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An offprint from

Cypriot Cultural Details

Proceedings of the 10th Post Graduate
Cypriot Archaeology Conference

Paperback Edition: ISBN 978-1-78570-066-8

Digital Edition: ISBN 978-1-78570-067-5

edited by

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© Oxbow Books 2015
Oxford & Philadelphia

www.oxbowbooks.com

Published in the United Kingdom in 2015 by
OXBOW BOOKS
10 Hythe Bridge Street, Oxford OX1 2EW

and in the United States by
OXBOW BOOKS
908 Darby Road, Havertown, PA 19083

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Paperback Edition: ISBN 978-1-78570-066-8
Digital Edition: ISBN 978-1-78570-067-5

A CIP record for this book is available from the British Library
Library of Congress Control Number: 2015945522

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Book design: John Volpato

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Contents

Preface by I. Hadjikyriakos, M. G. Trentin v

PRODUCTION, TRADE AND IDENTITY

Precious cloths & prestige technologies:
textile production from Pyrgos-Mavrorachi 3
Federica Gonzato

Inspiration, integration, trade connections: 21
Some evidence for Cypriot jewellery in Dark Age Greece
Anna Paule

Ship graffiti in context: A preliminary study of Cypriot patterns 41
Maria Michail

ARTIFACTS AND DECORATIONS

Investigating the bone artifacts from Early and Middle Bronze Age Cyprus 67
Polyxeni Ellina

Between Near Eastern and Minoan/Mycenaean traditions 79
The representation of the palm tree in Late Bronze Age Cyprus
Ilaria Caloi

LANDSCAPE AND URBAN ORGANIZATION

Tracing Hellenistic Salamis 97
Dimitris Vitas

Working with water	III
Procurement, consumption and water-based working activities at Middle Bronze Age <i>Erimi-Laonin tou Porakou</i> (2009–2011 seasons) <i>Luca Bombardieri, Francesca Chelazzi, Marialucia Amadio</i>	
Urbanization and urban identity in Nicosia (13th–16th centuries) <i>Philippe Trélat</i>	139
CYPRIOT SOCIETY	
Towards a history of the histories of Cyprus <i>Anna Cannavò</i>	161
Some remarks on the beginning of the cult of Apollo in Cyprus <i>Yannick Vernet</i>	179
Human bondage. The ultimate changes in the social status of <i>parici</i> in Venetian Cyprus (1560–1571) <i>Katerina V. Korrè</i>	197
The Venetian fabrics, their trade and use in Ottoman Cyprus: the list of fabrics <i>Iosif Hadjikyriakos</i>	211

Preface

...

*The glass palaces of the Doges are being pounded in a crystal mortar, strained through a prism.
Venice will never be far from me in Cyprus – for the lion of Saint Mark still rides the humid
airs of Famagusta, of Kyrenia.
It is an appropriate point of departure for the traveller to the eastern Levant...*

Lawrence Durrell, *Bitter Lemons of Cyprus*

So it was for us, a fair starting point toward the East.

The POCA 2010 was hosted in Venice, a city closely linked to the island of Cyprus, not only for the historical events but also for the numerous signs, still readable, in the two islands.

There are countless references to Cyprus in Venice: in palaces, primarily that of Queen Caterina Corner, in the church of Saints Giovanni e Paolo, where the skin of Mark Antonius Bragadin (the staunch defender of Famagusta) is guarded, in the *cicchetti* (small snacks usually accompanied by an aperitif) that preserve Levant reminiscences, in the spices, and especially in the famous wine of Cyprus (*Commandaria*), still today recalled in Venetian sayings.

The Venetian past, too, has many references in Cyprus where the evidence is focused on the fortresses and fortifications of Nicosia, Famagusta and Kerynia, in the lions that adorn them as well as in the traditional dishes and language.

The Venice edition of the conference celebrated two important events: the five hundredth anniversary of the death of Caterina Cornaro (1454–1510) and the twinning between the city of Venice and the city of Larnaca.

The most important anniversary in the year 2010 was for the conference itself, which achieves its tenth edition; ten events that have been a major point of encounter and engagement for young researchers from around the world who are concerned with the

history and archaeology of Cyprus. Initially, the conference was restricted to the study of archaeology, but over the course of the editions, the chronological interval of investigation has widened. With the Venetian edition we wanted to give a strong signal in this direction, with a call for papers addressed to scholars of different disciplines ranging from archaeology to art history, and from history to anthropology, by encouraging the submission of interventions concerning both antiquity and more recent times. This choice has been well received by the conference participants and by scholars who, for various reasons, have followed the conference.

A key element of the organization of POCA 2010 was the presence of academics dealing with subjects concerning Cyprus, who made themselves and their experience available to young scholars, listening to the reports and offering helpful questions and suggestions. Traditionally, each conference opens with a keynote. In Venice this was held in the prestigious seat of Ateneo Veneto and given by professor Mr. Graziadio who presented a speech entitled “The earliest contacts between Cyprus and Italy”. We take this opportunity to thank him once again for his contribution, which pointed out the ancient ties between the two territories, and also for his presence and participation in the conference program.

Thirty speeches were presented between the 29th and 30th of October 2010, divided into 4 sections: Production, Trade And Identity – Artefacts And Decorations – Landscape And Urban Organization – Cypriot Society. The program was rich with contributions that have ranged from archaeology to history and social history from the Bronze Age to the Eighteenth century. The debate that followed was lively and friendly, characterized by exchanges of points of view between scholars of different periods and areas, joined by their passion and interest for the history of the island.

The success of this edition is due primarily to the speakers, whom we thank. As a result of their constant work and commitment events like this become an important opportunity of growth and exchange.

As we mentioned earlier, an important contribution to the success of the conference was set up by the presence of academic members. Here we would like to thank prof. Demetrios Michaleides of the Department of Archaeology of the University of Cyprus and the prof. Filippo Maria Carinci, then dean of the Faculty of Humanities of the University Ca’ Foscari, who, as a representative of the University, welcomed all the participants and contributed to the creation and organization of this edition. A special thanks also goes to Mr Lorenzo Calvelli, young professor at Ca’ Foscari University, who has followed the entire program with interest, offering suggestions and ideas, and formulating a final report that highlighted the rich and diverse nature of the research presented. POCA 2010 was made possible thanks to the financial support of Ca’ Foscari University, the Humanities Faculty at Ca’ Foscari, the Cyprus Tourist Organization, the Cypriot Ministry of Education and Culture, and the municipality of Larnaca. We officially thank them all here.

This volume is intended to be a summary of those three days in Venice. Various events

PREFACE

and decisions have determined the publication of 12 contributions representing all eras and areas touched by all interventions.

Each article is the result of the work of scholars over the past four years, revised and updated both in the light of peer review and in the progress of the research.

The book we publish is, therefore, the *witness* to the Venetian edition; but, above all, it is an important contribution to the history and studies of it carried out by a new generation of scholars.

It was an honour for us, and a pleasure, to host such an event in this city, which, we hope, has been a appropriate point of departure for the traveller to the eastern Levant.

Iosif Hadjikyriakos
Mia Gaia Trentin

Working with water.
Procurement, consumption and
water-based working activities
at Middle Bronze Age
Erimi-Laonin tou Porakou
(2009–2011 seasons)

Luca Bombardieri, Francesca Chelazzi
and Marialucia Amadio

Collected data and results of the last fieldwork seasons at *Erimi-Laonin tou Porakou* revealed an interesting body of evidence mainly relying on the development of a community and rural settlement, with a peculiar handcraft character, during the Middle Bronze Age period.

The focus of the archaeological research project carried out by the Universities of Torino and Firenze, thanks to the scientific collaboration of the Department of Antiquities of Cyprus, was upon the use of differently oriented methods, topographical survey, systematic excavations of significant contexts and archaeometric studies on specific material assemblages, in order to approach the site investigation (Bombardieri 2010; 2011; Chelazzi and Davit 2010; Scirè Calabrisotto *et al.* 2012).

The site area of *Erimi-Laonin tou Porakou* lies on a high *plateau* on the eastern river

bank facing southward the Kouris Dam, just on the border between the Ypsonas and Erimi villages. The site was first identified as a result of a survey project focusing on the middle and lower Kouris Valley (Bombardieri *et al.* 2009a; 2009b). The preliminary evidence paved the way towards further investigations, aiming at a greater clarification of the occupation sequence and an increased understanding of the function and use of the different areas of the site.

The general chronology of the settlement sequence, as recorded by survey collections and excavation results on the top of the hill (workshop complex-Area A), the first lower terrace (domestic quarter-Area B), and the southern cemetery (Area E), hints at occupation throughout two main periods (Periods 1 and 2). At this point the most attested to is the earlier one, ranging from the beginning to the end of Middle Cypriote period, with two phases attested to within the sequence (Phases A and B); the following period (Period 1), apparently following a lengthy *hiatus*, is related to a possible sporadic use of the site area during the late-Hellenistic and Roman periods (Bombardieri 2009; 2011; Scirè Calabrisotto *et al.* 2012; Bombardieri 2012).

The main aim of this paper is to introduce a preliminary analysis of features and characters of the workshop complex organization, particularly focusing upon the use of water and liquid substances within the working processes performed in the area. The quantities of water and the supply sources will be analyzed, in order to possibly draw a clearer picture of the activities, use and function of the workshop complex.

Hence, we tried a sketch, drawn on two basic evaluation criteria to approach this specific analysis, which revealed an easy application and good final results. The selected basic criteria are:

- 1) Features of the working installations and processed quantities of water and liquid substances;
- 2) Characters and localization of the supplying sources.

Such a double-oriented analysis can produce a tentative answer to the whole basic questions related to this topic: How much water and liquid substances were processed in the workshop complex? Where were they processed? From which sources were they achieved?

The workshop complex: stratigraphy and chronology

The workshop complex cleared on the top mound extends over an area of 20 × 15 m, which is currently being investigated. This complex highlights the organization of distinctive spaces. The natural limestone bedrock has been carefully worked in order to construct a combined system of deep basins carved at different depths, connected to each other by a series of flow channels, thus outlining five discrete open space working areas (WA I to V) displayed on the northern wing of the workshop.



Figure 1: Erimi-*Laonin tou Porakou*. The Workshop Complex on the top mound (Area A).

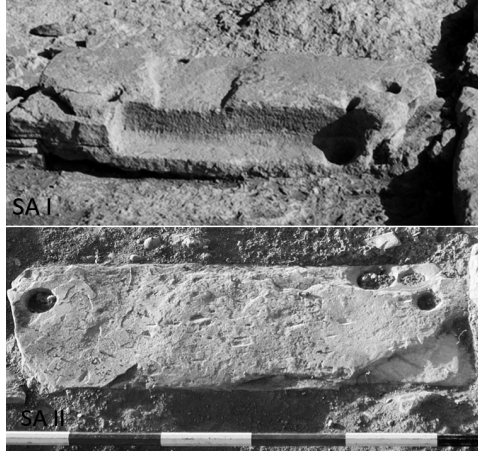


Figure 2: Workshop Complex. SA I, SA II. The stone thresholds.



Figure 3: SA II, Room B. Flat stone pavement and bin U.S. 444 (Phase A), built over the emplacement U.S. 442 (Phase B).

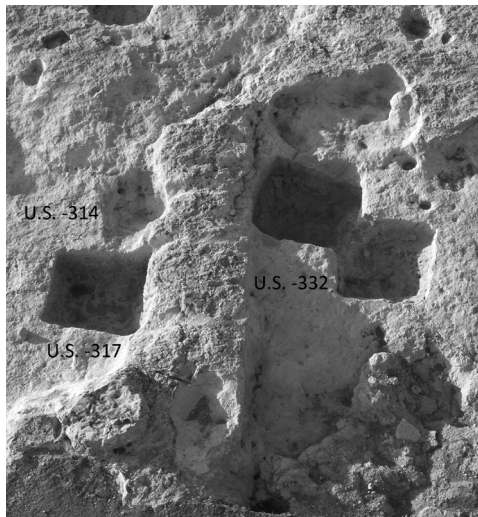


Figure 4: WA II, WA III. Squared basins (Type 1).



Figure 5: WA IV. The squared basin U.S. -373 (Type 1).

A series of roofed working and storage units extends southward the mentioned open working areas. At this point four were identified (SA I to IV), two of them completely investigated during the 2009–2011 fieldwork seasons, being the others partially over the actual limit of the excavated area (Fig. 1).

The complete extension of SA I was exposed as the entrance to the unit throughout the South-Eastern limit wall. The entrance is characterized by a huge limestone squared block carefully carved in order to create a step to access the floor of the roofed space. The door-socket and locking door devices, completely preserved, were also carved into the stone entrance block (Fig. 2). Opposite to the entrance, in the northern inner area of the room, a set of 4 storage *pitthoi* and a group of small vessels were found crushed *in situ*, leaning on the floor or inserted within. Two of the *pitthoi* were all around surrounded by a circle of irregular stones in order to fix them and possibly guarantee a better arrangement on the floor (Bombardieri 2011, Fig. 4.2).

The 2011 fieldwork season revealed the complete extension of SA II unit, which extends westward the larger SA I, having the same orientation. SA II is subdivided into two rooms (Rooms A and B) by an inner wall built in dry-stone masonry.

The entrance to the unit throughout the South-Western limit wall of Room B is again characterised by a huge limestone squared block equipped with circular pecked depressions intended for supporting the door pivot.

The large stone thresholds of SA I and SA II find comparisons from Alampra-*Mouttes*, where a not regularized stone threshold is attested in Building VI, Room 7 (Coleman *et al.* 1996, Pl. 5: c) and from Sotira-*Kaminoudhia*, where similar entrance blocks, even though not stepped and considerably smaller than the examples from Erimi-*Laonin tou Porakou*, were documented from Unit 25 in Area C (Swin 2003, 40; 87, Fig. 2. 11).

Thus, Room B of SA II can be considered as a small entrance room intended for storing pots as also confirmed by the presence of some plaster emplacements into the floor, as already recorded by similar devices at Marki-*Alonia*, possibly used for vessels or posts arrangement (Frankel and Webb 2006, LII 1009–1010; LVII 1530; CXII 2923–2924), and at Sotira-*Kaminoudhia* (Swin *et al.* 2003, Pl. 2.3a). Section 3 below will be dedicated to a systematic description and a deeper analysis of the working installations within the workshop complex.

As to the building technique, the analysis of the standing and the collapsed structures cleared that limestone slabs were used as basis of standing walls built on limits directly carved on the bedrock: with a bottom part of squared stones and a top elevation in mud-bricks and ‘plaster-bricks’ and wooden framed structure.

The stratigraphic deposit cleared by the excavation within SA I and SA II revealed a sequence of episodes of construction and use, sudden destruction and re-occupation on later floors, definitively marking out two following phases of use (Phases A and B) (Bombardieri 2011).

Both in SA I and II the transition to the most recent Phase A is marked by the construction of an upper new floor, made by a white and hard plaster-like layer, which

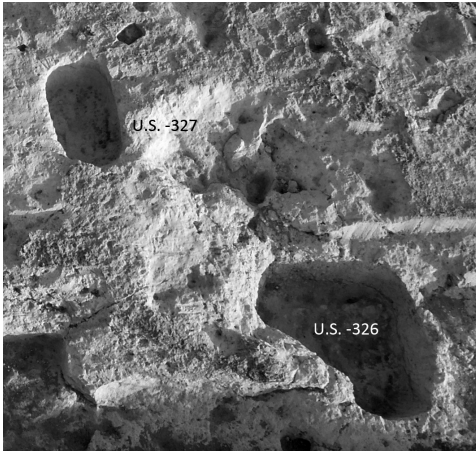


Figure 6: WA I. Elliptic and irregular basins (Types 2 and 4).



Figure 7: WA IV. The circular basin U.S. -379 (Type 3).



Figure 8: SA I. Emplacements; SA II. Emplacements and bench.

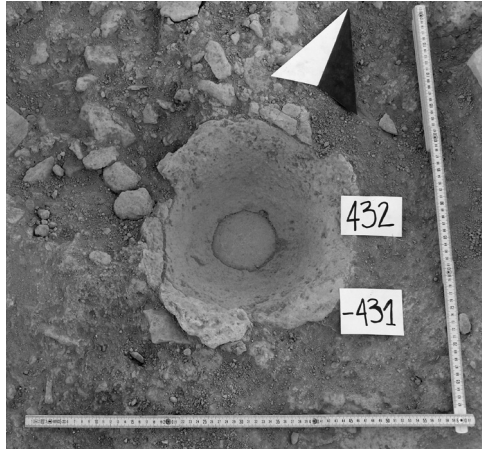


Figure 9: SA II, Room B. The emplacement U.S. -431.



Figure 10: SA I. The hearth U.S. 384.



Figure 11: SA I. RP *pitbos* (SAI.354.1).



Figure 12: SA I. DP *pitbos* (SAI.354.4).



Figure 13: SA II. Ceramic and small finds assemblage from rooms A and B.



Figure 14: SA II. RP jug with incised/punctured decoration (KVP11.A.427.10).

directly leans over the stones debris and beaten mudbricks filling layer corresponding to the collapse of the walls of the former Phase B. The wide plaster floor is contemporary with the construction of small pavements built with flat stone slabs for specific functions, for example in connection with stone basins or bins. This is the case of the slabs made bin Ft. 9 (US 444) in SA II, Room B, which finds strict parallels from Marki-*Alonia* (Frankel and Webb 2006, I-63) (Fig. 3).



Figure 15: SA II. RP handled bowl (KVP11.A.448.1).

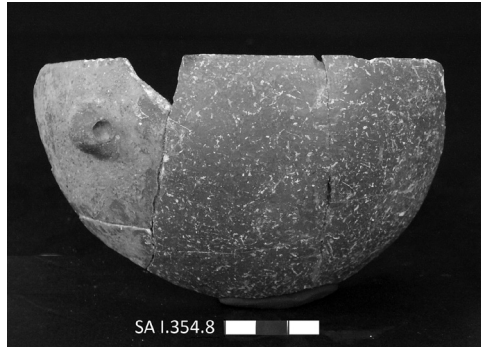


Figure 16: SA I. RP hemispherical bowl with pierced lug (KVP09.SA.354.8).



Figure 17: SA I. The pithos SA1.354.4 and the spouted juglet SA1.354.9 in situ.



Figure 18: SA I. The spouted juglet SA1.354.9.

After the main use of the area, corresponding to Phase A, the following collapse of the Phase A walls was likely caused by a sudden event; after that the workshop complex was not in use anymore.

The ceramic assemblage of the two Phases clearly hints at a production typical of South Coast Middle Bronze Age horizon, characterized by a large percentage attestation of Red-Polished and, at a lower percentage, of Drab-Polished wares.

The earlier Phase B assemblage shows a wide standard typological repertoire, where there are highly attested globular or ovoid jugs with cut-away rim and applied decoration, often a snake-like pattern. Counterparts for the whole assemblage are widely diffused. Examples comes from funerary contexts dated back to MC II in Katydhata (Åström,

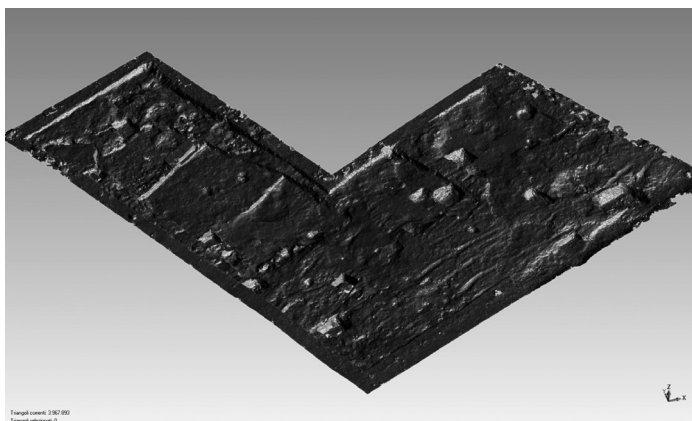


Figure 20: 3D model of the Workshop area.

Flourentzos 1989, 103, fig. 92), from Marki-*Alonia* (Frankel and Webb 2006, fig. 4.38) and Alambra-*Mouttes* (Barlow 1996, figs. 55–56), from MC I deposits and from burial contexts at Kalavassos-*Panagia Church* cemetery (Cullen et al. 1986, fig. 32–35), as well as from the cemetery area recently exposed at Psematismenos-*Trelloukkas* in the Maroni valley (Georgiou et al. 2011).

An interesting ceramic assemblage is documented by the former Phase A as well. The Black Slip Ware medium size jar KVP11.SAIIa.423.6, as well as the jars KVP11.A.427.10, found within ‘Room a’ of SA II, and KVP09.354.SA.6, discovered in SA I., show a similar incised decoration pattern characterized by punctured dots filling rectangular panels (Figg. 13, 14). The technique and general patterns of the decoration seem rather close to the typical *punctured decoration* of the so-called Episkopi ware (Tatton-Brown 1979, 35–36). This variety, defined by Stuart Swiny as Red Polished Punctured ware owing to its standard recurrent incised decoration (Carpenter 1981, 64), was first discovered in a stratified context at Episkopi-*Phaneromeni* with a decorative style diagnostic of the LC IA period (Herscher 1976, 11–19). Similar dating can be proposed for the small RP IV spouted juglet (KVP09.354.SA.9), comparable to a deep collar rimmed bowl from a chamber tomb in Mesoyi-*Katarraktis* dated back to the MC III – LC IA period (Herscher and Fox 1993, 72; 71, fig. 2), even though this one is considerably larger than the Erimi-*Laonin tou Porakou* example.

Furthermore, a collection of clay spindle-whorls with or without incised decoration, as well as a relevant assemblage of stone processing tools in ground and chipped stone come from the SA I and even more from SA II deposits, where an assemblage of seven whorls were found from the only Room B (Fig. 13). A more detailed analysis of the basic functional groups within the ceramic assemblage will be discussed below in section 4.



Figure 19: SAI. RP spouted basin modified (SAI.362.11).



Figure 21: 3D model of pithos SAI.354.1



Figure 22: 3D model of pithos SAI.354.4



Figure 23: 3D model of pithos SAI.354.7

The workshop complex: working installations

Structures for water-based activities: basins and flow channels

As stated above, the workshop complex is characterized by a system of inter-connected structures built onto or directly carved into the natural limestone bedrock, among which the structures related to water-based activities take up a relevant function. These are basically the basins and flow channels and the emplacements for *pithoi* and large containing vessels.

A series of twenty-two basins can be numbered, pertaining to different types and distributed within the open-air areas of the workshop complex as follows: WA I: 6 basins;

WA II: 6 basins; WA III: 2 basins; WA IV: 5 basins; WA V: 3 basins (Table 1).

The overall shapes and profiles of the carved basins point to four different types, maybe connected with a specific function.

TYPE 1. The most common type is the *squared basin*, that shows right angles and a width of 0,90 × 0,90 m. on average, such as the basin Ft. 25 (US -317) of WA II, measuring 0,95 × 0,90; the basin Ft. 30 (US -373) of WA III of 0,85 × 0,85 m.; Ft. 28 (US -359) in WA III, with measures of 0,90 × 0,70 m.; the basin Ft. 37 (US -399) of WA V measuring 0,85 × 0,85 m. Within the group, the basin Ft. 26 (US -332), shows peculiar features: double squared linked basins, which have different width (1,08 × 1,12 m. the bigger one; 1,00 × 0,93 m. the smaller one) and different depth in order to make possible the flow from one to the other (Fig. 4). The inner wall and the bottom of each basin is coated with an hard grey plaster-like covering, possibly with the function to waterproof the structure, except for the small squared basin Ft. 17 (US -303) of WA I (0,29 × 0,20 × 0,12 m.), cut into the bedrock without any coating. The bottom of Ft. 30 (US -373) is characterized by an arrangement partly built with plaster, partly cut into the western wall of the basin, in order to create two similar elliptic niches, maybe used to collect the fluid materials coming from outside (Fig. 5).

TYPE 2. The *elliptic basin* is a rather usual type into the range of workshop complex.

However just one, the basin Ft. 16, US -327 (1,26 × 0,78 × 0,40 m.) of WA I, shows a rounded, carefully carved profile, and a more flattened bottom. As to the dimensions, it resembles the basin Ft. 24 (US -314), located in WA II, which measures 0,98 × 0,64 × 0,20 m. Nevertheless, the latter Ft. 24 has a more irregular profile than the above mentioned Ft. 16 (Fig. 6). Another basin has to be mentioned within this typology, the Ft. 33, US -389 (1,70 × 1,00 × 1,00 m.), cut on the limestone floor of WA IV. Although its profile seems to be more similar to the squared type, its rounded angles and its bottom shape are comparable to the elliptic basins.

TYPE 3. A huge number of *circular basins* were carved into the bedrock of workshop complex, as well. They are characterized by a circular opening and rounded section profile. The diameter and the depth can differ from basin to basin. The maximum width is 0,67 m. (Ft. 22, US -322 of WA II); the basins Ft. 31 (US -331) of WA IV and Ft. 39 (US -403) of WA V measure 0,40 m. in diameter; the basin Ft. 29 (US -379) of WA III measures 0,35 m. in diameter (Fig. 7). Furthermore, there are the small size basins of 0,20 m. diameter average, usually associated with the bigger basins (squared, elliptic or circular), such as Ft. 38 (US -405) related with the squared basin Ft. 37 (US -399) in WA V, or Ft. 20 (US -308) and Ft. 23 (US -324) of WA II respectively linked with the circular basins Ft. 21 (US 310) and Ft. 22 (US -322). Most of the circular basins have a shallow depth of 0,10 m. on the average. However, some of them were cut more deeply, such as the basin Ft. 39 (US -403) measuring 0,40 m. depth, as well as Ft. 38 (US -405), both located on WA V.

TYPE 4. The last type comprises the *irregular shape basins*. Four of them are located on WA I: Ft. 18 (US -305), Ft. 19 (US -306), Ft. 15 (US -307), Ft. 14 (US -326); just one in WA III, Ft. 27 (US -413). Among these basins one has a particular relevance. Of note is a big basin located on the northern limit of WA I, named Ft. 14 (US -326). It is characterized by irregular rounded opening and section profile, measuring approximately 1,70 × 1,55 m., and two small niches, of about 0,20 m. width, in the inside wall (Fig. 6). The basin shows a quite high depth of 1,10 m. and its bottom is coated with a hard plaster covering. The other basins have a medium depth of 0,20 m. approximately and a rounded opening of different width, from 0,67 × 0,33 (Ft. 27, US -413), to 0,20 × 0,12 (Ft. 18, US -305).

A further type can be added to the previous ones: *the slab-made basins or bins*.

The basin Ft. 4 (US 383, 384) of SAI and the basin Ft. 9 (US 444) built into the Room B of SAII belong to this category. It concerns two rectangular structures, which extend 0,50 × 0,40 m. approximately, made with four limestone slabs vertically displayed.

The primary function of these basins is collecting the fluid material coming from the flow channels correlated with them. Several shallow sloping channels have been found within the workshop complex. Some of them show an irregular shape, such as US -320, US -321; a long angle-like carved channel, slopes from the western limit of WA II, making easier the flow to the circular basins Ft. 20 (US -308), Ft. 21 (US -310), Ft. 22 (US -322), Ft. 23 (US -324). Particularly interesting is the long channel U.S. -401, which slopes from South East towards the North West of WA V (Fig. 1). This channel, cut into the bedrock with a maximum width of 0,45 m., has an irregular, curved, profile interrupted by a deep rounded basin (Ft. 39, U.S. -403), possibly aiming at regularizing the channel flow.

It is interesting to note that the percentage of each type of basins shows recurring features within the workshop complex. The most evident recurring value is related to the presence of squared basin within each working areas except for WA I where the squared basin Ft. 17 (US -303) has smaller size than the standard ones. In WA I, II, IV the squared basins are associated with an elliptic basin and surrounded by a group of circular or irregular basins (four in WA I, II; two in WA IV) (Table. 1; Fig. 1).

Emplacements

A characteristic features of the closed Storage areas are the emplacements, set into the floor as supports for medium size vessels and *pitboi*. Three emplacements have been found within SA I. Two of them, Ft. 1 (US -374), Ft. 3 (US -376), show a circular opening of 0,25 m. diameter, and a depth around of 0,20 m. Both emplacements have been all around surrounded by a circle of big stones in order to fix two *pitboi* (respectively the *pitbos* KVP09.354.SA3 into the emplacement Ft. 1 and the *pitbos* KVP09.354.SA1 into the emplacement Ft. 3) and guarantee a better stability (Fig. 8).

A similar round structure made up by big stones has been displayed in the area between the *pitboi*, where two small bowls have been found. In this case the support was created without cutting the emplacement into the plaster floor.

Other two emplacements, Ft. 6 (US -431), Ft. 7 (US -442), Ft. 8 (US. -440) rounded in shape, (0,30 m. diameter) lie on the plaster floor of Room B of SA II. They are carved into the floor, lined with a thick and homogeneous plaster-like covering as well as Ft. 1 and Ft. 3 of SA I. Among them just the emplacement Ft. 6, has been entirely dug. It shows a peculiar feature, having the bottom reinforced by a diabase stone (Figs. 8 & 9).

Whereas the three emplacements of SA I were thought to be used as vessel support, the primary function of the three emplacements of SA II were different. Presumably they were set up to adjust the wooden posts of a temporary structure and just in a second phase they were re-used to fix the medium and big size vessels. This hypothesis can be supported by the finding, nearby Ft. 6, of large jar with disc base, which perfectly fill the inner space of the emplacement.

Other structures and installations: thresholds, post holes, hearths, benches

The use of huge limestone squared blocks as *thresholds*, during the Phase A, can be mentioned as well. Such step blocks allowed the entrance into the inner space of SA I and II, as mentioned above. The doorways, associated with big squared and flat slab stones walls, are located on the south-western corner of the storage rooms (Fig. 2).

The threshold Ft. 5 associated with wall 1 (US 411), of SA I, measures 1,85 × 0,65 m.; it is carefully carved in order to create a step to access the floor of Room 1, characterized by a setting for the door-socket.

The entrance of limit wall 4 (US 424), of SA II, is smaller than the one of SA I, measuring 1 × 0,45 m. The limestone block shows two door-sockets completely preserved, associated with two rounded settings of 6 cm. diameter, maybe used as locking-door.

The *post holes* within the workshop complex are often associated with the linear cuttings possibly used to set the temporary structures. This kind of arrangement was functional to cover such a wide space. The best example is provided by the structures cut on the bedrock floor of WA III. Here the bedrock limestone floor seems to be carved in order to create a corner, maybe functional to set the basement for closing structure of WA III. In fact the two straight cuttings, US -415 sloping toward North and US -416 leaning toward East, are related with two rounded cuttings of 0,08 m. in diameter, US -417, -418 (Ft. 32), possibly used to set the wooden post of temporary structures.

Other post holes have been found on WA II and WA IV floor. These cuttings are characterized by a diameter about of 0,12 cm. and a variable depth of 0,10 – 0,20 m. approximately. The upper block on the east side of the wall US 425 of SA II, Ft. 13, shows another kind of feature. It is characterized by two settings, one with a rounded shape, of 0,06 m. diameter (U.S.- 445), the second one, associated with

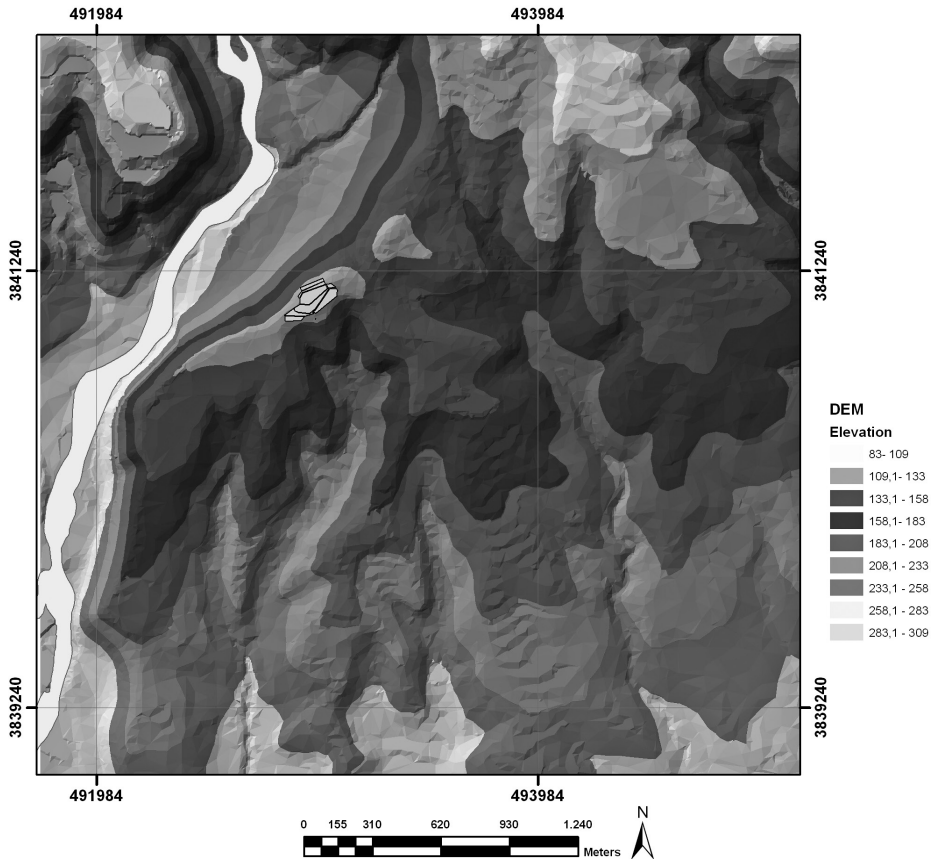


Figure 24: Digital Terrain Model (DTM) of the site surroundings with the location of the site and the river Kouris as from the 1980 Topographical map 1:5, 000.

the first, characterized by a straight profile, measures 0,026 × 0,065 m. (U.S. -446). Both them was used to set the upper structure of the wall in perishable material, possibly wooden frame structure.

Just one structure associated with the firing activity has been found within the workshop complex. It lies flanking the North-Eastern limit of SA I. It is composed of a built stone hearth Ft. 4 with rectangular chamber, US 384, (0,75 × 0,60 m.) and ashes and burnt debris filling. It is related with the basin US 383, similar for arrangement and measuring.

The *hearth* was built with small stone slabs vertically displayed and coated with plaster. This arrangement maybe was functional to preserve the temperature into the burning chamber. It is particularly interesting the evidence of two fragmentary ceramic vessels

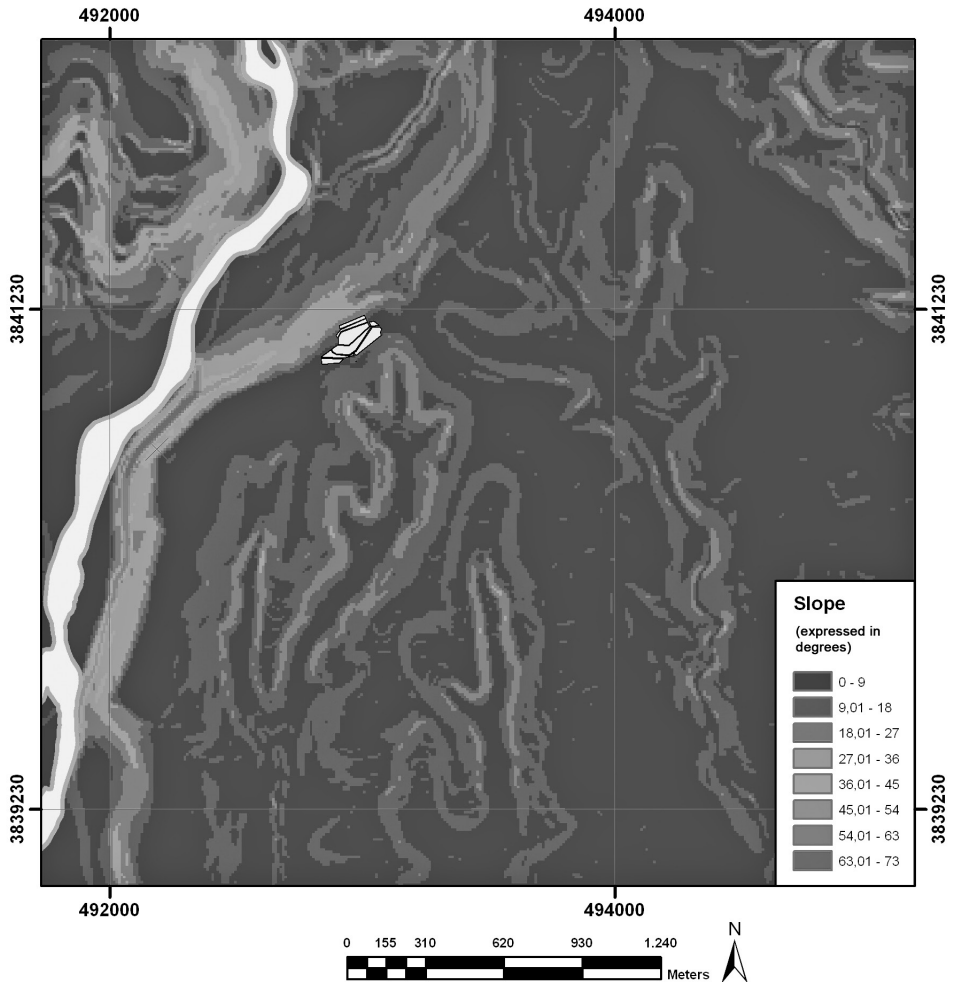


Figure 25: Slope map of the site and its surroundings (the slope is expressed in degrees).

found within the hearth chamber. The neck of first vessel was directly adjusted on the neck of the other, in order to create a sort of inner channel, which directly led to the inner hearth chamber. The arrangement of vessels, not casual, could be in some way related to the primary use of hearth, certainly linked with firing activity (Fig. 10).

The actual documentation almost completely lacks evidence, to provide elements about the use of *benches* into the workshop complex. Just one bench Ft. 11 (U.S. 447) has been found, lying on the north-western corner of Room A of SA II, associated with a milling installation (Fig. 8). The structure, of 0,40 × 0,40 m. approximately,

was made up with an hard plaster, it is higher of 0,30 m. than the level of the floor. This arrangement was presumably thought to make more comfortable the grinding activities.

Functional aspects of ceramic assemblage from the workshop complex: containing and storing vessels, pouring and drawing vessels

Two different “functional groups” can be identified within the ceramic assemblage of workshop complex. The first group includes the containing and storing vessel, the second one the pouring and drawing vessels (Fig. 30).

The containing and storing vessels assemblage

As far as the containing and storing vessels assemblage is concerned, a group of eight *pitboi* from Phase A of SA I and SA II is particularly relevant: KVP09.354.SA1, KVP09.354.SA3, KVP09.354.SA4, KVP09.362.SA14, KVP09.351.SA20, KVP09.351.SA21 found within ‘Room 1’ of SAI, KVP11.A.438.1 was found on the floor 438 of ‘Room a’ of SAII; KVP11.SAIIb.419.4 discovered within the ‘Room b’ of SA II (Figs. 11, 12).

They show some standard feature into the repertoire such as the vertical neck, an ovoid body and round or disk base the pointed or angle-like vertical handle, the applied/incised decoration on rope-like motif on the bottom of the neck, sometimes decorated with round finger impression (KVP09.354.SA3, KVP11.SAIIb.419.4), a medium height includes between 0,70–0,80 m. Though most of them belong to the Red-Polished ware type, some *pitboi* were also made in Coarse Ware (KVP11.SAIIb.419.4) and in Drab-Polished (KVP09.354.SA1) (Fig. 12).

Several jars can be included into the containing vessel assemblage, as well as a respectable group of jugs and juglets. The jars repertoire, in Red-Polished, Coarse and Black Slip wares, includes vessels of different size; the measures ranges from 0,10 m. diameter × 0,15 m. height on the average (KVP11.A.427.10, KVP11.A.427.11, KVP11.SAIIb.420.2); to 0,20 m. diameter and an height of 0,20/0,25 m. approximately (KVP11.SAIIa.423.6, KVP11.A.419.23, KVP09.362.SA.10). The usual decoration pattern shows incised parallel lines, creating a zig-zag motif, sometimes associated with punctured patterns (Figs. 13, 14).

The medium size jugs and the small juglets are actually well attested within the containing and storing vessels assemblage. Among these ones, the RP jug KVP11.SAIIa.423.7

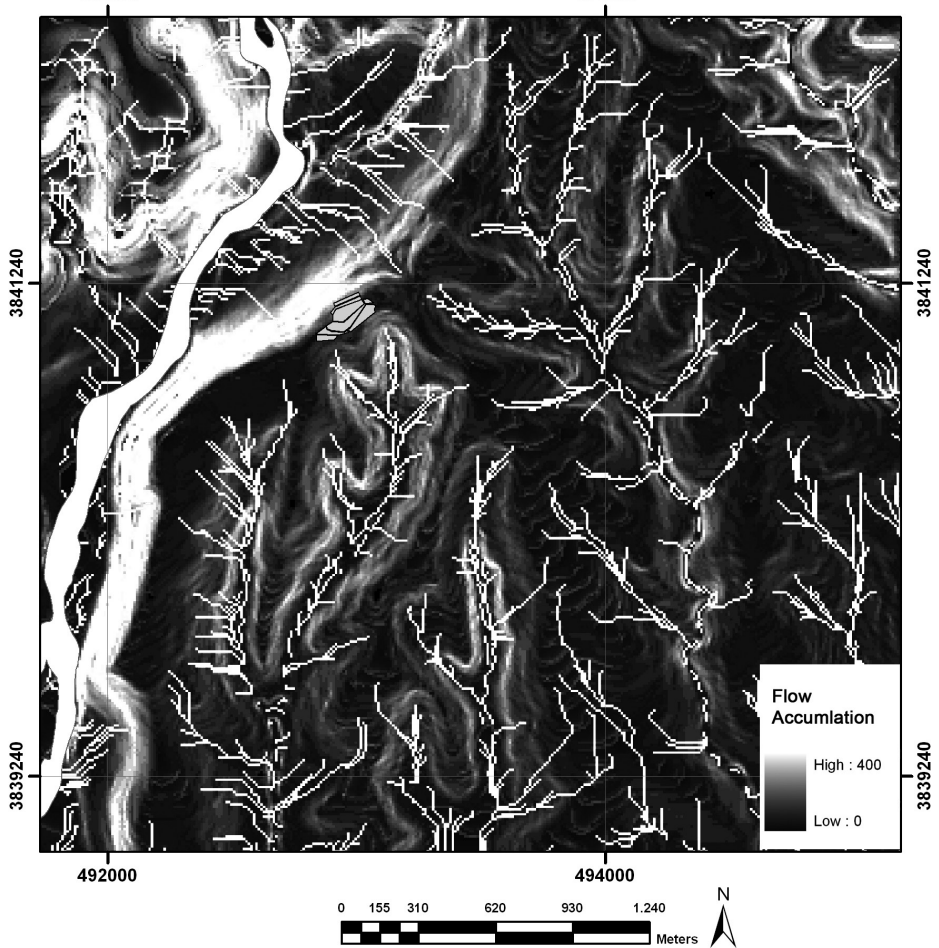


Figure 26: Flow accumulation map with stream channels (defined on flow accumulation ≥ 50).

has an applied and incised decoration on geometric pattern on the lower part of its neck as well as the juglet KVP11.SAIIa.434.8 in Drab Polished Grey Core, which has applied and incised decoration on geometric pattern on the lower part of the neck, while on the outer wall, an applied decoration of as snake-like wavy pattern.

The pouring and drawing vessels assemblage

The pouring and drawing vessels assemblage is formed by bowls, spouted bowls together with other objects functional to pour or add substances to the main liquid content of the containing vessels.

Both the bowls of Phase A and the bowls of Phase B are characterized by an hemispherical body, pointed rim and a medium diameter of 0,15 m. In some case such as KVP09.354.SA.8, KVP11,SAIIa.423.5, KVP11.A.448.1 they can be equipped of lugs or of horizontal handles, sometimes rounded, sometimes double pierced, often decorated with incised linear motif (Figs. 13, 15, 16).

Most of them were undecorated, but in some cases the incised decoration pattern is instead very elaborate. The presence also of a small spouted juglet (KVP09.354.SA.9) is relevant within this assemblage. It is decorated with a linear incised motif discovered just on the inside bottom of the big *pithos* KVP09.354.SA.1 (Figs. 17, 18).

Among the pouring vessels some simple or spouted basins can be included from SAI and SAII, belonging to Phase A and Phase B, and a small *askos* coming from the Room B of SA II.

Two fragmentary basins have been found in the workshop complex, KVP11.A.422.6 and KVP11.A.423.9. They are representative of RP vessels with curve profile and a diameter of opening respectively of 0,20 m. and 0,29 m., without any decoration. The spouted basin KVP09.362.11, instead, has peculiar shape and is characterized by two applied lugs on the rim with incised decoration motif and an hole, pierced on the bottom of its base after firing, possibly as the result of a secondary use of the basin as “funnel” (Fig. 19).

The RP *askos* KVP11.SAIIb.420.1 has cut away rim, short neck, vertical handle rim-to-shoulder, ovoid irregular body and two little rounded feet (the third is missing) on the lower rounded part of the vessel (Fig. 12). There are two pierced lugs on the rim, three on the neck and four on the shoulder. The decoration on the handle is incised, while the one from the neck to the body is applied and incised on “snake-like” wavy pattern.

Water use in the workshop complex

The presence in the workshop area of basins and channels and, in particular, their spatial arrangement, seem to suggest that this area was used for a production activity whose processing involved the exploitation of liquid substances; basins with variable dimensions, linked with each other by channels and located in strategic positions, often alternated with wide empty spaces, indicate an economic production presumably articulated in subsequent phases.

An interesting research topic is represented by the investigation concerning the liquid quantity processed in the area. Through the laser scanning 3D mapping of the areas

WA I-V (Fig. 20), it has been possible to estimate that main basins, in a full capacity condition, could collectively contain c. 8.000 litres of water (Table 2). We presume that, for a productive processing articulated in sequential phases, not all the basins were contemporary filled with water, but it is certain that this data is fairly high. Moreover, if we consider also the capacity of *pitthoi* in the roofed units (SA I-II), the amount rises to c. 8.500 litres of water (Table 3). In fact, at this moment, only three *pitthoi* from SA I have been reconstructed and restored (nn. 1, 4 and 7) and they could eventually contain respectively 30, 140 and 10 litres of water (Figs. 21-23). Ascribing the numerous *pitthoi* potsherds found in the roofed units to one of the three 'standards' and ascribing them to the three 'standards' by analogy of their the dimension of rim, walls and base, we have summarily estimated, in fact, that the total amount of water contained in the SA I-II *pitthoi* could be about other adjunctive 500 litres (Table 3).

Subsequently, we go back on the investigation of the economic activity performed in the area because it is difficult to propose a functional interpretation of the area in this first excavation phase; at the present moment we are trying to answer to the successive question about the availability of natural resources able to provide a so large water quantity, considering that water was used for a substantial community activity.

Water was an important natural feature for site location decision making since the early beginning of the Prehistoric period. In light of this settlement feature, the topographic location of Erimi- *Laonin tou Porakou* completely reflects the pattern: the choice of places for new site foundations during Early and Middle Bronze Ages was primarily affected by the presence, nearby, of perennial water sources because it is plausible that the economic background was mainly based on agricultural activities (Swiny 1981, 56 and 80-81; Swiny 1989, 16-17).

Moreover, the varying annual precipitations and the river environment offered a dense vegetation, mainly composed of bulrushes and reeds. Ethnographic comparisons indicate that, still today, these plants are exploited for wickerwork, plaited baskets and mats (Gheorghiu 2003, 40). In addition, on a practical level, proximity to water sources played a fundamental role in the cyclic process of construction-reparation-deconstruction-reconstruction of domestic architectonic structures (Gheorghiu 2001, 21; Gheorghiu 2003, 46).

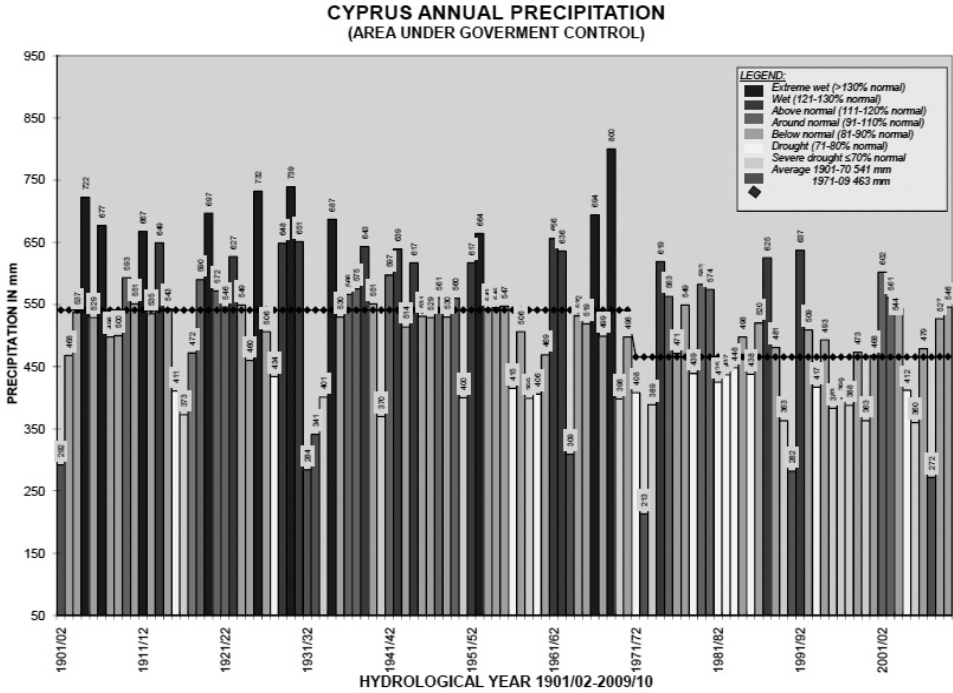


Figure 28: Cyprus annual precipitation from 1901 to 2010 (from: Water Development Department, Ministry of Agriculture, Natural Resources and Environment).

Environment and resources

Water resources

The Kouris river, which remained perennial until the recent building of a dam in 1979 (Fig. 24), undoubtedly represented an important source for the settlement of Erimi – *Laonin tou Porakou*: it was used for its freshly abundant waters as well as for its networking features, connecting the Troodos Mountains to the sea. Nevertheless the route from the site to the river bed is characterized by an extremely difficult slope with an inclination varying from 28 to 45 degrees and arriving to 74 degrees at South-Western side of site (Fig. 25).

Despite the unquestionable relevance of Kouris river for community activities, it is possible to hypothesize that the daily and most frequent supply could have come from other closer sources as well.

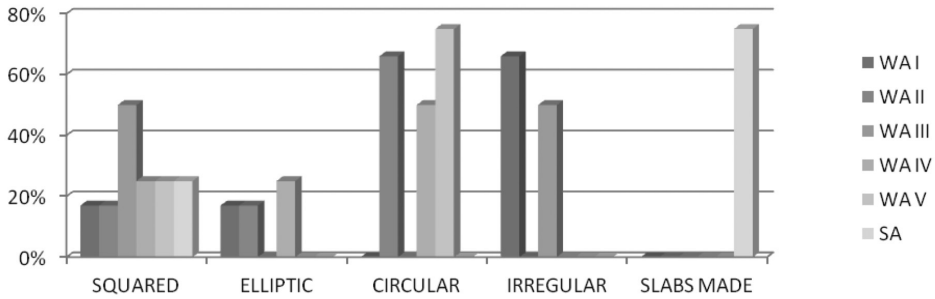


Figure 29 – Graph 1: Percentage distribution of basin types within the Workshop Complex.

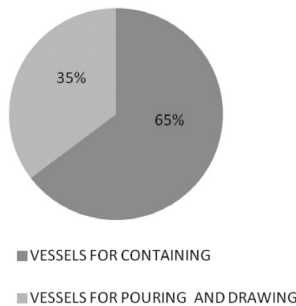


Figure 30 – Graph 2: Functional groups distribution within the ceramic assemblage.

South and South West of the site, in fact, two little valleys indicate the presence of two possible minor accumulation basins (Fig. 26) and up to 1980 a little stream was recorded in the maps (source: Sheet 53/XXII, Topographical Map Series D.L.S. 17 [D.O.S. 155], Scale 1:5.000, published in 1980 by the Department of Lands and Surveys, Cyprus). Comparing the location of these two possible streams with the slope map, it is evident that non only the streams are located more closely to the site, but also that their accessibility was extremely easier than the river. Unfortunately, the pottery assemblage from the workshop area has not shown pots specifically designed to extract or carry water, neither vases with particularly arranged holes or handles to fix ropes nor vases with arched bases for the multifunctional transport strategies (Gheorghiu 2003, 48). Nevertheless ethnographic analogies force us to speculate that the daily transport of water from these streams to the settlement was carried out using, for example, leather bags or plaited baskets (Rowlett 2003, 82–83).

Another hypothesis concerns the use of rainwater as possible source. As a possible source eventhough there are no traces of groundwater collection, which was usually drain from the wells (Fig. 27).

U.S.	WA / SA	Basin type
384	SA I	Slabs made basins/bin
444	SA IIb	Slabs made basins/bin
-303	WA I	Type 1. Squared basins
-327	WA I	Type 2. Elliptic basins
-305	WA I	Type 4. Irregular basins
-306	WA I	Type 4. Irregular basins
-307	WA I	Type 4. Irregular basins
-326	WA I	Type 4. Irregular basins
-317	WA II	Type 1. Squared basins
-314	WA II	Type 2. Elliptic basins
-322	WA II	Type 3. Circular basins
-310	WA II	Type 3. Circular basins
-308	WA II	Type 3. Circular basins
-324	WA II	Type 3. Circular basins
-332	WA III	Type 1. Squared basins
-413	WA III	Type 4. Irregular basins
-359	WA IV	Type 1. Squared basins
-373	WA IV	Type 1. Squared basins
-389	WA IV	Type 2. Elliptic basins
-331	WA IV	Type 3. Circular basins
-379	WA IV	Type 3. Circular basins
-399	WA V	Type 1. Squared basins
-403	WA V	Type 3. Circular basins
-405	WA V	Type 3. Circular basins

Table 1: SA I. RP *pitbos* (SAI.354.1).

Conveyors for the collection of rain and ground water were discovered in several Late Bronze Age sites, such as Alassa and Enkomi (Kampanella *et al.* 2003) and, in that period, the construction and use of these structures on a domestic and/or productive scale was extremely diffused, as it is represented by the several evidences from the Basin Building and House B in Toumba tou Skourou (Vermeule and Wolsky 1990, 47–68; 99–130).

Despite the lack of these arrangements at Erimi-*Laonin tou Porakou*, unroofed surfaces are very wide and easily accessible and it is possible also that basins as well as *pitboi* could be filled directly by rainwater.

Although the island of Cyprus is catastrophically undergoing a desertification process affecting the whole Mediterranean basins, only recently precipitations began to fall dramatically. From 1901 to 2010, and in particular in last 30 years, the Cypriote annual precipitation average has dropped from 541 mm. to 463 mm., passing from an alternation

of normal and wet seasons to climate ranging from normal to severely drought (Fig. 28) (source: Cyprus Annual Precipitation survey. Ministry of Agriculture, Natural Resources and Environment, Water Development Department). In particular the Limassol region falls in a Precipitation Zone characterized by a mean annual level of 400–500 mm. (source: average Annual Precipitation Map 1957–1980 of Cyprus. Scale 1:250.000. 1 ed., 1983. Ministry of Agriculture and Natural Resources, Meteorological Service), that is above the 300 mm. minimum required for sustainable agriculture (Issar 1995) as well above the 240 mm. minimum required for dry cereal cultivation in the Near East (Perrin de Brichambaut 1963).

Palaeoclimate

A common opinion is that there have not been drastic climatic changes since prehistoric times in Cyprus (Stanley Price 1979, 13; Jones *et al.* 1958; Frankel and Webb 1996); it is therefore reasonable to assume that annual precipitations should have a value similar to that recorded today. What has drastically changed is, in this case, the amount of tree cover and the diffusion of dense forests at low latitudes (Burnet 2003).

Palaeobotanic evidence from Marki-*Alonia* (Frankel and Webb 1996, 223–226) and from Lemba -*Lakkous* (Colledge 1985), in fact, delineates the presence of a flora array mainly characterized by grape fig, olive, vetch, barley and several other cereals, that is a vegetation range similar to the present arrangement. On the basis of these assumptions, therefore, it is possible to hypothesize that there has been no significant changes in the Cypriote climate since the Neolithic period (Hadjiioannou 1987). Differently other scholars (Issar 1995) state that the Middle East climate varied considerably over the last 10.000 years on the basis of the oxygen levels in several carbonate deposits in lakes and stalagmites in caves. These evidence points to an alternation among colder and warmer periods; in particular it delineates a warm period in 2100–1400 BC that probably could be the reasons for the abandon, for example, of some sites in the Near East as Subir in northern Iraq or Arad in Negev; another pick in oxygen levels is recorded between 500 and 800 AD and it should be correlated with a phase of rain reduction and, consequently, water lowering in Dead Sea. Nevertheless, there is no evidence of this phenomenon in Cyprus and, if there was, it would not have had a sufficient effect to produce desertification or evident climate alterations. (Frankel and Webb 1996, 17). It is therefore, probable that during Bronze Age the climate in the Episkopi region was similar to the current: a Mediterranean semi-arid climate, with a mean daily temperature average varying between 13° C (44F) in winter and 26° C (77 F) in summer (Swiny 1982, 2–3).

The severe reduction in the tree cover was chiefly caused by human destructive impact on the environment since the Roman period and, in particular, deforestation activities (Burnet 2004). Actually in the Kouris valley the flora array is formed by carobs (*Ceratonia Siliqua*) and wild olives (*Olea europaea*), alternated with wide maquis areas of thorny brooms (*Calycotome infesta*)

Basins	Volume	Water capacity
US. 303-	6960 ($\pm 1e-06$) cm ³	6,96 litres
US. 314-	48640 ($\pm 1e-05$) cm ³	48,64 litres
US. 317-	256500 (± 0.0001) cm ³	256,50 litres
US. 322-	77564.352 (± 0.01) cm ³	77,56 litres
US. 326-	2189000 (± 0.001) cm ³	2189,00 litres
US. 327-	393120 ($\pm 0,0001$) cm ³	393,12 litres
US. 331-	10053.097 (± 0.0013) cm ³	10,05 litres
US. 332-	1618680 (± 0.001) cm ³	1618,68 litres
US. 359-	378000 (± 0.0001) cm ³	378,00 litres
US. 373-	578000 (± 0.0001) cm ³	578,00 litres
US. 389-	1700000 (± 0.001) cm ³	1700,00 litres
US. 400-	289000 (± 0.0001) cm ³	289,00 litres
US. 403-	52810.173 (± 0.0068) cm ³	52,81 litres
TOTAL WATER CAPACITY		7598,32 litres

Table 2: SA I. RP *pithos* (SAI.354.1).

Storage pot Type	Volume	Water capacity	Capacity from reconstructed pots	General capacity from hypothesized pots
<i>Pithos</i> n. 1	27682,884 ($\pm 0,00005$) cm ³	27,68 litres	27,68 litres	221,44 litres (8 pots)
<i>Pithos</i> n. 4	141062,168 ($\pm 0,005$) cm ³	141,06 litres	141,06 litres	-
<i>Pithos</i> n. 7	9971,8286 ($\pm 0,00049$) cm ³	9,97 litres	9,97 litres	59,82 (6 pots)
TOTAL WATER CAPACITY:			459,97 litres	

Table 3: SA I. RP *pithos* (SAI.354.1).

and spiny burnets (*Poterium spinosum*). Recent paleofloral studies, however, show a different picture regarding the vegetation coverage of the valley. The Chalk Plateau, in fact, was originally covered by a dense vegetation and two primary forest types covered this area: a forest characterized by the association of carob and oak (*Quercus Coccifera*) with a possible understory of mastic (*Pistacia Lentiscus*) or a forest characterized by the association of Cyprus (*Cupressus sempervirens*) and juniper (*Juniperus Phoenicia*) with the frequent presence of wild olive. At the Neolithic site of Kandou *Koyphovounos*, and therefore extremely near to Erimi-Laonin tou Porakou, the latter coastal forest type has been identified (Burnet 2004, 76–77) that is the sign of a Mediterranean temperate climate in Prehistoric periods. Forests and thick vegetation affected obviously hydrology because they prevented severe soil erosion, facilitated formation of groundwater and prevent evaporation phenomena

Conclusions

After answering the questions “how much water?”, “where?” and “where from?”, last question, perhaps the most important, is: “why, for what use?”.

At the moment, it is not possible to establish a certain and well-structured functional interpretation because the workshop area needs to be further investigated and more extensively excavated. Nevertheless, we propose a preliminary hypothesis that will culminate in additional analysis and researches.

Preliminary chemical analysis done on some *pithoi* fillings as well as on some basins plaster covers, have not detected the presence of lipids, fatty acids or tartaric acid (Francesca Chelazzi *pers. comm.*); this excludes the hypothesis that in the workshop complex activities for the production of wine or olive oil were carried out.

The arrangement of the area might also suggest some kind of pottery production (see Toumba tou Skourou and Athienou), but the lack of kiln and waste pits makes this interpretation quite uncertain.

On the other hand, the palaeobotanic analysis on some *pithoi* fillings, which are actually being carried out at Universities of Torino and Bologna, suggest a different interpretation. In fact, the recent results of macro-characterization analysis on filling soil sampled revealed interesting preliminary data, outlining an array of plants (*Anchusa officinalis*, *Echium plantagiuneum* and *Ajuga chamaepitys*) characterized by dyeing properties (Scirè Calabrisotto *et al.* 2012; Carra 2010; Vassio *pers. comm.*).

Thus, the cross-analysis of the working installations related to the water-based activities (in particular the four identified basins types and the flow channels system), their capacity in terms of quantity of water processed and, lastly, the study of the procurement strategies within the palaeo-climatic and hydrological background, lead us to draw a clearer picture of the workshop complex function and use.

An interesting suggestion could, then, focus on an activity of textiles processing (spinning

and, in particular, dyeing), and it could be confirmed by other features of the workshop complex: the presence of large empty areas useful to stretch the tissues, the presence in the *pitthoi* fillings of plants from the dyeing properties and, at the end, the discovery in the area of several spindle whorls and loom weights.

This is clearly only a suggestion, which requires the continuation and enlargement of the excavation and doing further analysis. It is conceivable that up to now, certainly, in the workshop complex an important productive activity took place, probably involving a large part of the community. The presence of numerous basins and flow channels, as well as their spatial arrangement and the high percentage documentation of large storing vessels and *pitthoi* suggest that the activity required the use of large quantities of liquids, presumable water. Considering the topography of the valley, it is likely that the natural supply source was not only the Kouris river, which certainly provided water for the whole community, but also minor water sources, even seasonal, localized nearer and, eventually, rainwater as well.

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