

Cahier 41, 2011

CENTRE D'ÉTUDES CHYPRIOTES

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**DATING THE CONTEXTS (OR CONTEXTUALIZING THE DATING?)**  
**New evidence from the Southern Cemetery**  
**at Erimi-Laonin tou Porakou (EC-LC I)**

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***Abstract.** Depuis 2008, le site d'Erimi-Laonin tou Porakou (Limassol) fait l'objet d'une fouille systématique menée par une mission de l'Université de Florence en collaboration avec le Département des Antiquités de Chypre. L'objectif primaire de l'enquête était l'analyse du matériel funéraire de la nécropole Sud (Area E), où plusieurs tombes à chambre individuelle ont été fouillées. Les petits objets et les assemblages céramiques, par leurs typologies et leurs décors, se rapprochent d'une production typique de la côte méridionale qui se développe du Chalcolithique ancien au Chalcolithique moyen III/Chalcolithique récent I.*

*Au cours de la saison de fouilles 2010-2011, des échantillons d'ossements ont été prélevés à partir des restes de squelettes de trois tombes (228, 230, 248), dans le but de réaliser des analyses radiocarbones. Les résultats des études anthropologiques et des datations radiocarbones peuvent être croisés avec le matériel archéologique, afin de dessiner une séquence chronologique de la nécropole d'Erimi-Laonin tou Porakou, et d'apporter ainsi de nouvelles données à l'étude de l'Age du Bronze dans la région de Kourion.*

**CONTEXTUALIZING THE DATING**

The chronological and occupation sequence at Erimi-Laonin tou Porakou revealed interesting evidence mainly related to a small rural community and its development from Early Bronze Age to the very beginning of Late Bronze Age period.

Concerning the territory of the Kourion area and the Limassol region, to define the Early to Late Cypriote I period actually means to match and balance a broad chronological range widely documented by the rich cemetery areas of Erimi-Pitharka and Kafkalla, Lophou-Vournia and Kolaouzu, Paramali (especially Paramali-Pharkonia South and

North necropolis), Prastio, Anoyira, as well as Limassol downtown and Katholiki.<sup>1</sup> Despite wide spread funerary evidence for the period, mostly thanks to rescue-excavations carried out in the last decades by the Department of Antiquities of Cyprus, we are faced with limited, scant documentation on contemporary settlements and workshop areas.

Among these, the American excavation projects within settlements and cemetery areas at Sotira-Kaminouhdia and Episkopi-Phaneromeni, respectively in the late '70 and '90, as well as the evidence from Pyrgos-Mavrorachi, are essential to build up and increase the quantity and quality of the records at our disposal.<sup>2</sup>

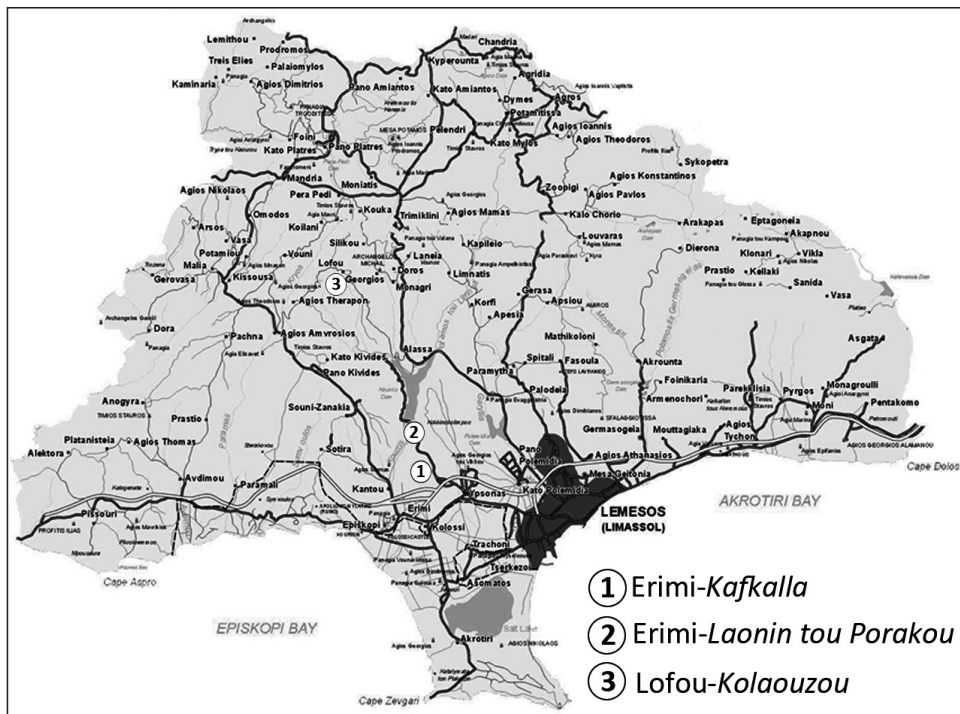


Figure 1. The Cemetery areas of Erimi-Laonin tou Porakou, Erimi-Kafkalla and Lofou-Kolaouzou within the Limassol District.

At the same time, ongoing and concluded excavations in other regions of the island can obviously offer further comparative data. In fact, the evidence from Alambra-Mouttes and Marki-Alonia<sup>3</sup> as well as, on a smaller extent, the recent investigations at Kissonerga-Skalia and Prasteio-Mesorotsos<sup>4</sup>, reveal that EC-MC settlements shared many common

1. Karageorghis 1964, 1971, 1977, 1978; Herscher, Swiny 1992; Christou 1994, 1996; Flourentzos 2010.

2. See in general Swiny *et al.* 2003; Swiny 1986; Carpenter 1981; Belgiorno 2009.

3. Coleman *et al.* 1996; Frankel, Webb 1996, 2006.

4. McCarthy *et al.* 2009; Crewe *et al.* 2008

features, such as architectural styles and technologies, but also had pronounced evident regional differences in pottery styles and material productions.<sup>5</sup>

Considering this, the evidence from the EC-LC I site area of *Erimi-Laonin tou Porakou*, where a Domestic quarter, a Workshop Complex and a contemporary Cemetery are currently being investigated, can actually contribute to the definition of a possible regional horizon.

For this reason, the archaeological research project carried out by the University of Florence focused on investigating the site through differently oriented methods: topographical survey, systematic excavations of significant contexts and archaeometric studies on specific material assemblages.<sup>6</sup>

In parallel with the ongoing investigation on site, a dedicated joint project, in collaboration with the Department of Antiquities of Cyprus, has been started up with the aim of mapping and matching the Early-Middle Bronze Age cemetery and settlement evidence in the Kourion area.<sup>7</sup>

We started with two funerary areas excavated in the last years by the Department of Antiquities through rescue-operations: the first is the cemetery of *Lofou-Kolaouzou*, situated north-west of the Kouris Dam, about 25 kilometers from Ypsonas village; the second one is the wider cemetery area of *Erimi-Kafkalla* and is located about 1 kilometer north of the modern village of Erimi (*Fig. 1*).

The above mentioned necropolises share peculiar features with *Erimi-Laonin tou Porakou* in terms of similar funerary architecture (mostly single rock-cut chamber or pits graves) and topographic arrangement (basically disposed on natural limestone sloping terraces). Moreover they all belong to Early to Late Bronze Age I period and have already investigated but still need a more precise contextualization. In order to verify the contexts and chronology of those three large cemeteries we designed a focused investigation dedicated to the analysis of the funerary evidence. Our research project developed in two main directions: on one hand the archaeological analysis of stratigraphy and funerary assemblages, on the other hand, the radiocarbon dating of the skeleton remains of the tombs, whenever preserved, in relation to absolute dates from contemporary settlement contexts, in order to define possible matching parallel sequences.

Among the three necropolises, *Erimi-Laonin tou Porakou* is the first example of how we managed to combine archaeological evidence, anthropological analysis and radiocarbon dating and this is the topic of this brief paper.

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5. Steel 2004; Crewe 2011.

6. Bombardieri *et al.* 2009; Bombardieri 2010; 2012; Scirè Calabrisotto *et al.* forthcoming; Chelazzi, Davit 2010.

7. The start up of the research project in 2010 is the result of a joint scientific collaboration between the Italian and Cypriote research teams of the University of Florence and the Department of Antiquities, coordinated by Yiannis Violaris and Luca Bombardieri. Excavations results and material assemblages from EC-MC cemetery area at *Lofou-Kolauzou* are currently being analyzed and will be published shortly.

Starting with the general chronology of the settlement sequence, as recorded by survey collections and excavation results on the top mound (Workshop Complex - Area A), the first lower terrace (Domestic quarter - Area B), and the southern Cemetery (Area E), an occupation throughout two main periods (Periods 1 and 2) is attested. At present the best documented is the earlier Period 2, ranging from the Early Cypriote to the Late Cypriote I periods, with two phases attested 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.<sup>8</sup>

Anthropological analyses were performed on the skeleton remains of two burials: Tomb 228 and Tomb 230. Moreover, during the fieldwork seasons 2010 and 2011, charcoal samples from the Workshop Complex and bone samples from the skeleton remains of three burials (Tombs 228, 230, 248) were appropriately taken for radiocarbon analysis to be performed by Accelerator Mass Spectrometry at the Istituto Nazionale di Fisica Nucleare-LABEC in Florence.<sup>9</sup> As a result, radiocarbon absolute dates now contribute to fixing the relative chronology produced by systematic excavation of the stratigraphic deposits.<sup>10</sup>

The stratigraphical and offering-goods deposits from southern cemetery Area E will be here briefly discussed as well as the results of the anthropological analyses and the absolute dates obtained by radiocarbon analyses.

## DATING THE CONTEXT

### **The Southern cemetery: relative chronology**

The necropolis extends on a wide surface, almost 2,5 ha., arranged on several terraces sloping south-westerly, toward a minor small valley, eastward of the Kouris path. Among

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8. Bombardieri 2009; 2012.

9. Fedi *et al.* 2007.

10. The use of radiocarbon dates as basic markers within chronological categories and periodization proposals is steadily increasing. Any attempt to categorize or divide time into named blocks produces a descriptive abstraction that provides useful syntheses while the precise beginning and ending to any “period” is often a matter of debate. For an overview of the debated issues and the theories background see in general Besserman 1996. A particular focus on radiocarbon dates in the periodization of Pre- and Proto-history of Cyprus was drawn in several works by Stuart Manning and Bernard Knapp, by the joint research of the Regional Group 3 within the Arcane Project - Associated Regional Chronologies for the Ancient Near East and the Eastern Mediterranean (<http://www.arcane.uni-tuebingen.de/rg3.html>), by the Special Research Programme SCIEM 2000-The Synchronisation of Civilisations in the Eastern Mediterranean in the Second Millennium B.C., as well as by the Radiocarbon Context Database project at Koln University (<http://context-database.uni-koeln.de/intro.php>). Among the most recent contributions see Peltenburg *et al.* 2001; Knapp 2010; Manning 2007; Manning *et al.* 2010. A complete report of the joint work by the Arcane Cyprus Group, edited by E.J. Peltenburg, is forthcoming in the series published by Brepols. An updated collection of radiocarbon dates from prehistoric and Bronze Age contexts will be also included in the forthcoming comprehensive volume by B. Knapp dedicated to Pre- and Protohistoric Cyprus.

the eight identified terraces, evidently two of them are occupied by the cemetery<sup>11</sup> (Fig. 2). As to the spatial organisation, the upper terraces show an arrangement mainly consisting of cave-like chamber tombs. The lower terrace, instead, has a different organisation with an intense exploitation (six graves within 25 square meters): three are single pit chamber graves of rounded plan, while the other three are single chamber graves with cave-like section (Fig. 3, 4). On the same terrace, next to the excavated graves, other tombs are presumed to be located.

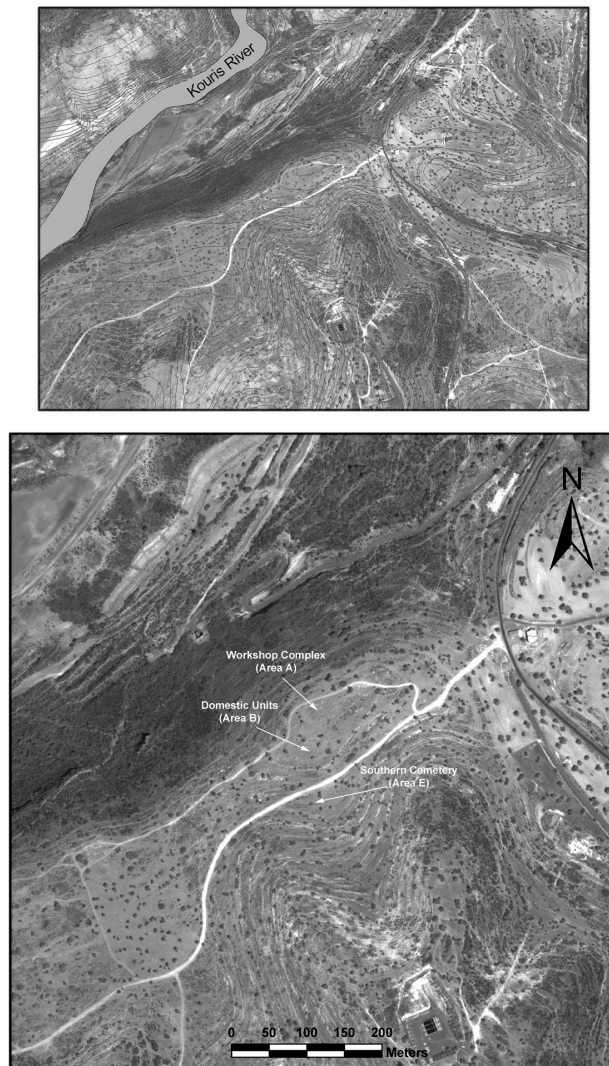


Figure 2. Erimi-Laonin tou Porakou. DEM of the site with the location of the Workshop Complex (Area A), the Domestic Units (Area B) and the Southern Cemetery (Area E).

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11. Bombardieri forthcoming *a*.



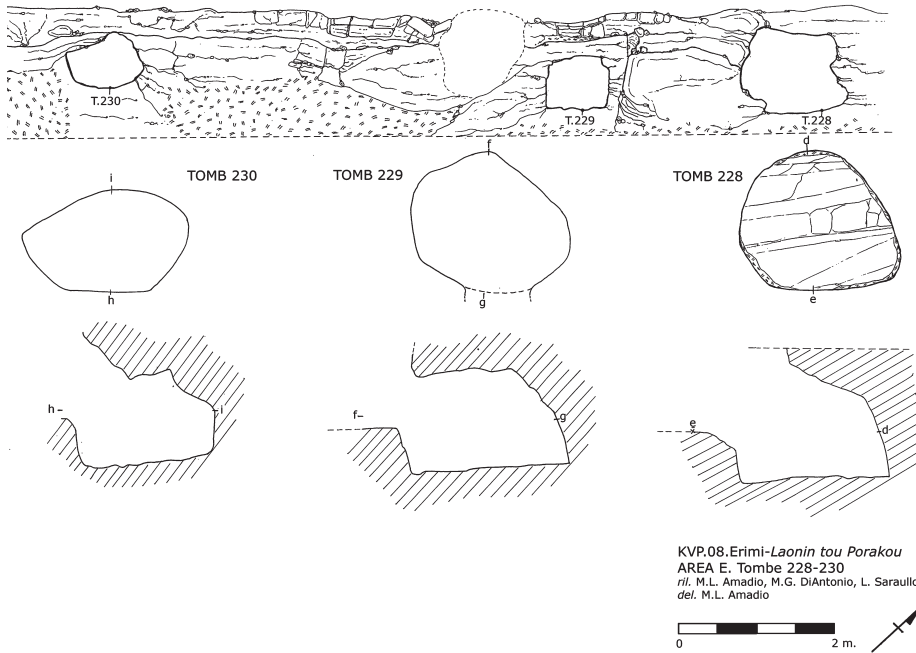


Figure 3. Erimi-Laonin tou Porakou. Southern Cemetery.  
 The single chamber graves of the upper terrace (Tombs 228-230).



Figure 4. Erimi-Laonin tou Porakou. Southern Cemetery. The single chamber graves of the lower terrace (Tombs 231, 232, 240, 241, 247, 248).



*Figure 5. Erimi-Laonin tou Porakou. Southern Cemetery. The ceramic assemblage from Tomb 248.*



*Figure 6. Erimi-Laonin tou Porakou. Southern Cemetery. Tombs 231 and 240.*



*Figure 7. Erimi-Laonin tou Porakou. Tomb 231. Gourd juglet with incised decoration (KVP09.T231.13).*

Among the last ones, Tomb 248 is of peculiar interest. The tomb, even if not completely investigated, as a consequence of the serious collapse of the structure, is actually larger than the other tombs of the terrace, and has a bench directly carved into the north limit of the chamber, possibly intended for some of the vessels pertaining to the offering-goods deposit (*Fig. 5*).

Concerning the chronology, the material assemblages from the offering deposits confirm the use of the cemetery area throughout the whole Period 2, that is, during a period ranging from the end of Early Cypriote to the Late Cypriote I, thus matching the occupation sequence of the Workshop Complex (Area A) and Domestic Unit (Area B).

Tombs 231 and 240 show the earliest assemblages. More than 35 objects have been documented within the deposits of these two burials, luckily found unlooted (*Fig. 6*). The ceramic assemblage generally points to a typical EC-MC repertoire with a good representation of RPSC ware.<sup>12</sup> Besides the original nomenclature introduced by Stewart (RPSC I), new evidence for the ware's chronology has become known, thus leading us to consider it not as a regional variant of the standard North Coast RP I ware, but as a particular South Coast production developed from the EC II period.<sup>13</sup>

Of a particular interest is the gourd juglet, with narrow cylindrical neck, out-curved rim and two small opposing pointed handles (KVP09.T231.13) (*Fig. 7*). Similar, relatively rare examples come from EC III contexts at Marki-*Alonia* and Psamatismenos and have been assumed by David Frankel and Jennifer Webb to be imports from the North Coast.<sup>14</sup> Comparable gourd juglets decorated with incised concentric circles are commonly found in the North Coast region and have been similarly dated back to the EC IIIB-MC I period, as Ellen Herscher already noted.<sup>15</sup>

More recent assemblages come from Tombs 228 and 230, located in the upper terrace, and from Tomb 248 on the lower terrace. In particular the presence of Black Slip II and Red Polished punctured double handled jars and globular jugs recovered in Tomb 248, points to a later date, to the MC III-LC I period, as discussed below more in detail. The punctured variants were already identified by Paul Åström who associated them

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12. Red Polished South Coast ware (RPSC) was first described by Stewart (1962, p. 270, 359); Ellen Herscher and Stella Lubsen-Admiraal widely discussed the more recent evidence for this production coming from Episkopi-*Phaneromeni*, Paramali, Sotira-*Kaminoudhia*, Anoyira, Limassol-*Katholiki* as well as from Yialia and Dhenia, out of the core region, which most probably extends from Limassol area to Anoyira. As to the nomenclature, see Merrillees 1991, p. 238; as to the geographical distribution of this ware, see Lubsen-Admiraal 1999 and Herscher 1981, p. 80 and 2003, p. 151 with references.

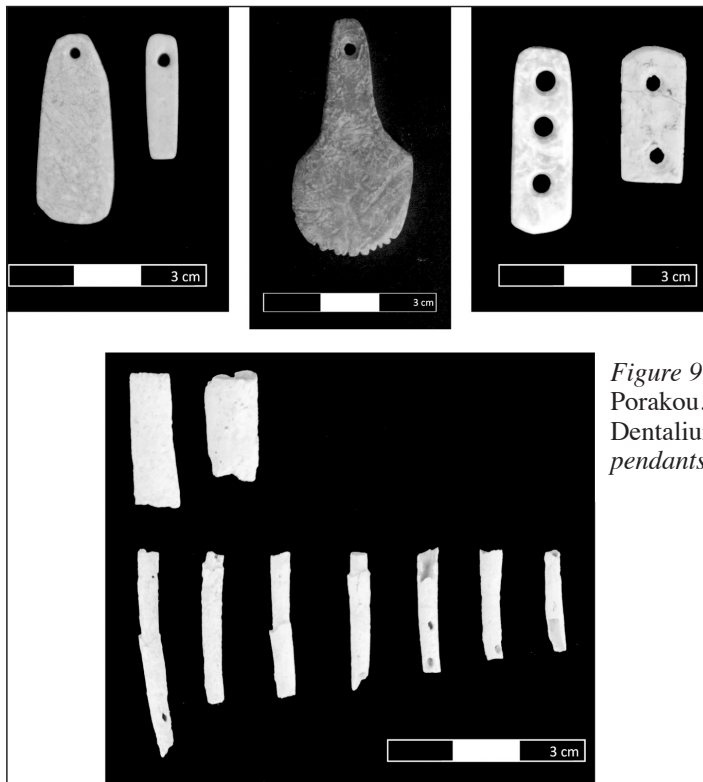
13. Herscher 2003, p. 150; Stewart was also aware of its possible EC II date (Stewart 1988, p. 60).

14. See Marki-*Alonia* (Units XCIX, XCIII) and Psamatismenos-*Koliokkremmos* Tomb PKK/94 (Frankel, Webb 2000, p. 77; Webb *et al.* 2007, p. 123; Georgiou *et al.* 2011 and the discussion in Frankel, Webb 2006, p. 125-126). The type corresponds to the Bottle Type C from Sotira-*Kaminoudhia* (Herscher 2003, fig. 4.10: P105).

15. Herscher 1991, p. 46.

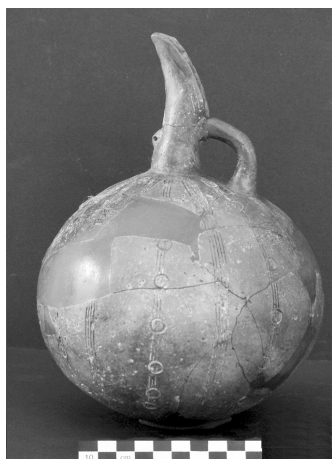


*Figure 8. Erimi-Laonin tou Porakou. Spindle-whorls and decorated Picrolite disk from Tomb 231; Picrolite disks from Tomb 230.*

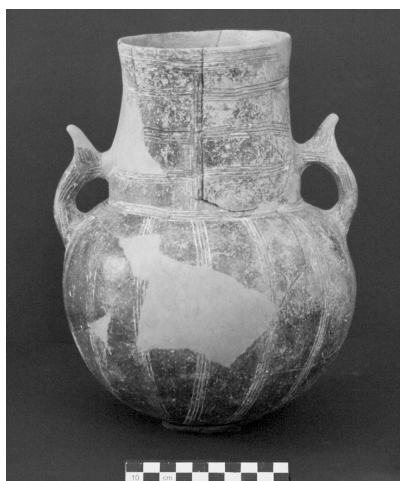


*Figure 9. Erimi-Laonin tou Porakou, Tomb 240. Dentalium beads and Picrolite pendants for necklace.*

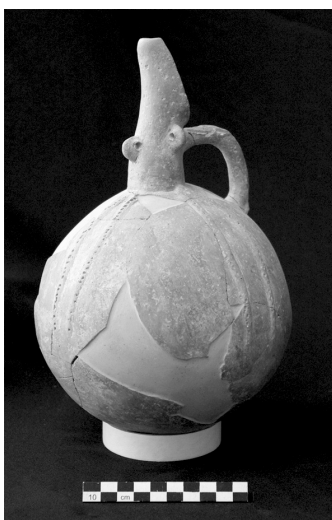
with some closely related fabrics with punctured decoration typical of South Coast styles ceramic horizon, such as the Red Polished Punctured ware, known also as Episkopi ware, as later on defined by Ellen Herscher.<sup>16</sup>



10. Tomb 228. BS globular jug with punctured decoration (KVP08.T228.36).



11. Tomb 228. Double-handled jar with incised decoration (KVP08.T228.5).



12. Tomb 228. RP globular jug with cutaway rim (KVP08.T228.2).



13. Tomb 230. Tankard (KVP08.T230.35).

*Figures 10-13. Erimi-Laonin tou Porakou. Pottery.*

16. Åström 1972, p. 95 (Type VIII B, 6e); Herscher 1976, 1991; Carpenter 1981, p. 61-64; Swiny 1981, p. 57-58.

The small objects repertoire well matches the EC-MC South Coast horizon. In particular the BP and RP spindle-whorls assemblage from Tomb 231, showing standard incised decoration patterns which mostly correspond to Crewe Types III C-D, can be dated back to the MC I-II period.<sup>17</sup> Picrolite disks and pendants are also well attested as personal objects from burials deposits (*Fig. 8*).<sup>18</sup>

Of a particular interest is the almost complete necklace, with dentalium beads and picrolite spacers and pendants, that comes from Tomb 240 (*Fig. 9*). The oval and rectangular flat pendants and spacers find few good parallels from EC and MC contexts at Paramali-*Pharkonia*, Sotira-*Kaminoudhia* to Marki-*Alonia* and Nicosia-*Ayia Paraskevi*;<sup>19</sup> the comb-shaped pendant pierced on the top with a fringe of incised combs is quite unusual and a further analogous example comes from the Phase A deposit in the Workshop Complex as well. The only published, close counterpart can be found in the Zintilis Collection,<sup>20</sup> and is supposed to come from a funerary context in Prastio (Limassol), dated to EC III-MC I period.<sup>21</sup>

### **The material assemblage from the offering-goods deposits of Tombs 228 and 230**

Tomb 228, even though looted in antiquity, contains a significant offering-goods deposit of ceramic vessels and small objects. From the surface filling (U.S. 1) and mostly from the filling layers of the grave (U.S. 3 and 6) a whole assemblage of 23 objects was recovered. Tomb 230 was also looted in antiquity. Within the filling layer (U.S. 14) three almost complete RP vessels have been found and some sherds belonging to a few other vessels, together with a few other small objects.<sup>22</sup>

The prominence of punctured decoration patterns within the RP, BS and DP wares ceramic assemblage from the offering-goods deposits, as stated above, refers to a production broadly dated back to the MC-LC I period. Examples of punctured decorative variants are illustrated by:

- Black Slip II jug with broad globular body, rounded base and backward-tilted neck, with blackish colour, small white calcareous inclusions and thick dark grey core (KVP08. T228.36) (*Fig. 10*). Good counterparts for this jug come from funerary contexts at Anoyira<sup>23</sup> and especially from LC IA domestic units at Episkopi-*Phaneromeni*.<sup>24</sup> A

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17. Crewe 1998, fig. 4.1, fig. 6.7, 6.8; Webb 2002, p. 365-6.

18. Bombardieri *et al.* 2009, fig. 34.

19. Swiny *et al.* 2003, p. 235, fig. 6.16; S208, pl. 6.3h; Herscher, Swiny 1992, p. 77, fig. 3:8; Frankel, Webb 2006, p. 193, pl. 54: B14; Stewart 1962, p. 261, fig. 105.6; Hennessy *et al.* 1988, p. 15, fig. 12: S2.

20. Lubsen-Admiraal 2003 n. 29b, 2004 n. 19.

21. See more in detail Bombardieri forthcoming *b*.

22. Bombardieri 2009, p. 287-288.

23. Karageorghis 1978, p. 893-894, fig. 38.

24. Carpenter 1981, fig. 3.16; Karageorghis 1971, p. 747, fig. 71.

similar date to MC III-LC I has been proposed by Jennifer Webb for two analogous BS jugs coming from the Sydney University Museum.<sup>25</sup>

- Black-Slip II small rounded deep bowl with incurving wall and simple pointed rim, pierced under the rim, reddish/blackish colour, small limestone inclusions and grey core (KVP.08.T228.10). The deep bowl is reminiscent of the so-called “tea pot” coming from Pyrgos-*Kipos*, from a funerary context excavated by the Department of Antiquities and now kept in the Lemesos Archaeological District Museum.<sup>26</sup>
- Red-Polished IV double handled small jar, with broad globular body and round base, reddish colour, small calcareous inclusion and greyish core (KVP.08.T228.5) (*Fig. 11*). Similar examples in RP IV ware are attested from Tomb 1 in Alassa-*Palialona*,<sup>27</sup> from Episkopi-*Phaneromeni*,<sup>28</sup> from a tomb in Pyrgos village, and from another one excavated in Ayios Athanasios, near Lemesos.<sup>29</sup>

The same punctured decoration pattern and analogous types are well attested in Red-Polished IV or Drab-Polished, dated back to MC III; examples of the three wares can be found in the recently published Severis and Phylactou Collections.<sup>30</sup>

A slightly earlier date can be argued as far as the other vessels are concerned; the small spouted jug found in Tomb 228 (KVP.08.T228.12), and the globular jug with backward-tilted neck and rope-like applied decoration on the shoulder (KVP.08.T228.2) (*Fig. 12*), find a parallel with an example from the cemetery area at Limassol-*Katholiki*,<sup>31</sup> dated back to the MC II period, and another in RP IV, even if with different rim type from Tomb 5 at Katydhata,<sup>32</sup> similarly dated back to MC II.

Other cases can be considered as largely attested productions during the whole Early to Middle Cypriote periods. This is the case of the tankard found in Tomb 230 (KVP.08.T230.35) (*Fig. 13*), which finds a parallel from Alassa Tomb 1<sup>33</sup> and from Pyrgos Tomb 2a.<sup>34</sup> This type is reminiscent of the Red Polished Coarse ware tankards from Makri-*Alonia* (Frankel, Webb 2006: Fig. 4.46) and the Red Polished B coarse cooking vessels from Alambra-*Mouttes* (Coleman *et al.* 1996: Fig. 61) and Sotira-*Kaminoudhia* (Herscher 2003, p. 187, fig. 4.15).

As to the small objects repertoire, three groups of objects can be recorded: weaving and spinning tools, ornamental personal objects and stone processing tools. Within Tomb

25. Webb 2001, p. 44-45, n. 70-71.

26. Christou 1994, p. 657, fig. 26.

27. Flourentzos 1991, pl. XVI: 39.

28. Carpenter 1981, fig. 3.15.

29. Karageorghis 1971, p. 358, fig. 43; 1977, p. 714, fig. 10.

30. Karageorghis 2010a, n. 51, 52, 54; 2010b, n. 32.

31. Karageorghis 1964, p.325, fig. 53.

32. Åström, Flourentzos 1989, fig. 83.

33. Flourentzos 1991, pl. XVIII:75.

34. Belgiorno 2002, fig. 8:38.

228 and 230 five terracotta spindle-whorls have been found: two in Tomb 228 and three in Tomb 230 (KVP.08.T228.24-25; KVP.08.T230.27-29). All the spindle-whorls show an incised decoration with geometric patterns which finds close parallels from the South Coast region. Counterparts come from Episkopi-*Phaneromeni*, *Alassa-Palialona* and *Pyrgos-Mavrorachi*.<sup>35</sup> Such a production actually has an islandwide distribution, even if with some differences attested to within the incised decoration patterns, from EC-MC contexts in *Alambra-Mouttes*,<sup>36</sup> *Deneia* cemeteries<sup>37</sup> and *Marki-Alonia*.<sup>38</sup>

Furthermore a limestone processing tool (KVP.08.T230.30), a stone polisher rather than a grinding stone, has been found in Tomb 230,<sup>39</sup> together with three picrolite stone disks (KVP.08.T230.31-33) (*Fig. 8*). A further smaller fragmentary picrolite ring bead comes from Tomb 228 (KVP.08.T228.30). The use of picrolite disks generally recalls similar objects widely documented from EC-MC contexts; among the nearest counterparts, examples come from *Sotira-Kaminoudhia*,<sup>40</sup> from *Episkopi-Phaneromeni* where they have been classified by Stuart Swiny among the miscellaneous stone objects *Type 1*.<sup>41</sup>

### **The human skeletal remains from Tombs 228 and 230**

#### ***Preservation, sampling and methods of analysis***

The most conspicuous feature about the skeletal material is the bad preservation of bones: the entire surface is covered with limestone concretions that limits the results of anthropological analyses. Sex determination was uniquely based on the observation of the muscles insertions along the midshaft (where preserved), while the age at death was estimated only for one individual of Tomb 228. Also anthropometric indexes were calculated to value the functional features linked to biomechanical activities. The palaeopathological analyses were limited by the limestone incrustations on the bones surface, thus it was not possible to clearly distinguish the presence of particular pathologies such as periostitis and enthesopathies.

Before completing the restoration of bones, at least one sample from each individual, identified through anthropological analysis, was collected for radiocarbon dating.<sup>42</sup> A total of nine samples, mainly obtained from femurs midshaft, were taken from the skeleton

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35. Mostly corresponding to Crewe Types III C-D (Crewe 1998). See Swiny 1986, fig. 68-73; Flourentzos 1991, Pl. XVII: 44, 45, 53; Gonzato 2010.

36. Coleman *et al.* 1996, fig. 52-53.

37. Frankel, Webb 2007, fig. 6.2.

38. Frankel, Webb 1996, fig. 8.5, 8.6; Frankel, Webb 2006, pl. 51.

39. Bombardieri *et al.* 2009, p. 140, fig. 33.

40. Swiny *et al.* 2003, fig.6.16: S667.

41. Swiny 1986, fig. 20: S95, S107.

42. The collected mass from each sample was chosen taking into account the possibility to perform further measurements such as stable isotopes analysis to estimate paleodiet.



remains of the two tombs: five samples from the five individuals of Tomb 228 and four samples from the two individuals of Tomb 230.

Preparation of samples and radiocarbon dating were performed at the INFN-LABEC Laboratory in Florence. The detailed description of the procedures can be found elsewhere, here we briefly recall some basic steps of the method.<sup>43</sup>

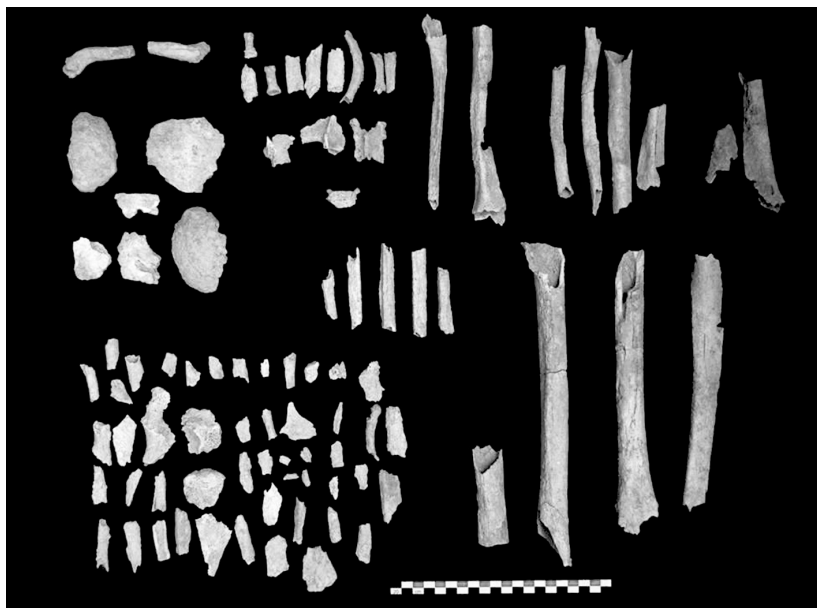
The samples were first crushed to small fragments in a mortar, then collagen, which is the organic residue needed for radiocarbon dating, was extracted following an acid-base-acid pre-treatment specifically modified to be applied to bones. Unfortunately, collagen yield is strictly related to the rate of bone diagenesis and in this case, given the bad preservation of bones, only five samples out of nine had enough organic matter to be dated. The collagen obtained was then reduced to graphite and dated at the AMS beam line of the AMS-IBA Tandem accelerator of the INFN-LABEC.

### *Anthropological analysis*

#### *Tomb 230*

##### *MNI and sex-determination*

Given the total absence of the pelvis and the cranium, it was not possible to make an accurate diagnosis of sex using standard morphological criteria. Additionally, the lack of all the epiphysis of long bones made it impossible to carry out the anthropometric measures necessary to determine the sex (*Fig. 14*). Therefore the analysis was only based on the observation of the size of the anatomic elements and mainly on the prominence of the muscle insertions.



*Figure 14. Erimi-Laonin tou Porakou. Tomb 230. Human skeleton remains.*

43. Scirè Calabrisotto *et al.* forthcoming.

Nevertheless the conclusion is that the individual of Tomb 230 is probably a female. Two additional mid-shaft fragments were recovered among the human remains of Tomb 230. They differ from the other bones in colour, size and preservation, and they are part of a left and right humerus respectively (*Fig. 15*). This fact would lead to the hypothesis of the presence of another individual. As a consequence, the value of MNI is 2, but, given the fact that the second individual is represented uniquely by one anatomic element, it seems correct to suppose a reuse of the tomb instead of a multiple burial.

#### *Age at death*

Because of the fragmentary state of the skeletal remains it was not possible to estimate the age at death of the individual. However osteological evidence shows adult features.

#### *Metric indexes of biomechanical stress*

The measurements provided mean values for all the indexes, with the exception of the pilastric index of the left femur that gave a very high value corresponding to a strong development of the rough line, meaning an intense muscular work of the thigh.



*Figure 15. Erimi-Laonin tou Porakou. Tomb 230. Mid-shaft fragment of the right and left humerus of the second individual.*

### ***Tomb 228***

#### *MNI and sex-determination*

Also in this case, the pelvis and the cranium are almost absent. According to the observation of muscle insertions, a male individual and at least one female and one subadult were identified.

The identification of the male individual has been possible thanks to the presence of the jaw which allowed morphological analysis using the method formulated by AÇSADI and NEMESKÉRI.<sup>44</sup> In conclusion the analysis evidenced a value of MNI corresponding to four individuals, amongst whom were one male, one female and one subadult of no definable age.

#### *Age at death*

Estimation of age at death was only possible for the male individual, using the Brothwell and Lovejoy<sup>45</sup> methods based on the observation of teeth wear (*Fig. 16*). The result ranges from 25 to 35 years old.

44. AÇSADI, NEMESKÉRI 1970.

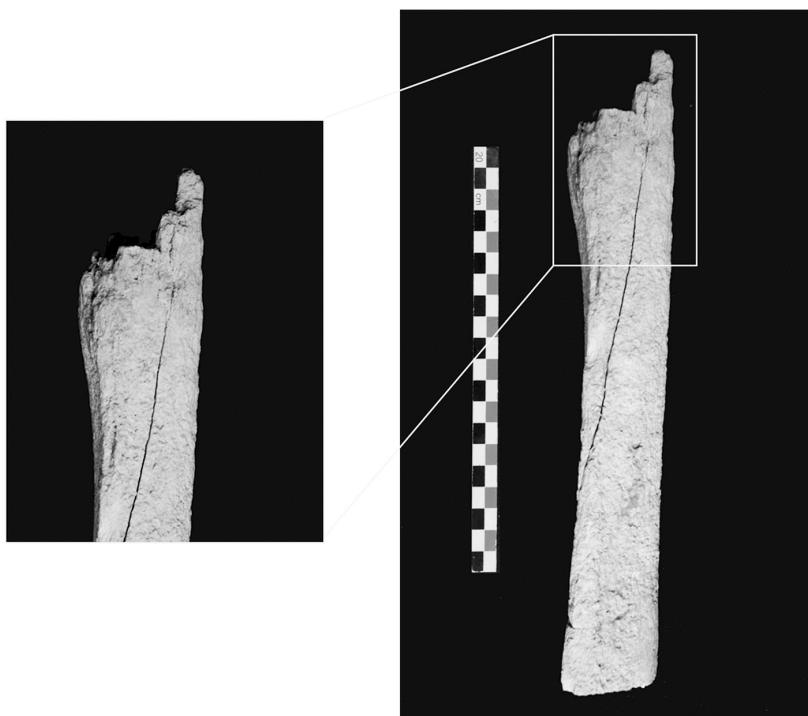
45. BROTHWELL 1981; LOVEJOY 1985.

*Metric indexes of biomechanical stress*

The resulting metric indexes mainly gave mean values, with the exception of the diaphysary index of radius that, in two cases (left and right), showed low values corresponding to prone and supine movements of the forearm. In addition, the tibia low index (platicnemia) suggests an extended and intense use of the legs.



*Figure 16. Erimi-Laonin tou Porakou. Lower jaw of individual from Tomb 228.*



*Figure 17. Erimi-Laonin tou Porakou. View and detail of the left femurus from tomb 228 showing a healed fracture correctly joined.*

*Palaeopathological analysis*

As noted above, the preservation state of the skeletal material is very bad, and limestone incrustations sometimes make the bone surface porous to the point that is quite difficult to recognize light forms of periostitis and enthesopathies.

With respect to other pathologies, one individual presumably shows a healed fracture correctly joined, with consequent formation of a callus, located halfway to the diaphysis of the left femur (*Fig. 17*).

*Radiocarbon dates*

The results of radiocarbon dating are summed up in the Table of *Fig. 18*: the measured conventional radiocarbon age, the corresponding calibrated age and the value of Carbon/Nitrogen atomic ratio of the collagen residues are given. In particular, the latter value is routinely measured in the laboratory in order to assess collagen quality; according to the literature,<sup>46</sup> Carbon/Nitrogen atomic ratio should range between 2.9 and 3.6 for guaranteeing a well preserved bone. As displayed in the Table, the average value of the C/N atomic ratio was 3.4, with the exception of samples T228\_sub and T228\_3 for which the values of C/N atomic ratio were 5.7 and 4.0 respectively, both values falling outside the recommended range. Actually, T228\_sub could not be measured (graphitization was not possible because of the low quantity of carbon dioxide collected from the collagen residue), while T228\_3 has been dated to a period from the second half of the IV century to the first half of the I century B.C., which corresponds to the Hellenistic Age. In literature a C/N atomic ratio which is greater than 3.6 indicates contamination of extraneous carbon therefore it can be argued that T228\_3, with a C/N value of 4.0, was a contaminated sample.

SAMPLE	C/N	T <sub>rc</sub> (Yr BP)	Cal. Age (95%)*
T228_1	3.4	3145 ± 30	1500-1380 B.C.
T228_3	4.0	2140 ± 50	360-46 B.C.
T228_sub	5.7	n.d.	n.d.
T230_1_f	3.4	3500 ± 65	2015-1665 B.C.
T230_1_o	3.5	345 ± 65	1900-1625 B.C.
T230_2	3.4	3240 ± 40	1610-1430 B.C.

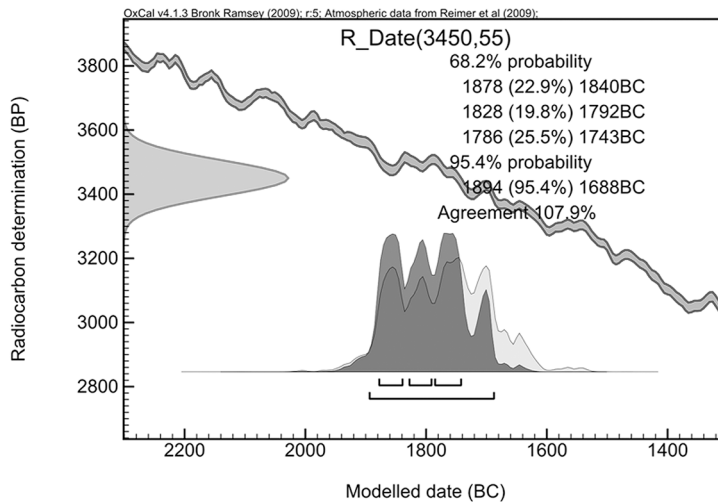
*Figure 18. Erimi-Laonin tou Porakou. Results of C/N atomic ratios, average conventional radiocarbon age (tRC) and calibrated age (Cal. age) of bone samples.*

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46. De Niro 1985.

Concerning samples T230\_1\_f and T230\_1\_o, consistent conventional radiocarbon ages were obtained, therefore, as they were supposed to belong to the same individual on anthropological basis, the best estimate for radiocarbon age was calculated as their weighted average (see in particular *Fig. 19* displaying the calculated radiocarbon age and the corresponding calibration to calendar age).

The final results of radiocarbon dating for the analysed burial contexts, can be summarised as follow: one individual from Tomb 230 has been dated to the XIX-XVIII centuries B.C. (generally corresponding to Middle Cypriote) while two individuals, one from Tomb 228 and the other from Tomb 230, have been dated to the XVI century B.C. (broadly corresponding to Late Cypriote I). On the other hand the analyses of the material assemblages from the offering-goods deposits of Tomb 228 and Tomb 230, allowed an estimation of the two burials contemporaneous to phase A, that is ranging from MC II/III to LC I.



*Figure 19.* Erimi-Laonin tou Porakou. *Modelled date for samples T230\_1\_f and T230\_1\_o taking their weighted average into account.*

### Conclusions

The human skeleton samples measured by  $^{14}\text{C}$  provide absolute dates consistent with the analyses of the material assemblages, thus contributing to confirm the chronological sequence suggested by the archaeological evidence. As already documented by the stratigraphic deposit of the Workshop Complex (Area A), the chronological range of the southern Cemetery (Area E) highlights the same chronological sequence: two main phases (phase A and phase B) consistent with the Bronze Age occupation of the site.

The earlier phase B, ranging from EC III to MC I/II, corresponds to the initial and progressively increasing workshop activity, which led to the first dedicated installation of

an organized complex on the top mound, as well as the organization of a wide cemetery area disposed on natural terraces sloping towards the south area of the settlement.

The following phase corresponds to the more recent phase A, ranging from MC II/III to LC I, and it is marked by the strong development and re-building of the Workshop Complex during which some of the former installations were reused while others were built as new. During this phase, the southern Cemetery possibly extended over a wider area; old tombs were perhaps kept in use for secondary inhumations on the lower terrace while others were built into the uppermost terrace, just adjoining the domestic quarter. Phase A is then followed by a collapse and finally by a phase of definitive abandonment of the site.

In the light of these recent results, the evidence of Erimi-Laonin tou Porakou can add further data to the study of Early to Late Cypriote period in the Kourion area, particularly with a view to the possible definition of a wider chronological framework on regional grounds.

In conclusion, it is evident that a multi-level analysis of the inhumation evidence (basic anthropological survey, palaeopathology, radiocarbon dating and potentially palaeodiet) and the grave deposits (stratigraphy, offering-goods assemblage) can highly benefit a fruitful approach to interpreting funerary contexts.

This assumption convincing becomes particularly cogent when the specific focus is upon chronological aspects. Thus, dating the context on relative chronology and fixing the sequence with absolute dating appear as a basic point to start from in order to build up any chronological framework. Beyond an easy *jeu de mots*, to date the contexts and to contextualize the dating do not mean a mirror reflection of the same concept; on the contrary, they can be considered the two basic interdependent steps of a cross-analysis intended to obtain an exhaustive approach to the chronology of a funerary context, also in a wider perspective.

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