzkarski, drawing (PCMA University of Warsaw), Adam Oleksiak, photography (freelance)

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at least partly stratified (Białowarczuk 2017). The 2017 season of fieldwork focused on a more detailed reconnaissance of the Stone Age occupation in the region. In particular, the work involved the extension of the excavation area at QA

2, which seems to be the largest and the best preserved of the registered Neolithic sites, as well as minor testing at QA 12 [Fig. 1], one of the sites that yielded the most interesting lithics discovered during the survey.

## EXCAVATIONS AT QA 2 IN 2017

Site QA 2 is the largest and the best preserved Stone Age site discovered so far in the Qumayrah Valley. The geographical coordinates of its center point are N 23°52'26.72" E 56°11'08.70". Remains of a campsite are situated on a flat terrace on the bank of a seasonal river bed, about 573 m ASL, making it an excellent observation point of the wide valley extending to the south (Białowarczuk 2017: Fig. 2). A reconnaissance in the autumn of 2016 (see Białowarczuk 2017) showed the site to be strongly deflated, yet with

a sizeable cultural deposit still extant in some parts. The current objective was to enlarge the excavated area to investigate whether the well preserved stone hearth and stone platform discovered in the previous season marked the presence of other structures in this part of the site. Another issue of interest was the actual extent of the site.

The principal area of excavation thus included four neighboring trenches with a total surface area of 70 m<sup>2</sup>. Fitted within a site grid, they were situated in quarter

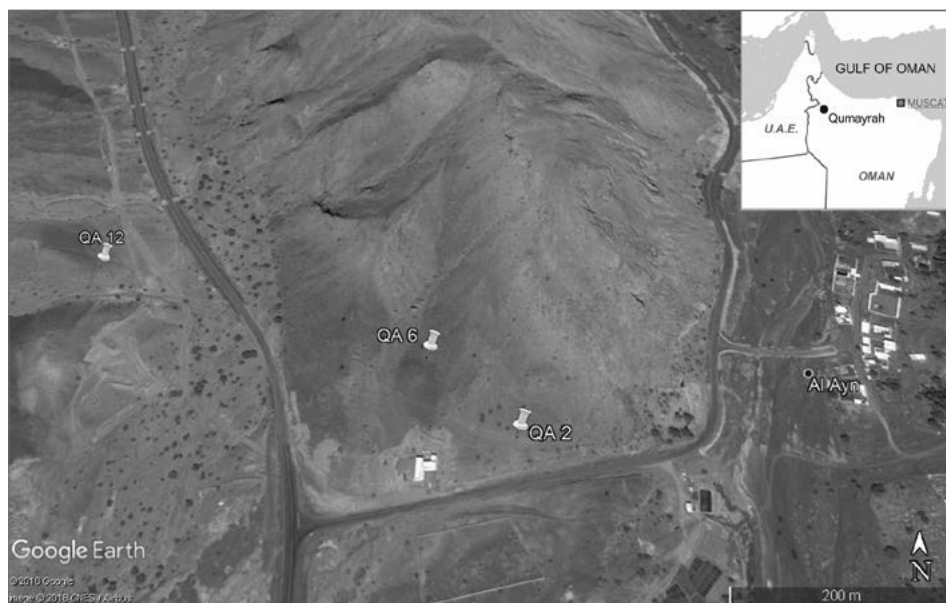


Fig. 1. Location of the study area (inset) and position of sites discussed in the text in the vicinity of the Ayn Bani Saed village (based on Google Maps; drawing M. Puszkarski, editing M. Momot)

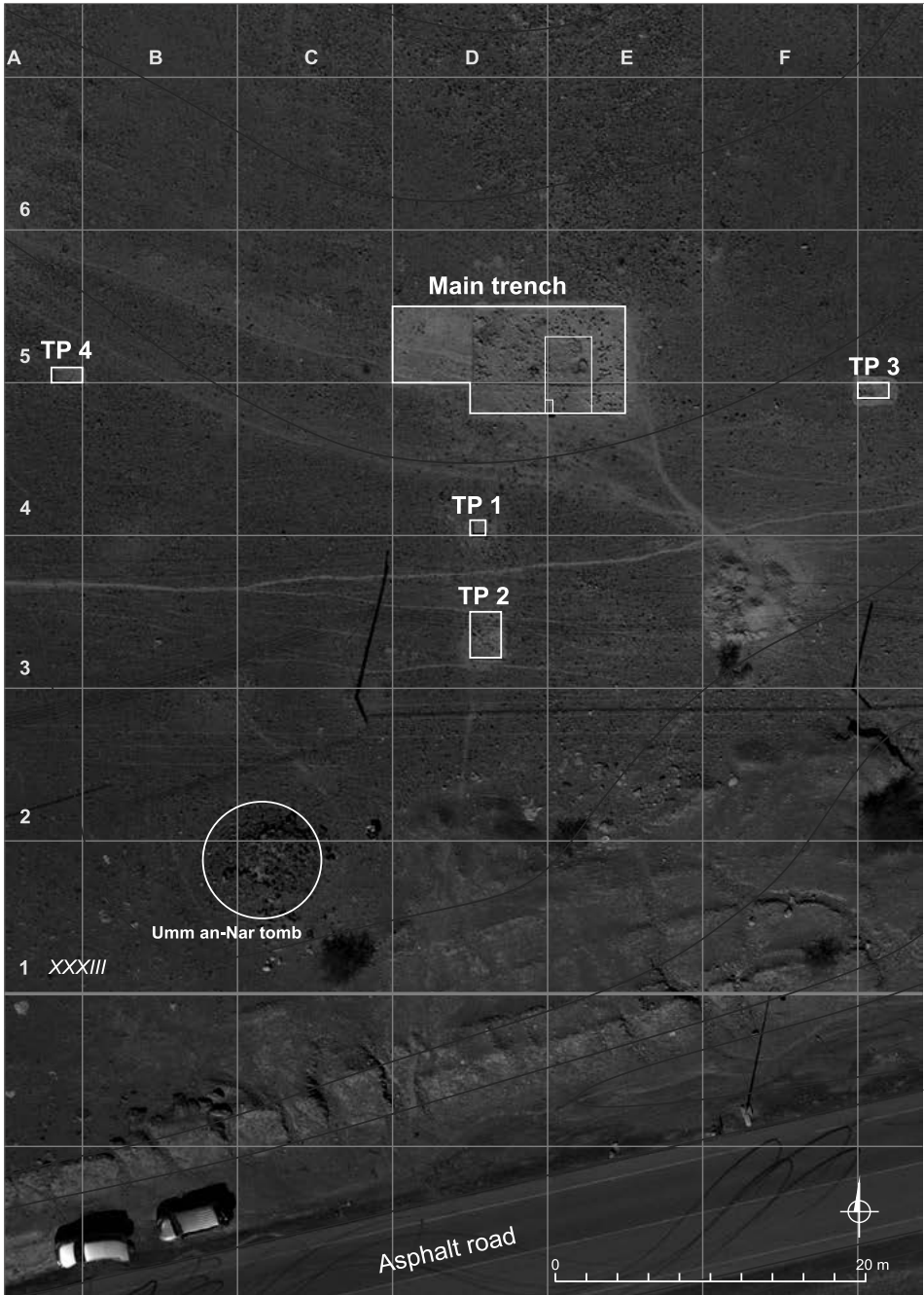


Fig. 2. Top view of site QA 2 with superposed site grid and placement of trenches excavated in 2017 (based on Bing Maps, processing M. Antos, M. Momot)



'd' of square XXXIII-d-5, quarter 'c' of square XXXIII-e-5, the northern part of quarter 'b' of square XXXIII-d-4 and the northern part of quarter 'a' of square XXXIII-e-4. Additionally, four test pits (TP 1–4), initially 1 m by 1 m in size, were dug on the southern, eastern and western fringes of the site. TP 1 and TP 2 were both dug south of the main trench, in line and aligned north–south with respect to it, while TP 3 and TP 4 were located, respectively, on the eastern and western slopes of the terrace [Fig. 2].

Fieldwork in the central trenches confirmed the idea, formed by the excavators in the wake of the first season's results, of further stone structures existing at the site. Remains of a circular shelter (Locus 1) were discovered immediately southeast of the best preserved hearth (context 005) discovered in 2016. The out-

line of the shelter, measuring approximately 3 m in maximum diameter, consisted of a double row of cobbles [Fig. 3]. The western part of the excavated area yielded also a presumed usage level with a few badly destroyed stone installations (contexts 017 and 019) and ashy deposits (contexts 008, 009, 016, 018, 029 and 030). A fair number of artifacts in the form of, predominantly, lithics, came from this usage level, with rare fragments of marine shells as well as single stone and shell beads being recorded as well.

This cultural deposit accumulated on a slightly sloping terrace. Its maximum thickness was observed in the central part of the site (in the main trenches and in TP 1); it disappears gradually towards the southern and eastern edges of the terrace, yet some traces of stone installations and a hearth were discovered there as well.

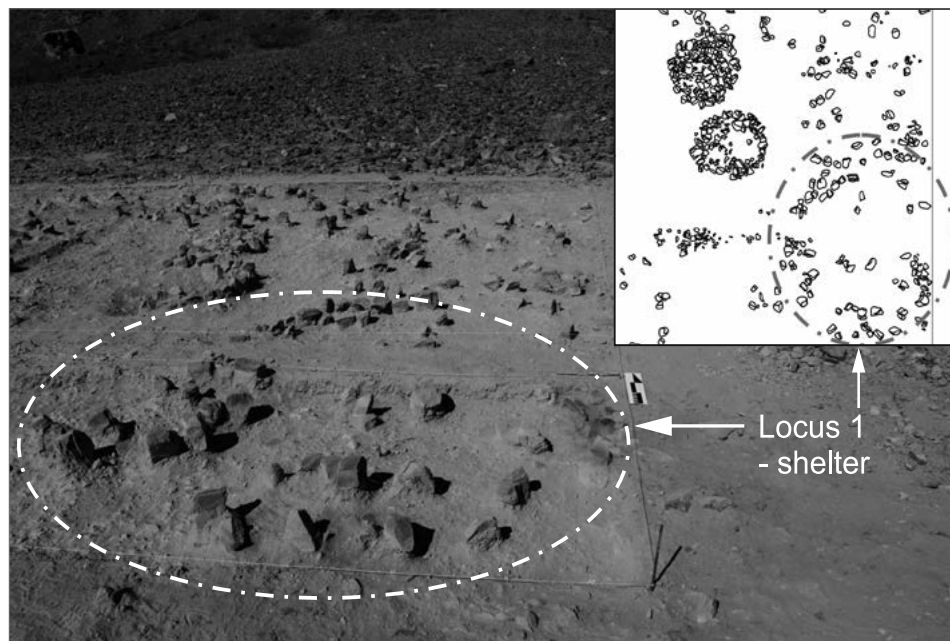


Fig. 3. Remains of a double row of cobbles forming the wall of a circular shelter Locus 1; inset, plan of Locus 1 and neighboring structures (PCMA Qumayrah Project/photo and drawing A. Szymczak)

As in the main excavation area, the structures were set on bedrock. In TP 2, they were covered by a thin cultural deposit,

in TP 3 by nothing but surface stone rubble. The westernmost trench, TP 4, was opened in the middle of the terrace slope.

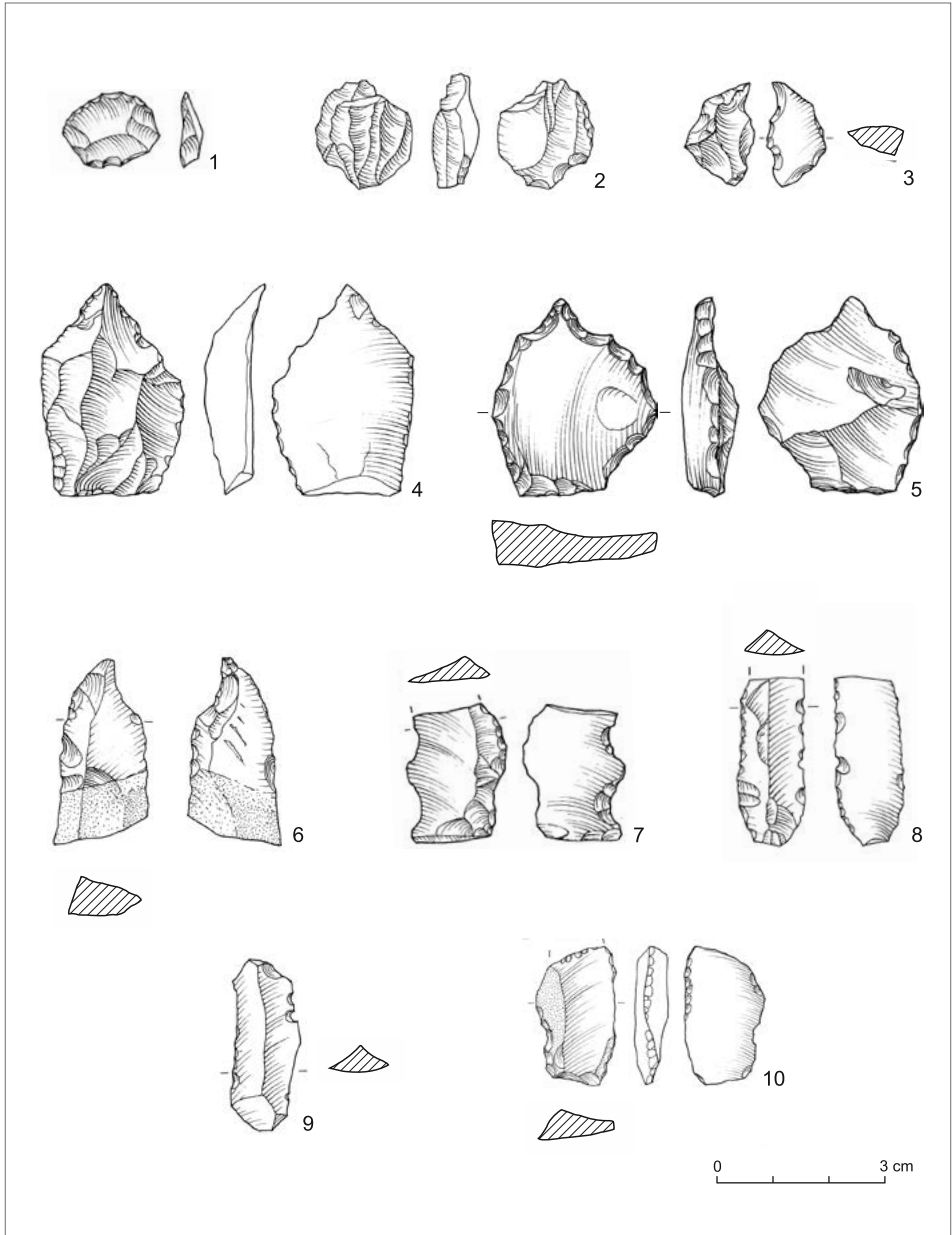


Fig. 4. Lithics from QA 2: 1, 10 – sidescrapers; 2 – splintered piece; 3–5 – perforators; 6 – borer; 7 – notched piece; 8, 9 – retouched blades (PCMA Qumayrah Project/drawing M. Puzskarski)

It contained only stone rubble washed down towards the bottom of the nearby small “wadi”. As no archaeological material was forthcoming, it clearly indicates that the original range of the QA 2 site was limited to the flat part of the terrace and was less extensive than first supposed. The surface scatter of worked lithics, covering an area of about one hectare, is thus rather a confluence effect, while the actual size of the campsite was about 0.30 ha. Several circular stone alignments visible on the surface in this area may in fact turn out to be the remains of further installations or other archaeological features.

Detailed planigraphy of the finds showed an even saturation throughout

the area under exploration, without any special clustering. This indicates regular, although temporary, human activity in the described area.

### LITHIC ASSEMBLAGE

Although the extension of the excavated area resulted in a much larger number of lithic artifacts for analysis, it did not significantly affect the general characteristic of the flint industry. Analysis of 2139 lithics from the current season, including 63 core forms, 159 blanks, 427 retouched tools and 1490 pieces of various waste debitage, confirmed earlier observations made on this assemblage (see Białowarczuk 2017). The most characteristic features are:

▷ using local sources of raw materials, mostly flint and radiolarite;

▷ coexistence of flake and blade techniques, with domination of simple direct hard hammer percussion and rare indirect percussion;

▷ domination of simple retouched tools produced by direct-scaled retouch, with fair occurrence of various sidescrapers [Fig. 4:1,10], end-scrapers [Fig. 5:2,3], retouched flakes including notched pieces [Figs 4:7, 5:4], retouched blades [Fig. 4:8,9], perforators [Fig. 4:3–5] and borers [Fig. 4:6], splintered pieces [Fig. 4:2], accompanied by rare tanged projectile points made on flakes [Fig. 5:5] and combined tools [Fig. 5:1].

The presence of a few projectile points within the context of a temporary stone structure is indicative of early Neolithic occupation (Białowarczuk 2017). The typological list of tools of the site was complemented with some occasional specimens of a different type [Table 1].

Table 1. Typological list of tools identified in 2017 at sites mentioned in the text

Tool types	QA 2	QA 6	QA 12
End-scrapers	22	2	1
Sidescrapers	101	7	10
Retouched flakes	153	5	8
Notches	23	1	3
Burins	2	–	–
Backed blades	1	–	–
Retouched blades	38	5	5
Perforators	52	2	2
Borers	7	–	1
Combined tools	6	–	1
Points	1	1(?)	3
Bifacial foliates	2	–	–
Splintered pieces	19	1	1
Total	427	24	35

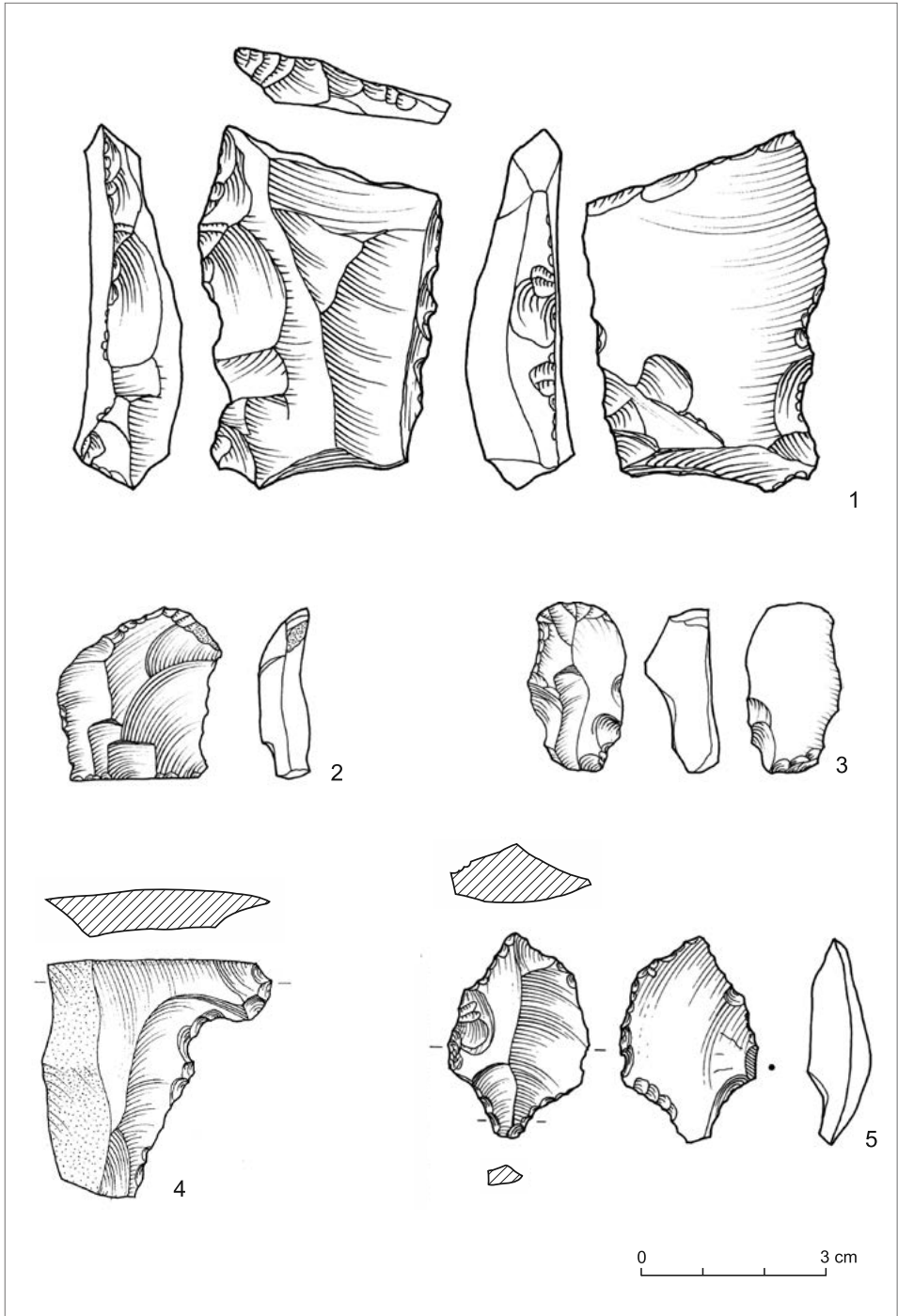


Fig. 5. Lithics from QA 2: 1 – combined tool: sidescraper and perforator; 2, 3 – end-scrapers; 4 – notched piece; 5 – tanged point (PCMA Qumayrah Project/drawing M. Puskarski)

They came from the deflated surface and subsurface contexts, and indicated a much later stage of occupation of the site as well. Among them are bifacial foliated pieces: one large fragment of unidentified function [Fig. 6:1], and smaller fragments of implied fusiform points [Fig. 6:2]. Linking the latter finds with fusiform points results from the fact that four other forms of this type, including two complete ones [Fig. 6:3], were found at the site of QA 1, which is mostly occupied by an Umm al-Nar period cemetery, located directly beside QA 2 (Rutkowski 2017). These complete forms are short and wide, of almond shape, biconvex section, straight convergent edges and V-shaped base. Similar examples are known from Wadi Dhahr in Yemen (Kallweit 2003; Fig. 4:14). They are also reminiscent of fusiform points from Suwayh SWY-1 (Biagi and Nisbet 2006) and Mundafin (Edens 1982: Pl. 101, B.18). From a tech-

no-typological point of view they can be ascribed to type 1.B. according to the classification proposed by Vincent Charpentier (2008: 67). The appearance of the same type of foliated pieces and points on these two neighboring sites, currently separated by a modern asphalt road, seems to confirm the hypothesis about their being actually a single Stone Age site inhabited in different periods of prehistory (Białowarczuk 2017: 544). The presence of the above-mentioned bifacial foliates attests to the existence of a late Neolithic phase of occupation there (Charpentier 2008; Uerpmann et al. 2013).

#### SMALL FINDS

Of chronological significance is the appearance of an Akab-type tubular bead made of dark softstone (Charpentier and Méry 2008). One such bead, with its characteristic double-angled perforation, was

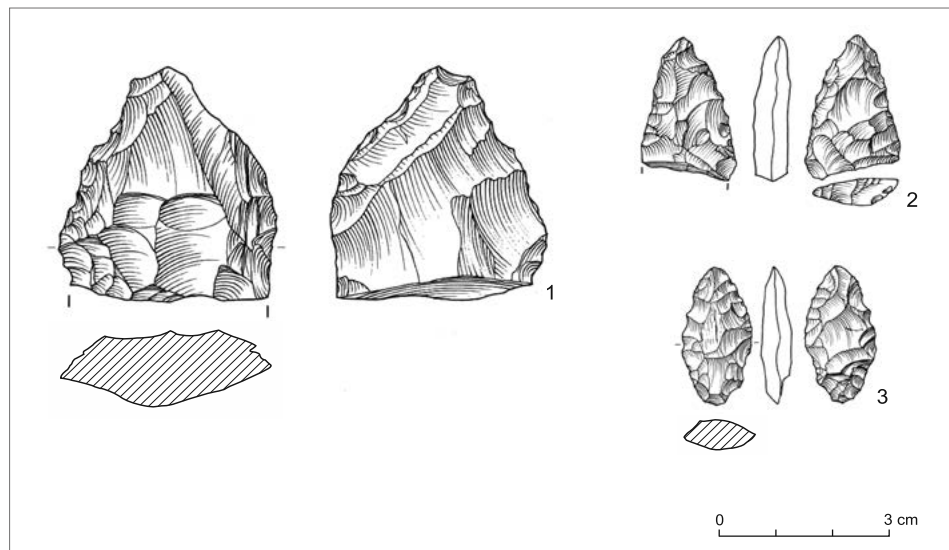


Fig. 6. Lithics: 1 – bifacial foliate from QA 2; 2 – point from QA 2; 3 – fusiform point from QA 1 (PCMA Qumayrah Project/drawing M. Puzskarski)



found at QA 2 [Fig. 7:2], whereas another one was picked up from the surface of QA 1 [Fig. 7:1]. Beads of this type have been found primarily in funerary contexts at coastal Neolithic sites in Oman and the United Arab Emirates dated to the 5th and early 4th millennia BC (Méry and Charpentier 2013: 77). The remaining small finds, comprising just a few objects, such as beads and marine shell fragments, are less chronologically indicative (e.g., a bead that was crafted from an *Olividae* sp. shell by removing the apex to obtain a hole [Fig. 7:3] could be dated much more

broadly to a period from at least the 5th millennium BC onward), although they also fit into a Neolithic framework.

### DISCUSSION

Both the bifacial foliates and the beads seem to be related to the late Neolithic period (see Charpentier 2008: 66–75; Charpentier and Méry 2008). The presence of marine shell fragments at a campsite in a mountain valley lying almost a 100 km from the shoreline is significant, as it proves some form of contacts between these two regions. Although

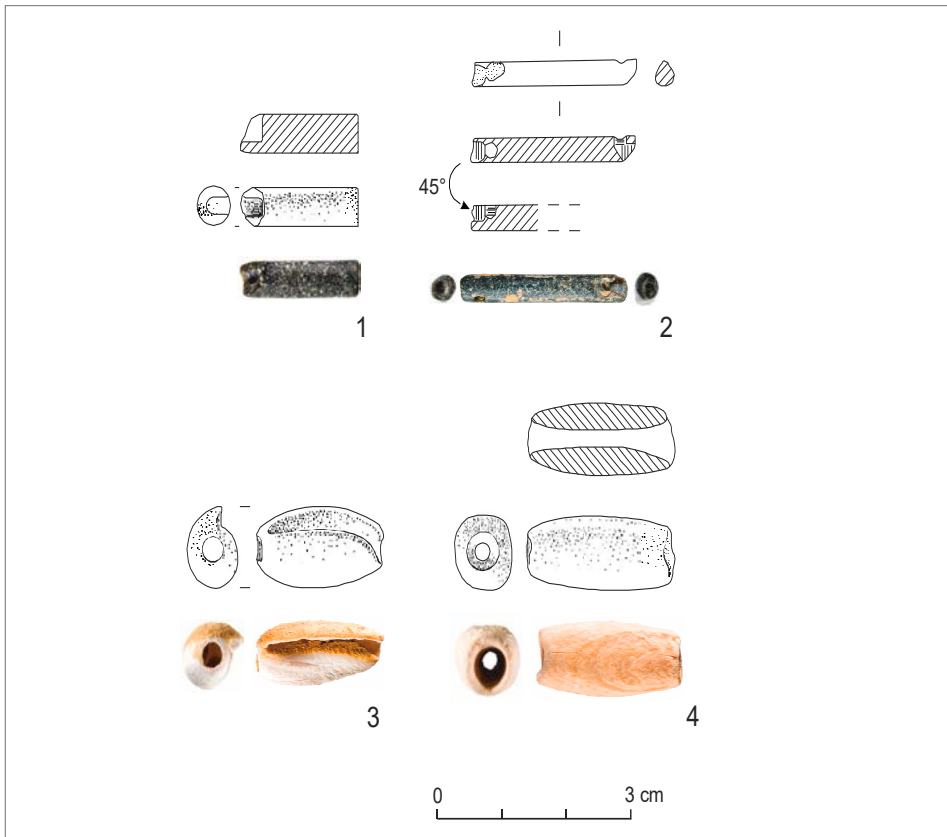


Fig. 7. Selected small finds: 1, 2 – stone tubular Akab-type beads from QA 1 (1) and QA 2 (2); 3 – *Olividae* sp. shell bead from QA 2; 4 – barrel shell bead from QA 6 (PCMA Qumayrah Project/ photos A. Oleksiak, drawings M. Momot and M. Puzkarski)

the character of these contacts is far from clear at this point, one possibility is related to a micro-nomadism model,

according to which human groups were moving seasonally from the coast to the mountains (Cavulli and Scaruffi 2013).

## SITE QA 6

Another site, QA 6, tested in 2016, is located just about 120 m northwest from QA 2 [see *Fig. 1*], with central geographic coordinates of N 23°52'29.03" E 56°11'05.20". It is also a campsite and covers a flat saddle of about 1000 m<sup>2</sup> between two hills. A small test pit (1 m by 1 m) was dug in the central part of the site, confirming the existence of an approximately 0.30 m thick deposit, similar to the one found on QA 2 [*Fig. 8*]. No structural remains have been discovered so far,

either on the surface or in the test pit.

The lithic assemblage consists of only 60 pieces, including five cores, 27 blank flakes, three blades, 24 retouched tools [see *Table 1*] and 13 pieces of waste debitage. It is characterized by the same simplicity as the assemblage from QA 2, but it is generally macrolithic. It includes mostly notched pieces [*Fig. 11:1*], sidescrapers [*Fig. 11:2,3*], retouched blades [*Fig. 9:1–4*] and denticulated pieces which could have been pre-cores [*Fig. 10:1,2*].

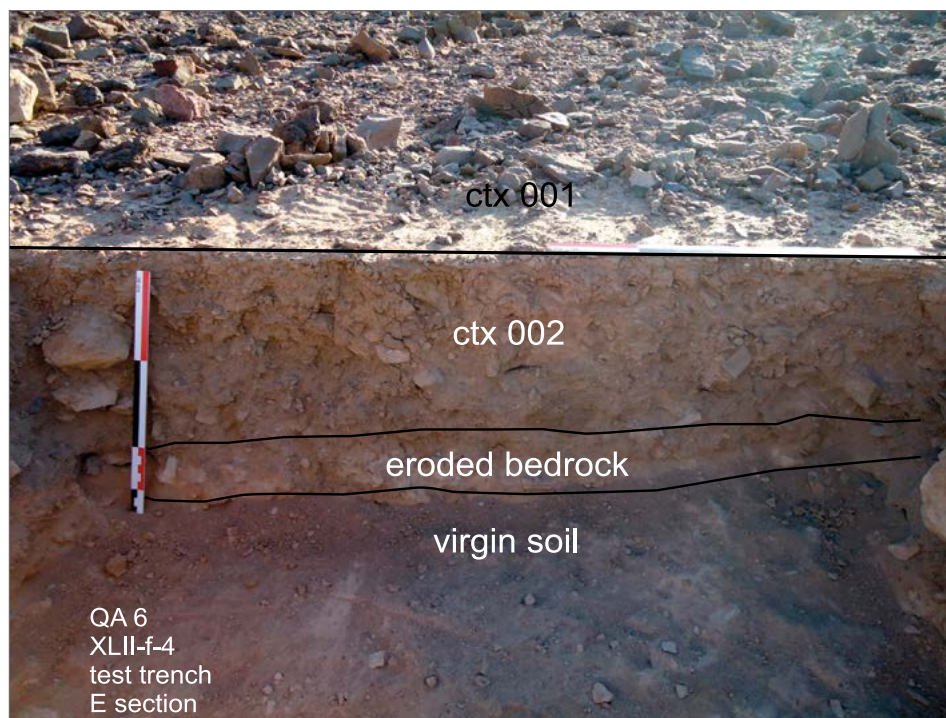


Fig. 8. East section of test trench at site QA 6 (square XLII-f-4) (PCMA Qumayrah Project/ photo M. Białowarczuk, processing A. Szymczak)

The character of the lithic assemblage from QA 6, scarce but fairly homogeneous, indicates a more temporary occupation of the site during only one period. From a techno-typological point of view, it seems to refer to the end of Neolithic occupation (Charpentier 2008: 75) with the nearest assemblages being from Suwayh SWY-2 and SWY-5 (see Char-

pentier 2008: Fig. 11), Wadi Shab (Tosi and Usai 2003: 12–14) and Ra's al-Hadd (Charpentier 2001).

QA 6 is the second Stone Age site yielding a marine shell artifact so far in the microregion of Qumayrah. An elongated barrel bead with biconical drilling was found on the surface [see Fig. 7:4]. It is also the most elaborate shell arti-

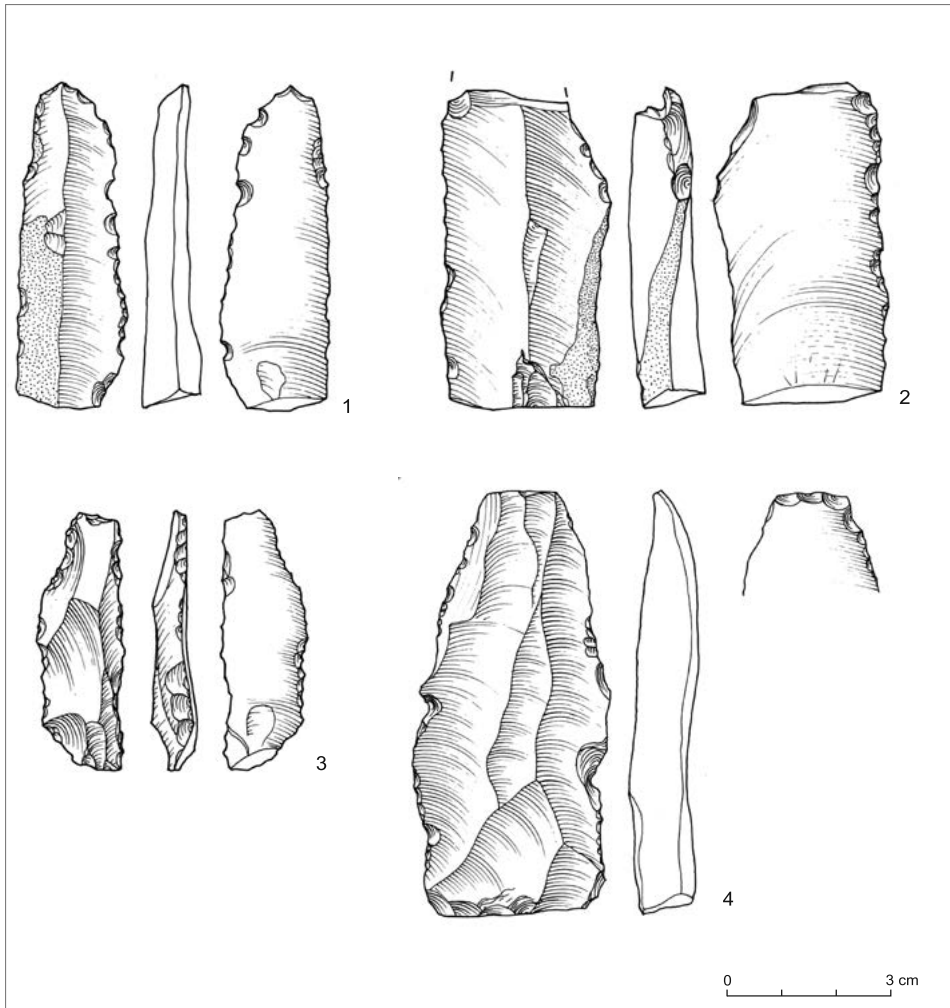


Fig. 9. Lithics from QA 6: 1–4 – massive retouched blades (PCMA Qumayrah Project/drawing M. PuszkarSKI)

fact found so far during the investigations. Parallels come from the Neolithic cemeteries of Buhais 18 and FAY-NE 15

(Beaclair, Jasim, and Uerpmann 2006: 179–180, Fig. 5; Kutterer and Beaclair 2008: 141, Fig. 14).

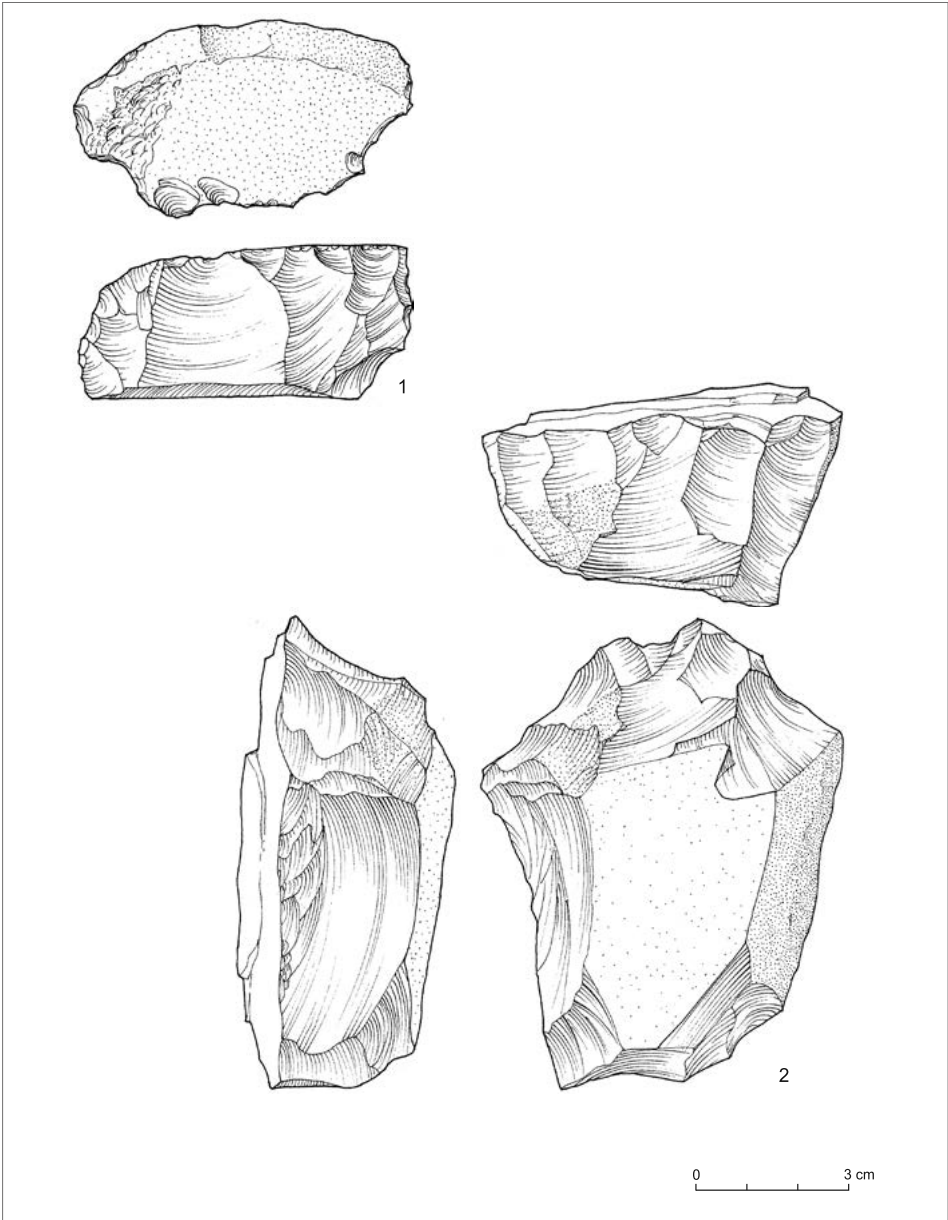


Fig. 10. Lithics from QA 6: 1, 2 – denticulates (PCMA Qumayrah Project/drawing M. PuszkarSKI)

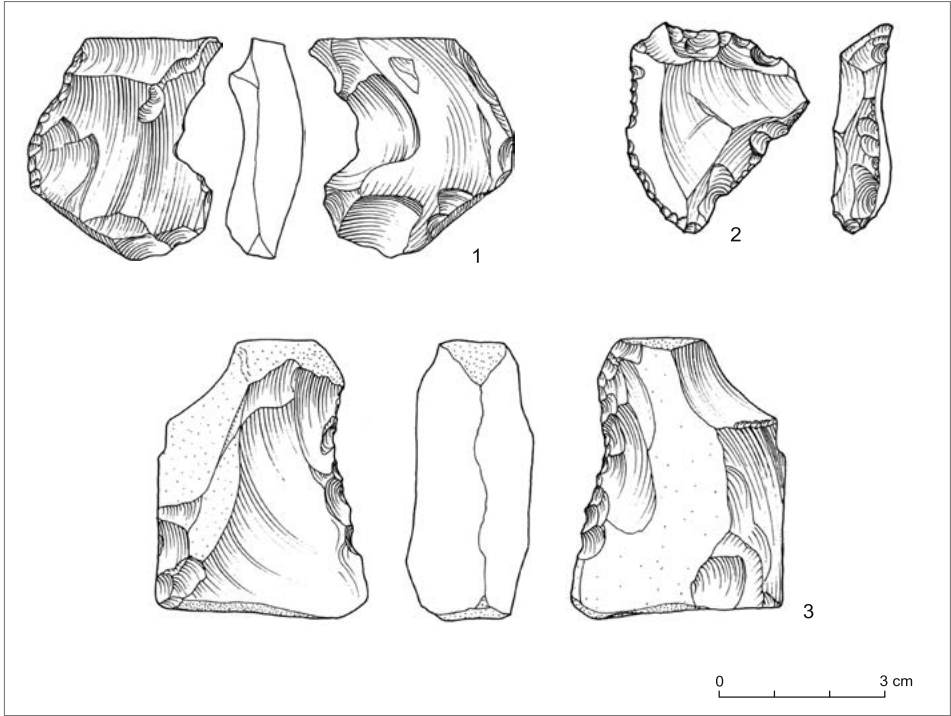


Fig. 11. Lithics from QA 6: 1 – notched piece; 2, 3 – various sidescrapers (PCMA Qumayrah Project/ drawing M. Puskarski)

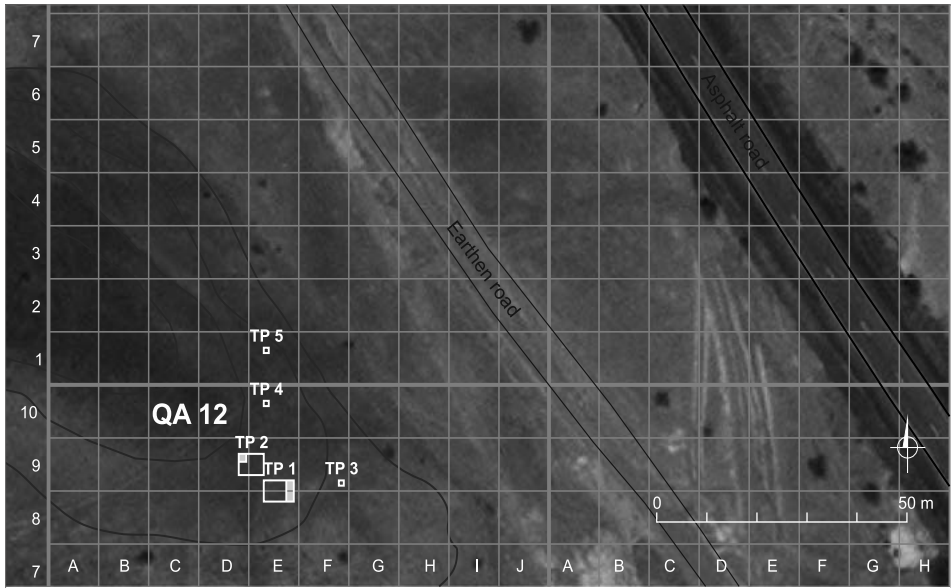


Fig. 12. Top view of site QA 12 with superposed site grid and placement of trenches excavated in 2017 (PCMA Qumayrah Project/ based on Bing Maps, processing M. Antos, M. Momot)



### SITE QA 12

Site QA 12 is located east of the previously described sites, at an elevation of about 575 m ASL. Its geographical coordinates are N 23°52'34.01" E 56°10'50.81" as taken at

the centre of the site [see Fig. 1]. It is a small campsite lying on a flattish top of an alluvial fan and measures approximately 50 m north–south and 40 m east–west [Fig. 12].

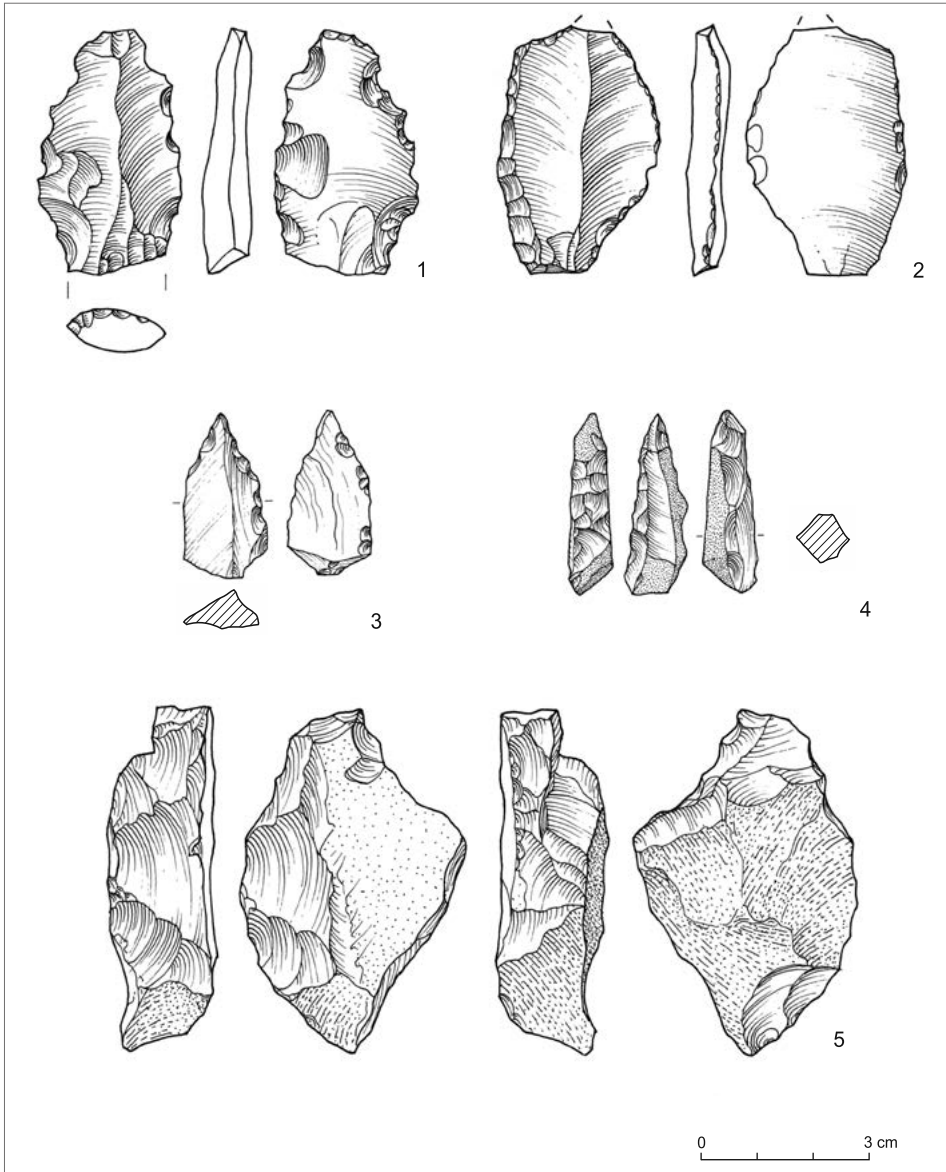


Fig. 13. Lithics from QA 12: 1 – retouched flake; 2 – retouched blade; 3 – perforator; 4 – borer; 5 – semi product of tanged point (PCMA Qumayrah Project/drawing M. Puzskarski)

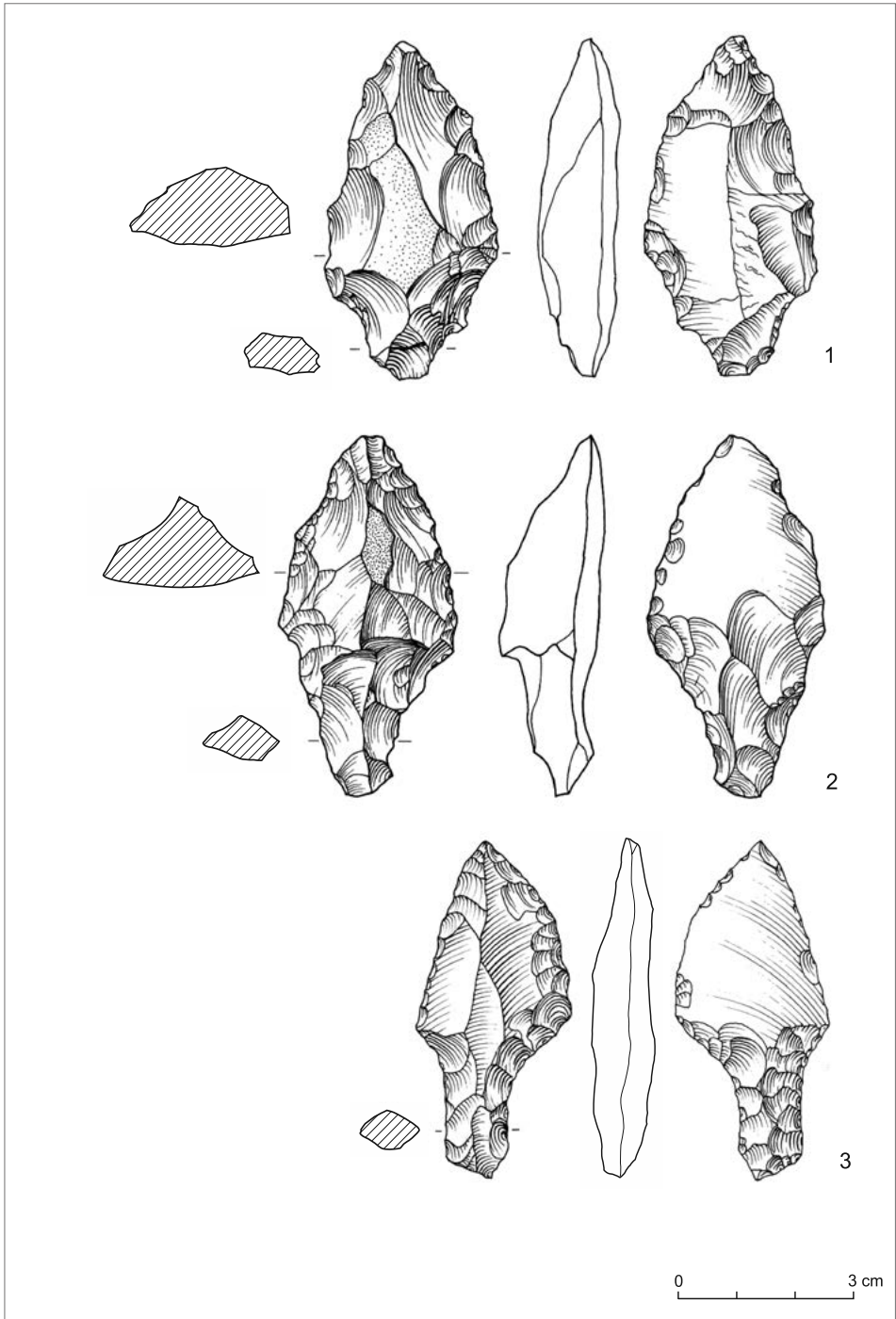


Fig. 14. Lithics from QA 12: 1-3 – tanged points (PCMA Qumayrah Project/drawing M. PuszkarSKI)

Rare lithics were scattered unevenly across the area, occasionally encroaching on the northeastern and eastern slopes. The finds included three tanged spear points, which were interesting enough to occasion more detailed investigation of the site.

Test trenches were laid to investigate a tentative stratigraphy. Two surface areas in the central part of the site were cleaned of the rocky overburden, comprising mostly broken fragments of brown flint nodules and single finds of small retouched tools. Five test pits (TP 1–5) were located along the major axes [see Fig. 12]. All of them yielded negative results and contained only alluvial deposits consisting of layers of gravel and eroded rock fragments.

Archaeological material was collected only from the deflated site surface. It consisted of 45 lithics, including five cores, three flake blanks, 35 retouched tools [see Table 1] and two pieces of waste debitage. The retouched tools are mostly flakes and

blades [Fig. 13:1,2], occasional perforators [Fig. 13:3], and one borer [Fig. 13:4].

The most interesting finds are the three tanged points made on massive flakes. Two of them [Fig. 14:1,2] represent a simple technology of production by direct hard hammering. The same technology of production is also attested by one massive flake found at the site [Fig. 13:5]. Additionally, its similar shape and size suggest that it may have been a semi-product of such a point, and indicate local manufacture for the latter. The morphology of the tanged points mentioned above assigns them to type 1B from the Hadramawt Plateau in Yemen, dated to about the mid 6th millennium BC (see Crassard 2008: 141, 144). The third specimen [Fig. 14:3] represents an apparently different type. It is more slender and slightly asymmetric, with a well pronounced tang. Invasive retouch with shallow knapping scars indicates an advanced pressure technique.

## DISCUSSION

The poor state of preservation of prehistoric open-air sites in the whole of Arabia is a well-known problem. Strong deflation by wind or violent erosion by streaming water will cause destruction of stratified levels on most early and mid-Holocene sites throughout the region. For these reasons, data from the study of surface collections and rare surviving fragments of cultural deposits is mixed and patchy, and cultural and chronological interpretation is difficult at best. The sites investigated in the Qumayrah Valley are no exception to this rule. In their case, the most characteristic feature of

the flint industries from all the discussed sites is their total reliance on local raw materials, easily available in the nearby, strongly eroded hills.

Another distinguishing feature is the blank production technology. The debitage includes both flakes and blades obtained by the hard-hammer technique, less frequently indirect percussion. Both kinds of blanks have a repeatable form and size, which indicates the intended coexistence of flake and blade techniques, rather than the reuse of selected waste in order to temporarily supplement the store of flakes for tool production.

In each case, the retouched tools are characterized by a simplicity of production with consistent use of the natural shape of the raw material, in order to reduce to a minimum necessary treatment. The resultant tools did not change over the ages and cannot be therefore reliable chronological indicators.

However, significant differences that can indicate the chronology of finds are visible in certain techno-typological details, such as the presence of certain types of blades, a bifacial technology or its lack, and macrolithization of the industry. These elements are noticeable in assemblages from the individual sites and seem to indicate some chronological differences between them. Typological and comparative analyses of the flint, stone,

and shell objects found at the sites seem to suggest three occupational phases associated with different stages of the Neolithic period. Early Neolithic occupation is indicated by the seasonal character of the oldest structures from QA 2 and the associated primitive tanged points. Typologically, this phase also seems to correspond to two of the three spear-points found on QA 12. The Late Neolithic is suggested by younger flint materials from QA 2, such as the retouched bifacial point and foliated piece, the stone Akab-type bead and, probably, the third of the QA 12 points. And the final stage of the Neolithic is indicated by the macrolithic flint industry and, perhaps also the bead, from QA 6.

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# Conservation of metal artifacts from the Polish Mission excavation at Saruq al-Hadid (UAE)



**Abstract:** The article documents and discusses field conservation methods and procedures applied to metal artifacts, both copper and iron, discovered by the PCMA team working at the Saruq al-Hadid archaeological site in the UAE (Emirate of Dubai) in 2016/2017 and 2017/2018. An overview is given of the conservation challenges that the state of preservation of the metal finds presented and the methods and procedures that were applied on the site, including brief case studies of the most important finds and treatments.

**Keywords:** Saruq al-Hadid, weaponry, copper, iron, conservation

The Saruq al-Hadid site in the Emirate of Dubai (United Arab Emirates) is located in the desert some 70 km outside of the city of Dubai. The site, a large mound covered with ancient metal slag, was discovered in 2002 by Sheik Mohammed bin Rashid Al-Maktoum, the Ruler of Dubai. A joint Dubai–Jordanian mission headed by Hussein S. Qandil embarked on an investigation of the remains of metallurgical activities and established site occupation mainly in the Iron Age II period, that is, around 900–600 BC (Qandil 2005: 138). The site also proved to be rich in metal artifacts, usually made of copper and copper-based alloys, as well as of iron, silver and gold.

At the invitation of the Dubai authorities, a team from the Polish Centre of Mediterranean Archaeology University of Warsaw carried out two seasons of research at the site in 2016/2017 and 2017/2018. The Polish sector (other exploration of the site during these seasons included a national Dubai team, the SHARP Project from the University of New England in Australia,

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a Spanish team from Sanisera Archaeology Institute and a German team from Thomas Urban and Partners) is located in the northern part of the slag-covered mound and has produced, expectedly, an abundance of metal artifacts (for an overview of the archaeological excavation project, see Zych and Wygnańska forthcoming) [Fig. 1]. The state of preservation of these finds varies significantly, hence the express need to preserve and conserve objects for study as well as for display in the site-dedicated Saruq al-Hadid Archaeology Museum in Dubai.

Conservators working with artifacts during archaeological missions in countries of the Near East are continuously challenged with difficulties of varying degree of complexity, not the least being to ensure a supply of essential chemical agents and appropriate specialist devices

and apparatus. Conservation procedures and treatment have to be planned to address these issues, “organizing” the needed equipment and materials, even if the only effective solution is transport by air from home. Consequently, having at hand a vast array of conservation methods, conservators must choose the procedures that will prove feasible in given circumstances, depending on the type of archaeological site and the digging situation. At Saruq al-Hadid, it was the inventiveness of the present authors, coupled with the efforts of the Dubai side, that enabled the conservation of metal objects from the Polish sector of excavations. The paper discusses the conservation procedures that were effectively applied during the project, presenting in exemplification case studies of selected artifacts from the metal finds collection.



Fig. 1. The Polish sector at the site of Saruq al-Hadid: excavation in Squire V8 in the earlier stages of the project, looking east (2017) (PCMA UW PMSaruq Project, Dubai Municipality/photo J. Rądkowska)

## STATE OF PRESERVATION OF METAL ARTIFACTS

The state of preservation of the artifacts was dependent on the kind of metal, of which they were made. Fragments of gold tape did not need to be conserved or even cleaned, whereas iron artifacts were in the worst possible condition, layered, swollen and cracking. Sword SAH17-V8/6515/001 was in the best state, being found in one piece, but could not be lifted whole [see *Fig. 11*]. The pieces could be glued together, as was frequently the case with other finds, but most of the time sieving techniques of excavation brought up splinters and corroded dust well beyond any attempt at shape identification.

The high salinity of the dune sand matrix affects the metal objects, those made of iron in particular, but also copper and even silver pieces. In extreme cases, salt efflorescence was present on the surface of the objects. Artifacts from the upper layers, near the sand surface, are usually in better condition than those found in the lower-lying strata. Copper-based items from the dune top are just weakly corroded on the very surface and this regardless of their size; the core is untouched and cleaning usually gives spectacular results. However, the thin-walled artifacts and sometimes even the thick arrowheads, especially from the

bottom layers of the dune, may be corroded completely, the oxide, chloride and sulfide compounds having eaten away the metal. At first glance, the shape of the object is evident, but cleaning will reveal a hollow where the metal core should be. In contact with air, the chlorides under the relatively weakly active surface corrosion in such artifacts will trigger more intensive corrosion, dissolving anything of metal that is still inside. The larger and thicker artifacts tend to be better preserved than the small objects.

Another issue at Saruq is the evidently intentional damage of the artifacts by their users, particularly in the case of finds from the topmost layers of the dune. Saruq has been proved to be a smelting and metallurgical center and, in its latest phase, it was remelting copper scrap. Apart from remains of furnace bodies, the evidence of these processes comes in the form of objects that had been recovered from the sand layers of the dune and portioned or broken, followed by secondary processing: cutting, forging, bending, hammering, fusing and melting together with other artifacts. Ingots have also been found, as well as copper scrap of all sorts, all a semi-product of the remelting process.

## CONSERVATION METHODS

The only way to expose and preserve the original metal surface or whatever is left of it, along with ornaments and post-manufacturing traces, is to stabilize the products of corrosion. For study purposes, the artifacts had to be exam-

ined macro- and microscopically and the requirements of these techniques largely determined the choice of conservation methods. Exposing the original surface was a way of checking for the presence of ornamentation; finding decoration led



to further treatment in order to uncover it fully and make it more pronounced.

Mechanical cleaning is the main procedure for removing dirt and corrosion products. Initial surface cleaning of the artifacts was carried out with a micro-engine fitted with appropriately selected diamond milling cutters. Precise manual tools, such as scalpels, hand scrapers, needles, tiny chisel-shaped scrapers, were used for the less easily reached spots. Tool tips were adjusted to the shape of the cleaned surface (Safarzyński and Weker 2010: 35) [Fig. 2 top].

The recorded high salinity also required that the artifacts be protected against secondary corrosion. Testing of different desalination procedures on the objects from the Saruq excavation allowed specific procedures to be chosen depending on the metal. For corroded iron artifacts, it was desalination in a sulphite bath. For artifacts made of copper and its alloys, active corrosion

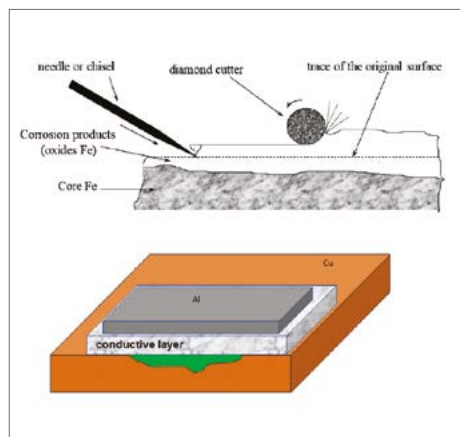


Fig. 2. Conservation procedures: top, mechanical cleaning; bottom, Rosenberg's method of electrochemical reduction (After Safarzyński and Weker 2010: 35 and 38)

was neutralized by electrochemical reduction using Rosenberg's method [Fig. 2 bottom] (Safarzyński and Weker 2010: 38), followed by stabilization in a sodium sesquicarbonate solution (Cronyn 1990).

### STABILIZATION IN AN ALKALINE SULPHITE BATH

The process chosen for stabilizing corroded iron artifacts consists of washing out chemical salts from the corroded layers to prevent secondary corrosion of an artifact that has undergone full and complete conservation when it comes in contact with moisture. The most common salt is the commonly encountered sodium chloride (NaCl). Chloride ions are bound with iron ions. The resultant highly hygroscopic  $\text{FeCl}_3$  catalyzes the iron corrosion process, leading to rapid chemical reactions which are dangerous for the object.

An alkaline sulphite bath is a mixture of 0.1 M NaOH and 0.1 M  $\text{Na}_2\text{SO}_3$ . The corroded item is placed in the solution, which is heated to a temperature of 65°C. Chemical reactions cause decomposition of the iron oxides and chloride salts; they are washed out from an object and removed with each change of the bath. After several changes, the salt concentration in the bath drops below 20 ppm and the chloride content in the corroded layers is so low that it no longer constitutes a threat to the artifact [Fig. 3 bottom].

The sulphite bath process was performed in a custom-built container made of stainless steel with automatic temperature regulation. The tub was prepared to fit the length of the iron sword that was discovered earlier in the season. It was

deemed more time- and effort-effective to have the container produced to order in Poland and brought to Saruq by the conservation team [Fig. 4].

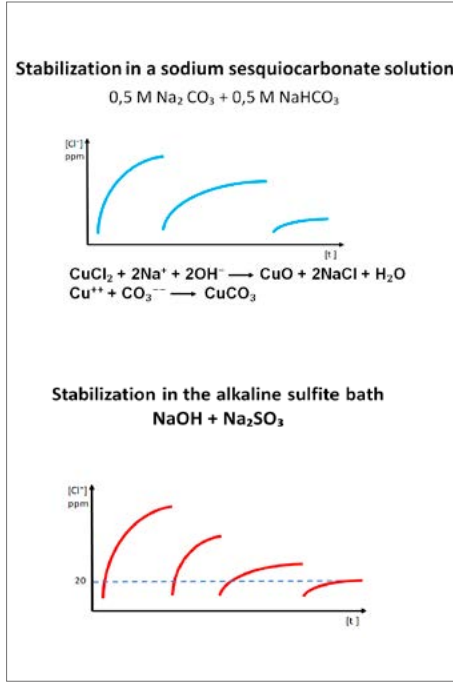


Fig. 3. Stabilization variants charting concentration of chloride ions washed out in subsequent baths: top, sodium sesquicarbonate solution for corroded copper and copper-alloy products; bottom, alkaline sulphite bath for corroded iron objects (Chart W. Weker)

**STABILIZATION BY MEANS OF ELECTRO-CHEMICAL REDUCTION**

The method assumes the creation of a galvanic cell in the place where active corrosion occurs. This is achieved by placing a zinc or aluminium foil on the treated fragment of the object. A layer of conductive gel (e.g., agar-agar) between the foil and the object acts as an electrolyte. As a result, the undesirable compound containing chlorides, i.e., paratacamite Cu<sub>2</sub>(OH)<sub>3</sub>Cl, is decomposed. The foil dissolves during the process. Harmful chlorides are removed along with the layer of used gel when the foil is replaced. The procedure frequently needs to be repeated several times. A modification of this method, known as Krefting's method, consists of total immersion of an object wrapped in foil in the electrolyte solution (weak base or weak acid).

**STABILIZATION IN A SODIUM SESQUICARBONATE SOLUTION**

Sodium sesquicarbonate is a mixture of 0.5 M NaHCO<sub>3</sub> and 0.5 M Na<sub>2</sub>CO<sub>3</sub>. Its reaction with paratacamite (MacLeod 1987): Cu<sub>2</sub>(OH)<sub>3</sub>Cl + 4 CO<sub>3</sub><sup>2-</sup> → 2 Cu(CO<sub>3</sub>)<sub>2</sub><sup>2-</sup> + 3 OH<sup>-</sup> + Cl<sup>-</sup> results in the creation of a soluble calcium carbonate (Cu(CO<sub>3</sub>)<sub>2</sub><sup>2-</sup>) which



Fig. 4. Custom-built container for the alkaline sulphite bath in use at the site (PCMA UW PMSaruq Project, Dubai Municipality/photo W. Weker)

dyes the bath blue. The chloride ions ( $\text{Cl}^-$ ), which permeate into the solution, are removed along with the used solution. The object concerned is placed in a sodium sesquicarbonate solution for 24 hours. The change of color of the solution means that paratacamite, a dangerous component of corroded layers of artifacts made of copper alloys, is decomposing. The bath should continue to be changed until the sesquicarbonate solution ceases to change color. A deposit of carbonates formed on the surface of the object acts as a stabilizing layer, insulating the deeper layers of corrosion products against the impact of the environment.

After exposing the original surface of copper or copper-based objects (laboratory tests for composition were not an option at the time), a test for the presence of active corrosion was performed. It consisted in observing the state of the artifact placed in a chamber with humidity at nearly 100%. Bright green efflorescence indicated the

presence of salinated areas requiring particular attention on the part of the conservator. Objects with active corrosion were subjected to further treatment by the stabilization methods described above. If there was no active corrosion, the object underwent further conservation procedures depending on its state of preservation. In some cases, corrosion products were removed chemically in a bath consisting of a 5% solution of sodium edetate (EDTA). After completion of the surface treatment, the surface was degreased and the object dried in order to protect it against further corrosion. A bath in a 2% alcohol solution of benzotriazole (BTA), used as a corrosion inhibitor for copper-based artifacts, was applied. Conservation was finished with the artifact surface being coated with a thin transparent layer of Paraloid B44 to protect against changes of environment parameters. The thin layer that is formed protects the object against pollution and contact with certain materials, and consequently against tarnishing.

## CONSERVATION AND METAL ARTIFACT STUDIES

In the course of two seasons at Saruq al-Hadid, 131 metal artifacts were conserved out of a total of almost 900 registered items from the excavation. Initial examination allowed the restorers to classify the finds to three groups depending on their state of preservation:

- requiring immediate conservation;
- suitable only for preventive conservation (objects too corroded to sustain any kind of conservation treatment);
- small and/or completely corroded fragments of objects with no study value; this group had the lowest level of priority,

to be treated more extensively at a later date.

The latter were usually artifacts with damaged structure, threatening to disintegrate should cleaning be undertaken. In these cases the layer of oxides was not removed and the objects were preserved in EDTA baths, then soaked with BTA corrosion inhibitors and coated thinly with Paraloid B44. Mechanical cleaning was carried out strictly for the purpose of rendering the original appearance as much as possible.

Finds coming in from the field were segregated first as either worked or unworked metal. Amorphous pieces of metal were not taken into consideration at this stage in the research. The worked finds were classified by form and function into the following broad categories: semi-products (mainly copper tape); weaponry including arrowheads, daggers, knives, swords; utilitarian tools, like axeheads, tweezers, rings; vessels; jewelry, e.g., bracelets, rings; ritual objects, i.e., snake representations; and the fairly large group of mystery objects for which a secure interpretation has yet to be found. An extensive category consisted of scrap metal, objects frequently cut assumedly for remelting, which cut across practically all other categories as these late craftsmen were obviously digging the dunes in search of valuable metal. A division by the kind of metal was also recorded, this again cutting across the functional and formal categories in some cases. There were also products of the furnaces, like ingots and copper and iron slag, but these will not be referred to in this paper.

Preliminary mechanical cleaning of the artifacts allowed the restorers to single out the objects with well preserved surfaces. From the point of view of research into metal-working technologies, these objects offered the greatest promise of marks that could be studied. Thus, the presence of technological and use-wear traces were the first criterion for selecting artifacts for full conservation treatment. Decoration also fell into this category; for instance, once a snake figure was found to bear incised decoration, all the other serpent bodies were tested to see whether they should be cleaned and preserved

more extensively (without finding any further decorated pieces, however).

The Dubai Municipality authorities were also instrumental in selecting objects for conservation, their aim being to prepare a wide range of interesting artifacts for future museum display. This was not always in line with research objectives, but was respected by the conservation team.

Last but not least, the conservators also followed the mission's agenda focused on the most important and prestigious finds from the Polish sector. Among these was the iron sword, the only artifact of its kind found complete in the trench excavated by the Polish team (complete iron swords have been picked up from other sectors in Saruq al-Hadid).

#### **TECHNOLOGY, FORM AND FUNCTION**

First and foremost, mechanical cleaning gave the chance of isolating finds that were fused together. This was the case of a bunch of arrowheads from Square V8 that had probably been deposited together in a quiver made of organic material. Careful separation of individual points allowed a full study of the content of this receptacle as well as permitting all the arrowheads (SAH18-V8/6515/002-019, 024, 025) [Fig. 5] to be cleaned and conserved. But these objects were in fair condition. The much poorer state of preservation of arrowhead SAH18-S7/7403/007 required far more precise action in order to preserve it, a decision justified by the fact that it represented a rather uncommon type, of which there was only this one example in the Polish sector.

Very poorly preserved and troublesome to clean and protect was a piece

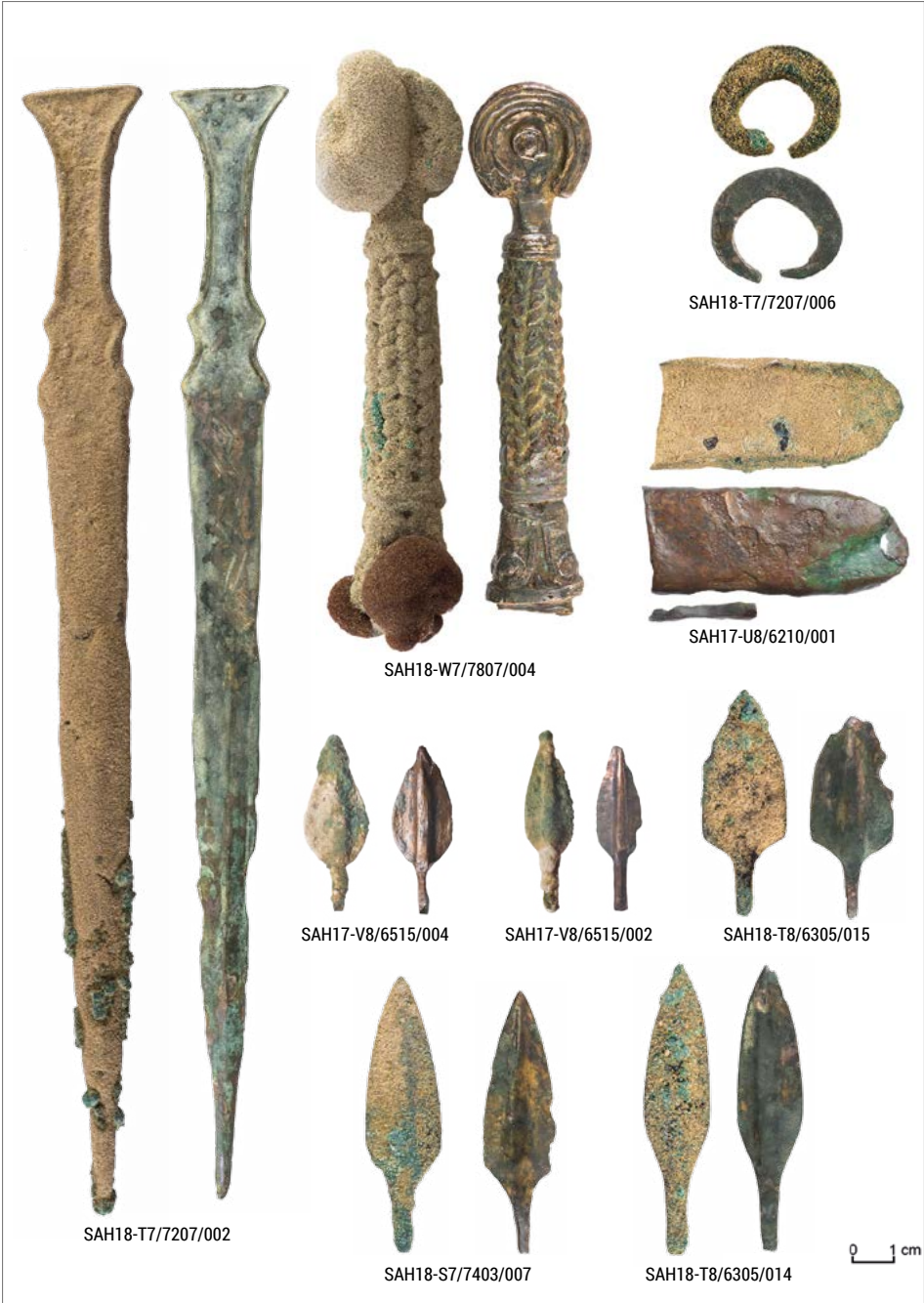


Fig. 5. Selection of copper and copper-based artifacts from Saruq al-Hadid conserved in 2017–2018 (views before and after conservation): left, small dagger; top center, handle of Luristan dagger; top right, crescent-shaped clasp(?); center right, copper-sheet belt(?) fitting; bottom right, selection of arrowheads (PCMA UW PMSaruq Project, Dubai Municipality/photos J. Kurzawa)



of copper metal SAH17/U8/6210/001 [see *Fig. 5*]. This piece without a parallel anywhere else in the United Arab Emirates could have been the end fitting of a leather belt. At first glance the fitting seems complete, but the thinness of the sheet metal (barely 1 mm) has resulted in the metal being corroded all the way through. Despite utmost care, one of the side surfaces broke off at the bending, losing also the joining surface. Nonetheless, cleaning helped to establish the thinness of the piece and excluded the presence of any rivets or other fastening devices suspected initially in the thick deposits covering it. The only way it could have been fastened to the belt was by clamping the sides and using perhaps some kind of adhesive (of which there was no trace).

Another curious object that revealed technological traces after cleaning was a crescent-shaped copper piece SAH18-T7/7207/006 [see *Fig. 5*]. This artifact, almost 2.5 cm thick, was preserved in very good condition. Once it was cleaned, the surface demonstrated marks that evinced hammering with a flat hammer at different angles and bending of the original cast element. No parallels are known from the site in general and knowing how it was made did not help in identifying its function. It may be a kind of crude buckle from a horserider's harness.

The handle of a dagger, SAH18-W7/7807/004 [see *Fig. 5*], was a particularly interesting piece to clean and conserve as it combines two different metals, that is, an iron blade fitted into an intricate handle made of a copper-based alloy. Only a minute piece of the blade was preserved by the end of the handle, the copper oxides from the handle weakening the corrosion

of the iron at this point. However, the proximity of the iron caused the copper-based handle to corrode more heavily. The presence of iron suggests that the dagger was brought in, perhaps from Iran, as it is from there that iron was imported at this time in the history of the region. The antennae-like shape of the handle terminal points to a Luristan origin of this piece. Interestingly, a few others of the same kind are known from Saruq al-Hadid, but none from other sites in the United Arab Emirates.

### DECORATED OBJECTS

The presumed Luristan dagger described above presented a richly decorated form. Cleaning of the surfaces articulated and enhanced it. In many cases, however, decoration was not immediately visible and only cleaning of the surface could bring it to light. This was the case of a copper snake SAH17-V8/6516/004+005, one of a triad found with the deposit of weapons and vessels in Square V8 (context 6515) [see *Fig. 8*]. This particular snake had been doubled over, the tail bent back over the head and upper part, probably until it had broken. It had been deposited in this condition and products of corrosion had fused together the side edges of the doubled body. The pieces were separated and cleaned, revealing decoration in the form of a line of irregularly spaced, incised circles. The two ends of the representation were then carefully recomposed and set together with an adhesive.

A bowl, SAH17-V8/6517/001, found in the same deposit turned out after cleaning to be decorated with incised ornaments on the flat rim [*Fig. 6*]. This ornament consisted of dotted triangles and herringbone pattern. The decoration

was consistent with parallels known from the site for this bowl, but conservation of this vessel proved extremely difficult. The thin walls were completely corroded, so despite the appearance of being complete, the inner metal had been attacked and destroyed by active corrosion operating under the surface coat of less active corrosion. The size of the vessel

and difficult access to the inside surface made the conservation treatment laborious and unrewarding. Careful observation revealed more decoration around the circumference and on the floor. It turned out that the decoration had not only been incised, but also cast in some places, and required meticulous cleaning not to be destroyed. The best solution

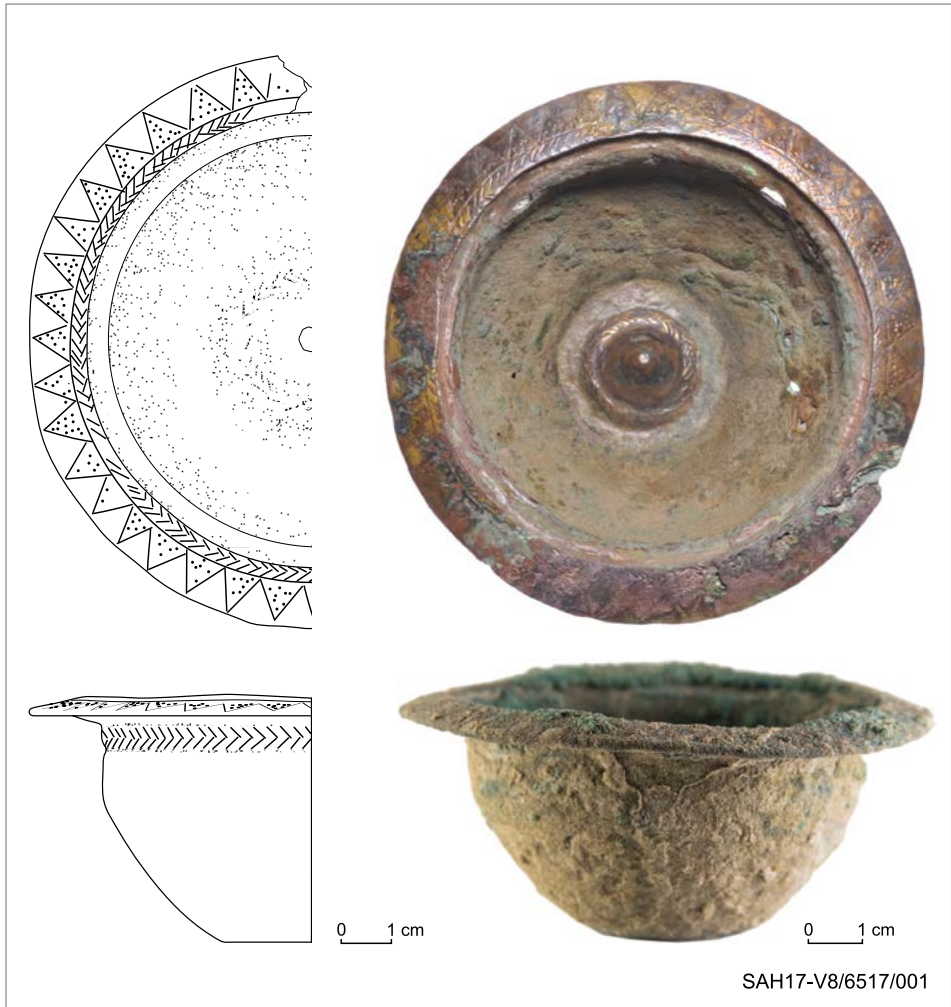


Fig. 6. Copper bowl: side view before conservation; top view after cleaning of the rim decoration and conservation; drawing shows the full extent of the decoration found on the bowl (PCMA UW PMSaruq Project, Dubai Municipality/photos J. Kurzawa, drawing M. Momot)



Fig. 7. Utilitarian copper tools: top, axehead with incised snake motif (view before and after conservation); bottom right, small scraper conserved as found (view after conservation); bottom left, anklet with parallel incisions on the terminals (view before and after conservation) (PCMA UW PMSaruq Project, Dubai Municipality/photos J. Kurzawa)

was to clean the decoration section by section. Action on the thin walls was reduced to a minimum. Stabilization in an electrochemical bath left empty spaces where active corrosion had operated. As explained in the methods section, the object was stabilized in a BTA inhibitor and coated with Paraloid B-44 to prevent further degradation. The gaps in the body of the bowl should be filled in, but this can be done in the course of a longer season.

Decoration in the form of an incised snake motif was revealed by surface cleaning of an axehead SAH18-W7/7807/005 [Fig. 7 top], a dagger SAH18-T7/7207/002 [see Fig. 5], and a flat triangular object, SAH18-U8/6216/006 [Fig. 8]. The snake has symbolic significance in late Bronze and Iron Age I–II Saruq al-Hadid as well as the region in general (Benoist 2007), the copper snake representations counted in the hundreds, if not thousands, being just one example. The presence of this decoration on other objects of different function (both utilitarian and ritual/symbolic) should be considered as telling. Both dagger and axehead also yielded technological traces associated with their making. Casting seams were revealed on the axehead, making it clear that it had been cast in a two-part mold. The dagger was cast in a much simpler mold (possibly openface one-part).

Another piece, a small sword SAH18-V8/6517/002, had a decorated handle and copper tape carefully soldered around the edges [Fig. 9]. These became obvious only after the handle had been cleaned. The dagger was a unique piece in terms of its preservation. Similar dagger handles with bone inlay had been found earlier at Saruq al-Hadid, but never complete on two sides and with the blade preserved. In

this case there was strong pressure from the Dubai authorities to complete a full conservation program which involved not only the copper parts, but also the bone inlays. The latter had to be removed, cleaned with ethyl alcohol, recomposed where cracked or split by the rivets, and set together with an adhesive (5% Paraloid B-44).

Last but not least, there were two anklets (SAH18-T7/7207/011) [see Fig. 7

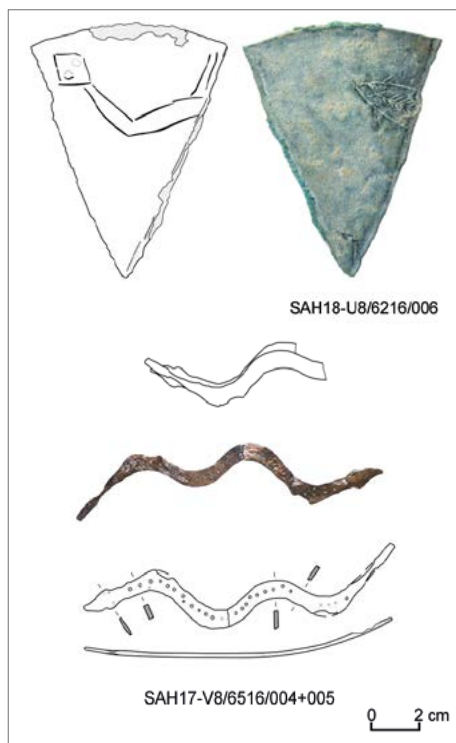


Fig. 8. Conserved decorated copper finds: top, triangular object with incised decoration, including snake motif (view after preliminary cleaning of the surface); bottom, snake figure decorated with incised dots along its back (view and drawing after conservation; at the top, drawing of the snake figure as found doubled and fused by corrosion at the edges) (PCMA UW PMSaruq Project, Dubai Municipality/photos J. Kurzawa, drawing M. Momot)



bottom left] with much simpler decoration in the form of four parallel incisions at each end. More interestingly, conservation in this case revealed three equally spaced incisions, but much shallower, on the inside. These had not been visible

before cleaning. It is not clear whether this is aborted ornamentation or it had some practical function. Interestingly, the same sets of four incisions can be observed on the ends of the much larger so-called camel anklets (discovered in other



Fig. 9. Small sword with bone-inlay handle SAH17-V8/6517/002: left, object after conservation; bottom center, pieces of bone inlay after conservation; top center, the bone inlays fitted back into the handle; top and bottom right, incised decoration of the blade below the handle on two sides of the weapon (PCMA UW PMSaruq Project, Dubai Municipality/photos W. Weker and J. Kurzawa, drawing M. Momot)



sectors of the Saruq al-Hadid site and now on display in the museum in Dubai).

### SILVER JEWELRY

The two small silver beads, from two different squares SAH17-T7/7201/012 and SAH17-T8/6301/007 [Fig. 10], were cleaned in order to study the techniques production. Microscopical examination of the two beads (they are each the size of a small green pea, 4 mm in diameter) have not provided any conclusive evidence in this regard. Granulation technique was used in their production, but the granules are not typical; they are flattened and irregular compared to the golden granules of European medieval artisans. The technique called for drops of silver being rained from a brush to cool in a vessel full of water. This gave them a round shape. But the granules in the two beads from the Polish sector of excavations at Saruq al-Hadid were made in a different way. Moreover, the joining between the granules was not discernible, thus giving the impression of a polished openwork wire. Microscopic examination has suggested that the granules were soldered together with silver. Using the same material that the granules were made of obscured all traces of potential tools. The appearance of the granules and the technology are



Fig. 10. Two silver rings: left, one ring before conservation; right, another ring after conservation (PCMA UW PMSaruq Project, Dubai Municipality/photos M.Sita)

identical with that of the mainly golden granulated jewelry from Iron Age sites in the United Arab Emirates.

### PRESERVING THE STATUS QUO

Little more than preservation of the status quo was possible for the long iron sword SAH17-V8/6515/001 [Fig. 11] discovered in a deposit in Square V8. Conservation in this case had to deal with the extraordinary size of this object, which had made its transport from the site, and storage until conservation could be arranged, troublesome and which required a custom-built receptacle for the bath. The process of stabilization of the piece was conducted in a sulphite bath; corroded and displaced fragments were reattached in place. There was no hope of cleaning the original surface owing to its considerable deformation [see Fig. 11: a, b]. Little could be done for the blade, which slowly disintegrated into several pieces and splinters, but careful treatment of the handle allowed a reconstitution of its structure [see Fig. 11: d]. In effect, it was possible to identify the origins of this sword as most likely coming from Luristan (Overlaet 2003).

The same restricted preservation process was applied to the small scraper SAH17-V8/6515/020 [see Fig. 7]. It was heavily damaged and delaminated, making any attempt at standard cleaning unfeasible. It was clear from the start that it would not yield the same kind of in-depth information as the axehead discussed above. It was conserved as is, primarily to preserve the artifact, the only intervention being to glue a few fragments that were breaking off. It is not always possible in such cases to observe production technique.



Fig. 11. Iron sword SAH17-V8/6515/001: left, state after conservation; right from top, a – condition of the blade after discovery; b – another fragment of the same blade before treatment; c – section through the blade, after stabilization in alkaline sulphite solution; note complete absence of iron core; d – handle after stabilization, cleaning and consolidation. The degree of damage (deformation, numerous cracks) prevented a reconstruction of the original surface (PCMA UW PMSaruq Project, Dubai Municipality/photos W. Weker and J. Kurzawa)

## CONSERVATION MONITORING

Monitoring is a requisite when artifacts that have undergone conservation treatment are kept in storage. For one, it was a way of checking on procedures applied in the first season to see how effective they were following a full year cycle in the conditions present at the site. There

was only one case that necessitated repeated treatment and these were tweezers SAH17-U7/7602/001 recovered from lower layers and hence more likely to be deeply corroded. Corrosion appeared inside the hard to access bend, which had not been cleaned sufficiently the first time around.

## SUMMARY

The task of all conservators, regardless of the material they are dealing with, is first of all to save historical artifacts that constitute man's heritage. In the two seasons at Saruq al-Hadid, the authors protected and conserved several hundred metal objects from the Polish sector, some of these unique. After conservation, these artifacts may be exhibited at the Saruq al-Hadid Archaeological Museum in Dubai, which was one of the objectives set for the team by the Dubai authorities.

A prime objective for the specialist, however, was to study artifacts under

a microscope to examine production techniques in an effort to expand the current technological knowledge of Bronze and Iron Age metal production in south-eastern Arabia and the region. This was achieved to a large degree. The applied conservation methods allowed traces of ornaments and various technological and ornamentation processes to be revealed on the surface of the artifacts. They were documented and may serve as reference for further research regarding not only the collections from Saruq al-Hadid, but also metal artifacts from the region.

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RESEARCH  
**STUDIES**





# Ceramic building material from the Roman forts on the Colchis coast: archaeology and archaeoceramological analysis



**Abstract:** The article collects the modest evidence available on the use (and possible production) of ceramic building material by the Roman army in Colchis, using it as a backdrop for presenting the exceptional richness, in quantity as much as diversity, of the finds from Gonio/Apsaros. The signatures on these products add to the value of this assemblage. Part 1 of the article presents documented examples of stamps on bricks, roof tiles and ceramic pipes from the Gonio/Apsaros fort and links them to the construction projects of specific Roman army units in the Cappadocia province. The results of laboratory tests conducted on samples of ceramic products and raw clay from Gonio, presented in Part 2, distinguish between two reference groups for the production of which clay from near the fort was used. However, it has not been possible to indicate the specific deposits of such raw material used by the Roman army.

**Keywords:** Roman army/fortifications/military architecture, army brick stamps, ceramic building material

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## PART 1. CERAMIC BUILDING MATERIAL FROM THE ROMAN FORTS IN COLCHIS: ARCHAEOLOGICAL DATA

The Roman military presence on the Colchis coast is attested among others by finds of stamped ceramic building materials. Bricks, tiles and pipes from five archaeological sites bear stamps referring to Roman army garrisons. A review of this material is presented in the context of the recent discoveries from Gonio/Apsaros down to the end of 2017.

Not much is known about the Roman army's use (and possible production) of ceramic building material in Colchis. *Opus mixtum* brickwork has been registered in the defensive walls of the forts in Pitsunda/Pityus and Sukhumi/Sebastopolis, but crucial data on sizes and signatures are missing. A brick with an incomplete legionary stamp is known from the latter site, but the find comes from a secondary context. The Roman fort in Poti/Phasis was supposedly made entirely of brick—Arrian's historical source was confirmed by the account of a 19th-century traveler, Frédéric Dubois de Montpéroux, who even described the plan of the fort and provided brick dimensions—but archaeologists have not found any trace of Roman fortifications near the Rioni River mouth. The Tsikhisdziri/Petra Justiniana site is located further south and is dated substantially to the reign of the emperor Justinian or later. Nevertheless, it has yielded a fragment of a stamped brick produced in an army brickyard during the Principate.

Against this backdrop, the ceramic building material finds, including bricks, roof tiles and ceramic pipes, from

Gonio/Apsaros (modern Georgia) are exceptional, in terms of both quantity and variety, but also due to the signatures on the products. The stamped finds are instrumental in linking construction activities to specific Roman army units present in the province of Cappadocia. The finds from Gonio/Apsaros have been sampled for archaeoceramological laboratory tests, which have also included samples of raw clay from Gonio. Małgorzata Daszkiewicz's work on this material, the results of which are presented in detail in Part 2 of this article, is an important element of the presented analysis. The distinguishing of two reference groups for the production of which clay from near the fort was used has demonstrated beyond doubt the production of ceramic building material (as well as pottery) near the site, without specifying however the potential deposits of raw material used for this purpose by the Roman army.

### ROMAN FORTS IN COLCHIS DURING THE PRINCIPATE PERIOD

The distribution of Roman and early Byzantine forts on the coast of Colchis has been the subject of a number of studies, frequently mapping the location of particular fortifications (Lekvinadze 1969: Fig. 1; Zuckerman 1991: 539; M.P. Speidel 1992a: Fig. 1; 1992b: Fig. 1; M.A. Speidel 2009: 627) and differing slightly in the details. This is due to the differences already present in the surviving ancient sources dealing with the Roman military presence on the eastern Black Sea coast. *Tabula Peutingeriana* presents two settle-

ments with possible forts: Apsaros (Gonio) and Sebastopolis (Sukhumi). These two are labeled with an icon signifying a legionary base, like *Novae* (in Moesia) and *Satala* (in Cappadocia). Pliny the Elder's description of this part of the Black Sea coast mentions both names (Plin. *Nat.* 6.4), describing a fort (*castellum*) next to each. Pliny also listed *Phasis*, but only as the name of a river and town located at its mouth. The *Heniochs* (*Heniochi*) are also said to live in the neighborhood of Apsaros (*Apsarrum*) and Sebastopolis. The tribe is listed (as the first alongside the Colchians) in Agrippa's speech cited in Josephus's text (Jos. *Bell.* 2. 366–367). Ἡνιόχους appear there in the context of dependence on Rome and the control maintained by Roman garrisons over the eastern and northern coasts of Pontus. However, no specific fortifications are mentioned as being located in their country. All the quoted sources appear to refer to the same period, that is, in all probability, prior to AD 69 (see also

Mitford 2018: 37) [Fig. 1]. Almost 60 years later, in his *Periplus*, Arrian described another garrison apart from the forts in the aforementioned settlements (Arr. *Peripl.* 6, 10, 17), namely *Phasis* (Arr. *Peripl.* 9), situating it between the two bases. Arrian's account is accurately dated to the time of his governorship in Cappadocia, that is, the 130s.

Keeping in mind the significance of the quoted sources, it can be assumed that in the second half of the 1st century the Romans established only two forts (*Apsaros* and *Sebastopolis*) on the coast of Colchis. The one in *Phasis* was built slightly later, most probably at the beginning of the 2nd century AD (Mitford 2018: 55, 412, 419). Investigations in Gonio have increasingly supplied evidence for a very early date for the fort there, even as far back as Nero's reign (Dąbrowa 1980: 385; Braund 1994: 178; Karasiewicz-Szczypiorski 2016: 62; Mitford 2018: 37–40, 55, 71). No comparable research results are known from Sukhumi. As for *Phasis*, Arrian's account of earthen fortifications and wooden towers being replaced by brick fortifications indicates the freshness of memories of this undertaking in people's minds at the time of his inspection. The *Periplus* suggests that *Sebastopolis* was the most distant garrison (Arr. *Peripl.* 17, 18). Therefore, the fort in *Pityus* (*Pitsunda*) must have been constructed later than the three forts discussed above (M.A. Speidel 2009: 604), which may be the reason for its absence from the quoted sources. The general assumption on these grounds is the much younger age of the remaining fortifications linked to Roman military presence on the Colchis coast.

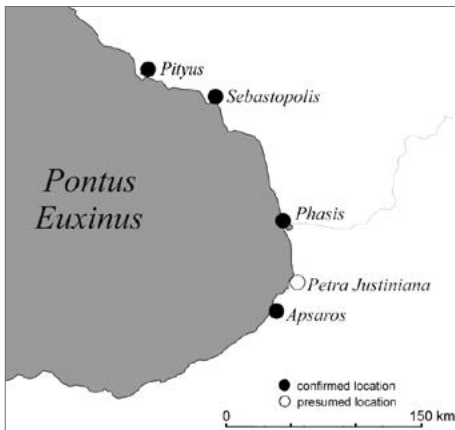


Fig. 1. The Roman forts in Colchis in the Principate period (Gonio/Apsaros Expedition/drawing O. Kubrak)



### ROMAN CERAMIC BUILDING MATERIAL IN FORT CONSTRUCTION IN COLCHIS

Roman ceramic building materials, including stamped fragments, have been recorded at four Roman fortification sites beside Gonio in Colchis. The following overview presents this assemblage and its limitations.

**Pitsunda/Pityus and Sukhumi/Sebastopolis.** Based on published information, excavation in the two forts uncovered remains of fortifications built in the *opus mixtum* technique with brick separators present in the stone walls. At Pitsunda these consisted of four brick courses, at Sukhumi only two (Lekvinadze 1969: 83–86). A mixed brickwork wall at Pitsunda was dated to the 4th–5th century AD, while a similar wall at Sukhumi was claimed to be of an earlier date, although the supporting evidence is questionable despite the location within the walls of an older “Roman” fort. This is due to the later construction within the ruins of a smaller fortification, referred to as Justinianic in date. The sites cannot be seen and there is no new research to clarify these doubts. Observations by Karasiewicz-Szczypiorski at Gonio/Apsaros, for example, indicate that walls considered earlier as being of Roman date were in fact Byzantine in their entirety, although perhaps Justinianic also in their lower parts. The same may be suggested for ancient Sebastopolis. The proposed dating of the fortifications using the *opus mixtum* technique in ancient Pityus seems highly probable however. Karasiewicz-Szczypiorski’s research into the fortifications of the Tauric Chersonesos places the first examples of walls with brick separators in Justinian’s reign. The situation

in the northern part of Colchis may have been similar.

Finding a fragment of a brick with the stamp **LEG [---]** (Lekvinadze 1969: 87) and two fragments of a “ceramic plaque” (probably a roof tile) with the stamp **[LE] G XV** in Pitsunda (Kiguradze, Lordkipanidze, and Todua 1987: 88; see Mitford 2018: 419, 551) is worth mentioning. The stamps, which all look very similar, have a rectangular frame and originated probably from the same matrix. The clay appears to be very much the same in all three cases. The brick fragment was discovered in a layer from the 2nd–3rd century AD within the ruins of an observation tower situated some 3–4 km northwest of the Pityus fort, near Lake Inkiti (Kiguradze, Lordkipanidze, and Todua 1987: 88; see Lekvinadze 1969: 87). The watchtower may have been part of a still unstudied system of observation posts in advance of the fort, presumably protecting the local port (see M.A. Speidel 2009: 604; see Karasiewicz-Szczypiorski 2015: 61–63, 69). The other two stamp fragments come from excavations within the fort, from layers dated to the end of the 2nd or beginning of the 3rd century AD. No other examples of legionary stamps from the Colchis area are known.

The nearest legionary fortress from the time of the Principate was Satala in the Cappadocia province. All the forts on the Colchis coast were under the authority of the same provincial governor of Cappadocia, as attested by Arrian’s *Periplus*, for example. Ceramic building material from Satala was stamped by the legio XV Apollinaris (Mitford 1997: No. 6; Hartmann 2004: 9–10), hence the proposed reconstruction of the stamp

from Pitsunda as **LEG [XV]** or perhaps **LEG [XV APOL]** (see Lekvinadze 1969: 87; M.A. Speidel 2009: 604; Mitford 2018: 551). It does not follow from this that building material was delivered to Pitsunda from the mother province. A more probable scenario is that the unit (*vexillatio*) responsible for construction works in Colchis consisted of soldiers and officers from the said legion, in which case the building material made near the construction site could have been marked using the legionary stamp. Physical and chemical analyses of the ceramic building material and raw clay have attested to a similar situation in the case of the use of the Claudian Ninth legion stamp in Crimea (Sarnowski 2005: 130; 2006: 100).

**Poti/Phasis.** Even the approximate location of the Roman fort in the Poti area is vague due to the accumulation of sediments carried by the Rioni River at its mouth, forming new stretches of land where it flows into the Black Sea. The remains of the fort are thus at some distance from the present riverbank and may have been covered with layers of silt that had accumulated later. In addition, the river tended to change its course as a result of being periodically “clogged up” with sediments at its mouth, making the whereabouts of the main channel in the Roman period unknown. Neither the dynamics of sediment accumulation nor details of the changes in the course of the Rioni River have been established in full to date. Moreover, with the modern town of Poti occupying much of the flat terrain at the former river mouth, it is possible that the remains of the fort are concealed under the present town or that they were destroyed during its expansion.

The Swiss traveler Frédéric Dubois de Montpéroux (1839: 67–70) could still see the ruins of the fort in the 1830s. He described a square fort with four square watchtowers and a gate facing the sea. The walls surrounded a public square with one side measuring 140 steps (180 m by 175 m; see Mitford 2018: 415). The fort, located five *viorsts* (5385 m) from the sea at the time, was allegedly built of brick bonded in pink mortar. Lekvinadze cited the Swiss traveler’s account, focusing on the plan from the atlas that supplements the description (Dubois de Montpéroux 1839: Atlas, XVIII; Lekvinadze 1969: Fig. 5). He reproduced a sketch outline of the fortifications on a square plan with four round(!) corner towers. The scale in steps (“pas”) indicates that the fortifications were slightly larger than could have been concluded based on the cited description.

Dubois de Montpéroux knew the text in Arrian’s *Periplus* and believed that the ruins he had seen should be linked to the described brick fortifications. However, both the description and the plan made by the Swiss traveler point to a later date for the remains. The fort was almost certainly a late Roman *quadriburgium*. In this particular form it could not have been constructed at the beginning of the 2nd century. However, it might have been built using bricks from older fortifications.

From the point of view of the subject undertaken in this article, the most significant piece of information is that of Arrian (*Arr. Periplus*. 9) that the walls and fort towers were in their entirety made of fired brick, a fact which he fails to note in his description of the other forts (Apsaros, Sabastopolis). This fragment

of the *Periplus* is significant for another reason, namely, that he makes it a point to say that the fort was previously an earth-and-timber construction with the towers built of wood. To be discussed thus in a report from an inspection tour by the governor, the reconstruction of the fort had to have been a relatively recent event. Otherwise, the text would not have mentioned the previous fortifications. Indeed, the brick building appears to have been an exception among the forts in the governor's charge for reasons connected to the availability of building material in the nearest surroundings. There were no stone deposits near the mouth of the Rioni River, as was the case of both Sebastopolis and Apsaros, hence the original earth-and-timber structure and the later introduction of brick.

In his description Dubois de Montpéreux recorded the dimensions of the brick used in the construction. His "le pouce" or inches, we get  $28.4 \times 16.2 \times 2.7$ , upon conversion into centimeters give  $27 \times 15 \times 2.5$  cm (see Mitford 2018: 415). No actual bricks survive for comparison, but it must have been a rectangular brick of Roman brick size and proportions, closest to the larger bricks known from Tauric Chersonesos (Sarnowski 2005: 127).

**Tsikhisdziri/Petra Justiniana.** The name as well as the discovered architectural remains point to the age of Justinian as the period of construction. Curiously, there are no apparent earlier fortifications in this spot. Some researchers, including Karasiewicz-Szczypiorski, admit the possibility of an earlier (perhaps short-lived) presence of the Roman army at the discussed site (see also Lekvinadze 1969: 87–88). Thus far, the only find con-

firming possible construction activity during the Principate period is a fragment of a brick with an intact **VEX FA** stamp (Lekvinadze 1969: 87; Braund 1994: 189; Todua 2003: 6). This inscription is read as an abbreviation originating from the name of a separate unit: *vex(illatio) fa(siana)* (M.P. Speidel 1992a: 206; see Lekvinadze 1969: 87; Braund 1994: 189; Mitford 2018: 412, 549–550). Looking at the better-identified Roman presence in Taurica (M.P. Speidel 1992a: 206), one is entitled to assume that a detachment consisting of soldiers delegated from various units of the Cappadocian army was stationed at Phasis. In all probability, they were under the command of an officer (or officers) of the legio XV Apollinaris (see *AE* 1996: 1358 = *AE* 1999: 1349; Vinogradov, Zubar', and Antonova 1999). The discussed stamp almost certainly confirms that a *vexillatio* from Phasis was producing ceramic building material (M.P. Speidel 1992a: 206), presumably for the fort that Arrian had seen there recently built entirely of brick (see above). Arrian's term for the soldiers garrisoned at the mouth of the Rioni river, **ἑπίλεκτοι**, quite probably signified a *vexillatio fasiana* (M.P. Speidel 1992a: 206). Therefore, it could be possible that bricks with the **VEX FA** stamp were produced near the fort of Phasis during the reign of Hadrian (see Braund 1994: 189).

The question is how the brick found its way to Petra and the circumstances under which it was found there (M.A. Speidel 2009: 603). Petra lies very conveniently on a lofty cape, affording excellent conditions for the observation of sailing routes and signaling passing ships in order to facilitate navigation.

It can be assumed that a fort or observation point was constructed there already in the first half of the 2nd century. The locality is also situated next to the most convenient route leading from the north (from central Colchis) in the direction of Cappadocia. From this perspective, having in mind control over this route, a fort in Petra would be a perfect substitute for Apsaros. In addition, the location rises above the plains that extend farther to the north and has a fairly convenient anchorage. In terms of the surrounding landscape, Petra resembles the Aj-Todor Cape in Taurica, where a Roman fort was constructed under the Antonines (Karasiwicz-Szczypiorski forthcoming).

The stamped brick in question is the sole find of its kind. One should keep in mind that building material (possibly from the demolition of other structures) for the construction of Justinian's fortifications at Petra must have been delivered by sea. However, at this time,

the late Roman *quadriburgium* at Phasis may have still been in use and indeed, as indicated above, it cannot be excluded that it was built on the ruins and/or using construction material from (some) older fortifications. All in all, it cannot be said with any certainty that an additional fort existed at the site of the later Petra between Phasis and Apsaros during the time of the Principate. Also we do not know when the brick with the VEX FA stamp was used at this site.

**Gonio/Apsaros.** In the case of this fort, Arrian's account does not provide many details of the fortification or building structures in place at the time of his inspection. The only information included regards the existence of walls and a moat (*Arr. Peripl.* 6). Research to date indicates that the fort from the time of the Principate, built on a "playing-card" plan, that is, a rectangle with rounded corners, was moved slightly to the north and arranged with its longer axis running N-S [*Fig. 2*].

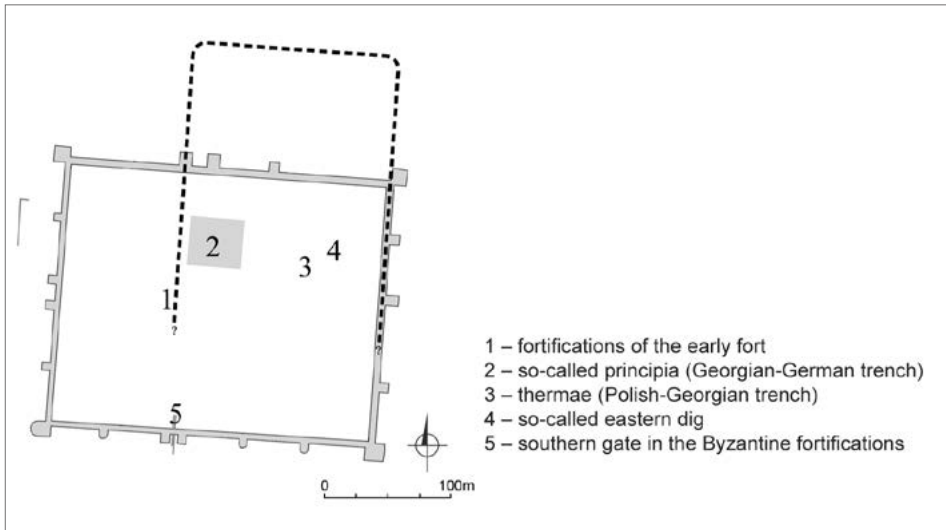


Fig. 2. Plan of the Gonio/Apsaros fort (Gonio/Apsaros Expedition/after Geyer 2003; adaptation R. Karasiwicz-Szczypiorski; drawing J. Kaniszewski and O. Kubrak)

As a result, parts of the fortifications from the first centuries AD can be observed in the form of earth ramparts outside the walls of the later fort

(Geyer 2003: Pl. 2). Nothing can be said of building material and techniques until these remains have been studied, but based on observations made at sites

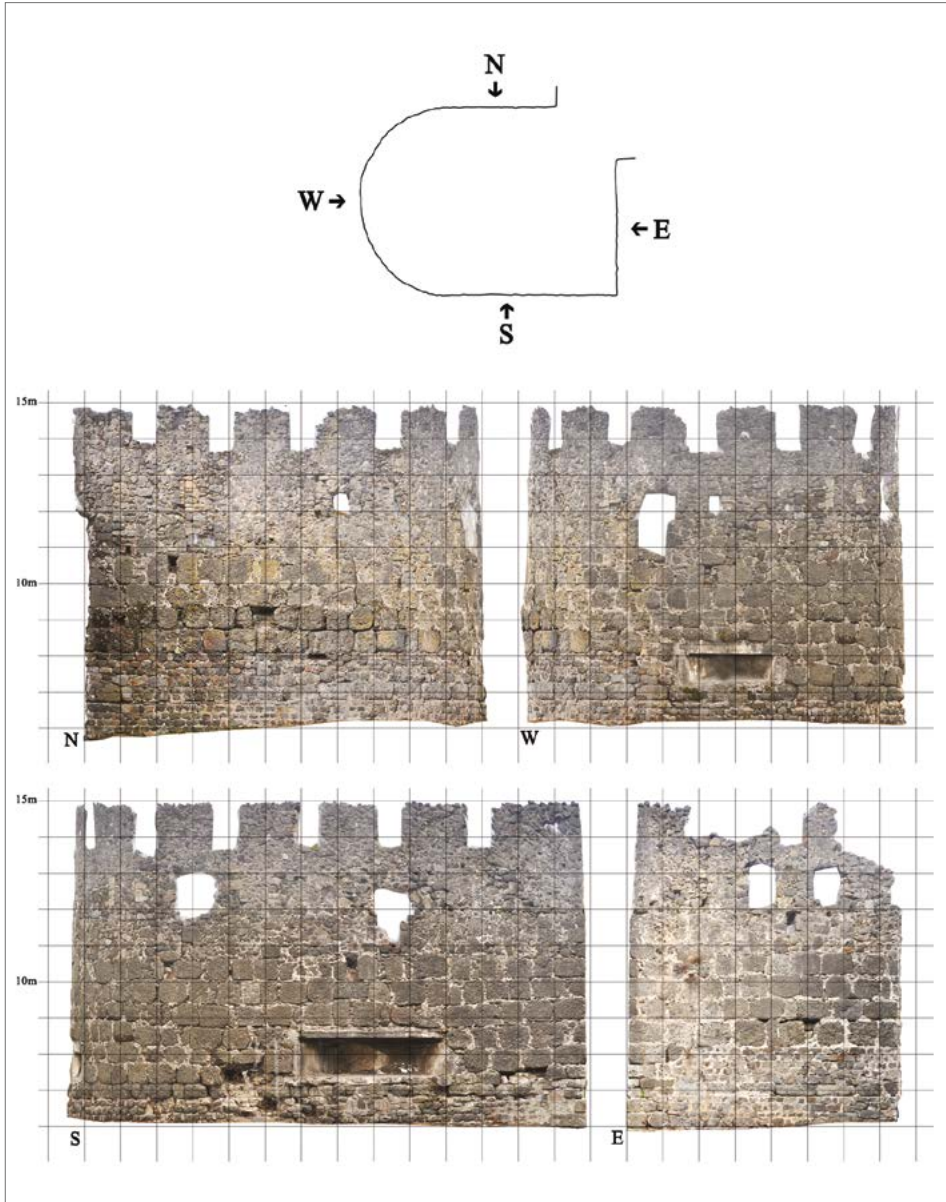


Fig. 3. Tracing successive stonework phases in the walls of the southwestern tower of the Apsaras fort (pre-renovation state) (Gonio/Apsaras Expedition/orthophotography and processing J. Kaniszewski)



studied in greater depth and linked to the presence of Roman garrisons in Crimea, it can be assumed that the earliest fortifications used to be made of partly worked blocks of local stone bonded with raw clay (see Sarnowski, Savelja, and Karasiewicz-Szczypiorski 2007: 61; Karasiewicz-Szczypiorski 2015: 57, Fig. 5: 2,3; see also Kakhidze 2008: 304–305; Kakhidze and Mamuladze 2004: 4–16). Research by the Polish–Georgian expedition has shown that some early buildings inside the fort of the time of the Principate were constructed in a similar way (e.g., the ruins of a granary discovered in 2017; see Karasiewicz-Szczypiorski and Mamuladze 2018). Walls of raw clay were raised on top of foundations made of broken stone bonded in clay mortar. They might have been reinforced using a wooden framework. The use of clay (without adding any stone) for wall construction is attested by clay backfills over 0.50 m thick observed in many places, the baths excavated in 2014–2017 being one example (Karasiewicz-Szczypiorski et al. 2016: 526–528). No wooden frameworks have been evidenced anywhere thus far.

Defensive walls observed on the surface (probably exclusively Justinian or later) were built using stone bonded in lime mortar. None of the observed phases of construction show the use of brick [Fig. 3].

Neither are there any examples of *opus mixtum* walls with an alternating stone–brick arrangement. Interestingly, mixed-work walls were constructed in the early Byzantine fortifications raised at Pitsunda and Sukhumi.

Despite the obvious superiority of stone structures and those made of raw clay, ceramic building material has been

noted in different contexts at Gonio in the fort from the time of the Principate. In the latrine, which was part of the Phase 1 bathhouse, the floor and the bottom of the drainage channel were made of square bricks [Fig. 4:2 and bottom]. Rectangular bricks were also found in the ruins of the furnace (*praefurnium*) used in Phase 2 of the building in question [Fig. 4:6]. In addition, individual pipes preserved *in situ* were the vestiges of draining systems from the *frigidarium* basins of Phases 1 and 2 [Figs 4:3; 5 bottom left]. A fragment of a ceramic pipe aqueduct was also uncovered in the street adjacent to the bathhouse on the north [Fig. 5 top]. In all probability, it should be linked to the renovation of the bathhouse building (Phase 2) and its later usage. In some of the bath chambers, primarily in the room with the mosaic floor, the remains of a collapsed roof from Phase 2 were preserved on the floor [Fig. 5 bottom right]. The destruction layer was full of broken roof tiles, both flat roof tiles (*tegulae*) and semi-circular ones (*imbrices*).

Other examples of secondary use of ceramic building material in the bathhouse include a wall (W2), reconstructed in Phase 2, in which concentrations of broken brick and ceramic tiles mixed with pure clay were observed in two places [see Fig. 4:5]. At the present stage of research it is unclear what the purpose was of these ceramic fillers in the structure of a wall made of stone mortared with raw clay. It might be some trace of unpreserved framework, e.g., a ceramic foundation placed beneath a vertical wooden post. Finely crushed ceramic material also constituted a significant admixture to the mortars used to seal

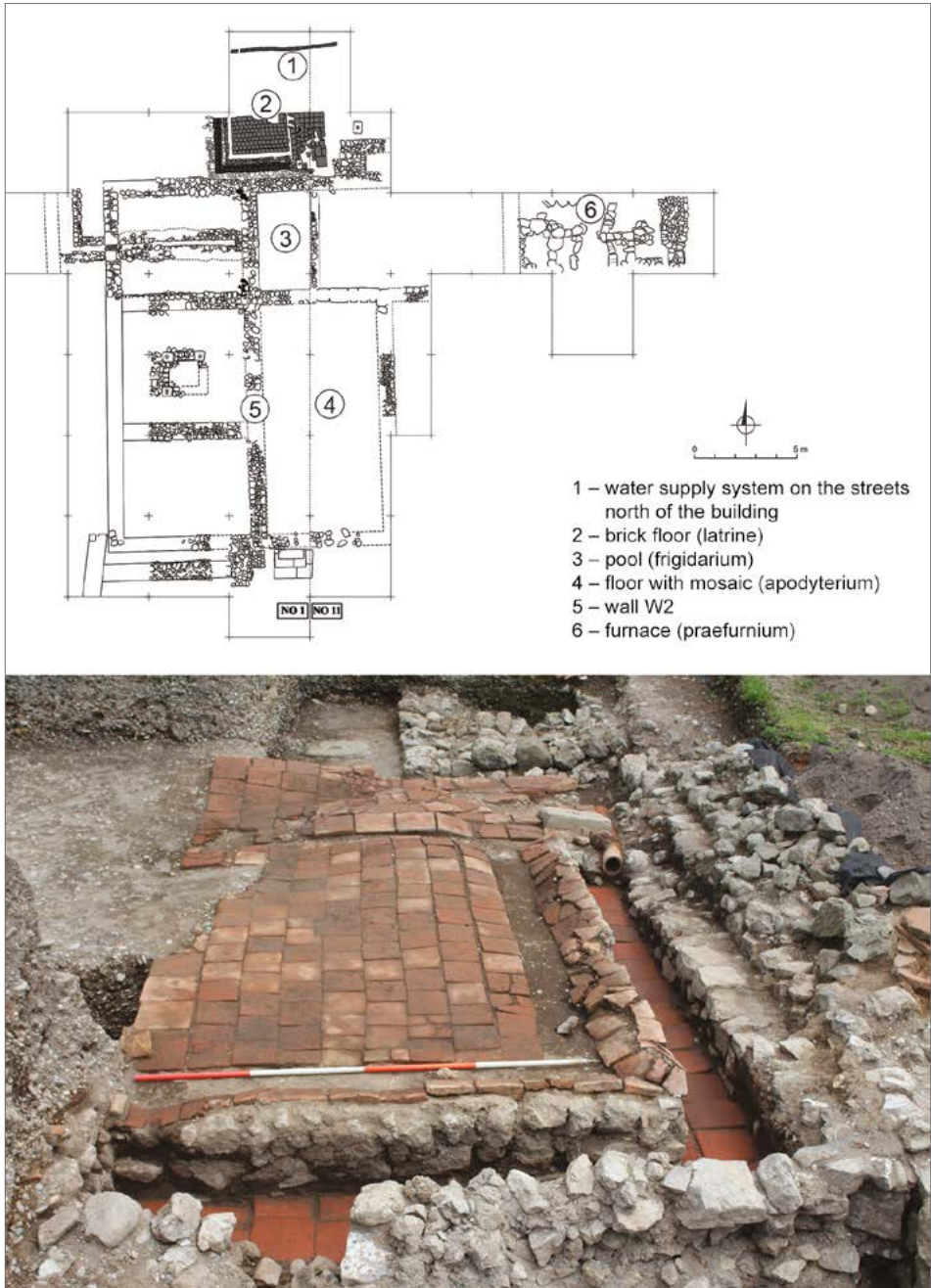


Fig. 4. Baths at Gonio. Polish–Georgian trench: top, plan; bottom, view from the west; note the floor and canal in the latrine made of square bricks (Gonio/Apsaros Expedition/drawing and digitizing M. Marciniak; photo A. Trzop-Szczypińska)



Fig. 5. Baths at Gonio: top, latrine floor (Phase 1) from east and water supply system consisting of ceramic pipes on the street north of the building (Phase 2); bottom left, northern edge of wall W2 viewed from the west, showing ceramic pipe for draining water from the *frigidarium* pool (Phase 1); bottom right, layer of broken roof tiles covering the mosaic floor from Phase 2, during exploration (Gonio/Apsaros Expedition/photos O. Kubrak, A. Trzop-Szczypiorska)



the *frigidarium* basins and floors in both Phases 1 and 2 [see Fig. 4:3].

Most of the excavated fragments of the water supply systems were made of ceramic pipes of varying diameters and lengths. Most examples of this type of installation come from the excavation inside the southern gate in the late fortifications [see Fig. 2:5]. The clearly observable connection between this water supply system and the gap in the gate indicates their late (Byzantine) origins. Smaller aqueduct fragments were also found during the excavation of the so-called command headquarters (*principia*) [see Fig. 2:2], as well as in the Polish–Georgian “eastern trench” (sector NO 11, Sqs 90 and 99) in 2014 [see Fig. 2:4]. The course of the pipelines uncovered so far indicates that during the time of the Principate water was supplied from an unknown source situated east of the fort. It was not until the Byzantine period that water came from



Fig. 6. Backfill of a bathhouse furnace (*praefurnium*) during exploration with a rectangular brick stuck in the layer (Gonio/Apsaros Expedition/ photo A. Trzop-Szczypiorska)

a source located south of the stronghold (Geyer 2003: Pls 2, 3).

To sum up, the ceramic building material originating from the excavations conducted at the Gonio/Apsaros fort represents the following categories:

► Square bricks. Bricks in three different sizes were used in the *thermae*: *bessales* (18.5–19 × 19 × 4 cm), *pedales* (26 × 26 × 4 cm) and *bipedales* (52.5 × 53 × 5.5 cm). Examples of all three types have been identified in the floor of the latrine from the Phase 1 bathhouse [see Figs 2:3; 4:2].

► Rectangular bricks. Only a few specimens have been found fully intact, excavated in the *thermae*. Their dimensions amount to 13–13.8 × 20–21 × 2.5–3 cm, and they come from Phase 2 bathhouse destruction layers (NO 11, Sq. 8). The dimensions of many fragmentary bricks, recognized by their proportions as rectangular, could not be reconstructed. A few broken specimens were found in the ruins of the furnace (*praefurnium*) and in the neighboring hypocaust basement (NO 11, Sqs 36–37). Based on the context, it can be concluded that they had been used to build the hypocaust system in Phase 2 [Fig. 6].

► Flat roof tiles with upturned ledges (*tegulae*). No complete specimen has been recovered so far, making an estimate of the original size impossible. Some examples bear the impressions of fingers running along the still wet clay surface [Fig. 7 top left]. On a few of the sherds, straight prominent “ribs” have been preserved, arranged perpendicularly to the upraised tile edges [Fig. 7 top right]. Holes made before firing can sometimes be observed on the roof tile fragments from Byzantine layers (see Karasiewicz-Szczypiorski et al. 2016:

530). Both solutions must have had some practical function, but in the case of the openings we can be certain that they served to attach the tiles to the roof structure using iron nails.

► Semicircular roof tiles (*imbrices*). One specimen, preserved intact, came from the ruins of the bathhouse; it was 46 cm long [Fig. 7 center left]. Its surface was decorated with elongated depressions



Fig. 7. Examples of fragmentary roof tiles from the bathhouse in Gonio/Apsaros: top row, flat roof tiles (*tegulae*), prominent "ribbing" on the surface of the tile on the right; center left, semicircular roof tile (*imbrex*); center right, round ceramic tile; bottom row, ornamental ceramic tiles (Gonio/Apsaros Expedition/photos O. Kubrak)



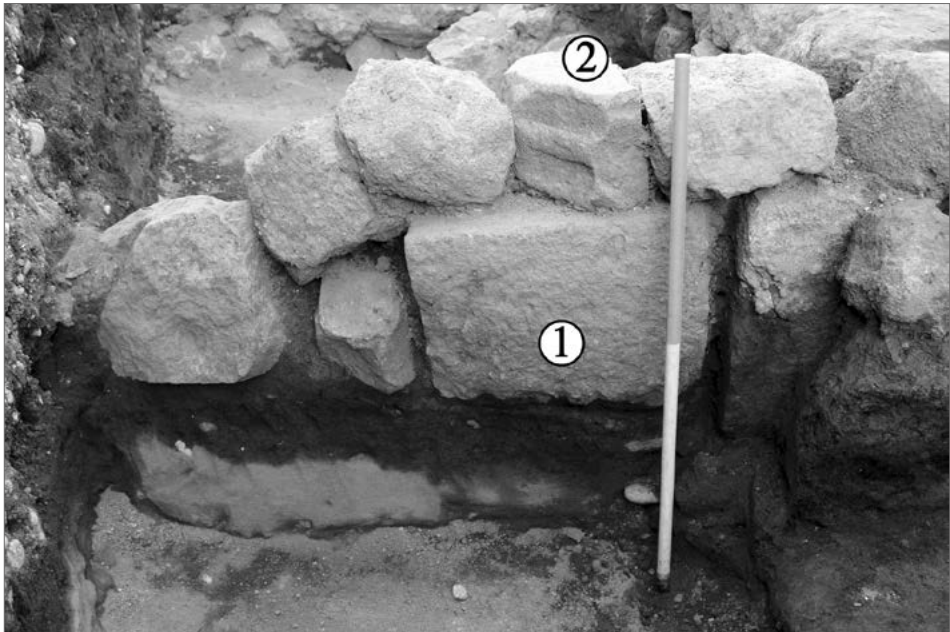
made by running fingers along the still wet clay surface. Similar traces could be observed on fragments of other specimens of this type.

► Flat tiles (*parietales*). Fragments of such ceramic tiles were excavated from the structure of one of the walls in the *thermae* reconstructed in Phase 2 [see *Fig. 4:5*]. An almost intact tile from this set measured  $22 \times 22 \times 3,5$  cm, but some of the other fragments must have come from larger tiles (a fully preserved edge of one tile amounted to 32.5 cm), although they could well be part of a square tile. A series of zigzagged and wavy grooves made with a pointed tool was noted on the surface of tiles of this kind [*Fig. 7* bottom row]. A single groove running around the tile near its edge was also observed on some of the specimens [*Fig. 7* bottom right]. These may be assumed to be the broken floor tiles from the *thermae*

before it was reconstructed, that is, from Phase 1. In all probability, the described incised ornament served a practical purpose as well (that is, preventing slipping on a wet floor).

► Tiles with protuberances (*tegulae mammatae*). This type of building material was found only in fragmentary form in the *thermae* area. Individual stubs were found in secondary contexts with fragments of the flat tiles of which they had originally been a part. The tiles were 1.4 cm thick.

► Round tiles. Recorded examples were about 27 cm in diameter and 4.5–4.9 cm thick [*Fig. 7* center right]. They came from secondary contexts inside the bathhouse and in one case, from a layer preceding the reconstruction of the *thermae*. In the latter case, it may have been part of a pillar (*pilae*) in the hypocaust cellar of Phase 1. However, the only hypocaust examined so far, situat-



*Fig. 8.* Stone pillar from the hypocaust basement by the furnace (*prae-furnium*). 1, 2 – secondarily used architectural elements (Gonio/Apsaros Expedition/photo A. Trzop-Szczypiorska)

ed next to the furnace in the northern part of the bathhouse (NO 11, Sq. 36), had stone pillars. Among other things, architectural elements from unidentified earlier buildings were used to make these pillars [Fig. 8].

► Ceramic pipes, round in section. Sections of aqueducts made of ceramic pipes were found in several places in the area occupied by the Byzantine fort. Most of these are therefore of Byzantine date, but in some cases the context is uncertain. A few can be assumed to be from the first centuries AD, but none so far have been recovered intact and hence could not be measured. In the so-called “eastern dig” (Sector NO 11; Sqs 89–90, 99–100), the situation was similar with damaged pipes being found from two different pipelines of various diameters. A section of a water supply system, consisting of cracked but usually fully preserved pipes, was found in the street north of the bathhouse [see Figs 4:1; 5 top]. This is almost certainly a later part of the pipeline (consisting of larger-diameter pipes) discovered in the “eastern trench” in question [see Fig. 2:4]. The two sections are aligned with

one another and the pipes are laid sloping downwards from east to west. This indicates that water must have been supplied from the hills to the east of the fort. So far, one sample has been taken from this pipeline for physico-chemical analyses and one complete pipe was removed for measurement and photographic and drawing documentation [Fig. 9]. This pipe proved to be 38 cm long and had an external diameter of 14.8 cm.

► No examples of pipes of quadrangular section (*tubuli*) have been found so far, although they were frequently used to lay vertical heating ducts in baths, for example. Their absence may be explained by the presence of tiles with protuberances which could have formed hollow spaces in the walls for the circulation of hot air.

This exhausts the list of types of ceramic building material found during the excavations at the Gonio/Apsaros fort, especially the bathhouse, but without discussing specific variations in full, since the main objective of this presentation is provide an introduction to the physicochemical analyses of

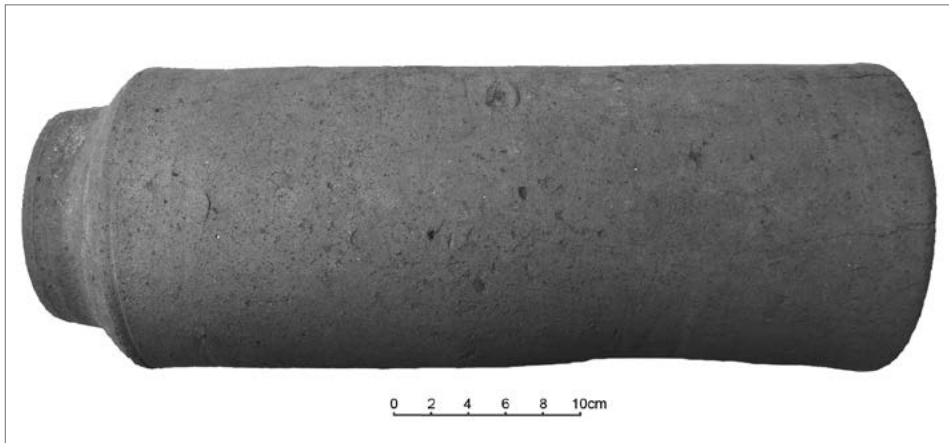


Fig. 9. Pipe from the water supply system discovered north of the bathhouse in Gonio/Apsaros (Gonio/Apsaros Project/photo O. Kubrak)

this category of material (see below). This topic, as well as that of the frequency with which various products were encountered among the finds from Gonio, and other statistical comparisons involving the ceramic building material, will be dealt with in a separate study.

### STAMPS ON CERAMIC BUILDING MATERIAL FROM GONIO/APSAROS

The small size of the assemblage of stamped building material from Gonio/Apsaros is surprising, especially when compared with the number of such finds from other collections, such as the Roman forts and posts in Taurica (Sarnowski 2005; 2006). For example, more than a dozen roof tile fragments with stamps were found in a small watchtower on the Kazackaya Hill near Inkerman, where—one should keep it in mind—only the roof was covered with ceramic tiles (Sarnowski, Savelja, and Karasiewicz-Szczypiorski 2007: 62). The other architectural features there were built of broken stone and raw clay.



Fig. 10. Example of a stamp from the bathhouse excavation: fragment of a rectangular field with an almost illegible inscription C[---] (Gonio/Apsaros Project/photo K. Żywicki)

Only a little more than a dozen stamped bricks and tiles were found within the entire Gonio/Apsaros fort. Almost all of them were found in fragments. In most cases, this makes a reconstruction of the inscriptions and, in consequence, the identification of the military unit that produced the building material impossible. The high soil acidity levels in Gonio constitute another destructive factor, leaving ceramic surfaces eroded and soft. Without the usual calcium carbonate patina encountered at most other archaeological sites, even gentle washing of the specimens leads to further damage and abrasion. However, the original percentage of stamped brick and roof tile specimens may be assumed to have been comparable to the production of other military brickyards. The unfavorable circumstances of deposition must have contributed to traces of weakly impressed stamps, especially letters, being rubbed off [Fig. 10]. It is also possible that many impressions could have gone unnoticed during routine documenting of large amounts of material.

### Stamp types

#### COH II [---]

Inscription placed within a rectangular field [Fig. 11:a,a']. At least four such stamp fragments have been found on roof tiles and two on bricks. None of these is complete. The stamped bricks come from the so-called “principia” [see Fig. 2:2], one of these from backfill consisting mainly of broken roof tiles. This layer is dated broadly to the 1st–3rd centuries AD. A stamped roof tile fragment was also found in the *thermae*, but in a layer connected to the destruction of the roof from the Byzantine

period; it is perhaps evidence of secondary use of older material following the dismantling of the previous building.

The most probable reconstruction of the inscription is COH II [CLA], read as

*Coh(ors) II Cla(udia) or Cla(udiana)* (M.P. Speidel 1984: 106; Mamuladze, Khalvashi, and Aslanishvili 2002: 34, Figs 1 and 2; Kakhidze 2008: Fig. 19; M.A. Speidel 2009: 613; Mitford 2018: 412, 550).

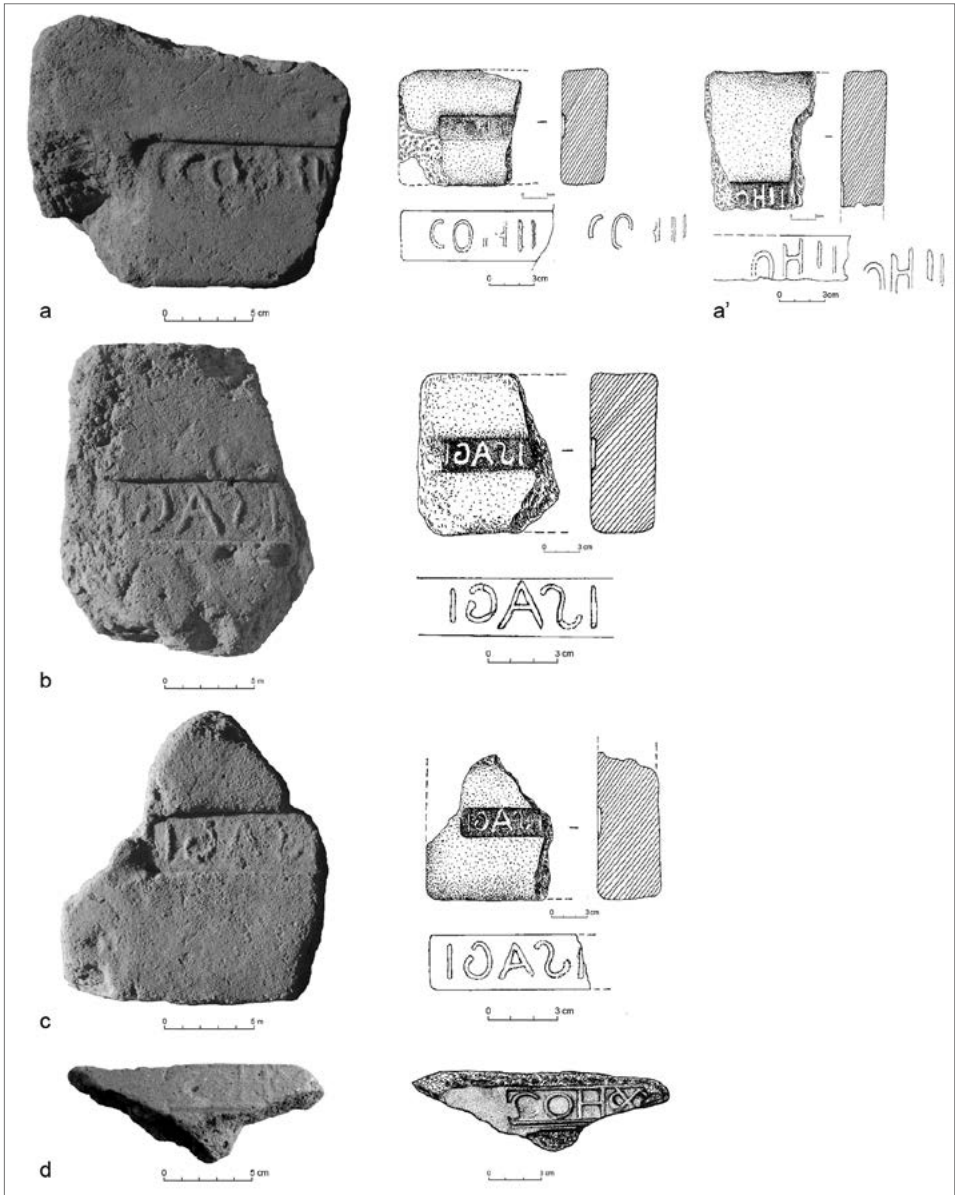


Fig. 11. Stamped brick and roof tile fragments: a – COH II [---]; b – I SAGI; c – [II] SAGI; d – COH II [---] (Gonio/Apsaros Project/photos G. Dumbadze, drawing A. Javelidze)



**I SAGI or [II]I SAGI**

Inscription placed in a rectangular field, incised as a mirror image [Fig. 11*b,c*]. Two examples, one fully preserved, were found on bricks. One of the bricks was found in a humus layer.

The most probable reconstruction of the inscription is (*Cohors*) I *sagi(ttaria)* or (*Cohors*) [II]I *sagi(ttaria)* (see Mamuladze, Khalvashi, and Aslanishvili 2002: 35, Fig. 3; Kakhidze 2008: Fig. 20; M.A. Speidel 2009: 620; Mitford 2018: 550).

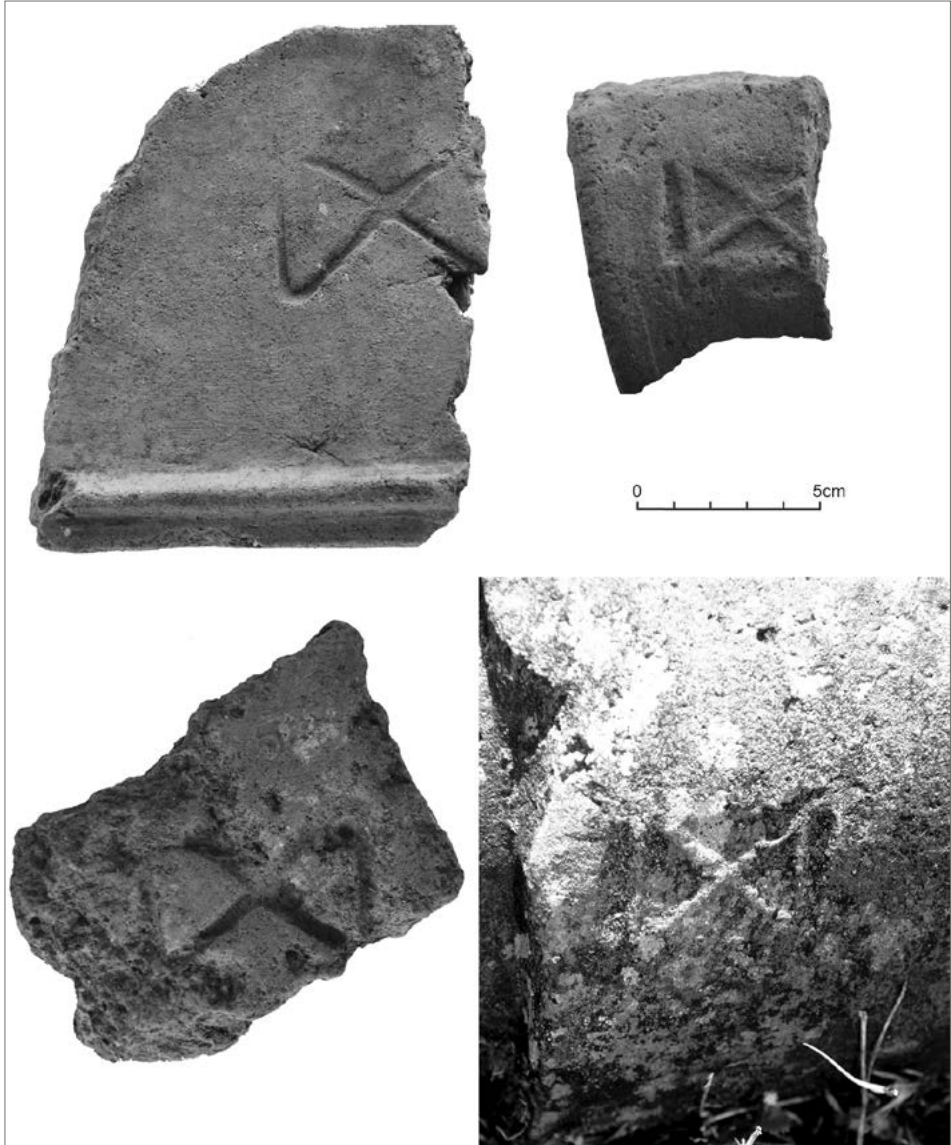


Fig. 12. Building ceramic fragments stamped with the X mark: top row, roof tiles; bottom row, pipes (Gonio/Apsaros Project/photos G. Dumbadze)



In light of the information gathered to date on the auxiliary forces that composed part of the army of the Cappadocia province, this might be a signature left behind by the *Cohors III Syrorum sagittariorum* (M.A. Speidel 2009: 619–620). However, three other archer cohorts should also be taken into consideration: *Cohors I Bosporanorum milliaria equitata sagittaria* (M.A. Speidel 2009: 612) or *Cohors I Ituraeorum milliaria equitata sagittaria* (M.A. Speidel 2009: 616), and also perhaps *Cohors I Numidarum (equitata?) sagittaria* (M.A. Speidel 2009: 618).

### COH ∞ [-]

Inscription in a rectangular field. Only one fragment of such a stamp on a roof tile was recorded from Gonio, in a layer of rubbish along with other bricks and roof tiles from the Roman period (Khalvashi and Aslanishvili 2014: 336) [Fig. 11:d]. The stamp may have been produced in a brickyard serviced by soldiers of the *Cohors milliaria equitata civium Romanorum* (M.A. Speidel 2009: 617). If this assumption is correct, the following reconstruction of the inscription can be proposed: **COH ∞ CR** – *Coh(ors) milliaria c(ivium) R(omanorum)*. The ∞ mark pertains to finds from the Gonio/Apsaros fort. This indicates that signatures from this group represent production by the same military unit, which was in all probability the said *Cohors milliaria equitata civium Romanorum*.

### X

The mark is said to be present on ceramic pipes from the 2nd century AD (Mamuladze, Khalvashi, and Aslanishvili 2002: 38). It was also encountered on fragments

of ceramic building material collected during a fieldwalking survey of the Satala site in 2004 (Hartmann 2004: 9, Nos S 04/8 and S 04/9), which also yielded from the same area legio XV Apollinaris stamps on ceramic building material. At Gonio, several examples of X stamps were collected from the humus layer or from contexts that were in one way or another unprovenanced. Roof tiles were also marked in this way. These are undoubtedly complete stamps, consisting of a single graphic symbol. At least four variants can be distinguished [Fig. 12]. Based on an analysis of a larger number of specimens, it can be said that the symbol used in Satala was not identical to that used in Gonio. At Apsaros there are no tiles with an X mark, only ∞ marks.

### CERAMIC BUILDING MATERIAL AT APSAROS: PRODUCTION OR DELIVERY?

The results of physicochemical analyses, presented below in Part 2, of a number of specimens from different ceramic products (including roof tiles, bricks and pipes), as well as raw clay from various deposits, have provided some crucial information. Primarily, most of the specimens taken from ceramic building material, including all of the stamped specimens, belong to two reference groups distinguished as a result of the analyses [see below, Table 1]. However, it should be noted that only products signed with the stamp **COH II [---]** were categorized in the Apsaros 2 group, while the Apsaros 1 group contained examples with this stamp and with the **I SAGI** stamp. In addition, it can be said that Apsaros 1 clay was used to produce bricks, roof tiles and pipes, while Apsaros 2 clay has been confirmed

as having been used only for roof tile production. However, at the current state of research, it is difficult to formulate more far-reaching conclusions as in the case of the majority of the stamped bricks and roof tiles the context and circumstances in which they were found remain unknown. Information available about the dig, the sector and square from which they originate is insufficient.

The relatively high number of samples allocated to each of the two listed groups allows for the assumption that the products from these clay types were locally made (in bulk and over a longer period). This remains a hypothesis since the currently analyzed raw clay samples from the vicinity of the fort did not show any similarity to the above-mentioned reference groups [see below, *Table 1*]. It is interesting to note that raw clay also used as a substructure layer under the frigidarium floor (MD5784) in Phase 2 was not present in the production of items belonging to the Apsaros 1 and Apsaros 2 groups. Acquiring the clay necessary for the construction works somewhere nearby seems almost certain. This same clay might have also been supplied to the brickyard.

In turn, in light of the analysis results, it should be assumed that other producers may have provided smaller consignments of building material, probably by sea. This might have been the case especially at the onset of Roman presence in Apsaros, before local facilities, indispensable for fort construction, were organized. Confirmation of this hypothesis is provided by the analysis results of a sample taken from one of the bricks from the latrine floor, functioning in Phase 1 of the bath-

house (MD5782). The result in this case is not concordant with the results of any of the other analyses. The outcome of an analysis of a roof tile fragment originating from the backfill formed following the collapse of the bathhouse roof is the most surprising (MD5779). This roof functioned in Phase 2, that is, in the first half of the 2nd century. In that period, local building material must have been in use; nonetheless, the discussed roof tile differs from the remaining ones.

To summarize, it is proposed that the products made from clay classified as belonging to the Apsaros 1 group may have been manufactured at the time of Arrian's inspection of the fort or, more broadly, during Hadrian's reign. The reconstruction of the garrison bathhouse took place then, at the latest (Karasiewicz-Szczygiński 2016: 54). This is the farthest-reaching conclusion that can be drawn from an examination of the contexts from which some of the samples originated. Phase 2, that is, the reconstruction of the *thermae* (and perhaps also of other buildings in the fort), would refer at the latest to the first half of the 2nd century AD. Intensified construction activities required large amounts of different material. In the case of the bathhouse, this signifies the necessity of producing diverse building ceramics that would be water- and fire-proof. Two samples originate from contexts obviously linked to the Phase 2 building: a pipe fragment (MD5783) and a brick sherd (MD5780). One other such sample, probably linked to the reconstruction of the *thermae* (Phase 2), is a roof tile fragment (MD6144).

These observations refer indirectly to Arrian's comment about the presence of

a garrison composed of as many as five cohorts in Apsaros during his inspection. It can be assumed that two of them signed their ceramic production using stamps: **COH II** [---] and **I SAGI**. Does it mean that the Apsaros 2 group represented earlier production? This currently seems to be the most probable interpretation. It can be assumed that the limited selection of produced items (only roof tiles?) comes from a period preceding the concentration of the army and Arrian's visit. The reinforcement of the garrison in Apsaros (most probably only temporary) seems to have led to intensified construction activities. The increased demand for brickyard production may explain the opening of an additional, perhaps more efficient clay deposit (Apsaros 1). Simultaneously, extraction of raw material that had been in use previously (Apsaros 2) may have been terminated, but this remains uncertain. Simultaneous use of two different clay deposits (for a period of time) may have been caused by the different properties of the raw material. Technological and functional analyses should resolve this issue.

Although clay deposits corresponding to the reference groups Apsaros 1 and Apsaros 2 could not be determined, the general ceramic production at the site in the Roman period has been confirmed ar-

chaeologically. A kiln for firing amphorae was found in the southwestern part of the late fort (Mamuladze, Khalvashi, and Aslanishvili 2002: 38). Under the Principate, this area was located outside the defensive walls [see *Fig. 2:1*]. This, most probably, pertains to civilian production carried out in a settlement next to the garrison.

In the case of Apsaros, continued research into the sources of the construction material (including clay) is most certainly required, hopefully determining the deposits used by the Roman army. Further analyses should give more in-depth knowledge into two reference groups possibly applicable to the study results from Gonio. So far, there are only a few amphora and cooking ware sherds that have been found to belong to these groups [see below, *Table 1*]. The group including two amphorae from chemical groups 1 and 13 (MD214 and MD6141) may attest to production involving the use of clay from the vicinity of the fort [see below, *Fig. 17*].

Research into the ceramic production in Apsaros from the Roman period is in its initial stage. Undoubtedly, continued excavations will lead to acquisition of more stamped bricks and roof tiles, including specimens with fully preserved stamps.

## **PART 2. CERAMICS AND RAW MATERIALS: RESULTS OF ARCHAECERAMOLOGICAL ANALYSIS OF CERAMIC SAMPLES FROM GONIO/APSAROS**

An archaeoceramological analysis was carried out on five pottery sherds (Colchian amphorae and common wares), 16 fragments of ceramic building materials (bricks, roof tiles, one pipe and one floor tile fragment) and one sample of daub clay (MD5784) from the excavations at the Gonio/Apsaros fortress. Ten samples of clay raw materials collected by Shota Mamuladze from the vicinity of the site were also analyzed. The analysis was undertaken in order to determine whether the ceramic finds from Apsaros are homogeneous or non-homogeneous in terms of the raw materials used to make them (both clay and non-plastic components), and to assess the chemical composition of clay available in the region and its suitability for making pottery.

To this end the analyzed ceramics from Apsaros were classified using a provenance classification system, taking into account matrix type (the matrix being the plastic part of the ceramic body which hardens during firing, commonly referred to as ‘clay’) and the chemical composition of the ceramic material (known as the fingerprint of the ceramic body from which a particular ceramic artifact was made) as well as non-plastic inclusions (clastic material = natural or intentional temper). A firing test was used to classify the raw material samples according to their suitability for making ceramic building materials (CBM) and/or pottery. Subsequently, the matrix type and chemical composition of selected raw

material samples was determined, as was the case with pottery.

The analytical methods used were as follows: MGR-analysis (Matrix Group by Refiring) for pottery; plasticity test (determining water of plasticity values), and firing test for raw material samples; chemical analysis by wavelength-dispersive X-ray fluorescence (WD-XRF) for both artifacts and raw materials.

The MGR-analysis was applied in order to determine the composition of the ceramic matrix. Matrix types can be identified using this technique because the thermal behavior of plastic components during firing is governed by their chemical and phase composition (Daszkiewicz 2014; Daszkiewicz and Maritan 2017; Daszkiewicz and Schneider 2001). After the sherds are refired, at a temperature higher than their original firing temperature, i.e., once the effects caused by the original firing temperature and conditions are ‘removed’, the color, shade and appearance of the matrix relate to the chemical and phase composition of the plastic part of the body. The MGR-analysis allowed the pottery to be classified into groups of sherds made of the same plastic raw material.

The chemical analysis of sherds was used to establish the chemical composition of both the plastic and non-plastic ingredients of the pottery fabric. This analysis enabled the quantity of major and trace elements in the body to be established, revealing the geochemical characteristics of the raw materials used, although the

phases in which individual elements occur could not be determined<sup>1</sup> (giving the major elements as oxides<sup>2</sup> is standard procedure in geochemistry when presenting the results of chemical analysis).

When using these two analytical methods in provenance studies, ceramic groups are determined independently using MGR-analysis and chemical analysis. Each of these methods yields a different type of classification (matrix groups and geochemical

groups respectively). Collectively, this type of classification allows provenance groups to be established, highlighting differences in chemical composition but also demonstrating what these differences are associated with (e.g., ceramic artifacts belonging to two different groups may be locally produced using the same clay with the addition of different tempers depending on the intended function of the product).

## ANALYSIS RESULTS

### CERAMICS

All ceramic building material fragments (CBM) and pottery sherds were made of non-calcareous clays colored by iron compounds. These samples have a sintered matrix type (SN).<sup>3</sup> Ten MGR-groups<sup>4</sup> were identified based on the thermal behavior of the matrix. Group sizes vary. The most numerous represented is MGR-group 1 (seven samples). Eight MGR-groups are each represented by a solitary sample<sup>5</sup> [Table 1].

The CBM was made of plastic raw materials that fired to various shades of red-brown at 1200°C [Figs 13–14: MGR 1–5]. In contrast, pottery sherds fired to shades of

red, brownish-red and reddish-brown at 1200°C [Fig. 14: MGR 6–10].

Non-plastic temper was noted in all of the samples. This was readily visible macroscopically (particularly after refiring) in the form of black particles characterized by a melting point of below 1200°C. Particles with a melting point of below 1150°C were also observed. Clastic material groups (groups of samples with similar quantities, composition and particle size of non-plastic ingredients) are consistent with plastic raw material groups (i.e., MGR-groups). Two rim sherds (samples MD6140 and MD6142 representing MGR-groups 7

1 Ca content, identified by chemical analysis, may be attributable to, for example, inclusions of calcite or dolomite or anorthite, or may occur exclusively in the clay fraction in the matrix.

2 Si = silicon, calculated as SiO<sub>2</sub>; Al = aluminium, calculated as Al<sub>2</sub>O<sub>3</sub>; Ti = titanium, calculated as TiO<sub>2</sub>; Fe = iron, total iron calculated as Fe<sub>2</sub>O<sub>3</sub>; Mn = manganese, calculated as MnO; Mg = magnesium, calculated as MgO; Ca = calcium, calculated as CaO; Na = sodium, calculated as Na<sub>2</sub>O; K = potassium, calculated as K<sub>2</sub>O; P = phosphorus, calculated as P<sub>2</sub>O<sub>5</sub>.

3 Sintered matrix type (SN) = the sherd is well-compacted; it may or may not become smaller in size in comparison to the original sample, whilst its edges remain sharp.

4 MGR-groups represent groups of greatest similarity. Samples attributed to the same MGR-group and to the same clastic material group were made of the same ceramic body.

5 It is highly unlikely that only a single vessel would have been made from one ceramic body, thus it is assumed that the sample submitted for analysis represents a group of vessels made of the same raw material. This is why the term 'group' is used even in relation to so-called groups that are represented by only one sample.



and 9 respectively) were very distinctive because of the size and composition of their inclusions, which were macroscopically observed almost exclusively in the

form of black particles characterized by a melting point of below 1200°C [see Fig. 14]. A much greater diversity in temper composition was macroscopically visible

Table 1. List of analysed samples: laboratory number in Daszkiewicz & Schneider database, water of plasticity, MGR-groups, chemical groups and reference groups (Digitizing M. Daszkiewicz)

Type of sample	Stamp or inventory number	Laboratory number	Plasticity water H <sub>2</sub> O/100g [%]	MGR group	Chemical group	
brick	I SAGI	MD204	-	1	G2	reference group Aps 1
roof tile	[CO]H [II ---]	MD205	-	1		
brick	I SAGI	MD208	-	1		
brick	[C]OH II [---]	MD209	-	1		
tegula		MD5781	-	1		
pipe		MD5783	-	1		
roof tile	C[OH II ---]	MD6144	-	1		
brick		MD5780	-	5		
roof tile	C[OH II ---]	MD206	-	4	G3	reference group Aps 2
roof tile	CO[H II ---]	MD207	-	4		
roof tile		MD210	-	4		
roof tile		MD211	-	4		
roof tile		MD212	-	4		
roof tile		MD213	-	4		
Colchian amphorae		MD6141	-	8	G1	?
amphorae		MD214	-	6	G13	
rim fragment		MD6140	-	7	G10	?
rim fragment		MD6142	-	9		
Colchian amphorae		MD6143	-	10	G11	
clay daub		MD215	-	11	G4	various local and regional clays and products
clay	clay 2015	MD5784	37	12	G5	
clay	No. 1	MD5939	40	13		
clay	No. 4	MD5941	56	15		
tegula		MD5779	-	2	G6	
floor tile		MD5782	-	3	G7	
clay	No. 5	MD5942	36	16		
clay	No. 6	MD5943	43	17		
clay	No. 7	MD5944	52	18		
clay	No. 2	MD5940	50	14	G9	
clay from mountain	No. 9/2016	MD6176		19	G12	
clay	No. 3	-	41	not analysed		
clay	No. 8	-	66			

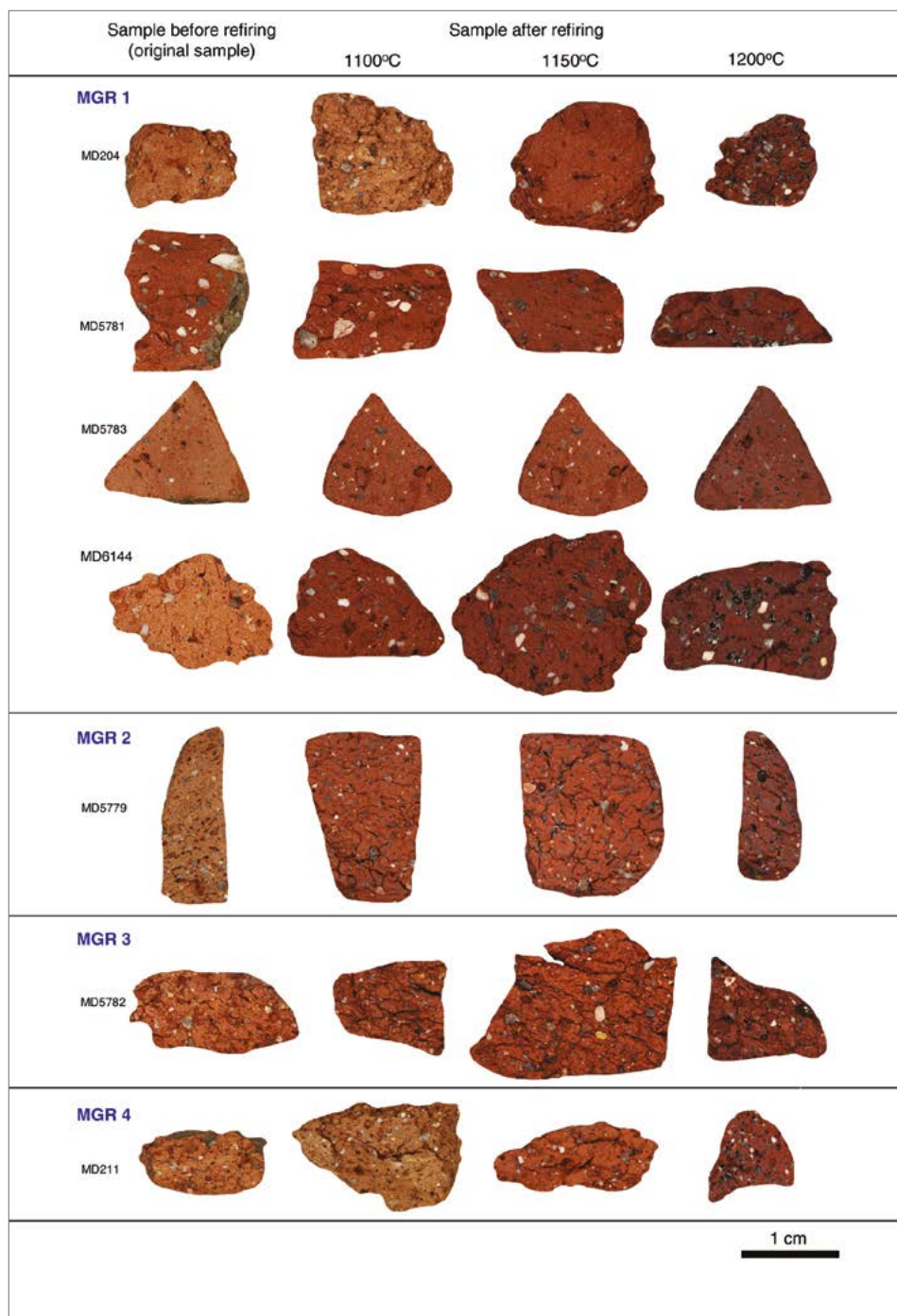


Fig. 13. MGR-analysis results: MGR 1–4 – ceramic building material (CBM)  
(Digitizing M. Daszkiewicz, macrophotos M. Baranowski)

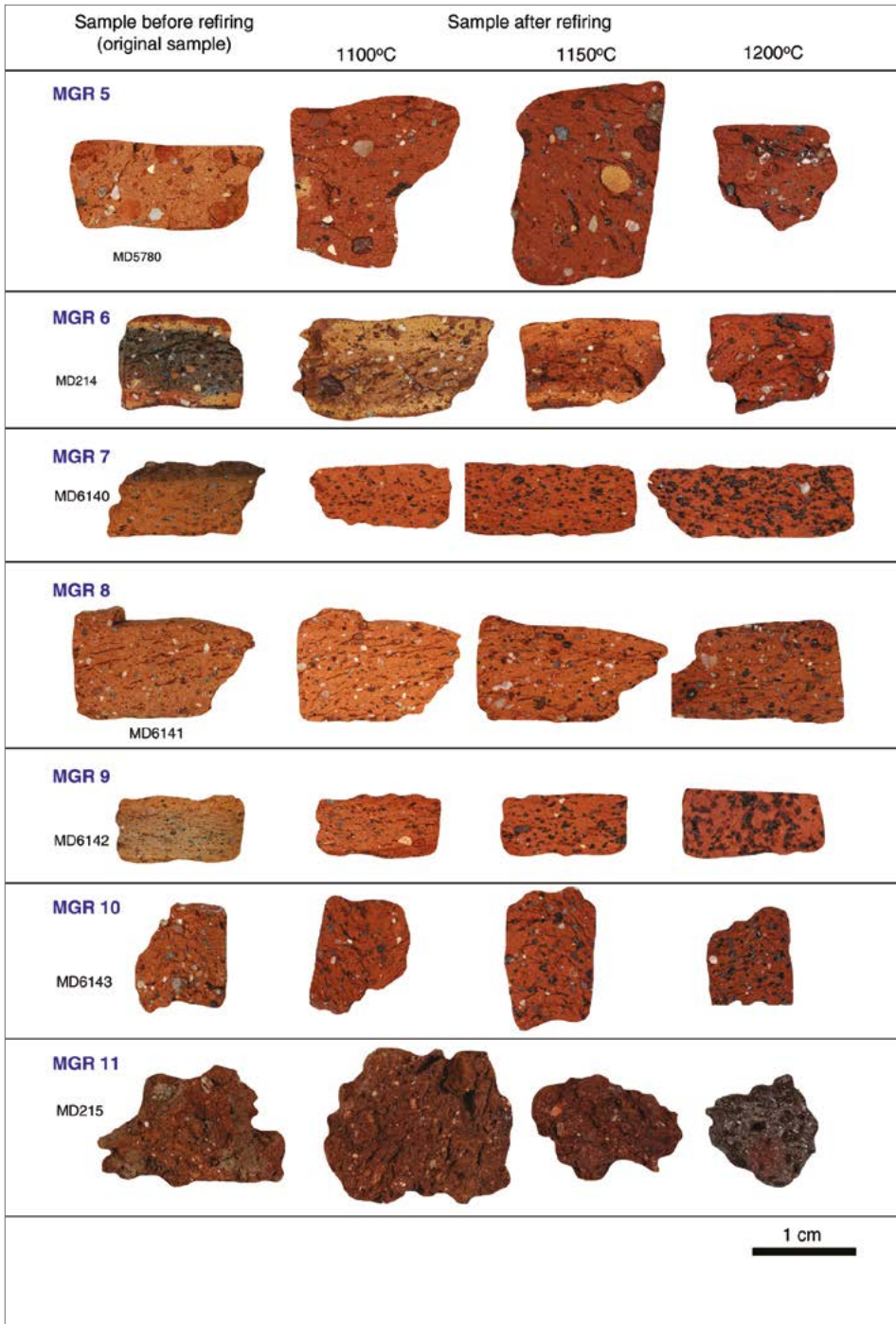


Fig. 14. MGR-analysis results: MGR 5 – brick fragment; MGR 6, 8 and 10 – amphora sherds; MGR 7 and 9 – pottery rim sherds; MGR 11 – daub (Digitizing M. Daszkiewicz, macrophotos M. Baranowski)

in all the other samples of amphorae and CBM [see Figs 13–14]. Furthermore, larger particles of temper were visible in some CBM samples (brick MD5780, tegula MD5781), as were clay aggregates or clay lumps, indicating that the preparation of the plastic part of the ceramic body did not produce homogeneous material (brick MD5780, pipe MD5783, roof tile MD6144).

The recipes (the proportion of the plastic to the non-plastic part of the ceramic

body) used in making the two vessels represented by the rim sherds were not the same. The percentage of non-plastic ingredients used was estimated at 30% for sample MD6140 and 20% for sample MD6142. The ceramic bodies from which the amphorae were made (MD214, MD6141 and MD6143) were prepared using a different recipe. They contain 15% non-plastic ingredients. Fewer non-plastic particles are visible in the CBM samples (10–15%).<sup>6</sup>

Table 2. Chemical analysis results for ceramic building material (Aps 1 and Aps 2), pottery (chemical groups 1, 13[1], 10, 11) and locally/regionally occurring clays  
Results of chemical analysis by WD-XRF (Preparation M. Daszkiewicz, measurements G. Schneider and A. Schleicher in GFZ Potsdam). Analysis on ignited samples, major elements normalized to a constant sum of 100%, loss on ignition stated in column 'l.o.i.', elements in brackets are determined with lower precision (Digitizing M. Daszkiewicz)

MGR group	Chem. clus.	Lab. No.	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MnO	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	V	Cr	Ni (Cu)	Zn	Rb	Sr	Y	Zr (Nb)	Ba (La Ce Pb)	l.o.i. %					
			per cent by weight										ppm														
8	1	MD6141	68.14	1.27	19.24	7.59	0.045	0.78	1.06	0.44	0.96	0.48	165	178	34	34	79	49	97	21	258	31	363	20	51	42	5.84
6	13(1)	MD214	66.22	0.96	19.22	9.22	0.028	1.63	1.26	0.57	0.84	0.05	193	125	36	32	48	45	74	16	164	11	421	12	23	23	0.20
<b>Aps1 reference group</b>																											
1	2	MD209	67.30	1.11	18.53	6.87	0.088	1.35	1.17	1.58	1.82	0.17	163	203	47	54	84	63	168	23	215	12	409	26	53	22	0.96
1	2	MD204	65.10	1.04	18.66	8.04	0.100	1.23	1.78	1.92	1.68	0.44	143	210	50	65	80	53	176	21	194	12	402	17	50	19	4.24
1	2	MD208	64.85	1.15	19.43	7.04	0.065	0.90	1.26	1.78	1.65	1.89	162	210	49	79	114	59	163	22	223	12	450	17	43	30	5.60
1	2	MD205	65.31	1.11	18.83	7.44	0.088	1.83	1.52	1.79	1.83	0.27	166	249	60	80	109	56	208	27	191	10	444	29	60	30	1.64
1	2	MD6144	64.96	1.06	19.26	7.77	0.096	1.50	1.44	1.38	1.78	0.75	140	188	59	67	90	58	194	28	192	14	449	15	45	23	1.51
1	2	MD5783	64.56	1.22	19.85	8.48	0.095	0.84	0.95	0.97	1.87	1.16	140	228	51	81	72	68	150	22	234	18	458	17	24	21	4.46
1	2	MD5781	64.56	1.12	19.73	9.04	0.086	1.47	0.93	1.01	1.83	0.23	197	202	56	73	89	62	164	23	197	16	436	21	47	22	1.00
5	2	MD5780	66.01	1.02	19.55	7.75	0.048	1.23	1.25	1.22	1.60	0.33	121	157	49	90	78	53	151	18	182	17	380	20	30	130	1.34
<b>Aps2 reference group</b>																											
4	3	MD211	54.89	1.23	25.10	10.71	0.098	2.77	2.42	1.27	1.16	0.36	268	203	46	114	94	36	175	22	141	7	419	6	40	16	1.55
4	3	MD210	54.10	1.24	24.63	11.45	0.096	2.91	2.87	1.29	1.06	0.36	267	208	41	100	99	32	182	22	128	7	421	<5	38	15	1.52
4	3	MD206	54.34	1.23	24.97	11.28	0.098	2.76	2.63	1.29	1.04	0.36	259	155	53	112	96	33	176	22	126	6	430	<5	33	112	1.50
4	3	MD207	54.33	1.24	24.90	10.83	0.096	2.92	2.78	1.32	1.04	0.55	234	244	62	114	109	35	181	20	139	6	397	8	41	16	2.16
4	3	MD213	54.67	1.26	24.88	10.77	0.077	2.19	2.90	1.39	0.95	0.93	222	256	43	89	82	29	188	21	129	8	390	7	26	18	5.15
4	3	MD212	52.93	1.31	24.83	11.25	0.129	2.32	3.27	1.43	0.99	1.54	249	269	46	93	96	31	200	22	141	8	393	12	38	74	6.85
<b>various local/region clays and products (* = tegula; ** = floor tile)</b>																											
11	4	MD215	53.40	1.10	21.43	11.48	0.178	4.42	4.15	1.47	1.83	0.55	313	192	67	158	107	52	385	23	107	<5	433	15	36	16	1.07
12	5	MD5784	58.75	1.49	23.73	12.28	0.109	1.28	0.64	0.14	1.15	0.43	390	220	79	118	83	90	20	234	21	228	40	47	22	9.03	
13	5	MD5939	56.80	1.59	26.04	12.96	0.222	1.03	0.08	0.06	1.04	0.18	348	263	143	154	105	81	67	23	247	24	262	41	85	30	10.06
15	5	MD5941	55.07	1.56	28.50	13.09	0.038	0.79	0.08	0.00	0.76	0.11	330	163	73	192	88	64	64	29	229	20	179	38	66	21	11.20
2	6*	MD5779	53.02	1.21	25.36	12.46	0.162	1.87	1.92	0.89	1.45	1.65	242	147	73	241	93	46	213	29	125	10	468	14	58	15	7.52
3	7**	MD5782	52.48	1.45	26.41	13.81	0.122	2.51	1.30	0.49	1.06	0.37	339	193	96	203	96	51	144	26	133	14	349	17	64	17	1.15
16	7	MD5942	50.10	1.77	28.02	15.65	0.144	2.10	0.50	0.15	1.39	0.19	504	169	85	199	132	61	143	22	141	12	426	33	39	13	12.08
17	7	MD5943	47.96	1.63	28.21	16.50	0.128	2.76	0.85	0.22	1.44	0.30	486	128	77	206	128	50	137	29	121	9	468	30	44	15	10.64
18	8	MD5944	47.41	1.51	32.07	16.44	0.097	1.58	0.00	0.01	0.64	0.25	426	150	54	264	92	39	39	55	108	<5	188	31	56	8	12.23
14	9	MD5940	51.02	1.47	24.74	16.68	0.154	1.89	0.41	0.09	3.31	0.24	438	392	83	186	116	99	309	20	123	10	758	38	25	14	9.16
19	12	MD6176	44.44	1.73	32.02	19.00	0.228	1.73	0.09	0.01	0.46	0.29	546	333	470	491	111	26	56	37	101	6	249	49	57	15	12.87
<b>?</b>																											
9	10	MD6142	66.72	1.29	15.04	8.14	0.039	3.12	4.00	0.28	0.40	0.96	180	454	56	25	47	31	98	25	232	25	194	26	53	31	3.12
7	10	MD6140	61.82	1.52	16.13	9.11	0.058	4.22	5.55	0.37	0.42	0.82	143	646	83	31	70	26	123	29	251	31	161	29	71	32	3.06
<b>?</b>																											
10	11	MD6143	60.98	1.61	16.87	13.76	0.079	1.74	2.69	0.52	0.40	1.36	266	499	67	47	110	32	158	27	259	24	180	34	37	32	5.34



The chemical analysis results indicate that the analyzed pottery and CBM were made from raw materials of very diverse chemical composition [Table 2].

### RAW MATERIALS

The plasticity test, which included estimating the water of plasticity (make-up water) content, was the first analytical procedure to be performed. The amount of make-up water was determined in all of the clay samples discussed in this paper. The resultant values (in g H<sub>2</sub>O per 100 g of dry matter) are listed in Table 1. Water of plasticity is the amount of water needed to bring 100 grams of clay to a workable plasticity (see Appendix below). This test revealed that the water of plasticity content in the analyzed raw material samples ranges from 36 g to 66 g H<sub>2</sub>O/100 g clay. Two of these samples did not exhibit the characteristics of plastic raw materials (clay Nos 3 and 8); however, the first firing test was also performed on these samples. In order to determine water of plasticity, the prepared clays were pressed into plaster moulds of a Gorgon's mask. These masks were fired at 900°C [Fig. 15].<sup>7</sup>

Clay Nos 3 and 8 did not produce suitably workable plastic masses. They could be formed into briquettes, but because of their high content of silt- and sand-sized particles, the objects made of these raw materials had very little mechanical resistance (grains crumbled away

from their surfaces when lightly rubbed with a finger). Thus, these raw materials could not have been used either for making pottery or CBM (it is unlikely that these types of raw materials would have been levigated). One sample (MD5941) is characterized by severe shrinkage, resulting in cracks. This clay would have had to be tempered. The remaining raw materials would have been suitable for making ceramics without the need for any additional processing (such as levigation or tempering).

The next stage of the raw material analysis (two non-plastic samples were excluded from further analysis) was to carry out a firing test to assess whether the raw materials could have been used for making the pottery and CBM discovered at Apsaros. Briquettes for this test were formed using a plastic mass and non-porous porcelain moulds to create dome-shaped (plano-convex) samples; these were then dried and fired in the same conditions used for pottery subjected to the MGR-analysis. The fired briquettes were subsequently classified into the MGR-groups using the same procedure as for refired ceramic specimens.

All of the raw materials are non-carbonate clays colored by iron compounds, and they all have a sintered (SN) matrix [Fig. 16].

This is the same matrix type as that of the analyzed ceramic artifacts. Similar non-plastic ingredients were also

- 6 Macroscopic assessments were carried out using the AGI Data Sheets for Geology in the field, laboratory, and office, compiled by R.V. Dietrich, J.T. Dutro, Jr. and R.M. Foose, American Geological Institute 1982.
- 7 Taking into account loss on ignition, it can be assumed that the original firing temperature of pottery and CBM falls within a range of 800–900°C.



observed in the form of black particles with a melting point of below 1200°C. When fired at 1200°C, the clays take on various colors, from beige-brown (MD6176) to reddish-brown (MD5784) and brown (MD5942). Extensive cracks were observed in the briquette made of

clay characterized by severe shrinkage (MD5941). Each of the raw material samples was attributed to a different MGR-group (MGR-groups 12–19).

The daub clay sample stood out among the tested samples. It represented a combination of two raw materials



Fig. 15. Plasticity test: samples formed in plaster moulds and fired at 900°C in an oxidising atmosphere in a laboratory kiln (Digitizing M. Daszkiewicz, photos M. Baranowski)



Fig. 16. Firing test results: briquettes made in porcelain moulds (Digitizing M. Daszkiewicz, macrophotos M. Baranowski)

characterized by very different thermal behaviors. One of the raw materials has a sintered matrix (SN), while the second, which is the predominant of the two, has an over-melted matrix (ovM).<sup>8</sup> The daub was exposed to a temperature that was high enough to cause the thermal decomposition of clay minerals, resulting in a loss of plasticity (it is in fact a ceramic fabric).

The chemical analysis was performed on all of the raw materials and on the daub sample [see *Table 2*]. The results are discussed in the following section together with the results of the chemical analysis carried out on the ceramic finds.

### PROVENANCE GROUPS

In provenance studies it is important to remember that there are two principal means of determining the provenance of a sample. Samples can be attributed to:

- reference groups with a known production place,
- reference groups without a known production place.

In the first instance, comparative studies are required to establish whether a particular compositional group represents kiln wasters, potter's tools or raw materials (the fact that a ceramic find belongs to a group representing the majority of samples from a given site does not always mean that the majority represents local products native to that site). In the second instance, the compositional group does not correspond to any group of known provenance

(at the current stage of research).

The local provenance of the pottery and CBM found at Apsaros could potentially be confirmed by comparing their analysis results with those of the raw materials.

The MGR-analysis and firing tests demonstrate that none of the analyzed ceramic samples belong to the same MGR-group as the raw material samples [see *Table 1*]. However, they do share certain traits: an SN matrix type and macroscopically visible black particles characterized by a melting point of below 1200°C. They differ in color when fired at 1200°C; only the tegula fragment (MD5779) fires to the same color (albeit of a different shade) as raw material MD5784.

Once the results of the MGR-analysis are known, this will enable the correct interpretation of chemical clusters deriving from multivariate statistics. This means that after the MGR-analysis and firing tests, it is evident that none of the analyzed clays were used directly as raw materials for making the analyzed fragments of pottery and CBM. However, given the fact that there are certain similarities between them, this does not rule out the possibility that they may belong to the same chemical group.

The results of chemical composition analysis of ceramic finds and raw materials enabled various chemical groups to be identified and some of these could be combined into larger provenance groups. The results of multivariate cluster analysis<sup>9</sup>

8 Overmelted matrix type (ovM) = the surface of the sample becomes overmelted and its edges slightly rounded.

9 Both the multivariate cluster analysis and principal components analysis were carried out using a licensed copy of the SYSTEM Package obtained from the Weierstrass Institute for Applied Analysis and Stochastics, Leibniz Institute in Forschungsverbund Berlin e.V.

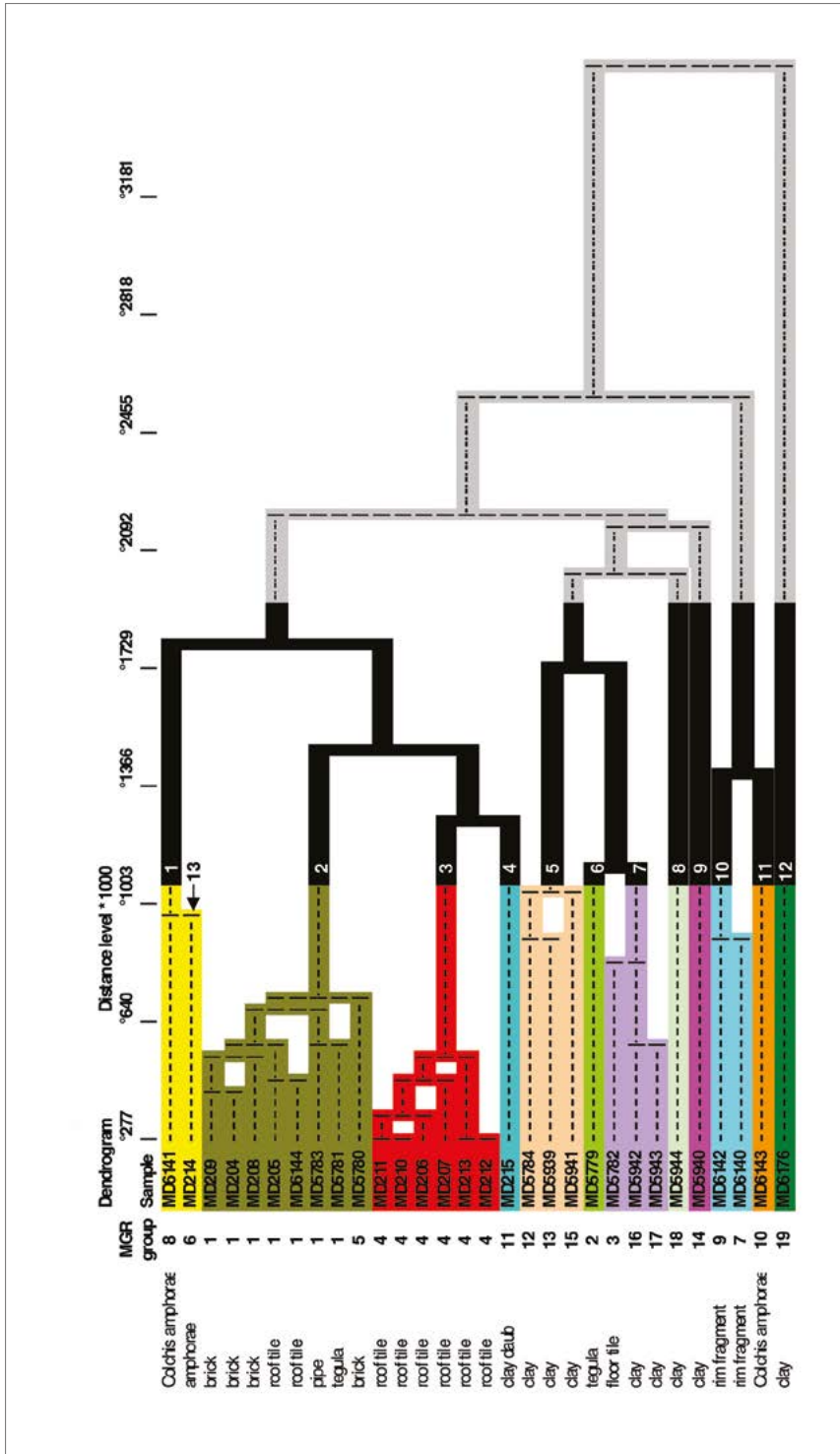


Fig. 17. Dendrogram of the results of multivariate cluster analysis (Digitizing M. Daszkiewicz)

are presented as a dendrogram [Fig. 17].

This analysis<sup>10</sup> takes into account the chemical composition of all 30 analyzed samples. Twelve clusters were singled out. The first of these encompasses two fragments of amphorae made from different clays, as determined by the MGR-analysis (MGR groups 6 and 8). The differences in chemical composition between these two samples (e.g., in their Ti, Mg, Cr and Zr levels) are significant enough for this cluster to be divided into two chemical groups, each represented by a single sample: group 1 by sample MD6141 and group 13 by sample MD214 [see Fig. 17 and Table 2]. The remaining clusters produced by multivariate cluster analysis are consistent with the chemical groups (denoted as G<sub>1</sub>–G<sub>13</sub> in Table 1). Cluster 2 in the dendrogram (chemical group G<sub>2</sub>) consists of eight samples, including all of those attributed to MGR-group 1 (seven samples) and one sample representing MGR-group 5. These are fragments of four bricks, two roof tiles, one tegula fragment and the sole fragment of pipe analyzed. These chemical groups are characterized by SiO<sub>2</sub> levels of 64.56–67.30wt.%, Fe<sub>2</sub>O<sub>3</sub> levels ranging from 6.87 to 9wt.%, and by relatively high levels of Na<sub>2</sub>O [see Table 2]. Although the amphorae representing chemical groups G<sub>1</sub> and G<sub>13</sub> have similar levels of SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub> and Fe<sub>2</sub>O<sub>3</sub>, Group G<sub>2</sub> differs from them in having higher levels of Na<sub>2</sub>O, K<sub>2</sub>O and Cr and much higher levels of Sr despite having a similar CaO content (strontium is a geochemical correlate of calcium). The third cluster (equating to

chemical group G<sub>3</sub>) is represented by six samples, all of which belong to the same MGR-group (4) and all of which are roof tile fragments. All samples belonging to MGR 4 and G<sub>3</sub> have a very similar chemical composition, which differs markedly from the samples attributed to G<sub>2</sub>. SiO<sub>2</sub> levels are much lower (52.93–54.89wt.%), Al<sub>2</sub>O<sub>3</sub> levels are much higher (24.63–25.10wt.%) and Fe<sub>2</sub>O<sub>3</sub> levels range from 10.71 to 11.45wt.%. MgO and CaO levels are also higher, whilst the Sr/Ca ratio is twice as low. The average Al/Si ratio is 0.29 for G<sub>2</sub> and 0.46 for G<sub>3</sub>. The results of the MGR-analysis show that the increased silica content in the samples attributed to G<sub>2</sub> is not related to larger numbers of coarse grains of quartz temper, but to grains measuring less than 100µm (macroscopically visible at 40× magnification), hence to the type of clay.

The fourth cluster comprises only one sample: a piece of daub representing MGR-group 11. It differs from the samples ascribed to G<sub>3</sub> in having higher levels of MgO and CaO, though, unusually for a daub sample, it does not have elevated levels of phosphorus or barium.

The next cluster consists of three clay samples attributed to MGR-groups 12, 13 and 15. These clay samples also fall into cluster 7 (encompassing two clay samples and a floor tile fragment) and clusters 8 and 9 (each containing one clay sample). The three clusters comprising clay samples and a floor tile, together with cluster 6, comprising a tegula (MD5779), can be classified as one large group. The characteristic feature of all these clays is

10 Analysis using Euclidean distance and average linkage aggregative clustering of a distance, Z-scores transformation, elements used: Si, Ti, Al, Fe, Mn, Mg, Ca, Na, K, V, Cr, Ni, Cu, Zn, Rb, Sr, Y, Zr and Ba.



their very low CaO and NaO levels, their high  $\text{Al}_2\text{O}_3$  content (up to 32.07wt.% in sample MD5944) as well as their very high  $\text{Fe}_2\text{O}_3$  content (12.28–16.67wt.%) and associated high vanadium content. This group does not include cluster 9, comprising clay MD5940, which was the only clay sample characterized by high levels of potassium (3.31wt.%  $\text{K}_2\text{O}$ ) and had the highest Sr content (309 ppm) noted in any of the analyzed samples, whilst also having a very low CaO content (0.41wt.%).

The group of clusters containing clays include neither the daub sample nor the clay sampled from the hills overlooking the site (R. Karasiewicz-Szczypiorski, personal communication) (sample MD6176, cluster 12, see Fig. 17), which is characterized by a very high  $\text{Fe}_2\text{O}_3$  con-

tent (19.00wt.%) and, rarely noted, very high levels of Ni, Cu and Zn (according to the person who collected this clay sample, there is no possibility of contamination resulting from the sampling method). High Cu levels (though not as high as those of clay MD6176) are characteristic of all the clay samples and of the tegula and floor tile samples included in the clay clusters [see Table 2].

Two pottery sherds (MD6140 and MD6142) representing two different MGR-groups have a similar chemical composition characterized by MgO and CaO levels higher than noted in other ceramic finds and a high Cr content, much bigger than that of the remaining ceramics and clays. Cluster 11 comprises a single sample, that is, a Colchian amphora sherd



Fig. 18. PCA scores plot. Elements used: Si, Ti, Al, Fe, Mn, Mg, Ca, Na, K, V, Cr, Ni, Cu, Zn, Rb, Sr, Y, Zr and Ba. G1–G13 = chemical groups (Digitizing M. Daszkiewicz)

(MD6143) with high levels of  $\text{SiO}_2$ ,  $\text{TiO}_2$  and  $\text{Fe}_2\text{O}_3$ , and a high  $\text{P}_2\text{O}_5$  content as well as low Ba concentration.

Defining groups based on chemical composition led to the identification of 13 chemical groups [Fig. 18]: G1–G13, nine of which are associated with one MGR-group. Four of the chemical groups encompass various MGR-groups [see Table 1]. Discrimination between groups G1–G13 was carried out by means of a principal components analysis (PCA).<sup>11</sup> Here, component 1 explains 39.2% of the variation, while component 2 20.0%.

As can be seen from the loadings plot, Si, Ti, Al, Fe, Ca, V, Ni, Cu and Zr

have a high correlation with PC1; Na, Y and Zr with PC1 as well as with PC2; and K, Rb, Sr and Ba with PC2. Three samples grouped into one cluster by the multivariate cluster analysis (chemical group G7, three different MGR-groups) fall into two groups in PCA: two clay samples and a separate group comprising a floor tile fragment. This is attributable to the higher levels of silica and calcium and lower concentrations of iron, vanadium, zinc and barium in this sample. Given that this sample also belongs to an MGR-group different than either of the two clays, it is probable that an analysis of a larger number of floor tiles

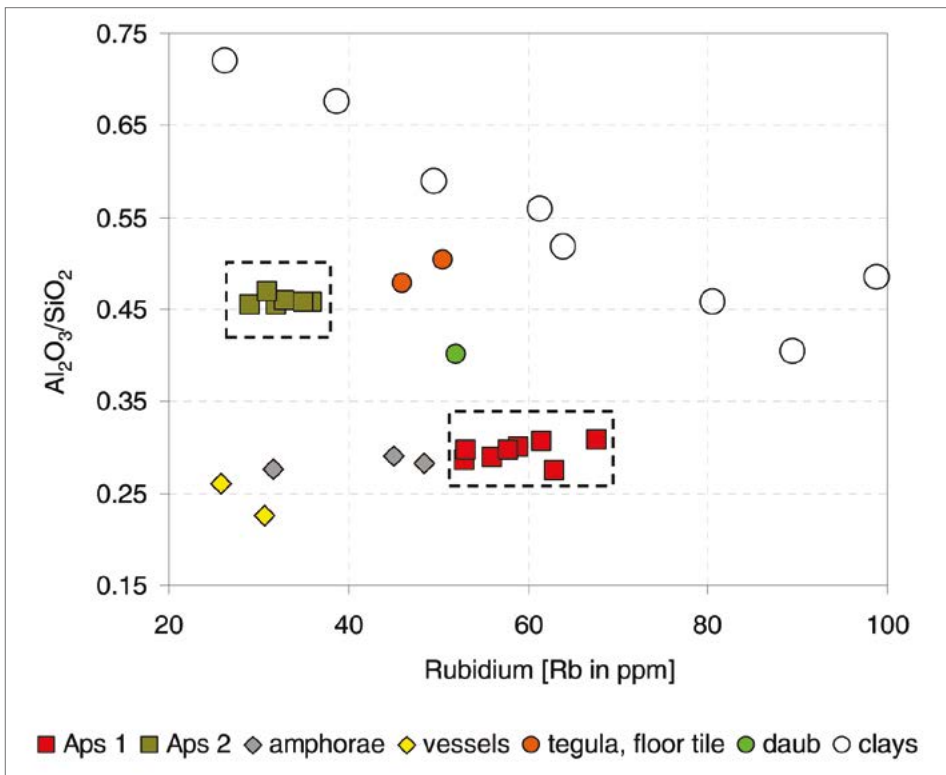


Fig. 19.  $\text{Al}_2\text{O}_3/\text{SiO}_2$  ratio versus Rb content (Digitizing M. Daszkiewicz)

11 Using the same elements as for the multivariate cluster analysis.

would lead to the identification of a distinct chemical subgroup. Both the PCA and a bi-plot of rubidium content versus  $Al_2O_3/SiO_2$  ratio show good discrimination of chemical and MGR groups. Two homogeneous groups consisting of CBM fragments are clearly distinguishable (chemical group G<sub>2</sub> = MGR 1 and 5; and chemical group G<sub>3</sub> = MGR 4). If the archaeological evidence supports the idea that bricks with stamps: **I SAGI** and **[C]OH II [---]** and roof tiles with stamps: **[CO]H [II ---]** and **C[OH II ---]** were locally made, then group G<sub>2</sub> (MGR<sub>1</sub> and 5) can be recognized as an Apsaros reference group 1 (Aps 1). Similarly, if roof tiles bearing the stamps: **C[OH II ---]** and **CO[H II ---]** can also be deemed to be local products, then group G<sub>3</sub> (MGR 4) can be recognized as a second Apsaros reference group (Aps 2) [Fig. 19].

Courtesy of A. Rogava we could compare the results of chemical analysis of pottery vessels and clay raw materials done by him (unpublished master's thesis) with the results of our analysis. One of the chemical groups includes two ceramic fragments analyzed as part of Radosław Karasiewicz-Szczypiorski's project (sample MD6140 and MD6142). Interestingly, the clay raw materials

collected by Rogava and those analyzed within the framework of this project, differ in chemical composition from the chemical composition of ceramic vessels and CBM (and this is not related to the effect of temper).

## CONCLUSIONS

1. Three principal CBM groups can be identified: a group of samples (mostly brick fragments) attributable to the Aps 1 reference group; a group of samples (exclusively roof tiles) attributable to the Aps 2 reference group; and a tegula and a floor tile associated with the analyzed raw materials [see Table 1].

2. The analyzed pottery was not made of the same raw materials as the CBM. Each of the sherds was made of a different plastic raw material (different MGR-groups). No Colchian amphorae with a similar chemical composition have been noted in the literature. The provenance of these vessels remains unknown.

3. The analyzed local/regional raw materials were not used for making the analyzed pottery and CBM (the tegula and floor tile mentioned in the first point are similar in chemical composition, but belong to different MGR-groups than the raw materials).

## APPENDIX

## DESCRIPTION OF METHODS USED

**PLASTICITY TEST AND ESTIMATION OF WATER OF PLASTICITY**

Water of plasticity values were estimated for eight samples. These values are given in *Table 1* in g H<sub>2</sub>O per 100 g of dry clay (water of plasticity is the amount of water required to bring 100 g of clay to a plastic state; in practical terms, this means that the clay can be rolled into a ball which will not feature any cracks, and when a certain amount of pressure is subsequently applied to it—the amount depending on the type of clay—the clay ball will merely become misshapen but will not crack). Gorgon's masks were made from the prepared clays using a plaster mould (the mould was made from a replica of a Gorgon's head from Taranto) and the behavior of the ceramic body was assessed after firing at 900°C.

**FIRING TEST**

After adding water of plasticity (distilled water) to the raw materials, the resultant plastic masses were formed in a non-porous porcelain mould. Four briquettes were made from each raw material. These dome-shaped (plano-convex) briquettes were then dried and three of them were fired at the following temperatures: 1100°C, 1150°C and 1200°C. They were fired in a Carbolite laboratory resistance furnace in static air, at a heating rate of 200°C/h and a soaking time of 1 h at the peak temperature and cooled at a cooling rate of 5°C/min to 500°C, followed by cooling in the kiln for one hour. They were subsequently removed from the kiln and left cooling until they

reached room temperature. Having been cooled, each of the briquettes was glued onto card and photographed in standardized conditions using a digital SLR camera with a fixed macro lens.

One unfired briquette of each raw material was kept as a reference of the original sample, and another unfired briquette was processed for chemical analysis by WD-XRF.

**MGR-ANALYSIS**

Four thin slices were cut from each sample in a plane at right angles to the vessel's main axis. One of these sections was left as an indicator of the sample's original appearance, whilst the remaining three were refired, each one at a different temperature, in a Carbolite electric laboratory resistance furnace using a standard procedure. Firing was carried out at the following temperatures: 1100°C, 1150°C and 1200°C in static air (i.e., without airflow), at a heating rate of 200°C/h and a soaking time of 1 h at the peak temperature, and cooled at a cooling rate of 5°C/min to 500°C, followed by cooling in the kiln for one hour. They were subsequently removed from the kiln and left to continue cooling until they reached room temperature. The fragments were then glued onto paper and a photograph was taken with a macro lens for each slice.

**CHEMICAL ANALYSIS**

Chemical analysis by WD-XRF (wavelength-dispersive X-ray fluorescence) was

12 In the case of raw material samples, the cast discs cracked during cooling. It was only after three attempts using different cooling rates that a disc suitable for measurement was obtained.

used to determine the content of major elements, including phosphorus and a rough estimation of sulphur and chlorine. Total iron was calculated as  $\text{Fe}_2\text{O}_3$ . Samples were prepared by pulverising fragments weighing approximately 2 g, having first removed their surfaces and cleaned the remaining fragments with distilled water in an ultrasonic device. The resulting powders were ignited at  $900^\circ\text{C}$  (heating rate  $200^\circ\text{C}/\text{h}$ , soaking time 1 h), melted with a lithium-borate mixture (Merck Spectromelt A12) and cast into small discs for measurement.<sup>12</sup> This data is, therefore, valid for ignited samples but, with the ignition losses given, may be recalculated to a dry basis. For easier comparison the major elements are normalized to a constant sum of 100%. Major elements are calculated as oxides (see above note 2) and are given in per cent by weight; trace elements are given in ppm. Analysis precision for the major elements is below

2%, rising to a maximum of 6% for sodium and trace elements (for very low contents, it rises to 20%). Accuracy was tested by analyzing international reference samples and by exchange of samples with other laboratories. For major elements in standard reference samples, the maximum deviation is mostly below 5% and for sodium and trace elements (except La, Ce, Nb, Pb, Th) it is below 10%.

Preparation of the samples for analysis was carried out by Małgorzata Daszkiewicz at ARCHEA. Measurement using a PANanalytical AXIOS XRF-spectrometer and the calibration of Arbeitsgruppe Archaeometrie was performed by Gerwulf Schneider (Freie Universität Berlin) and Anja Schleicher (Helmholtz-Zentrum Potsdam, Deutsches Geo-ForschungsZentrum GFZ, Sektion 4.2, Anorganische und Isotopengeochemie).

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## Abbreviations

◦AÉ *L'Année épigraphique*

◦Arr. *Peripl.* Arrian, *Periplus Ponti Euxini*

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◦Jos. *Bell.* Josephus, *Bellum Judaicum*

## Editions:

*Flavii Iosephi opera* VI. *De bello iudaico libri VII et index*, ed. by B. Niese. Berlin: Weidmannos, 1895 (Greek)

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◦Plin. *Nat.* Pliny (the Elder), *Naturalis historiae*

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◦Tab. *Peut.* *Tabula Peutingeriana*

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# Wall paintings from the House of Aion at Nea Paphos



**Abstract:** This paper studies a collection of painted plaster fragments excavated between 1984 and 1989 in the northern part of the so-called House of Aion, that is, three small rooms (Nos 3, 13, 14, 15 and 7). The architectural context of these finds and their dating is first recapitulated: the house was constructed in the second half of the 4th century only to be demolished by a strong earthquake at the end of the century or the beginning of the following one. Most of the plaster pieces were small and of little significance in terms of the remaining colors, but a few from Room 7 were sufficiently well preserved to support a reconstruction of parts of five figural images (three muses, Apollo and a mask) and determine their hypothetical position in this room. Parallels, in painting and floor mosaics, range from Ephesos and Kos in the east to Vichten (Luxembourg) in the west. Based on the iconographic identification, the 4th century AD Muses from Paphos could be recognized as: a standing Thalia holding a mask, a seated Urania and a standing Euterpe with a double flute in her hand, accompanied by Apollo holding a lyre. Together they constituted typical decoration of a Mediterranean Roman house, common from the early Empire through late antiquity.

**Keywords:** Paphos, House of Aion, wall paintings, stratigraphy, muses, Thalia, Urania, Euterpe

Between 1984 and 1989, a University of Warsaw Polish archaeological mission headed by Wiktor Andrzej Daszewski from the Polish Centre of Mediterranean Archaeology uncovered the so-called House of Aion in Nea Paphos. The rich and colorful floor mosaics, particularly those found in its largest dining hall (*triclinium*), have already become famous and the object of a lively scientific discussion (Daszewski 1984; 1985b; Deckers 1986; Olszewski 1991; 2013; Balty 1995: 275–289; Bowersock 1990: 49–53; Quet 2006; Musso and La Rocca 2018). The figural painted decoration of the House, which has survived on hundreds of plaster fragments fallen from

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the walls and vaults mainly of Room 7, northeast of the vestibule of the *triclinium*, remains virtually unpublished. And yet, as evidence of late antique wall painting, it is of considerable interest and value, being one of very few surviving examples of such decoration as compared to

the hundreds of preserved floor mosaics from the same period. These fragments were collected, put in cases and stored. Those from Room 7 are also relatively well documented and preserved.

The main purpose of this presentation of preserved fragments of wall painting is

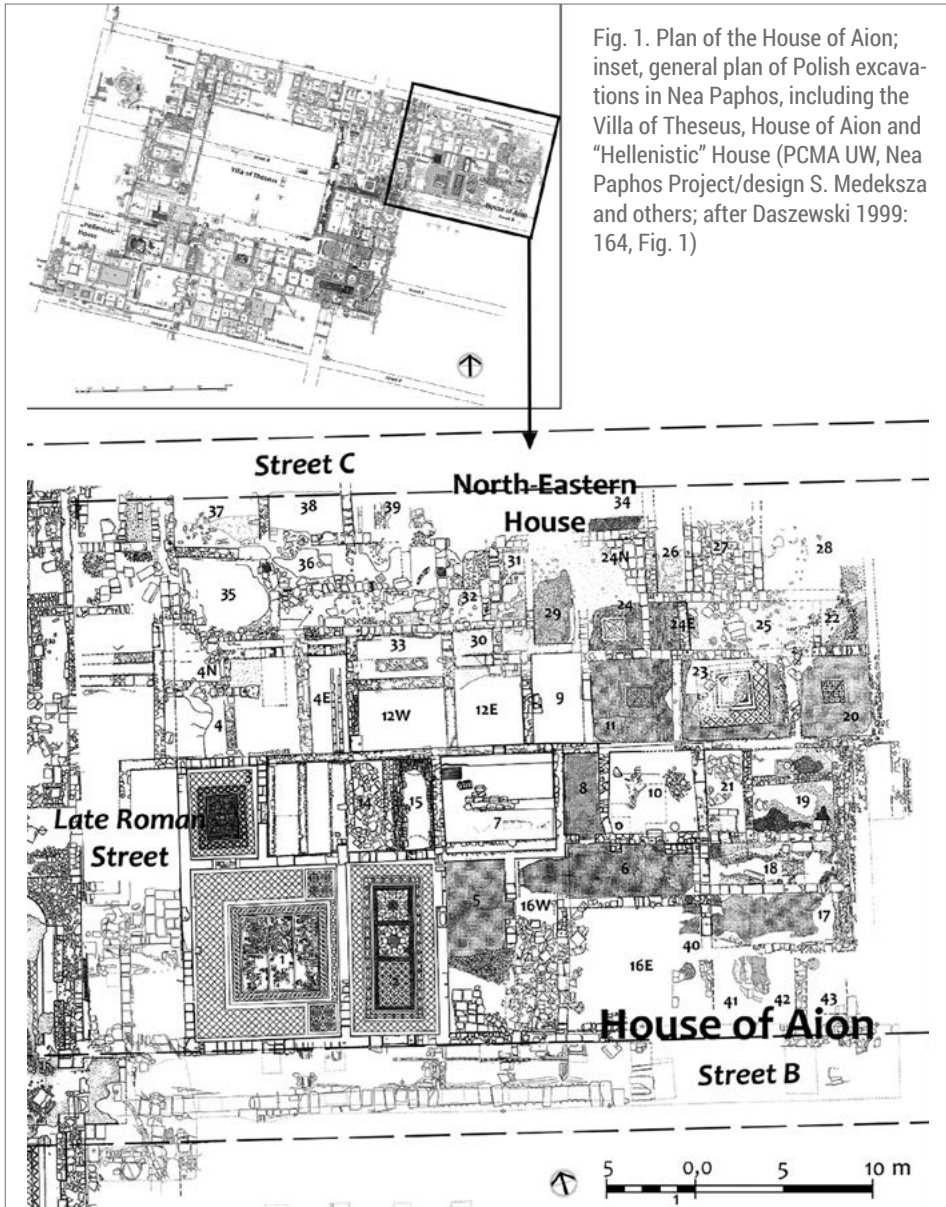


Fig. 1. Plan of the House of Aion; inset, general plan of Polish excavations in Nea Paphos, including the Villa of Theseus, House of Aion and "Hellenistic" House (PCMA UW, Nea Paphos Project/design S. Medeksza and others; after Daszewski 1999: 164, Fig. 1)

to propose an identification of the figural representations and study their possible positioning on the walls of Room 7. The study has been based on old excavation records and a fresh look at the architectural remains still surviving *in situ*. Ultimately, the objective was to determine the role and significance of this decoration in the context of known parallels of wall paintings and floor mosaics from Roman-age houses from near and far within the Roman Empire.

Revisiting these fragments thirty years after their discovery required a review of the old written and photographic documentation and an inventory of the remains that are still available for examination. Some groups of painted plaster fragments are known only from black-and-white photos and their present location is not known; they may not have survived the passage of time, being in poor condition already at the time of their discovery. Different attempts to assemble these fragments have tended to add to the confusion, leaving fragments mixed up before they could be fully documented. Most of the surviving pieces were small with some remains of color. There were fragments, however, found next to one another and presenting parts of figured images. They were reassembled by the team's conservator Ewa Parandowska on sand beds in wooden cases and subsequently restored by Evangelos

Hadjistephanou from the laboratory of the Department of Antiquities in Paphos. The restored fragments of paintings—five figural images—were subsequently exhibited in the Archaeological Museum in Paphos in 1996 and again in 2015 at the exhibition “Nea Paphos: 50 years of Polish excavations 1965–2015” organized at the Cyprus Museum in Nicosia.

The archaeological context of this discovery was presented briefly in reports and communiqués, as well as a paper by Barbara Lichočka and Henryk Meyza (see the references in Daszewski et al. 2007: 395, Note 2; Lichočka and Meyza 2001: 150). The remains of the House of Aion lie east of the Villa of Theseus [Fig. 1], off a late Roman street running from north to south between these two architectural complexes, and north of Street B leading from the west side of the promontory to the eastern harbor of Nea Paphos. Therefore, the position of this House, at the northeastern corner of one of the town's more important street intersections, the only part of the former residential quarter still occupied in the 4th century, is proof of its importance in the life of ancient Paphos. An entrance to the house was from the east (from Street 8), but most probably it could also have been accessed from the south (from Street B), where the southeastern part of the House has either been destroyed or has not yet been explored.

## ARCHITECTURE AND STRATIGRAPHY

The house in its final phase was of a moderate size [see Fig. 1] and seems to have been enclosed within a rectangle with a longer east–west axis (34 m by 17 m). It

is not possible to determine if the original (earlier, as from the 4th century AD) width was equal to the width of insula (34 m), as the northern half is occupied

by the late North-Eastern House (NEH) and the excavations have not shown the 4th-century structures continuing under it. Preceding strata have to be dated to the 2nd century AD. The northern limit of the insula is uncertain. The excavations have not reached the line of street C, which closes the Villa of Theseus from the north. The line of Street 8 is known only in the area of the House of Dionysos. The name of the House of Aion is arbitrary, given by its discoverers in view of the name of a central personage depicted and subtitled in the mythological floor mosaic in the *triclinium* (Daszewski 1985a: 32–33, Pl. 2, Fig. 3). The house has an irregular and asymmetrical layout, which is quite different from other residential Roman houses in Nea Paphos, i.e., from the more or less typical so-called peristyle

houses, which were very popular in the eastern part of the Roman Empire, with rooms symmetrically projected around a central courtyard. The largest hall, the *triclinium* (No. 1), with the mentioned mythological floor mosaics [Fig. 2], was in the southwestern corner of the house. The vestibule (No. 2) with geometric floor mosaics preceded the *triclinium* to the east. Following room numbers, which correspond to the chronology of their discovery, the next small room (No. 3) lies in the northwestern corner of the house, and was accessible from the south, from the *triclinium* and from the east. Farther eastwards, in the same row of chambers, are seven or eight other rooms (Nos 13, 14, 15, 7, 8, 10, 21, 19). Southwards of them and to the east of the vestibule there were two porticos (Nos 16W, 6) perpendicular



Fig. 2. Scene of Marsyas and Apollo, fragment of a mosaic from the *triclinium* of the House of Aion (Photo E. Jastrzębowska, 2017; digital processing T. Szmagier)



to each other, the courtyard (No. 16E), the possible corridor to the eastern entrance (No. 18) and adjacent rooms to the north of this corridor (Nos 19, 21) and to the south of it (Nos 17, 41, 42, 43).

The walls of all these rooms are present mostly as foundation courses, only a few rising higher in places and in a dif-

ferent condition of preservation. The reconstructed *triclinium* doubles now as a modern pavilion sheltering the mythological mosaics, including under its roof also the fully reconstructed west wall with a central niche for a lost statue (Mikocki 1992). There is no evidence for the walls in this most sumptuous hall of



Fig. 3. Wall between rooms 13–15 on the left and 7 on the right, with plaster remains visible to the left and above the cistern (unit 15) and above a support wall in Room 7 (Photo E. Jastrzębowska, 2017)



Fig. 4. Rooms 13–14 with low walls aligned N–S and the cistern (unit 15) at back, supporting an unpreserved wooden floor; view from the southwest (Photo E. Jastrzębowska, 2017)

the house having been painted. The same is to be said of the walls of the vestibule with the colorful and elaborate geometrical floor mosaics. There are plain grey mosaics in the porticoes or rooms adjacent to the courtyard (Nos 5, 16W, 6, 8, 17, 40) and there probably were wooden floorboards in the smaller rooms to the

north (Nos 13–15 and 7). Rooms 18 and 19 (its southern part) initially formed a single unit, possibly a small entrance hall or courtyard, and were paved with pebbles. The northern part of what had once been Room 19 belonged to another unit with the same type of floor that was restructured at a later time when the complex



Fig. 5. East wall of Room 7, of Hellenistic date, presenting remains of painted plaster on its face (Photo E. Jastrzębowska, 2017)



Fig. 6. Room 7 with low walls aligned E–W supporting an unpreserved wooden floor (the three deeper rectangular pits are modern); view from the southwest (Photo E. Jastrzębowska, 2017)



of the so-called North-Eastern House was built to the north of the House of Aion and a wall cut through that floor. However, painted wall decoration was found mainly in Rooms 7, 13–15 and 3 lining the *triclinium*, vestibule and the western end of one of the porticos (No. 6) of the courtyard on the north.

However, there are some stratigraphic issues regarding these rooms with the vestiges of the decoration that need to be addressed before going on to a detailed presentation of the wall paintings. Only one wall from the oldest building has survived in place. It was built of large, stone blocks in characteristic Hellenistic manner referred to as *opus emplectum*; in the late edifice, it served as a foundation and lower part of the east wall of Room 7 [Fig. 5].<sup>1</sup> Moreover, a stratigraphic trench dug in 1990 and 1991 proved the presence, north of Room 7, of some Hellenistic structures forming the foundations for the Roman building (Daszewski 1991a: 823; 1992: 67; Papuci-Władyka 1995: 87–88, referred to erroneously as the North-western House). There are no remains of any early Roman architecture here, but this need not be surprising considering the extensive earthquake-related damage in the ancient city (Lichočka and Meyza 2001: 146–150). Excavations in 2008 and 2011 under the floor of Room 7, in two trenches at points 509 and 512, yielded early Roman 1st/2nd century AD pottery over an earlier east–west wall (S.14/08), with late Hellenistic finds in a lower stratum. A vaulted water cistern, unit 15 on the plan [Fig. 3; see Fig. 1], most probably belonged to the same construction phase

as the rest of the rooms in that line, but only the date of its destruction in the second half of the 4th century has been confirmed (Lichočka and Meyza 2001: 157–158). Units 5, 16W and 6 formed three porticoes on an L-shaped plan, west and north of courtyard 16E. Rooms 13, 14 and 15 (assuming the space above the cistern was used as living space) should be interpreted as a single large room with wooden floor, rather than three separate chambers (Daszewski 1986: 861; Lichočka and Meyza 2001: 157). The construction date for the house remains vague, but the chronology of its decoration and destruction is better studied (Lichočka and Meyza 2001: 150–168). The walls of the house are not homogeneous; they show some unclear restructuring and some later additions. Moreover, floor levels in individual rooms are of varied height, the mosaics in the *triclinium*, dated by a coin of Licinius (317–323) found under the floor, lying higher than the mosaic in the adjacent Room 3 and the mosaics of the presumed porticoes of the court (Daszewski 1985b: 954; Lichočka and Meyza 2001: 154, 157).

Constantinian Dynasty coins, only decades earlier than the said coin of Licinius, were found also in the fill of rooms 14, 15 and 7 (Daszewski 1987: 687, 689; Lichočka and Meyza 2001: 160). In addition, coins from the 3rd century were found “above the floors and within foundation trenches” and this observation, together with the one about “the existence of two different layers of paintings”, has led researchers to assume the 3rd century as the date of construction for the house

1 Other Hellenistic structures to the north of Room 7 are dated tentatively to the 2nd century BC (Daszewski 1991b: 80).

along with its first painted decoration (Lichočka and Meyza 2001: 154; see also Daszewski 1988: 839). The dating of the destruction of this complex, which had such a significant impact on the condition of its wall paintings, is more certain. According to coins of the Constantinian Dynasty and pottery finds from the northern line of chambers, the ultimate destruction of the House of Aion at the end of the 4th century was the result of a strong earthquake (Lichočka and Meyza 2001: 154–206). In any case, the preserved floor mosaics and the shattered painting decoration date to late antiquity, i.e., from the mid-3rd through the mid-4th and to the end of the 4th century (Daszewski 1988: 839; Lichočka and Meyza 2001: 207–208).

To have a full picture of this unique assemblage, it is necessary to review the field excavation reports to assess the lesser pieces of painted wall plaster that were found within the northern line of chambers in this house. The northwestern corner of the building was taken up by Room 3 (4.80 m by 3.55 m) connected by two separate doors with marble thresholds still in place to the *triclinium* on the south and a chamber (units 13–15) to the east. A geometric mosaic of exquisite quality still covers the floor of this chamber (Daszewski 1984: 950; 1985a: 20; 1986: 861, Fig. 94). As for the wall paintings, the excavator noted: “Les murs bien conservés, parfois jusqu’à une hauteur de 1 m, ont gardé des traces de décoration peinte ou prédominaient des motifs végétaux” (Daszewski 1986: 861) and “Nach den vorhandenen Resten zu urteilen, waren sie mit Inkrustationsmalerei überzogen, die

Marmor- und Alabasterbelag imitierte. Auf der Ostseite ist noch eine Tür von 1,05 m Breite sichtbar, die zu einem derzeit noch nicht bestimmbareren Raum (Innenhof?) führt. In der Nähe dieser Tür wurden auf der Innenseite zahlreiche Fragmente bemalten Verputzes von hervorragender Qualität gefunden. Einige Bruchstücke weisen darauf hin, dass es sich hier um Teile einer figürlichen Dekoration handelt, über die man jedoch zur Zeit noch nichts Genaueres aussagen kann” (Daszewski 1985a: 20). Nothing is to be added to these observations today as none of the painted fragments from Room 3 were preserved in the Plaster Conservation Workshop.

The same has to be said of the wall painting remains from the eastern chamber (Nos 13–15). As far as painted wall decoration is concerned, no fragments of painted plaster from this room have been preserved in storage.<sup>2</sup> It was most likely a single room measuring 9.50 m by 6.40 m that was connected with chamber 3 on the west (see above) and the vestibule on the south; a stone threshold was fitted in this latter doorway [Fig. 4]. There are three low parallel masonry walls dividing the interior from north to south. Together with the partly destroyed vault at the southern end of the cistern, these walls formed a kind of strip foundation for the joists supporting the wooden floor boards of the chamber. A socket for a wooden joist survived in the west wall of Room 13, south of the marble threshold in the doorway. The actual wooden joists or boards were not found, but the “numerous iron nails” from the fill confirmed the presence of an

2 For general information on these in the excavations reports, see Daszewski 1985a: 20; 1985b: 954; 1986: 861; 1987: 687; 1988: 837.

ordinary wooden floor here (Daszewski 1986: 861; 1988: 837; Lichočka and Meyza 2001: 157). The vault of the cistern at its northern end and the top surface of the three low walls were all on the same level (the author's measurements in the field confirm the observations in the excavation journal from the 1986/1987 season), this level was 15 cm below that of the marble threshold in the doorway to Room 3. As for the date of destruction of this room, it is important to note that numerous coins, mostly dating from the first half of the 4th century, as well as pottery, of the African Red Slip Ware type from the second half of the same century (until AD 400), were found in this chamber and in the cistern (Daszewski 1986: 861; Lichočka and Meyza 2001: 157, 160).

No traces of the wall paintings have survived on the standing walls apart from some small fragments of plain plaster on the north wall above and to the west of the cistern [see *Fig. 3*]. However, reports from the excavation in 1985 and 1986 bring some detailed comments: "Tout l'espace entre le ressaut et ce mur était comblé et surmonté par un éboulis de blocs mêlés de nombreux fragments d'enduits peints, parmi lesquels des fragments de décoration géométrique comportant des rosettes à quatre pétales, blanches et jaunes sur fond violet, ainsi que des représentations figures dont il reste des fragments de mains, de bras, de visages humains" (Daszewski 1985b: 954) and: "Dans l'éboulis remplissant l'espace compris entre ces murs de fondation furent trouvées de nombreux fragments d'enduits peints de grande qualité. La décoration florale prédominait, quoiqu'apparaissent également des motifs

géométriques (rosettes jaunes sur fond violet) et des fragments de scènes figurées. Nous avons également trouvé quelques infimes fragments d'une inscription peinte en grec" (Daszewski 1986: 861). This last observation about some tiny fragments of a painted Greek inscription is interesting in the light of similar fragments being discovered also in Room 7. An updated report was published two years later when units 13 and 14 started to be excavated: "parmi les enduits prédominaient des fragments portant des restes de décoration peinte et de moulures en relief. L'analyse de ces fragments permet de reconstituer une décoration composée de panneaux floraux encadrés de bandes de couleur unie" (Daszewski 1987: 687). The fill of the cistern 15 resembled that found between the three walls of the strip foundation in units 13 and 14, under the unpreserved wooden floor: "Dans les remblais de la citerne et à proximité, dans l'éboulis de blocs, furent découverts de nombreux fragments de peintures murales d'excellente qualité, à motifs géométriques et floraux, ainsi que de petits fragments de scènes figures. Au fond de la citerne furent trouvées quelques monnaies de la période de Constantin et de ses successeurs immédiats" (Daszewski 1988: 837, *Fig. 77*; see Lichočka and Meyza 2001: 157–160). This indicates that the cistern vault collapsed at this time, the ultimate destruction of the cistern corresponding to the destruction of the house in the aftermath of a strong earthquake. The Plaster Conservation Workshop does not hold any cases of plaster fragments marked as found in this chamber.

The documentation concerning Room 7 to the east is more accurate. The

wall paintings from this room survived in far better condition than those in any other chamber of the House of Aion. Even though fragmentary, they appear in large quantities and some of the pieces are of high artistic quality. The assemblage consists of hundreds of fragments of painted plaster collapsed from the walls and vault (Daszewski 1989: 834–836; 1990: 975; 1991b: 80; Lichočka and Meyza 2001: 160–163). Pieces with elements of figural representations were selected first from among the fragments collected during the excavations in 1988 and 1989. The five best preserved images were consolidated and are now in the District Archaeological Museum of Paphos, while the rest of the collection was moved to the Plaster Conservation Workshop of the Department of Antiquities in Kato Paphos (Daszewski 1990: 975, Fig. 95; 1991b: 81, Fig. 2). These fragments, still in their wooden cases (see the Catalog, pages 572–593), were reassembled wherever possible, reconstructing figures that were eventually put on display at the Cyprus Museum in Nicosia in 2015 to celebrate 50 years of Polish archaeological research in Cyprus.



Fig. 7. Probable entrance to Room 7 in the eastern end of the south wall (Photo E. Jastrzębowska, 2017)

Room 7 has a rectangular plan, measuring 5.59 m by 4.80 m, with longer north and south walls [Fig. 6]. The walls of this room survived 1.50 m on average from the bottom of the excavated space. They had been constructed in an irregular bond using unworked stones of different size, except for the lower part of the east wall, which is made of large regular blocks characteristic of the Hellenistic period. The state of wall preservation today is such that the location of the entrance to Room 7 is doubtful; it seems likely that the door was originally at the eastern end of the south wall, where the wall masonry is most destroyed [Fig. 7]. It would have given access to the room from the portico (No. 6) in the northwestern corner of the courtyard. This seems the most logical solution for the entrance to this room in view of the general layout of the House of Aion.

In the middle of the north wall in Room 7 is a rectangular recess preserved only in its lower part (0.58 m wide, 0.60 m high and 0.40 m deep), flanked by two large blocks of stone and blocked by a square stone slab from the outside [Fig. 8]. The sockets at the bottom front



Fig. 8. Remains of a cupboard in the center of the north wall in Room 7 (Photo E. Jastrzębowska, 2017)

edges of the lateral slabs and the characteristic grooves at mid-height in the side surfaces of these stones indicate that this recess, a “window” in the opinion of the excavators, was actually a lockable cupboard divided inside by a horizontal shelf, which may have held scrolls and other valuable documents. A small round stone altar (HA 11/85) with traces of a *tabula ansata* (without an inscription on its shaft and with remains of burned incense on top) was found in 1985 in the north wall of Room 5, that is, the south wall of Room 7, but the exact coordinates of that discovery were not recorded (Tybulewicz forthcoming).

Low masonry walls (0.53 m wide and 0.53 m high) line the north and south

sides of the room. The third low wall, of the same height, but more poorly preserved, is presently represented by two tilted rows of stones in the center of the room, parallel to the lateral ones and of a similar height (Daszewski 1989: 834 and the *Excavation Journal*). Their function was the same as in the case of the previously described walls from the next-door chamber, that is, to support a wooden floor, the sole difference being the different orientation, perpendicular to the low walls in the other chamber. There were no traces of wooden joists or boards found in this room during the excavations, but the discovery of numerous iron nails indicated the existence of a wooden floor. However, there were no sockets for the



Fig. 9. Deposit of collapsed painted plaster fragments in the northeastern corner of Room 7 (PCMA UW Nea Paphos Project/photo W.A. Daszewski, 1988; digital processing T. Szmagier)



joists visible above the low walls, either in the north or the south wall, and, puzzlingly, the surviving plaster fragments on the north wall reached down to the top of these presumed supports [Fig. 11].

It would indicate that the walls were plastered already after the supports had been constructed, the wooden floor was then installed on them and only then were the walls painted.



Fig. 10. Deposit of collapsed painted plaster fragments fallen from the vault in the northeastern corner of Room 7: top and side views showing the structure of the deposit (PCMA UW Nea Paphos Project/photos W.A. Daszewski, 1989; digital processing T. Szmagier)

A small rectangular shaft (0.67 m by 0.77 m, 1.03 m deep) in the northwestern corner of Room 7 formed the entrance to the cistern (unit 15) (Daszewski 1989: 836, Fig. 121 and *Excavation Journal* from 1989) [see Fig. 6 left]. It was framed with large, vertical stone blocks. The shaft may be what remains of an earlier water inlet to the cistern, blocked off after the construction of the walls and strip foundation under the floor of Room 7.

A more substantial deposit of large collapsed plaster fragments accumulated along the east wall of the room and between the low walls in the lowest level [Fig. 9], while the stone blocks tumbled from the walls and vault were found

above this deposit, reaching 0.20 m above the low walls of the strip foundation (Lichočka and Meyza 2001: 160). As images from the excavations show, the painted plaster fragments were discovered in a compact mass, some with the painted surface facing upwards, others downwards, reflecting the dynamics of a collapsing wall of plaster [Fig. 10]. The “quite numerous coins from the destruction strata—both from the rubble or plaster conglomerate and from below them—are all datable before AD 351–355”, while the pottery fragments discovered could be contemporaneous or even later (Lichočka and Meyza 2001: 160–161).

## WALL PAINTINGS

While the fragments preserved directly above the supports along the north wall of Room 7 bore no trace of painting, some poorly preserved remains of painting can be seen on the east wall (four fragments of a double-layered plaster) and the south wall (one larger fragment) [Fig. 11 bottom]. These remains have been protected *in situ* with gauze stuck to the surface with Paraloid B72.

### EAST WALL

To begin with the east wall, which, in its lower part, presented a typical Hellenistic bond [see Fig. 5], its highly irregular superstructure was evidently of later date, but the painted plaster covered both parts. Two fragments of a double-layered plaster are still visible on the northern end of the east wall, while two other pieces of the same plaster, a smaller one in the center of this wall and a larger one on its southern half,

are preserved as a single layer, apparently the earlier one. In the latter case, either the plaster had not been painted or the colors had all washed off or faded, this second possibility suggested by faint flecks of color still discernible on the other two fragments at the northern end of the same wall. The bottom layer of the fragment farther to the north even shows a black horizontal stripe on a white background [Fig. 11 center left]. Some traces of two perpendicular red bands with blue between them are still observable on the upper layer of this plaster fragment. The upper plaster layer of the second fragment (more to the center on the east wall) presents some traces of blue, on the same level as on the northern fragment, but more pronounced on the bottom layer, that is, a black horizontal stripe with some remains of reddish-brown above this line [Fig. 11 center right].





Fig. 11. Remains of painted plaster discovered still attached to the walls of Room 7: top, plain fragments on the north wall, touching directly on the surface of the support wall (1990); center, two layers of painted plaster on the northern end of the east wall; bottom, painted plaster in the western corner of the south wall (PCMA UW Nea Paphos Project/photos W.A. Daszewski, 1990; E. Jastrzębowska, 2017)

### STANDING FIGURES AND INSCRIPTION ON SOUTH WALL

A larger protected fragment of painted wall plaster (1.12 m by 2.00 m) appears on the south wall, just above the support wall, close to the southwestern corner of the room [Fig. 11 bottom]. On the left there is the lower part of a panel edge painted yellow-white and orange in imitation of onyx or alabaster, the ancient *Alabastro Egiziano* (see

M.C. Marchei in: Borghini 1998: 140), and a surviving frame corner composed of two perpendicular black strips flanking a dark red one (whether imitated stone or just painted frame could not be identified in view of a conservator's protective gauze applied to the surface of the plaster for consolidation purposes, which effectively blurs the image). Larger traces of blue, framed by a black band, are present to the right of the alabaster



Fig. 12. Painting of standing figures above a band of inscription from the south wall of Room 7: left, larger fragment reassembled from pieces; right, other fragments of the inscription (Photo E. Jastrzębowska, 2017; digital processing T. Szmagier)

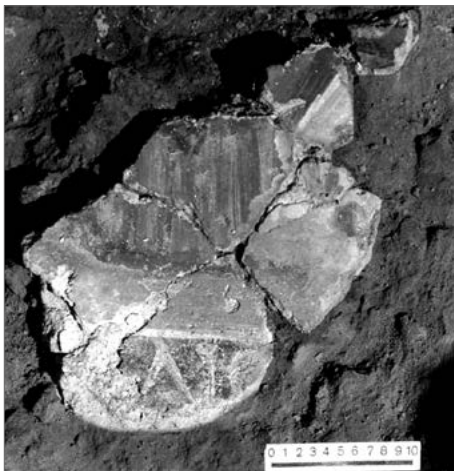


Fig. 13. Broken fragment of painted plaster with the bottom edge of a tunic above a band with Greek letters (PCMA UW Nea Paphos Project/photo W.A. Daszewski, 1988)

imitation. Remnants of the same blue color (better visible in excavation photos, which are, however, black-and-white) are still visible above the said frame corner. The description in the 1989 *Excavation Journal* speaks of painted plaster *al secco* above the benches, decorated with multi-colored rectangles: burgundy on the left and black inside a burgundy frame on the right, above a marble–alabaster imitation with black and white stripes directly above the low wall (see also Daszewski 1990: 975).

The *Journal* also mentioned floral and figural decoration, which should have appeared above the rectangular panels (see also below). This decoration, as attested by fragments excavated from the fill, was framed in yellow and black bands, the latter bearing a Greek inscription. This was neither copied nor transcribed in the *Journal*. Examination of the collected fragments of painted plaster from Room 7, kept in the Plaster Conservation Workshop, revealed a group of fragments showing remnants of a Greek inscription (Case VI, Nos 63–67) and some other illegible fragments of painted images (Case VI, Nos 70–73) [see *Catalog*]. These fragments show six or seven letters: A, I, K, Λ, M, O, Π, painted in white on black horizontal bands between white lines, against a dark red (possibly burgundy) background. The pieces are poorly preserved and their edges do not fit, making it quite impossible to reconstruct the character and meaning of the inscription. However, there are two surviving fragments with a painted black band and letters: KA on the first of them, ΛΙ and possibly a fragment of O on the second one (Case VI, Nos 64 and 67) [see *Catalog*], on a faded

orange background that could have originally been red [Fig. 12 right]. There were three other plaster fragments forming a whole with this piece in the excavation image from 1988 [Fig. 13]. Together, they form the remains of a presumed standing female figure, the bottom edge of her tunic shown above the band with three letters. If all these fragments were put together, they would maybe show a lower tunic's edge subscribed: KA(Λ)ΛΙΟ(ΠΗ) that will be discussed later. A careful examination of the image indicates that it was taken at high noon and that the fragments were lying against the south wall of the room. Thus, it may be deduced that this particular painting had dropped from the south wall. A very distant parallel for a continuous black band with Greek legends painted in white above instead of below the mythological scenes, dated to the 4th century, occurs at Amheida, Dakhla Oasis, Egypt (see McFadden 2014: Pl. CXXVI, Fig. 4,7).

Seven other fragments of the lower part of a standing figure's tunic above a black band with the letters Π and O are still preserved in the Plaster Conservation Workshop (Cases IV: Nos 49 and 52; VI: Nos 63 and 65) [see *Catalog*]. This figure is painted on a red background, 2.5 cm above the black inscription band [Fig. 12 left], with the same red background continuing below the inscribed band. The figure is dressed in a greyish white tunic falling in folds with a black *clavus* visible on her right side. Her white right heel in a black sandal peeks out below the tunic and it is evident that the foot had been turned to the right. The lower edge of a yellow mantle appears at knee height, and continues diagonally up to the fig-



ure's left side. A close resemblance between this inscription band and the other fragments of the band with Greek letters indicates that they had originally been painted in the same row on the south wall. Had they referred to a female figure, the preserved letters would give the name of a second muse ΠΙΟΛ(YMNEIA) that will also be discussed later.

There may have been a third figure painted on this wall. Several fragments of painted plaster were reassembled into the upper part of a woman's body (Case V: Nos 53–56, 58, 60–62) [see *Catalog*]. The painting employs the same color scheme and style as described above, but the pose and attitude are reversed; this figure is turned to the left, while the figure with the foot in a sandal, described above, turns to the right. The figure is depicted in a white tunic, her right arm covered by a yellow mantle, her right hand emerging from the folds at chest height. The neck can be seen above the neckline of the tunic, but her head is not preserved [Fig. 30 bottom left]. Of the painted heads known from Room 7 that have yet to be fitted to a figure, none is suited to this body in size (Cases III: No. 23; IV: Nos 50, 51; VII: Nos 90, 95; VIII: No. 112) [see *Catalog* and Fig. 30 top left].

Taken all together, these fragments show that the inscribed band ran below a large figural composition comprising a row of standing persons. Representations of a standing figure above an inscription are known from Paphos, for example, three painted stone slabs sealing a loculus grave of late Roman date inside an early Roman rock-cut tomb (P.M.3510) discovered in 2001 by Eustathios Raptou (the slabs are now in the Paphos Archaeological Museum; Raptou

2004: 314–317; Michaelides 2004: 94–95). The central slab presents a colorful and richly dressed woman above some fragmented Greek letters which can be read as the common funerary formula: *χρήστη χαίρει*, “well attested on the island especially in the 2nd/3rd century” (Raptou 2004: 315). These loculus slabs, albeit local and maybe contemporaneous, are not really relevant here, as this addition of the written formula is part of their funerary function.

#### THEATER MASK AND THE MUSE THALIA ON THE EAST WALL

Broken plaster fragments with the image of a theater mask can be seen in another excavation photo from 1989 [Fig. 14 left]. This mask was reconstructed [Fig. 14 above] and is exhibited at the Archaeological Museum in Paphos. The archaeological context is in the corner of the room, between the east wall and the central support wall, at the bottom of the fill, photographed at high noon. This suggests that the mask had fallen from the northern end of the east wall. The excavation photo also shows the right part of a Corinthian capital at the top of a fluted column. The capital is at the left of the mask, partly overlapping the frame around the panel. The rest of the column would have appeared below this capital, and this means that the mask had once decorated the upper part of the wall. Unfortunately, the greater part of this Corinthian capital, beyond its right profile, appears to be lost.

Similar painted columns dividing rectangular panels of painted marble imitations occur in the so-called *cenatorium* in Slope House 1 in Ephesus, dated to the

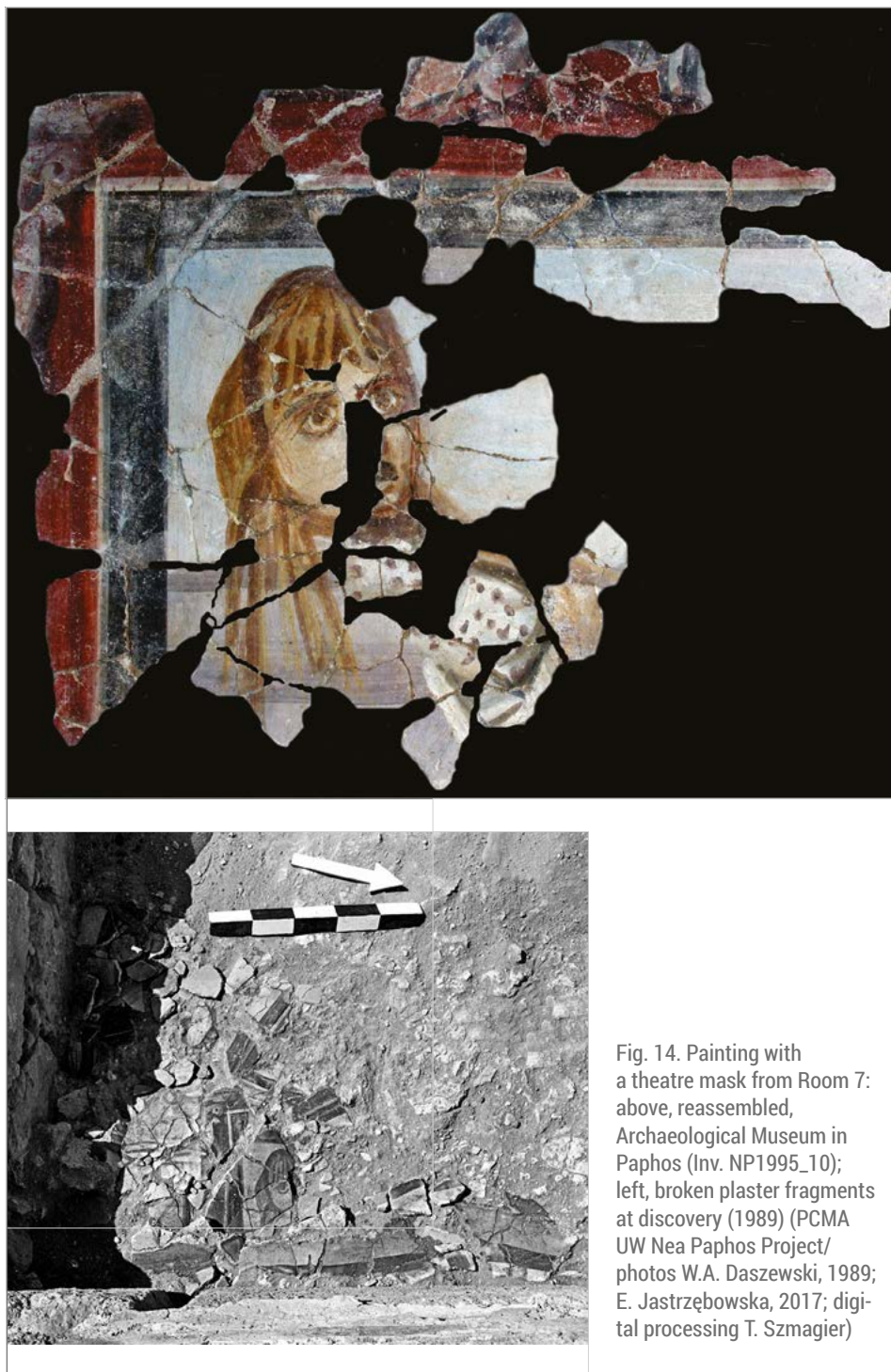


Fig. 14. Painting with a theatre mask from Room 7: above, reassembled, Archaeological Museum in Paphos (Inv. NP1995\_10); left, broken plaster fragments at discovery (1989) (PCMA UW Nea Paphos Project/ photos W.A. Daszewski, 1989; E. Jastrzębowska, 2017; digital processing T. Szmagier)

first half of the 4th century (Zimmermann 2007: 377, Fig. 2; 2011: 127, Fig. 1; Zimmermann and Ladstätter 2011: 165–167, Fig. 344). Moreover, it seems that numerous fragments of painted marble imitation discovered in Room 7 in the 1988 and 1989 seasons, which cannot be found any longer, but exist in excavation images [Fig. 15], belonged to such painted columns separating rectangular panels and to the panels themselves. Another example of such painted “marble incrustation” was also discovered in the said late antique house in Ephesus cited

above, where it was dated as early as the second half of the 4th century (Zimmermann 2011: 129–130, Fig. 2; Zimmermann and Ladstätter 2011: 165–167, Fig. 346).

The location of the fragment inside the northeastern corner of the room indicates its original position in the left upper corner of a probably larger rectangular panel. The frame consisted of an external band of red (6 cm wide) and an internal one of black (3.5 cm wide) separated by a white line (1 cm wide), into the top of which the Corinthian capital (see above) cuts. The reassembled fragment of imita-

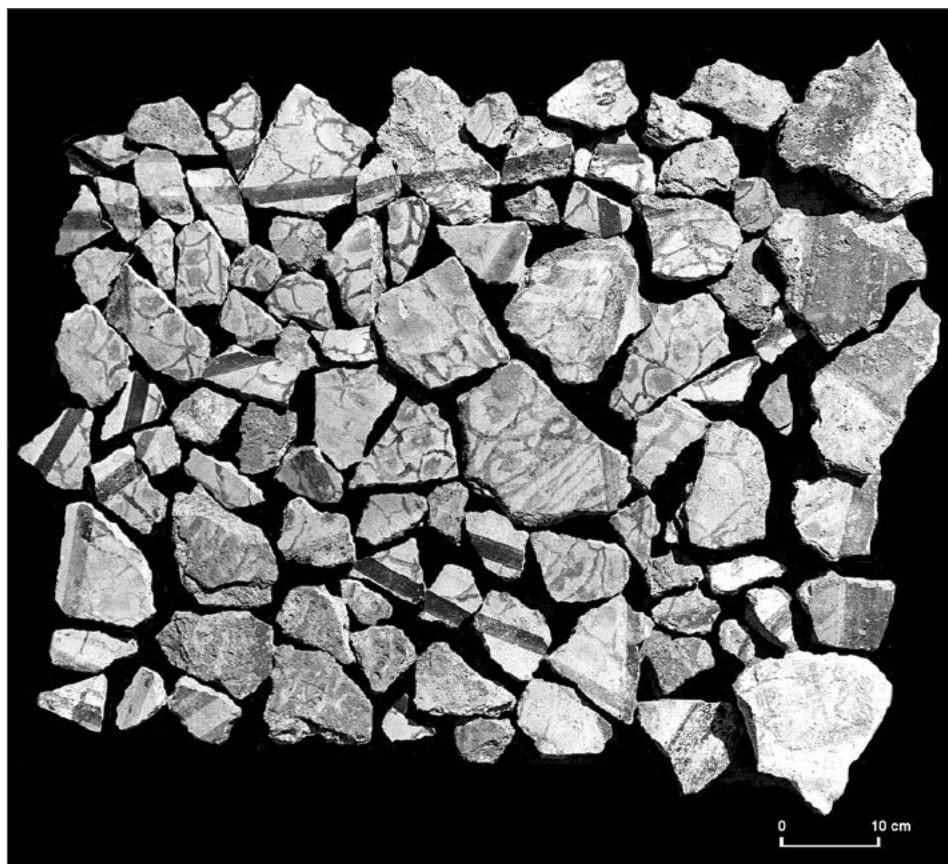


Fig. 15. Fragments of painted plaster with marble imitation from Room 7 (PCMA UW Nea Paphos Project/photo W.A. Daszewski, 1988/1989; digital processing T. Szmagier)

tion stone inserted at the top of this frame in the present reconstruction is a disconcerting addition, not shown in the excavation images. The main reconstructed image of the painted mask (0.30 m by 0.15 m) is composed of 20 plaster fragments of different size and shape, with a vertical gap in the middle [see *Fig. 14* above]. The background of the mask is white, blending into light blue to the top and to the right. The mask is adorned with a brown-yellow wig, sporting a fringe over the forehead and long straight hair down its right side. The skin color of the mask is beige with dark brown linear features, the large eyes are wide open as is the mouth, of which only the left half has survived. The nose of the mask face is not preserved. The large white collar under the chin, decorated with small black dots, seems again an arbitrary addition by the restorers working with the fragment as there is nothing in the excavation photos to suggest its presence. The background below the mask shows a grey-blue horizontal band, clearly separated by a narrow dark grey band from the upper part of the white background.

The image of one of the muses, found in fragments in Room 7, is bordered above and to the right side by a corner composed of two bands similar to the frame of the theater mask: red on the outside, black on the inside and a white line in the middle. Moreover, the same horizontal dark-grey and light grey bands as below the mask are painted in the background of the muse. Another vertical light-grey and dark-grey band is visible behind the head of the muse. This band crosses the horizontal one behind the figure of the muse forming a kind of a large

cross comprised of two double grey bands on a white and blue background similar to that behind the mask.

The fragmentary figure and the frame are composed of about 120 painted plaster fragments (the measurements of the preserved painting being roughly 0.81 m by 0.62 m) [*Fig. 16*]. Of the body of the youthful female figure just the left arm and part of the breast have been preserved, but her head and face are in exceptionally good condition, having broken into only three plaster fragments [*Fig. 17*]. She is shown frontally, but turning her head slightly to the right. Her young face (10 cm high and 7.5 cm wide) is a creamy-beige with highlights on the right side and shadows on the left. The linear features are brown, with large wide-open brown eyes, straight nose, and faintly outlined full lips. Her vivid quasi-impressionistic face bears a faint smile, painted with quick, easy brush strokes. The earrings she wears in her ears—the right one can be seen more clearly—are two white pearls strung vertically. The slightly curly, brown hair is parted in the middle above the forehead and falls loosely to her shoulders. Gracing her head is a large, dense wreath, apparently of olive leaves, painted in light and dark green. Five white vertical feathers slightly inclined to the left are visible above her head; they form a traditional iconographic attribute of Roman muses, as an emblem of their victory over the sirens (see Kees 1933/2000: 723; Falzone 2007: 60; Schindler, Moormann, and Deckers 2013: 204–205). Her white tunic, which can be seen on her front, billows out at the bottom, as if she was turning abruptly to the left (her right side), assuming that the rather doubtful





Fig. 16. Painting of a muse, tentatively Thalia, from Room 7, Archaeological Museum in Paphos (Inv. NP1995\_08) (Photo E. Jastrzębowska, 2017; digital processing T. Szmagier)





Fig. 17. Detail of the face of a muse interpreted as Thalia from Room 7 (PCMA UW Nea Paphos Project/photo W.A. Daszewski, 1990; digital processing T. Szmagier)

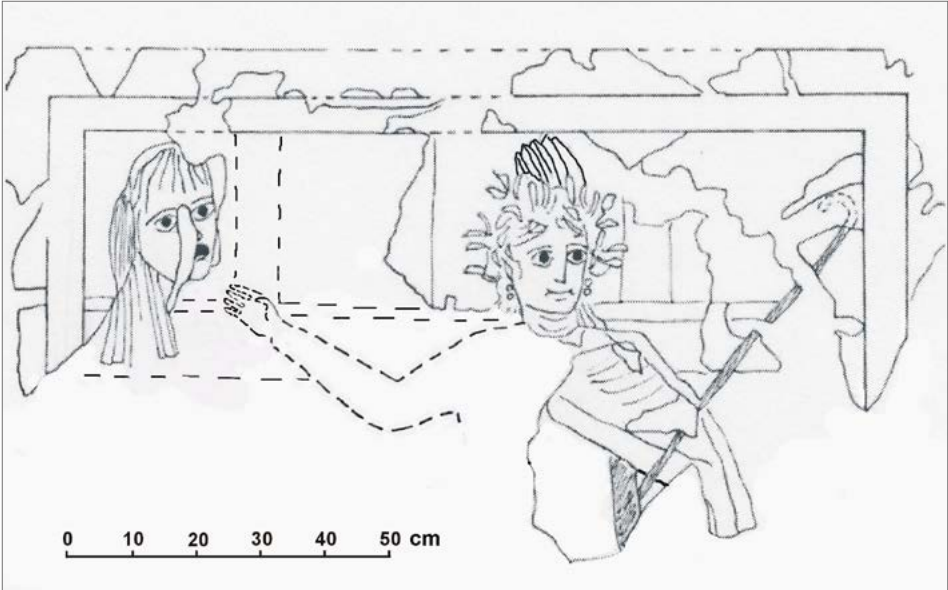


Fig. 18. Hypothetical reconstruction of the painting of Thalia holding a mask from Room 7 (Image E. Jastrzębowska with M. Puzskarski, 2018)



Fig. 19. The muse Thalia in a wall painting from the Room of the Muses in Residential Unit 3 of House 2 in Ephesus (Courtesy Bilddatenbank Österreichisches Archäologisches Institut A-W-OAI-EHH2-00820)

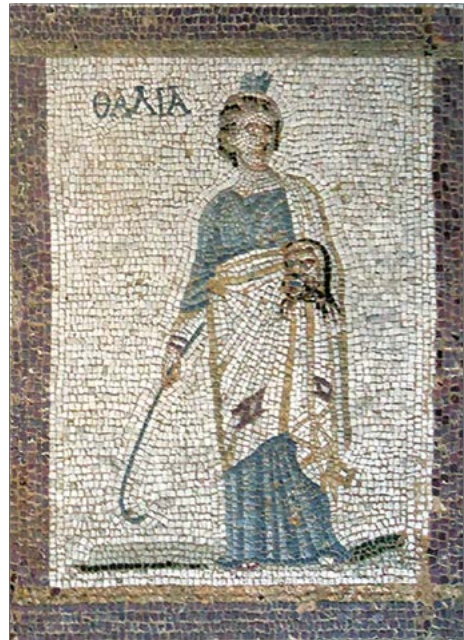


Fig. 20. The muse Thalia on a floor mosaic from the House of Paris at Kos (Courtesy Archive of Archaeological Ephoria Dodekanesou)

reconstruction in this part is correct. The left hand of the muse is totally missing and the painted folds of her tunic and the edges of plaster fragments do not fit properly. Regardless, her tunic would have been decorated with two (the left one survives) vertical, black bands (*clavi*), of which only that on her left side is shown, composed, as noted, of problematically restored pieces. A red mantle with a yellow-black lower edge and a dark red contour line covers her left shoulder, but the reconstruction of its lower end also raises some doubts.

As restored, a thin black diagonal line runs across the front of the figure, from her lower right to the upper left, without no apparent beginning or end. The upper end seems to have been repainted in modern times. Should one of the ends of this line be curved into a semicircular shape, in the form of a traditional shepherd's crook (*pedum*), the figure holding it could be Thalia, the muse of comedy and pastoral poetry. A rod of this kind was her attribute. Her second, and even more frequent attribute, was a comedy theater mask. A good example comes from the wall paintings in the Ephesian Slope Houses (Zimmermann and Ladstätter 2011: 105, Figs 176, 177, 179; 113, Fig. 195,1; 134, Fig. 220).<sup>3</sup> If the two images, the mask and the muse, are considered together and the red and black frame on both has the same scale, it turns out that they could well have formed the com-

position of a single rectangular panel with Thalia holding the mask in her right outstretched hand or just pointing to it [Fig. 18]. Assuming that, as the archaeological evidence indicates, the image of the mask had slid down from the upper part of the northern end of the east wall, then the image of Thalia would have fallen from the same wall, but further to the south, that is, toward the center of the east wall. The mask appears to be on the same grey horizontal background as that behind the muse, and these grey features, horizontal and vertical, here and elsewhere, look like the distant views of architecture that appear in the background of more elaborate architectural compositions (like that in the Palatine "House of Augustus", Room of the Masks, for instance).

A very similar figure of Thalia wearing a white tunic and mantle and holding a mask in her right hand with a thin *pedum* in her left, partly hidden in the folds of the mantle [Fig. 19; see also Fig. 33], is painted on one of the walls of the so-called Room of the Muses in Residential Unit 3 of House 2 in Ephesus; it is assigned to phase 4, dated to the second half of the 3rd century (Strocka 1977: 128, Figs 321, 333, with erroneous dating; Zimmermann and Ladstätter 2011: 99, Fig. 156). Thalia is generally represented in this manner, that is, with a comic mask in one hand and a *pedum* in the other, on mosaics throughout the Roman Empire.<sup>4</sup> The

3 Theater masks were often used as a motif in paintings and mosaics in Roman houses. For similar masks on mosaic floors, see Theophilidou 1984: 243–247, Figs 1, 2; 271–277, Figs 11, 20b; 316–321, Figs 38, 39, 41; Lancha 1990: 17–21, Figs 1, 1–8, 51–56, Fig. 23.

4 See mosaics from Trier, end of the 3rd/beginning of the 4th century AD, in the Rheinisches Landesmuseum, Dorigo 1966: 236–238, Pls 185–188; 217–218, Pls 195, 196; Theophilidou 1984:



mosaic of muses next to a scene of the Judgment of Paris from the Roman house in the Western Archaeological Site at Kos is a close parallel. Thalia, super-signed there, stands with a *pedum* in her right hand and a mask in her left (Theophilidou 1984: 248, 253; see color photographs at [http://viagallica.com/grece/lang\\_en/ville\\_kos\\_-\\_ville\\_greco-romaine](http://viagallica.com/grece/lang_en/ville_kos_-_ville_greco-romaine)) [Fig. 20; see also Fig. 32].

### THE MUSE URANIA

Excavation documentation from 1990 revealed fragments of another painted figure being found together with the mask fragments in the northeastern corner of Room 7. This figure (0.73 m by 0.54 m), composed of 33 plaster fragments, shows a woman sitting frontally on a large dark blue cushion [Fig. 22]. She seems to be more mature and larger than the young Thalia, and is wearing a white tunic, belted with a golden sash at the waist. A wide central band of purple flanked by narrow stripes runs vertically down from the neckline probably to the bottom of the tunic. The tunic is devoid of any other decoration; it has wide elbow-length sleeves. The woman has her right arm raised and bent. The palm of the hand is open and seems to be too large for the elbow, but the skin color on both fragments is the same. She has a simple gold bracelet on the right wrist and is wearing a gold necklace. Her complexion and color of neck and hand is beige with

darker shadows particularly visible on the left cheek and on the left half of her neck. Her face is 11 cm high and 8 cm wide, and seems to be schematically painted and with less character than the faces of other muses from the same room. Her large wide-open eyes are brown and deeply set, looking to the left. She has brown and rather straight hair slightly parted in the middle above her forehead and gathered at the back of the head. Her clearly outlined nose is straight, but her full lips are faintly marked. The head is surrounded with a large wreath of small, light green leaves which cannot be identified as a plant species. Three small, blue feathers—the muse's attribute—are set in her hair; they have white highlights, and are slightly pointed, but seem to represent only one side of the original cluster of five feathers. The woman's dark purple mantle falls from her left hand, which is not preserved, and it covers her knees and legs with straight folds. She may have been holding her attribute in the left missing hand or was pointing to it either with this hand or with a thin pointer (see below). This attribute could have been a celestial globe; such a painted object—a globe with two crossing tapes around the sphere—was found among other motifs on the plaster fragments from Room 7 (it could not be located in the store in 2017) [Fig. 21]. The globe was painted in a three-dimensional manner, applying highlights and shadows; the linear decoration on the sphere is in

271–275, Fig. 11; Ternes 2002: 177, 180; Roman Spain, San Nicolás Pedraz 2011; el-Jem/Thysdrus in the Bardo Museum, 3rd century AD, Theophilidou 1984: 317–318, Fig. 38; see also another mosaic from el-Jem in the local Archaeological Museum, Theophilidou 1984: 320–322, Fig. 41; and a mosaic in the so-called House of Muses in Kasserine/Cillium, second half of the 4th century AD, Darmon and Gozlan 2015: 115–116, Figs 6, 8 and a mosaic in the House of Euphrates at Zeugma, first half of the 3rd century, Önal 2009: 74–75.

the form of double crossed circles. It resembles closely numerous representations of such globes, which were an attribute of the muse Urania, the muse of astronomy, on Roman mosaics throughout the Empire.<sup>5</sup>

Assuming the muse from Room 7 had held such a globe in her left hand or had sat near it, she would be recognized as Urania. The dark blue, possibly celestial cushion, on which she is sitting, and the purple mantle covering her knees,

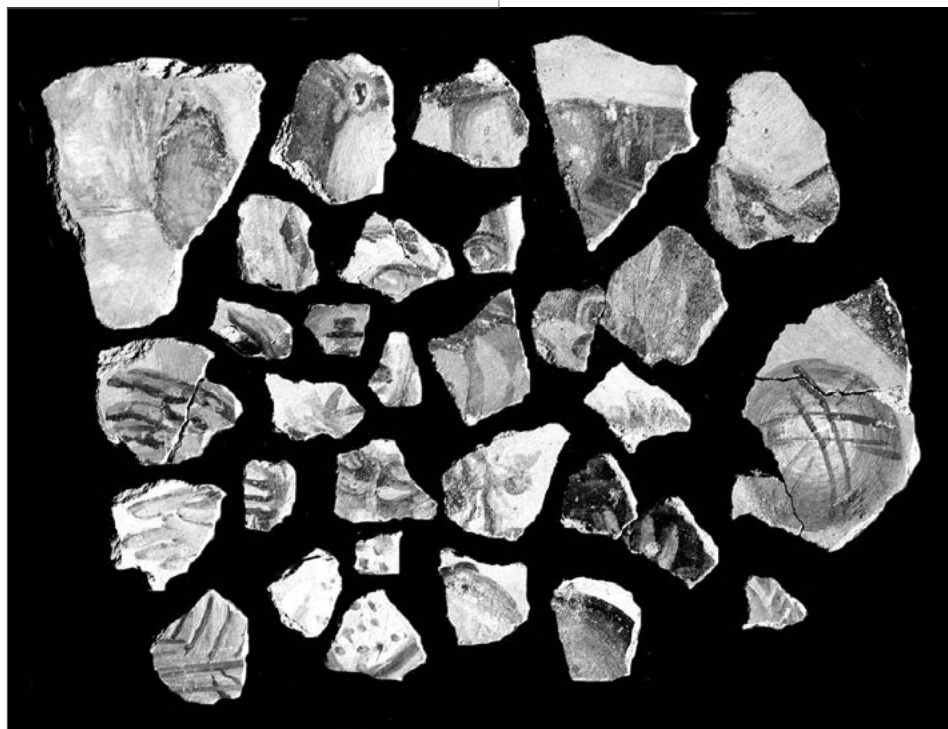
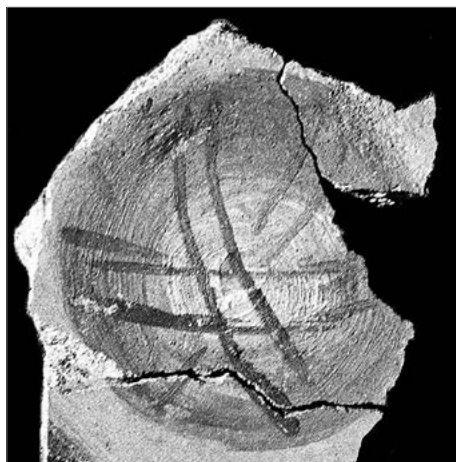


Fig. 21. Fragments of painted plaster with image of a globe (detail in inset) and of a female figure from Room 7 (PCMA UW Nea Paphos Project/photo W.A. Daszewski, 1990; digital processing T. Szmagier)

5 See mosaics from: Vichten, Krier and Reinert 1995; Trier in the Rheinisches Landesmuseum, Dorigo 1966: Pl. 186; Theophilidou 1984: 271–275, Fig. 17; Ternes 2002: 177, 183; Elis and Kos, Theophilidou 1984: 243–250, Figs 1, 2, 4; el-Jem/Thysdrus, 3rd century AD, Theophilidou 1984: 317–318, Fig. 38.





Fig. 22. Painting of a muse, tentatively Urania, from Room 7, Archaeological Museum in Paphos (Photo E. Jastrzębowska, 2017; digital processing T. Szmagier)

would constitute another iconographic indication. An image of a seated Urania, captioned above in Latin, in a turquoise tunic and purple mantle appears on a mosaic floor [Fig. 23] from the Roman villa in Vichten (Luxembourg) from about AD 240 (Krier and Reinert 1995).<sup>6</sup> She

is pointing with a thin rod to a globe decorated with some interwoven circles, which is mounted on a small three-legged table to her right. The figure of a standing Urania holding a globe in her left hand can be seen on a mosaic from the second half of the 2nd century in the Western



Fig. 23. The muse Urania on a floor mosaic from a Roman villa in Vichten, Luxembourg, Musée Nationale d'histoire et d'art Luxembourg (Courtesy Musée Nationale d'histoire et d'art Luxembourg)

6 Unpublished, except for a brief note in Danguillier 2001: 267. The mosaic is in the National Museum of History and Art, Grand Duchy of Luxembourg. See brief note about its discovery and lavish images by Rudolf Schmidt at the site of The International Coronelli Society for the Study of Globes, News 2003.

Archaeological Site at Kos (Theophilidou 1984: 249–250, Fig. 4; see color images at [http://viagallica.com/grece/lang\\_en/ville\\_kos\\_-\\_ville\\_greco-romaine](http://viagallica.com/grece/lang_en/ville_kos_-_ville_greco-romaine)).

The probable position of Urania on the walls of Room 7, reconstructed from its find spot near the theater mask, was the eastern part of the north wall in this room.

### THE MUSE EUTERPE AND APOLLO

In the early 1990s, Ewa Paradowska assembled the first of these two figures from about 80 painted plaster fragments (Daszewski 1991b: 80–81, Fig. 2) and later, these fragments as the other painted human figures from Room 7 were consolidated by E. Hadjistephanou. The young standing woman is preserved from the knees up, almost to her full height (0.86 m by 0.62 m) [Fig. 24]. She wears a rich dress that is different from the tunics of the other muses described above. This exquisite, deep red (burgundy) robe with blue ornamentation has long narrow sleeves. The tunic is held at the waist with a golden belt, which also secures the golden ends of the mantle over her shoulders. The blue ornamentation comprises: a square on the chest with an inner black ornament, two small roundels (*orbiculi*) on the shoulders, and triple bands on the forearm and on the wrist, as seen on the preserved left arm, and a horizontal band lower down on the skirt. Her short mantle, of the same red color, can be seen on both sides of her body beneath the waist and arms. This mantle is folded and decorated at the bottom with a gold horizontal band. It would have been fixed to the shoulders of the muse, spreading out behind her. Her face (11.5 cm high

and 8.5 cm wide) is wholly preserved, and slightly inclined to her left [Fig. 27]. She has regular, but rather masculine features, masterfully rendered with brown lines: large, brown eyes looking to the left, straight nose and a small full, slightly open mouth. Her brown, short and curled hair, not preserved above the forehead, is crowned with a green wreath of possibly laurel leaves, but they are rather difficult to identify. Three pointed blue feathers with white highlights are clearly visible at the top of her head, above and to the right of the gap in the painting. Her left arm is slightly extended from the body with the forearm bent horizontally and the palm at waist level. Held in this hand is a vertical long gold flute with four or five pointed keys below the fingers and a barely visible mouthpiece above the belt. She should be holding, in her right hand, the second part of this presumably double flute. However, this hand and the right forearm have not been reconstructed correctly. In addition, her right forearm is evidently too short in comparison to her left forearm. The proposed gesture of her right hand also poses some difficulties. There are some remains of the second flute discernible in this hand, as well as another small piece of this instrument on one fragment of her robe, inserted separately and incomprehensibly in the middle of this reconstruction. It seems more probable that the muse might have been holding the flute more horizontally in her right hand and her right arm straight. Only a small part of the background behind the muse has survived, to the left and above her right shoulder, but it seems to have been





Fig. 24. Painting of a muse, tentatively Euterpe, from Room 7, Archaeological Museum in Paphos (Photo E. Jastrzębowska, 2017; digital processing T. Szmagier)

painted white with the background behind her head grey-blue.

This muse is clearly identified by her attribute, the *tibia* or one part of a double flute, called the *diaulos* or *tibiae*, held in her left hand. She is Euterpe, the muse of lyric poetry, music and the flute. Her rich dress, the so-called theater robe (*Theatergewand*), became typical of Euterpe, but such a robe could also have been worn by Apollo, as in the image on the mosaic in the *triclinium* of the same house in Nea Paphos [see Fig. 2],

resulting in the initial identification of this figure as Apollo (“a male figure in the dress of a *kitharodos*, perhaps a representation of Apollo”, Daszewski 1991b: 80, Fig. 2). The best parallel for such an image of Euterpe, dressed in a similar richly decorated orange robe, captured in full motion or standing calmly, always with the *tibiae* in both hands, is present on two mosaics: one from the Roman villa in Vichten [Fig. 25] and the other from the Roman house at the Western Archaeological Site on Kos (Theophilidou



Fig. 25. The muse Euterpe on a floor mosaic from a Roman villa in Vichten, Luxembourg, Musée Nationale d'histoire et d'art Luxembourg (Courtesy Musée Nationale d'histoire et d'art Luxembourg)



1984: 247–248, Fig. 3) [see Figs 26 right, 32].<sup>7</sup> The second flute held more horizontally in the right hand is paralleled by a wall painting of the muse from the so-called Room of the Muses in Residential Unit 3 of House 2 in Ephesus, from the second quarter of the 3rd century AD (see above, Note 7) [see Figs 26 left, 33].

The other consolidated image (0.41 m by 0.40 m) of a human figure from Room 7 was in the worst condition. It was assembled from 37 fragments and undoubtedly represents a man, easily rec-

ognized as Apollo holding a lyre [Fig. 28]. Only the upper part of the god's body has survived: the head with a floral wreath, the right arm with a hand clutching the lyre and a small fragment of his chest. Thus, it is impossible to say whether he was originally standing or sitting. Apollo's face is 7.5 cm wide and could have been approximately 10 cm long, which is important when comparing it with the size of the faces of muses from the same room. His face has a yellow-beige skin with brown linear features, brown eyes



Fig. 26. The muse Euterpe: left, painting from the Room of the Muses in Residential Unit 3 of House 2 in Ephesus (Courtesy Bilddatenbank Österreichisches Archäologisches Institut A-W-OAI-EHH2-00821); right, floor mosaic from the House of Paris at Kos (Courtesy Archive of Archaeological Ephoria Dodekanesou)

7 See above, note 6. For other Roman-age images of Euterpe either in painting or mosaic, see: for paintings, Euterpe from phase 4 (second quarter of the 3rd century AD) in the Residential Unit 3 of House 2 in Ephesus, Strocka 1977: 128, Figs 315, 330, 334; Zimmermann and Ladstätter 2011: 99, Fig. 155; for mosaics from the western Roman Empire, Trier, see Theophilidou 1984: 280–286, Fig. 23, and from the eastern provinces, Kos, today at the Grand Master's Palace on Rhodes, Theophilidou 1984: 244–248, Fig. 2.

looking to his left and set in dark sockets. The left eye is intact, the right one is damaged. The nose is long and straight, but the mouth is missing. The hair is brown and curly, barely parted in the middle above his forehead, the long side curls falling below the shoulders. Apollo wears a double white band on his head and a wreath of sparse light and dark green leaves. The leaves are blurred, but one of them looks like an ivy leaf. A small part of the god's bare torso has survived below his right arm. Apollo's body, and particularly his face, are painted with a masterly use of highlights and shadows emphasizing the volume of his figure. The background behind Apollo is varied; it is white to the left of his torso, with blue streaks above his head. Apollo raises his right arm high above his head and bends his forearm, which is painted a lighter

beige color. In his right hand he holds the nearside grey and black arm of the lyre or kithara, to the left of his head. The other arm, only partly preserved, is shown parallel to this, further to the right and high above the god's head. It is not certain whether the upper end of the left arm of the instrument has been correctly restored. Between the two arms of the frame we see the horizontal crossbar (*zugon*) and vertical strings delineated in black, but the sound-chest below is not preserved. This painted image of the instrument of Apollo is more similar to the lyre of Orpheus in the earlier mosaic from the so-called House of Orpheus in Nea Paphos (late 2nd and early 3rd century AD, Michaelides 1987: 13–14, Fig. 6; Christou 2008: 107; Daszewski and Michaelides 1988: 49–51, Figs 38, 39), than to the *kithara* of Apollo in the mo-



Fig. 27. Detail of the face of a muse interpreted as Euterpe from Room 7 (Photo E. Jastrzębowska, 2017; digital processing T. Szmagier)

saic from the *triclinium* of the same House of Aion [see Fig. 2].

Apollo with a *kithara* surrounded by the muses appears on a mosaic from the not-so-distant island of Kos (second half of the 2nd century AD, Theophilidou 1984: 248) [see Fig. 32 center]. The god is presented there seated, semi-nude, with

a purple mantle covering the knees, holding the *kithara* in the right hand and a *plektron* in his outstretched left. His image appears in a central rectangular panel between two similar panels with the muses Euterpe to his right and Thalia to his left. In this mosaic Apollo is in the company of the same muses as in Room 7 of the

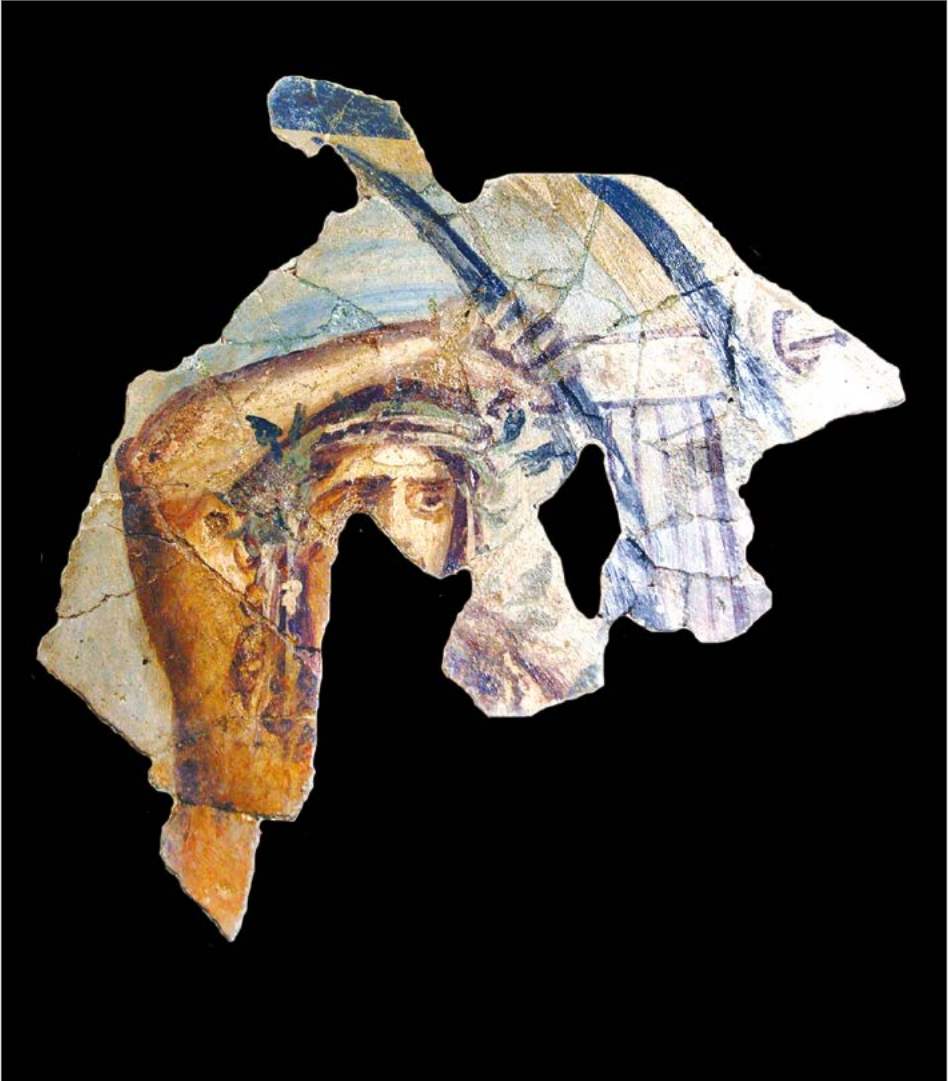


Fig. 28. Painting of Apollo from Room 7, Archaeological Museum in Paphos (Photo E. Jastrzębowska, 2017; digital processing T. Szmagier)



House of Aion. There is a difference, however, and it concerns what the god is doing. The Apollo from Paphos in Cyprus is not playing the lyre, but grasping the instrument, as if meaning to pick it up

and start playing. This particular manner can be simultaneously explained by a specific iconographic tradition connected with some representations of Apollo, typically the standing sculpted figures of the



Fig. 29. Apollo in a wall painting from the Room of the Muses in Residential Unit 3 of House 2 in Ephesus (Courtesy Bilddatenbank Österreichisches Archäologisches Institut A-W- OAI-EHH2-00824)

Lykeios type (see Strocka 1977: 127; Simon and Bauchhness 1984: 383–384, Nos 61, 222). This gesture, of the right arm posed above the head, is frequent in images of this god. He is similarly represented in the so-called Room of the Muses in Residential Unit 3 of House 2 in Ephesus from the second quarter of the 3rd century AD (Strocka 1977: 127–128, Figs 316, 321, 340, with erroneous dating; Zimmermann and Ladstätter 2011: 99, Fig. 153) [Fig. 29].

### OTHER FIGURAL REPRESENTATIONS

Other figural representations, both male and female, once painted in Room 7, have survived in much worse condition and seem to be of inferior artistic quality. Modest parts of the heads and faces of three other human figures could be reassembled. There is a partial reconstruction of the top of a young woman's head (Case VII: No. 90, see *Catalog*) in a white diadem painted quickly and carelessly, which cannot be identified either as a wreath of leaves or as a bunch of feathers. Her hair is dark, almost black, slightly parted in the center above a high forehead. The face is beige in color, the upper part preserved with two black eyes looking up to her left, a straight nose and both cheeks. Matching this fragmentary face is a remnant of feminine chin above a thick neck and triangular neckline of a yellow tunic, bordered by black and grey bands (Case VII: Nos 90, 94, see *Catalog*) [Fig. 30 top right]. The light blue-violet background is the same on both these fragments. The fragment of another woman's lips (Case VII: No. 95, see *Catalog*) [Fig. 30 center left], proposed as the completion of this face, does not fit, the lips being proportionally too large for the upper and lower parts of this face. A fragment of a black

border, or something different, visible to the right of this head, matches two other fragments of similarly painted plaster (Case VII: Nos 89, 91, see *Catalog*). This is all that could be done to complete this figure.

Nothing more was done or said in the excavation reports about two other partly assembled faces: one of a young woman (Case VIII: No. 112, see *Catalog*) and the other possibly of a young man (Cases IV: Nos 50, 51; VIII: Nos 111, 112, see *Catalog*), which are too poorly preserved [Fig. 30 top left].

Many small fragments, painted on a deep blue background, represented the figure of presumably another youth, bareheaded, his face framed with short curly hair (Case III: Nos 23, 24, 25, see *Catalog*), a possible Dionysian *thyrsus* next to him, or alternatively the mane of a horse (M. Romaniuk, personal communication) [Fig. 30 bottom right]. The edges of the fragments do not fit, except for some arbitrarily glued pieces forming the upper part of a head (Case VI: Nos 9, 19, 24, 25, 28) of a boy who might be identified as one of the Dioscuri due to the possible presence of his characteristic cap (*pilos*) with a star (Case III: No. 28) as proposed by Marcin Romaniuk (personal communication).

Still to be discussed are the numerous smaller fragments of painted plaster with garden motifs, that is, flowers, leaves and birds, which are known from black and white excavation photographs from 1988–1989. Some of these “garden pieces”, which are missing today, were photographed with fragments of a border forming a roughly-shaped trapezoid [Fig. 31]. It seems that the most significant among these fragments are those present-



ing two opposite acute corners of a garden border, which, however, could have well been the ends of a bottom border of a much larger, semicircular or semi-

oval surface. A surface of this shape could have filled the upper part of the east wall under the arch of the vault. If the numerous fragments of this painted



Fig. 30. Fragments of painted plaster from Room 7: top, three fragmentary heads of young women (Cases VIII: Nos 112, 111; IV: 47, 50, 51; VII: Nos 90, 94); center left, fragments of a right hand and of a mouth (Cases IV: No. 48; VII: No. 95); bottom left, fragmentary female bust (Cases V: Nos 53, 54, 55, 60; VII: No. 98); bottom right, face of a youth and horse's mane (Case III: Nos 9, 19, 23, 24, 25, 28) (Photos E. Jastrzębowska, 2017; digital processing T. Szmagier)

garden representation and of its border were found in the same conglomerate of painted plaster pieces under the east wall, their original location could have been on the upper part of this wall, which means above the figural panels of the muses and below the vault.<sup>8</sup>

#### PAINTED PLASTER FROM THE VAULT

Last but not least, some larger fragments of painted plaster from the collapsed vault were found in Room 7. They were discovered in the upper level of the fill, in the northeastern corner of the room [see *Fig. 10*]. Today, they are easy to recognize due to their curved surface and greater thickness compared to the other fragments of plaster (Cases I, XI and XII, see *Catalog*). The largest irregular piece of the vault (0.35 m by 0.36 m) was composed of three heterogeneous layers of plaster [see *Fig. 10*].

and seems to curve gently (difference of depth 1 cm). The lower plaster layers are now visible only at the edge of this fragment. The uppermost finest white surface was covered with painted decoration: a corner of a large hexagon or lozenge, a linear black corner of a small square or rectangle with a red line running between them. The hexagon/lozenge was painted in dark and light red to imitate a slab of red marble with black veins and a black linear border. This kind of marble is most similar to the antique Greek decorative stone called *Portasanta* from the island of Chios (M.C. Marchei in: Borghini 1998: 285–287). The side of this hexagon/lozenge would originally have been at least 20 cm long. The square or rectangular marble imitation is similar, but painted in light yellow and framed by a black border. Both these geometrical figures are divided by a thick

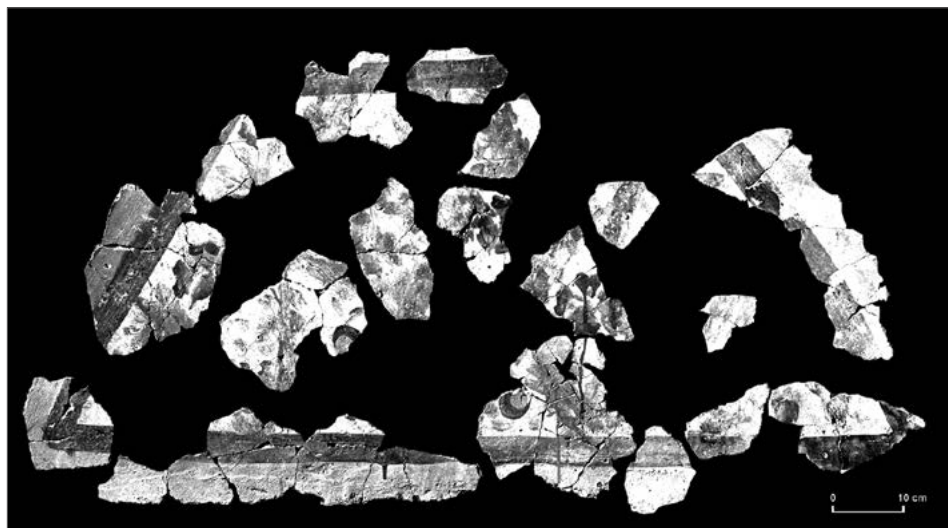


Fig. 31. Fragments of painted plaster with image of a garden from Room 7, image from 1989 (Project PCMA UW Nea Paphos Project/photo W.A. Daszewski, PAF 89 067; digital processing T. Szmagier)

8 See painted garden scenes with flowers and birds in the Slope Houses in Ephesus, Zimmermann and Ladstätter 2011: 80, Figs 131–135; 96, Fig. 150, 3.

red line, from which a thin red line forks of parallel to the edge of the hexagon/lozenge. Many small fragments of painted plaster with similar marble imitation can be seen in excavation photos from 1989 (no longer in storage) [see *Fig. 15*].

Other important fragments show another corner of an even larger white hexagon/lozenge bordered by a thinner red band and by a larger yellow one (Cases XI: Nos 151–162, XII: Nos 163–172, see *Catalog*). At the time of discovery in 1989, they formed part of one curved piece of cracked painted vault plaster [see *Fig. 10*]. The white large hexagon/lozenge shows a very thin grey-green venation that could indicate a marble imitation of light alabaster, for example the so-called *alabastro marino* originating from North Africa (M.C. Marchei in: Borghini 1998: 147).

Painted ceilings and vaults are rarely preserved in domestic contexts. In Nea Paphos, they have survived in some Hellenistic and Roman tombs, but these are monuments of earlier date and they do not present anything similar to the decoration of the vault from Room 7 (Michaelides 2004).

A very distant parallel for this decoration so far is to be found far westwards in Naples. It is the painted ceiling decoration from a destroyed Roman house from the beginning of the 2nd century AD (Bragantini 2004: Figs 7, 9, 10). This ornament consists of white-yellow lozenges and squares bordered in black and divided by red bands, painted as a three-dimensional imitation of ceiling coffers (Bragantini 2004: 178). The illusion of the three-dimensional coffers is missing from the vault painting found in Room 7 of the House of Aion in Nea Paphos, while in the Naples paintings there is no marble imitation. However, the color selection and the ornamental scheme are quite similar in both cases. A composition of other geometrical forms (octagons, squares and triangles) imitating vault coffers was found in fragments in Residential Unit 2 of House 2 in Ephesus, dated to the second half of the 2nd century AD (Strocka 1977: 129, Fig. 349 with erroneous dating; Zimmermann and Ladstätter 2011: 109, Fig. 188). It may be assumed therefore that these ornaments were commonly, although locally differentiated, in use all over the Roman world from the 2nd until the 4th century.

## RECONSTRUCTION OF WALL DECORATION

The painted walls of Room 7 of the House of Aion in Nea Paphos started with an ornamental frieze of marble imitation slabs on the lower parts, topped by a figural decoration on the upper parts. Two figures of supposed muses: Kalliope and Polyhymnia, appear to have filled the figurative zone on the south wall, to the west of the possible entrance to the room. The muse Thalia with the mask high in her right hand occupied the northern half

of the east wall, adjoining across the corner the muse Urania on the eastern part of the north wall. The images of Apollo and of the muse Euterpe cannot be placed with any certainty based on the find spot of the fragments, but upon consideration of the length of the east wall, which was 4.80 m, and the estimated width of the panel with the image of Thalia holding the mask (about 1.20 m), there is enough space on the east wall for at least two



more images with borders and columns separating them. It should be kept in mind that the largest accumulation of painted plaster fragments was found at the foot of this wall [see Fig. 34]. As for the composition of rectangular panels

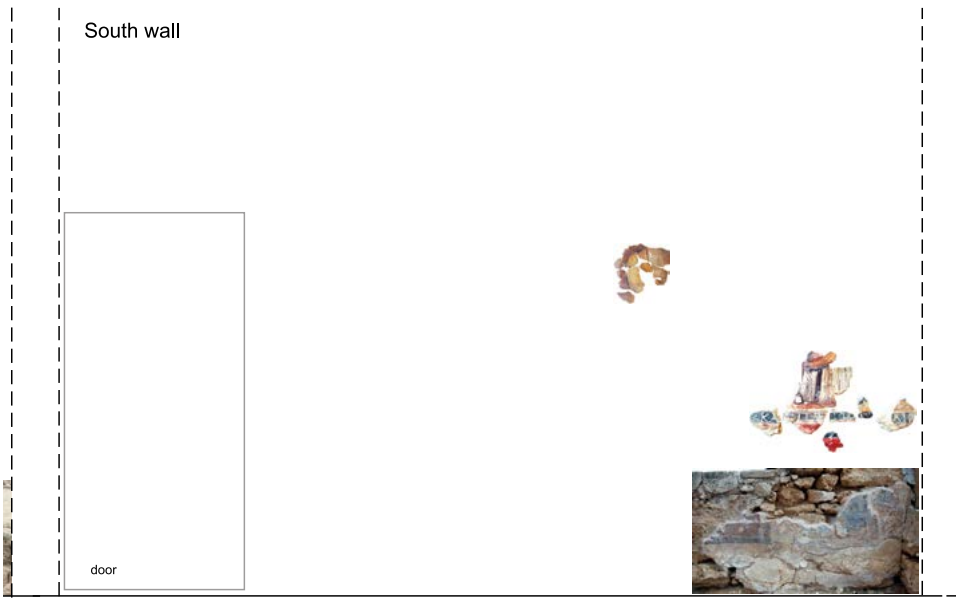
with individual figures, in particular of the muses, they are best represented in the so-called Rooms of the Muses in the Residential Houses in Ephesus (Parrish 1999: 507–513). The other parallel, but more distant eastwards in Asia Minor,



Fig. 32. Mosaic of Muses and Apollo with a central panel showing the Judgment of Paris from the House of Paris on Kos (Courtesy Archive of Archaeological Ephoria Dodekanesou)



Fig. 33. Painted east wall of the Room of the Muses in Residential Unit 3 of House 2 in Ephesus (Photo E. Jastrzębowska/digital processing T. Szmagier)





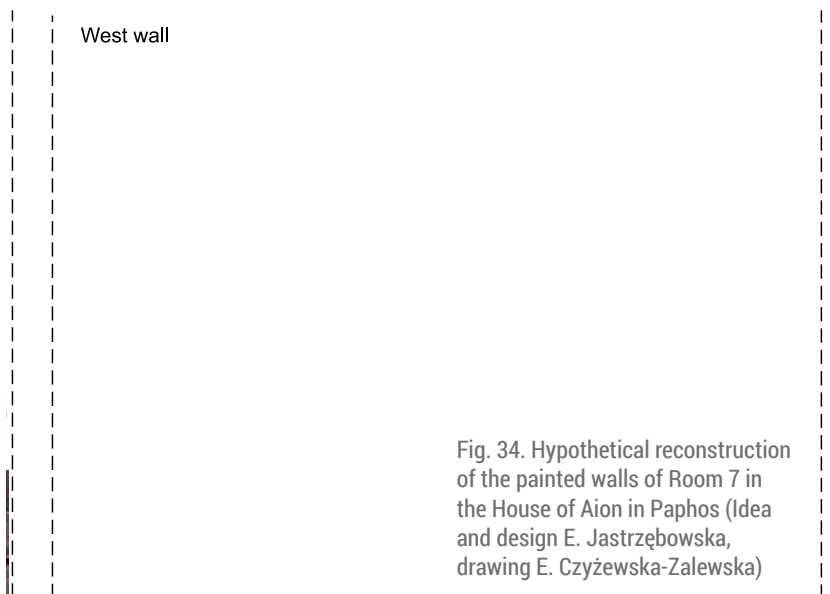
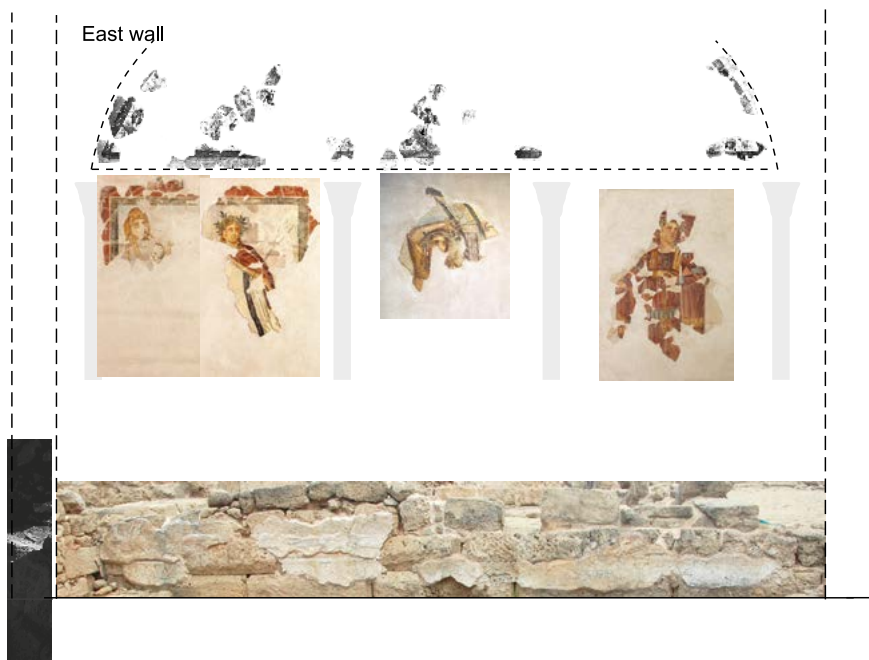


Fig. 34. Hypothetical reconstruction of the painted walls of Room 7 in the House of Aion in Paphos (Idea and design E. Jastrzębowska, drawing E. Czyżewska-Zalewska)

0 1 m

and also different stylistically, shows the figures of the mythological heroines Penelope and Deidameia and more extensively damaged other motifs painted originally on the walls of room P26 in the House of the Euphrates in Zeugma. These frescoes are now in the Archaeological Museum in Gaziantep, their *terminus ante quem* being the Sasanian sack of AD 252/253 (Barbet 2005: 144–157, Pl. XXIII, 1, 3, XXVI, 3, XXX; Moormann 2018: 15–16).

The supposed two female figures on the south wall might be identified as the Muses Kalliope and Polyhymnia. The muse of epic poetry, philosophy and rhetoric was usually represented with a scroll, as in the so-called Room of the Muses, in Residential Unit 3 of House 2 in Ephesus, whereas the latter muse, of sacred hymns, dance and pantomime, was depicted either with a scroll or a long rod, as in the same painting in Ephesus (Strocka 1977: 127–129, erroneously dated; Zimmermann and Ladstätter 2011: 97–101, Figs 151–161; Moormann 2018: 15). However, neither the hypothetical names, inscribed on the black band in Room 7 in Paphos, nor the incompletely preserved parts of the presumed muses above this band, can be interpreted with certainty.

As far as the reconstructed human figures are concerned, below this probable garden ornament, it seems quite possible that Thalia, Apollo and Euterpe were represented together on the same east wall. An inducement to this hypothesis is the composition of the same figures in a floor mosaic from the Roman House at Kos (Theophilidou 1984: 247–250, Figs 3, 4) [see Fig. 32]. Apollo, as the *Musagetes*, is a central figure there, Euterpe is to his right and Thalia to his left, two other

muses Klio and Melpomene are at the respective ends of a row of five panels. The other five muses: Terpsichore and Erato (with missing names), as well as Polyhymnia, Urania and Kalliope (better preserved), are in a symmetrical row of panels on the other side of the central mosaic scene, which is the Judgment of Paris. The muses Thalia and Euterpe are also painted next to one another on the east wall of the so-called Room of the Muses [Fig. 33], in Residential Unit 3 of House 2 in Ephesus, while Apollo is represented there between Sappho and Kalliope on the south wall (Strocka 1977: 127–129, erroneously dated; Zimmermann and Ladstätter 2011: 97–101, Figs 151–161). Nine muses with Homer (all captioned in Latin) also decorate the mosaic floor of the Roman villa in Vichten (see above) Thalia, Euterpe and Urania are shown there in neighboring octagons, the orange theater robe of Euterpe and the sitting Urania next to a globe being fairly similar to the images of these two muses painted in the House of Aion. Both these examples are a clear indication of the commonness of images of muses in the painted and mosaic decoration of Roman houses and the similarity of the composition schemes, in which they could have been arranged. It is irrelevant here whether it was due to itinerant craftsmen or traveling sketchbooks in circulation. The muses had already been a beloved subject in Pompeian painting and had become even more common in wall painting around the Mediterranean from the 2nd to the 4th centuries AD (in particular, see Strocka 1977: 133–137; Theophilidou 1984: 239–348; Moormann 1997; San Nicolás Pedraz 2011; Schindler, Moormann and

Deckers 2013: 201–217). The same is true of the sculptural decoration of public buildings and of tombs, particularly the reliefs on Roman sarcophagi (Wegner 1966). The paintings from Room 7 are dated to the end of that long tradition, which lasted at least 300 years. There is also a mosaic with Muses in distant Trier, from the second half of the 4th century.<sup>9</sup> These two examples of painted and mosaic decoration, from Paphos and Trier, prove that the old decorative tradition associated with the muses was still in use at the time.

Finally, here are some further observations regarding the style and the authors of these paintings. The face of Apollo shows some similarities to that of Thalia [compare *Figs 17* and *28*]. They are both painted in the same “impressionistic” manner and are of similar dimensions: 10 cm high and 7.5 cm wide. Their noses are very similar and their eyes are looking to the left; the wreaths on their heads, formed of sparse light and dark green leaves, are also comparable. No further comparison of these two figures is possible due to the poor state of preservation of Apollo’s image. The faces of Euterpe [see *Fig. 27*] and Urania [see *Fig. 22*] are larger: 11.5/11 cm high and 8.5/8 cm wide respectively. Nevertheless, they are painted quite similarly in a quasi-impressionistic manner, with the same gaze of the eyes directed to the left and similar, slightly open lips, as well as deeper shadows on

their left cheeks. The face of Euterpe, however, is more masculine and refined, while the face of Urania is feminine and painted hastily. Moreover, they also have similar simplified wreaths with sparse plain green leaves and the same blue pointed feathers on their heads. Therefore, it seems possible that one hand is responsible for painting Apollo and Thalia, while another one rendered Euterpe and Urania. All these masterpieces are in any case of outstanding quality, unlike other known paintings from the same period. They are stylistically too different and distant from the western masterpieces from the same period, as, for instance, the paintings in the nymphaeum–hypogeum at Via Livenza in Rome (Usai 1972; Croisier 2006; Brenk 2010: 16–17) and those from the ceiling of the so-called *cubiculum Faustae* in Trier (Simon 1986; 2007; Weber 1984; Zimmermann 2007: 378–379, *Fig. 5*). Still, the images of Apollo and the muses from Room 7 in the House of Aion in Nea Paphos represent a fine example of the direct extension of the paintings in at least five rooms of the House in Ephesus, which are, however, a hundred years older.

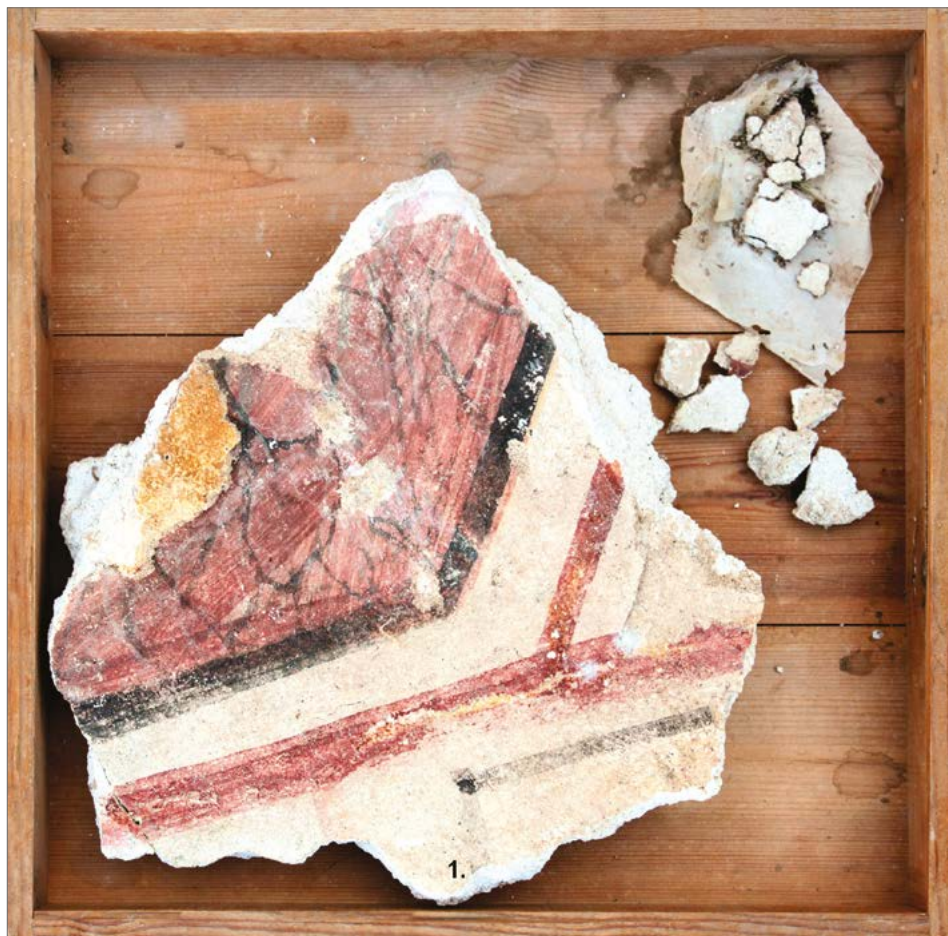
The presentation of the wall paintings from the House of Aion in Paphos does not go into the function of the decorated chambers within the house or the house itself. These issues are being researched by the author and will be the subject of a separate article.

9 A mosaic discovered at Johannisstrasse, Hoffmann 1999: 34–37, No. 7, where three other older mosaics with muses were found (Hoffmann 1999: 37–45). See together with some Spanish mosaics from the 4th century, San Nicolás Pedraz 2011.

## Catalogue

Cases I–VII were photographed at the time of excavation, cases VIII–XII in 2017 in the storeroom of the Plaster Conservation Workshop in Kato Paphos, where all the selected fragments are now in store (hence the repetition of some fragments). There may have been more cases, but only these are presently accessible in the workshop. Digital processing of the images T. Szmagier.

No.	Motif	Description/color	Size/preservation
CASE I			
1.	Hexagonal(?) coffer with a side at least 20 cm long, edged in black. Imitation black-veined red marble on the inside.	White background. Red border band of two different widths, partly outlining coffer.	35 x 36 cm Three-layered piece (1 large and 8 smaller fragments) from the vault, depth of the concavity of the curve 1 cm





CASE II			
2.	Part of a robe(?)	Light beige with gray brush strokes; two parallel curving lines of darker gray, terminating in a yellow circle with black center.	23.5 x 17 cm 1 fragment recomposed from 18 pieces
3.	Part of the background.	Light blue (now faded to gray).	14.5 x 10 cm 1 fragment recomposed from two pieces
4.	Part of a border frame.	Black band framing panel with green-colored motif (plant?) on a white background. Wide yellow edge (see No. 6).	28 x 17 cm 1 fragment recomposed from 22 pieces





5.	Part of a border frame.	Wide red band and yellow-beige panel surface.	15.5 x 8 cm 1 fragment recomposed from two pieces
6.	Part of a border frame.	Wide yellow edge bordered with a narrow black strip and wider black band (same as No. 4).	11 x 10.4 cm 1 fragment recomposed from seven pieces
7+7a.	Part of a robe(?).	Light beige with gray-brown brush strokes (two sets of two parallel lines).	20 x 11.5 cm 1 fragment recomposed from two pieces plus a small lost fragment
8.	Ornamental motif(?).	Red-colored parts of an ornamental motif(?) against a yellow background.	15.5 x 8.5 cm + 6.5 x 6 cm 6 x 3.5 cm 1 fragment recomposed from four pieces and two other fragments
CASE III			
9.	Horse's mane or part of a <i>thyrsos</i> [see <i>Fig. 30</i> bottom right]	Blue background, with a roughly rounded darkening of the color away from the figural motif on the right (similar to Nos 24, 25, 28).	17 x 15 cm 1 fragment recomposed from five pieces
10.	Surface.	Indeterminate.	3.5 x 2 cm 2 fragments
11.	Rod(?), white and brown. Brown (hair?) at the edge of the fragment to right of rod.	Blue background.	7.5 x 4.3 cm 1 fragment
12.	Part of a border frame.	Black wide band with gray on one side, yellow on the other, bordered in red.	1 fragment
13.	Small blue circle.	Off white and brown, blue.	4.3 x 2.5 cm 1 fragment
14.	Surface.	Brown.	3.8 x 2.5 cm 1 fragment

15.	Bands.	Black, gray, blue and yellow.	4 x 2.7 cm 1 fragment
16.	Irregular shapes (hair?).	Off white and brown.	3.7 x 2.1 cm 1 fragment
17.	Irregular shapes (hair?).	Off white and brown.	3.6 x 3.1 cm 1 fragment
18.	Irregular brown lines (hair? star?).	Blue background, brown shapes.	7.2 x 4.5 cm 1 fragment (now 2 recomposed)
19.	Locks of hair(?) [see Fig. 30 bottom right].	Yellow-brown locks on a blue background.	7 x 4.3 cm 1 fragment recomposed from two pieces



20.	Indeterminate.	Off white with brown edge.	10 x 6.5 cm
21.	Indeterminate.	Off white with brown edge.	
22.	Part of face (forehead?). Possibly above No. 23.	Brown and flesh-colored.	3.5 x 2 cm 1 fragment
23.	Part of face (lines of nose and eyes). Joins with Nos 24 and 25 [see <i>Fig. 30</i> bottom right].	Flesh-colored face with facial features in brown.	6.3 x 3.5 cm 1 fragment
24.	Rod and locks of hair to left of it. Joins with Nos 23 and 25 [see <i>Fig. 30</i> bottom right].	Yellow brown rod and brown hair, on a darker blue background (as in Nos 9, 11 and 25).	18.5 x 10 cm 2 fragments recomposed from six pieces
25.	Locks of hair fringing left-side part of forehead. Joins with Nos 24+23 [see <i>Fig. 30</i> bottom right].	Yellow-brown hair, flesh-colored forehead, against a darker blue background (as in Nos 9, 11 and 24).	9 x 5 cm 1 fragment recomposed from two pieces
26.	Numerous irregular shapes (plant?).	Multi-colored.	7 x 5.5 cm 1 fragment recomposed from two pieces
27.	Parallel bands(?), not as regular as in a frame.	Yellow and off white, blue-gray (black?), light blue (set as in No. 31).	1 fragment
28.	Peaked cap surmounted by star(?). Yellow at bottom edge. Arching brown shaded element on left [see <i>Fig. 30</i> bottom right].	Brownish to yellow shape and element, against a darker blue background (as in No. 9)	8 x 4.5 cm 1 fragment recomposed from two pieces
29.	Irregular shapes (hair?).	Off white and brown spot.	3.5 x 2.8 cm 1 fragment
30.	Irregular shapes (hair?).	Off white and brown.	2.6 x 2 cm 1 fragment
31.	Parallel bands(?), not as regular as in a frame.	Yellow and off-white, blue-gray (black?) and light blue (set as in No. 27; similar to No. 34).	1 fragment
32.	Locks of hair, lanceolate shape away from the hair.	Brown shaded hair against a flesh-colored background; dark brown shape against background.	4 x 4.7 cm 1 fragment

33.	Wide band(?).	Dark gray band against blue background.	6.2 x 4 cm 1 fragment recomposed from three pieces
34.	Wide black band between narrower bands/planes of lighter color and terminated by perpendicular crossing elements.	Black band between off white surface on one side and off-white strip on the other, here sided with yellow surface. Brownish perpendicular edges cutting off band at each end (similar to No. 31).	1 fragment
35.	Fragment with relief molding.	Light blue background with yellow on molding.	3.5 x 3 cm 1 fragment
36.	Locks of hair(?).	Off white and brown.	1 fragment
37.	Part of background(?).	Darker blue into gray shades. Yellowish edge(?).	8 x 6 cm 1 fragment
38.	Part of background(?).	Blue, shaded.	2.5 x 2 cm 1 fragment
39.	Rod with finial(?). Border with motif of capital(?).	Shaded off-white to gray-brown rod against a darker blue background (as in No. 9). Finial of rod against a wide black band, sided on the other side with a yellow band.	10 x 9 cm 1 fragment recomposed from four pieces
40.	Indeterminate.	Grey-blue with white patch	4.5 x 2 cm 1 fragment
41.	Indeterminate.	Grey-blue background with light brown dashes.	2.5 x 2 cm 1 fragment
42.	Part of background(?).	Light blue.	5 x 3 cm 1 fragment
43.	Part of background(?).	Light blue. Brown lines.	4.2 x 2.8 cm 1 fragment
44.	Indeterminate.	Flesh-colored shaded arched line against a light blue background.	3.5 x 3 cm 1 fragment

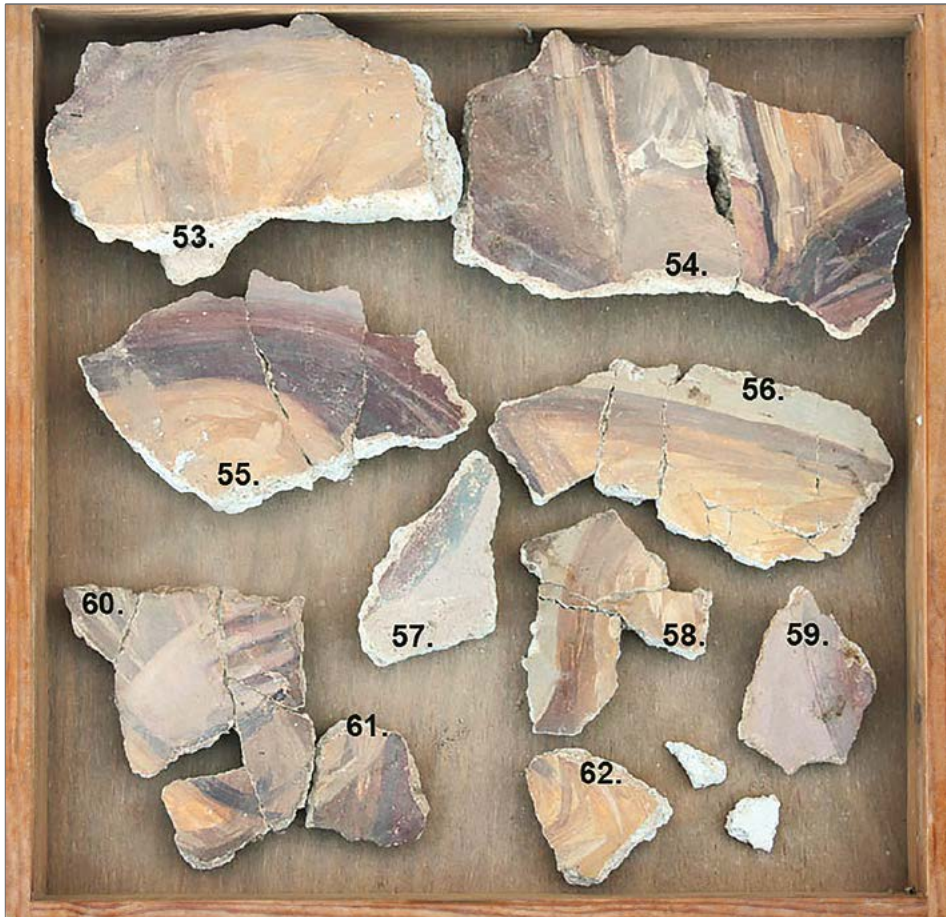
CASE IV			
45.	Part of robe(?).	Red-brown shape, lined on one side with yellow.	13 x 9 cm 1 fragment recomposed from two pieces
46.	Part of robe(?). Folds spreading fan-shaped from one point.	Light gray to purple with brown line shading.	10.5 x 10 cm 1 fragment
47.	Part of forehead with hairline(?). Joins with No. 51 [see Fig. 30 top left].	Red and brown shapes separated from flesh-toned plane by black sinuous line.	7.8 x 5 cm 1 fragment
48.	Right hand, open palm, thumb pulled in [see Fig. 30 center].	Pink shaded fingers against a white background.	9 x 8 cm 1 fragment





49.	Part of robe with rolled fold (or mantle) arching down and <i>clavus</i> . At bottom left, oblique sandal strap(?). Joins No. 65 and may continue on No. 52 [see <i>Fig. 12</i> left].	Beige fabric shaded with pale brown lines imitating folds, dark brown <i>clavus</i> . Roll (or sleeve) yellow-brown.	27 x 26 cm 1 fragment recomposed from four pieces
50.	Right side of neck and face, lined with locks of hair; right corner of mouth. Lock of hair on the right side of the head. Joins with Nos 51, 111 [see <i>Fig. 30</i> top left].	Flesh-colored, shaded neck and face. Mouth in brown, maroon brown hair. Creamy-yellow shaded background.	11 x 10.5 cm 1 fragment recomposed from two pieces
51.	Upper part of the face with nose, eyes and locks of hair above the right side of the forehead. Joins with Nos 47, 50 and 111 [see <i>Fig. 30</i> top left].	Darker greyish fleshy color of face, facial features shaded in brown. Maroon brown hair.	9 x 8.4 cm 1 fragment
52.	Part of robe with rolled fold (or mantle) and draped fabric at a diagonal angle. Continues from No. 49(?).	Beige fabric shaded with pale brown lines imitating folds. Roll (or sleeve) yellow brown.	9.5 x 7.5 cm 1 fragment
CASE V			
53.	Part of robe(?) [see <i>Fig. 30</i> bottom left].	Yellow fabric with gently rounded brown shading.	20 x 12 cm 1 fragment
54.	Part of robe at neckline(?). Tunic with two narrow <i>clavi</i> , mantle thrown over shoulders [see <i>Fig. 30</i> bottom left].	Yellow mantle on left shoulder. White tunic, above flesh-colored to grayish neck. Narrow brown <i>clavi</i> .	21.5 x 14 cm 1 fragment recomposed from three pieces. Gap in the plaster.
55.	Roll of fold(?) of robe; right shoulder of figure(?). Continued in No. 54 [see <i>Fig. 30</i> bottom left].	Maroon brown shaded fold against a yellow plane surface (fabric of robe?).	19.5 x 12 cm 1 fragment recomposed from three pieces
56.	Mantle fold bent at an acute angle.	Yellow fabric with folds and volume shaded in brown, against a gray-white background.	20 x 9.5 cm 1 fragment recomposed from eight pieces
57.	Part of figure(?).	Reddish-blue rounded shape against a grey-white background.	11 x 6.5 cm 1 fragment

58.	Part of mantle(?), arched and angled contour.	Yellow mantle with folds shaded in brown, against a gray-white background.	16.5 x 11 cm 1 fragment recomposed from three pieces
59.	Edge of right side of mantle(?).	Brown mantle against an off-white background.	9.5 x 6 cm 1 fragment
60.	Part of right hand against the front of a robed figure [see Fig. 30 bottom left].	Flesh-colored hand. Yellow sleeve, shaded brown mantle.	16 x 12 cm 1 fragment recomposed from five pieces
61.	Part of mantle with folds.	Shaded brown edge of mantle with yellow brush-strokes.	6.5 x 6 cm 1 fragment
62.	Part of mantle with folds.	Yellow mantle with light-colored folds. Background bluish-white (two pieces of plain white plaster?).	7 x 6 cm 3 fragments



CASE VI			
63.	Border frame with band of inscription: possibly Λ [see Fig. 12 left].	Wide red frame. Black band with white letters (compare No. 65).	8 x 6.5 cm
64.	Border frame with band of inscription: K and A [see Fig. 12 right].	Wide red frame. Black band with white letters (compare No. 67).	14 x 12 cm
65.	Border frame with band of inscription: Π and O. Sandal heel and small fragment of robe. Joins with No. 49 [see Fig. 12 left].	Wide red frame. Black band with white letters. Narrow white lines edging the black band (compare No. 63).	17 x 12.5 cm 1 fragment recomposed from three pieces



66.	Band of inscription: possibly I and M [see <i>Fig. 12</i> ]	Black band with white letters.	11 x 6 cm 1 fragment
67.	Part of border frame with band of inscription: Λ, I and O(?), fragment of figural panel [see <i>Figs 12, 13</i> ].	Wide red frame. Black band with white letters. Narrow white line edging the black band. Maroon yellow of panel above frame (compare No. 64).	16.5 x 10.5 cm 1 fragment
68.	Part of border frame(?).	Black band with white line in the middle	9 x 6 cm 1 fragment
69.	Part of border frame(?).	Black band with white line in the middle.	8.5 x 6 cm 1 fragment
70.	Part of border frame with band of inscription(?).	Black band edged with a white line; wide red band on one side. Yellow panel surface on the other side. See Nos 73 and 75.	13.2 x 10 cm 1 fragment
71.	Part of robe (bottom hem) and band of inscription(?) [see <i>Fig. 12</i> right].	White robe on a yellow panel background, above black band.	10 x 6 cm 1 fragment recomposed from two pieces
72.	Part of border frame with band of inscription.	Black band edged with a white line and wide red band.	10 x 6.5 cm 1 fragment
73.	Part of border frame with band of inscription.	Black band edged with a white line and wide red band. See Nos 70 and 75.	13 x 11 cm 1 fragment
74.	Part of band of inscription(?).	Black band.	5.5 x 2.5 cm 1 fragment
75.	Part of border frame with band of inscription.	Black band edged with a white line and red band. See Nos 70 and 73.	8 x 5.2 cm 1 fragment
76.	Part of bands.	White and black.	1 fragment
77.	Part of border frame(?).	Wide red band and narrow white line; color on other side of white line indeterminate.	6 x 5.3 cm 1 fragment
78.	Part of border frame(?).	Black band, narrow white line edging it and red band.	4 x 3.7 cm 1 fragment



79.	Part of border frame.	Black and red bands.	8 x 7 cm 1 fragment recomposed from two pieces
80.	Part of border frame.	Black band and red band.	5.5 x 4 cm 1 fragment
81.	Indeterminate.	Indeterminate.	5.2 x 4.3 cm 1 fragment
82.	Part of border frame.	Black and red bands.	4.5 x 4 cm 1 fragment
83.	Part of band(?).	Red.	2.5 x 2 cm 1 fragment
84.	Indeterminate.	Obscured by adhering sand.	1 fragment
85.	Part of border frame.	Black and red bands.	5.5 x 4 cm 1 fragment
86.	Part of border frame.	Black and red bands.	5 x 3.5 cm 1 fragment
87.	Part of border frame.	Black and red bands.	4.7 x 3.6 cm 1 fragment
88.	Part of border frame.	Black and red bands.	4 x 3.4 cm 1 fragment
CASE VII			
89.	Corner of object(?).	Black element corner against a light blue sky.	8 x 7.5 cm 1 fragment
90.	Upper part of face and head of a female figure, next to vertical feature/ border frame(?) [see <i>Fig. 30</i> top right].	Flesh-tone of face with facial features in shaded brown, brown hair, white flower wreath, against a light gray-blue back- ground. Dark gray vertical feature.	24.5 x 16.5 cm 1 fragment
91.	Indeterminate.	Dark gray (feature?).	3 x 2.8 cm 1 fragment
92.	Right earring(?).	Grey surface and white dot.	4.7 x 3 cm 1 fragment



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93.	Right shoulder with part of mantle(?).	Yellow mantle with folds painted a lighter color, brown border.	1 fragment
94.	Upper chest and neck with chin outline, deep V-shaped tunic neckline and edge of mantle on right side, left earring [see <i>Fig. 30</i> top right].	Flesh-tones for skin with shading in brown; tunic grey with maroon brown edges; earring formed of two white dots; yellow mantle on right side of figure. Against a light gray-blue background.	18 x 13 cm 1 fragment recomposed from two pieces
95.	Large mouth with thick lips and bottom of nose [see <i>Fig. 30</i> center].	Flesh-tones for skin, red lips.	4.7 x 3.8 cm 1 fragment

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96.	Part of robe(?).	Dark grey robe against gray-blue background.	4.8 x 4 cm 1 fragment
97.	Part of mantle. Angular shape on a diagonal [see <i>Fig. 30</i> bottom left].	Yellow textile with vertical folds in lighter color, shades in brown.	5.9 x 4.6 cm 1 fragment
98.	Part of mantle, vertical folds [see <i>Fig. 30</i> bottom left].	Yellow textile with vertical folds in lighter color, shades in brown.	8 x 8.5 cm 1 fragment
99.	Locks of hair or burning flame(?).	Two red locks against a white background.	5.5 x 4.3 cm 1 fragment
100.	Part of band.	Gray-black band with red edge (like No. 106).	10.5 x 6.8 cm 1 fragment recomposed from two pieces
101.	Indeterminate.	Red color against white background.	5 x 3.7 cm 1 fragment
102.	Indeterminate.	Light yellow surface with black strip.	5.4 x 3.5 cm 1 fragment
103.	Indeterminate	Washed out.	1 fragment
104.	Indeterminate.	Yellow and blue.	1 fragment
105.	Part of border frame and panel with marble imitation.	Yellow-red veining on white marble imitation, bordered by a wide white band edged with a red strip.	15.5 x 9 cm 1 fragment
106.	Part of band.	Gray-black band with red edge (like No. 100).	1 fragment
107.	Part of bands.	Yellow, brown, dark gray.	4.5 x 3.5 cm 1 fragment
108.	Part of bands.	Black and white.	1 fragment
109.	Indeterminate.	Washed out.	1 fragment
110.	Indeterminate.	Yellow.	4.2 x 3.5 cm 1 fragment





CASE IX			
113.	Indeterminate.	Yellow.	4 x 3.5 cm 1 fragment
114.	Part of band.	Washed out.	4.5 x 5 cm 1 fragment
115.	Part of band.	Yellow, white and black.	2.7 x 2.5 cm 1 fragment
116.	Part of surface.	Maroon brown.	8.2 x 5.3 cm 1 fragment
117.	Part of band.	Black band between narrow white strips.	8 x 5 cm 1 fragment



118.	Part of band.	Yellow, white and black.	4 x 3.5 cm 1 fragment
119.	Part of surface.	Maroon brown.	6.6 x 3.5 cm 1 fragment
120.	Part of border frame(?).	Red band edged with narrow white strip, separating from a yellow surface.	6 x 5 cm 1 fragment
121.	Part of surface.	Maroon brown.	14.5 x 7 cm 1 fragment recomposed from two pieces
CASE X			
122.	Part of band.	Black band against a beige background.	6 x 6 cm 1 fragment
123.	Part of background.	Light blue.	3.9 x 3.5 cm 1 fragment
124.	Part of bands.	Sequence of bands: dark gray, light gray, narrow dark gray and panel surface.	5 x 5.7 cm 1 fragment
125.	Part of background.	Light blue.	2.5 x 1.1 cm 1 fragment
126.	Part of robe(?).	Beige and brown coloring with gray streaks.	4.8 x 3.2 cm 1 fragment
127.	Part of robe(?).	Pale yellow.	4.1 x 2.2 cm 1 fragment
128.	Thick lock of hair(?).	Black lock(?) on a light blue background.	3.2 x 2.5 cm 1 fragment
129.	Part of bands: narrow stripe and wider band.	Red stripe against a yellow background and part of a wider black band.	5.8 x 2 cm 1 fragment recomposed from two pieces
130.	Part of border frame(?).	Black wide band next to pale yellow surface.	7.3 x 6.5 cm 1 fragment
131.	Part of background.	Light blue.	3.3 x 2.6 cm 1 fragment



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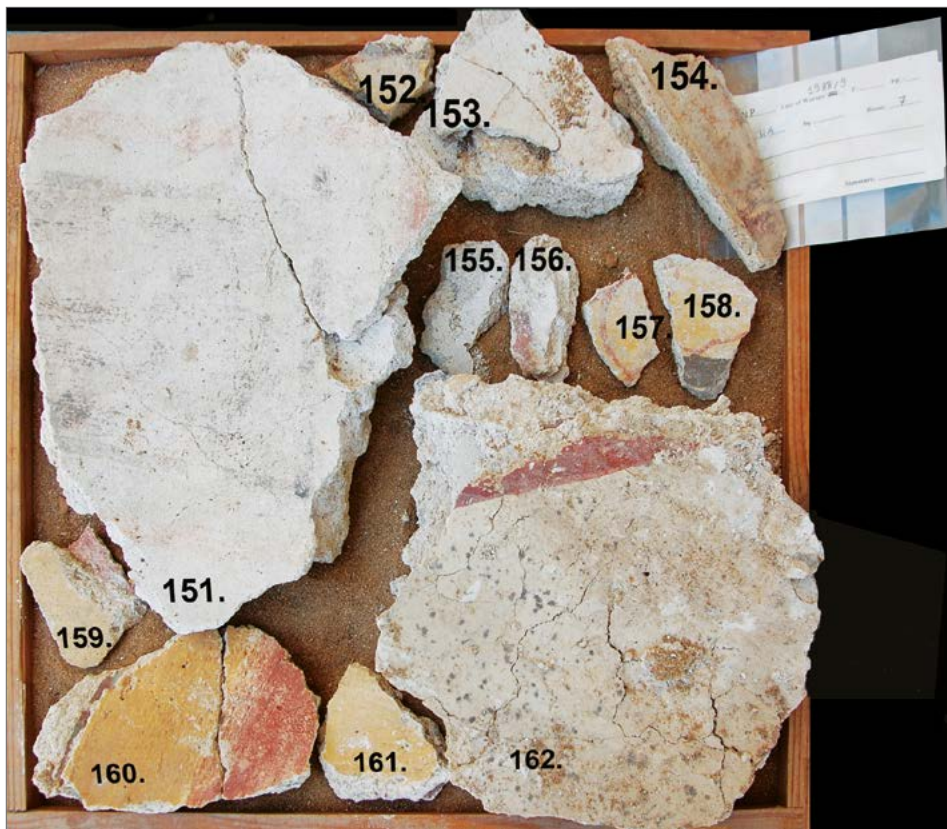
132.	Part of background.	Blue.	7.2 x 6 cm 1 fragment
133.	Part of background.	Blue.	7.8 x 4.2 cm 1 fragment
134.	Part of surface.	Beige-brown.	4.3 x 1.6 cm 1 fragment
135.	Part of surface.	Dark grey.	3 x 3.2 cm 1 fragment
136.	Part of band.	Black band against light blue background.	6 x 5 cm 1 fragment recomposed from two pieces

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137.	Part of band.	Black band against light blue background.	8.7 x 7 cm 1 fragment
138.	Part of band.	Black band against light blue background.	6.2 x 4.7 cm 1 fragment recomposed from two pieces
139.	Part of surface.	Beige-brown.	5.5 x 4 cm 1 fragment recomposed from two pieces
140.	Part of border frame(?).	Wide black band against a blue background; perpendicular brown band streaked with gray.	4.5 x 4.2 cm 1 fragment
141.	Part of bands.	Red panel surface, wide white band and black band.	10.5 x 6 cm 1 fragment recomposed from two pieces
142.	Part of background.	Light blue.	7.5 x 6.2 cm 1 fragment recomposed from three pieces
143.	Part of background.	Light blue.	5 x 2.8 cm 1 fragment recomposed from two pieces
144.	Part of surface.	Brown.	3.2 x 1.2 cm 1 fragment
145.	Part of background.	Light blue.	3.2 x 2.5 cm 1 fragment
146.	Leaves or locks of hair(?).	Brown with gray streaks. See No. 148.	2.4 x 1.7 cm 1 fragment
147.	Part of surface.	Brown.	3.7 x 1.7 cm 1 fragment
148.	Leaves or locks of hair(?).	Brown with gray streaks against blue background. See No. 146.	3 x 3 cm 1 fragment
149.	Four wisps.	Brown wisps against a beige background.	5 x 4 cm 1 fragment
150.	Part of border frame(?).	Black band between beige panel background and red panel background.	6.5 x 6 cm 1 fragment

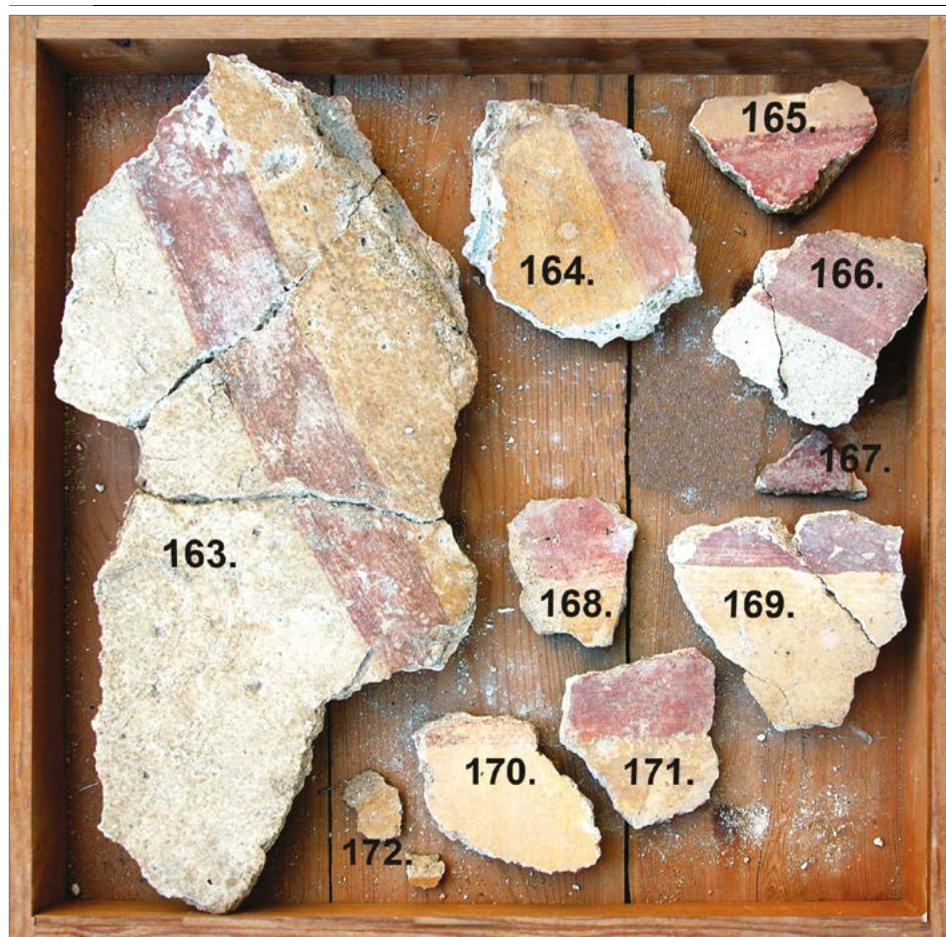
CASE XI			
151.	Fragment from the vault. Thin red line around rectangular panel.	Dark gray panel against white background. Thin red line.	31 x 24 cm 1 fragment recomposed from two pieces Vault, depth of arch 1.4 cm
152.	Part of bands.	Narrow red and wide black bands against a yellow background.	6.3 x 4.7 cm 1 fragment
153.	Fragment from the vault/wall(?).	Remains of black edge on a white background.	12 x 10 cm 1 fragment recomposed from three pieces
154.	Edge of plaster. Band starting from this edge of the wall.	Dark red band on yellow background.	15.5 x 4.8 cm + 15.5 x 1.5 cm 1 fragment from edge of wall
155.	Indeterminate.	Broken plaster.	8 x 6 cm 1 fragment



156.	Part of vault. Wide band.	Dark red band on white background.	8 x 3.5 cm 1 fragment
157.	Curved feature.	Semicircular red line, forked at the end, against a yellow background. Like No. 158.	6.3 x 4 cm 1 fragment
158.	Curved feature.	Double curved red line, against a yellow background. Like No. 157.	8 x 5 cm 1 fragment
159.	Part of surface, on two layers.	Red (lower layer), yellow (upper layer).	8 x 6 cm 1 fragment Two-layered, upper layer 1.6 cm thick
160.	Part of band (upper layer), surface (lower layer).	Red and gray (lower layer), yellow with red band at the edge (upper layer).	17 x 10.5 cm 1 fragment recomposed from two pieces Two-layered, upper layer 0.8 cm thick
161.	Part of surface on two layers.	Red (lower layer), yellow (upper layer).	8.5 x 8 cm 1 fragment Two-layered, upper layer 1.6 cm thick
162.	Fragment from the vault on two layers, band.	Dark coloring (lower layer), red band on white background (upper layer).	29 x 23 cm 1 fragment Vault, depth of arch 1.5 cm
CASE XII			
163.	Part of band.	Wide red band against a white background, yellow panel surface on other side.	42 x 20 cm 1 fragment recomposed from three pieces
164.	Part of band on two layers.	Light blue (lower layer), red band and yellow surface (upper layer).	14 x 10 cm 1 fragment Two-layered, upper layer 0.8 cm thick
165.	Part of band.	Red band framing yellow surface.	9.5 x 6.5 cm 1 fragment
166.	Part of border frame(?).	Dark red band against a white background, framing yellow panel surface.	10 x 8.5 cm 1 fragment recomposed from two pieces



167.	Part of band(?).	Red.	5.7 x 3.5 cm 1 fragment
168.	Part of band.	Red band framing yellow surface.	8 x 6.5 cm 1 fragment
169.	Part of band.	Red band framing yellow surface.	11.5 x 11 cm 1 fragment recomposed from two pieces
170.	Part of band.	Red band framing yellow surface.	11.5 x 7 cm 1 fragment
171.	Part of band.	Red band framing yellow surface.	8.5 x 8 cm 1 fragment
172.	Part of surface.	Yellow	4 x 2.5 + 2 x 1.5 cm 2 fragments





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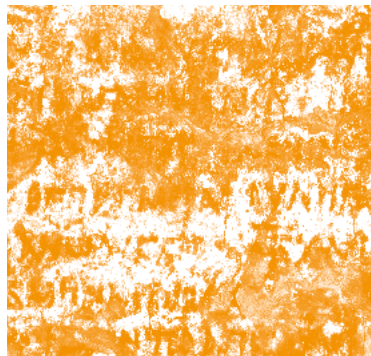
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# Short history of the Church of Makuria (mid-6th–early 12th century)



**Abstract:** The article outlines the history of the Makurian church from the conversion of the kingdom to Christianity until the death of the archbishop Georgios in AD 1113, focusing particularly on the relations of the Makurian Church with the Church of Alexandria, and emphasizing its independence from Byzantine and Coptic influence from the second half of the 8th century until the time of Georgios.

**Keywords:** Makuria, Church, Archbishop Aaron, Archbishop Georgios, Bishop of Pachoras Paulos, King Ioannes I, King Zacharias I, King Merkurios, King Ioannes II, King Chael, King Georgios I, Metropolitan bishop of Pachoras Ioannes I, Church of Archangel Raphael in Dongola [SWN.B.V]

Two decisions taken in the first half of the 6th century were crucial to the formation of Africa's most important late antique and early medieval kingdom, the Kingdom of Makuria. First, the power center was transferred from the region of Napata to the territory of Dongola and second, relations were established with Byzantium, Makuria acknowledging conversion to Christianity as a prerequisite condition for admission to the Byzantine civilizational sphere. This coincided with Justinian's aspirations to spread Christianity beyond the borders of the Empire by political means. The one-sided report of Nubia's Christianization left by John of Ephesus cannot be considered as a just base for the present considerations. Archaeological sources, broadly understood, are much more reliable in this respect. The huge citadel fortifications of Dongola and the rock tombs on the southern fringes of the necropolis in el-Ghaddar, as well as the building MC on Kom E, a civil structure in their vicinity, constitute at present the fullest body of evidence for the first stage in the emergence of Makuria as a Christian kingdom with its power center in Dongola (Godlewski 2013b).

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The anonymous king, who is the most likely person to have been buried in one of the tombs (RT.1) in el-Ghaddar north of Dongola, seems to have been a highly cultured man with broad horizons, clearly no stranger to the late antique world. It is more than likely that he and his kind came from the elite of the fallen Meroitic kingdom with roots deep in ancient Roman civilization. Missionaries arriving most probably from Anatolia established a monastery in the desert near the Citadel (the so-called Kom H). Not only did they convert the royal court to Christianity, but they also laid the foundations for the Church of Makuria. The

fullest picture of these missionary efforts at this stage of the research is given by the Monastery Church on Kom H, which remained an inspiration for the kingdom's religious architecture for the next millennium (Godlewski 2018b) [Fig. 1]. The monastery included two buildings: NW.B.I, which probably sheltered the first monks and candidates for monks, and NW.B.II, which was where the local community held its gatherings, and finally the Central Building just north of the Monastery Church, the walls of which bear the earliest wall paintings found to date in the monastery complex. It cannot be excluded that those primarily respon-



Fig. 1. Monastery on Kom H, aerial view from the northeast; center left, ruins of the Monastery Church, bottom right the Central Building (roofed), center right, the roofed Northwest Building; the Nile can be seen on the horizon, beyond the town, and at top left, the Mosque (PCMA UW Dongola Project/photo S. Lenarczyk)

sible for the conversion of the kingdom to Christianity were buried in the crypts of Building B.X and their worship ceased only after the complete destruction of the CC.II church (Godlewski 2013b: 39–41 and 75).

Makuria's Church was formed as a Chalcedonian institution and it must have been the Chalcedonian Church of Alexandria that played a decisive role in the administrative development of the Church of Makuria. The conversion of Makuria should be considered from three perspectives. The external perspective takes into view the role of Byzantium in spreading Chalcedonian Christianity in an effort to curb the regional expansion of the Monophysite Church. The other

two perspectives are of a local nature: on one hand, there is the ruler's expectation to legitimize his power based on the new religion and, on the other hand, the civilizational impact of Makuria's adherence to the Christian world through the opening of the kingdom and Makurian society *en large* to an economy-driven relation with Byzantine Egypt. The Constantinopolitan Creed on the walls of chambers in the monastery, including the Monastery Church, is of a much later date, being attributed to the times of the Kingdom of Dotawo, but it may be assumed that this tradition in the Monastery was rooted in the 6th century, that is, in the period of early Christianity in Makuria (Lajtar 2018).

## **KING IOANNES AND THE CHURCH OF MAKURIA: TURN OF THE 6TH CENTURY**

The end of the 6th century saw the emergence of Great Makuria following the incorporation of Nobadia after the year 580, as well as the establishment of a territorially developed church administration. In a centralized state with a civil authority fostering the development of urban centers, the Church established three bishoprics in the territory of Nobadia. Cities located between the First and Second Cataract, in the territory incorporated into the Kingdom of Makuria, were naturally better developed. The most developed of these was Kurte, of which little is known, then Phrim and Pachoras, the latter having the largest citadel after Dongola. In keeping with Byzantine practice, these centers became seats of bishops, ordained presumably

in Alexandria. Considering that three separate bishoprics were formed in this territory and taking into account the number of temples changed into churches to prevent further pagan worship, one is entitled to view pagan belief as still strong in Nobadia. It is also possible that the impact of the Monophysite Thebaid on the territory between the cataracts had to be countered and reduced.

An important issue to consider is why only two bishoprics, compared to Nobadia's three, were formed in the remaining, proportionately huge territory of the kingdom. One was in Zae and the other in Dongola. In the present state of the research, there is nothing to intimate the existence already at this date of the other bishoprics later mentioned

in Coptic from the times of Ioannes II (see below).

Altogether, in the earliest period, the existence of five bishoprics is documented by the three surviving cathedrals: the one in Phrim founded by Bishop Agathos (according to a foundation inscription) (Łajtar and van der Vliet 2010: 15–20), the

one in Pachoras built by Bishop Aetios to believe the List of Bishops from the Cathedral, and the last one in Dongola, the so-called Cathedral EC.I [Fig. 2]. No such architectural evidence comes from Kurte and Zae, but the existence of these bishoprics in the early period is attested in documents of a later date.

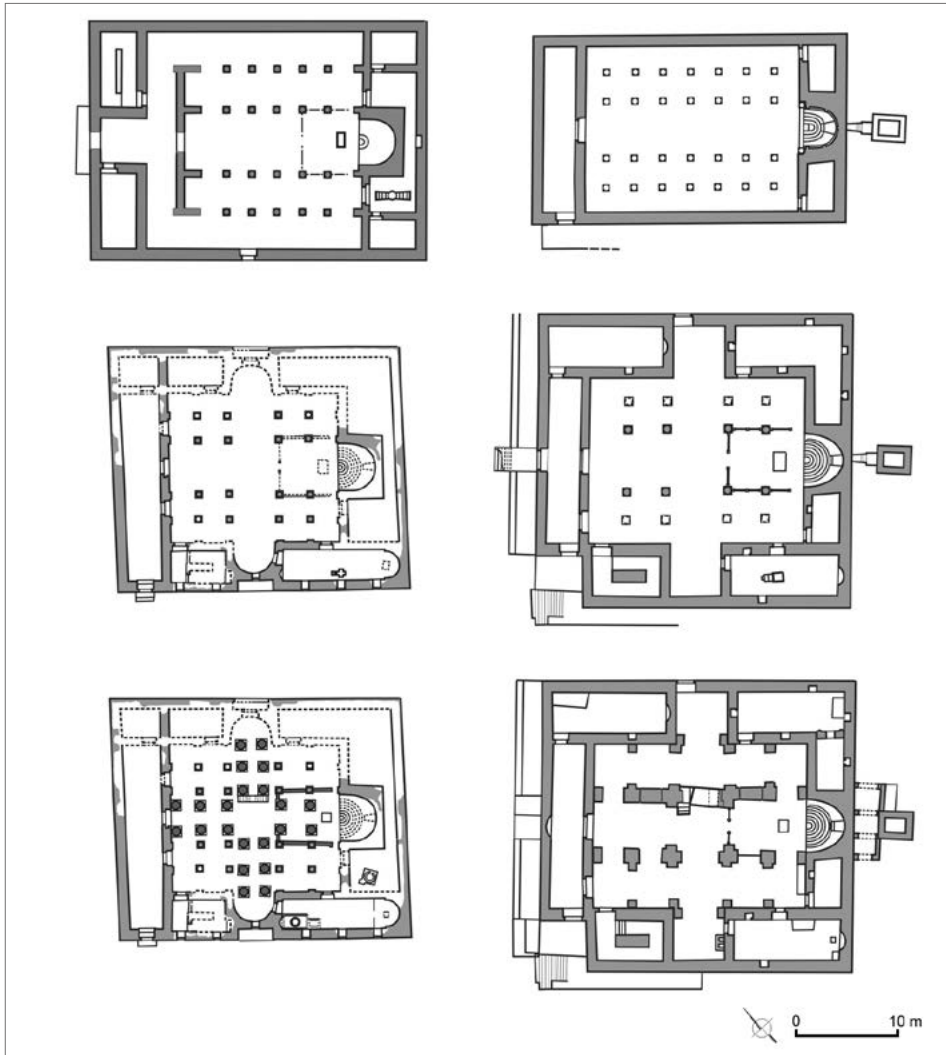


Fig. 2. The known cathedral churches from Dongola and Pachoras (6/7th–13th centuries): left, from top, Dongola EC.I, Dongola RC.I, Dongola, RC.II; right, from top, Cathedral of Aetios, Cathedral of Paulos, Cathedral of Petros (Digitizing E. Czyżewska-Zalewska)

The first bishops must have been outsiders as it is unlikely that the local community had grown sufficiently in numbers and stature, even assuming that the monastery in Dongola had already been functioning for more than a dozen years. One would think that the Bishop of Alexandria would have

had the last say in the case of the bishops' nominations, but most certainly they could not have proceeded without the favor, if not the will, of the king. The cathedrals in Makuria were constructed, presumably, by local craftsmen with essential support from outside the kingdom.

## **THE CHURCH OF MAKURIA IN THE REIGN OF KING ZACHARIAS I: THE YEARS 653—ABOUT 670**

Zacharias took the throne right after the successful defense of the citadel in Dongola against raiding Arabs from the north, during a period of turbulent change, the Arab aggression and evident weakness of the Byzantine Empire. The departure of the Chalcedonian patriarch of Alexandria Cyrus and the diligence of Benjamin, Pope and Patriarch of Alexandria (623–662), in taking over the property of the Chalcedonian Church in Egypt, including the actual churches, must have reflected importantly on the situation.

The consequences of the events in Dongola—the city had been damaged and the cathedral razed as well as some settlements around Dongola (like Selib perhaps) were destroyed—demanded the Church's efficient cooperation with the civil authorities. The cathedral had to be rebuilt urgently. A new domed basilica, EC.II, was constructed, the mosaic floor in the sanctuary clearly demonstrating local ambitions in terms of interior decoration (Godlewski 2011). Mosaics were also introduced in a highly interesting religious and public building, coded MC, located on Kom E, where the entire naos

featured such floors. The Church was evidently a buoyant and socially important organization in this age.

The arrival in Dongola of Bishop Joseph from Syene had a political underpinning regardless of whether he was acting as an envoy for the Arab governor of Egypt (646–656) ʿAbdullāh Ibn Sād Ibn Abī Sarḥ or as a missionary for the Pope Benjamin. He clearly represented Egyptian interests, although his exact objectives are obscure. He had surely been charged with the task of subordinating the Makurian Church. His funerary stela is an important document (Jakobielski and van der Vliet 2011). The bishop seems not to have attained his goals prior to his death and we know nothing of his successor in Dongola. The Makurian Church remained Chalcedonian and in the King's protection and with bishops already ordained in the five bishoprics: Qurta, Phrim, Pachoras, Zae and Dongola. There is no evidence for a larger number of bishoprics at this time.

The king's role in shaping Makurian politics during this breakthrough period must have been crucial. A monument to the heroes of Dongola's defense was built



in front of the entrance to the palace. This small cruciform building with a dome and quality wall paintings symbolizes a continuation of Makurian court politics and the court's understanding of late antique civilization (Godlewski 2013b: 34–39; Zielińska 2010). Dongola had its own well-trained and ambitious artistic milieu as demonstrated by the mosaic floors and wall paintings. The monastic community in Dongola may also be seen as the court's intellectual powerhouse.

The king had no doubt that the threat from the north had not been stopped. There is nothing but the Arab literary

and historical tradition in favor of the signing or even negotiation of some kind of *baqt* at the walls of Dongola. The Arabs were fighting the Byzantine Empire and the Sassanids, and Makuria was for them nothing but a military episode. The king, however, enlarged the citadel, building the northwestern tower on the Nile side. This is the state of our knowledge on the subject (Godlewski 2013b: 20–22). It is most likely that the King and the Bishop of Dongola (that is, of the Church of Makuria) had not lost a strong belief in a rapid rebuilding of the Byzantine Empire.

## **THE CHURCH OF MAKURIA AND KING MERKURIOS (697–715/20) AND HIS SON ZACHARIAS (UNTIL THE 740s)**

A ruler of unknown name reigned in the last quarter of the 7th century, after Zacharias I and before Merkurios. It may be assumed that he followed the same policies as his predecessors. The new Cathedral, the Church of the Granite Columns (RC.1), was built most probably during his reign.

The times of his successor, King Merkurios (697–about 720), are much better illuminated by written sources compared to the earlier reigns. The foundation stelae from the Cathedral of Paulos in Pachoras (Jakobielski 1972: 39–45; Kubińska 1974: 14–19; Łajtar 2003: 260–270; van der Vliet 2003: 3–15) and the Church in Tafah (Kubińska 1974: 18–19), added to the information from the *Life of the Patriarch Michael I* by John Deacon (Vantini 1975: 40–45), highlight the special role played by this ruler in the development of the Makurian Church

and its relations with the Monophysite Alexandrian patriarchate. Merkurios is referred to by John Deacon as a New Constantine, which has been interpreted as proof of the introduction of Monophysitism in the Makurian Church and of this Church's subordination, in terms of structural organization, to the Bishop of Alexandria. Establishment of direct contacts with the Monophysite Patriarch of Alexandria is a fact, confirmed by John Deacon's report of the conflict between the Bishop of Dongola Kyriakos and king Abraham, one of the successors of Merkurios, and the role played by the Patriarch Michael I in resolving this conflict. In turning to the patriarch with a request to remove Bishop Kyriakos from office and ordain in his place Ioannes, the man sent with this request to Alexandria, the Makurian king undoubtedly acknowledged the authority of the

patriarch. However, this does not necessarily prejudice the question of whether the Church of Makuria was subordinate to the Monophysite Patriarch of Alexandria or not.

Events at the turn of the 7th century and in the early years of the 8th century bear on the transformation of the Church of Makuria, although the full scope of the change is beyond comprehension. On one hand, there is the new cathedral in Pachoras and the person of its founder, the Bishop of Pachoras Paulos (Godlewski 2006: 43–76). On the other hand, there is the elusive figure of King Merkurios in Dongola, who is known from local Makurian sources as a proponent of a centralized state structure administered by the Eparch of the Kingdom Markos, which stood in opposition to the territorial organization of the Church with most likely the five bishoprics mentioned above.

In Dongola, a new splendid cathedral, RC.I, the third in line, was raised next to Cathedral EC.II, which was rebuilt after the Arab raids (Gartkiewicz 1990: 109–261) [see *Fig. 2*]. This colonnaded foundation on a central plan was the work of a local architect. Two cathedrals standing close to one another were not so uncommon in early Christian times; the same can be said of Arwan and Makurian Churches with double cathedrals in Soba and, not much later, in Dongola (EC.II and RC.I). The question is why this happened in Dongola. It may have been ambition (doubtful) or there may have been reasons more complex than that and of greater importance to the Makurian Church as an institution. Cathedral EC.II went back to an earlier age; it was a continuation of the first cathedral, EC.I.

The new cathedral, RC.I, quickly became a model for other buildings; already in 707, the first cathedral in Pachoras was rather hastily developed and a new complex of buildings raised for Bishop Paulos [see *Fig. 2*].

One wonders about the identity of this Bishop Paulos, who founded a cathedral on his own, along with an associated complex of structures south of it, and who heralded this to his flock on behalf of King Merkurios and the Eparch of the Kingdom Markos, in bilingual foundation stelae written in Greek and Coptic. These two inscriptions stand without parallel. Their form is exceptional, their wording very diplomatic, taking into account the attachment of the royal court to Greek as the official language and the local popularity of Coptic in Nobadia, which was incorporated as a province barely a hundred years earlier and still showed a preference for its own traditions best attested in its religious architecture. Paulos must have been a man of special importance. By formulating his foundation stelae in two languages, following the Dongolan model of the new cathedral RC.I, Bishop Paulos was in all likelihood emphasizing his roots. He may have been a Dongolese, perhaps someone close to the king, someone from the royal family, although this is not said in the text on the stelae. The architecture of Paulos' cathedral is Dongolan overall, but the wall paintings decorating the interior apparently are not, especially when compared with the early wall paintings from Dongola preserved in the Central Building of the Monastery on Kom H (Godlewski in preparation), the Cruciform Building on the Citadel (Zielińska 2010) and House A in the

northern town (Martens-Czarnecka 1990; Jakobielski 2004). They are the work of a different group of painters, most certainly not the royal-commissioned atelier, rendering their creations on lime plaster (Godlewski in preparation). From a technological point of view, the wall paintings from the Cathedral of Paulos are different; the murals were painted on a coat of mud plaster with whitewashed surface.

The question to be asked at this point is whether the new cathedrals in Dongola and Pachoras were a reflection of a new situation in the Church of Maku-

ria, pressed by King Merkurios into a union with the Alexandrian Monophysite Church? The *History of the Patriarchs* is convinced that this was the case, but there may be more to the issue than meets the eye. In any case, the simultaneous functioning of two cathedrals in Dongola is an important sign: was there perhaps some kind of tolerance agreement between the Church and the King? New texts from Makuria may yet bring light to bear on what the Makurian Church was like in the early 8th century.

## THE CHURCH OF MAKURIA DURING THE REIGN OF KYRIAKOS AND IOANNES II: SECOND HALF OF THE 8TH CENTURY

The *History of the Patriarchs* is the only source of information on the serious crisis in Makuria in the late 730s, resulting from the conflict between the young king Abraham and Bishop Kyriakos. Immature political adventurism is perhaps not the sole reason for the altercation between the young ruler and the elderly bishop. The events that followed the death of Abraham and his successor Mark in tragic circumstances should be seen as proof of a deeper crisis, touching on Dongolan affairs that are beyond the scope of current knowledge. The two kings were killed, Mark despite seeking asylum at the altar of the church, as reported by the *History of the Patriarchs*. Perhaps the relations between civil and church authorities were at the root of the conflict. This was a time when the Chalcedonian bishop returned to Alexandria and the Abbasids seized power from the Omayyads over the territorially extensive Arab realm. These

events were surely followed closely in Dongola, as far as circumstances allowed.

The one to introduce serious changes in the royal administration of the kingdom was the next king, Kyriakos, and it is also then that the Church of Makuria underwent significant changes, including its administration. The *History of the Patriarchs* presents Kyriakos in very flattering terms as a defender of the Monophysite patriarch, reporting with great imagination the expedition mounted by the King of Makuria all the way to Fustat in Cairo. The description is more literary than factual. In reality, Kyriakos reformed the kingdom, establishing Nobadia as an eparchy. The names of the first three eparchs are known from epigraphic sources. However, their authority in Nobadia was not necessarily related in any way to the implementation of the *baqt* treaty, because it did not define the trade relations between Egypt and Maku-

ria. The Eparch of Nobadia had wider powers and his seat was in Pachoras, in the largest citadel after the Dongolan fortifications that the kingdom had. Like Dongola, Pachoras, too, was based in an extensive agricultural hinterland.

It is in this situation that Bishop Ignatios (766–802) came to preside over the see of Pachoras. His funerary stela, which was mounted on his simple tomb on the southern side of the cathedral, contains some interesting bits of information. He was ordained as a bishop two years before being called up to the bishopric of Pachoras; before that he was a monk at some unknown monastery and he continued to consider himself a monk even after being ordained. The stela says that he was a monk for 58 years, for 36 years a bishop, spending 34 years of that time in Pachoras. His stela is exceptional in the Makurian milieu, both in its graphic form and in the composition of the text (Łajtar 2003: 279–289). It is written in Greek and the year of his death is given according to the Alexandrian Era, from the creation of the world (Ochala 2011: 183–204); this was the first use of this dating formula in Makuria and after him three other bishops of Pachoras had the same chronology cited on their stelae. Ever since his tomb was discovered, Ignatios had been considered a foreigner to Makuria. His term in office as bishop was linked to a flourishing of the art of wall painting in Pachoras, although one should keep in mind that at this point the cathedral had already been standing for almost 50 years and there were surely standards in force for adorning the interior with murals. No one noted, however, the connection between the arrival

of Ignatios in Pachoras, which could not have occurred without the approval of King Kyriakos and the Bishop of Dongola, with the renewal of the Chalcedonian patriarchate in Alexandria in 742 and the installation of Bishop Cosmas there. There can be no doubt that Cosmas, and his successors as well, were driven by the need to restore their administrative control over the churches they had owned earlier in Egypt which Pope Benjamin had taken over after 645. The only report available is that in the *History of the Patriarchs*: a somewhat nervous and fantastic description of the cooperation between the Patriarch Michael and King Kyriakos, and it could be an attempt to cover up the real situation.

Considering that there are other “migrants” from the North apart from Ignatios, a good example being the priest Zacharias from Dongola, whose stela confirms his origin (Łajtar 2003: 111–115), relations between the Church of Makuria and the Chalcedonian bishops of Alexandria should be seen as practically a certainty. It is easier in this context to understand the changes taking place in the Church of Makuria. Bishop Ignatios was most likely a metropolitan bishop, the superior of the bishops in Kurte and Phrim, and the same can be said of his successor, Bishop Ioannes I, as confirmed by an inscription from the years 802–804 from the Church of Archangel Raphael in Dongola (A. Łajtar and T. Derda, personal communication, 2016). Likely in the mid-8th century, concurrently with Kyriakos’ establishment of the Eparch of Nobadia, the Church of Makuria established a metropolitan bishop over the same territory. Both the civil and the religious authori-

ties had their seats in Pachoras. A reliable description of the situation inside the Church of Makuria would require a broader source base than is currently available, but it seems that there was a climate of general tolerance sustained by King Kyriakos and the archbishop of Dongola Aaron (even if the year in which he took office is not known) on one side and

the Pachoras metropolitan on the other, although there is no evidence that Bishop Ignatios ever held this title. All that is clear is that the title existed after 802. It is highly probable that Ignatios was the first metropolitan of Pachoras and that he had been called on to serve in this capacity by the Chalcedonian Bishop of Alexandria with the Makurian king's placet.

### THE INSCRIPTION FROM THE CHURCH OF RAPHAEL IN DONGOLA: THE YEARS 802–804

The first lucid report from a meeting of Makurian bishops gathered together in the Church of Raphael on the Citadel in Dongola, a meeting which took place under the patronage of King Ioannes II and which was headed by Archbishop Aaron, was inscribed in the church *diakonikon*, 3 m above the floor, hence intended for posterity [Fig. 3]. The Greek text was formulated with care and described the situation inside the Church

of Makuria at the beginning of the 9th century (A. Lajtar and T. Derda, personal communication, 2016). The text is not dated, but to judge by the dates of death of some of the participants, it must have taken place between 802 when Ignatios died and Ioannes I was made the metropolitan bishop of Pachoras in his place, and 804 when King Ioannes II died, leaving the throne of Makuria to his successor Chael. The meeting lasted for seven days.

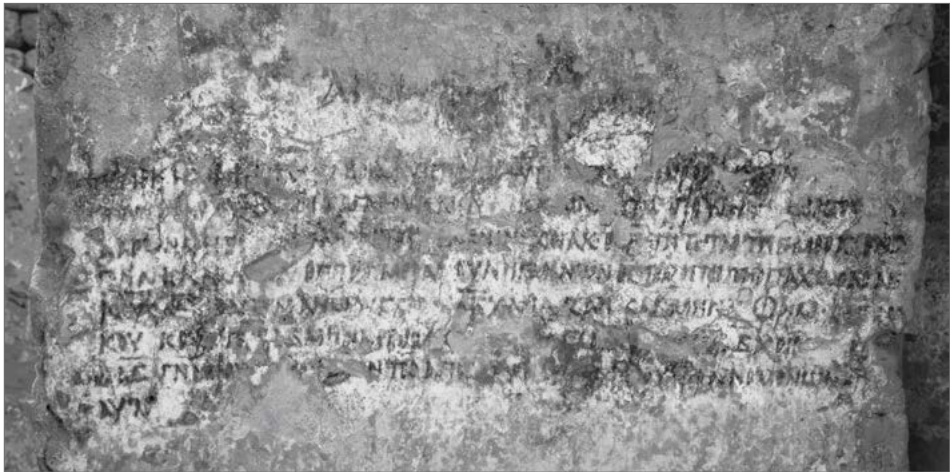


Fig. 3. Inscription recording a meeting of the Makurian Church hierarchy between AD 802 and 804, in the diakonikon of the Church of Archangel Raphael on the Citadel (PCMA UW Dongola Project/ photo M. Reklajtis)



The record of the meeting lists the participants in hierarchical and territorial order: Archbishop Aaron, Metropolitan of Pachoras Ioannes I, and the Bishops of Ouno unger(?), Zae, Kurte, and Phrim.

This listing reflects the five existing bishoprics and a description of Makurian Church hierarchy, while distinctly acknowledging royal patronage. The walls of the cathedral in Pachoras and

the Church of Raphael (SWN.B.V) in Dongola preserved the oldest paintings from the official program of representations of Bishops, Kings and members of the royal court. This program was to undergo intense development in the 10th and 11th centuries, as well as later, and it would start being introduced also in the more local church buildings around the land (Godlewski 2008).

### CHURCH OF GEORGIOS I: MID 9TH–10TH CENTURY

The “nationalization” of the Church of Makuria, a process observed already from the beginning of the 9th century, speeded up significantly during the rule of the Dongolan dynasty of kings starting with Zacharias II and terminating with Georgios IV (Godlewski forthcoming). The EC.II cathedral was dismantled during this period and a grand building on a cruciform plan, the Church of Iesou, referred to as CC.I, was raised in its place by King Georgios I. The literary tradition has it that it was built as a thanksgiving for the safe return of Georgios from a meeting with the Caliph in Baghdad. But the building may have had another

important purpose: the commemoration of Makuria’s conversion to Christianity, marking the long historical traditions of the Church of Makuria. This can be read from the architecture: a domed complex on a cruciform plan with a commemorative chapel in its eastern arm, built over a crypt containing the burials of two nameless men who must have been interred in the 6th-century Building B.X once standing on this spot. The Cruciform Building, CC.I, was built on the combined foundations of Building B.X from the mid-6th century, the first cathedral EC.I from the second half of the 6th century that was ravaged by the

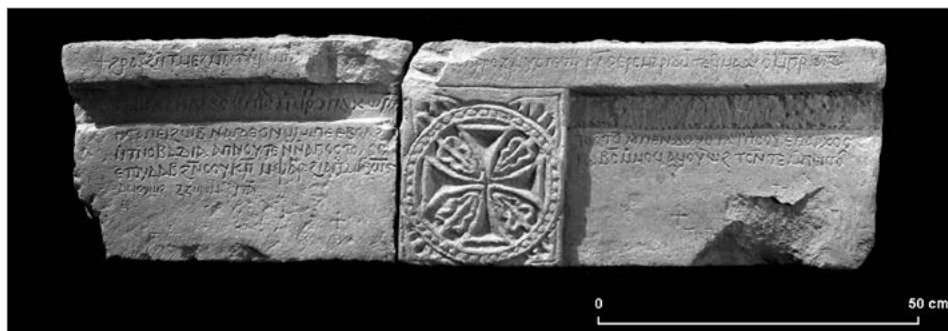


Fig. 4. Lintel from Pachoras (AD 930) with the foundation inscription of the Eparch of Nobadia Iesou, containing the titles of King Zacharias son of Georgios, Mother of Kings Mariam and metropolitan bishop Helias (PCMA UW Archives/photo A. Dziewanowski)

Arab invaders, and the second cathedral EC.II from the mid-7th century. The site was obviously a hallowed place and remained so throughout the existence of the churches in this place (Godlewski 2013b: 61–64 and 39–41).

Two other cathedrals were also rebuilt under the rule of the Dongolan dynasty: cathedral RC.II in Dongola and the cathedral in Pachoras, rebuilt completely by Bishop Petros [see *Fig. 2*]. The walls of this new building bear a well-preserved official program of representation, including Bishop Petros in the protection of Saint Peter the Apostle, next to King Geor-

gios IV in the protection of the Virgin, both in the *diakonikon*, and the Mother of Kings Martha in the protection of the Virgin Theotokos and the Child in the northern aisle, the space that was intended for women (Godlewski 2008).

It is interesting to note in this context a lintel, on the southern side of the Cathedral of Pachoras (dated to 930), bearing the foundation inscription of the Eparch of Nobadia Iesou [*Fig. 4*]. It contains the titles of other officials: King Zacharias son of Georgios, Mother of Kings Mariam and metropolitan bishop Helias (Jakobielski 1972: 110–114; van der Vliet 2003: 15–21).

## BISHOP IOANNES OF PACHORAS AND HIS BISHOP SONS

The ordainment of Ioannes as Bishop of Pachoras in 999, at the age of 74, was an important and unprecedented event that has gone underestimated in modern research. Who was Ioannes? Surviving archaeological and written sources, mostly from the 12th and 13th centuries, support the assumption that he was not a person of the clergy and that he had two adult sons, Marianos and Merkurios. He is of interest, however, in the context of events linked to Bishop Marianos, his son, and the Archbishop of Dongola Georgios.

The preserved epigraphic sources, mainly stelae, demonstrate that before this Ioannes no layman had ever been ordained a bishop in the Church of Makuria and at such an advanced age. The reason must have lain with Dongola, not Pachoras, and it may have been of a political nature. It is more his son Marianos and his ambitions as manifested in his portrait from the Cathedral (Michalowski 1974:

208–221; Jakobielski et al. 2017: Cat. 95), in which he is depicted standing between Christ and the Virgin Theotokos [*Fig. 5*], that speak volumes regarding the identity and position of Ioannes. Marianos's presumed connections with Babylon in Egypt (and hence the Coptic patriarch, whose seat was moved from Alexandria to Cairo, as well as the fact that his name was struck from the list of bishops written on the wall of the cathedral in Pachoras (see Jakobielski 1972: 190–195), possibly in effect of his actions, and his funerary stela from Phrim may be interpreted as attestations of his unfulfilled royal ambitions (Łajtar and van der Vliet 2010: 86–91). The following interpretation of the situation is possible: Perhaps King Georgios had no son, but he had an aged brother whose sons had been sent to the monastery much earlier in order to maintain political order and preserve the rules of inheritance. Georgios was followed on



Fig. 5. Bishop Marianos, portrayed standing between Christ and the Virgin Theotokos, mural from the Cathedral in Pachoras, The Professor Kazimierz Michałowski Faras Gallery, National Museum in Warsaw (Photo T. Żółtowska)

the throne by Raphael, who was most probably the son of his sister. The change is signaled by a change of royal names, from the Georgioses, Zachariases and Ioanneses of an earlier time to Raphael. Thus, it would be a side line, but the succession to the throne would have been in accordance with an old Nubian tradition (Godlewski forthcoming).

This line of reasoning is furthered by the tomb of Ioannes with wall paintings in the vestibule depicting the Virgin Theotokos and the Archangel Michael. His sons and successors on the episcopal throne of Pachoras were not buried there, even though they died many years after him. The stela of Bishop Chael of Pachoras, son of the Bishop of Dongola Joseph, was removed after his death. It

may be assumed that there was opposition in the Church against nominees from the royal family and in particular against sons living in monasteries and ordained as bishops because of dynastic politics.

The wall paintings from the Cathedral of Pachoras tell a story that may be interpreted as a record of Bishop Marianos's ambitions. Not only did he commission the painting of his portrait in the protection of Christ and the Virgin Mary on the cathedral walls, but he also had a burial chamber prepared in the southern vestibule of the Cathedral, where his portrait was painted above the altar. It is also possible that Marianos purchased his nomination in Egypt, a common enough practice in this period.

## THE CHURCH OF ARCHBISHOP GEORGIOS AND THE THREE KINGS OF DOTAWO: SOLOMON, GEORGIOS IV AND BASILIOS

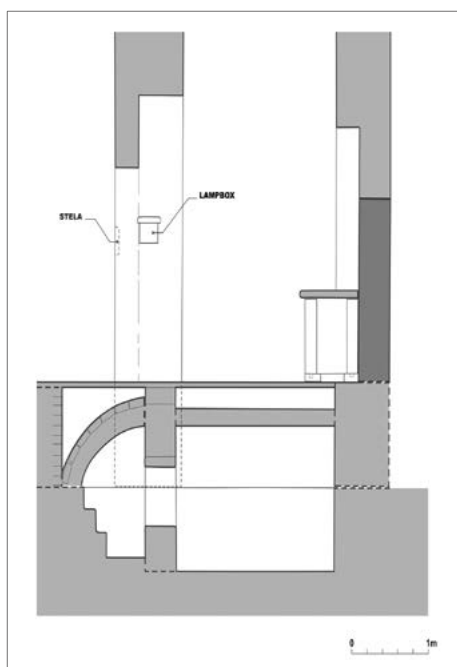
Members of royal families who became bishops and archbishops, like Georgios, introduced the posthumous cult of bishops to the Church of Makuria, paralleling the posthumous cult of rulers which was already a standard (Godlewski 2013a). The tomb and chapel of Georgios by the Building NW.B.I in the Monastery on Kom H [Fig. 6] is the best evidence in this respect, elaborated even further in the neighboring sanctuary with two crypts (Łajtar and van der Vliet 2017).

The Dongolan Georgios is an exceptional figure in the history of the Church of Makuria. As archpresbyteros and archistylites, he established the cult of his royal father not at the burial site, but in

a place that was publicly accessible, that is, a church which he founded and where the king was depicted being carried by an archangel *psychopompos*, possibly Raphael, although the identification cannot be certain (we can refer solely to the preserved wall paintings in the Church of Raphael on the Citadel from the end of the 8th century), in the company of the Apostles, to the heavens to a waiting Christ Pantokrator shown above.

Georgios managed something even more important, which ensured his greatness: he prevented the introduction of Arabic into the liturgy of the Church of Makuria, which is what the Patriarch Christodoulos did in Egypt, and he did





this by promoting mass translation of Greek texts into Old Nubian, which thus became an official language also of the Church.

It is presumably Georgios who can be said to stand behind the developed and monumental cult of the dead kings of Downtawo, represented so extravagantly in the Upper Church at Banganarti (Żurawski 2014). The sanctuary of Anna next to the Monastery Church in Dongola can also be linked to his episcopate.

A broader view of the evolution of the Church of Makuria in this period and its relations with the Church of Arwa and with Egypt remain more or less unknown. Changes were taking place for sure, but they were not linear. The

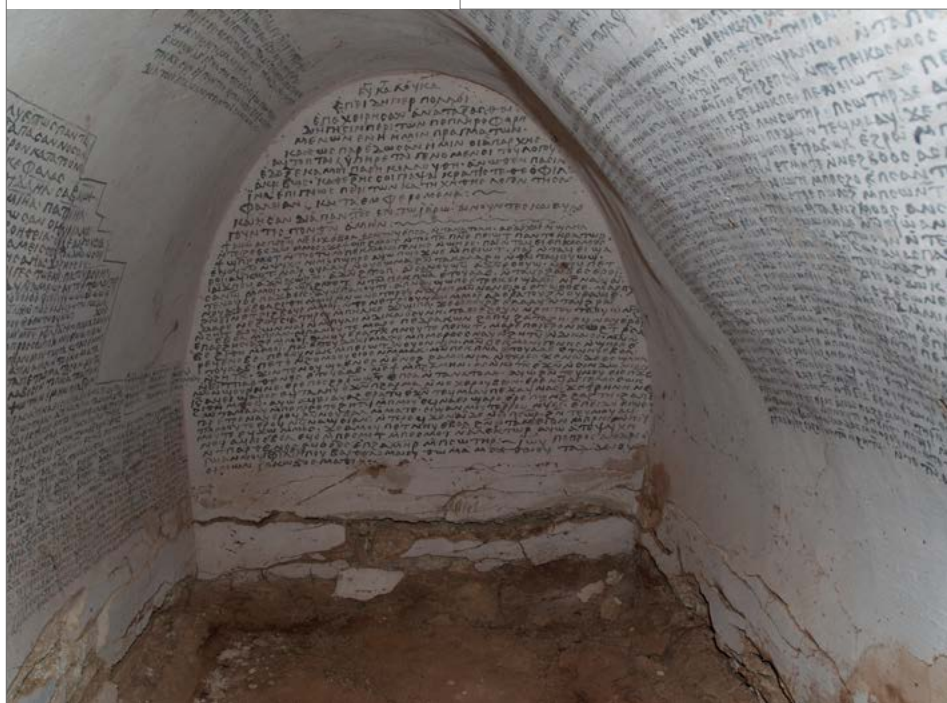


Fig. 6. Crypt believed to be the last resting place of Archbishop Georgios in the Monastery on Kom H in Dongola: top, E-W section looking north; bottom, view from the entrance (PCMA UW Dongola Project/photo C. Calaforra-Rzepka, drawing W. Godlewski and S. Maślak)



Constantinopolitan Creed preserved on the walls of the monastery in Dongola, including the Monastery Church, and also identified among the texts from Gebel Adda is perhaps the most important witness of the transformation. The union of the kingdom with Arwa must have had its impact on the functioning of the Church of Makuria, but very little is known about the Church of Arwa, hence it cannot be said how the Arwan Church's traditions could have influenced the Church of Makuria after

the union. One thing is rather clear: the church organization of the two rather did not merge into one homogeneous unit, as indicated by the Coptic lists of bishoprics, which report the episcopal sees of Makuria separately from those of Arwa (Seignobos 2015).

The history of the Makurian Church in the 12th through 14th centuries, after Makuria's union with Arwa, in times referred to as the Kingdom of Dotawo, was even more complicated, but that will be the subject of another article.

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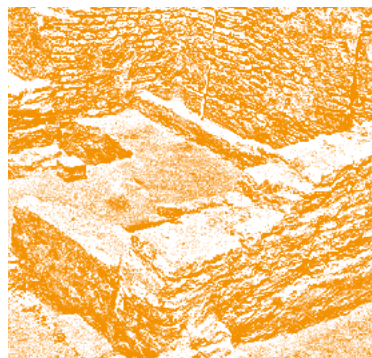
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# Archaeological and architectural evidence of social change in 13th–17th century Dongola



**Abstract:** The article reviews the body of archaeological and architectural evidence for social transformation taking place in Dongola during the period from the end of the 13th through the end of the 17th century, the uppermost stratum uncovered by Polish archaeologists excavating the ruins of the medieval seat of Makurian kings. Domestic architecture from the late 14th through 17th centuries and the artifactual finds from these dwellings, which were built on top of the ruins of the Makurian capital, demonstrate the character and extent of changes in the education, culture and religion of the inhabitants of the city from the Funj period.

**Keywords:** Dongola, Nubia, Funj, domestic architecture

Dongola—and, presumably, all the territory of Makuria as well—was set upon a gradual process of transformation from the time the dynastic treaty between the ruling families of Makuria and Alwa was concluded. The system of royal succession changed, shifting the mutual political and economic relations of Makuria and Alwa in favor of the latter. Social and civilizational changes inevitably followed (Godlewski 2008: 270–274; 2018b; Welsby 2014). Archbishop Georgios of Dongola added to the volatility of the situation by introducing changes in the functioning of the Church. Old Nubian took strong root in everyday life (Godlewski 2013a), largely replacing Greek as the official language of the Church and the language of education. A plethora of graffiti on walls and objects highlights this process (Łajtar 2008; Łajtar and Pluskota 2001). The cult of dead rulers changed

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significantly as well (Godlewski 2018b; Żurawski 2014), and so did that of bishops who had passed on (Łajtar and van der Vliet 2017; Godlewski 2018b).

The pace of social change accelerated in the 12th and 13th centuries, additionally fueled by migration, that is, influx into the valley (including Dongola) of people from the sub-Saharan region in the west. The reason for these population movements surely must have been climatic, one being a seven-year drought in the mid-11th century (Lane-Poole 1901: 142–143). Several years of low floods triggered a serious economic crisis that also must be calculated in as a factor in this transformation. Intensive migrations are well attested in Arabic sources of the time (Monneret de Villard 1938: 195–210).

The wars with the Mamluks in the last quarter of the 13th and beginning of the 14th century had a cataclysmic effect on Dongola. The city was destroyed, plundered and depopulated, the people enslaved or fleeing enslavement. There are accounts of how the Mamluks behaved in Syro-Palestine—their actions in Dongola would hardly have been more cultured (Waterson 2007: Chapter 5). The economic situation, already poor due to armed conflicts, must have been further aggravated by cyclic bouts of the plague. In Egypt, at least 55 different episodes were noted in Mamluk times (Northrup 1998: 287–288; Garcin 1998) and it should probably be assumed that the disease also would have been a real enough threat in the southern part of the Nile Valley during the late Kingdom of Makuria and early years of the Funj.

In the face of these events Dongola remained an important political and

religious center. The royal administration operated effectively under successive Makurian kings. Some kings converted to Islam before their coronation, thus gaining favor with Egypt, but their reigns usually were rather short-lived. The Church administration in Dongola continued to be with the bishops of Dongola residing there through the 14th century and presumably also in the early 15th century. A church newly discovered in 2018 in the Monastery on Kom H (NB.2), preserving numerous wall paintings and inscriptions, is dated to the middle of the 14th century. The monumental image of a king under the protection of Christ and two nameless saints attests to the continued rule of kings supporting the Church. The last dated inscription from the Dongola monastery, found on the wall of the Central Building (CB.2 room 2), dates to 1498.

It is easier to understand the economic straits of Dongola as a consequence of wars, plunder and imposed tributes for Egypt, than to describe social transformation without insight into local archives that surely must have existed. There is evidence, even if not entirely satisfactory, for two important aspects of the transformation of social life at Dongola: changes in Christian religion still prevalent in the 13th and 14th centuries and in broadly understood education. These two issues will be discussed below, based on available sources.

In 1317, Dongola received its first mosque, created on the first floor inside the so-called Throne Hall (Godlewski 2013b: 42–47 and 137). This event must have signified a lowering in prestige of the kings of Makuria, but is hardly a reason



to assume a growing popularity of Islam as a religion in the city. In all likelihood, the mosque served the religious needs of the newcomers from the north such as soldiers, merchants and tax collectors. In that sense, it symbolised Makuria's subjugation to the Mamluks. However, the Church retained its efficient organisation and enjoyed popular support, as attested by numerous graffiti engraved on walls of churches and on objects, particularly tableware. The Great Church of Jesus (CC) and the Cathedral of the Holy Trinity (RC.II) were still open in the 14th century, the monastery of Anthony functioned (Godlewski 2013b: 29–41, 55–57, 78–91) and a new church (NB.2) was installed. Another new church, the Tower Church atop the citadel wall, was constructed in this period (Godlewski 2013b: 74–75). The Cruciform Building was converted into a small church, even though the Church of the Archangel Raphael still functioned beside it (Godlewski 2013b: 75–77). New bishops were ordained and those who were deceased were buried in crypts situated in the Northwest Building within the monastery (Godlewski forthcoming). Priests and deacons also are attested, their presence being especially important to the local community they served on a daily basis.

The other domain in which the transformation is evident is education, understood primarily as literacy. The evidence in favor is strong and yet questions must be posed that, if answered, could throw more light on the issue of the transformations taking place in Dongolan society at this time. First of all, Greek continued to be taught in Nubia, best attested on the one hand by the great inscription in the

main monastic church rebuilt in the 12th century and, on the other, the numerous Greek–Nubian graffiti on all kinds of objects. This is a natural reflection of a society's attitude to religion and, while one may note the "fugitive ink" phenomenon in the 14th century, the explosion of scratched and engraved texts, by lay people as well as by the clergy, is a good indication of writing skills in Dongolan society. This, allegedly, went hand in hand with a fairly general ease of reading. Old Nubian was beyond doubt accessible in reading and writing to the people at large and not just the clergy and monks.

One is entitled to wonder why the total absence of graffiti in other languages, whether African or Arabic. The archives in Qasr Ibrim (Adams 1996: 213–255) constitute a special case, presumably due to the specific role of Nobadia in the general structure of the kingdom, admitting migrants from the north only as far as the second Nile cataract where a royal customs authority presumably operated. It is more than obvious that people with oral and written knowledge of Arabic and others speaking various African tongues were present in Dongola, but in a strictly practical sense. They were the necessary agents of a functioning economy and commerce on a local as well as more geographically extended scale. Thus, their languages were not written down and especially not on movable objects. The newcomers evidently adapted to local culture, in terms of both religion and the usage of Old Nubian. After all, the language survived until the mid-20th century, mainly in domestic talk of women and children, which was also of social significance in the broader aspect of human communication.

In the second half of the 14th century, Dongola was still a functioning and important center of the kingdom, despite the transfer of the royal court to Daw (Gebel Adda) described in the Arab sources. A single inscription from the ruins of the church in Banganarti, mentioning a King of Dongola called Paper (Łajtar 2008: 329–330) hardly signifies unequivocally the fall of Makuria as a state polity. It may, at most, indicate division of the state into smaller territorial units. Documents from Qasr Ibrim and Daw, dated to the end of the 15th century and evoking the full organizational structure of the kingdom (without the bishop of Dongola, which is understandable considering that the documents are written in the Phrim bishopric), are an important indication (Łajtar and Ruffini 2011).

Dongola remained a Christian city throughout the 15th century, with functioning churches and a monastery but, to judge by the technical state of the religious and monastic architecture, the economic condition of the Church had weakened severely. Perhaps the processes of assimilation of incoming people, to the Christian religion as well as the Old Nubian cultural identity, had begun to peter out. Texts in Old Nubian disappeared about this time but no new ones in Arabic replaced them, and a long period of illiteracy began at Dongola. This silence has another consequence: we have no way of measuring the extent of the Arabization or Islamization of Dongolan society although, in the author's opinion, one cannot speak of a real Islamization of the city before the beginning of the 16th century.

The makeup of society must have changed radically with Bedouin coming from both the eastern and western deserts, initially in the wake of Mamluk activity in the region and then on a more independent basis. But the vitality of oral Nubian in Dongola demonstrates the existence of a significant population substrate that had largely lost its economic and intellectual position. The few known texts in Arabic from the city, amulets and magical texts on a Koranic base written on potsherds (Vanthieghem 2015), are not necessarily sufficient proof of a population group versant in the language. There are, after all, no funerary stelae written in Arabic. The three fragments of stone stelae found near the Mosque Building in the past 50 years of excavations were out of context and hardly well dated. The recipients of these few texts may have been individuals, solitary men and women and not necessarily permanent residents of Dongola. What is important regarding these texts is the belief in their magical value, and this certainly finds continuity in a Nubian milieu.

While we cannot speak of processes of Islamization or Arabization in the local Dongolan community at the end of the 15th century, one thing is certain: it was not a community living in isolation. To get a better understanding of these issues, one should take a broader look at the relevant archaeological assemblage, including dietary preferences that speak volumes on animal breeding and customs, and the products of local craftsmanship catering for the basic needs of the residents of Dongola in the 16th and 17th centuries. Polish excavations in Dongola over the years have yielded a sizable

assemblage from the extensive ruins of domestic architecture, which in itself is an important witness to the social changes taking place in the city. Dongola was still a regional center of some standing, as described by the Turkish writer and traveler, Evliya Celebi, who penned a multi-volume description of the known world.

The sprawling location of private houses was a vibrant and quite visible part of the urban agglomeration, and Celebi's description (although there is no absolute certainty that he actually visited Dongola) is surprisingly consistent with the discoveries made so far on the citadel and its northern outskirts (Godlewski 2015b: 211–213).

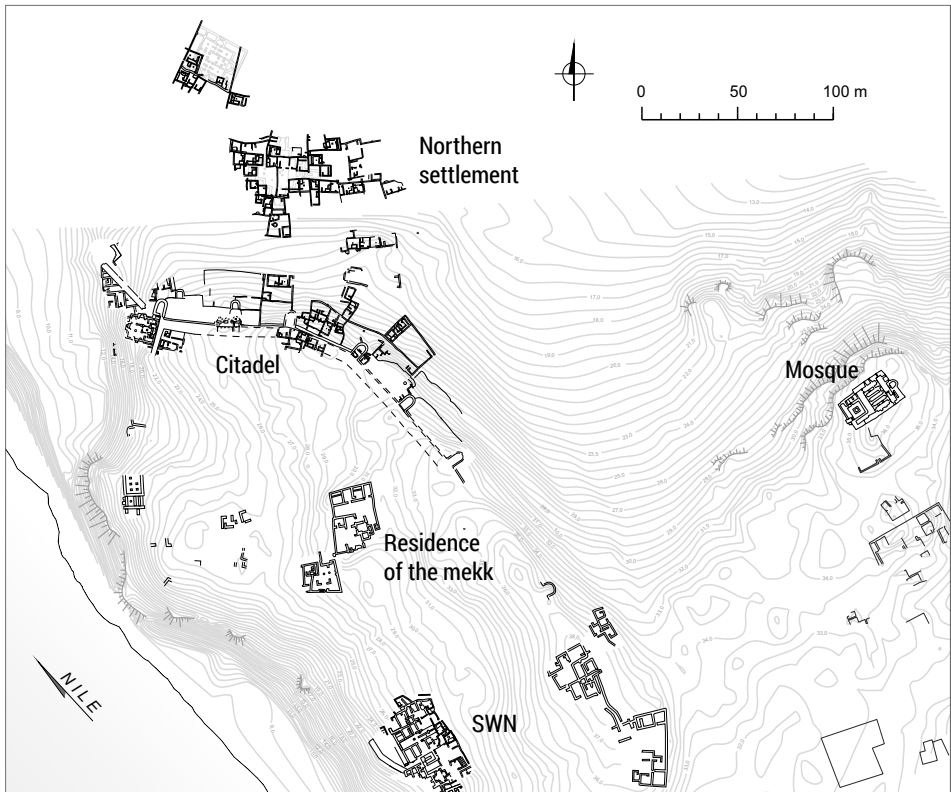
## URBAN TOPOGRAPHY OF 16TH–17TH CENTURY DONGOLA

In the 16th–17th century, the city spread over an area of some 150,000 m<sup>2</sup>. The architecture is easily observed on the ground and, between 1969 and 2017, parts of it were explored by the Polish archaeological project. It covers the entire citadel including the fortifications, the curtain walls and towers, the area to the north and east of the defenses, sitting atop the ruins of the successive Cruciform Church (CC) and cathedral (RC.II), the rocky plateau between the citadel and Mosque on the east and most probably also the area in the immediate neighborhood of the citadel on its southern side [Fig. 1]. Current excavation work has focused on the architecture in the northern and eastern part of the agglomeration and on site SWN on the citadel directly next to the Palace of Ioannes (SWN.B.I) (Godlewski 2015a; 2015b; 2018a; Maślak 2015).

Celebi's description in the second half of the 17th century (Žurawski 2001: 95–97) is generally consistent with the architectural remains observed today on the ground surface. Celebi counted 650 houses on the citadel and another 3000 beyond the fortifications. On this basis, a cautious estimate of the popu-

lation totals about 18,000. Traders also convened on the city in large numbers; Celebi speaks of even a thousand merchants visiting Dongola, an indication of this local market's attraction. This group was mostly itinerant, as Celebi says that they came from both the north and south, evidently considering the city a good meeting point and a place for conducting business.

Celebi also mentioned a palace of the local *mekk* (or ruler), a number of different public buildings (six schools, a khan or hostelry) as well as a mosque and seven other places of prayer (Prokosch in Žurawski 2001: 95–97; Godlewski 2015b: 212–213). To date, the only building of these to be explored, at least in part, is the Mosque. The building, originally the throne hall of the kings of Makuria, was turned into a mosque in 1317 by taking advantage of the upstairs rooms. The foundation stela of the mosque has survived; it is now immured in the east wall of the interior, left of the mihrab. The palace of the *mekk* has been tentatively located on the citadel, the ruins of which can be traced on the ground, but its function has yet to be confirmed by excavation.



### DOMESTIC ARCHITECTURE

The domestic architecture from the period discussed here, excavated to date on the citadel and to its north [see *Fig. 1*], is entirely different from its Makurite counterparts (Godlewski 2013b: 96–107)—in building plan, mutual topographic relations, building technique and interior furnishings. This new type of architecture first appeared at the end of the 14th or

beginning of the 15th century and seems to have been the work of an incoming population.

The oldest of the explored houses presented in this paper is Building R (excavated in 1985), situated within the high-standing walls of the ruined Cruciform Church [*Fig. 2*]. Another house described here is Complex U (excavated



◀ Figs 1–2. Architectural remains from the 13th–17th centuries in Dongola: opposite page top, aerial view of the city of Dongola from the north; opposite page bottom, general plan of the excavated remains; above, dwellings from the 16th–17th century on the site of the ruined Cruciform Church (CC) (church walls in outline underlying the architecture) and northwest of it; inset, the earliest dwellings of this phase located within the standing walls of the ruined church (walls in outline) (PCMA UW Dongola Project/plans W. Godlewski, W. Małkowski and S. Maślak, digitizing and correlation S. Maślak and M. Puzkarski, aerial photo S. Lenarczyk)



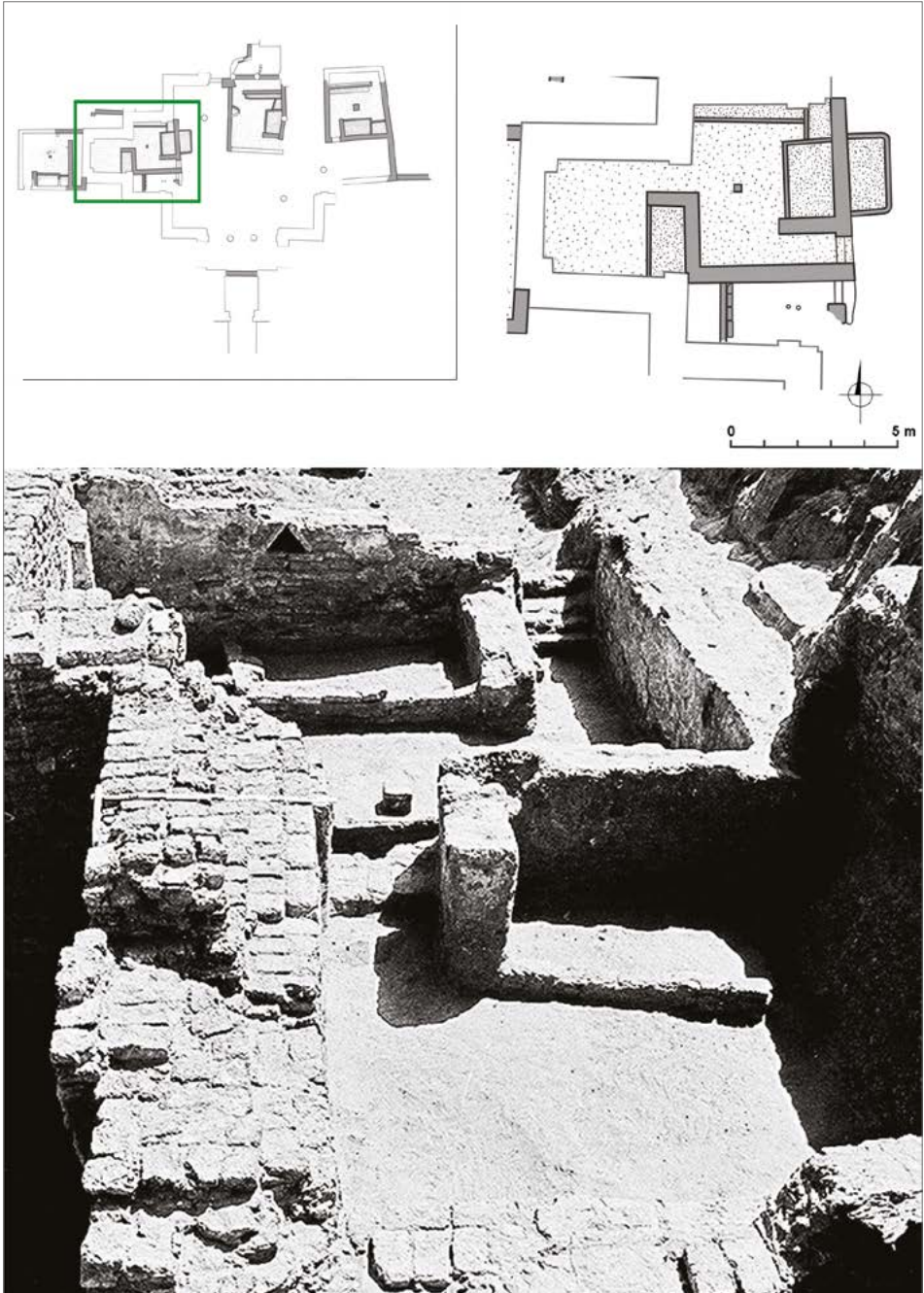


Fig. 3. House R.1–2 (site CC): top, house plan with location shown in the inset; bottom, house interior, view from the west (note thick brick wall of the church at extreme left) (PCMA UW Dongola Project/ plan W. Godlewski; photo W. Jerke)

in 1974), which represents some of the latest buildings of its kind from this area. It is situated directly south of House R, on a level approximately 3.50 m higher than the earlier building. The other three units described here are located on the citadel. The earliest, probably contemporary with House R, is House SWN.H.3, built onto the standing walls of the ruined Palace of Ioannes. SWN.H.1 was a house constructed at a later stage, when the palace was already in ruins, hence the period between them must have lasted some time (probably within the 14th century). Both were excavated in 2003. The last here is House Y (excavated in 1982), next to the ruins of the residence of the *mekk* of Dongola as seen by Celebi. It is probably not as early as Houses R and SWN.H.3, but it preceded the other two complexes described here. They are presented below in more or less chronological order of construction as ascertained in research to date and, taken together, exemplify 200 to 300 years of domestic Funj architecture. They also demonstrate the nature and extent of the changes taking place in this sphere in post-medieval Dongola.

### HOUSE R.1–2

The house occupies the interior of the western portico and the western arm of the Cruciform Church (CC), taking advantage of its north wall that still stood high. The south and east walls of the house were constructed from scratch (Godlewski 1990a: 532–533) [Figs 3, 4]. The layout was determined, to some extent, by the adapted space inside the ruined CC building. Two chambers of similar size are joined by a doorway. The house

is entered through a doorway only 0.80 m wide in the southern corner of the east wall. A low wall, 1.70 m long, borders the entryway on the interior. The roof was supported on a central pillar, which may be reconstructed on the grounds of its preserved stone base. Two mastabas stand on the tamped clay floor by the east wall, the larger measuring 2.35 m by 1.45 m and the smaller 1.15 m by 0.80 m. A narrow bench (0.55 m wide) is by the north wall. All structures are made with low brick walls. The walls were mud-plastered and whitewashed repeatedly.

Room R.2 was smaller (4.30 m by 3.40 m) and it also had a low wall, 1.15 m long, bordering the entryway, and a mastaba by its east wall, measuring 2.15 m by 1.15 m. Yet another mastaba, 2.45 m by 1.40 m, stood in front of the east facade of the house, north of the entry.

A small room was formed between the south wall of the house and the south wall of the portico of CC. It was just 4.30 m by 1.90 m; it could be entered via a separate door from the east. A mastaba formed of a low brick wall filled the western end of this chamber, 1.90 m like the room and 1.40 m deep. This chamber presumably served household purposes.

### HOUSE SWN.H.3

House SWN.H.3 was built onto the north facade of the presumably already deserted Palace of Ioannes (SWN.B.I). It most likely had a courtyard before the two-unit interior, but this remains unexcavated (Godlewski 2007: 289–293) [Fig. 5].

The entry to the large room was 0.65 m wide, bordered by a low wall some 1.70 m long. The walls were mud-plastered



and repeatedly renovated; they stand to 1.30 m. The big room, 4.80 m by 3.70 m, had a tamped floor and was furnished with two mastabas by the west wall:

the larger measuring 1.90 m by 1.50 m, the smaller 1.40 m by 0.70 m. Both were made of low walls around a sand-filled core with a hardened surface. A low bench



Fig. 4. House R.1–2 (site CC): house interior, view from the southwest (top) and southeast (PCMA UW Dongola Project/photos W. Jerke)

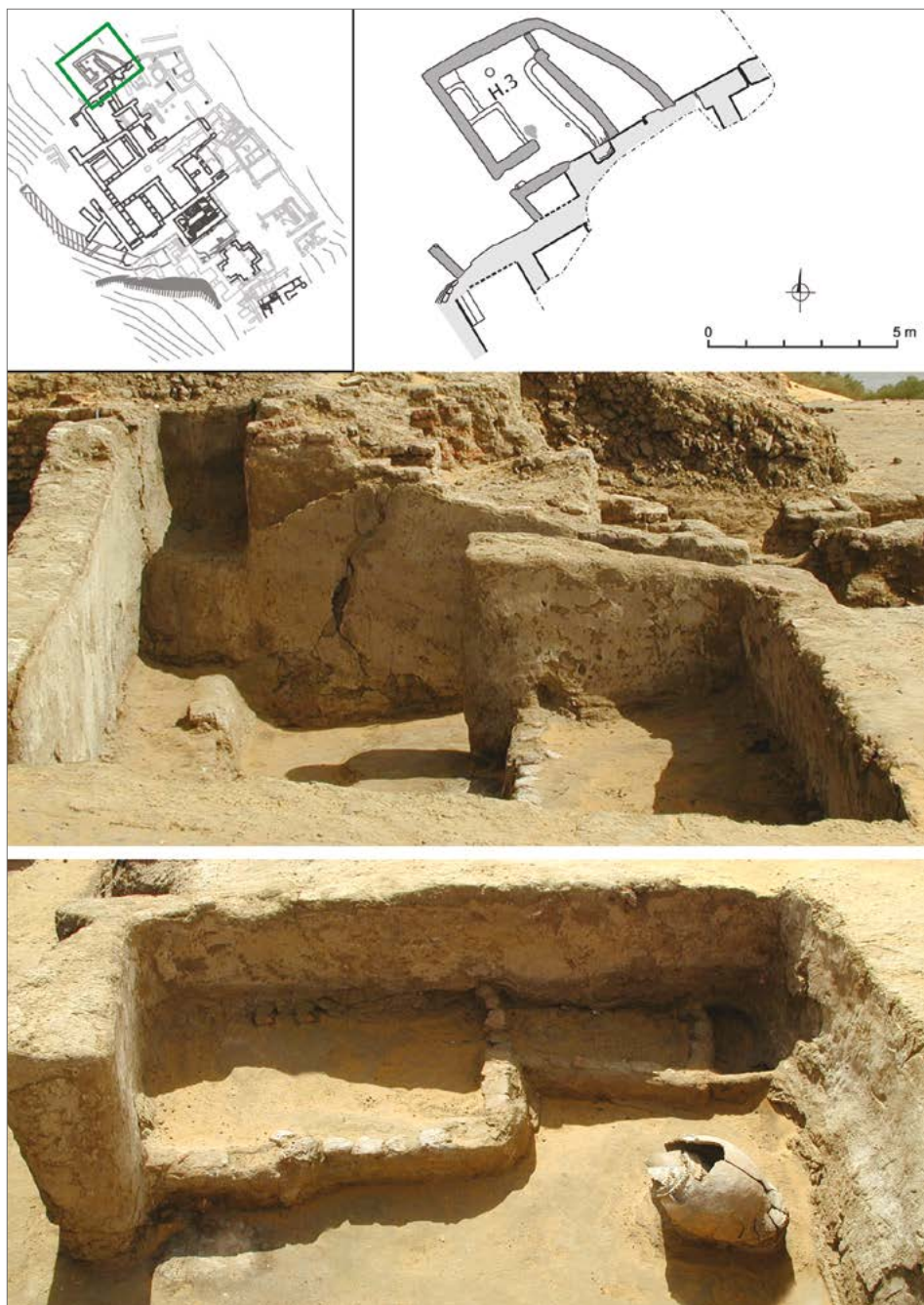


Fig. 5. House SWN.H.3 on the citadel: top, plan with location on the SWN site; center, house interior, view from the northwest; bottom, close-up of the installations and storage container in the northwestern corner of the room inside the entrance, view from the northeast (PCMA UW Dongola Project/plan W. Godlewski and S. Maślak, photos W. Godlewski)



of similar construction, 0.70 m wide and 4 m long, stood by the east wall. A deep niche with missing arch in the southeastern corner of the south wall was 0.80 m wide and 0.50 m deep. Traces of a hearth were observed on the clay floor by the southeastern corner of the large mastaba.

The narrow room, some 5.00 by 1.00–1.90 m, lacks a floor, wall plastering and

interior furnishings. It was entered from the northeastern corner of the big room and had a low wall bordering the entryway. In the last phase, it was blocked off entirely and abandoned.

Finds from the house included a storage container [see Fig. 5 bottom], cooking ware pots and bowls, and some artifacts of everyday life [Figs 6, 7].



Fig. 6. Handmade clay vessels from house SWN.H.3: 1 – bowl (H. 10 cm; D. 22.5 cm; room SWN.H.3.1); 2 – bowl (H. 10 cm; D. 37.5 cm; room SWN.H.3.1); 3 – bowl (H. 13 cm; D. 21 cm; room SWN.H.3.1); 4 – pot (H. 10 cm; D. 14 cm; room SWN.H.3.2); 5 – cooking pot (H. 16 cm; D. 12.5 cm; room SWN.H.3.2); 6 – pot (H. 19.5 cm; D. 17 cm; room SWN.H.3.2)



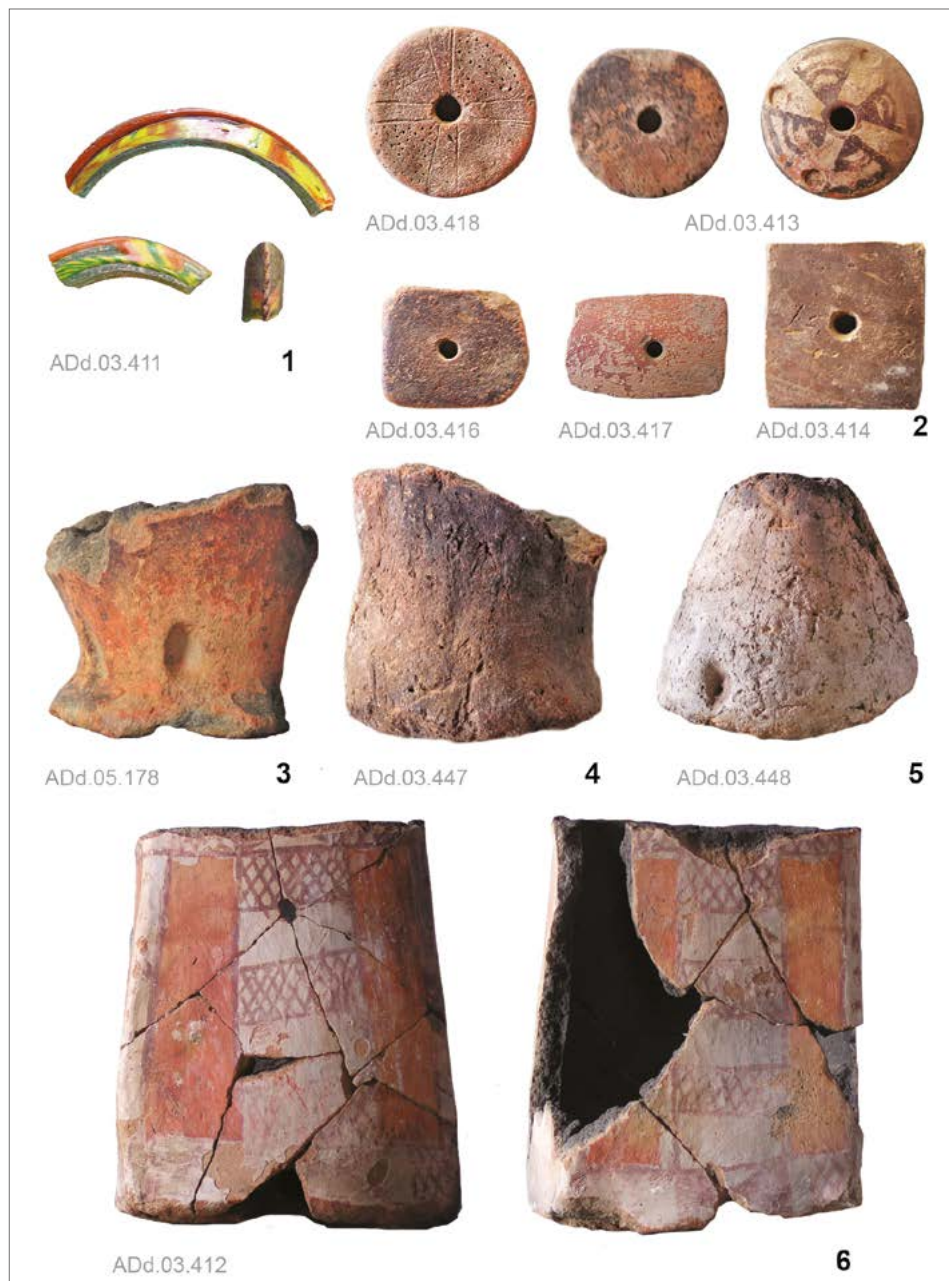


Fig. 7. Clay finds from house SWN.H.3: 1 – glass bracelet fragments; 2 – spindle whorls: ADd.03.413 back and front (Dia. 5.7 cm; Th. 0.9 cm), ADd.03.414 (5.2 x 6.0 cm; Th. 0.8 cm), ADd.03.416 (4.8 x 6.0 cm; Th. 1.0 cm), ADd.03.417 (4.7 x 7.7 cm; Th. 0.8 cm), ADd.03.418 (Dia. 5.9 cm; Th. 0.9 cm); 3 – handmade incense burner (*mubhar*), ADd.05.178 (H. +9 cm; Dia. base 9.4 cm; room SWN.H.3.2); 4, 5 – firedogs of Nile silt, ADd.03.448 (H. 15 cm; Dia. base 18 cm), ADd.03.447 (H. +7.2 cm; Dia. base 6.8 cm); 6 – box with lid, ADd.03.412 (H. approx. 35 cm; base 18.5 cm by 19.5 cm) (PCMA UW Dongola Project/photos W. Godlewski)

### RESIDENCE OF THE *MEKK* ON THE CITADEL

Exploration cleared some 18 m by 28 m of a large structure in the central part of the citadel southwest of the ruins. The size of these remains, much larger than of regular houses known from this period, and their location have led to their purported identification as the residence of the *mekk* that, according to 16th and 17th century travelers, was located on the citadel [see Fig. 1]. The most recent architecture preserved there was traced and the house (House Y) identified is described below. An extensive courtyard (X.1) was entered via a separate entrance and apparently unconnected with the house, although the two are contemporary. A trench was dug by the east wall of the courtyard to establish the stratigraphy of the complex down to the ruins of the citadel building from Makurian times. The uppermost horizon of organic deposits in the yard was

identified as horse manure, indicating that it had served to keep the *mekk*'s horses.

### HOUSE Y

The mud-brick house had a regular layout composed of a big square room (4.80 m by 4.70 m) and a narrow rectangular one (4.35 m by 1.15 m) [Fig. 8]. A small trapezoid courtyard (4.20 m by 2.80–3.75 m) opened south of the house, fenced in by a stone wall. The building was cleared at the most recent occupational level, elevated approximately 0.30 m above the original floor. The interior walls, preserved low, were mud-plastered and repeatedly lime-washed, the last time in conjunction with the most recent occupational level.

The large room (Y.1) was entered from the courtyard in the north (Y.3) through a 0.75-m-wide doorway, with a low 1.60-m-long wall bordering the entryway. A socket for the door pivot was found by the threshold in the doorway. The furnish-

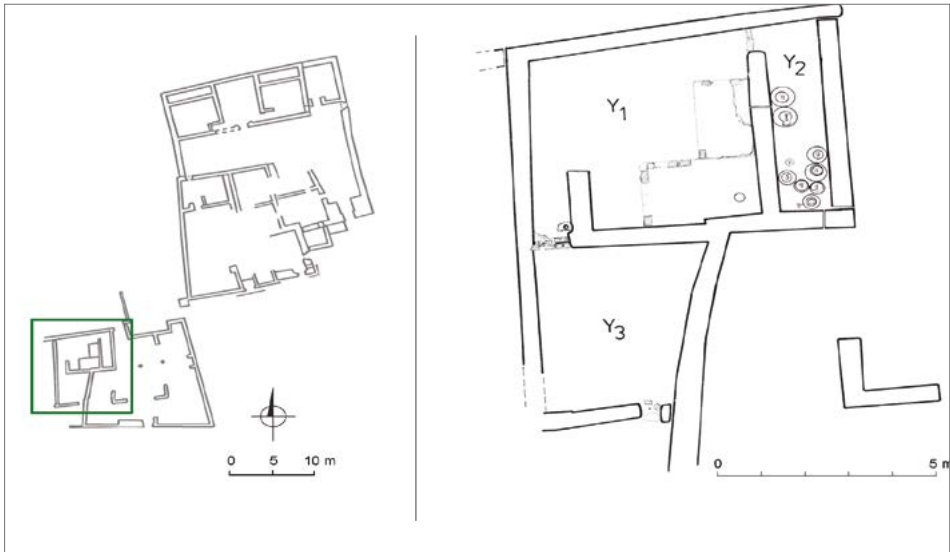


Fig. 8. House Y, plan (right) and its location on the site of the so-called residence of the *mekk* in the northern part of the citadel (PCMA UW Dongola Project/plans S. Medeksza; digitizing S. Maślak)

ings preserved at the tamped floor level (elevation 26.60 m ASL) include two mas-tabas by the northwestern corner walls of the unit. One was 2.55 m long and 1.50 m wide, the other 2.00 m long and 1.23 m wide. Both consisted of a sand-filled core

lined with narrow mud-brick walls and a hardened surface 0.27 m above the floor.

The narrow room (Y.2) opening off the southwestern corner of the big room was a storage space. It yielded a few dozen storage containers and domestic pottery [Fig. 9].

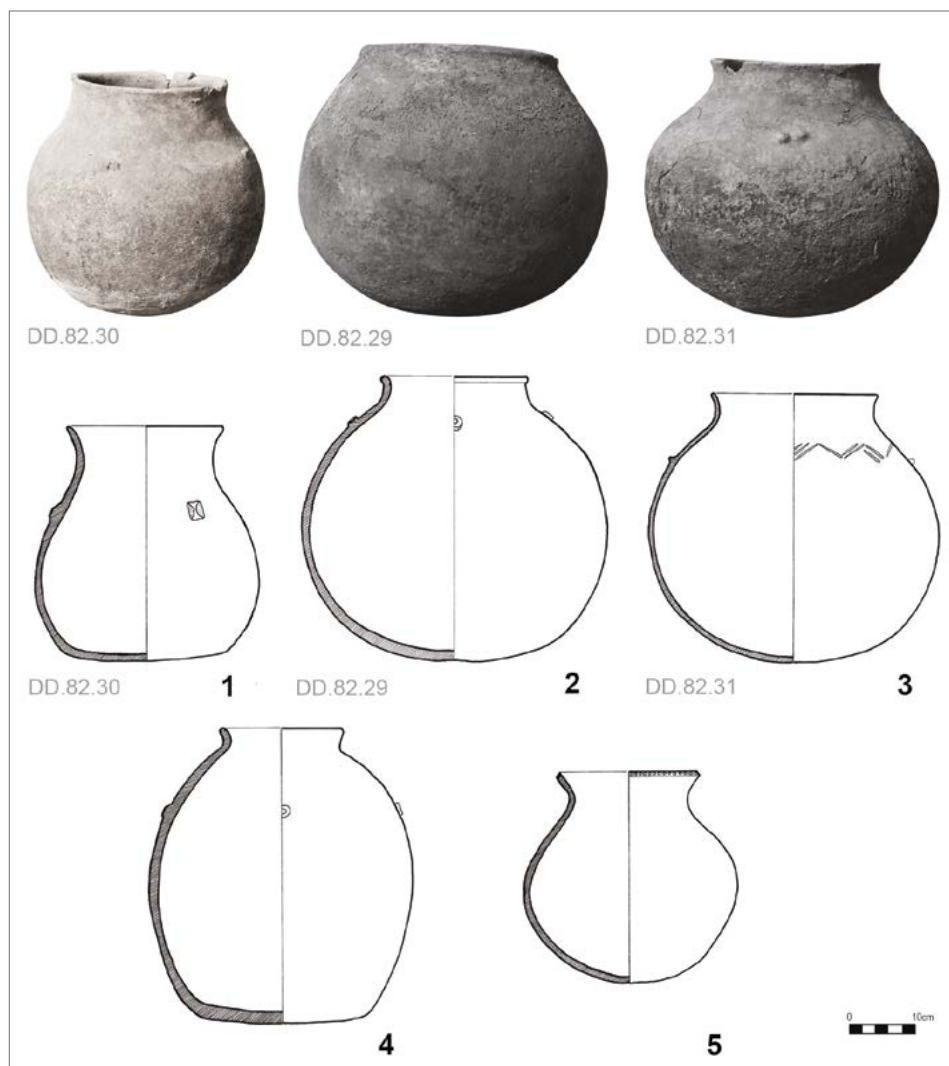


Fig. 9. Clay storage containers from the storeroom of House Y [see Fig. 8]: 1 – pot D (H. 38 cm; Dia. 25.5 cm); 2 – pot E (H. 42 cm; Dia. 22 cm); 3 – pot C (H. 40 cm; Dia. 25 cm); 4 – pot I (H. 46 cm; Dia. 20 cm); 5 – pot F (H. 34 cm; Dia. 23 cm). All except pot C are handmade (PCMA UW Dongola Project/photos and drawing W. Godlewski)



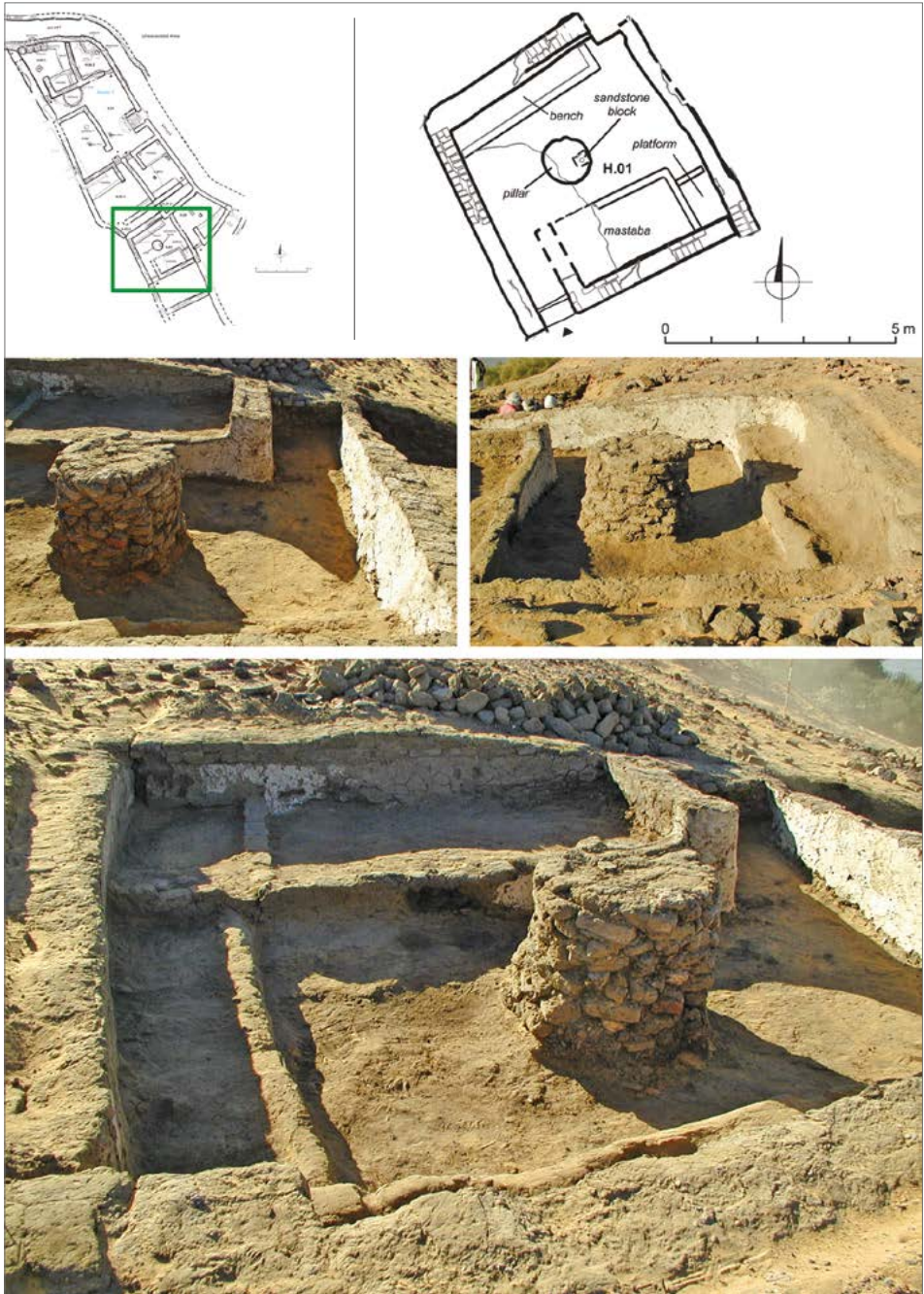


Fig. 10. House SWN.H.1 on the citadel: top, plan and location on the SWN site; center, views of the massive central pillar in the interior, from the north and east; bottom, western part of the house, view from the north (PCMA UW Dongola Project/plan and photos W. Godlewski)

**HOUSE SWN.H.1**

The ruins of a house were cleared atop the remains of the Palace of Ioannes, in the southeastern corner of the building, directly below ground surface. It had only one chamber, 4.50 m by 4.70 m, most likely preceded by a courtyard on its south side [Fig. 10 top]. It seems to have taken advantage of the remains of an earlier house (2H.1), but at a higher occupational level. The entry from the south, in the southwestern corner, was 0.65 m wide, with a long low wall bordering its side. The walls were mud-plastered and lime-washed. The roof was supported by a massive pillar constructed of bricks in the center of the unit [Fig. 10 center and bottom], probably a later addition and not plastered. The floor was weakly tamped.

The furnishings were composed of two mastabas by the south wall, the larger 2.75 m by 1.50 m and the smaller 0.60 m by 1.65 m, and two benches by the east wall, 2.50 m by 0.60 m and 4.20 m by 0.50 m respectively on the north and south. A pot containing notary documents in Arabic written on paper was concealed inside the central section of the large mastaba (Vanthieghem 2015) [Fig. 11]. It is a solitary example from Dongola of how important family deeds were kept. Each document was separately wrapped in a textile, tied, and then packed together in another piece of cloth [Fig. 12]. The double protection proved effective as the documents have survived in good condition.



Fig. 11. House SWN.H.1 on the citadel (site SWN): view of the mastaba concealing the pot (PCMA UW Dongola Project/photo W. Godlewski)



**COMPLEX U**

Architecture occupying the southwestern part of the ruins of the Cruciform Church (CC) consisted of three separate houses and a courtyard giving access to all [Fig. 13]. The complex was built onto the western side of a partition wall in the central space above the older ruins. The six units making up the complex may not all have been contemporary but, as no extensive excavation was carried out here, it was not possible to discern their mutual chronology.

**Unit U.1–2**

This unit incorporated earlier walls of units U.3 and U.4, using them as its side walls. The north and south walls were built of mud brick, the east and west walls of red brick. Five coats of mud plaster were recorded on the walls, standing about 1.00 m. Room U.1 was almost square, 4.00 m by 4.50 m, and its connected rectangular room U.2 was 4.00 m long and 0.90 m wide. The entrance from the courtyard, in the southwestern corner, was 0.70 m wide and was fitted with a red-brick



Fig. 12. Pot ADD.07.426 and parcel ADD.07.447 containing the paper documents, each individually wrapped deed ADD.07.448–452 shown below; bottom left, the pot *in situ* inside the mastaba (PCMA UW Dongola Project/photos W. Godlewski)

threshold and a low wall some 1.60 m long, bordering the entryway on the right side of the doorway. A door socket was noted in the southeastern corner of the entrance and a slot for the bolt was preserved in the west wall. The smaller unit was entered from U.1 via a doorway 0.60 m wide, situated by the east wall. It, too, had a red-brick threshold. The floor in U.1 was a tamped mud and sand layer that appears to have been repeatedly renovated.

Two mastabas stood in the southeastern part of chamber U.1. The larger, at 3.00 m by 1.70 m and 0.27 m high, lay between the low wall bordering the entryway and the east wall. The smaller mastaba, 2.15 m by 1.10 m, joins the first at right angles. Both are formed of a narrow brick wall surrounding a sand core and finished with a tamped surface. Three large storage pots stood on the large mastaba, set off by a partition and sealed with

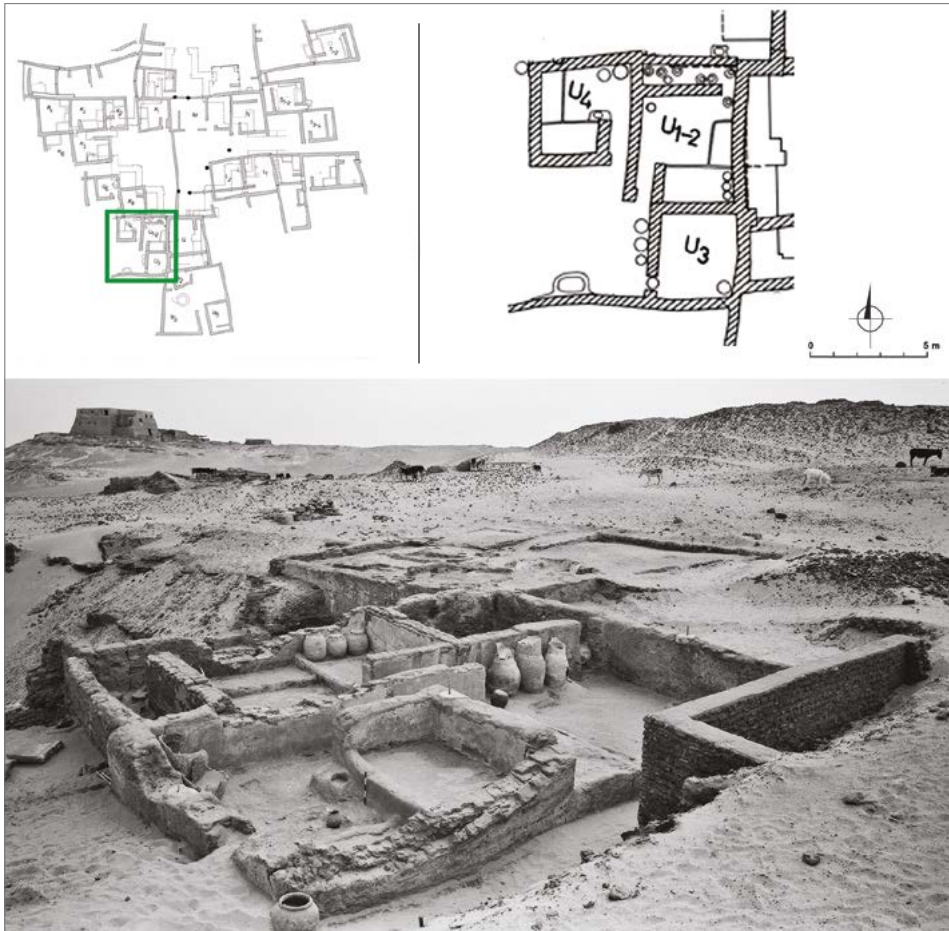


Fig. 13. House complex U on the ruins of church CC: top, plan and location within site CC shown in the inset; bottom, general view of domestic complex U from the west (PCMA Dongola Project/plan R. Sobolewski and S. Medeksza; photo W. Jerke)

clay [Fig. 14 top]. Two *gessebas* (bins of dried clay) stood by the west wall and a fired vessel, a *zir*, was still present in front of the threshold to U.1, by the east wall. Unit U.2 contained seven large storage pots, each different in size and all broken, the sherds also scattered within the 0.60 m wide entry.

### Unit U.3

This unit is south of U.1–2. The walls, standing to a height of 1.30 m, were of dried mud brick; the lower part of the east wall, of red brick, was actually the top of the wall of the southern arm of the Cruciform Church (CC) [see Fig. 2]. The unit was small and



Fig. 14. Storage pots in place inside the rooms of Complex U: top, pots on a mastaba in unit U.1; bottom, pots in unit U.4 (PCMA UW Dongola Project/photos W. Jerke)

squarish at 3.60 m by 3.30 m. The inner walls were given one coat of a yellowish sand–lime plaster, now blackened with soot. A lighter-colored plaster was used for repairs. The entrance from the courtyard was in the southeastern corner, the width of the doorway 0.60 m and, in this case, lacking a low bordering wall. A sand–clay floor was repeatedly relaid, rapidly accumulating a thickness of about 20 cm.

Furnishings included a low clay structure 1.20 m by 1.00 m in the southeastern corner, serving as a stand for storage containers. Two somewhat damaged pots were still in place at the time of discovery. A patch of intensive burning and ashes was noted on the floor by the west wall. A large pot had been left in the entrance. It is handmade, fired, 49 cm high and with a rim 27.5 cm in diameter, decorated with a relief pattern of four “V”s.

#### Unit U.4

The walls of unit U.4, immediately west of U.1–2, appear to have collapsed at some point, leading to abandonment of the structure. Debris from the walls lay on the floor under drifted sand, whereas the west wall had tumbled to the outside, leaving the wall stub also clearly leaning outwards. Mud brick was used to construct these walls, standing about 1.00–1.50 m in height at the time of discovery. The interior had been plastered and whitewashed three times, the second and third coats being refreshed only with whitewash.

The entrance from the courtyard was in the southeastern corner of the south wall. The threshold was of dried mud brick, but with the first ground course of

red brick. A door socket in the threshold by the east wall had been worn into a red brick, while a vertical semicircular niche worn into the east wall is the negative of the door pivot. The slot for the door bolt was 0.98 m above the floor, cut in the low wall bordering the entryway, which was 1.30 m long. The sand–clay floor was tamped heavily.

Furnishings consisted of a mastaba by the south wall between the low wall by the entry and the west wall; it was 2.30 m by 1.40 m, and 0.45 m high. A wall of dried mud brick around a sand core formed the mastaba, finished with a kind of mortared surface. Lying on it was a coffee set: china cup (D.14/73-4), a pot for making *gabana* coffee (D.11/73-4), firedogs (D.12–13/73-4), a bead (D.15/73-4) and a metal ring band (D.16/73-4). The bench by the west wall, between the mastaba and the north wall, was a low wall constructed around a sand core with a tamped surface. A brick-made structure by the high mastaba and low entry wall incorporated within a vessel with broken off bottom; the structure was plastered.

A bench for storage containers stood in the northeastern corner. Two *gesseba* vessels of dried mud, their function being to store dry products, were found in place, broken to pieces [Fig. 14 bottom]. Clay had been used to cement them to the bench. Both had a body diameter of approximately 65 cm, one preserved to a height of 50 cm and the other to 75 cm.

A hearth occupied the center of the room. Mud bricks and vessel sherds were incorporated into the clay floor, which was fired in the immediate vicinity of the bricks. Found next to the hearth was



a handmade pot probably for cooking, with the body daubed with rough clay on the exterior. It was 22 cm high with a rim diameter of 16 cm. The shoulder was decorated with an engraved wavy-line ornament.

A large handmade globular pot was found outside the unit, by the northwestern corner. It was 51 cm high, 35 cm in rim and 50 cm in diameter, and had four small loop handles situated axially at the junction of body and shoulders.



Fig. 15. Unit U.6 in house complex U (Site CC): room with *murhaka* (PCMA UW Dongola Project/photos W. Jerke)

### Courtyard U.5

An open courtyard of irregular shape opened onto all units of House U. Walls delimited it on the north and south, being continuations of the walls of unit U.6 and U.3 respectively (the western boundary wall remains unexcavated). The walls were constructed of dried mud brick, with some red brick thrown in for good measure. The interior walls are mud-plastered, three coats were noted. The floor was tamped only around unit entrances and the various structures found in the courtyard.

These structures consisted of a mastaba by the south wall of U.4, formed by a wall 0.50 m high, some 3.80 m long and 1.40 m wide. The core is of sand with tamped surface. A kind of shallow clay basin of oval shape, roughly 1.75 m by 0.95 m, stood by the south wall of the courtyard. Three large *gesseba* vessels of dried clay were found standing in the sand by the west wall of U.3, and a small globular pot was found by the entrance to U.1–2.



### Unit U.6

The unit was built onto the east and north walls that originally bordered the complex of House U. The added walls were of dried mud brick. The unit was practically square at 3.35 m by 3.45 m, the walls still standing to about 0.58–1.09 m above the clay floor at the time of discovery. They were mud-plastered and whitewashed both inside and outside.

The entrance from the courtyard was from the northeastern corner. It was 0.60 m wide and fitted with a threshold of red brick. The door socket in the form of a worn circular depression in a red brick was found in the southeastern corner by the threshold. A low wall bordered the entryway from its western side and a slot for the door bolt cut into its side. The sand-clay floor was tamped.

Furnishings included a structure by the east wall, probably a *murhaka*, a flour-grinding place with stone querns set into the base (one had been ripped out) and two vessels incorporated into it, for storing the flour once it had been milled [Fig. 15]. The structure was thickly coated with lime plaster. A globular pot was found in the center of the unit. The floor along the west wall was burnt through and covered with ashes. A single firedog came from this context.

A clay structure with a low wall around it was found opposite the door, in the corner between U.4 and the east wall bordering the courtyard (a party wall with unit U.6). It was 1.40 m by 0.80 m and incorporated a pot at its northern end. The inside of this pot was burnt, hence its probable use as a hearth. Another pot stood next to this structure.

## DOMESTIC ARCHITECTURE AND SOCIAL TRANSFORMATION IN 16TH–17TH CENTURY DONGOLA: DISCUSSION

The oldest domestic housing known at Dongola was preserved in the western part of the Cruciform Church (CC), in the western arm of the building and to its west. This location, in an abandoned royal church (Godlewski 2013b: 39–41), suggests the people who occupied it had no ties with Christian religion. The houses had only two chambers with no upper floor; one chamber was small and narrow, the other squarish in plan with much more space. This arrangement at Dongola first appears only at this time. It is best exemplified by House R.1, incorporating the ruined west wall of the church to some extent, House SWN.H.3,

attached to the north facade of the Palace of Ioannes, House Y by the ruins of the so-called residence of the *mekk*, and the complex of House U on site CC north of the citadel. Walls in these buildings are constructed of brick: initially baked red brick from dismantled Makurian structures and later dried mud brick. The houses only have ground floors with walls 0.40–0.50 m thick, built properly and plastered with mud, renovated repeatedly with the same kind of plaster and whitewashed with locally produced lime (*gir*). No windows have been recorded, but we can assume the presence of small openings in the missing upper

parts of the walls. Stone thresholds were found at the doorways and presumably wooden lintels. The doors were of wood turning on a pivot, sockets for which were preserved in the form of use-wear, circular hollows in pieces of stone or baked bricks. Bolts were used to close the doors from within; appropriate slots for sliding the bolts are recorded in door jambs or, more often, low walls bordering the entryways. A flat roof rested on wooden beams supported atop the walls, propped up on a wooden pillar in the middle of the larger room. The stone bases of these beams (pillars) were preserved, raised insignificantly above the level of the tamped earthen floor surface. Much less often floors were composed of bricks laid flat. The narrow rooms have neither plastered wall surfaces nor tamped floors; theirs was a typical household role.

The large chamber was a multi-functional living room during the day, turning into a bedroom at night. Furnishings included benches and rectangular mastabas consisting of thin low walls only one-brick thick, around a sand fill. A coat of mud or (less often) a layer of bricks served to harden the surfaces of these structures. Usually each house had two mastabas, sometimes with a small square structure attached to the large mastaba, built around a usually bottomless cooking pot set into it. Charcoal preserved in these pots indicates their use as hearths with limited intensity. Traces of fires also are usually found on the mud floors of the rooms, in the form of burnt-through circles. Low circular stands for cooking pots also are recorded. The objects left in the deserted houses include mainly handmade cooking and tablewares

(Wodzińska 2015). *Qawadis*, vessels traditionally used in *saqiya* water-wheels, are the only form of ceramic vessel that continues to be wheelmade. They also are found in houses. Still standing on the mastaba in House U.4 is a typical pot for making *gabana* coffee, a china cup, stands for vessels in the hearth, a headrest and some jewelry (Then-Obluska 2013). Nonetheless, the majority of the space within the houses or inner courtyards is taken up by large storage jars, baked or merely of dried clay, set upon the benches. Larger silos sometimes are placed in deep pits in the courtyards, their body walls lined with bricks and plastered on the surface. Frequent are so-called *murhakas* (stones mounted on a masonry podium) with one or two vessels by the side. Equally common are flat stones for grinding grain or other products. Granite capitals sometimes fulfil this role.

There seem to be no outbuildings for cattle or structures for keeping birds in the immediate neighborhood of the houses. However, there are places on the citadel where animals could have been kept for some time, presumably prior to being slaughtered. The courtyard between the ruins of the palace (SWN.B.I) and the Church of Raphael (SWN.B.V), still standing high with preserved vaults, seems to have been an area where animals were kept and food prepared for large numbers of people for a long period of time. This is evidenced by a thick accumulation of hearth deposits, ashes and animal bones in the courtyard, but also inside the church, where a deposit of ashes reaching 2 m in thickness suggests a cooking area. Thick accumulations of horse manure and straw were also noted

in the urban area between the palace of the *mekk* and House Y; the obvious interpretation is that horses were kept here periodically, presumably catering for the needs of the people residing in the palace.

The domestic architecture known from the citadel and the area north of it betrays a planned layout easily interpreted as an urban topography by our modern standards, expressly a form of settlement with no economic base for keeping domestic animals. In African circumstances, however, it is hardly an urban layout, but rather a well organized village with inhabitants undertaking different activities, nearer to a trade-and-crafts economy. The fields they would have cultivated would have been located on the river islands and banks, as well as in the Letti basin lying north of Dongola.

Houses consisting of several units, like Complex U—and they are more numerous in the village on the whole—show a functional differentiation of particular units, as well as an agglutinative form of development with new units being added to the principal ones in rhythm with the growth of the owner's family. Of significance for understanding social aspects of family make-up is the absence of a distinct gender division with no part of the house being separated out for women in opposition to the “male” part open to visitors. This may be interpreted as a still traditional family model in Dongola. Transformation will occur only with the firm arrival of Islam and the norms imposed by religion, shaping also the interior of the family home.

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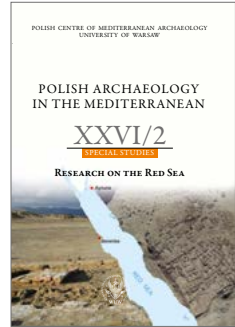
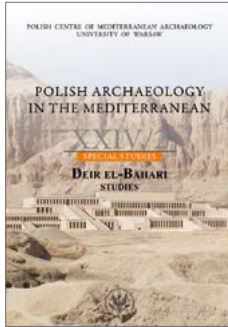
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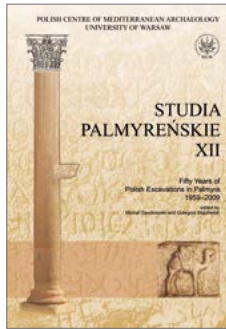
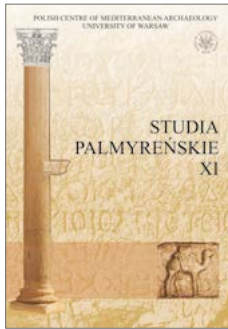
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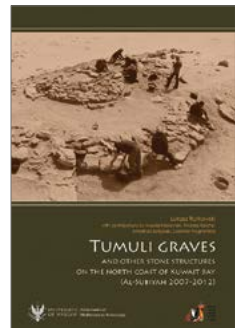
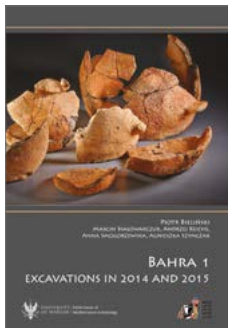
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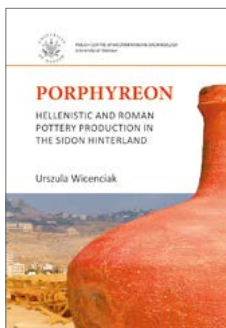
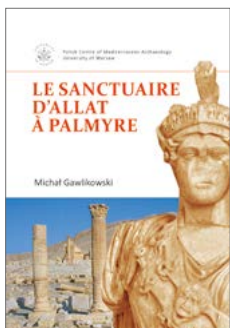
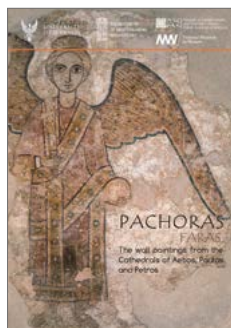
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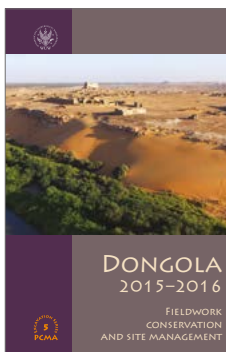
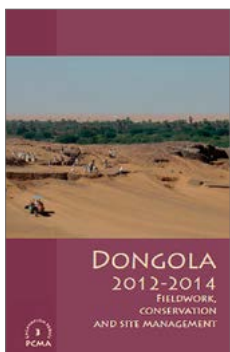
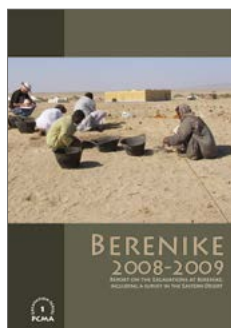
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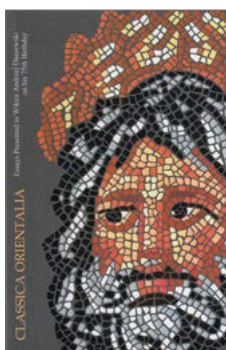
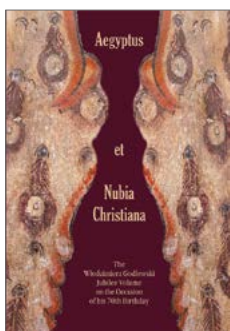


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