Excavations at Sissi III

Preliminary Report on the 2011 Campaign

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1. Excavations at Sissi, 2011

Introduction

Jan Driessen

A fifth excavation campaign by the Belgian School at Athens on the Bouffo or Ayos Antonios Hill at Sissi took place from June 20th to July 29th, 2011. This concludes our first five-year programme of excavations. As before, the excavations were a collaboration between the Université Catholique de Louvain and the Katholieke Universiteit Leuven and, as before, we sincerely thank the previous head, Ms. Villy Apostolakou, the present head Ms. Chryssa Sophianou and Ms. Vasso Zografaki of the 24th Ephorate of Prehistoric and Classical Antiquities in Ayios Nikolaos for aid and advice. Financial support this year came from the Institute for Aegean Prehistory, the Katholieke Universiteit Leuven (IDO), the Fonds National de Recherche Scientifique, the Ministère de la région wallonne (Mr. J.-M. Nollet, Mr. R. Martin), the Communauté française de la Belgique (Mr. A. Antoine) and the Loterie Nationale, and a series of private sponsors, amongst whom we especially thank the T.F. Cunningham family, the H. and B. Davis family and Mr. M. Conreur. Couderé Geoservices (esp. Ms. M. Couderé, M. F. Rahier, M. M. Hennau) are thanked for putting a Trimble S3 as well as a Trimble Scanner at our disposition. Dr. A. Sarris (IMS-Rethymnon) lent us a Leica Total Station and Dr. D. Mulliez, previous director of the French School at Athens, again graciously put the dighouse at Malia at our disposition. Dr. T. Brogan, director, and C. Papanikolopoulos, photographer, of INSTAPEC provided valuable advice and services, Dr. D. Evely, Knossos curator lent us two site sieves. Ms L. Manousogiannaki again represented the 24th Ephorate on site. Environmental studies, under general direction of Dr. V. Isaakidou, were carried out by D. Decarle, I. Papadopoulou and S. Donata (flotation, sorting). Dr. A. Livarda (archaeobotany) and Dr. R. Veropoulos (shells) came out for a week to study samples. Dr. C. Tsoraki studied ground and other stone tools and vessels. F. Carpentier took a series of micromorphological samples whereas S. Jusseret supervised fytolith sampling. Photography was the work of L. Manousogiannaki, G. McGuire, the area supervisors and Chr. Papanikolopoulos (INSTAPEC), for the objects. As before, C. Gaston provided us with a superb series of kite photographs of the site and specific details at the end of the campaign. Site conservation during excavation was carried out by N. Nikakis while A. Nikakis was responsible for object restoration. J. Milathianakis installed a route through the site for visitors. Topographical work under direction of P. Hacigüzeller was executed in the field by M. Pietroviot and P. Baulain, trained by N. Kress, who participated the first week. A team of architects directed by A. Chalkidi, with V. Gouliopoulou and M. Nasi, made a new stone-by-stone plan of the final state of the site, which accompanies this report. M. Hennau (Couderé) scanned the top of the hill for a planned 3D reconstruction to be made available through our website. Workers this year were G. Metaxarakis, J. Milidakis, M. Vrachnakis, M. Papadaki, M. Tzanakis, J. Milathianakis, K. Jacobson and M. Vrachnakis. Apotheke work was directed by Dr. C. Langohr (first two weeks) and Fl. Liard, assisted by I. Kritikopoulos, E. Steinwart, V. Vanderlinden and A. Stienon. H. Joris, assisted by D. Riccardi-Cunningham, acted as draughtsman whereas R. McGuire was site artist. As before we received plenty of visitors, local and foreign. Especially appreciated were comments and advice from V. Apostolakou, V. Zografaki, C. Sophianou, His Excellency the Belgian Ambassador M. M. Van de Reeck, consul O. Mcbe, J.-P. Olivier, J. Wright, T. Brogan and the INSTAPEC crew, I. Papadatos, E. Nodarou, G. Cadogan, C. Knappett, T. Whitelaw, J. Bennet, E. Hatzakti, C.F. Macdonald, D. Haggis, B. Molloy, K. Palyvou, D. Nodaro, A. Farnoux, D. Small, S. Hemingway, D. Evely, I. Caloi, L. Girella and I. Jacobs.

This introduction attempts to present a brief chronological overview of occupation on the Kefali based on the 2007-2011 excavation campaigns. This is, evidently, a preliminary assessment that will certainly need to be amended once full study is completed.
Fig. 1.1. **Kefali Settlement at Sissi: Topographical Plan (P. Hacigüzeller)**
Fig. 1.2. KEFALI SETTLEMENT AT SISSI AERIAL VIEW (C. GASTON) (NORTH AT TOP)
1. Preliminary Observations on the Diachronic Occupation of the Kefali

Late Neolithic occupation has been identified in the immediate hinterland of Sissi (Müller 1998: 549), on the south slope of the Arkovouno hill, and closer to the hill some sherds may suggest a Final Neolithic/EM I occupation covered by alluvium (S. Jusseret, pers. com.). By EM I, a settlement existed in Kharkoma bay (Sissi I: 24), seen by M.S.F. Hood, P.M. Warren and G. Cadogan in 1963 but now entirely destroyed. It is possible that the rising sea level in the Early Bronze Age forced people up the Kefali hill since from EM IIA onwards, the site may have been continuously occupied. Since some EM I sherds were found in the cemetery, although without clear architectural association, it is possible that the cemetery dates back this early. In this case, it cannot be excluded that it first served the Kharkoma settlement and only somewhat later that located on the Kefali itself. Or that initially the cemetery served two separate hamlets, one at Kharkoma, the other on the Kefali. It remains unclear, however, when the Kharkoma settlement was abandoned.

In any case, the first main period of use of the cemetery seems to be the beginning of EM II when a series of house-tombs were built against the foot of the north slope of the hill (cf. fig. 2.1A & B). These tombs were used for primary burials but there are many signs for interference with the bones of the deceased: some were pushed aside, others removed and in a nearby ossuary, some of the selected skulls and long bones were redeposited (Schoep, Schmitt, Crevecoeur and Déderix, this volume). In the tombs and ossuaries there is evidence for the burial of men, women and children of all ages so that, even if we cannot be sure that all people had the right to formal burial, at least all people from a particular group seem to have had equal access. Surprisingly perhaps in view of the evidence elsewhere, apart from the occasional cup, there are almost no objects accompanying the deceased and most pottery seems either to have been placed (or used) outside the tombs or deposited when bone interference took place. It may be noted, however, that foetuses and neonates were often deposited within ceramic containers. There is very little occupational evidence from the settlement which dates back to this phase apart from some sherds. An early wall which follows an entirely different orientation found in zone 5 (room 5.2) may date to EM II (Sissi II: 145) and a series of stray finds such as fragmentary axes, stone vases and pendants may originally have been part of Prepalatial contexts (Sissi I: 28, 126; Sissi II: 28; Devolder, this volume for a bird pendant).

From the late Prepalatial period (EM III/MM IA) onwards, there is increasing evidence for the use of the cemetery and the top of the hill. Most of the house tombs in the east part of the cemetery seem to date to this phase. Although none is completely preserved or excavated, it is very likely that each of these funerary buildings had a rectangular shape and was formed by a series of small spaces and cells used for primary deposition. Some of the buildings may have been quite large. Again very few objects are associated and most finds come from outside the tombs. Some of the contexts seem to suggest rituals taking place close to the tombs. To the same EM III/MM IA phase date the remains of what originally may have been a larger building found to the north of zone 5 and cut through by the construction of later building CD (Zones 3-4 wall (Devolder, this volume, cf. fig. 5.2, 5.9 & 5.10)). A small floor deposit (with vase 11-5-3809-OB004) is all that remains but immediately to the north of it, within the later building, a floor was bedded on a massive fill which comprised many typical white-on-dark sherds in the East Cretan tradition of very good quality (Letesson, this volume) (fig. 1.3). It is interesting to note that the pottery encountered in the settlement seems of better quality than that in the cemetery, which makes one wonder whether special ceramics were produced to be consumed in funerary contexts.
To a slightly later phase, MM IIA, probably dates the construction of a large house tomb 9, in the west part of the cemetery (cf. fig. 2.1 & b; Schoep, Schmitt, Crevecoeur and Dédéix, this volume). Again this structure probably comprises several spaces but only two have been completely excavated. These housed the remains of almost 30 people. Apart from a few cups and plates that may have accompanied the dead, a gold earring was found on a skull and the same tomb also yielded an amethyst bead, a tiny gold stud and a soft seal stone of the *petschaft* type. One of the deceased had been placed within a larnax, others within pithoi. The latter may date to MM IIB, the mature Protopalatial period since during this phase, all deceased within the Sissi cemetery seem almost exclusively to have been buried in pithoi usually within earlier existing graves. Moreover, the number of MM II deposits in the cemetery suggests a busy ritual use of the area. In the settlement, very little MM IB-IIA evidence has been found but MM IIB material, either residual, redeposited or in situ is abundant and in several areas on top of the hill good architecture is associated (already *Sissi II*: 106, 108, 131, 139-140; Devolder this volume). In zone 5, for example, there are remains of several Middle Minoan rooms which preserve red and blue paint against their walls and plastered floors and to the north of zone 3 & 4, a test yielded extensive Middle Bronze Age architectural remains with associated pottery deposits. These, taken together with the MM II deposits found in rooms 4.5 and 4.14, may suggest the presence of one or more larger buildings on top of the hill. Middle Minoan was also identified to the southeast of the top, in zone 6, and all this gives the impression that at least the summit of the hill was densely occupied at the moment of Malia’s glory and destruction in MM IIB. The Malia survey has found traces elsewhere in the Sissi valley for MM II (Müller 1998: 549, 551) and there was probably a rural sanctuary close to the sea, west of the Kefali, on the Kremasma promontory where plenty of human and animal figurines were found by earlier explorers (*Sissi I*: 23-24). Although most of the surviving surface material on Kremasma appears Neopalatial, some of it goes back to MM II. The location of a seaside shrine on a promontory close to a settlement now finds a parallel at Papadiokampos (C. Sofianou, pers. comm.). There are no signs, at the moment, for more elaborate pottery, architecture or other elite elements such as writing during this phase in the settlement. Moreover, traces of a MM IIB fire destruction exist but are rather rare, this in comparison with Malia. Still, there seems, in any case, a clear break between this phase and the next.

At the beginning of the Neopalatial period (MM III), the site may have briefly been fortified since at the southwestern foot of the hill, a tower-like megalithic construction was built, without doubt to protect the easiest access to the hill. By this time, the cemetery seems to be abandoned and we do not know where the dead of Sissi were deposited during this or the later Neopalatial periods.

The Neopalatial period seems in any case to have been the moment of the Kefali’s settlement’s largest extension with occupation on the lower terraces and the top of the hill. During this phase, the hill may have received a building of which the nature is not yet entirely clear. In zone 6 (cf. fig. 6. 5), the southeast summit of the hill, earlier Protopalatial ruins of unknown character but with parallel walls and an orientation that is identical to its Neopalatial successor, were overbuilt with more prestigious architecture (Jusseret, this volume). A 20 m long *euthynteria* or levelling course formed by fine limestone slabs forms a north-south façade which originally carried an ashlar wall.
This wall faces a court of at least 9.50 by 20 m, strewn with blue pebbles in a clay and lime matrix. Against this façade and next to what seems to have been a doorway entering the building was a built platform of which the top slab carries a series of shallow depressions along the outside and deeper depressions in the centre. Such pierres à cupules or kernoi are usually interpreted as ritual installations. This possibility is made more convincing since to the north of the façade and on a right angle with the latter, we came across a double wall of which the south side also carries a dozen shallow artificial depressions, between one and three per stone. West of this wall we uncovered an ashlar wall which runs parallel to the euthynteria to the east. A massive, plastered ashlar block, located during the survey, sits not very far from here and may come from the same building (Sissi I: 41) (fig. 1.4) and in the area other large walls with similar orientations abound.

Although very little has been excavated, it is not unlikely that we have a court-centred building here. Two further observations may reinforce this hypothesis: the general orientation of the court, which is about 16.5° east of north and points to the top of the Selena Mountains, hence corresponding with general practices at other important Minoan sites, and the discovery of a few ‘postminoan’ figurines in the surface layers of the room close to the ashlar wall suggestive of a later respect towards an earlier place of importance (fig. 6.17). The largest pottery deposit thus far encountered within one of the spaces of the east rooms dates to the end of MM IIIB or early LM IA and consists of cups and rhytons. The building was, however, largely reused during LM IIIB, so that very few original contexts are preserved. If we are right in seeing a Neopalatial court-centred building in the remains, the presence of such a building at only 4 km from Malia may parallel situations encountered elsewhere, e.g. between Phaistos and Agia Triada, Knossos and Archanes. Future excavations may confirm this hypothesis. If correct, it would mean that we have revealed much of the East Wing. Ground cover is, however, much better to the north and west which allows optimism for preservation conditions.

During LM I, the top of the hill (zones 3-4) and the middle terrace (zone 2) to the northwest were occupied by a series of buildings and there is a clear difference in the quality of construction and ceramics between these two zones. The middle terrace (figs. 1.1 & 3.1) carried several more or less rectangular buildings (BA, BB and BC) which seem to have combined domestic and semi-industrial functions; textile production may have formed an important feature here. From the floor deposit of Building BC come two limestone figurines in a pseudo-Cycladic style, paralleled in certain Neopalatial houses at Malia, and within two different rooms of the same building were found the burials of two children, placed in a large pyxis (Sissi II: 76-77). The top of the hill (zones 3-4) (figs. 1.1 & 4.1-5) seems to have witnessed the construction of a more monumental type of construction with a façade made of large, roughly trimmed blocks facing east and a paved road perhaps coming from the more public building in
zone 6. A fragment of a large, plastered horns of consecration found against its northwest angle may underline its importance (fig. 4.35; Letesson, this volume). Many of the walls seem to have been reused in LM III but for details more study is needed. Within some rooms, such as 3.5, there is good evidence for substantial LM I occupation (ceramics, sealstone, stone vessels; Gaignerot, this volume) and against the east façade, in room 4.19, a thick fire destruction deposit was encountered with one vase still containing plenty of carbonised lentils (Sissi II: 104, fig. 5.23). Elsewhere Neopalatial occupation was only encountered sporadically but in several spaces, walls go down beneath the floors of the LM III phase. Reoccupation pottery is almost absent apart from the surface layers from the entire zone east of room 3.1 and this entire area seems to form part of a large Neopalatial structure, still largely buried. There is, on the other hand, very limited evidence for Neopalatial occupation in the open area to the south of the main buildings in zones 3-4 where bedrock surfaces, apart from an extensive cup deposit found in isolation close to its western edge (Sissi II: 159). The deposit comprised at least 90 complete conical cups, some still stacked, and many dozens of broken examples as well as a few other types of cups and other vases. This seems to suggest that this area was already open and may have been used for certain ritual practices involving consumption during the Neopalatial period.

Especially on the middle terrace (Zone 2) there are signs that the buildings suffered minor damages in the course of the LM I period and a LM IB fire destruction, certainly not generalised, was also identified in both zones.

The Late Minoan I and IIIA1 phases are for the moment only represented by sherd material, again in the open area 5.10 south of zones 3 & 4 and again especially by open shapes which could suggest that even if there was no habitation, the site or its Minoan ruins may have been used for certain ritual practices (Sissi II: 194).

From LM IIIA2 and till the advanced LM IIIB phase, the remains on top of the hill were patched up and incorporated into a new, large, monumental complex with two wings, located to the north and south of the open area 5.10. The northwest and north facades of this complex closely follow the contour lines of the top of the hill and present a long, closed face without any entrance. The use of roughly trimmed conglomerate boulders – perhaps quarried opposite the hill to the west – and the position of the building further enhance the apotropaic aspect of the construction. This contrasts with the southeast side which seems to have been open and more permeable. The entire complex as originally constructed late in LM IIIA comprised two wings north and south of the open area. The south wing seems to have been destroyed first, late in LM IIIA2 or early in LM IIIB, perhaps by fire and earthquake and several deposits were found in place, including metal objects such as bronze chisels and a large lead vessel (Sissi II: 189-191 for a discussion of the pottery; Langohr, this volume). It has been suggested that the hill about 500 m south of the Kefali was used for a chamber tomb cemetery during this period (Müller 1998).

The following period, mature LM IIIB, sees occupation reduced to the northwest part of the summit (figs. 1.1 & 4.1-5). The remains of the Neopalatial east façade were reused as a terrace wall to establish a large open court of about 100 m². From here, the main entrance of the complex into Hall 3.1 could be accessed: this is formed by a massive sideropetra threshold. A large rectangular boulder in front but off centre of this entrance may suggest that a porch protected this access. The main room, Hall 3.1, carries two large column bases in its central axis (Sissi II: 93). Between these were some traces of burnt clay and two large domed shaped terracotta objects which may be interpreted as opaia, chimney pots (cf. Lamaze 2011). They are specially made and decorated so their function may have been regarded as important. In the east part of the hall was found a pottery deposit, including a pithos and a deep bowl and an industrial installation, perhaps a press. Hall 3.1 measures about 6.5 by 8 m and was meant to receive a larger number of people, perhaps more than those living in the complex itself. Around the hall are a series of service rooms: one was certainly a kitchen, the other some kind of pantry in which a series of drinking and pouring vessels were found but the access to both was blocked before the final destruction. Moreover, to the west and south were other halls with double pillar bases and a hearth in between. The one to the west, in room 4.7, dates to an earlier phase (Letesson, this volume) whereas that to the south, in room 4.11, may have existed at the same time as Hall 3.1. It certainly served for preparing food since three tripod cooking pots were found with their contents at about a metre in a half circle around the hearth. Between both halls, but only accessible from the room 4.11, is a small shrine (3.8) in which the ritual equipment was found in situ (Sissi II: 89-92). It included two snake tubes, a large triton shell, a series of kalathoi and some other pottery. Along the south side of the complex, facing the open area 5.10, are a series of rooms which communicate with the inside of the building, apart from the most western room, 4.15, which is only accessible from the open area. Within this latter room were found several vases, some pithoi (one half buried containing a variety of shells), a cooking installation, a fine imported stirrup
1. Excavations at Sissi, 2011. Introduction

jar and a hut model (Letesson, this volume). If the objects found in this room relate to activities taking place in the open area, we may perhaps think of a continuation of practices here since Late Minoan I. This is also suggested by the material found in some pits in this open area which all suggest ritual consumption practices and perhaps intentional breakage. Along the west side of the complex are a series of other rooms which seem to have been used for storage and production. Several rooms may have been used for production of stone objects and activities involving pumice which was found in great quantities (Gaignerot & Driessen 2012). From a LM IIIB level in one of the rooms (3.6) come two large deposits of terracotta spools of a type usually connected with the Sea Peoples or LM IIIC sites (Gaignerot, this volume). They suggest the production of textiles within the complex. From the destruction layer against the façade comes a clay fragment (11-04-1783-OB001) with some incised signs, perhaps Linear B (Letesson, this volume) and hence suggestive of some form of administrative control taking place. We can tentatively read: [ri 10 INGOT[ or ]RI 10 INGOT[ (fig. 1.5), with the possibility that the ingot sign was accompanied by another sign such as we or pe]. It may have been some kind of label, originally pressed against a basket or perishable container explaining the striations on the back. If it is really Linear B, it may be called SI 1. It adds to the already known corpus of stirrup jars inscribed with Linear B found at nearby Malia (Farnoux & Driessen 1991). In this case, however, it suggests active administration going on rather than receiving inscribed vases from elsewhere. Interestingly, the sequence [ri and INGOT[ also occurs in the Knossos tablets. That the label may have accompanied some kind of bronze military material is a hypothesis that cannot be further explored for the moment. As a preliminary date, early LM IIIB may be retained. This may also have been the period when zone 6 was abandoned.

Fig. 1.5.  CLAY FRAGMENT WITH INCISED SIGNS FROM THE DESTRUCTION LEVEL TO THE WEST OF BUILDING CD (CHR. PANIKOLOPOULOS)

Before the final destruction in the advanced LM IIIB period, as suggested by some of the pottery, several rooms had already been abandoned and most of the doorways leading into Hall 3.1 were found blocked. How the complex was eventually destroyed remains something of an enigma. The end came suddenly and the rooms were left with most of their objects in place but metals were taken along so perhaps the inhabitants had some time before leaving. If we are correct in our preliminary dating, the Kefali at Sissi has evidence for three different phases in LM IIIB: a first, LM IIIA2/B destruction in Zone 5 or Building E, a second, mature LM IIIB phase in which Building CD (and F) may have been damaged and partly given up, and a third and last advanced LM IIIB phase during which only a few spaces (3.1; 3.3; 3.8; 4.11) were still occupied (Langohr, this volume). In any case, the Kefali carries one of the latest settlements located in the plain in this area.

1 I would like to thank J.-P. Olivier for help with this object (for similar signs, see Vandenabeele & Olivier 1979, plates LXXXIX-XCII).
By LM IIIC, higher locations would be looked for, such as the nearby Anavlochos. The Kefali site was by then abandoned. If the small deposit of figurines, including horses, found in the western part of Zone 6 (Jusseret, this volume, fig. 6.17) dates indeed to the Geometric period, a limited religious re-use of (part of the) hill may have accompanied a more discrete repopulation of the Malia plain. A small Geometric cemetery was installed on Christ’s Island (l’îlot du Christ), west of Malia, but the settlement has not yet been identified (van Effenterre 1963: 112). On Kremasma, the flat hill west of the Kefali, some remains and vases also suggest a small settlement or sanctuary (Sissi I: 24).

2. Conservation, Site embellishment and Study

During excavation, limited interventions were done on the site, to consolidate excavated standing remains (cf. N. Nikakis in Sissi II). At the end of the excavation, all ancient floor levels were covered with resistant geotextile and A3 gravel. An initial scheme for site embellishment and visit has been drawn up by the director, L. Manousogiannaki and A. Chalkidi, with some input by A. Chrysanthi. A full study for site preservation is being prepared. The eventual aim is to present the site to the public. An initial attempt was undertaken to trace simple paths throughout the site which stay clear of the remains at the same time offering a good view of the remains (fig. 1.6). This path is lined with field stones and can be removed and repaired easily.

Finally, proposals have been made to the local municipality to transform the old school of Vrachasi, to which Sissi belongs, into a study centre. More information on this can be found on the website of the project (www.sarpedon.be).
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3. References

Excavation in the fifth and final campaign focused on completing the exploration of the compartments and structures that had been started in the previous campaigns. At the end of the 2011 campaign, however, some structures remained incompletely excavated because of the appearance of unsuspected earlier levels and because some structures turned out to be larger than expected. After five years of excavation it is certain that all the tombs so far tested at Sissi are rectangular house-tombs, a type of tomb that is frequent in East Crete in the Early and the Middle Bronze Age (e.g. Mochlos, Pseira, Palaikastro, Petras; cfr. Soles 1992; Schoep forthcoming). The lower western and northern slopes were used for burial structures and the house-tomb (9.1-9.4) on the west slope, immediately east of the Neopalatial houses in Zone 2, has proved to be more substantial than expected (fig. 2.1 A & B). Depositional activity in the cemetery can be dated between EM I/II A and MM IIB and so far there is no evidence for later activities, funerary or otherwise. As was the case in previous reports, the following discussion of the compartments will be structured according to the terrace on which they were found.

1. **Upper Terrace (Zone 1)**

1.1. Spaces 1.17, 1.18 and 1.29

Spaces 1.17, 1.18 and 1.29 are situated on the upper terrace of the north-east slope in the south part of the cemetery. To the south of 1.29 and 1.18 there is bedrock and this area seems to have functioned as open space, within which some pottery (cups, juglets) was deposited.

1.2. Space 1.17

Compartment 1.17 to the south of the EM IIA tomb 1.11-1.12 has revealed a complex stratigraphy that testifies to intensive use of this area in MM I-IIA. The latest phase of funerary activity in 1.17 is represented by the construction of a rectangular compartment with two slightly curved walls and a floor of large pebbles (fig. 2.2), part of which had already been excavated in 2009. This feature was constructed in the eastern part of 1.17 over a horizontally placed pithos that contained the remains of a woman of advanced age (Sissi II: 48, fig. 3.7), crushing the pithos in the process (Sissi II: 50, figs 3.10a & b). The 2011 campaign revealed the southern half of the compartment and confirmed the stratigraphy encountered in 2009: there were two burial levels each containing the remains of one individual. The bones found directly on the floor of large pebbles were better preserved than the remains of the second individual found higher up. Although showing some anatomical connections the remains on both levels had been disturbed after decomposition.

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1 Participated in the 2011 campaign: N. Calliauw (KULeuven), S. Lozano Rubio (UMadrid), S. Geijsels (KULeuven), Ann Gilon (Université de Bordeaux), T. Devos (2011), Jeroen Vanhercke (KULeuven), Anneliene Rumens (KULeuven), S. Déderix (UCLouvain), C. Dalberra (Université de Bordeaux), P. Baulain (Paris IV-Sorbonne), Isabelle Crevecoeur (Université de Bordeaux), Aurore Schmitt (CNRS, Marseille), Aurore Lambert (Université de Aix-Marseille), Petra Verlinden (KULeuven), Katrien Devijver (KULeuven), Manolis Vrachnakis (2011), Ben Chan (Sheffield University), Ria Korpe (University of Thessaloniki).

2 The secondary pottery deposit in 1.1 can be dated to MM II on the basis of fragments of a straight-sided cup in style écossais (Sissi I: 50-51).
Fig. 2.1. A: Sissi: PRELIMINARY STATE PLAN OF THE CEMETERY IN 2011 (A. CHALKIDI) (NORTH AT TOP), B: SISSI: AERIAL VIEW OF THE CEMETERY IN 2011 (C. GASTON) (NORTH AT TOP)
In 2009 below the horizontally placed pithos an earlier burial level had been identified, which continued underneath the floor of large pebbles (Sissi II: 50). It contained a multiple burial of two superimposed individuals who were buried facing each other and at the same time (fig. 2.3). One of them could be identified as a woman. This earlier level could not be completely excavated because it continued southwards where it disappeared underneath the double east-west running south wall of 1.17. Since some foot bones were found in the area of the coxal bone, it is clear that the multiple burial had been disturbed after the decomposition of the bodies. It is likely that these disturbances as well as the absence of the lower body of the two individuals took place when the overlying pithos containing the mature woman was installed (see supra and Sissi II: 50).
1.3. Space 1.29

The northern limit of 1.29 is formed by the south wall of 1.17 and its southern limit may originally have been formed by a wall constructed on top of the bedrock that has since all but eroded away (Sissi II: 51). The 2010 excavation of space 1.29 revealed three pithoi (fig. 2.4), one of which was lying against the south face of the south wall of 1.17 and thus post-dates the wall and the floor of small pebbles upon which it was sitting (Sissi II: 51, fig. 3.11). Pithos 2 was excavated in 2010 (Sissi II: 51), while pithoi 3 and 4 were excavated in 2011. Pithos 3, the opening of which was oriented east, contained the primary burial of an individual of undetermined age, perhaps an adolescent. The bones were badly preserved and the skull and mandible are missing. The body was placed head first into the pithos head and the hyper-contracted position of the lower body seems to suggest that the legs were bound together or contained in a perishable container upon their placement in the pithos (fig. 2.5). A wheel-made MM IIA juglet was found beneath pithos 3, which itself was placed on top of a pebble floor.

Pithos 4 (fig. 2.4) was in fact not a complete pithos but fragments of different storage vases that were positioned so that they covered the bodies of at least two individuals. A pithos base was placed against the collar of the pithos to close off the opening and cover a skull. Both individuals were partially preserved. The lowest one, of which only the upper body was preserved, was put on top of a pebble floor on its left side with its head facing east. An obsidian blade was placed in the left orbit of the skull. The individual found higher up was separated from the lower one by a fine layer of sediment and was also partially preserved (humerus, tibia, fibula and a fragment of mandible).

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3 The south wall of 1.17 was built at the same time as the east wall of 1.20. Space 1.20 is a small room filled with redeposited pottery (but no bones). Both 1.17 and 1.20 were constructed on top of the same floor of small sea-pebbles.
It is possible to reconstruct the chronological relationship between the three ‘pithoi’ in space 1.29 on the basis of stratigraphical observations (fig. 2.5). Pithos 2, which contained the remains of a MNI of 4, was the first to be placed in this area. Upon the burial of a new individual, remains of the previous burial were taken out and deposited to the east side of the pithos over the east wall of space 1.29 (see the position of the long bones in *Sissi II*: fig. 3.12). This suggests that the latter wall was no longer functioning as a wall by then and that this space was probably open-air. The next event is the placement of the two bodies that were covered by the fragments that have been called ‘pithos’ 4, which clearly predate pithos 3 since one of the stones supporting the latter was placed on top of the higher individual covered by ‘pithos’ 4 (fig. 2.5). The absence of the lower body of the lower individual in pithos 4 may be connected to the disturbance caused by the installation of pithos 3.

Fig. 2.4. *Space 1.29 with three pithos burials (I. Crevecoeur)*
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fig. 2.5. space 1.29, stone supporting pithos 3 on top of individual 2 of ‘pithos’ 4 (i. crevecoeur)

fig. 2.6. pithos in 1.18 over which is redeposited material (i. schoep)

1.4. space 1.18

a horizontally placed pithos was found on a pebble floor in 1.18 (fig. 2.6). it was found beneath an extensive mm iia dump of mainly pottery but also stone vase fragments, obsidian blades and loose bones. this dump appears to have been laid out over an area covering 1.18-north and 1.18-south as well as the west part of 1.29 and perhaps even part of 1.11-1.12 and 1.18. upon excavation it became clear that the ‘pithos’ was made up of halves belonging to two different storage vases (2011-1-9500-ob001 pithos 1 and 2011-1-9531-ob001 pithos 2). while
the opening of the top half (pithos 1) was oriented west, that of the lower half (pithos 2) was oriented east (fig. 2.7). In addition, fragments of additional storage vases and the base of pithos 2 were used to cover the remains that were not covered by the top half of pithos 1. Like all the other pithos burials, the lower half of the pithos was supported by a semi-circle of stones. The remains belong to an adult placed in a hyper contracted position, suggesting that the legs had been bound together (fig. 2.8).

Fig. 2.7. Pythis burial 1.18 (I. Crevecoeur)

Fig. 2.8. Pythis burial 1.18 (I. Crevecoeur)
In the south part of 1.18, beneath the level of the pebble surface on which the above described pithos burial was placed, another pithos burial containing a child was found (fig. 2.9). The vase fragments covering the remains also belong to multiple, different containers (2011-1-9675-0B002; 2011-1-9685-OB001) and the largest had clearly cut through the skull of the child underneath. On the basis of its dental development the child can be placed in class [1-4]/[5-9]. The position of the bones suggests that the body decomposed in an empty space. An inverted cup was placed on top of the deposit and a possible stone tool (2011-1-9710-OB003) was found between the right femur and the left fibula. This pithos burial was placed over what appears to be an earlier wall and postdates the pebble floor on which the pithos immediately to the south was lying (figs 2.6 & 2.10). This earlier wall appears to form the western limit of the EM IIA tomb 1.11-1.12.

After completion of the excavation of 1.18, it seems that it was probably an outside space to the west of EM IIA tomb 1.11-1.12. The child burial in 1.18 south (fig. 2.9) post-dates the west wall of 1.11 but predates the structure to the west (1.20, 1.23), which was sitting on a higher level of pebbles. Since MM IB/IIA material was found (#2011-1-9666) right down to bedrock in 1.18, interspersed with several layers of pebbles, it is clear that most activity dates to this period.

![Pithos Burial with Child in 1.18 South (I. Schoep)](image-url)
2. Middle terrace (Zone 1): soundings in 1.1, 1.2 and space to south of 1.1-1.2.

In order to clarify the chronology of the tombs on the middle terrace, soundings were undertaken in rooms 1.1, 1.2, and the space between the south wall of 1.1-1.2 and the outcrop of bedrock further south. Previous excavations in the southern half of compartment 1.2 brought to light a MM II pithos burial and a burial level with the remains of at least two individuals (Sissi I: 47-49, 71-73) situated ca. 0.10 m above a pebble floor. The 2011 sounding in the northern part of 1.2 brought to light an earlier east-west wall that has a slightly different orientation to the later north wall of 1.2 and was constructed in a different technique using very small to small-sized stones (fig. 2.11). To the north of this wall and associated with it was a pebble floor, on which was sitting an inverted, hand-made straight-sided cup (EM III/MM IA) containing charcoal fragments. About 0.10 m above this cup were the remains of a primary burial comprising one individual who had clearly been splintered by the construction of the later north wall of 1.2, the construction of which post-dates this level. The earlier wall made of small stones can be identified as the south wall of 1.13. This is suggested by the fact that the pebble floor in the northern part of 1.2 slopes down to the north and corresponds to the pebble floor found in 1.13. In addition, the remains of four individuals (three adults and a child) in 1.13 were also found about 0.10 m above the pebble floor. This would imply that the individual that had been cut by the later wall of 1.2 actually formed part of compartment 1.13, bringing the MNI in the latter to five (Sissi II: fig. 3.19). The lack of human remains on the pebble floor could suggest that the compartment had been emptied (with the exception of the single inverted cup found sitting on the floor) and was
reused for burial at a later date (to be established by detailed study of the pottery). This area was substantially reorganised between EM III/MM IA and MM IIB.

Fig. 2.11.  EM III/MM IA WALL AND BURIAL LEVEL IN THE NORTHERN PART OF 1.2 (FROM NORTH) (I. SCHOEP)

The EM III/MM IA date for the earlier pebble floor and wall found in the sounding in the north part of 1.2 corresponds to the preliminary date established for compartment 1.3, which seems to form part of the same structure as 1.2 (Sissi I: 47-49). An earlier (EM III/MM IA) level was also encountered between the outcrop of bedrock to the south of the southern wall of 1.2-1.3 (fig. 2.12). On top of a pebble floor and underneath the overhanging bedrock were found a triton shell, a handmade carinated teapot and two handmade straight-sided cups (fig. 2.12). This suggests that in EM III/MM IA the tomb ran all the way up to the outcrop of bedrock, which would have functioned as the (lower part of the) south wall of the structure (cf. Gournia Tomb III, cf. Soles 1992: 28). Since the southern wall of 1.2-1.3 is not sitting on the pebble floor, it would appear to post-date it and may belong to the same period of reorganisation as the northern wall of 1.2.

Fig. 2.12.  EM III/MM IA DEPOSIT TO THE SOUTH OF 1.2: TRITON SHELL, CUP AND TEAPOT (I. SCHOEP)

A sounding in compartment 1.3 revealed that the deposit of 11 EM III/MM IA cups was sitting on a level of sediment that had accumulated over an earlier pebble floor (Sissi I: 49). Underneath the pebble floor a fill layer containing numerous small stones and sherds, some of which are EM II and some possibly even EM I in date, was
laid out to level the bedrock. The EM I sherds are the earliest recovered in the cemetery so far, but no associated architectural remains were identified and the nature of the activity which they represent remains unclear.

3. **Lower terrace with 1.15-1.16 and 1.30-1.31**

The excavation of compartments 1.15-1.16 to the east of 1.7 and 1.30 and 1.31 was started in previous campaigns (*Sissi I*: 51-52; *Sissi II*: 58-60). Excavation in 2011 revealed that 1.16 formed part of a larger structure that incorporated compartments 1.7, 1.8 and 1.31. The previously identified compartment 1.15 turned out not to be a compartment after all but a narrow open space between a large terrace wall to the east and a large structure incorporating 1.7, 1.8 and an unexcavated compartment (fig. 2.13). The northern wall of this large structure has eroded away and the southern wall of 1.16 constitutes its southern limit. Space 1.30 appears to have also been an open space delimited to the south by rock outcrops, under which large quantities of tableware were deposited.

Two main episodes of deposition could be identified in this area: one in MM II(A?) comprising large amounts of pottery, mainly tableware, stones, human and animal bones and fragments of burnt mudbrick (*Sissi II*: 60) and an earlier one, provisionally dated in EM III/MM IA and comprising large amounts of tableware placed in the space between the southern edge of 1.16 and the overhanging bedrock. This lower level yielded large quantities of charcoal but almost no human bones.

3.1. **Compartments 1.15-1.16**

Following the completion of the 2011 campaign it is now clear that the eastern wall of what hitherto has been termed ‘compartment 1.15’ (*Sissi II*: 58) runs as far as the rock outcrops that delimit the lower terrace to the south. This wall, preserved over a length of 5.80 m and consisting of large- and medium-sized blocks resting on a lower course of large, roughly squared stones, now appears to be a retaining wall or terrace wall rather than the east wall of compartment 1.15 as previously assumed (*Sissi II*: 58). Consequently, 1.15 should be redefined as a narrow open space between this terrace wall and the east wall of 1.16. Owing to the fact that the terrace wall follows a slightly different orientation to the east wall of 1.16, space 1.15 is triangular in form.

The 2011 excavation has also shown compartment 1.16 to be larger than expected (4.20 x 1.35 m) since its southern wall is not found on the same alignment as the southern wall of compartment 1.7 to the west but a considerable distance further south, in front of the rocky outcrop that delimits the lower terrace to the south. Even though its northern part has been completely washed away, 1.16 constitutes one of the better preserved structures and more carefully built structures in the cemetery (fig. 2.13). The walls (0.35-0.55 m thick) are constructed of medium-sized, roughly squared blocks and a doorway (0.55m wide) furnished with a threshold provided access between compartments 1.7 and 1.16. Even though compartments 1.7 and 1.16 share a common wall and communicate by means of a doorway, it is not certain that they were constructed at the same time. It is possible that 1.16 is a later addition that was constructed on top of an earlier fill. After the construction of 1.16, the east wall and the southeast corner of 1.16 were lined with a row of medium-sized blocks, which lies at a higher level than the external face of the eastern and southern walls of 1.16 and was perhaps intended to serve as a bench. The northern end of the west wall was also provided with a similar bench, save of course for the doorway which was left free. Compartment 1.16 is characterised by a lack of human and animal skeletal material. The pottery, although consisting of a fair number of complete shapes, appears to have been in a secondary depositional context. No clear floor level was identified. Although the walls were carefully constructed it is noteworthy that no stones that could have fallen from the walls were recovered and one wonders whether the upper part of the walls was originally constructed in mudbrick.
3.2. Space 1.30

The area between the rock outcrops that form the southern limit of the lower terrace and 1.16 (fig. 2.14) was used for the deposition of large amounts of tableware, presumably over different periods (EM III/MM IA and MM IIA). The overhanging bedrock seems to have been used for the storage of an extensive deposit of EM III/MM IA pottery, especially cups, jugs and juglets, bowls, dishes, trays and a single (empty and broken) larnax. Noteworthy is a small bowl with appliques of bovine figurines on the rim (fig. 2.17). Copious amounts of charcoal were also recovered throughout the deposit (fig. 2.16) in addition to some animal bone and obsidian blades. The charcoal had clearly been deposited inside the bowls and cups intentionally, but the latter do not show any traces of fire and had thus not been used as lamps. Most of the pottery is complete and seems to have been placed (or stored) here rather than dumped (fig. 2.15). There are no indications that this space was roofed over. The relationship between this EM III/MM IA deposit and compartment 1.16 to the north is not clear at present but it seems possible that space 1.30 was a larger, open space in EM III/MM IA, prior to the construction of 1.16, which appears to be a later addition to structure 1.7-1.8 (see supra).

There are almost no human bones in the EM III/MM IA deposit and the few that occurred were found mainly higher up and can be associated with the MM IIA deposition of large quantities of pottery and bones, human as well as animal (Sissi II: 59-61) placed over this area. It is clear that at the moment that this material was deposited, the walls of 1.16 were no longer standing. Significant quantities of small burnt bones were associated with this second episode of deposition as well as burnt mudbrick. There were also large amounts of human bone without traces of burning and with a clear preponderance of long arm and leg bones. The preliminary study of the bones suggests a MNI of 16 adult individuals in 1.30 and 1.31. In addition, a lower molar and some phalanges of the hand...
and foot were also recovered. Small and short bones (carpals, phalanges, tarsals, spine etc.) are missing. The most likely explanation is that this later deposition is related to the clearing out of (a) nearby tomb(s). The pottery and the long bones were reasonably well preserved and had clearly not been eroded down the hill or transported over a long distance. It is not entirely clear how the burnt bone should be explained but it is not impossible that the burnt mudbrick is somehow connected to it.

Fig. 2.14. **Space 1.30, to the south of 1.16 with vessels in situ (from east)** (I. Schoep)

Fig. 2.15. **Pottery deposit in space 1.30, to the south of 1.16** (I. Schoep)
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4. **Zone 9**

The 2011 season also established that the cemetery extended further to the west than previously thought (fig. 2.1A & B). The lower terrace of the northern slope of the Sissi hill also seems to have comprised several small structures. Excavation of a large structure that is perched on the edge of this terrace overlooking the sea was started in 2010 and continued in 2011 (Sissi II: 65-67). This tomb comprises at least 4 compartments of which only compartment 9.1 and 9.2 have been completely excavated. The structure was built on irregular bedrock so that the floor of compartment 9.1 is situated at a lower level than the floor in compartment 9.2. There are no obvious points of access to these two rooms. The tomb appears to have been constructed and used in MM IB/MM II.

The tomb is delimited to the west, north and east by doubled-faced walls made of large- and medium-sized stones (ca. 0.45-0.50 m thick). Although the external walls are only preserved up to one course, the partition wall between Compartment 9.1 and 9.2 stands up to four courses thanks to the rising bedrock and a stone fill that provided protection against erosion. The southern wall of compartments 9.1-9.2, which was built at a higher level on the bedrock, is now completely eroded away save for a few small stones that remain in situ. Nevertheless, these small stones contrast with the larger blocks used for the outer walls of Building 9 and suggest that the southern wall may have actually been an internal division. A space (9.3) has been identified to the south but it is not entirely clear whether this was a closed compartment or an open space. At any rate, 9.3 was delimited to the south by a double-faced wall, against which a platform or bench was constructed. This space was accessible from the southeast. To the east of 9.2, another compartment (9.4) was identified. It is not clear whether the eastern wall of 9.4 marks the
eastern limit of this large tomb. This wall seems to have been cut by the construction of a small rectangular room (unexcavated) at a higher level with a slightly different orientation.

### 4.1. Compartment 9.1

Compartment 9.1 is a rectangular space measuring ca. 3.50 by 1.50 m. The 2010 excavation in compartment 9.1 yielded eight individuals. Of these, seven were primary burials and one was a secondary burial. The 2011 excavation that went down to bedrock recovered in the lowest burial level three concentrations of bones of perinatals that were still partly in anatomical connection and thus primary depositions. These had been placed on a levelling layer containing pebbles and small stones and can be associated with a deposit of three complete vases (2011-9-9848-OB001 and OB002; 2011-9-9856-OB001) (fig. 2.18). There are also a number of commingled human bones associated with this level. This earliest burial level was sealed off by a layer of sediment, above which a pithos containing individual 1 was installed together with the primary burials of individuals 4, 5 and 8 (*Sissi II*: 66).

![Compartment 9.1, South-East Corner with Pottery on Earliest Floor (A. Schmitt)](image)

### 4.2. Compartment 9.2 (fig. 2.19)

Compartment 9.2 is situated to the east of 9.1 and measures 4.50 by 2.50 m. Three burial layers were identified containing a total MNI of 16 (fig. 2.19).
Fig. 2.19.  
Schematic rendering of the burials in compartment 9.2 (A. Schmitt)

The oldest level was a levelling layer, consisting of pebbles, stones and sherds, laid over the bedrock. Against the eastern wall a pebble floor was installed over an area measuring 1 by 0.50 m, on which was placed a larnax containing the remains of one adult (no. 7, fig. 2.19). The body was lying on its back, with its legs drawn up and the head and knees probably resting against the sides of the larnax (fig. 2.20). Although the absence of small bones of the hand, feet and spine could be explained by bad preservation, the missing tibia bones cannot and clearly suggests that they have been removed after decomposition. In the north-east corner of the compartment to the north of the larnax and at the same level as the larnax three individuals were found (one adult, one child between 3, 5 and 6,5 years and a baby). The adult was placed over the infant on his/her front with legs drawn up to the thorax. Associated with this level and these burials was an inverted cup and an adult humerus (fig. 2.21).
The oldest burial level (and the bottom of the larnax) was sealed by a layer of gravel on top of which a large fragment, broken off from the larnax (see supra), had been placed horizontally. Individual no. 2 (fig. 2.19) was placed on this larnax fragment on his/her back with arms folded across the upper body and legs drawn up to the thorax, a position which can only be explained by assuming that the legs were bound together or contained in a tight perishable container, such as for example, a piece of textile or a basket. This skeleton is not complete since the feet and the right-hand tibia and fibula are missing. The placement of the latter individual probably disturbed the left humerus of the individual buried in the larnax (fig. 2.22).
The primary burials of three additional adults (nos. 3, 4 and 6, fig. 2.19) were found at this same level. The exact chronological relationship between them cannot be established because of the lack of stratigraphical interrelation. Individual 3 had been placed on his/her back, fore-arms crossed across the upper body with legs drawn up. This individual has undergone several disturbances after decomposition and the skull, mandible, right-hand ribs and humerus are missing. Individual 4 was placed along the west wall and is badly preserved; only the left femur, a pair of tibia bones and a fragment of humerus, ulna and fibula are preserved. These were not in anatomical connection and despite the fact that their fragmentary preservation could be due to erosion (since the bones were in a bad state of conservation) it cannot be excluded that we are dealing with a secondary burial. Individual 6 is represented by the skull, mandible, fragments of long bones, metacarpals, and was placed on his/her left side with the legs drawn up to such a degree as to suggest that they has been bound or contained in a perishable container. This burial is associated with a bead (fig. 2.26). In the southern part of the compartment, a pebble floor was laid and on it the remains of two adults (nr. 5 and 8, fig. 2.23) were found. Of individual 5, which was placed on his/her left side, the long bones, the left part of the coxal bone, the skull and some metacarpal bones are preserved. Individual 8 was placed along the west wall on his/her back, with the legs drawn up to the upper body (fig. 2.24). This burial is associated with a gold earring and gold ‘drawing pin’ (fig. 2.25).

Fig. 2.23. COMPARTMENT 9.2, INDIVIDUAL 5 (A. SCHMITT)

Fig. 2.24. COMPARTMENT 9.2, INDIVIDUAL 8 WITH HYPER-CONTRACTED LEGS (A. SCHMITT)
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Fig. 2.25. A. Compartment 9.2, Individual 8, detail of skull and earring (A. Schmitt). B. Compartment 9.2, earring (Chr. Papanikolopoulos). C. Compartment 9.2, gold 'drawing pin' (Chr. Papanikolopoulos)
Post-dating these seven inhumations, which were covered by a layer of sediment, was the construction of a low wall that runs parallel to the east wall, thus forming a small compartment of 1.50 by 0.50 m. (fig. 2.19, fig. 2.27). This compartment was found to contain the remains of at least five individuals (four babies and one adult) that were only partially preserved but presented evidence for anatomical connections. The last individual to be buried in this tomb was an adult male (no. 1, fig. 2.19). Although the skeleton was fairly complete, it is clear that some bones were disturbed and a detailed analysis is necessary to restitute the exact initial position of the body (fig. 2.28).
Compartment 9.3

Compartment 9.3 is situated to the south of 9.1 and 9.2 and measures 3 m by 2.50 m. As in the other compartments in this tomb the bedrock was found to have been leveled by a layer comprising fragmentary pottery and small stones. On this leveling layer some complete cups had been placed upside down (2011-9-9916-OB001; 2011-9-9917-OB001/003). Not a single bone was found in this compartment and it does not appear to have been used for burial. Along the southern wall of 9.3 was a low bench or platform.

Compartment 9.4 (fig. 2.29)

Compartment 9.4 is situated to the east of 9.2 and 9.3 and excavation uncovered a collective deposit that was only partially excavated. In addition, a sealstone (fig. 2.30) was found in the doorway between 9.2 and 9.4. Because the compartment was not completely excavated it is not clear whether the eastern wall of 9.4 constitutes the eastern limit of the tomb. To the east of this eastern wall the tops of three jar burials were uncovered (fig. 2.29)
5. A Sealstone from Compartment 9.4 (Maria Anastasiadou)

A Middle Minoan soft stone signet (11-9-9906-OB001) with a convex seal face⁴ (fig. 2.30). The measurements of the seal are: seal faces: 1.70 cm; height: 1.70 cm; stringhole: 0.25 cm. The seal is only somewhat abraded, the edges of the stringhole are slightly rounded. It is engraved with hand tools and displays V-shaped intaglios, each created by the combination of two slanting cuts. On the seal face, the combination of four border segments creates a lozenge with concave sides⁵. Inside the lozenge is inscribed a smaller square and within this latter, a cross. Sets of parallels echo the sides of the square by extending from them outwards and thus filling the area between them and the lozenge. The shape of the seal is unusual as the combination of a concave conical (bell-shaped) body and a spherical grip is encountered for the first time. Concave conical bodies are met on some steatite MM II Petschafts whereas a spherical grip is encountered on an EM II-EM III cylinder seal with a grip⁶. The only piece that combines these two characteristics is the MM IA CMS V Suppl. 3 no. 476 whose grip is, however, not pierced. The motif of this seal does not find exact parallels among the existing seal corpus. The concave lozenge created by border segments is only paralleled on the rock crystal discoid CMS V Suppl. 1A no. 328 where a cross is inscribed in the shape⁷. A lozenge with straight sides, an inscribed cross and parallels filling the latter’s interstices is encountered

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⁴ Possibly calcite or limestone (whitish in colour).
⁵ Border segments consist of a curved line and a set of parallel hatching placed vertically with regard to it such that a surface at the edge of the seal faces is filled. For another example of a concave lozenge, see CMS II,8 no. 1. For a triangle created by border segments, see CMS V Suppl. 1A no. 212.
⁶ MM II Petschafts: CMS VI no. 135; CMS X no. 44; CMS XI no. 289. EM II-EM III cylinder seal with a grip: CMS II,1 no. 23.
⁷ For a similar motif but with straight sides, see CMS IV no. 10D b.
on the chalcedony (?) discoid CMS V Suppl. No. 57. The shape of the piece combined with the convex seal face, the use of stone, and the motif date the seal to MM II.

Fig. 2.30. COMPARTMENT 9.4, SEALSTONE (CHR. PAPANIKOLOPOULOS)

6. References


8 To these compare also somewhat the motifs on Dimopoulou 2000: 33 no. 11, 35 no. 22.
1. **Introduction**

Located on a large terrace about halfway between the coast and the summit of the Kefali, Zone 2 comprises the remains of at least three LM I structures: Buildings BA, BB and BC. Although these are located close together up to the point of coalescence, the area is otherwise sparsely occupied, especially in comparison to the dense architecture found on the summit. Building BA was partially explored by K. Davaras in the 1960s (Davaras: 1963, 1964) and completely excavated during the previous campaigns in 2007 and 2008 (*Sissi I*: 96-106). Building BB was tested in 2007 (*Sissi I*: 106-107) while Building BC was partially excavated between 2009 and 2010 (*Sissi II*: 69-82). The objectives for the 2011 campaign were the excavation of the area in between Buildings BA and BC (grid squares AR 73-75), finishing the excavation of Spaces 2.6, 2.7, 2.8, 2.9 and 2.12 in Building BC (grid squares AQ-AR 73-76) and the exploration of the area between Buildings BA and BC and the terrace limit to the west, where wall remains had been identified during the 2010 campaign (AR 72, AS-AT 71-72) (fig. 1.1).

2. **Building BC, spaces 2.6 and 2.7**

While most of the archaeological deposits from within the spaces of Building BC were excavated during previous campaigns, there was still a substantial amount of material left, particularly in Space 2.6. The excavation revealed the remaining parts of the lower courses of walls B21, B22 and B25, indicating a three-course build-up for the former and the existence of a platform, buttress foundation or buttress (11-02-2255-FE001) located midway wall B21. The protruding rectangular feature (fig. 3.1) measures 1.49 m² and is on a level with the exterior wall foundation. The feature has been constructed in a similar fashion to that of the interior walls, with smaller sized amorphous field stones reaching up to three courses.

The material consists mostly of a fill which seemed to suggest a sequential build-up, exemplified by sets of horizontally articulated animal bone (such as 11-02-2253-OB003, 11-02-2270-OB003 and 11-02-2271-OB001) and patches of plaster. The pottery found here is comparable to that found during earlier campaigns and mostly consists of LM I coarse ware fragments. However, unlike previous years, a number of MM III sherds were recognised in the lowest strata of the fill. The sherds were found randomly distributed and had weathered breaks, suggesting they were part of a levelling event or perhaps more likely the earliest deposition phase of a continued dumping process. Apart from large amounts of animal bone and sherds, the fill contained a lot of marine shells, charcoal, mudbrick, pumice, a few obsidian fragments and a piece of stalactite.

For Space 2.7 (fig. 3.1), the objective was to investigate the transition to Space 2.6, obscured by a tumble of large stones. The tumble covered part of the fill which was taken out and contained more utilitarian LM I sherds, animal bone, shell, charcoal, mudbrick, pumice and a few obsidian pieces. The fill continued up to the bedrock which rises slightly towards Wall B28.
Stone objects (Tsoraki, this volume, for the lithic material) included vase fragments (11-02-2255-OB001, 11-02-2270-OB002, fig. 3.2o-r), one of which belonging to a bird’s nest bowl type (fig. 3.2n), part of a lamp (fig. 3.2s), lithic tools (fig. 3.2h-k), a gourna fragment (fig. 3.2g) and an architectural fragment (11-02-2243-OB002). A number of (fragmented) terracotta loomweights (11-02-2247-OB002, 11-02-2266-OB003, fig. 3.2a-f) were also found as well as a rounded and pierced terracotta disc (11-02-2245-OB004). Pottery found here consisted of fragments of a tripod cooking pot 11-02-2266-OB001, three conical cups (11-02-2245-OB001, fig. 3.2l-m) and a possibly imported bridge-spouted jar (11-02-2245-OB003).
OBJECTS FROM SPACES 2.6 AND 2.7 (CHR. PAPANIKOLOPOULOS)

Although the existence of a buttress or platform and its proximal location respective to the main doorway of Building BC adds significantly to the space’s configuration, it does little to upset previously made interpretations as it could equally have featured in a room or courtyard. Especially if the space was roofed, adding a buttress (or foundation thereof) could be understood as relieving the inward and downward forces of the long and otherwise unsupported wall B21. One possibility for such an intervention could have been the insufficient counterforce provided by perpendicular wall B22 due to the location of a doorway where walls B21 and B22 meet. While the use of buttresses is an option, it is uncertain whether this interpretation holds as none of the essential perishable wall components of Building BC have been preserved. In terms of size, the feature seems exceedingly large if present for structural reasons only covering the southeast wall of 2.6 for nearly half of its length. Therefore it may be more correct to envision a platform here, a feature previously recorded for adjacent space 2.8 (infra) and neighbouring Building BA (Sissi I: 103). This would be perfectly located to receive materials brought in through the nearby entrance. While its surface is far from level, wood or wicker may have provided such. Lastly, it should be noted that the southwest limit of the feature seems to be aligned with wall B28, suggesting it formed part of the initial construction.

3. Building BC, spaces 2.8 and 2.9

Additional cleaning operations were undertaken in spaces 2.7, 2.8 and 2.9 in order to complete their respective excavation. The material found repeats that discovered during previous campaigns (Sissi II: 72-75).

In Space 2.8 (fig. 3.1), further clearing around the pumice-covered platform in its northeast corner (Sissi II: 73) revealed bedrock. Apart from some LM I sherds and a considerable number of pumice fragments (probably also forming part of the platform), the fill contained charcoal, ash, animal bone, shell and small amounts of mudbrick. There were larger fragments of some cups (11-02-2252-OB003, 11-02-2262-OB001, 11-02-2252-OB001, 11-02-2252-OB 004-6, fig. 3.3b), of a vase (11-02-2252-OB002), a bridge-spouted jug (11-02-2262-OB002), an oval-mouthed amphora (fig. 3.3a) and of a brick or tile (11-02-2242-OB003).
Space 2.9 next to it (fig. 3.1) needed some additional cleaning which yielded finds up to a depth that slightly undercut the mortar located here (Sissi II: 74). Apart from some MM III material, the pottery is mostly LM I and of the utilitarian type. Other finds include animal bone, mudbrick, shell and charcoal. Objects were few in number, consisting of fragments of a tripod cooking pot (11-02-2294-OB003), three cups (11-02-2292-OB003, 11-02-2292-OB001-2) and two lithic tools (figs. 3.3c-d).

Fig. 3.3. OBJECTS FROM SPACES 2.8 AND 2.9 (CHR. PAPANIKOLOPOULOS)

Further investigation of Space 2.9 in particular was interesting as the depth of the fill here was considerably lower than that in adjacent Space 2.8. In both cases, the fill descends to a hard but unconsolidated layer of decayed bedrock that overlies the solid bedrock and the difference in depth is a result of a difference in bedrock levels (Sissi II: 69, n.3). The presence of MM III material in the earlier strata of 2.6 (supra), similar to Space 2.9, may indicate that the stratigraphy of both rooms may have undergone partially parallel deposition sequences.

4. Building BC, space 2.12

Partially excavated in 2010, Space 2.12 (fig. 3.1) was destroyed by fire, as exemplified by the rubified soil, burnt mudbrick, a vitrified cup, a burnt beam and earth (Sissi II: 78). It contained a range of ceramics that was somewhat unusual within Building BC in the sense that decorated and finer wares occurred, contrasting to the utilitarian wares found elsewhere. Upon reaching the floor level in Space 2.12, a buried vat (10-2241-OB001) was noted. This vat had been placed alongside wall B33, close to the corner with wall B34 and with the rim more or less at the floor level as indicated by a burnt fallen beam (11-02-2237-FE001), a column base and a patch of pebble floor (Sissi II: 78). The vat, with rope decoration under the rim and two vertical handles, has a diameter of 0.43 m and a height of 0.35 m. It is reasonably well preserved but surprisingly there is a large hole (diameter: 0.18 m) in its base, covered by a flat, roughly fitting stone (11-02-3201-OB001), measuring 0.18 x 0.17 x 0.06 m. The primary evidence for fire destruction, the overall preservation of the vessel as well as the position, shape and dimensions of the stone suggest that the stone is in situ and formed part of an installation (fig. 3.5). Whatever the intended use of the vat, it had either been buried into the soil while already broken or the breaks occurred later on and the sherds were removed. The latter seems unlikely though because the hole is fairly central and regular, leaving a more or less equidistant rim radius and no further cracks seemed to be present. Unless the stone held an impermeable material such as leather in place, the vessel would have been inappropriate for containing liquids and better or easier alternatives may exist related to, rinsing, filtration or drainage. While further analysis is planned, the function of the installation is yet to be satisfactorily explained. For the rest, the finds were similar to those of the previous season: large amounts of (burnt) mudbrick, burnt earth, abundant charcoal. Further finds consisted of shell, bone, pumice, obsidian fragments and LM I sherds. There were also a burnt stone (11-02-2265-OB001), a burnt terracotta tile (11-02-2265-OB002), both with heat-induced cracks, part of a vase (11-02-2263-OB001), a

4 C. Langohr, pers.comm.
5 Ibid.
tile fragment (11-02-2265-OB003), two terracotta loomweights (11-02-2265-OB004, fig. 3.4a), a stone tool (fig. 3.4b) and a fragment of a drilled stone, perhaps of a lamp (fig. 3.4c).

Fig. 3.4. OBJECTS FROM SPACE 2.12 (CHR. PANIKOLOPOULOS)

Space 2.12 also featured a small recess in wall B33, close its west corner. Large, articulated sherds were found here, one on top of another and it is assumed that a closet was located here.

Fig. 3.5. a) BURIED VAT IN SPACE 2.12; b) CUTAWAY DRAWING OF VAT IN SPACE 2.12 (F. CARPENTIER)

5. Building BC, space 2.13

Space 2.13 (fig. 3.1) was covered by one of the spoil heaps that resulted from excavations in the 1960s. It is formed by a relatively small (9.96 m²) space with a plan in the shape of an inverted “F”, located between Space 2.5 of Building BA and Space 2.12 of Building BC. Its northeast wall is shared with Space 2.12 (B33; Sissi II: 78) but only partially which makes Space 2.13 set further west compared to adjacent Space 2.12 and thus leaving a recess of 2.91 m². The southwest wall is formed by Space 2.13, the easternmost part of the north wall of space 2.5 (B16,

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6 These spoil heaps were attested outside the four walls that defined room 2.5 (‘Davaras Building’, Sissi I: 96); all but one of them were found deposited on top of adjoining smaller spaces (respectively 2.1, 2.2, 2.3, 2.4 and 2.13).
3. The Excavation of Zone 2. The 2011 Campaign

Sissi I: 97), be it located higher than the other walls of 2.13 (and Building BC, for that matter). To the east, wall B34 (FE 11-02-2291-FE001) was constructed in a double-skin fashion with small and medium-sized field stones. Parallel to B33, it is located 1.07 m further west, forming the west wall of the recess (supra) between spaces 25, 2.12 and 2.5. The west limit of 2.13 is formed by wall B37 (11-02-3204-FE002) which runs perpendicularly from the western end of B33 up to where it is intersected by wall B36 (infra) which causes it to shift 0.81 m southward before linking up with B16. Space 2.13 is subdivided by wall B35 (11-02-3204-FE001) which runs parallel to B33. Stopping at 0.75 m from wall B34, it leaves an opening through which the two subdivisions are interlinked.

Beneath the spoil heaps from Davaras’ excavations, the original topsoil was identified which signalled the start of a similar stratigraphy as was recorded in Building BC during previous years. Still, the very dense scatter of stones with dimensions akin to those used in smaller walls was remarkable and cumulated in the square stone concentration in the west part of the space. The rest of the fill contained sherd of utilitarian LM I type ceramics, bone, shell, mudbrick, charcoal and small amounts of pumice and obsidian. Objects from this room were few, but with a significant concentration of large lithic (grinding) tools (11-02-2298-OB001-002, fig. 3.6a-e), an architectural fragment (11-02-2291-OB003), a stone vase fragment (11-02-2295-OB002), a large vat fragment (11-02-2285-OB002), a basin fragment (11-02-2291-OB001), vase fragments (11-02-2291-OB002, 11-02-2285-OB001), two cups (11-02-2288-OB001, 11-02-2297-OB001) and a conical cup with pierced base (11-02-2295-OB002).

![Image](image.png)

Fig. 3.6. **Objects from Space 2.13 (Chr. Papankolopoulos)**

Although the space adjoins both Buildings BA and BC, it seems to have been part of the latter because of the bonding of walls B34 and B33. Moreover, the corresponding wall and floor heights of Space 2.13 with the rest of Building BC contrast with the difference of 0.80 m which exists with the walls and floors of Building BA. Wall B16 is partly undercut by the smaller stones that delineate Space 2.13. In addition, the orientation of the walls, as is the case for the rest of BC, is slightly angled in comparison to BA. The size and configuration of 2.13 restrict functional possibilities. The smaller of the two is a narrow, rectangular space, the size (1.89 m²) of which would have restricted any sort of activity. It could have served as a storage space on the condition that items were either only occupying part of it, or they were stacked in a preferential order as items at the back would not have been readily accessible otherwise. The amount of stone tools (all barely worn grinding equipment) attested here may support this theory. Alternatively, the narrow part served as a stairwell. This hypothesis is supported by the large amount of stone rubble and the dense stone packing that is located in the west part of 2.13, which, if indeed massive, would have easily afforded a turn and continuation of the stairs. Unlike the flight of stairs that remained in Space 2.2 (Sissi I: 103-104, 108), no such stones could substantiate this idea for 2.13 and it seems unlikely that the large amount of flattened grinding stones could have fulfilled such a role. Rather, the construction of stairs out

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7 C. Tsoraki, pers. comm.
of wood should be considered with the remainder of the space used for passage and storage.

6. The Area in between Buildings BA and BC

The area bordered by walls B16, B24, B30, B34 and the east limit of grid square AR 74 (fig. 3.1) was tested as a rectangular, *ammouda* bench (11-02-2284-FE001) with a 0.29 m² surface and a 0.15 m height, had been attested positioned parallel to wall B16 at 1.12 m distance. In the area, a group of four stones, arguably parallel to B34 and in the axis of B30 was found abutting Building BA. These could have formed a small wall in support of a light roof, covering the recess in between Room 2.5 and Spaces 2.12 and 2.1,3 thus providing a small sheltered space of 2.91 m².

Excavations yielded very few finds for such an extensive area, with low counts of pottery, mudbrick, shell and bone. Objects were mostly fragmentary and included fragments of vases (11-02-2259-OB001-2; 11-02-2284-OB001-4), a small terracotta spiral fragment (fig. 3.7), lithic tools (11-02-2280-OB001, 11-02-2282-OB001), and an architectural fragment (11-02-2282-OB002).

Fig. 3.7. **Objects from the area between buildings BA and BC (Ch. Papnikolopoulos)**

The small number of finds and lack of structural supports suggest this was an open space, perhaps with a small, roofed, semi-open space located near its west wall. Such a space would have been reasonably well-protected from the elements and could have functioned as a covered storage or animal shelter (perhaps with the bases of broken vases, some perhaps in situ position near wall B16, recycled as troughs). The space featured an *ammouda* bench which could have provided a multifunctional work surface. The only ground-floor doorway accessing this area directly would have been the presumed doorway towards Space 2.8 (*Sissi II*: 72). A large basin with drainage hole buried near the doorway (*Sissi II*: 73) would then have provided an ideal collection facility for (household) production or processing activities taking place on the courtyard.

7. The Area west of Buildings BA and BC

During the 2010 campaign, the area between the edge of the terrace and the west limit of Building BA and BC, represented by wall B15 (*Sissi I*: 97) was cleared of vegetation and a series of isolated, fragmentary walls appeared. These mostly consist of large uncut field stones similar to the boulders used in the exterior walls of the two other structures as well as Building BC (especially wall B23) (*Sissi II*: 71) (fig. 3.1). The existence of a large wall, B36 (11-02-2257-FE002), running from 2.13 towards the terrace wall, and the identification of an entrance connecting to the area west of Building BA and BC warranted renewed exploration. Despite being the only wall with a structural connection with the buildings, it cannot be ascribed to a delineated space. It abuts wall B37 (supra) through means of a perpendicular, northwest shift of the latter, indicating that wall B36 and Space 2.13 were contemporaneous. Where B36 meets B37, an entrance (11-02-2257-FE002) of 1.09 m wide and consisting of

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8 A comparable observation has been made for Maison Zα at Malia (Deshayes & Dessenne 1959: 10-11), and has been suggested for other sites (Preziosi 1983: 7, 43, 135).

9 *Ammouda* is a sandstone variety (Shaw 2007: 23) which was frequently used in local architecture, both worked and unworked.
small stones with smooth surfaces, could be identified. Parallel to Building BC’s exterior northwest wall B15 (Sissi I: 97), at ca. 2 m distance, five boulders form fragmentary wall B38 (11-02-2257-FE001). A similar configuration is found further west, where another two boulders are located, forming a parallel fragmentary wall B39 (11-02-2257-FE003). A fourth wall, B40 (11-02-2257-FE004) perpendicular to B38 and B39, and consisting of two separated parts, is located towards the end of the terrace. No remains of a connection to wall B15 could be traced. Lastly, wall B41 (11-02-2257-FE004) is located further south and runs parallel to B40. Compared to most walls in the area, this last wall is relatively well preserved, running uninterrupted for 6.08 m.

Across the area, bedrock was found to be present immediately beneath the topsoil and very few finds (mostly eroded sherds) were encountered. The walls follow orientations that parallel those of Building BC and the location of the entrance in wall B36 seems to accommodate fragmentary wall B38. They could be the relics of an older building that was (at least partly) contemporaneous to or even part of Building BC. If one were to reconstitute the wall remains along their respective trajectories, a structure very similar to Space 2.5 in Building BA is possible (fig. 3.8). The current state of the walls could then be explained through the re-use of stones for the construction of Building BA yet does not account for the seemingly haphazard removal of large stones. The (remaining) wall parts could equally well have been (re)used as the structural supports for light outbuildings (e.g. for storage or stables). As for the westernmost parts of Building BC, the progressive erosion of a hypothetical once present terrace wall (Rackham & Moody 1992) has severely impacted the area. It is unclear whether this wall once formed a part of the fragmentary remains between B41 and B36, although their identical orientation does suggest they were constructed at around the same time.

![Fig. 3.8. Overlays on an aerial photo for Buildings BA (red), BC (yellow) and a hypothetical building west of it (blue) (F. Carpentier, aerial photo by C. Gaston)](image-url)
8. Conclusion

The addition of Space 2.13 to Building BC completes our understanding of how BC was structured, as the possibility of a staircase there would have provided access to a roof terrace, an upper storey or a small attic space. Remains of stairs were found in situ in neighbouring Building BA, befitting the architectural similarities that exist between the two structures. Small scattered wall remains in the area west of Building BA may imply the existence of a precursor to BA which, like its successor, was integrated within Building BC. Although evidence is scant and it remains unclear whether these were once complete walls, small structural elements for light outbuildings or both. Buildings BA and BC may have had similar occupation histories, as exemplified by the neatly abutting architecture and the gradual filling up of BC, perhaps while BA was occupied. During the time they coexisted, the space between the buildings and lined by them on three sides, provided a large, open (court)yard with reasonable protection from sun and wind. The 2011 campaign confirmed that part of the buildings was lost to erosion.

Both buildings contain objects and features that are typical for a domestic context, but some elements may indicate that some specialised activities were also carried out: the dowelled, double-troughed gourna (Sissi I: 100-101, 108-110), the bronze tool kit (Sissi I: 98-99, 110-111) and accompanying loomweights (Sissi I: 110) in Building BA; the mortar (Sissi II: 74), large vat, pumice platform (Sissi II: 72-73) and vat-stone installation (supra) in Building BC. The results of 2011 can therefore be seen as supportive to the interpretation of the buildings as modest versions of the house-workshops of neighbouring Malia (Poursat 1996). The occurrence of MM III sherds towards the earliest strata (supra) provides a terminus ante quem for the origins of Building BC. This earliest deposition was likely a levelling layer with material brought in from elsewhere or residual material dating to the early occupation phase while the massive body of LM IA material represents refuse. Hence, it is hypothesized here that the Building BC was constructed and saw its first occupation phase some time during the early LM IA period, which is the period to which most of the pottery can be ascribed to (Sissi II: 179), and that it was abandoned during or towards the end of this same period, after which it served as a dumping area, perhaps from clearing nearby buildings. In nearby Malia, similar contexts are being related to clearance dumps after an earthquake that occurred at the end of the LM IA period (M. Pomadere, pers. comm.).

9. References

- Davaras 1963 = K. Davaras, in Κρητηκα Χρονικα 17 (1963), 405.
- Davaras 1964 = K. Davaras, in Αρχαιολογικων Δελτιων 19, II (1964), 442.
3. The Excavation of Zone 2. *The 2011 Campaign*
4.1. The Excavation of Building CD

Introduction

This introduction aims at updating the general plans of Building CD provided in the last preliminary report. Although the 2011 campaign allowed us to clarify some issues in terms of layout and connections between rooms, an overall architectural and stratigraphical study of the remains still needs to be conducted, without mentioning the invaluable information that the ceramic study will provide in terms of phasing. All the plans proposed here should therefore be considered as provisional.

The reader can find a somewhat more detailed introduction to Building CD in the previous report (Sissi II: 83-88) even if some new data will be outlined below.

1. The 2011 campaign

In 2011, in Zone 3, excavation was resumed in the western part of Building CD, in Rooms 3.4, 3.5, 3.6, and 3.11 (Sissi I: 123-128). Cleaning in Rooms 3.8, 3.9 and 3.10 (Sissi II: 89-92, 100-101) was also conducted.

In Zone 4, this season saw the south and southeast parts of Building CD being investigated. This allows a better definition of rooms 4.15-18 (Sissi II: 132-135), the discovery of an eastern limit for rooms 4.12 and 4.13 as well as the continuation of the street level unearthed in space 8.1 in previous years (Sissi I: 137-138, fig. 6.33 and Sissi II: 136-139, figs 5.79-80). A central corridor, labeled 4.21, was also explored and the tumble that obstructed it cleaned. Some other tests that did not modify the provisional plan were also conducted and are described in detail below.

2. Updated plans

Each plan provided in this introduction is related to its earlier version provided in the 2009-2010 preliminary report over which it should take precedence.
2.1. **Aerial view**

Compare with *Sissi II*: 83, fig. 5.1.

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**Fig. 4.1.** AERIAL VIEW OF BUILDING CD AND SURROUNDINGS (C. GASTON)
2.2. Stone-by-stone plan

Compare with Sissi II: 83, fig. 5.2.

Fig. 4.2. Preliminary stone by stone plan of Building CD with features indicated (Q. Letesson, F. Gaignerot, P. Hacigüzeller)\(^1\)

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\(^1\) For a larger version, see back of the volume.
2.3. **Schematic plan with blockings and thresholds**

Compare with *Sissi II*: 83, fig. 5.3.
2.4. **Major LM III phase**

Compare with *Sissi II*: 83, fig. 5.4.

![Building CD (Major LM III Phase) (Q. Letesson)](image)
4.1. The Excavation of Building CD. Introduction

2.5. Sectors within major LM III phase

Compare with Sissi II: 83, fig. 5.5.

Fig. 4.5. BUILDING CD (POSTPALATIAL PHASES AND SECTORS) (Q. LETESSON)

3. References

4.2. The excavation of Zone 3

Florence Gaignerot-Driessen

The 2011 four week campaign conducted in Zone 3 focused on the western part of Building CD (Rooms 3.4, 3.5, 3.6, and 3.11). Room 3.8 and the two compartments 3.9 and 3.10 were also intensively cleaned and the tumble blocking the opening between Room 3.1 and Room 4.11 was removed, without, however, revealing a threshold.

![Aerial Photograph of Zone 3](image)

Fig. 4.6. AERIAL PHOTOGRAPH OF ZONE 3 (CH. GASTON)

1. Room 3.8, 3.9 and 3.10

Room 3.8 – ‘the shrine’ – was excavated in 2009 and a preliminary report was published in the previous Sissi volume (Sissi II: 89-92). In 2011, cleaning in the southern part of the room allowed the south wall to be delimited.
and highlighted the existence of the small space 3.12 to the south of 3.8. The excavation of compartments 3.9 and 3.10, only accessible with a ladder from the platform located to the east of Room 3.10, was also completed in 2011. A kalathos (11-09-0579-OB004) similar to the ones found in the shrine in 2009 was found against the eastern wall of Room 3.9. Under the LM IIIb floor level was a LM IA layer containing a conical cup (11-03-0579-OB003) and the leg of a tripod cooking pot with a typical oval section. The walls delimiting Room 3.9 and Room 3.10 were built above this LM IA layer. It thus became clear that these two tiny spaces were part of a building plan including Room 3.1, 3.4 and 3.8 during the last phase of occupation of the building and may have served as granaries or the like.

2. Room 3.4

To the west of Room 3.8 and Room 3.9 is Room 3.4, partly excavated in 2008 (Sissi I: 123-125). Then different enigmatic features were encountered, including a circular hearth (C 20) (diam: ca. 1.70 m) located in the north-west corner and above all floor levels identified in the room (fig. 4.7). No clear substructure was identified. The hearth comprised a thick layer of ash and charcoal but no other material apart from some unburned shells, sherds, and fragments of plaster and pumice. A few bricks which seemed to delimit the hearth were recovered in 2008 which could suggest that the structure may rather have been an oven than a hearth, but we still lack convincing evidence to confirm this hypothesis. Fragments of two broken but complete pithoi were recovered around C 20 (fig. 4.7). Beneath the pithos to the east (11-03-0570-OB005), charcoal, shells and a concentration of unburned bones were recovered. To the south-west, against the hearth and underneath fragments of a second pithos (11-03-0570-OB008), representing the only burned sherds recovered from this part of the room, was a 0.15 m deep pit containing a stone vase (11-03-0573-OB001) and a lithic tool (11-03-0573-OB002) (fig. 4.8). Immediately to the south of the pit and roughly in the middle of the room was built a stone platform from where a conical cup (11-03-0570-OB009) and lithic tools were recovered (fig. 4.8). A triton shell (11-03-0570-OB004), kalathoi (11-03-0555-OB002, 11-03-0570-OB003 and 6), a conical cup (11-03-0570-OB007) and some shells were found in front of a large ammouda block that was lying in a niche in the north-east corner, along Wall C 21 (fig. 4.7). This ammouda block was probably fallen from the eastern part of Wall C 18. The kalathoi are similar to the ones found in Room 3.8 in 2009 (Sissi II: 89-92) and the one found between the ammouda block and Wall C 21 in 2008 (Sissi I: 125). Two of the kalathoi (11-03-0570-OB003 & 6) were found stacked and upside down. Among the finds from this part of Room 3.4 a possible seal in steatite deserves mention (11-03-0570-OB001; see Anastasiadou below). In general, the nature and the location of the finds from the northern part of the room suggest a connection with the ritual equipment from the shrine 3.8 and a possible ritual function for the hearth C 20.

Fig. 4.7. NORTHERN PART OF ROOM 3.4 (1: KALATHOI 11-03-0570-OB003 AND 6; 2: TRITON SHELL 11-03-0570-OB004; 3: AMMOUDA BLOCK; 4: PITHOS 11-03-0570-OB005; 5: PITHOS 11-03-0570-OB008) (F. GAIGNEROT-DRIESEN)
To the south, large fragments of pithoi and a mudbrick structure (C 37) in which three circular spaces were arranged was found (fig. 4.9). Since the structure, tentatively interpreted as a vase support, as well as some of the pithoi fragments clearly pass beneath Wall C 13 and were found under a LM III destruction layer, it can be assumed that this structure was related to an earlier phase of occupation of the space and built against Wall C 25 (see Sissi I: 125). The excavation of this part of Room 3.4 also yielded lithic tools, fragments of stone vases, obsidian blades, a fragment of metal, a lead cylinder (11-03-0553-OB003) and a circular lead weight (11-03-0553-OB007).
3. Room 3.6

Cleaning of Wall C 19 in Room 3.4 revealed in the southern part a possible space for a window opening on Room 3.6 (figs. 4.9 and 4.10). This hypothesis was confirmed by the find of a jamb in ammouda fallen immediately in front of the opening in Room 3.6. A similar L-shaped block, possibly the second part of the window frame, was recovered from a dump in Zone 5 (Devolder, this volume). A bronze knife (11-03-0565-OB001), inserted in the western part of Wall C 16, was found during cleaning (fig. 4.11). The south part of the L-shaped Room 3.6 was excavated in 2008 when a large amount of pumice, known for its abrasive properties (Gaignerot-Driessen and Driessen 2012), as well as several pithoi in which the lumps of pumice were seemingly stored, was found beneath an abandonment layer belonging to the last phase of occupation of the building (Sissi I: 123, 127-128). The excavation of the northern part revealed a similar concentration of pumice, another pithos (11-03-0557-OB002) and a lekane (11-03-0557-OB001) (fig. 4.10). Fragments of plaster were recovered from the room, most probably fallen from the walls. On the floor and close to the western façade wall was a toolkit of 28 stone items, including pounders, polishers and a polygonal possible granodiorite pestle (medium to coarse grained igneous rock) (11-03-0559-OB001) (for a detailed description and illustration, see Tsoraki this volume). From the same context also come a steatite spindle whorl with a decoration of inscribed circles (11-03-0587-OB003), very similar to that found in Zone 6 (11-06-2184-OB001; Jusseret, this volume, fig. 6.22) (fig. 4.12), fragments of possible stone vases, obsidian blades as well as an inverted quern (11-03-0561-OB005), set against Wall C 19 (fig. 4.10). A champagne cup (11-03-0561-OB002) was recovered to the south of the toolkit and represents the second prestige drinking vessel from the area since a kylix was already found in 3.6 in 2008 (see Sissi I: 123). More lithic tools were recovered from the south-eastern part of the space, particularly a fragment of a pounder (11-03-0584-OB001; 11-03-0587-OB001-2; see Tsoraki this volume).

Fig. 4.10. FLOOR DEPOSIT IN ROOM 3.6 (1: FALLEN PARASTADE; 2: INVERTED SADDLE QUERN 11-03-0561-OB005; 3: FRAGMENTS OF PITHOS 11-03-0557-OB002 AND PUMICE LUMPS; 4: LEKANE 11-03-0557-OB001; 5: TOOLKIT; 6: LOCATION OF BRONZE KNIFE 11-03-0565-OB001 (F. Gaignerot-Driessen)
Once the large belly fragments of pithos 11-03-0557-OB002 were removed, two nests of spools north and south of a slab appeared together with the three legs of the pithos (fig. 4.13). In total, 58 terracotta spools, sometimes poorly fired, were collected from Room 3.6, with a range of weight between 0.63 and 0.80 g, 38 of them weighing between 0.70 and 0.75 g² (fig. 4.14). Their presence in a LM IIIB context at the latest on a Cretan coastal site is of particular interest. These hourglass-shaped loom weights are considered as a typical production of the Sea People (Rahmstorf 2003; 2005; 2011: 320-322; Stager 1995; Yassur-Landau 2003: 588; 2010: 132, 267-270, 841). Until now the earliest published examples in the Aegean came from LM IIIB2 contexts in Kastelli Chania (Bruns-Lundgren & Wiman 2000: 177-178, pl. 97, 99a.1.3, 100b.1-7, 1003e.10-2, 104a.5, 106c.5, 110a.9, 112c.1; Yassur-Landau 2010: 132). Quartier Nu at Malia also yielded four comparable spools coming from probable LM IIIA2-B1 contexts (J. Driessen pers. com.). However, most of the Mainland and Aegean examples date to LH IIIC Early and later (Rahmstorf 2003; 2005; 2011: 321; Yassur-Landau 2010: 132) and they were also recovered on Crete in LM IIIC contexts, e.g. from Room K 44 in Karphi (Preston Day 2011: 123 and pl. 15c), Chalasmenos (Tsipopoulou & Coulson 1994: 80 pl.10.3; Tsipopoulou & Nowicki 2003: 566, 580 fig. 26), Knossos (Warren 1982-83: 73 fig. 58; Evely 1984: 248, 297, pl. 231.14-5), Phaistos (Rahmstorf 2003: 400 n. 37), and Palaikastro (Sackett et al. 1965: 45-50, 305, fig.19). In a recent theoretical approach on interregional interactions in the 12th century Levant, Yassur-Landau (2011: 248-253) considers the use of spool loom weights on Cyprus and in Philistia during this period among other domestic behavioural patterns as an indicator of what he calls a ‘deep change’ caused by migrants intending to settle down. Nevertheless, it is worth to note that traditional, circular perforated loom weights in terracotta (11-03-0584-OB003 and 11-03-0587-OB004) were also recovered from the spool assemblage in Room 3.6 at Sissi and elsewhere in Building CD in contemporaneous contexts (Letesson, this volume). On the basis of the model developed by Yassur-Landau (2011), the ethnicity of the inhabitants of Sissi in LM IIIA-B, or at least the nature of their interaction with the Sea People during this period, clearly needs to be further explored.

To conclude on the function of Room 3.6, it can be said from the nature of finds that the space was devoted to various kinds of domestic/industrial activities, including weaving and possibly stone working, although we lack as yet sufficient conclusive evidence to confirm this second hypothesis (Tsoraki, this volume).

² Special thanks go to Th. Claeys who washed and measured the spool assemblage during the 2011 campaign.
4.2. The excavation of Zone 3

An opening in the eastern end of Wall C 15 to the north of Room 3.6 gives access to Room 3.11 (ca. 19 m²), which, in its turn communicates with Room 4.7 to the north. It seems, however, that during the last phase of occupation of the building, all accesses to Room 3.11 were blocked. A thick and compact abandonment layer covered a destruction layer with typical architectural debris, itself covering a badly preserved pebble floor. A column base (C 39) is located in the middle of the room (fig. 4.15). The many plaster fragments found in the corners of the room suggest that the walls of the room were plastered. An important quantity of pumice stones (albeit less numerous...
than in Room 3.6) were collected from the abandonment layer. Very little other material was found apart from a champagne cup (11-03-0581-OB001), a kalathos (11-03-0604-OB002), a fragment of a beehive (11-03-0604-OB001), a stone bead (11-03-0591-OB002), a fragment of a figurine (turtle?) (11-03-0596-OB001), some lithic tools and obsidian flakes. A stone with a circular depression (11-03-0600-OB001), apparently fallen, was close to Wall C 19. Tests into the pebble floor brought to light a lekane (11-03-0608-OB001), next to the column base (fig. 4.10), and two other vases (11-03-0610-OB001 and 2) along the north part of Wall D 17.

Room 3.5

Room 3.5, to the south of Room 3.6, was also abandoned during the last phase of the building as attested by the stratigraphy and the blocking of the door into adjacent Room 3.3 (Sissi I: 123). Excavation in 2011 revealed a circular hearth (C38) in the south-east corner below the abandonment layer. This hearth was built on a mudbrick substructure and delimited by a stone structure to the south (fig. 4.16). Waste from the hearth was seemingly deposited in a pit in the north-east corner of the room. A square stone built structure was found empty in the south-west corner.

Immediately to the east of the entrance into Room 3.6, three large sideropetra blocks were embedded into the floor along and at a distance of ca. 0.30 m from the north wall C15. In the western part of the room, the rest of a pithos partly removed in 2008 (08-03-0485-OB001; see Sissi I: 123) was found. A large amount of pumice was also collected from this area. From the same context come two fragments of stone vases (11-03-0582-OB001; 11-03-0593-OB003), numerous lithic tools including two possible hammers (11-03-0589-OB006; 11-03-0593-OB007), a fragment of a grinding slab (11-03-0589-OB008), a stone with a circular depression (11-03-0594-OB002), a possible stone weight (11-03-0594-OB004), a circular stone object with two perforations (11-03-0594-OB001), a bone needle (11-03-0594-OB005), two conical cups (11-03-0582-OB002; 11-03-0588-OB004), a fine LM III alabastron decorated with panels (11-03-0589-OB005; see Langohr, this volume fig. 7.2) and two jugs (11-03-0585-OB001; 11-03-0589-OB003). Some patches of floor were conserved, in clay along the western wall, in tarazza along the south wall (fig. 4.16).

Tests in the eastern part of the room revealed a Neopalatial destruction layer containing at least 15 vessels lying on the bedrock (fig. 4.16), among them an ogival cup (11-03-0598-OB001), a globular cup (11-03-0603-OB006), the base of a beehive (11-03-0603-OB007) and a conical cup (11-03-0609-OB003). Small finds further include a glass bead (11-03-0601-OB001), a terracotta circular loom weight (11-03-0601-OB003), a terracotta spindle whorl (11-03-0601-OB007) and a fine sealstone representing a lion and a tree (11-03-0603-OB001; see Anastasiadou.
4.2. The excavation of Zone 3

below). It is likely that this deposit continues. Large fragments of painted plaster were collected and it is assumed that they originally decorated the walls. Differences in the construction of the south wall C10 moreover suggest that Room 3.5 may have been cut in two east and west parts in a previous phase. During conservation of the platform in the southwest corner of the room by N. Nikakis after the excavation, a complete stone blossom-bowl (11-03-0611-OB002) was found outside and beneath this structure, along the western side. It is quasi identical to that found in Zone 2 in 2010 (10-02-2202-OB002; see *Sissi II*: 78 and 79, fig. 4.11g). It should also be Neopalatial.

Fig. 4.16. DESTRUCTION LAYER IN ROOM 3.5 (L. MANOUSOGIANNAKI)

6. A Note on the Seals (Maria Anastasiadou)

A seal and a pendant or the remains of a pendant seal were found in Zone 3 during the 2011 campaign. Seal 11-03-0603-OB001 is a Late Minoan soft stone lentoid (fig. 4.17). The measurements of the seal are: seal faces: 1.45 x 1.40 (parallel to the stringhole) cm. The edges of the intaglio are very sharp and the engraving shows no signs of abrasion which suggests that the seal is almost workshop fresh. The piece is engraved with hand tools. Depicted is a seated lion to the left and behind it, a plant with three ‘leaves’. The pose of the lion, the depiction of four bent legs in profile, and the downwards bending claws are common in LM I lions carved on soft stone (Pini 1995: 194-200). The plant motif is also encountered on LM I seals in connection with seated lions (Pini 1995: 299, fig. 6b,c). On the other hand, rather rare among such lions is the direction of the head to the front as opposed to the back\(^3\). The seal is dated to LM I and is therefore contemporaneous to its context.

\(^3\) For some more examples of LM I lions looking in front, see *CMS* I nos. 504, 505; *CMS* II,4 nos. 60, 139; *CMS* III no. 406.
Pendant 11-03-0570-OB001 is a soft stone pendant of an non-canonical pyramidoid shape⁴ (fig. 4.18). The measurements of the piece are: height: 0.98 cm; breadth (max.): 0.78 cm; stringhole: 0.20 cm x 0.25 cm⁵. The pendant is abraded. The stringhole has opened and is rounded from the friction of the string. The closest parallels to this piece among Minoan pendants are baton-shaped pendants dated to EM II-MM II (for these, see Effinger 1996: 48). Among seals, those with a similar shape and size are dated to EM II but some examples dating later and down to the MM II period are also encountered⁶. The best parallel for the shape of the piece is the seal CMS V Suppl. 1B no. 310, which interestingly also comes from a late context (LM II-LM IIIA2). If the piece is a seal, the intaglio is totally worn away as no traces of engraving can be discerned on the base.

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⁴ Steatite?
⁵ The measurement of the breadth is taken from the side shown in the figure.
⁶ Compare for example the EM II CMS II,1 nos. 198, 199, 364, 425; CMS V no. 17; V Suppl. 1A no. 238; CMS VI no. 2; and the later CMS XII no. 23. Also less, the later CMS V Suppl. 1A nos. 226, 238; CMS III no. 69; CMS XII no. 54.
7. References


4.2. The excavation of Zone 3
4.3. The Excavation of Zone 4

Quentin Letesson

The main goals of the excavation campaign in 2011 in Zone 4 were to determine the southeast limits of Building CD (see rooms 4.12, 4.13, 4.18 and area 4.20), to excavate the southern spaces identified in 2010 (spaces 4.15-4.18) as well as the central corridor (space 4.21), and to conduct local tests in key areas of the building and in its immediate vicinity (spaces 4.7-4.9, 4.11, 4.19 and 8.4, and within the destruction level against the west facade). After this fifth season, the latest levels of occupation (mostly LM IIIB) were reached throughout the building, and discrete, deeper soundings were conducted and earlier levels reached that gave insights on previous phases of occupation on the top of the Kefali.

1. Building CD

Some of the rooms and spaces described here were already discovered and excavated at various levels of completion in previous campaigns (spaces 4.7-4.9, and 4.11-4.13). Their description in this volume is therefore limited towards rather specific issues (e.g. the blocking of a door, a test in earlier levels, etc.); more comprehensive accounts of these rooms can be found in the previous volumes of the preliminary reports (*Sissi I*: 136-137 and *Sissi II*: 108-117 and 121-129). The rooms mostly or totally excavated during the 2011 season (spaces 4.15-4.18, and 4.21) receive a fuller description.

Before the room-by-room description, a remark is necessary on the foundation deposit that was discovered in 2008 between wall C1 and D11 (*Sissi I*: 133-134, figs 6.26-27). During the 2011 campaign, these walls were thoroughly cleaned for consolidation and, during this process, part of a MM II carinated cup was found (fig. 4.19).

It seems likely that this cup was part of the same deposit and could give a *terminus post quem*. Since all other MM architectural remains are at a much lower level, it cannot be excluded that the cup was a heirloom by the time it was included in the deposit.

![MM II Carinated Cup in the Foundation Deposit between C1 and D11 (Q. Letesson)](image)

**Fig. 4.19.** MM II Carinated Cup in the Foundation Deposit between C1 and D11 (Q. Letesson)

1 Postdoctoral Fellow FRS-F.N.R.S. (Université Catholique de Louvain). Team: M. Anastasiadou (University of Marburg), C. Cajot (Université de Liège), M. Hanquart (UCLouvain), G. McGuire (Vrakhasi), K. Jacobson (Vrakhasi), N. Kress (UCLouvain), G. Metaxarakis (Vrakhasi), M. Pietrovito (University of Vienna), E. Stevens (Bryn Mawr College), H. Thomas (University of Zagreb).
4.3. The Excavation of Zone 4

1.1. Room 4.7

In an attempt to obtain a better picture of the stratigraphy in room 4.7, the excavation was continued. At first, it focused on the southwestern part of the room where part of a massive stone tumble, previously identified as wall D31, was left in place in 2009 (Sissi II: 110, fig. 5.35), but, ultimately, the whole room was attacked with the exception of the floor level identified to the east of wall D42 (Sissi II: 109, fig. 5.30). During the removal of the tumble, a small deposit was unearthed that seemed to have rested on a damaged floor surface (see arrows on figs 4.20 a-b). It comprised a broken plate (11-04-1780-OB002), a lid (11-04-1780-OB003), part of an amphora (11-04-1780-OB004), a juglet (11-04-1780-OB007), the upper part of a stirrup jar (11-04-1785-OB003), a broken quern (11-04-1780-OB005), and several lithic tools (11-04-1780-OB001, 11-04-1780-OB006, 11-04-1785-OB001, 11-04-1785-OB002, 11-04-1785-OB004, and 11-04-1785-OB005). The soil that was removed to clean the deposit contained a fair amount of ash, fragments of plaster as well as flecks and small fragments of schist that might have been part of some roofing material (domatochoma). When the evacuation of the tumble and the deposit came to an end, two small roughly hewn blocks (one of which was in ammouda) were left in place (ca. 0.25 x 0.30 m; ht. 0.34 m and 0.35 x 0.35 m; ht. 0.22 m for the ammouda block). So close to the façade D63, it seems unlikely that they constituted part of a wall. They probably formed a small platform or a stand (figs 4.21 a-b). On figure 4.21 a, a second fragmentary ammouda block² found nearby in the tumble was tentatively placed on top of the first one which has roughly the same measurements. On the same figure (see arrow), one can also notice, next to wall D27 delimitating the room the south, the upper face of a large block that turned out to be part of an earlier (Neopalatial?) wall. Apart from the small patch of floor surface identified beneath the plaster stack that probably corresponded to the level on which the hypothetical column bases D59 and D74 rested (Sissi II: 110, fig. 5.34) as well as to the floor level to the east of D42, the work conducted so far in room 4.7 could not identify a clear level of occupation throughout the space. For this reason, excavation was resumed over the entire surface of the room which yielded some noticeable results.

Fig. 4.20. A-B: TUMBLE IN THE SOUTHWEST CORNER OF ROOM 4.7 AND FLOOR DEPOSIT (SEE ARROWS – Q. LETESSON)

² This block was later seen to have a dowel hole.
Below the level reached at the end of the previous campaigns (*Sissi II: 112*), the northern part of the room kept on producing a large amount of plaster fragments, some painted in red or dark blue. In the corner between walls D49 and D63 was a small deposit (fig. 4.22), comprising a smashed pithos (11-04-3623-OB004), the upper part of a small jar (11-04-3623-OB005), a cup (11-04-3623-OB006), a stone vase fragment (11-04-3623-OB001) and a stone lid (11-04-3623-OB007), as well as an obsidian blade (11-04-3623-OB002).
4.3. The Excavation of Zone 4

When this deposit was removed, a slightly harder surface appeared. The latter might have constituted an earlier floor level, the traces of which were also spotted along D42 where many pebbles were found. Between these areas, as seen on fig.4.23, and further south in the room, the soil was silty and yellowish to light brown. Locally, especially around the hearth (see below), it also contained many small stones, broken lithic tools and loom weights, as well as a fair amount of rolled sherds (some of which apparently as early as EM IIB, i.e. Vasiliki ware). Such a layer probably constituted a fill and might represent a leveling operation, particularly visible in the south part of room 4.7.

![Northern part of room 4.7 with hypothetical floor surface (white arrows) and fill area (Q. Letesson)](image1)

**Fig. 4.23. Northern part of room 4.7 with hypothetical floor surface (white arrows) and fill area (Q. Letesson)**

Already visible during the 2010 campaign (Sissi II: 111, fig. 5.35) and originally considered as part of the tumble, several stones turned out to circumscribe a roughly oval area which contained ashy earth and many flecks of charcoal (fig. 4.24). Identified as a hearth, this stone feature, located just to the north of D59, was labeled D75. It can be tentatively argued that this hearth, located in between column bases D74 and D59 and clearly closer to the latter, could have been contemporary with the latest phases of the room. As such, it could have been a half-sunken hearth, with its lower stones being at ca 0.20 m deeper that the base of D59

![Room 4.7: hearth D75 and surroundings (Q. Letesson)](image2)

**Fig. 4.24. Room 4.7: hearth D75 and surroundings (Q. Letesson)**

The excavation of the neighboring room 3.11 (see Gaignerot, this volume) also made it clear that an opening had existed between the latter and room 4.7. This doorway, 1 m wide, was located between walls D17 and D27 (fig. 4.25). Already provisionally identified during the excavation of the southern part of room 4.7 (Sissi II: 108),

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3 For a general discussion on hearths of various types in the Eastern Aegean (Crete, Cyprus, and Philistia) at the end of the Late Bronze Age and the beginning of the Iron Age, see Maeir and Hitchcock 2011.
its existence is now unquestionable. Its blocking and transformation into a small niche, probably during the latest phase of building CD, almost totally cut the north sector of the building from the intermediary zone (Sissi II: 87, fig. 5.5).

It is also worth noting that another wall labeled D43, perpendicularly to the south extremity of wall D42, was better delineated. It is on an east-west axis and runs towards room 3.1. It seems likely that this wall belongs to an earlier (Neopalatial?) phase of occupation of the area.

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**Fig. 4.25.** Entrance between walls D17 and D27, southeast corner of room 4.7 (Q. Letesson)

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**1.2. Room 4.8**

Room 4.8 was almost entirely excavated in 2009 and 2010 (Sissi II: 113-115). After the removal of a large stray boulder partly lying on D61 and C1, the northern section of wall C1 was thoroughly cleaned (fig. 4.26a). This revealed a potential opening – maybe a door or a window sill – between rooms 4.8 and 4.5 (see white arrows on fig. 4.26a). As a matter of fact, the masonry in this part of the wall is somewhat different (made of small and medium-sized stones rather than the large boulders that form C1 further to the south). This opening, of course, remains hypothetical, especially if one considers that room 4.5 may well have been out of use during the latest occupation phases of building CD. During the same cleaning operation, a small rectangular feature – labeled D76 – made of small-sized stones (ca 0.60 m x 0.30 m) was also uncovered in the southeast corner of the room, between walls C1 and D22/C3 (fig. 4.26b).

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**Fig. 4.26.** A-B: Northeast and southeast corners of room 4.8 (Q. Letesson)

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4 This would make the hypothesis of a window sill more satisfactory than a door.
4.3. The Excavation of Zone 4

1.3. Room 4.9

In 2011, we also briefly returned to room 4.9 to examine the outer face of the northern facade wall D62. This contributed to contradict the previous hypothesis of the existence of a blocked opening (*Sissi II*: 115). Once carefully cleaned and cleared of floating stones, the alignment of wall D62 simply appeared to have been severely disturbed, possibly when the summit of the hill was under cultivation or used as a military position.

1.4. Room 4.11

Excavated in 2009 (*Sissi II*: 121-126), pillar hall 4.11 was the theater of three small tests, all conducted in the south-southwestern part of the room. The first test consisted in excavating a large depression filled with pottery fragments, just to the north of wall D39 (*Sissi II*: 125-126). It turned out to be a shallow area corresponding to a slight variation in the level of the bedrock (fig. 4.27). This hollow was filled with sherds, probably in an attempt to level the area for the creation of one of the latest floors of the room. Some of the sherds are clearly LM IIIA. In the same area, a test was also opened to find out if wall D39 continued to the west. This turned out not to be the case as it stops at the pillar base D32 (see white arrow on fig. 4.27).

![Fig. 4.27. Pit in the southwest corner of room 4.11 (M. Pietroito)](image)

The third test was mostly a cleaning operation of the doorway between rooms 4.11 and 4.17 (fig. 4.28). It revealed that a threshold may have once existed there when the floor surface of the two rooms were presumably at the same level (see below).

![Fig. 4.28. Doorway with robbed out threshold (?) between room 4.11 and 4.17 (Q. Letesson)](image)

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5 On fig. 4.28, the stones marked with a white * could be all that is left of this badly preserved threshold.
1.5. Space 4.12

Fig. 4.29. SPACE 4.12 UNDER EXCAVATION AND FRAGMENTS OF A DRAIN 11-04-3628-OB001 (Q. LETESSON)

One of the main goals of the 2011 campaign was to uncover the southeastern limit of building CD. For this purpose, the dump located just to the east of spaces 4.12, 4.13, and 4.18 was pushed east to allow a 2.50 m wide test. As frustrating as digging through a dump may be, the operation was a success: good eastern limits were found for the aforementioned spaces and the continuation of the street level identified along wall D2 was discovered (Sissi I: 137-138; Sissi II: 136-139).

Within room 4.12, the first goal was to reach the level where the excavations stopped in 2009 (Sissi II: 126-127, fig. 5.61). A ca 2.70 m stretch of wall, labeled D71, was unearthed and this almost certainly constituted the east limit of the room (fig. 4.29). It is badly preserved and its northern part is lost apart from one or two large boulders, close to wall D36, which may have been part of it. With this new wall taken into consideration, 4.12 forms a 15 m² room connected with room 4.13 by means of a large ammouda threshold in wall D36, and with space 4.18 by a large opening between walls D33 and D71. It is worth noting that the whole area cleaned in the test beneath the dump was heavily disturbed. When the excavations started in 2007, the area already presented a small mound made of earth, rubble and bushes (see fig. 4.51), which is why the spot was chosen to discard our own soil. The nature and composition of this earth (many small to medium-sized stones, loose earth and very few sherds) suggest itself to represent dumped material (either from earlier excavations or from wartime intervention). It is not unlikely that these operations contributed to damage the architectural remains in this particular area.

In the process of reaching the level where excavation stopped in 2009 in the western part of the room, a surface was identified which bore many small pebbles and stones. It could have constituted a floor – missed in the west part of 4.12 – on which the slightly higher wall D33 could have rested. On this surface were found the fragments of a drain (11-04-3628-OB001) (fig. 4.29), a gourna (11-04-3628-OB002), a lithic tool (11-04-3631-OB001), and a pumice tool (11-04-3631-OB002).

When the 2009 level was reached throughout the room, it appeared quite clearly that it did not correspond to a floor surface because large sherds were protruding through it. Somewhat lower, small patches of a badly preserved floor level were identified at different locations within room 4.12. It was covered with a yellowish layer of silty earth and, locally, patches of decayed mud-brick and ash. Wall D34, bordering room 4.12 to the west, was clearly associated with this floor level. The latter yielded two obsidian blades (11-04-3643-OB001 and 11-04-3647-OB003), a small vessel (11-04-3647-OB002), four stone tools (11-04-3643-OB002-005), two ‘pot boilers’ (11-04-3643-OB006 and 11-04-3647-OB006) found together, a spool (11-04-3647-OB001)\(^6\), a small stone cylinder (11-04-3647-OB004), and a fragment of stalactite (11-04-3647-OB005).

During the cleaning of the head of wall D71, we came across a lentoid seal (11-04-3636-OB001) (see Anastasiadou, below) and a half-spherical stone object with a pierced base (11-04-3636-OB002). This may have been a game board piece or the pommel of a small dagger (figs 4.30a-b).

\(^6\) This spool is a roughly made version of the same kind of object found in an impressive set in room 3.6 (Gaignerot, this volume).
4.3. The Excavation of Zone 4

4.6. Room 4.13

As in room 4.12, the main goal of the 2011 season in room 4.13 was to find its eastern limit by removing a part of the dump that was just next to it. Unfortunately, the area was particularly disturbed and, apart from two large boulders that might have once been part of a wall (see fig. 4.52 b below), no clear limit could be securely identified that would have bordered room 4.13 to the east. When the floor level in the eastern part of the room was reached where excavation ended in 2009 (Sissi II: 127-129), it appeared that wall D36 was also badly preserved, with only a few stones suggestive of its original alignment (fig. 4.31).
The northeast corner of the area, just to the north of feature D40, the *ammouda* platform, was found covered with medium-sized stones and boulders embedded in a very hard reddish layer (see white arrows on fig. 4.31). This surely corresponds to the fire destruction level discovered a bit further to the east, laying on top of the street level in space 8.1 of which the upper layer was also characterized by a massive stone tumble (*Sissi II*: 136-139).

1.7. Room 4.15

Rooms 4.15-18 constitute the southern limit of building CD. Their general plan was traced at the end of the 2010 campaign (with the exception of the east of space 4.18, see below). Information about their size and surroundings walls can be found in the previous preliminary report (*Sissi II*: 132-135).

4.15 turned out to be the most interesting space in this row of rooms. It formed a relatively small, square room not connected to the rest of Building CD but only open onto space 5.17 (Devolder, this volume) through a 0.80 m wide doorway between walls D51 and D52. In terms of features, the room presented a bench-like structure crudely made of medium-sized stones along the northern half of wall D53 (figs 4.32 a-b). In an attempt to determine if an opening could have existed in the northeast corner of the room towards 4.16,7 this hypothetical installation was eventually removed during the excavation of the massive floor deposit of the room. The second installation of the room was constituted by a small L-shaped stone structure – labeled D70 – abutting wall C10 in the northwest corner of the room (figs 4.32 c-d and 4.33 a-b). This feature partly bordered a cooking area found full of ash, flecks of charcoal as well as seashells (limpets) and the remains of sea-urchins. It also produced a cooking plate (11-04-3618-OB002), presumably *in situ*, made out of the footless base of a tripod cooking pot (see white * on figs 4.33

7 It is precisely in this location that part of a *sidheropetra* slab that had the usual shape and smoothness of a threshold block was visible in the alignment of wall D53 (*Sissi II*: 133, fig.5.72; but also fig. 4.32a).
4.3. The Excavation of Zone 4

In the light of these discoveries, it can be soundly argued that D70 and the cooking plate worked together as a hearth, the wood being burnt in the area delimited by the L-shaped feature – where most of the ash was found – and the charcoal produced being used in connection with the cooking plate. Just to the west of this installation, a small pit was found (ca. 1 m x 0.80 m; some 0.40 m in depth from the floor surface). At the bottom of this pit, the bedrock seemed to have been roughly cut and served as foundation for the north-south part of D70, as well as for wall C10 (fig. 4.34 b). An inverted conical cup (11-04-3629-OB003) was found just beneath the lower course of the wall and may have formed some sort of modest foundation deposit (see white arrow on fig. 4.34 b).

![Fig. 4.33. A-B: Cooking area in room 4.15 (A-B) and associated pit (b) (Q. Letesson)](image_url)

Stratigraphically, the situation of room 4.15 was particularly clear: a rich destruction deposit was found lying on a relatively well preserved hard-packed earth floor surface. Judging by the vessels – and especially the large pithoi – found squashed on the floor, this deposit seems to testify to a single destructive event that certainly provoked the collapse of the surrounding walls (fig. 4.32 a)\(^8\). The deposit produced several pithoi (11-04-1779-OB001, 11-04-1779-OB002, 11-04-1779-OB004-007, 11-04-1779-OB009-010, 11-04-1779-OB013, and 11-04-1789-OB004-005), a deep bowl (11-04-1779-OB003), a fine decorated globular stirrup jar (11-04-1789-OB009) (see Langohr, this volume), the upper part of another globular painted stirrup jar (11-04-1789-OB001), a terracotta hut model (11-04-1789-OB003)\(^9\) (fig. 4.35 a), the head of a small terracotta statuette (11-04-3614-OB001), a set of miniature vessels (fig. 4.35 b) comprising a juglet (11-04-1794-OB001) and two opium poppy-shaped goblets (11-04-1761-OB002 and 11-04-1766-OB001), a lentoid seal (11-04-1770-OB001) (see Anastasiadou, below), several lithic tools (11-04-1761-OB001, 11-04-1779-OB011, 11-04-1779-OB014, 11-04-1798-OB002-003, 11-

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8 This plate was extremely fragile and it seems reasonable to suggest that its paste may have been made that friable and crumbly because of its use as a cooking device.

9 Whether this collapse was the result of a sudden earthquake – which seems more likely – or the progressive decay of the building after its abandonment is still an open question which will require closer examination.

10 For a recent discussion and references on LM III and Minoan hut models, see Hallager & Hallager 2011: 346. Another hut model was also found in Zone 5.3 (Sissi I; 147, n:5)
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04-3614-OB004), grinding stone fragments (11-04-1762-OB002 and 11-04-3614-OB005), three actual grinding stones found stacked upside down, one on top of the other (11-04-3614-OB002-003 and 11-04-3614-OB006), four stone vase fragments (11-04-1762-OB001, 11-04-3600-OB002, 11-04-3614-OB007, and 11-04-3618-OB003), a pierced pumice stone (11-04-1754-OB001), a bronze needle (11-04-3600-OB003) and an obsidian blade (11-04-3600-OB001).

It is also worth noting that the pit in the northwest corner of the room was found filled with the sherds of a large pithos (11-04-3618-OB001) which was probably originally embedded in the cavity (fig. 4.34 a)11. It contained a large amount of limpets as well as the remains of many sea-urchins (figs 4.36 a-b). It is not unlikely that, at some point, this pithos may have been used as a kind of trash bin to discard the remnants of the food prepared just next to it, in the cooking area. Also in the pit were found two lithic tools (11-04-3621-OB002 and 11-04-3629-OB001), a small bronze blade (11-04-3621-OB003), and three conical cups (11-04-3626-OB002 and 11-04-3629-002-003).

If one takes the material and the installations of 4.15 into consideration, it does not seem too far-fetched to suggest that this room may have worked simultaneously as a small storage space (pantry) and a kitchen. The fact that the room only opened onto the exterior suggests that it was used in close connection with the open area that was located immediately south of building CD (Sissi II: 154-159 and Devolder in this volume). It can thus be argued that the meals prepared in the cooking area, the goods stored in the pithoi, and more generally the vessels and objects found in the room were used outside on specific occasions like communal meals. It is indeed difficult to imagine that the secluded character of the kitchen-pantry 4.15 might have been dictated by the concern of keeping food and fire at some distance of other activities for reasons of cleanliness and safety (cf. Brogan & Barnard

Fig. 4.34. A-B: PIT IN THE NORTHWEST CORNER OF ROOM 4.15 (Q. LETESSON)

11 The earth that was found around the pithos fragments was extremely loose which is consistent with the hypothesis that the large storage vessel was partly sunken in the pit and kept in place with earth packed around it. Possible sherds of another pithos (11-04-3621-OB001) were also found in the pit.
4.3. The Excavation of Zone 4

2011: 197), because several other cooking areas are securely identified at different locations within building CD (for example in rooms 4.7, 4.8, 4.11, see above and Sissi II: 113-114 and 121-126). The existence, in LM III, of small rooms fitted with a hearth and yielding cooking wares and installations that were part of a building but only connected to the exterior – often in close relation with a relatively large open air space – is far from unusual. Examples can be found in Quartier Nu at Malia (Driessen et al. 2008) or in the so-called ‘cook sheds’ of the LM III town of Mochlos (Soles et al. 2008: 8-9 with references). The only thing that clearly distinguishes room 4.15 from these humble ‘cook sheds’ or small kitchens-pantries is the fact that part of the material discovered in the room is of a type and quality (e.g. the decorated stirrup jars, the hut model, the miniature vessel set, the lentoid seal, etc.) which does not quite fit with the idea of a space only dedicated to food processing and short-term storage of consumable goods. One would then be tempted to suggest that room 4.15 also acted as storeroom for less mundane objects that may have been used in relation with the activities taking place in the open area to the south.

Fig. 4.35. ROOM 15: A-B: HUT MODEL (11-04-1789-OB003) (A) AND MINIATURE VESSEL SET (11-04-1794-OB001, 11-04-1761-OB002 AND 11-04-1766-OB001) (B) (CHR. PAPANIKOLOPOULOS/G. McGUIRE)

12 This type of kitchen-pantry only opening onto the exterior is also a common phenomenon in LM I (Brogan & Barnard 2011: 197-198).
1.8. Room 4.16

Located just to the east of room 4.15, room 4.16 yielded less interesting results. It contained no floor deposit, far less sherds than the adjoining rooms and very few finds. Once a very clayish fill (roofing material?) was removed, we quickly reached an uneven floor level throughout the room. It was partly made out of bedrock as well as hard-packed earth, together with patches of a pebble surface. While cleaning the room, we uncovered a fair amount of wall plaster fragments, traces of charcoal, ash and small bones along D53 and, in the northwest corner of the room, several stone tools (11-04-1760-OB002, 11-04-1765-OB001-002, 11-04-1775-OB001), the foot of a kylix (11-04-1760-OB001), and some fragments of stone vases (11-04-1776-OB001 and 11-04-1782-OB001).

The most noticeable feature of room 4.16 is the presence of an earlier wall, labeled D69, along C10 (fig. 4.38). It was built directly on top of the bedrock – at least in its eastern part – and simultaneously reused as a step towards room 3.3 and probably some kind of work platform in its western section. The discovery, stacked against D69, of a possible set of lithic tools is indeed in favor of this interpretation (see fig. 4.37 and the white arrow on fig. 4.38).
4.3. The Excavation of Zone 4

Fig. 4.37. Nest of Lithic tools along D69 (Q. Letesson)

Fig. 4.38. Room 4.16 at the end of its excavation (Q. Letesson)

1.9. Room 4.17 and niche 3.7

Very much like 4.16, room 4.17 forms a small roughly square room. Their only difference in layout is the existence, in the northwest corner of the latter, of a small niche, labeled 3.7. The excavation of this room made us realize that the stratigraphy was more complex than originally assumed. Already during the superficial cleaning of the area in 2010, it was noted that the room produced an unusual large number of sherds (Sissi II: 133). In 2011, a very thick fill (ca. 0.35 m in depth) was found to cover the entire room, with about 12,000 sherds for a total of ca. 130 kg. Preliminary ceramic analysis shows that the fill includes a large quantity of EM III/MM IA sherds with less
Protopalatial and Neopalatial (perhaps some LM IB), the latter indicating when the fill may have been put down. Indicated by the white arrows on fig. 4.39, one can clearly see this thick fill in the northern section of the room. Note that the poorly preserved threshold identified between room 4.11 and 4.17 (see above, fig. 4.28, as well as the slabs bordering niche 3.7 to the west seem to rest almost directly on top of this fill. Together with the small deposit of four miniature jugs found in niche 3.7 in 2008 (Sissi I: 122-123, fig. 5.72), these stratigraphical observations suggest that a later floor – probably of LM III date – once existed in the room. Unfortunately, it was too badly preserved or eroded to be clearly identifiable. If one considers the situation in room 4.16 with this hypothesis in mind, it seems plausible to admit that the same later floor may have existed here too. This is further corroborated by the discovery, in the neighboring room 4.15, of such a higher floor surface which produced the very rich floor deposit described above.


Fig. 4.39. ROOM 4.17 UNDER EXCAVATION (Q. LETESSON)

Although most of the material from the fill was dated to EM III-MM IA (Driessen, this volume, fig. 1.3) and LM IA.
4.3. The Excavation of Zone 4

When the fill was removed, a clay floor of an orange-reddish color was uncovered. It was well preserved in the eastern half of the room but, apart from sporadic patches, it was almost entirely gone in the western half. This clay floor did not run beneath walls D50 and D52 and does not seem to have been cut by them so it is possible that they are contemporary. Apart from two loom-weights (11-04-1793-OB002 and 11-04-3601-OB001), two lithic tools (11-04-1793-OB001 and 11-04-1795-OB001) and an obsidian blade (11-04-1793-OB003), the most noticeable discovery made on this earlier floor level was a large surface of red-painted wall plaster fragments, located in the southeast corner of the room (see * on fig. 4.39 for the location). These fragments were found in two or three layers, most of them lying on their reverse side while those of the first layer were upside down (figs 4.40 a-b). The clay floor and these remains of red-painted wall plaster clearly testify of an earlier state of room 4.17, possibly during the Neopalatial period.

When fully excavated, niche 3.7 appeared to have been made out of a hollow cutting in the bedrock between wall C11 and D54 (fig. 4.41). Along D54, a stone that seemed in situ presents a small depression that may have been a pivot hole: was the small niche shut by a door at some point? A large patch of ashy earth dotted with flecks of charcoal was also identified just to the southeast of the niche (see white arrow on fig. 4.41) and seemed to continue beneath wall C11. Together with the fact that the latter is clearly higher in the stratigraphy than walls D52 and D54, this ashy layer testifies to the fact that, originally, room 4.17 presumably extended further north than in its later LM III state.

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14 During excavation, it was tentatively suggested that this situation may have been related to the fact that the material of the fill had been dumped in the room from the west, the initial impact destroying most of the clay floor in this side of room 4.17 before the material was spread over the entire surface.
1.10. **Space 4.18**

As in rooms 4.16 and 4.17, the LM III floor in Space 4.18 was too badly preserved for it to be securely identifiable. It probably corresponded to the level on which the sherds of a krater with octopus decoration (09-04-0785-OB002) were found squashed, just next to the threshold leading to pillar hall 4.11 (*Sissi II*: 134-135, fig. 5.76-77). It is therefore likely that the levels reached at the end of the 2011 campaign represent an earlier state of the area. Unfortunately, excavation was halted before we were able to delineate space 4.18 or clarify its function.

When the western part of the area was excavated, it produced what seemed to be the continuation of the fill encountered in the northeast corner of Zone 5 (*Sissi II*: 155-157, fig. 6.20). This fill was characterized by very loose earth with many pieces of charcoal, patches of ash, traces of burning and a large number of bone fragments. It also contained a considerable quantity of sherds (fig. 4.42 b), including many fragmentary cups (among which were 11-04-1759-OB004, and 11-04-1763-OB001-004), several lithic tools (11-04-1755-OB001-003), the fragment of a stone vase (11-04-1759-OB001), and a lentoid seal (11-04-1759-OB005) (see Anastasiadou, below). As we progressed towards the north, the nature of the soil changed. It became more yellowish and contained less sherds, testifying to the end of the area covered by the fill (fig. 4.42 a).

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15 It is also the level on which wall D33 rests.
16 Due to its openness towards the south, space 4.18 was originally interpreted as a porch (*Sissi II*: 135).
Fig. 4.42. A-B: WESTERN PART OF SPACE 4.18 UNDER EXCAVATION (Q. LETESSON)

The extension of the trench towards the dumping area (see above) allowed the east part of Space 4.18 to be excavated. It comprises an area between the baulk visible on fig. 4.42 a and a NE-SW wall, labeled D72, which was uncovered at the eastern limit of the new trench (fig. 4.43). This area was found almost empty with the exception of fragments of a plate (11-04-3640-OB001), a small slab with hollows that may have been a rudimentary *kernos* (fig. 4.43), as well as, closer to D72, several lithic tools (11-04-3642-OB001, 11-04-3642-OB003 and 11-04-3642-OB005-006), two 'pot boilers' (11-04-3642-OB002 and 11-04-3642-OB004) and a broken grinding stone (11-04-3642-OB007). Beyond the alignment of wall D71 (see dotted line on fig. 4.43), what was originally considered as the eastern part of Space 4.18 became the southern part of the street level 4.20 (see below).  

17 A slab of this street level is actually already showing on fig. 4.43 (see white arrow).
At the end of this last campaign, the nature of space 4.18 remains elusive. As mentioned, the LM III levels of Building CD are badly preserved in this area, perhaps a result of earlier excavations or war-time intrusions (see above). If one considers (1) the lack of clear limits to the south and east of the area, (2) the fact that in an earlier phase its eastern half was occupied by the slabs of a street, (3) the continuation of the fill deposit identified in the northeast corner Zone 5, and (4) the presence of a hypothetical kernos often associated with transitional spaces or practices (Chapouthier 1928: 317; Pelon 1980: 191, n.1; Soles 1992: 219, 222-223), it may perhaps be argued that space 4.18 was an open space directly outside Building CD. In this case, the southern façade would have made a recess with a direct entrance, marked by a *sidheropetra* threshold, to the pillar hall 4.11 and, possibly a more modest opening towards room 4.12.\(^{18\text{a}}\)

1.11. Space 4.19

The 2.50 m² test opened in the corner between facades D55 and D3 was considerably extended during the 2011 campaign and labeled space 4.19. This test finally covered an area of ca 9 m² (figs 4.44 a-b). The original test brought to light a very clear fire destruction provisionally dated to the Neopalatial period. It included a broken storage vessel (10-04-1730-OB001) of which the lower part still contained burnt peas or lentils (*Sissi II*: 103-104, figs 5.22-23). This fire destruction layer was revealed throughout the extension of the original test. It represented a

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\(^{18\text{a}}\) The situation is particularly confusing in this area: D56 is nothing more than a 1.90 m stretch of wall and we do not know whether walls D33 and D71 – both badly preserved – were connected or not and if an opening may have existed between them (cf. fig. 4.2).
4.3. The Excavation of Zone 4

single destructive event which sealed a floor deposit which is described below. The fire destruction level constituted a very hard and thick – some 0.90 m in depth – reddish layer comprising stones of various sizes, decayed mud-bricks, fragments of mud-bricks and architectural elements (such as ammouda slabs and fragmentary ashlar blocks, see fig. 4.44 b, or even a stone with a pivot hole), fragments of wall plaster, pumice, several pieces of tarrazza floor or ceiling, as well as many dark patches of burnt material, countless pieces of charcoal, remains of charred wood, and, locally, burnt peas/lentils closer to the location of the storage vessel found in 2010. It also yielded several lithic tools (11-04-1778-OB001, 11-04-1778-OB003-004, 11-04-1781-OB002-003, 11-04-1791-OB001, 11-04-3603-OB001-002), a loom-weight (11-04-1778-OB002), a stone vase fragment (11-04-1781-OB001), but also more sherds of the painted vessel that contained the burnt peas (10-04-1730-OB001).


At the end of the season, we only managed to remove the deposit but the floor level per se was not yet reached. Bedrock is, however, appearing in the southeast corner of the test and some small roots running through the destruction deposit suggest that a floor level, if preserved, is probably very close to the level at which we stopped the excavation. Furthermore, at this stage, in the southwest corner of the trench, two stone ‘pillars’ of about 1.10 m high became apparent in the west section (figs 4.46 a-b). They stand all the height of the sounding and their upper part was already showing when the area was first explored in 2007 (Sissi II: 129-130, figs 6.21-22). It is possible that these pillars may have framed a stairway leading down into Space 4.19 which may then be regarded as a basement.
Fig. 4.45. **DESTRUCTION DEPOSIT IN SPACE 4.19 – WEST PART (A) AND EAST PART (B) (Q. LETESSON)**
Fig. 4.46.  A-B: STONE 'PILLARS' IN THE SOUTHWEST CORNER OF SPACE 4.19 (Q. LETESSON)

1.12.  Corridor 4.21

Corridor 4.21 (ca. 9 m E-W x 1.25 m N-S; 11.25 m²) is the main transitional space in Building CD (fig. 4.1-5; figs 4.47 a-b). It is bounded by platform 3.2 to the east, by walls C7, C9, C14, C23 and C13 to the north, and by walls C8, C11, C17 as well as C15 to the south. This passageway connects several rooms that constitute the central part of the building and must therefore have been an essential component of the circulation patterns within it. To the west, its leads to room 3.6 (see Gaignerot, this volume); to the north, it opens onto a small space that precedes the shrine 3.8 (Sissi II: 89-92; Gaignerot, this volume); and, to the south, it gives access to rooms 3.3 (Sissi I: 121-122) and the pillar hall 4.11 (Sissi II: 121-126).
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The area was first cleaned during the 2008 campaign, when the top soil was removed and the eastern end of the corridor was originally identified as room 3.2 (Sissi I: 121; fig. 6.11; see also Sissi II: 126, fig. 5.60 for the platform)\(^19\). While excavating the corridor, it became clear that a large quantity of medium to large-sized stones and blocks had fallen in it\(^20\). Once removed, we quickly reached an uneven floor surface throughout the corridor. It was made of hard-packed earth and, locally, patches of pebble surface and roughly flattened bedrock. In its eastern part, this floor surface produced a small deposit of vessels that clearly was crushed by the stone tumble (figs 4.47 a and 4.48). It contained at least two fragmentary stirrup jars (11-04-3668-OB001 and 11-04-3668-OB007), the sherds of two different pithoi (11-04-3668-OB002 and 11-04-3668-OB006), the upper part of a lentoid flask (11-04-3668-OB005), an obsidian blade (11-04-3668-OB002), a sidheropetra slab (11-04-3668-OB003), two grinding stone fragments (11-04-3651-OB001 and 11-04-3668-OB010), a complete ammouda quern (11-04-3668-OB004) and a fragmentary one (11-04-3670-OB003), two lithic tools (11-04-3651-OB003 and 11-04-3668-OB009), a stone object (11-04-3651-OB004), a small stone ball (11-04-3670-OB001), a stone weight (11-04-3670-OB002), and a fragment of stalactite (11-04-3670-OB004). Further to the west, we also found a stone pestle (11-04-3676-OB001), a loom-weight (11-04-3663-OB001) next to feature C25 and, along wall C17, another small stone ball (11-04-3667-OB001), a stone weight (11-04-3667-OB003) and a conical cup (11-04-3667-OB004).

Excavating corridor 4.21 also allowed us to clarify certain issues related to neighboring walls and features. As one can see on fig. 4.48, it seems now even more unlikely that the small gap identified between walls C7 and C9 in the southwest corner of room 4.14 (Sissi II: 130, n. 30) could have been a door\(^21\). Further to the west, when the tumble was removed to the south of 3.8, a small portion of a wall was traced and provisionally labeled D77 (figs 4.47 b and 4.49 b). It seemed to be connected to C14 and both walls were constructed on a slightly higher level than the floor surface identified in the corridor\(^22\). In the western part of the corridor, two earlier – presumably

\(^{19}\) When it became obvious that the so-called room 3.2 was actually part of a larger corridor, the latter number was used to identify the platform that constituted its eastern limit.

\(^{20}\) Among these fallen architectural elements, a fine ammouda block with one of its face covered with plaster was found between walls C7 and C9.

\(^{21}\) Although the existence of a narrow opening of some sort – maybe a window – in this location cannot be totally ruled out.

\(^{22}\) The fact that the last course of these walls was slightly higher than the floor surface could be explained by the fact that the Minoans
Neopalatial – walls running on an E-W axis were also uncovered. The first one, feature C25, already identified in 2008 and probably part of an earlier structure (*Sissi I*: 123), may have been used as a kind of platform or bench within corridor 4.21. The second one, D78 was found just beneath the badly preserved wall C17 which, like D77, was already floating when the floor surface was discovered in the corridor (fig. 4.48 a). It ran for about 3.50 m along wall C15 and stopped in the southeast corner of room 3.6. Lying just in between walls C17 and C25, in the middle of the corridor, an *ammouda* block, upside down, showed a concave face that may have been used as a grinding stone (fig. 4.49).

**Fig. 4.48.** DEPOSIT IN EAST PART OF CORRIDOR 4.21 (L. MANOUSOGIANNAKI)

...may have thoroughly cleaned the area between the Neopalatial and Postpalatial occupations (for a similar stratigraphical observation in contemporary Quartier Nu at Malia, see Driessen & Farnoux 1993: 681). Further stratigraphical analysis and architectural studies are necessary to determine if wall D77 might not simply have been a later addition, however. If this is the case, corridor 4.21 would have widened till the south wall of 3.8 in an earlier phase, between walls C9 and C23, hence forming a regular room instead of a passageway.

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23 After a closer examination, it appeared that wall C25 was actually resting on the mentioned floor surface of the corridor. Earlier walls slightly protruding from later floors were identified in room 4.14 (*Sissi II*: 130-131, fig. 5.69) and 4.16 (see above) and similarly interpreted as work platforms.
Fig. 4.49. Space 4.21: Wall D17 and earlier wall D78 (a) and wall D77 (b) (Q. Letesson)
2. Surrounding spaces and external areas

Some tests were also conducted in the immediate vicinity of Building CD\textsuperscript{24}.

2.1. Area 4.20

While opening a 2.50 m wide test to find the eastern limit of rooms 4.12-13 and space 4.18 (see above), the continuation of the street excavated in 2008 and 2009 further to the northeast (\textit{Sissi I}: 137-138, fig.6.33 and \textit{Sissi II}: 136-139, figs 5.79-80) was located. It stretches for about 7 m along room 4.12 and into space 4.18 (fig. 4.50). The excavation area labeled 4.20 also extended further north and brought information on the eastern limit of room 4.13 and the existence of an earlier wall with a N-S alignment.

\textsuperscript{24} For earlier tests in surrounding areas of Building CD, see \textit{Sissi II}: 136-141.
The first part of area 4.20 to be excavated was situated directly to the east of wall D71. As mentioned in the description of room 4.12, we firstly encountered traces of an older dump or backfill, perhaps from earlier excavations or intrusions. Once this layer — still visible in the eastern baulk — was removed, we reached a thick level of friable grayish brown earth mixed with pebbles and small rolled sherds that, once excavated, revealed the slabs of the street level (fig. 4.51). The level directly on the street was also characterized by the presence of burnt mud-brick and tiny plaster fragments and comprised a lithic tool (11-04-3646-OB001), a broken grinding stone (11-04-3646-OB002), and a fragment of a fishing net weight (11-04-3653-OB001). Along wall D71, where no slabs were found, the soil was harder and much more compact; at the level of room 4.13, this destruction level was reddish brown, contained more medium- to large-sized stones and became gradually harder as we progressed towards the north (see room 4.13 above).

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25 This layer was also uncovered in the eastern part of space 4.18.

26 The ceramic material is quite fragmentary and rolled. It mostly contained Neopalatial and LM III sherds and probably constituted a secondary deposit (fill). The presence of LM III pottery on the street level in area 4.20 contrasts with its almost total absence in the destruction level that covered the street in area 8.1 which produced MM II-LM I ceramics (Sissi II: 136-137). This seems to indicate that this new portion of the street (area 4.20) may have remained in use.
4.3. The Excavation of Zone 4

As in area 8.1, the street level was made of irregular slabs of various sizes embedded in hard-packed earth and, locally, of roughly flattened bedrock. The street continues south where it disappears in the baulk of the test but clearly continues towards Zone 5. It became obvious that wall D72 in the east part of space 4.18 formed a clear limit for the street of which the slabs are set against it (fig. 4.52 a). There, the pavement also curves towards the west and the street may give the impression to widen slightly. Given the absence of slabs on a ca 0.70 m wide band along D71, a test was conducted to determine if a drain may have existed there (fig. 4.53 a). This layer produced a considerable amount of ceramic material\(^27\), small- to medium-sized stones, as well as several lithic tools (11-04-3673-OB002-003, 11-04-3677-OB001-002, and 11-04-3679-OB003), a stone vase fragment (11-04-3673-OB001), and two loom-weights (11-04-3679-OB001-002). Even if there was no conclusive evidence for the existence of a drain at this location, the test revealed the existence of an earlier wall beneath D71 that seems to extend towards the north (see below) and also exposed the foundation level of the street (fig. 4.53 b). The latter appeared to have been made of medium- to large-sized stones and slabs, resting on an irregular layer of boulders and wedged into place by packed earth and smaller stones.

To the east of room 4.13, an earlier wall, labeled D73, was identified beneath the destruction level. Its upper course is at the same level as the slabs of the street and it is probably the continuation of the wall discovered beneath D71. At the present stage of excavation it is still impossible to determine its relation to the street or to other structures in the area\(^28\). While the northern part of area 4.20 was excavated, two large boulders were identified (see white arrows on fig. 4.52 b). The northern one was protruding out of the latest floor level of room 4.13 and both went all the way till the level of the upper course of D73\(^29\). Hypothetically, they may represent all that is left of the eastern wall of room 4.13.

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\(^{27}\) Preliminary studies give a MM II date for most of the material in both fine and coarse wares with possible later (LM III) intrusions. This MM II date would be consistent with the dating proposed for the construction of the street in area 8.1 (Sissi II: 137).

\(^{28}\) Its masonry nonetheless recalls that of wall H1 that may have formed the south limit of a portion of the street in area 8.1 (Sissi II: 137).

\(^{29}\) The southern boulder is also in the alignment of wall D36 of which the eastern part is particularly badly preserved.
2.2. Area 8.4

Area 8.4 (3.10 x 2.40 m; ca 7.50 m²) is located just to the west of room 4.10, in the very northwest angle of Building CD, forming a recess in its façade. It is bordered by walls D48 to the east and D49 to the south (figs 4.54 a-b). At first briefly examined in 2010, the test was then limited to the west by large boulders that may have been part of a modern terrace wall and to the north by a massive tumble comprising blocks, large boulders and medium-to large-sized stones (fig. 4.54 a). During the same season, the tumble level within area 8.4 was excavated (fig. 4.54 b). In 2011, the large blocks to the west were removed and the area slightly extended up to the alignment of the west façade D63, whereas the north part of the tumble was also removed. This sounding was first opened to investigate walls D48 and D49 and to determine if this specific area was of a particular function in relation to Building CD.
4.3. The Excavation of Zone 4

It quickly became clear that 8.4 formed an external area and no finds were made to clarify its function. The thick and soft layer of yellowish brown silty earth beneath the tumble within space 8.4 recalls the fill that was identified at various locations in the northern part of Building CD (especially in rooms 4.7 to 4.10) (Sissi II: 114). Together with a large number of sherds, this fill also yielded a crude stone cylinder (11-04-3639-OB001), a fragment of a terracotta drain (11-04-3639-SA009), a Neopalatial conical cup (11-04-3674-OB002), a *sidheropetra* slab (11-04-3674-OB001), but also one half of a white plastered *ammouda* horns of consecration (11-04-3674-OB003) (fig. 4.55 a).
Under one of the last courses of wall D48, a conical cup (11-04-3639-OB001), set between the façade stones, may have formed a simple foundation deposit (fig. 4.55 b).

### 2.3. Destruction level along the west façade

Part of a destruction level west of façade wall D64, immediately west of room 3.11, was identified during the 2010 campaign (Sissi II: 105, fig. 5.24). In all likelihood the material derives from Building CD and probably fell from a neighboring space down to the foot of the west façade where it was protected by the projecting wall of room 4.7 (figs 4.56 a-b). This reddish brown destruction layer contained a lot of pumice, many small- to medium-sized stones, numerous plaster and mud-brick fragments, as well as a heavy concentration of LM IIIA2/B sherds, some lithic tools (10-04-1748-OB001-002, 11-04-1799-OB001, 11-04-1799-OB004, and 11-04-3632-OB001), the lower part of a vessel with open shape still containing of few bones (11-04-1787-OB001), several champagne cup bases, a bell-shaped cup (11-04-1799-OB006), a deep bowl with dark-on-light decoration (11-04-1799-OB007), a terracotta spool (11-04-1799-OB008) comparable to those found in room 3.6 (see Gaignerot, this volume), the
4.3. The Excavation of Zone 4

outlet of a terracotta drain or gutter (11-04-1787-OB002), a stone vase fragment (11-04-3632-OB002), but also a small, thin piece of burned clay with several signs inscribed (11-04-1783-OB001) (Driessen, this volume). The excavation made it also clear that façade wall D64 rested directly on the bedrock.

![Image of excavation site]

**Fig. 4.57.** DESTRUCTION LEVEL BEFORE (A) AND DURING (B) EXCAVATION (Q. LETESSON)
Three sealstones were found in Zone 4 during the 2011 campaign: 11-04-1759-OB005 was recovered from a fill containing mostly LM III material, 11-04-3636-OB002 was found in the cleaning of a possible LM III wall and 11-04-1770-OB001 in a certain LM III context (Letesson, this volume). It seems then that 11-04-1770-OB001 was, as also 10-05-1882-OB001 which was recovered from the same building in 2010 (Sissi II: 160-161), either an heirloom or a chance find. 11-04-1759-OB005 and 11-04-3636-OB002 could have been lost or discarded pieces either early or even later in the LM period. 11-04-1770-OB001 and 11-04-3636-OB002 are cut in the same stone and display stylistically similar intaglios. A seal 11-03-0603-OB001 from elsewhere in Building CD shows a similar style and also a lion (see Anastasiadou in Gaignerot, this volume). The fact that it was found in a Neopalatial context verifies the use of such seals in the area in LM I and suggests that the two seals with the animals found in the later contexts were part of the inventories of the building in the LM I period.

Seal 11-04-1759-OB005 is a Late Minoan soft stone lentoid (fig. 4.58). The measurements of the seal are: seal faces: 1.20 cm; stringhole: 0.20 cm; maximal thickness: 0.55 cm. The surface of the seal is shiny and slippery as if it had been polished. The motif is cut with tools operated in the horizontal spindle and is moderately abraded. Part of the seal face is broken away and as a result of this part of the stringhole channel is left open. The seal face displays a star with four (?) arms. Hatching created by sets of vertical and horizontal parallels is placed between the arms. It is not certain whether two antithetical sets of vertical parallels at the wider angles created between the arms are part of the hatching or are meant to be further arms. The seal is dated to LM I. Similar stars with arms created by the combination of two lines set in an angle and a line filling the latter are common in LM I soft stone lentoids.

Seal 11-04-1770-OB001 is a Late Minoan serpentine lentoid with flat-convex seal faces (fig. 4.59). The measurements of the seal are: seal faces: 1.50 x 1.30 (parallel to the stringhole) cm; stringhole: 0.20 cm; maximal thickness: 0.40 cm. Some parts of the intaglio have a milky shade. The seal is moderately abraded whereas part of the intaglio at the waste of the quadruped is worn and thus shallower than the rest. The seal is engraved with hand tools, the eye and perhaps the end of the muzzle are drilled. The intaglio is executed by flat cuts, appears rather soft and is not too deep. One edge of the seal on the side of one stringhole exit is missing. Depicted is a bovine (bull?) in left profile. The animal is shown in a ‘walking’ pose with the back legs ‘standing’ and the front ones ‘galloping’. The head is directed upwards, the eye is rendered by a dot, and the long tail is folded under the rump. The pose of

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Fig. 4.58. Seal 11-04-1759-OB005 (CHR. PAPANIKOLOPOULOS)

Seal 11-04-1759-OB005 is a Late Minoan soft stone lentoid (fig. 4.58). The measurements of the seal are: seal faces: 1.20 cm; stringhole: 0.20 cm; maximal thickness: 0.55 cm. The surface of the seal is shiny and slippery as if it had been polished. The motif is cut with tools operated in the horizontal spindle and is moderately abraded. Part of the seal face is broken away and as a result of this part of the stringhole channel is left open. The seal face displays a star with four (?) arms. Hatching created by sets of vertical and horizontal parallels is placed between the arms. It is not certain whether two antithetical sets of vertical parallels at the wider angles created between the arms are part of the hatching or are meant to be further arms. The seal is dated to LM I. Similar stars with arms created by the combination of two lines set in an angle and a line filling the latter are common in LM I soft stone lentoids.

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For the spindle, see Müller 2000, 195-198.
31 Compare for example CMS II,3 no. 198; CMS III nos. 515, 516; CMS VIII no. 142; CMS V Suppl. 1A no. 389.
32 Green and with light green patches. The material is the same as that of 11-04-3636-OB002.
33 For the pose compare CMS I no. 492; CMS II,3 nos. 89, 174; CMS II,4 nos. 82, 105, 132, 223; CMS III nos. 417, 419, 427; CMS IV nos. 281, 300; CMS VI nos. 410, 411; CMS VII no. 193; CMS VIII no. 126.
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The animal and the direction of the head are typical for bovines encountered on LM I seals. However, the animal has no horns which makes it stand out from the remaining depictions of LM bovines. While the underside of the neck is delimited by a ‘band’ which is typical for LM I bovines, the quadruped does not find very good stylistic parallels among the existing bovines depicted in this pose. Most of the latter have an eye rendered by a centred-circle and full bodies in contrast to the Sissi quadruped whose eye is marked by a small dot and whose body is much more slender and rather elongated. Closer is the execution of the body to that of the animal on CMS IV no. 9 which although not elongated displays a ‘band’ delimiting the underside of the neck, a drilled nose, and a soft and rather flattened intaglio. The pose of the animal is also encountered on LM III bovines although in these examples the head is directed to the back.

Fig. 4.59. **Seal 11-04-1770-OB001 (CHR. PAPANIKOLOPOULOS)**

**Seal 11-04-3636-OB002** is a Late Minoan serpentine lentoid with flat-convex seal faces (fig. 4.60). The measurements of the seal are: seal faces: 1.55 x 1.45 (parallel to the stringhole) cm; stringhole: 0.25 cm; maximal thickness: 0.45 cm. Some parts of the intaglio (rump and mane) have a milky shade. The seal is abraded and part of the motif (waste, forepart of the body, face, tail and part of the legs) is worn away. The seal is engraved with hand tools, the intaglio is soft and, at least in its abraded condition, shallow. Both stringholes are slightly broken in two opposing edges, one at the side of the seal face and one at the back of the seal. The back of the seal shows scratch marks. Depicted is a seated lion to the left with the head turned to the back. Above the back of the animal at the edge of the seal a short line can be discerned. Three more lines on the face of the animal are most probably scratches. While the pose of the lion finds good parallels to LM I lions cut in soft stone, the animal does not seem to have had an eye marked by a centred-circle which is typical for these animals. Stylistically, the Sissi lion fits well within the LM I/II lion repertoire which have rather shallow intaglios, rumps created by the combination of two slightly curving cuts joined in a line, and legs whose claws curve slightly downwards. Seated lions on LM III seals display only two legs in profile with the front nicked and directed upwards.

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35 See Müller 1995, 152-156.
36 For some examples, see Müller 1995, 153 fig. 1; 155 fig. 2. For the ‘Leistenstil’, see Müller 1995, 152-154. For the depiction of a bovine (?) shown without horns and with a tail also delimiting the underside of the rump, see CMS II,4 no. 90.
37 For some examples, see Müller 1995, 157 fig. 5, 158.
38 Dark olive green with light green and whitish patches. The material is the same as that of the piece 11-04-1770-OB001.
39 For a similar element, see CMS II,4 no. 1.
41 For some examples, see Pini 1995, 194 fig. 1, 197 fig. 4, 198 fig. 5.
42 For some examples, see Pini 1995, 201 fig. 7.
4. References

- Chapouthier 1928 = F. Chapouthier, Une table à offrandes au palais de Mallia, BCH 52.1 (1928) : 292-323.
- Soles et al. 2008 = J. Soles, Mochlos IIIA. Period IV. The Mycenean Settlement and Cemetery. The Sites (Pre-
4.3. The Excavation of Zone 4
5. The excavation of the open area north of Building E in Zone 5

Maud Devolder

1. Introduction

After Building E had been explored thoroughly in four successive campaigns between 2007 and 2010 (*Sissi* I: 139-156; *Sissi* II: 143-162), in 2011 we focused on the open area north of it. This open area was first identified in 2008, when a concentration of sherds, animal bones, shells and ash was found topping what later appeared to be pit FE081, in what was then dubbed space 5.10 (*Sissi* I: 153; *Sissi* II: 154-155). The protruding bedrock and the nature of the excavated deposits suggested that one was dealing with an open area. Further exploration in this area allowed the identification of the south façade of Building CD, and unveiled the large open area between it and Building E (fig. 5.1 and 5.2).

Preliminary study of the material excavated allowed identifying various deposits. These included deposits resulting from single or short-term events (such as pits FE081 and FE087) as well as ongoing processes of dumping.

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1 Postdoctoral Researcher of the F.R.S.-FNRS (AEGIS-UCLouvain) and Belgian Member of the French School at Athens. Also participated in the excavations: G. Metaxarakis (Vrakhasi), C. Oliveira (Kenyon College), M. Meneux (Paris 1 Panthéon-Sorbonne), A. Meulemeester (UCLouvain) and H. Bouillon (UCLouvain).
Amongst other purposes, the exploration of the open area was meant to clarify the phasing of the occupation in this part of the hill between the two buildings, E and CD. Indeed it has now become clear that Building E was already destroyed by a violent fire in LM IIIA2 or early LM IIIB as deposits in rooms 5.11, 5.12 and 5.13 indicate (Sissi II: 189-192), while Building CD seems only destroyed in an advanced stage of the LM IIIB period (Sissi I: 169-173; Sissi II: 181). This year’s excavation intended to understand the nature and phasing of the occupation of the open area during the distinct phases of use of the two buildings framing it to the north and south. We were also interested in uncovering traces of the early occupation on the top of the hill. In 2010 a stack of conical cups, probably deposited in a single event in LM IA (preliminary date), had been discovered along the western terrace wall in the open area between Buildings E and CD (Sissi II: 158-159, 198-199). Such discovery, together with sporadic early finds in Zones 3 and 4 (Sissi I: 140-142; Sissi II: 85-86, 145) and elsewhere in Zone 5, encouraged deeper exploration of the area. Rapidly, occupation levels and architectural remains dated to the MM II but also EM III/MM I periods were discovered. The work accomplished in 2011 will be described following an artificial and preliminary subdivision of the area excavated (fig. 5.1), based on the nature and date of the deposits. We will first concentrate on newly excavated data of the LM III occupation of the open area, and then we will focus on the MM II and EM III/MM I remains beneath the LM III occupation.

Fig. 5.2. AERIAL VIEW OF THE OPEN AREA BETWEEN BUILDINGS E AND CD, TOWARDS SOUTH-WEST (C. GASTON)

2. LM III occupation

The large (ca. 5.69 x 4.32 m) space immediately north of spaces 5.12, 5.14, 5.8 and 5.9 of Building E and bordered by low walls (E22, E23, E24, E27), protruding bedrock and rough alignments of stones (FE107, FE110) is labelled 5.10. Excavations in this space revealed the presence of a pit (FE081), mostly filled with fine pottery, ash, bone and shell, very likely deposited there in a single event in LM IIIA2 or early in LM IIIB (Sissi I: 153; Sissi II: 155). The early date of the LM III material discovered around the pit on the occupation level of space 5.10 was also noted, but more study is needed to attribute it to a more precise phase of the LM IIIA period, and to identify perhaps the presence of later, LM IIIB material. In 2011, the layer under the LM III occupation level of space 5.10 was explored (09/05/1823/FE082), which allowed for the discovery of the earlier use of the space down to another floor level partly covered with pebbles (fig. 5.3). This yielded a homogenous MM II ceramic deposit.
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despite some earlier residual material and some later, mostly LM III, intrusions (fig. 5.4). The generally eroded state of the sherds was noted which leads to the suggestion that even then space 5.10 may already have been an open space. Amongst the finds are stone pestles and other stone tools 11-05-1976-OB001 and OB002, 11-05-1990-OB002 to OB005, 11-05-3821-OB002 and OB003 and 11-05-3822-OB002 to OB003, obsidian blades 11-05-1995-OB002 and OB003 and 11-05-3822-OB001, an obsidian flake 11-05-1976-OB003, terracotta loom-weight 11-05-1990-OB001 and several better preserved vases 11-05-1971-OB001, 11-05-1981-OB001 (a beehive), 11-05-1995-OB001 and 11-05-3821-OB001. The protruding bedrock was here used as a floor in several parts of the excavated space. Moreover, a possible early wall on the west side (FE100) and an alignment of stones set on the bedrock in the south-west corner (FE108) appeared (fig. 5.1, 5.2 & 5.3).

Fig. 5.3. Pebble floor in the western part of space 5.10 and western wall FE100 (M. Devolder)

Fig. 5.4. MM II ceramic deposit in the north-east corner of space 5.10 (M. Devolder)
FE087 is a large pit in the north-east corner of the open area, south of space 4.18. Two parts can be distinguished. The southern part contained a white-yellowish powder, first interpreted as ash, but of which a sample still has to be analysed. The sherds associated are dated LM IIIA2 and their appearance suggests a single-event deposition (Sissi II: 155-156). The northern part of the pit was covered with a heap of large to medium-sized stones, which continued appearing within the pit mixed with ceramics, stone tools, pumice and architectural fragments (Sissi II: 156-157). Again the ceramics suggest a single event deposition, this time during LM IIIB. Mainly because of the presence in the pit of sandstone architectural elements, notably absent from Building E, but also because of the advanced LM IIIB date of the deposit in this part of the pit, a connection with Building CD had already been suggested. The large amount of pumice discovered in FE087 corroborates this connection, as this material was also found in large quantities in several rooms of Building CD (Sissi I: 127-128). Also, a sandstone window jamb discovered amongst the stones heaped in and on the pit has its exact parallel in room 3.6 of the same building (Gaignerot, this volume). It then seems that the content of the pit is connected to the main edifice on the top of the hill, most probably to a cleaning operation linked with an architectural renovation after a destruction. The large number of stone tools discovered in the northern half of the pit also points to such interpretation (Tsoraki, this volume). As noted by C. Tsoraki, the size, weight and wear patterns of the pounders or hammers unearthed from this pit may be indicative of their use for percussion in situations requiring heavy impact force, such as construction activities.

Fig. 5.5. Pit FE087. Note the sandstone jamb in the middle right (arrow) of the photograph (M. Devolder)

2 At least 45 stone tools, not including grindstones, were identified in the northern part of pit FE087: 10-05-1927-OB002, OB003, OB005, OB006, OB009, OB013, OB014, OB016, OB017, OB019, OB020, OB023, OB024, OB025 and OB027, 10-05-1929-OB003, OB004, OB006, OB009, OB011, OB013, OB014, OB017, OB019, OB022, OB023, OB024, OB025, OB026, OB027, OB028, OB030, OB034, OB035, OB036 and OB037, 10-05-1932-OB002 and OB006, 11-05-3863-OB001, OB002, OB003 and OB006, 11-05-3864-OB001, OB002 and OB003. Note differences with the catalogue numbers provided in Sissi II: 157, n. 14, which is due to the revision by C. Tsoraki of the material excavated before 2011.
At the bottom of both the southern and northern half of the pit, most of the sherds are MM II, though EM II, EM III and MM I material was also present. Some walls remains were also found (fig. 5.5 and 5.8). These may be part of earlier structures covered up when Building CD was constructed and dated by the EM III/MM IA deposit found further north (see below). In any case, these early walls were constructed immediately on top of the bedrock.

A long and relatively large space was explored along the southern façade of Building CD (wall D52) and north of spaces 5.16 and 5.10 (marked A on fig. 5.1). The discovery along this façade of a LM IIIA1/2 deposit of fine drinking vessels may be remembered (Sissi II: 158, 193-195). Except for this deposit which was easily isolated during excavation, the LM III (from LM IIIA1 down to LM IIIB) occupation of the area is illustrated by sporadic, heterogeneous and mixed contexts, most probably the result of continuous dumping of material in the area. Earlier occupation remains were, however, identified in many instances and range from EM II to Neopalatial with sherds found mixed with later material or remains of early structures and occupation levels.

Immediately north of space 5.16, in the south-east corner of the large open area (marked B on fig. 5.1), excavation proceeded through a layer of yellow compact soil in which mainly MM II-III material (preliminary date) with some intrusive LM III was noted. This went down to an occupation level which yielded several stone pounders (11-05-1934-OB001, OB003 and OB004, 11-05-1937-OB001 and 11-05-1938-OB001), a terracotta object (11-05-1934-OB002) similar to 10-05-1872-OB001 (Sissi II: 158 and fig. 6.24) – perhaps also part of some model –, a conical cup (11-05-1934-OB005), a terracotta loom-weight (11-05-1937-OB003), a stone pivot hole (11-05-1937-OB002), a fragment of a terracotta hearth (11-05-1937-OB004) and an obsidian blade (11-05-1938-OB002).

Against the western terrace wall bordering this side of the top of the hill, several walls indicate the presence of early structures (marked C on fig. 5.1). A roughly south-west/north-east running wall FE092, made of small to medium-sized rubble stones set on earth and bedrock is hidden by the terrace wall which was built against and partly collapsed on top of it. Perpendicular to this wall ran three badly preserved walls made of small-sized rubble stones (FE101, FE093 and FE111). These three walls are set on the bedrock and the space between them was excavated independently as southern and northern compartments. It is not unlikely that this structure continued to the north under Building CD, but a narrow band of LM III occupation along wall D52 was left unexplored.

Fig. 5.6. WESTERN PART OF THE OPEN AREA, WITH EARLY STRUCTURES AGAINST THE WESTERN TERRACE WALL, INDICATED BY ARROW (C. GASTON)

Once the topsoil was removed, only little soil covered the bedrock in the southern compartment, bordered by walls FE101, FE092 and FE093. Most of the pottery seems EM IIB with some LM IA and LM IB sherds. This
5. The excavation of the open area north of Building E in Zone 5

and the joins among the fragments probably indicate the redeposition of an EM IIB deposit during the Neopalatial period. No Protopalatial material was noted, however, during the preliminary study of the pottery. The presence of a large number of shells was noticed and an obsidian flake (11-05-1959-OB001) and a three-holed terracotta object (11-05-1959-OB002) were found. The northern compartment was delimited by walls FE093, FE092 and FE111. Again Neopalatial sherds were found mixed with earlier material, especially EM III, MM I and MM II. A possible occupation level was identified against the back wall FE092 above an irregularity in the bedrock. Beneath this, the material is homogeneous MM II down to the bedrock which is here slightly lower. An incised sherd (11-05-1989-OB001), six obsidian blades fragments (11-05-1993-OB001, 11-05-1996-OB001, 11-05-3800-OB001, OB002, OB004 and OB005) and three lithic tools (11-05-1993-OB002, 11-05-1996-OB002 and 11-05-3800-OB003) were collected. Although it is difficult to assess the precise date of these structures, the disturbance created by the construction of the terrace wall, very likely in the Neopalatial period, and material dated from LM I present in the mixed contexts, offers a *terminus ante quem*. It is impossible however, without further study, to date these better.

3. Earlier occupation

The central part of the area examined north of Building E and along the southern façade of Building CD is marked by the presence of the outcropping bedrock (fig. 5.1 and 5.2). It was explored down to the latest occupation levels when these were present, and when not, down to bedrock and sometimes into some of the cavities which appeared sporadically. The eastern side of this central area mostly preserved mixed deposits with sherds ranging between EM II to LM III. Near the two compartments previously described, however, and especially where the bedrock showed irregularities, patches of soil contained homogeneous or only slightly mixed deposits of EM II and MM II material. Further east, north of the north-east part of space 5.10, the area was explored down to bedrock, with again mixed material but especially MM II sherds. Amongst the finds made in the central northern part of Zone 5 are several obsidian blades (11-05-1940-OB001, 11-05-1956-OB001, 11-05-1958-OB001, 11-05-1983-OB004-OB006), two obsidian flakes (11-05-1973-OB002 and 11-05-1983-OB001), a stone blade (11-05-1973-OB001), an unidentified stone object (11-05-1983-OB007), a stone lid (11-05-1983-OB003), several stone tools (11-05-1956-OB002 to OB005 and OB007 to OB013 and 11-05-1983-OB002), two terracotta loom-weights (11-05-1956-OB006, 11-05-1973-OB003), and a terracotta cup (11-05-1983-OB005).

![Aerial view of the north-central area of Zone 5 (C. Gaston)](image)

Fig. 5.7.
Further west, between the protruding bedrock to the west and pit FE087 to the east, several walls of a single, early structure were found, indicated by a series of parallel and perpendicular walls (marked D on fig. 5.1, fig. 5.7 and 5.8). These were largely disturbed by erosion, the cutting of pit FE087 to the east and the construction of Building CD to the north. Walls FE152, FE116, FE118 and FE122 all seem to belong to this same structure. Wall FE120 partly covered wall FE118. It indicates remodelling of the building after an earlier phase dated by an EM III/MM IA deposit against wall FE118 and partly sealed by FE120 (fig. 5.9) (Driessen, this volume, fig. 1.3). The red rammed earth floor associated with these walls not only gave EM III/MM IA material, but also large amounts of MM II sherds. It cannot be excluded that the structure remained in use continuously during these periods. The objects discovered associated with the layer on the red floor are eight obsidian blades (11-05-1999-OB003 and OB004, 11-05-3805-OB002, 11-05-3806-OB001, OB002, OB004 and OB005 and 11-05-3816-OB001), an obsidian flake (11-05-3816-OB002), terracotta loom-weights (11-05-1999-OB001 and OB002 and 11-05-3812-OB001), a terracotta weight (11-05-3805-OB001), a possible bone tool and several lithic tools (11-05-3806-OB003, OB006, OB008 and OB009 and 11-05-3812-OB002). The walls discovered at the bottom of pit FE087 were already mentioned (fig. 5.5, 5.7 and 5.8). It is not excluded that these were associated with the red floor structure, as the north-south wall FE147 within the pit seems to extend wall FE122 towards the south. The cutting of the pit and the heap of stones associated to it, however, disturbed this early occupation and more study is needed to understand the phasing of the early occupation on the top of the hill.

Fig. 5.8. PLAN OF EARLY WALLS ASSOCIATED WITH RED FLOOR LEVEL AND AT THE BOTTOM OF PIT FE087 IN THE NORTHERN PART OF ZONE 5 (A. CHALKIDI, V. GOULIOPOULOU AND M. NASI)
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In the north-easternmost part of the early structure, along the southern façade of Building CD (wall D52), a foundation trench was identified. Its exploration indicated that this façade very likely dated to the Neopalatial period (fig. 5.10).

Fig. 5.9. EM III-MM I DEPOSIT ON RED EARTH FLOOR AGAINST WALL FE118 (M. DEVOLDER)

Fig. 5.10. NEOPALATIAL FOUNDATION TRENCH OF FAÇADE WALL D52 INTO EARLY RED FLOOR (M. DEVOLDER)
Space 5.16 is a small space situated between wall E27 (east), the western terrace wall and wall E26 (south) immediately north of space 5.13 (fig. 5.1, 5.2 and 5.11). Some low walls appeared bordering it to the north (FE097 and FE105) but they correspond to an early phase of the space, before the Neopalatial redeposition of earlier material in order to create the most recent occupation level in the area. After the topsoil had been taken away in 2009 down to the top of a layer in which large amounts of ceramics appeared, the zone was newly excavated in 2010 and again in 2011. Since wall E28 distinguished two halves in its southern part, the sherd concentration was explored separately in a western and eastern part of space 5.16. Especially in the northern part of the area, where the heap of conical cups stacked against the western terrace wall mentioned earlier was discovered, a very large number of sherds were noted (Sissi II: 158-159, 198-199). In 2011, exploration in the northern part of space 5.16 went down to bedrock under the occupation level associated with this LM IA deposit (+21.07 m). The excavation and preliminary study of the material unearthed indicated the presence of mainly Neopalatial (LM IA) sherds, although Protopalatial (mostly MM II) sherds became more numerous while getting closer to the bedrock and rammed earth forming the lower occupation level reached in the space at +20.65-20.84 m. It is not excluded that space 5.16 contained Protopalatial material re-deposited during the Neopalatial period. The objects associated with this layer are several terracotta vases (cup 11-05-1936-OB009, jug 11-05-1944-OB001, cup 11-05-1950-OB001, and lamp and support 11-05-1950-OB004 and OB005), a sherd with an incision in the shape of a double-axe (11-05-1936-OB008), a stone bead or button (11-05-1954-OB001), a fragment of a terracotta drain (11-05-1968-OB001), four terracotta loom-weights (11-05-1936-OB001, 11-05-1944-OB002, 11-05-1968-OB003 and perhaps 11-05-1939-OB001), three obsidian blade fragments (11-05-1936-OB006, 11-05-1968-OB002 and 11-05-1953-OB001), five obsidian flakes (11-05-1936-OB004 and OB005, 11-05-1978-OB001 and 11-05-1954-OB002 and OB003), one possible stone weight (11-05-1936-OB003) and five stone tools (11-05-1936-OB002 and OB007, 11-05-1950-OB002 and OB003 and 11-05-1939-OB003).

Fig. 5.11. MM II MATERIAL IN THE NORTH-EAST CORNER OF SPACE 5.16 (M. DEVOLDER)
The south-east corner of space 5.16 was excavated independently from its northern part, in connection with space 5.15 of which exploration had started in 2010. Then we noticed a large quantity of plaster fragments and these now also appeared while exploring the south-east corner of space 5.16. Excavation revealed the north-east corner of a plastered room including space 5.15 and the south-east corner of space 5.16, dubbed space 5.18, bordered by wall FE098 to the north and E22 to the east (fig. 5.1 and 5.12). The latter wall remained visible during the late, LM III, occupation of the area while the first was hidden beneath the later occupation. The layer on the plaster floor comprised fallen stones, charcoal and plaster fragments, which suggest a destruction. This came down to a fine plastered floor of which the plaster also ran up walls FE098 and E22. Several MM II cups (11-05-1969-OB002, 11-05-1977-OB001, OB002, OB003 and OB004) were found crushed partly into the floor (fig. 5.13), together with an oval-mouthed amphora (11-05-1972-OB001). Other objects associated with the lower part of the destruction layer are three stone pounders (11-05-1951-OB001, 11-05-1969-OB003 and OB005), an obsidian blade (11-05-196-OB001) and a large stone lid (11-05-1969-OB004).
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Only part of space 5.18 was preserved, as its south-western corner had been cut off when space 5.13 (fig. 5.14) was made, implying an intricate architectural stratigraphy on this part of the hill. Indeed, the plastered floor was found running within the corner formed by walls E25 and E26 in the north-eastern corner of space 5.13. Both walls were backed by medium to large-sized boulders which encroached upon the destruction layer in the plastered room. Those boulders were aimed at setting firmly the north wall of space 5.13 at a marked change in level of the terracing. This also suggests space 5.13 was the northernmost built space of Building E during the LM III period.
5.18 (L. Manousogiannaki)

While exploring the south-western part of space 5.16, we found that the north-western limit of space 5.18 was partly hidden under later wall E28. A sounding was opened here since a squarish space had appeared beneath the topsoil, bordered by late walls E26, E28, a lower wall FE099 and the western terrace wall. The north-eastern part of a room bordered to the north by a wall formed by cut bedrock (FE132) and to the east by a wall of rubble FE131 (itself the western limit of space 5.18) was found (fig. 5.1 and 5.15). This was dubbed space 5.19. It comprised a homogeneous destruction deposit, probably of MM II date. Again the floor and walls of the excavated room were coated with plaster, here painted blue and red. The deposit comprised very red soil, as if it was burnt or consisted of burnt decomposed mudbrick, and only few stones were found, mostly of very small size. At the bottom of the sounding, down to floor level at +20.05-20.07 m, three vases (11-05-3865-OB001, OB002 and OB003) but no other objects were found, caught in the destruction layer beneath wall E26 and the main terrace wall (fig. 5.15 and 5.16). Again wall E26 was backed with stones encroaching upon the MM destruction layer. Interestingly the floor level in space 5.13 to the south was at the very same altitude (i.e. +20.02 m). Since this also presents itself as cut bedrock covered with a coated layer of tarazza, it is very likely that space 5.19 initially extended further south, before part of its surface was taken for the construction of space 5.13. More to the west, the main terrace wall seems to have been set immediately on top of the MM floor of space 5.19. The cut bedrock is very evident here. Where it formed the floor (+20.02 m), it was coated with tarazza, itself coated with finer plaster, exactly as is the case in space 5.13. Part of the MM destruction layer was still visible beneath the stones of the lower course of the terrace wall (fig. 5.17). Such discovery is very relevant as far as the dating of the terrace wall west of the open area is concerned. Indeed, as far as preliminary study of the material indicates, it must be later than MM II, but could have happened as early as MM III, during the Neopalatial period. As mentioned, the discovery in 2010 of a heap of presumable LM IA conical cups partly covered with stones fallen from this terrace wall offers a terminus ante quem (Sissi II: 158-159, 198-199).
Fig. 5.15.  
SPACE 5.19, DURING EXCAVATION (M. DEVOLDER)

Fig. 5.16.  
MM II VASES BENEATH WALL E26 (LEFT) AND WESTERN TERRACE WALL (TOP) IN SPACE 5.19 (M. DEVOLDER)
5. The excavation of the open area north of Building E in Zone 5

While exploring the area west of the western terrace wall, some traces of LM IIIA2/B occupation were found, in the shape of fallen stones, a terracotta beehive (11-05-3846-OB001), obsidian flakes (11-05-3847-OB002 and OB003) and stone tools (11-05-3827-OB001 to OB006, 11-05-3831-OB001 and OB002, 11-05-3846-OB002, 11-05-3847-OB001, OB004 to OB006 and 11-05-3853-OB001 to OB004) (fig. 5.18). This area was only partly explored, but a pebble floor was reached towards the north, indicating an occupation level. Future exploration in this area down the terrace wall to the west might shed more light on the occupation against the slope of the hill.

A restricted area was also explored to the east of space 5.10 and to the southeast of spaces 5.8 and 5.9. Excavation went mostly down to bedrock, which showed many hollows, some of which were filled with soil and sherds (fig. 5.19).
5.1 and 5.19). The layer beneath the topsoil contained material mixed in date, from EM I down to LM III. Lower down, however, approaching the bedrock, LM intrusions stopped appearing and most sherds dated to EM I-MM III, with a majority of EM II-MM II. Some deposits could be more easily isolated, such as a MM II/MM III fill immediately south of pit FE087 (fig. 5.19). Two cavities in the bedrock south of this fill respectively yielded MM II (east) and EM II-EM III (west) material. This recalls the traces of early occupation in the bedrock hollows found in the southern part of Zone 5 during the first excavation campaign in 2007 (Sissi I: 140-142). From the mixed to purer early layers above the bedrock come a terracotta loom-weight (10-05-1857-OB001) and a stone tool (10-05-1861-OB001). From the MM II/MM III fill south of pit FE087 are ten stone tools (11-05-1984-OB001 and 11-05-1988-OB003 to OB011), a terracotta loom-weight (11-05-1984-OB003), a terracotta cup (11-05-1988-OB001), two fragments of terracotta slabs (11-05-1984-OB002 and 11-05-1988-OB012) and a fragment of a steatite object (?) (11-05-1988-OB002). From the cavities in the bedrock come 13 stone tools (11-05-3808-OB001, 11-05-3811-OB001 to OB003 and 11-05-3814-OB001).

![Fig. 5.19. EM IIB/MM I FILL IN BEDROCK SOUTH OF PIT FE087, DURING EXCAVATION (M. DEVOLDER)](image)

South of these cavities, east of spaces 5.8 and 5.9, excavation also went down to bedrock (fig. 5.1 and 5.20). Though some Neopalatial material was noted in the upper layer and southern part of the area (especially near the north-eastern corner of space 5.8), the material is almost exclusively EM IIB/EM III and MM I and the homogeneity of the deposit may be noted. Again, cavities in the bedrock were explored. An obsidian blade (11-05-3820-OB001), a terracotta object (a pestle ?) (11-05-3820-OB002), a conical cup (10-05-1870-OB001) and a fragmentary terracotta jug (11-05-3849-OB001) were found associated with mixed, notably Neopalatial, material. Associated with the earlier, EM IIB/EM III-MM I, deposit were 11 stone tools (11-05-3823-OB001, 11-05-3826-OB001, 11-05-3848-OB001 to OB006, 11-05-3854-OB001, 11-05-3830-OB001 and 11-05-3835-OB001), two obsidian blades (11-05-3823-OB001 and OB002), an obsidian flake (11-05-3833-OB002), a terracotta loom-weight (11-05-3824-OB001), a possible stone lid (11-05-3830-OB002) and a fine bird-shaped steatite pendant (11-05-3833-OB001) (fig. 5.21).
5. The excavation of the open area north of Building E in Zone 5

Fig. 5.20. VIEW OF THE ZONE EXCAVATED EAST OF SPACE 5.8 AND 5.9, DOWN TO BEDROCK (L. MANOUSOGIANNAKI).

Fig. 5.21. BIRD-SHAPED STONE PENDANT (11-05-3833-OB001) (CHR. PAPANIKOLOPOULOS)
To conclude, the five successive campaigns of excavation in Zone 5 have allowed us to explore a significant part of the southern slope of the top of the Kefali. A large, well-built Postpalatial domestic unit, Building E was completely excavated. The exploration beneath some of the spaces of this structure and of the northern open area which was probably used by the inhabitants of both Buildings E and CD also allowed us to explore earlier levels which have given us a glimpse on the diachronic occupation of the Kefali, from EM II (if not earlier) through the Prepalatial, Protopalatial, Neopalatial and Postpalatial periods. Good architectural evidence for the EM III/MM IA and for the MM II periods has now been identified which provide interesting comparative and contextual habitation material for the cemetery on the northern fringe of the hill (Zones 1 and 9) where these two periods are the best represented (Schoep, Schmitt, Creveceur and Déderix, this volume). Furthermore, Neopalatial material suggests an important construction program on the top of the hill during this period, albeit largely hidden by the Postpalatial complex.

4. References

5. The excavation of the open area north of Building E in Zone 5
6. The Excavation of Zone 6

Simon Jusseret

1. Introduction

Previous excavation campaigns in Zone 6 (Sissi I: 157-161; Sissi II: 163-172) revealed a large architectural structure (Building F) at least occupied until LM IIIA2/B, with traces of activity mainly restricted to the southern part of the excavated area (Spaces 6.2, 6.3, 6.4.1, 6.4.2) (fig. 6.1). In 2011, excavation proceeded in grid squares BJ 86-90, BK 86-91, BL 88-91, BM 87-91 and BN-BQ 87-88 (fig. 1.1). The main objectives of the 2011 campaign were (1) to complete the excavation of space 6.2, (2) to determine the northern and western limits of Building F suggested by walls F2 and F21, (3) to explore the (open air?) area east of the building (Space 6.8; Sissi II: 166), and (4) to clarify the connexion between architectural features defined during the previous years (walls F5-F7 and walls F39-F21). Targeted stratigraphical tests opened along exterior walls were selected as the most appropriate solution to reach these objectives while at the same time allowing site conservation.

2. Spaces 6.2, 6.14 and 6.15 (fig. 6.2)

In 2010, excavations in the northern part of space 6.2 produced evidence for a poorly preserved floor level associated with LM IIIA2/B material (Sissi II: 165). Exploration of the southern sector of the room in 2011 produced a single fragmentary cup found close to the floor level. In the south-western corner of the space, an irregular stone concentration (ca. 2 m²) was brought to light and interpreted as a pit (F43) cutting through the LM IIIA2/B floor. Excavation of pit F43 proved unrewarding due to difficulties of identifying the edge of the feature. The pit was found filled with stones of all dimensions (up to ca. 0.30 m) and contained a pithos lid fragment (11-06-2117-OB001). Pottery associated with the upper part of the feature is mixed (MM II, LM I and LM III) with possible post-Minoan intrusions. The lower part of the pit produced MM II pottery with residual EM material.

Immediately beneath the LM IIIA2/B floor surface was a fill containing mixed MM II, MM III/LM I and LM IIIA2 pottery. Excavation of the upper part of the fill brought to light the continuation of wall F24 previously identified in space 6.1 (Sissi II: 165) and a new wall (F46), abutting onto wall F24 to the south. In view of the limited length of wall F46 (0.60 m), it is not impossible that its southern end was cut by pit F43. In space 6.2, wall F24 can be traced for a distance of 3 m before disappearing beneath wall F7. Wall F24 divides space 6.2 into two compartments belonging to an earlier architectural phase of Building F: space 6.14 (north) and space 6.15 (south). Although only the upper part of the fill was excavated in space 6.14, it produced several lithic tools, a spool (11-06-2188-OB003), a stone vase fragment (11-06-2194-OB002), a terracotta loom-weight (11-06-2194-OB001) and a circular weight made of sandstone (11-06-2197-OB003). In space 6.15, the upper part of the fill yielded a lithic tool, a terracotta lid (11-06-4008-OB001) and a terracotta loom-weight (11-06-4008-OB002).

Chargé de Recherches F.R.S.-FNRS. Took part in the excavations : K. Bernhardt (Austrian Academy of Sciences), A. Cappon (UCLouvain), T. Gomréé (ULyon 2), M. Mesogeiti (Southern University of Denmark), A. Meulemeester (UCLouvain), N. Rouvroy (UCLouvain), T. Sgalbiero (UCLouvain), H. Tomas (UZagreb) and K. Van Liefferinge (UGent). Our workman was Manthos Vrachnakis, with occasional assistance by Kristian Jacobson, Manolis Tzamakis and Yannis Milathianakis.
A limited stratigraphic test of ca. 0.60 x 0.60 m was made in the angle of walls F24 and F46. It entered at least 0.40 m of stony fill without reaching bedrock. Contrary to the mixed upper part of the fill in spaces 6.14-6.15, the test produced homogeneous MM II pottery including straight-sided cups and feet of tripod cooking pots. The homogeneous and residual character of the material (fresh breaks, isolated sherds) suggests deposition as a single dump.
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3. Space 6.9 (fig. 6.2)

A test trench, ca. 4 x 3 m, was opened alongside the southern façade (F30) of space 6.2. Under a thin layer of topsoil were the remains of two walls (F52 and F54) running in a northwest-southeast direction, parallel to wall F24 (Space 6.2). F52, F54 and F24 define two elongated rooms (Spaces 6.9 and 6.15) predating the construction of space 6.2. Wall F53, perpendicular to F52 and F54, divides space 6.9 into two compartments, spaces 6.9.1 and 6.9.2. These architectural remains probably belong to a construction preceding the LM IIIA2/B occupation of Building F. In spaces 6.9.1 and 6.9.2 was a levelling fill made of small stones, the upper part of which contained mixed pottery no earlier than MM II. It is not impossible that the deposition of the fills in spaces 6.14, 6.15, 6.9.1 and 6.9.2 occurred as a single event.

Excavation also revealed a good Neopalatial (MM IIIB/LM IA) pottery deposit lying against wall F30 (figs 6.2 and 6.3). The upper course of wall F52 was apparently modified (southern face raised ca. 5-10 cm above the northern face) to accommodate the pottery in a box-like structure. However, patches of white plaster found at the western end of wall F52 may also suggest modification related to the construction of a drain channelling run-off towards the eastern cliff of the hill which is here only 5 m away. According to this hypothesis, it is likely that the drain went out of use before the dumping of the pottery. Indeed the deposit does not appear to have suffered from water erosion. The deposit mainly produced undecorated drinking vessels (81 objectified). The majority were conical cups, some of them found in stacks. There were also ledge-rim bowls, some of them painted, as
6. The Excavation of Zone 6

well as S-profile and rounded cups, a globular rhyton painted with brownish red spirals and tortoise-shell ripple (11-06-2149-OB025) (fig. 6.4), an amphora (11-06-2149-OB020), and the head of a terracotta figurine (cobra?) bearing traces of red paint (10-06-4004-OB001). The western end of the deposit was found covered by wall F28, suggesting an LM IIIA2/B construction for the southern part of Building F (Spaces 6.4.1 and 6.4.2, see also Sissi II: 167-169).

Fig. 6.3. **SPACE 6.9: NEOPALATIAL (MM IIIIB/LM IA) POTTERY DEPOSIT AGAINST WALL F30 (S. JUSSERET)**

**Fig. 6.4.** **SPACE 6.9: DECORATED GLOBULAR RHYTON (11-06-2149-OB025) FROM NEOPALATIAL (MM IIIIB/LM IA) DEPOSIT (CHR. PAPANIKOLOPOULOS)**

4. **Spaces 6.5, 6.10, 6.16 (fig. 6.5)**

Excavation of a test trench south of space 6.5 (Sissi II: 170) allowed clarifying the southern limit of Building F. In particular, clearing of the south-western corner of space 6.5 revealed a doorway marked by a threshold of sideropetra (F64). To the west of the threshold was a round limestone pebble (diameter 0.15 m) bearing a 4 cm-deep cavity interpreted as a pivot-hole (F45). Inside space 6.5, cleaning of the northern face of the threshold brought to light a patch of pebble floor (+16.77 m) on which was found a fragmentary conical cup (11-06-2175-2).

2 A similar globular rhyton with tortoise-shell ripple was found in Gournia (House Cm, Room 58) (Koehl 2006: 98, n°170; plate 14; figure 8). Koehl (2006) dates the Gournia specimen to LM IA. Another similar example was found in Bastion E of the Malia palace (Chapouthier & Demargne 1942, 41-42, fig. 18 and plate XLVIII,2).
OB001). To the north of the patch of pebble floor and at a slightly lower level (+16.74 m) were slabs of sideropetra most probably corresponding to an earlier floor surface. The two floor levels should in all probability be linked to the two intermediate pebble floors (+16.77 m and +16.74 m respectively) previously identified in space 6.5 (Sissi II: 170) (fig. 6.6).

Fig. 6.5.  **SPACES 6.5, 6.10 AND 6.16: AERIAL VIEW (C. GASTON) WITH MAIN FEATURES INDICATED**

Fig. 6.6.  **SPACE 6.5: SUPERIMPOSED FLOOR LEVELS (+16.77 M, +16.74 M) WITH FRAGMENTARY CONICAL CUP (11-06-2175-OB001) SITTING ON THE HIGHER FLOOR (S. JUSSENET)**

Excavation south of space 6.5 revealed the remains of a rubble wall (F62) running parallel to the southern façade of Building F. Walls F39 and F62 define a narrow space (6.10) bounded to the west by wall F21 and to the east by a smooth bedrock outcrop. Apart from the doorway leading into space 6.5 (see above), there may have been access to space 6.10 from the south where a threshold slab (F63) was uncovered. In space 6.10, a burned deposit, 15-25 cm thick, was found resting on the bedrock of which irregularities had been filled by small- to medium-sized stones. The upper part of the deposit contained a 5 cm thick compact layer of red clay interpreted as burned mud brick.
remains. The lack of associated finds prevents conclusions about the function of the room.

Likewise, little can be said of space 6.16 south of space 6.10 until further trials are conducted, but the shallowness of the soil cover suggests that most of the occupation in the area may have been eroded away. Space 6.16 may have been accessible from the west by a doorway of which only the pivot-hole survives as a 4 cm-deep cavity carved in the lower course of Wall F21.

5. **Space 6.6 (fig. 6.7)**

Space 6.6 (internal dimensions ca. 5.90 by 4.60 m), located to the north of spaces 6.1 and 6.3, is delimited by Walls F2, F8, F12 and F21. This large room (ca. 30 m²), occupying the north-western angle of Building F, probably formed the central part of the complex during its last phase of occupation. In 2011, our efforts were mainly concentrated in the northern and western sectors of the room and involved the removal of large stone heaps partly covering the western stretch of façade wall F2. To the north of space 6.6., wall F2 is made of a single line of cut limestone blocks and is preserved to a maximum height of ca. 0.55 m at its western end. To the west of space 6.6, excavation allowed us tracing the plinth or *euthynteria* F21 further north for a distance of ca. 4.7 m before arriving at a carefully cut block of *sideropetra* (ca. 0.55 x 0.65 m) marking the north-western corner of Building F. Some of the slabs of F21 were found covered by a mixture of earth and rubble interpreted as the remains of the backing wall for the original ashlar façade. Space 6.6 was most probably accessed from the north via an entrance marked by a large (1.25 x 0.55 m) threshold made of *sideropetra* (F70).

![Fig. 6.7. Space 6.6: Aerial View (C. Aston) with Main Features and Tumble Indicated](image)

The southern part of space 6.6 was found filled with tumble covering an area of ca. 7 m² (ca. 4.30 x 1.70 m). The density of the tumble, as well as its rectangular outline, may suggest sudden collapse of Wall F12. Tumble was also revealed in the south-western and north-western corners of the room.

Space 6.6 had very few finds, among which a faceted stone weight (11-06-2141-OB001), and produced only fragmentary and eroded pottery. In the south-western part of the room, a compact, burned layer containing small mud brick debris, fine charcoal fragments, burned bone and plaster was found beneath tumble. Below this layer
was an earth floor surface (ca. +16.48 m) on which a quern (11-06-2143-OB002) was found resting.

A limited sounding (ca. 2.30 x 1.50 m) was opened in the south-western corner of the room and excavated to bedrock. The test provided evidence for a loose, silty clay floor packing, max. 0.15 m thick, containing mud brick and plaster fragments. A few eroded sherds of LM IIIA2/B drinking vessels were found associated with the packing and provide a minimum date for the laying of the earth floor. Under the packing was a stony layer containing heavily eroded pottery including Neopalatial conical cup fragments. This layer was most probably deposited to level out the bedrock which slopes here towards the north.

6. Space 6.7 (fig. 6.8)

Space 6.7, adjacent to the east of space 6.6 and to the north of space 6.2, was partly explored in 2008 (Sissi I: 158). Excavation revealed a complex assemblage of architectural remains (Walls F1-F6) of which the date, function and relation to other structures in Zone 6 remain unclear. In 2011, two trials were sunk in order to clarify the western and southern borders of space 6.7.

The first trial, ca. 1 x 3 m, was opened along the north wall of space 6.2 (F31). Immediately below the surface was a deposit of LM IIIA2/B pottery. The homogeneous and fresh character of the pottery suggests that the assemblage originates from a destruction nearby. Below this deposit was a relatively loose layer of brownish silty clay containing mixed and eroded pottery, among which the fragmentary rim of a deep bowl painted with dark-on-light spiral decoration and datable to LM IIIB. To the east of the sounding, excavation also brought to light the continuation of wall F5 and provided clear indication of its use as foundation for façade wall F7.

The second trial, ca. 0.70 x 3.50 m, was excavated to the east and north of wall F8. The upper part of the test produced a layer containing fragmentary LM IIIA2/B pottery including a mug rhyton with whorl shell decoration (11-06-4036-OB001) (fig. 6.9) (Langohr, this volume). Beneath this upper layer was a homogeneous MM II fill deposit containing feet of cooking tripod pots and tronconical/carinated cups. The fill was found resting on a stony layer which also served as foundation for wall F8. Associated pottery is preliminarily dated to MM II and may
provide a *terminus post quem* for the construction of the wall. Although it is conceivable that wall F8 originally continued further north, evidence for it appears to have been largely removed by recent agricultural activities.

Fig. 6.9. **SPACE 6.7: MUG RHYTON WITH WHORL SHELL DECORATION (11-06-4036-OB001) (CHR. PAPANIKOLOPOULOS)**

### 7. The court and its north-eastern recess: spaces 6.8, 6.13 and 6.17

Undoubtedly the most surprising result of the 2011 campaign came from the area adjacent to the west of Building F. Here, in 2009, superficial cleaning had suggested the possible existence of an open area covering grid squares BL-BM 88 (fig. 1.1) (*Sissi II*: 166). In 2011, several trials opened to the south, east and north of space 6.8 (grid squares BJ-BK 86-89, BL-BQ 87-88, fig. 1.1) allowed the confirmation of this hypothesis by bringing to light the remains of a large rectangular pebble court, ca. 9.70 m by at least 20 m³. For the sake of convenience, presentation of the finds from space 6.8 is organised according to the five main sectors investigated (south, southeast, east, northeast and north).

#### 7.1. Space 6.8 S (fig. 6.10)

Excavation of the sector covered by grid squares BN-BQ 87-88 (fig. 1.1) revealed the southern end of wall F21, giving a northeast-southwest running, linear façade more than 19 m long. F21 was here found partly covered by a stony packing extending over grid squares BN 87-88 and containing few eroded MM III/LM I sherds. Resting on this packing were eroded post-Minoan sherds preliminarily identified as VII-IV c. BC Cretan productions. Together with several fragments of terracotta figurines (see below space 6.8 N), these remains represent the first clear traces of post-Minoan occupation of the Kefali.

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3 The length of the court is indicated on fig. 6.24.
4 Dr. T. Brisart (Itanos excavations) examined the sherds and kindly provided advice on their date.
A large block, apparently fallen from F21, and a threshold of blue limestone (F61) forming a slight angle with the line of the façade were found to the south of F21, here constructed of a single line of limestone boulders. The fact that there is an angle suggests that the threshold does not belong to the original layout of F21 and may relate to a construction as yet unexcavated. Further south, a bedrock outcrop shows a linear cutting perpendicular to the alignment of threshold F61. The cutting may correspond to the foundation of the building associated with F61. It may also provisionally be regarded as the south edge of the court.

West of wall F21 a stratigraphic test (ca. 3.00 x 1.00 m) was made to determine the date of the façade and assess the existence of an associated open area. Removal of the stony packing (see above) revealed a 0.30-0.40 m-thick clayey deposit containing few eroded and mostly undiagnostic sherds. From the upper part of the deposit come a spool (11-06-4010-OB001) and an eroded figurine (Minoan head?) (11-06-4010-OB002). This layer was found resting on a surface made of blue and white pebbles set in clay which also corresponds to the level of foundation of wall F21 (+16.69 m). The pebble surface was preserved over the whole area tested and was covered by a thin layer of compact, slightly sandy clay suggesting episodes of flooding. In the eastern part of the test, a limestone block, fallen from the façade, was found resting on the layer of compact clay (fig. 6.10b). This evidence suggests at least partial collapse of the façade after abandonment and intermittent flooding of the pebble court.

### 7.2.  Space 6.8 SE

Further evidence for the pebble court came from a limited trial (2.50 x 1.90 m) opened along F21 in square BM 88 (fig. 1.1). There, the pebble floor surface was reached at a level similar to that observed in space 6.8 S (+16.69 m) and associated pottery sherds indicate a LM date for its use. The court level had four irregular limestone slabs, as well as patches of pebbles set in lime. Excavation also provided clear evidence of the association between kernos F19, façade wall F21 and the pebble court. Indeed, F19 was set directly on top of the pebble surface which also corresponds to the level of foundation of F21 (fig. 6.11).
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The upper part of the sounding was found filled with tumble including several large blocks of *ammouda*. Under the tumble and resting against F19 and F21 was a fragmentary plate (11-06-4038-OB001) possibly representing the remains of consumption activities in relation with the use of *kernos* F19. A deposit of compact sandy clay was found immediately below this layer of collapsed debris. This deposit, similar to that identified in space 6.8 S, was found resting on the court surface and may indicate intermittent flooding during heavy rains.

7.3. Space 6.8 E

The opening of a 1 m-wide trench north of space 6.8 SE led to exposure of façade wall F21 over a distance of ca. 10 m. Excavation revealed three isolated groups of limestone slabs set against F21 ca. 3.70 to 4.70 m apart, as well as a small patch of *tarazza* (F65) bevelled up against *euthynteria* F21 (fig. 6.12). Similar patches were found in space 6.8 NE and N (see below) and may suggest that the eastern and northern edges of the court were initially lined with *tarazza*. This material may have been used to keep dampness away from the lower part of the surrounding walls (cf. Shaw 2009: 149).
Immediately below the surface was a loose deposit containing irregular stones of *sideropetra* (dimensions up to ca. 30 cm) and several fragments of cut *ammouda* ashlar blocks, undoubtedly fallen from façade F21. In the northern part of the trench, the deposit contained a vase fragment with a bull’s head applique under the rim (11-06-2137-OB001) (fig. 6.13). Below the collapse was a ca. 10 cm-thick clayey layer containing fine waterborne gravels. This deposit, interpreted as rain wash, was found resting on the pebble court at a level comprised between ca. +16.70 m (south) and ca. +16.60 m (north). In the central part of the trench, close to Wall F21, an accumulation of loose pebble floor material could similarly indicate erosion of the court by rain water. In the northern part of the trench, a limited trial (ca. 3 x 1 m) opened below the court yielded heavily eroded pottery, a doughnut-shaped stone weight (11-06-4067-OB002) and an obsidian blade (11-06-4067-OB001). Preliminary examination of the pottery suggests that the latest sherds are Neopalatial. This observation might indicate a Neopalatial date for the placing of the court but a thorough study of the material is necessary before any firm date can be put forward.

Fig. 6.13. **SPACE 6.8 E: VASE FRAGMENT WITH BULL’S HEAD APPLIQUE (11-06-2137-OB001) (CHR. PANIKOLOPOULOS)**

### 7.4. **Space 6.8 NE and space 6.13 (fig. 6.14)**

Exploration of the area bordering the northwest angle of Building F revealed the outline of a square recess (Space 6.13, internal dimensions ca. 2.65 x 2.70 m) which could have served as an entry for space 6.8. Space 6.13 is bordered by walls F47, F49 and F50. Wall F47, set back ca. 1.00 m from façade wall F21, abuts against the northern façade of Building F. The southern part of wall F47 is constructed of two megalithic blocks and is preserved to a height of ca. 0.75 m. The northern part of the wall includes a doorway, 1 m wide, marked by a threshold of *ammouda* (F66). The doorway, originally giving access to space 6.12 to the east, was blocked by a rubble wall at some stage in the building’s history. Two large *sideropetra* blocks, carefully cut, define the northwest angle of space 6.13 (walls F49 and F50). A smooth ridge visible on the upper face of F49 may indicate the use of a bronze tool (chisel?) for the dressing of the block (Shaw 2009: 52-53). No architectural remains were found in the north-easter corner of the space, which may be due to robbing and/or erosion. The south side of space

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5 Of uncertain date but probably Neopalatial. For bull’s head appliques at Malia, see Detournay *et al.* 1980: 110-111 and figs 153-154 for examples from MM IIB Quartier Mu and Deshayes & Dessenne 1959: 47 and plate XIV,1 for an example from LM IB Maison Zβ.
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6.13 is occupied by an irregular stone base of *ammouda* (F57, ca. 0.75 x 0.45 m) surrounded by small slabs of *sideropetra*. To the west, slabs of larger dimensions (up to ca. 0.60 m) were found associated with the surface of the pebble court at a level of ca. +16.50 m (see below space 6.8 N). Running east of the stone base is a rubble wall (F55) dividing space 6.13 into two compartments. It is difficult to understand the relation between F55 and the surrounding walls F47, F49 and F50 since a series of architectural modifications seem to have taken place in this limited area. At present we are not able to say which walls formed part of the original design of space 6.13 and which walls or portions of walls represent later additions.

Two large slabs of *sideropetra* were found against the north-western corner of Building F (Space 6.8 NE). The slabs are associated with the pebble court and a patch of *tarazza* bevelled up against the corner of Building F. It is not impossible that these slabs represent the western edge of the paved area uncovered east of wall F47 (Space 6.12). If this is the case, spaces 6.12 and 6.13 may have once functioned as a single architectural unit later subdivided by the construction of Walls F47 and F55.

![Fig. 6.14. Spaces 6.8 NE and 6.13: Aerial view (C. Gaston), with main features and excavated pebble court (Orange) indicated. S = slabs of sideropetra](image)

7.5. Space 6.8 N and space 6.17 (fig. 6.15)

Cleaning of the western limits of space 6.13 revealed the remains of a substantial wall (F48) running perpendicular to façade wall F21. This evidence raised the possibility that F48 may represent the northern façade facing the pebble court. Hence it was decided to follow the wall by opening a trench along its southern face. Complete excavation of the architectural remains was, however, not possible due to the presence of a thick cover of topsoil in this part of the site, sloping up west and north. The top of wall F48, constructed of irregular limestone boulders, could be followed upslope for ca. 11.50 m: after a distance of ca. 8.00 m F48 has a small jut and continues again west for ca. 3.50 m. At the point where the wall juts, the top of another, perpendicular northeast-southwest wall (F59) was found. This wall F59 is constructed of *ammouda* ashlar (top dimensions of the blocks: 0.98 x 0.50 m and 0.81 x 0.57 m) and can be traced south for a distance of ca. 2.15 m. The wall is parallel to façade F21 at a distance of ca. 9.70 m, which could indicate that F59 served as a façade wall facing the pebble court to the west. If this hypothesis is correct, the ashlar façade may be here preserved to a height of ca. 1.40 m above the court level. This is at least partially supported by the discovery of the top of an ashlar block immediately to the east of F59. Indeed, the position of the block suggests that it fell vertically from a height (fig. 6.16). From the same area east of wall F59 come two terracotta figurine fragments (11-06-4083-OB001, 11-06-4092-OB007) which may be parts...
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of horses (figs 6.17 a and c). The western end of wall F48 is indicated by a perpendicular, northeast-southwest line of limestone boulders (F58) which could be followed south for a distance of ca. 5.30 m. Walls F48, F59 and F58 enclose a rectangular space (Space 6.17) of which little can be said until further excavations are conducted. It is, however, not impossible that space 6.17 formed part of another architectural complex to the west of the pebble court. Numerous plaster fragments, as well as a possible amnoueda doorjamb base, come from the topsoil layer of space 6.17 and may suggest that a fine (Neopalatial?) building existed nearby.

Fig. 6.15. SPACES 6.8 N AND 6.17: AERIAL VIEW (C. GASTON) WITH MAIN FEATURES INDICATED

Fig. 6.16. SPACES 6.8 N: ASHLAR WALL F59. ARROW INDICATES FALLEN ASHLAR BLOCK (S. JUSSERET)

611-06-4083-OB001 appears to be the solid body of the animal. The base of the neck is preserved and its tapered upper part suggests the representation of a mane. Only stubs of the front legs are preserved. The second fragment (11-06-4092-OB007) is a leg with possible remains of a tail. The leg seems to have been formed around a small wooden stick (impression still visible). Although the date of the fragments remains uncertain, macroscopic examination of the fabrics suggests post-Minoan production. A Protogeometric to Geometric date is not excluded. Advice from A.-L. D’Agata and A. Kanta (pers. com. to J. Driessen) is gratefully acknowledged.
The eastern end of wall F48 was excavated over a distance of ca. 3.90 m in order to clarify its relation with the pebble court. Removal of the topsoil brought to light a low bench (F51) running along the south face of wall F48 (fig. 6.18). The feature remains to be investigated in detail but at present its eastern end is made of seven medium-sized blocks of fine bluish limestone of which the tops have all been hollowed out, forming a series of oval depressions, each between ca. 10 cm and 20 cm across and ca. 1 to 2 cm deep. Individual blocks have up to three depressions. In total, 12 depressions have been made out. Cut marks parallel to their long axis show that the depressions were intentionally made.
Removal of the topsoil to the south of the bench yielded eroded LM IIIA2/B sherds including fragments of conical cups and feet of champagne cups. The topsoil also produced a terracotta figurine fragment belonging to the head of a horse (11-06-4061-OB001) (fig. 6.17 b). Below the topsoil was a thin layer of compact sandy clay which was found resting on the pebble court at a level comprised between 16.60 m (west) and 16.50 m (east). Traces of tarazza were found against F51 and could have been laid to prevent water accumulation close to the bench. The level of the bench is here ca. 0.50 m (west) to 0.40 m (east) above the pebble surface and it is not impossible that this installation formed part of the northern façade facing the court.

Space 6.12 (fig. 6.19)

Space 6.12, adjacent to the north of Building F (grid squares BJ 89-90, BK 89-91) (fig. 1.1), was uncovered during the last two weeks of the 2011 campaign in order to facilitate conservation of north façade F2. Cleaning operations and removal of the topsoil rapidly brought to light the remains of an L-shaped paved area made of large sideropetra slabs (fig. 6.19 a). The pavement covers a surface of ca. 5.5 m² but it may have been originally much larger. Against the north façade of building F the surface is ca. 1.10 m wide and can be followed for 4.70 m east of wall F47. In front of the north entrance of building F (threshold F70), the pavement was found preserved over a width of ca. 2.10 m. The slabs are irregular in shape and their dimensions range from ca. 0.10 to 0.95 m. The largest slabs were found along façade F2 and it is not impossible that some of them were broken after the laying of the pavement. Oriented fracture sets and pop up-like structures may suggest earthquake effects (e.g. Rodríguez-Pascua et al. 2011) but this hypothesis awaits further investigation (fig. 6.19 b). It can, however, be noted that fractures of similar orientation occur on the pavement of area 4.20 described by Letesson (this volume) (fig. 6.20). This observation suggests that local effects (e.g. soil compaction, creep) cannot solely account for the observed fracture pattern.

In the southwest angle of space 6.12 was a small rubble platform F60 (1.08 m x 0.50 m x 0.35 m) constructed on top of the pavement. The platform is covered by a limestone slab and could have been used as a bench. A rectangular stone (F71) base was also found ca. 2.10 m north of façade F2 and may suggest some kind of portico or lightwell. It is not impossible that this construction once extended to space 6.13 where two slabs of sideropetra and another stone base (F57) were found (fig. 6.14). This hypothesis would imply that walls F47, F55 and platform F60 represent later additions.

Severe erosion appears to have affected the area of space 6.12 since topsoil was found resting directly on the pavement. Rolled LM I material with LM III intrusions was collected close to the pavement surface, together with a stone axe (11-06-4070-OB001) and a lithic tool (11-06-4076-OB001). Two U-shaped terracotta drain fragments (11-06-4086-OB001, 11-06-4086-OB002) were found resting on the pavement close to a concentration of patella shells (fig. 6.21).

7 The head is broken lengthwise and the impression of a small wooden stick is clearly visible on the interior. The head appears similar in manufacture to 11-06-4092-OB007 (animal leg).
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Fig. 6.19. **SPACE 6.12:** a) View from the east with main features indicated; b) Oriented fracture sets (white lines) and pop-up (uplifted) structures (white arrows) visible on the pavement (S. Jusseret)

Fig. 6.20. **ZONE 3, AREA 4.20 (SOUTHERN END)** (Q. Letteis): a) View from the east; b) View from the east with oriented fracture sets indicated (black lines). **Note the orientation of the fractures similar to that observed in space 6.12 (fig. 6.19a)**

Three baulks left at the end of the 2010 excavation campaign were removed in anticipation of architectural consolidation.

9.1. Space 6.3

In space 6.3, removal of a baulk left against platform F20 brought to light the base of a storage vessel (11-06-2177-OB001, transport stirrup jar?) resting on the LM IIIA2/B floor level previously identified (*Sissi* I: 161; *Sissi* II: 166). This find was discovered close to the amphora excavated in 2008 and may confirm the use of space 6.3 for activities involving the treatment of liquids.

9.2. Spaces 6.4.1 and 6.4.2

Excavation of the doorway between spaces 6.4.1 and 6.4.2 yielded a fine “Mycenaean” button (11-06-2184-OB001) in steatite with concentric design (fig. 6.22). The button has a good parallel in Zone 3, Room 3.6 (11-03-0587-OB003) which is reported to come from a LM IIIIB context (Gaignerot, this volume, fig. 4.12).
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![Image](image1.png)

**Fig. 6.22.** SPACES 6.4.1-6.4.2: STEATITE BUTTON WITH CONCENTRIC DESIGN (11-06-2184-OB001) (CHR. PANIKOLOPOULOS)

9.3. **Space 6.5**

Removal of the baulk left in the north-eastern angle of the room revealed a blocked doorway ca. 0.95 m wide in wall F26. The blocking appears partly covered by the doorway leading to spaces 6.4.1 and 6.4.2 and may therefore precede the final LM IIIA2/B occupation of these two compartments (fig. 6.23).

![Image](image2.png)

**Fig. 6.23.** SPACE 6.5: BLOCKING WALL COVERED BY DOORWAY LEADING TO SPACES 6.4.1 AND 6.4.2 (S. JUSERET)

10. **Conclusions**

The fourth season of excavations in Zone 6 has provided us with a better understanding of the plan of Building F and has opened promising avenues for future research. It is now clear that the final, LM IIIA2/B occupation of the building left very few floor deposits, with evidence mainly limited to spaces 6.2, 6.3, 6.4.1 and 6.4.2. Although previous excavation campaigns made clear that Building F had a long occupation history, few traces of earlier phases are preserved. The most surprising result of the 2011 excavation campaign is undoubtedly the discovery of a large, northeast-southwest oriented court to the west of Building F. On present evidence, the court seems to have been installed during the Neopalatial period and has provisional dimensions of 9.70 m by at least 20 m. It was made of pebbles set in clay and occasionally in lime. To the east and west were façades made of ammouda ashlar. A large kernos was set against the east façade. To the north, a low bench with shallow depressions was set against a southeast-northwest running façade made of limestone boulders. The court was probably accessible from the northeast via a rectangular recess (Space 6.13). It is not excluded that space 6.13 was part of the paved area identified to the north of Building F (Space 6.12) (fig. 6.24).
What happens to the south of Building F is as yet unclear but substantial architectural remains observed against the south slope of the hill may suggest the presence of other buildings in this area (fig. 6.25 a). It may be interesting to add that the presumed court is oriented about 16.5° to the east of north and that it in general aligns with the top of the Selena mountains behind (fig. 6.25 b). Although it seems perhaps too early to decide that Neopalatial Building F is a court-centred building, the discoveries in Zone 6 may open up interesting perspectives of research since the distance between Sissi and Malia – about 4 km as the crow flies – echoes that between Phaistos and Hagia Triada. The presence of a small court-centred building – the court is smaller than that at Zakros (ca. 30 m by 14 m), but twice as large as that at Petras – so close to a major palatial centre may invite reconsideration of traditional ideas about the Minoan palace. Only future excavations can answer this question.
6. The Excavation of Zone 6

11. References

7. Observations on some Late Minoan Pottery from Sissi

Charlotte Langohr

The 2011 excavation and conservation campaigns at Sissi yielded some more Late Minoan (LM) pottery of great interest. This pottery essentially belongs to the LM IIIB occupation of the Kefali and comes from Building CD on top of the hill (Gaignerot, this volume; Letesson, this volume) and from Building F on its south slope (Jusseret, this volume). The excavation of the open area between Buildings CD and E on the summit also provided additional material corresponding with the successive dumping episodes carried out through the Final Palatial and Postpalatial periods but also to building activities linked to the Neopalatial period (Devolder, this volume).

The following presentation and analysis of a small sample of the pottery from Sissi only takes into account a number of vases which were conserved, drawn, photographed and preliminarily studied during the 2011 campaign. Since the systematic study of the assemblages will only start in the summer of 2013, we cannot yet provide any details on the internal ceramic sequence of the site. The aim of the present chapter is only to offer a preliminary idea of the consumption of certain types of ceramic vessels at Sissi from the Neopalatial to the Post-palatial periods and to place this in a regional and wider Cretan context. To this is added a discussion of the first results of our program of petrographical analysis (Liard, this volume).

1. The open area between Buildings CD and E (Zone 5)

The additional LM IIIA1-B fills excavated in 2011 in the open area between Buildings CD and E is here not further considered (Sissi I: 174, fig. 9.17-9.18; Sissi II: 188, fig. 8.11). Still, some remarks are necessary with regard to the LM IIIB date of the ceramic material found in the upper levels of the “lakkos” FE87 and directly to the north of this pit, and discussed in the previous report (Sissi II: 188, fig. 8.11). Stylistic parallels were made, among others, with patterns and motives painted on LM IIIIB2 drinking vessels from Kastelli Khania (Hallager 2003: fig. 49, pl. 49). Discussions with pottery specialists and above all the thorough publication of the pottery of the LM IIIB1 settlement on the Agia Aikaterini Square at Kastelli Khania (Hallager 2011) now allow the recognition of a great deal of LM IIIB1 shapes and stylistic features among this refuse material, dumped along the south façade of Building CD. Nevertheless, the particularly large assemblages of finely decorated and plain, freshly broken pottery found in and around pit FE 087 requires a careful study which, in connection with the stratigraphical and taphonomic data, may eventually allow the definition of a proper LM IIIA2-IIIB internal ceramic sequence.

Apart from the important use of this open area in the Final Palatial and Postpalatial periods, the 2011 campaign has clarified some of the Neopalatial activities which took place here. It has now become clear that Building CD in part is the result of a Neopalatial process which overlaid and disturbed earlier Prepalatial and Protopalatial structures and levels (Devolder, this volume). The fills installed on occasion of the building operation contained pottery with a LM IA terminus post quem. Of particular interest among the sherd material of these fills are several joining pieces of a finely decorated LM IA vessel (11-05-1959; fig. 7.1). This closed shape is made in a fine buff fabric and decorated with a red to dark brown paint. The top surface of the flat horizontal, thickened rim is adorned with groups of parallel lines alternating with a cross pattern. Above several horizontal bands the generous decoration of the shoulder depicts a curve-stemmed ivy pattern, combining spirals and stamens with dotting in

1 Postdoctoral fellow F.R.S.-FNRS (UCL-INCAL-CEMA-AegIS).
2 In 2011, the processing of the archaeological material and the strewing of the pottery was carried out in the Apothiki of the French School at Malia, with the assistance of Drs F. Liard (UCL) and I. Kritikopoulos (Univ. Toronto). The pottery and other artefacts were conserved by A. Nikakis and drawn by Drs H. Joris (Univ. Hasselt). Chr. Papanikolopoulos (INSTAP) took the photographs. For preliminary reports on the Minoan pottery found at Sissi, see Sissi I: 163-178 and Sissi II: 179-210. I would like to thank Jan Driessen and Alexandre Farnoux for allowing me to refer to two vases from their excavations of Quartier Nu at Malia (French School at Athens).
added white paint (for the LM IA date of the motive, see Popham 1967: fig. 1:11, pl. 77d, 2nd row, 2nd from left). A similarly decorated vessel was found at Mochlos (Barnard & Brogan 2011: 434, fig. 7 [P25]) where it is considered as a probable Maliot import. Additional LM IA ceramic vases showing this specific motive and style come from other Eastern Cretan sites, including Pseira (Betancourt 2011: 403, fig. 2 [AB 4, n°10]) and Palaikastro (Bosanquet & Dawkins 1923: 30, fig. 19b). The combination of spirals and floral patterns is characteristic of LM I, and especially LM IA, in Eastern Crete (Betancourt 1999: 154).

LM IA pottery evidenced at Sissi before the last campaign was almost exclusively represented by plain or sometimes very simply dark-on-light decorated domestic wares making up the massive fills collected in rooms 2.6. and 2.8. of Building BC on the north slope of the hill (Carpentier, this volume; Sissi II: 175-176, fig. 8.1). However, sherd material from fine and pattern-decorated LM IA pottery, often mixed with similar material of a LM IB date, was found in some of the soundings carried out within the rooms (such as 4.9) of Building CD (Sissi II: 179). Once again, the future definition of an intra-site ceramic sequence for the different and scattered ceramic assemblages of the settlement may allow in this case to consider if very distinct LM IA pottery groups were consumed in distinct but contemporaneous and nearby dwellings.

**Fig. 7.1.** OPEN AREA BETWEEN BUILDINGS CD AND E, NEopalatial fills against the western terrace wall. SEVERAL JOINING PIECES OF A FINELY DECORATED LM IA VESSEL, CURVE-STEMMED IVY PATTERN (11-05-1959) (CHR. PAPANIKOLOPOULOS)

### 2. Building CD

Room 3.5 in the western wing of Building CD revealed a primary floor deposit. It probably belongs to a phase preceding the last, abandonment phase of the complex (Gaignerot, this volume). The deposit includes two jugs, two conical cups and a three-handled, straight-sided alabastron (11-03-0589-OB005; fig. 7.2). The latter shows a rounded base, an angular shoulder, a concave neck and a short, everted, horizontal rim. Two of the horizontal handles are missing. The alabastron is made in a fine light brown fabric and decorated in a red to brown paint of thin and thick horizontal bands and a panelled pattern structured by the position of the three handles. The top of the rim is decorated with adder marks and the underside of the vase is painted with a solid and several concentric circles.
The straight-sided alabastron (and its globular version) is particularly common in West-Crete and especially popular in the LM IIIB tombs. They are more generously decorated with various abstract motives (Tzedakis 1973-1974: pl. 687ττ, 689α-β; Tzedakis 1976: pl. 291γ, 292ε; Tzedakis 1980: pl. 318β, 320δ; Godart & Tzedakis 1992: pl. CXXVII:3, pl. CXXXV:2). Closer to Sissi, decorated three-handled angular alabastra have been discovered in LM IIIB tombs at Milatos (Aghios Nikolaos Museum), Gournes (Kanta 1980: fig. 22:6), Knossos-Zapher Papoura (Evans 1906: pl. XC, fig. 100v). These examples also show a banded decoration on the body and neck while the Milatos and Knossos examples are decorated on the shoulder with a frieze of flowers and pendant festoons respectively. In the present state of knowledge, B. Hallager has noted that the straight-sided alabastron “seems to have been a rare shape in central and eastern Crete” (Hallager 2003: 218) and that in Central Crete the straight-sided alabastron provided with a spout and two lateral horizontal handles, and sometimes a third vertical one, is more common (Hallager 2011: 303, n. 402 with references). For example, a straight-sided spouted alabastron has been found at the neighbouring site of Malia, in LM IIIB Quartier Nu (91.1507.002; fig. 7.3).
The primary destruction deposit uncovered in the relatively small room 4.15 has provided several restorable vases, notably pithoi, a small hut-model (Letesson, this volume, fig. 4.35), a deep bowl and two small decorated stirrup jars, one of which is exceptionally well-preserved (11-04-1789-OB009; fig. 7.4). This small globular stirrup jar shows an elegantly painted decoration covering the upper half part of the body. A large rosette adorns the space below the spout. The petals are bordered by dots and underlined by a double exterior line. The rest of the upper body zone is decorated with the octopus tentacles motive, here reduced to its simplest form of two superimposed undulating and graceful lines ending in a spiral on both sides of the top of the rosette. Two groups of two horizontal bands framing horizontal thin lines fill the lower part of the body. The whitish fabric, the bright red to brown colour of the paint, and the style and composition of the decoration of this stirrup jar make it a very good candidate for an import of the Kydonian Workshop of the LM IIIB1/Early period (on the Kydonian Workshop, see Tzedakis 1969; Hallager 2003: 261; Hallager 2011: 375-376). At Khania, B. Hallager noticed that the “small globular stirrup jars are very rare in the settlements at Agia Aikaterini before LM IIIB:1 but in this period they suddenly become very popular together with the small squat stirrup jar” (Hallager 2011: 299). Small stirrup jars, with notably linear octopus decoration and flower motives, continue at Khania in LM IIIB2 (Hallager 2003: 215, n. 204, 216, n. 215) although they become more rare\(^3\).

\(^3\) As such, the small Khaniote globular or squat stirrup jar is a valuable chronological marker, as shown by the chronological distribution of this specific shape at Khania, at the Agia Aikaterini Square: two in LM IIIA2, 33 in LM IIIB1, 39 in LM IIIB1/2, 12 in LM IIIB2 (Hallager & Hallager 2003: table 6; Hallager & Hallager 2011: table 12).
LM IIIB1 Khaniote small stirrup jars decorated with this rosette motive are numerous, but the motive is generally smaller or included in a larger flower pattern (Tzedakis 1969: fig. 32; Hallager 2011: 299, pl. 169e:3). This picture is completed by Khaniote or possibly Khaniote imported small globular or squat fine stirrup jars which are painted with this motive and have been found in the following Cretan sites, in settlements or tombs: Maroulas-Rethymnon (Papapostolou 1974: pl. 191δ), Knossos-Zapher Papoura (Evans 1906: fig. 114 [54.a]), Gournes (Kanta 1980: fig. 22:3), Gournia (Boyd Hawes 1908: fig. 25, pl. X:39), Krita (Kanta 1980: fig. 117: 4), Episkopi-Ierapetra (Kanta 1980: fig. 131: 2), Mochlos (Smith 2010: fig. 57 [IIB.729]) and Kalochorafitis (Kanta 1980: fig. 43: 4). In particular, three examples from tombs at Armenoi are especially similar to the Sissiot vase with a rosette as principal motive, dotted decoration along the leaves and undulating stems or stylized tentacles which frame the rosette (Tzedakis 1971: pl. 524β, 528a, γ; Godart & Tzedakis 1992: pl. CXVIII: 1, CXXX:1). Finally, a very comparable example in shape and decoration comes from Episkopi-Ierapetra (Kanta 1980: fig. 131:2, top left). It has a globular shape and the decoration consists of a “big rosette with a double outline from which the tentacles project in three tiers” (Kanta 1980: 155). A. Kanta has noticed that this hybrid motive where a rosette substitutes the body of the octopus is “peculiar to the Chania workshop” (Kanta 1980: 155). The rosette remains a common pattern on small globular stirrup jars in the LM IIIC period (Kanta 1980: 256, 304-307, fig. 50:7; Popham 1967: pl. 89f). It should be noticed that the rosette motive depicted in such a style is not unknown in the preceding Neopalatial period as shown by a LM IB fine decorated cylinder-necked jug found at Palaikastro (Bosanquet & Dawkins 1923: pl. XVIIIb).

When it especially adorns the LM IIIB1 Khaniote small globular stirrup jar the octopus decoration generally
covers a large part of the belly zone and is often shown in its complete form, which means an octopus body and head surrounded by either thick tentacles framed by a thin line or two or three superimposed regular undulating thin lines (Tzedakis 1969: fig. 14; Hallager 2011: 299, n. 346, n. 348, n. 350, pl. 98, 154c:1 [84-P 0390]). Small fine globular LM IIIB stirrup jars decorated with the octopus and found on other Cretan sites can be recognized as Khaniote imports on the basis of their whitish fabric and/or stylistic features, such as the following examples from Armenoi (Tzedakis 1970: pl. 418c; Kanta 1980: fig. 93:4-7), Knossos (Popham 1964: pl. 10a-b; Kanta 1980: fig. 10:4-5), Malia (Farnoux & Driessen 1991: fig. 26 [Quartier Nu]), Kastelli-Pediada (Rethemiotakis 1997: fig. 2), Kritsa (Popham 1967: pl. 86c) and Gournia (Boyd Hawes 1908: fig. 25, pl. X:2).

Nevertheless, imitations of the small globular LM IIIB decorated stirrup jars made in the Kydonian Workshop may have existed, possibly made by other Khaniote (Hallager 2011: 376) but also Cretan regional workshops (see already Kanta 1980: 254). The latter is here suggested because of the discovery of two small fine stirrup jars decorated with octopus pattern found in rooms 4.11 and 4.15 in Building CD at Sissi (09-04-1609-OB001: Sissi II: 184, fig. 8.7c; 11-04-1789-OB001; fig. 7.5a-u) but also in Malia, Quartier Nu (fig. 7.5c). All three vessels are made in a soft buff to pinkish-buff fabric and decorated with orange-red to brown-red paint. The fabric of the Sissi vessels does not correspond to the products of the Kydonian Workshop. Moreover, B. Hallager (pers. com. Nov. 2009) noticed that the way the octopus was drawn on 09-04-1609-OB001 was far from being characteristic for the Kydonian workshop. The other stirrup jar from Sissi (11-04-1789-OB001) looks very different in decoration as the stylized and linear octopus is rendered in a very clumsy manner. A similar behavior is noticeable on a stirrup jar from Episkopi-Ierapetra (Kanta 1980: fig. 60:12). Several small decorated stirrup jars imported from Khania have been found in tombs of the area of Episkopi (Kanta 1980: 154-156) but this vase has been interpreted as a probable local imitation of those (Kanta 1980: 254). The palm motive depicted on the opposite face of 11-04-1789-OB001 is a usual motive on the larnakes from the same Episkopi region (Kanta 1980: fig. 63: 4) or on larnakes from the Rethymnon and Amari Valley regions (e.g. Suta; Prokopiou, Godart & Tzigounaki 1990: pl. 34down).

The combination of the octopus and palm motives on the belly of a small stirrup jar is illustrated on a vase from an unknown provenance conserved in the Ashmolean Museum (Kanta 1980: 254, fig. 96:4). The style of the decoration is however different and more carefully executed than on the Sissi vessel. Its fabric suggests an east Cretan product to A. Kanta (1980: 254). The Maliot stirrup jar shows a light buff fabric and a rather finely painted decoration. The latter is composed by two opposite octopuses whose tentacles join on both sides of the vase. The tentacles are uniformly figured by a group of six thin wavy lines framed by dots. The not particularly whitish colour of the clay and the style and depiction of the decoration do not tend towards a proper Kydonian Workshop product while this is not totally excluded (B. Hallager, pers. com., Feb. 2012). Indeed, a stirrup jar found in a tomb of the cemetery at Armenoi shows a very similar decoration and style (Tzedakis 1971: pl. 525c). It is painted with the same groups of five or six wavy lines framed by dots or not and joining on both sides of two opposite octopuses. This vase has been presented in a group of stirrup jars from Armenoi which include Kydonian workshop products even if it is not explicitly and individually recognized as such (Hallager 2011: 300, n. 372). It should be noticed that another small decorated squat stirrup jar found at Sissi in 2008 depicts the same groups of wavy thin lines framed by dots in the decorative zone located below the spout (08-03-0482-OB001: Sissi I: 173, fig. 9.15 top left). The central motive surrounded by these wavy lines is completely erased but could have originally been the body of an octopus. This vase, made in a particularly whitish fabric and also decorated on the shoulder with elaborate triton shell motives, has been presented as a very probable Khaniote import (Sissi I: 173). Finally, it is worth noting that the decoration of four of these five small decorated stirrup jars from Sissi, Malia and Armenoi shows the particularity of dotted lines framing the tentacles or the body of the octopus. This feature is generally considered as a late LM IIIB characteristic. It is then not excluded that at least some of these vases are “provincial” imitations of the Kydonian Workshop products which would have substituted for the possible diminution of their production and exportation in the second half of the LM IIIB period.
A monochrome deep bowl was found with the two small globular stirrup jars in the destruction deposit on the floor of room 4.15. (D. rim 0.14; 11-04-1779-OB003; fig. 7.6). It has an orange fabric and a dark brown monochrome surface treatment. The shape of the lower body is almost conical with an upright upper part and a slightly everted rim. It has a flat base and two horizontal handles round in section. Usually the LM IIIB1/Early deep bowls show a globular shape with an upright profile and a straight or slightly everted rim, while the S-profile and the flaring rim are novelties of LM IIIB2/Late deep bowls (Hallager 2003: 205, 208; Hallager 2011: 285-286, 288-289; Hatzaki 2007: 239, fig. 6.27:1-2). The shape of the present example is quite similar to a very large
decorated LM IIIB Early Knossian example from the Little Palace (D. rim 0.22; Popham 1970: pl. 50b; Hatzaki 2005: fig. 4.31.6), but especially to a deep bowl in a brown fabric, plain or monochrome painted, found at Malia, Quartier Lambda, in the “Maison à la Cave au Pilier” (D. rim: 0, 16: van Effenterre & van Effenterre 1969: 127, pl. LXIV:59) dated to LM IIIB1/Early (Hallager 2011: 289). Another monochrome deep bowl of a different shape with a globular profile, straight walls, a slightly everted rim and a raised concave base was found in Building CD, room 3.1 and could belong to a later stage of LM IIIB (D. rim 0.14; 07-03-0419-OB008, Sissi I: 170, fig. 9.9).

The analysis of this selected pottery assemblage from the primary deposits found in the adjacent rooms 3.5 and 4.15 of Building CD may point to a LM IIIB Early destructive event in this western wing of the complex. This is plausibly corroborated by other primary destruction deposits found elsewhere in the building (Sissi I: 169-174, Sissi II: 177-184). Still, it has become obvious that the primary deposits uncovered on the floors of the respective rooms of Building CD are not all contemporaneous. This is suggested by a preliminary analysis of the pottery but also by the architectural phasing of Building CD, with evidence for the blocking of certain rooms, limiting the last occupation phase to the central part of the building (Gaignerot, this volume) while some of the peripheral rooms are abandoned with their destruction deposits left in place. A full study of architectural and stratigraphical phasing and ceramic assemblages of the building is needed to assess and detail this hypothesis. In the present state of knowledge some pottery collected on the floors of three internal rooms may suggest a more advanced LM IIIB phase: the monochrome dark deep bowl from room 3.1 (Sissi I: 170, fig. 9.9), the panelled-pattern bell krater from room 3.3 (Sissi II: 172, fig. 9.12a), and perhaps the cultic assemblage from room 3.8 (Sissi II: 89, 92, fig. 5.7-5.9), associated with several transport vessels among which is a plain globular stirrup jar with a wide flat base (Sissi II: 181-182, fig. 8.3). This last shape also suggests a later stage of LM IIIB (Kanta 1980: 250) or even a LM IIIC date (Kanta 1980: 173, fig. 66:9 [Tourloti], 181, fig. 68:3 [Praisos-Photoula], 250, fig. 28:1 [Episkopi-Pedhiadhos]). It is of particular interest that another globular stirrup jar with a wide flat base, complete and unbroken, was found in room 4.7, a peripheral north room probably blocked in the last stage of occupation of Building CD (09-04-1639-OB001: Sissi II: 112, fig. 5.38). The precise location of this vase in the stratigraphy of the room is noteworthy. It was found at the very beginning of the excavation of this area, just below the modern surface as it rested above the tumble which covered the last floor level of room 4.7. Stirrup jars with a similar profile with the same horizontal banding decoration on the body have been found in a LM IIIB context at Palaikastro (MacGillivray et al. 1987: 143, pl. 23b), at Mochlos, where it is considered as a Palaikastro import (Smith 2010: 86, IIB.695, fig. 48, pl. 18), and at Malia, Quartier Epsilon (Deshayes & Dessenne 1959: 130, pl. XLVI:11) and Quartier Lambda, in the

4 A LM IIIB1 Khaniote deep bowl decorated with Light-on-Dark motives is very similar in shape to the Sissi vase (Goddard & Tzedakis 1992: pl. XXX :2).
“Maison de la Façade à Redans” (van Effenterre & van Effenterre 1969: 101, pl. LIV : 115). In general, these different contexts involving a globular stirrup jar with a wide flat base may shed some light on the final and perhaps limited LM IIIIB occupation of the related settlements.

3. Building F

A broken mug rhyton (11-06-4036-OB001; Jusseret, this volume, fig. 7.7) was found in the upper part of a test opened between Spaces 6.6 and 6.7 in Building F. Shaped like a large cup with concave walls, it has a vertical handle with oval section. It is made in a fine buff fabric and decorated in red-brown to dark-brown paint with repeated whorl triton shells. The latter punctuate the body zone and are framed by groups of three thin horizontal bands at the base and on the internal and external rim. The decoration points to a LM IIIIB date as the whorl shell motive is often presented as a good chronological indicator very probably inspired by the LH IIIB1 Mainland (Watrous 1997: 186; Hatzaki 2007: 245). A similar pierced vessel made in a similar buff fabric and with comparable dimensions (H. c. 0.10-0.11; D. of the opening slightly wider than the D. at base) and decorated with the same groups of three thin bands at the base and rim but only with a thick horizontal band at mid-body had already been found in room 3.3 of Building CD (08-03-0460-OB001; Sissi I: 173, fig. 9.14. 1st from left, published upside down). This shape finds comparisons at other LM IIIIB sites such as Amnisso (Schäfer 1992: pl. 41:3), Malia, Quartier Nu (J. Driessen, A. Farnoux, pers. com.), Gouves, Building K (Vallianou: 240, fig. top right), or Knossos (Popham 1964: pl. 7a-b). Not far from the rhyton and also in the same room 6.7, south of wall F1, was found a much damaged squat stirrup jar in 2008, also datable to LM IIIIB (08-06-2002-OB002; Sissi I: 176, fig. 9.20). Although the painted decoration has largely vanished and the vase is very broken, the original decoration must have been rather fine. Both these restorable vases suggest the original existence of primary (?) destruction) LM IIIIB deposits in Building F, extremely disturbed and damaged however by the erosion of the slope and the proximity of the modern surface.

Fig. 7.7. BUILDING F, TEST OPENED BETWEEN SPACES 6.6 AND 6.7. LM IIIIB MUG RHYTON (11-06-4036-OB001) (CHR. PAPANIKOLOPOULOS)

At the other extremity of Building F, in Space 6.4.2, an exceptional fine decorated stirrup jar was found in
It seems to belong to a primary floor deposit caught beneath fallen rubble. It is made in a fine buff fabric, slipped in light buff and decorated with a dark brown paint, today much vanished. It shows a ring base and an ovoid-biconical profile (FS 175) (max. D. 0.18). The style and arrangement of the elaborate decoration on the shoulder and at the body zone seem to point to a Minoan product. Indeed, a panel of cross-hatching on the shoulder opposite the spout, elaborate triangles with concentric arcs between the handles and spout, dot rosette fills in all four quadrants of the shoulder, and the handle and disc decoration are all features which are alien to Mycenaean LH IIIB stirrup jars. Four groups of thin and thick bands order the body zone while a frieze of flowers is depicted below the shoulder, above the banding set at maximum diameter. This type of Minoan flowers is also seen on LM IIIB deep bowls from Knossos (Popham 1970: 199, pl. 52a) and Kommos (Watrous 1992: 69, fig. 44 [1155]), for example. Another ovoid-biconical stirrup jar with a ring base and made in a similar fabric was already found at Sissi in room 4.11 of complex CD (09-04-0757-OB001; Sissi II: 183, fig. 8.7b). It presents a similar decorative frieze set on the belly zone below the shoulder. The area around the spout and handles is decorated with two Minoan stemmed flowers, similar to those which punctuate the frieze of 10-06-2084-OB001. From the evidence at Khania, B. Hallager noticed that “decorated belly zones rarely appear on Minoan stirrup jars, as opposed to Mycenaean, and they seem to be a late LM IIIB feature” (Hallager 2003: 217, n. 226). If this impression is correct, further study of the stratigraphic and ceramic data will need to decide if Building F knew two distinct LM IIIB occupation phases.

This short overview of Late Minoan IIIB pottery found at Sissi shows the important consumption of fine decorated stirrup jars within the settlement, and not exclusively in the vast and important top-hill Building CD, as the examples recovered from Building F on the south slope indicate. On the contrary, the last destruction deposits from Building E, dated to the end of LM IIIA2 or the very beginning of LM IIIB, lack clearly datable LM IIIB pottery. The LM IIIB complex of Quartier Nu at Malia has revealed the same profusion of LM IIIB fine decorated small stirrup jars with squat, globular or ovoid-biconical profiles (J. Driessen, A. Farnoux, pers. com.). On the other hand, the excavations of the houses of the LM IIIA2-IIIB coastal settlement at Mochlos further east did not yield any substantial number of finely decorated stirrup jars, although the tombs on the hill of Limenaria to the south of the settlement contained a good number of such vessels, with different origins and of both LM IIIA2 and LM IIIB date (Smith 2005: 198-202; Smith 2010: 84-93). The LM IIIB period seems to be one of apogee at Sissi when the site is connected to the wider prestige economy by external ceramic exchanges as shown by the imported small decorated stirrup jars and other small containers of hypothetical high-valued contents (see also Sissi I: 171, fig. 9.10, 173, fig. 9.15, 176, fig. 9.20, Sissi II: 183-184, fig. 8.4, 187-188, fig. 8.7b-d).

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5 I warmly thank J. Rutter for sharing with me his observations on this specific vessel.
6 The settlement of Mochlos seems to be in decline by LM IIIB when only five of the thirteen LM III houses remained inhabited (Brogan & Smith 2011: 152).
Fig. 7.8. **Building F, Space 6.4.2. Fine decorated LM IIIB ovoid-biconical stirrup jar (10-06-2084-OB001)** (a. Chr. Papanikolopoulos; b. H. Joris)
4. **References**


- Popham 1964 = M.R. Popham, *The Last Days of the Palace at Knossos. Complete Vases of the Late Minoan*
IIIB Period (SIMA V), Lund, 1964.


7. Observations on Some Late Minoan Pottery from Sissi
1. Introduction

This contribution presents the results of a petrographic analysis of conical cups dating to the MM III, LM I and LM IIIA2/B ceramic phases of occupation at Sissi. The main issue to be considered in this report is the development of conical cup fabrics through the Neo- and Postpalatial periods, especially in regard to the macroscopic analysis of the three assemblages conducted during the 2010 campaign (Sissi II: 197-210). I seek here to better evaluate the technological diversity and/or standardization, continuity and/or shift of interests in imports and in potting traditions for this conspicuous type of drinking vessel at Sissi through the Late Bronze Age. As this is the first petrographic analysis to be conducted on the site, grouping has been pushed in detail as to allow more hypotheses on technological variability, adaptations and filiations, particularly for the question of raw material choices. Specific attention is given to the observation of argillaceous inclusions in the ceramic thin sections, as they have proved to bear valuable information for the provision of comprehensive clues of techniques and provenance in the characterization of pottery groups (Whitbread 1986).

The clay and sediment samples collected by Carl Knappett in the Malia Plain are used as references for the local geology. This collection will be enlarged in the future by a new sampling program guided by the technological questions raised by the present study. The existing geological referential is housed in the Aegean Material Culture Laboratory at the University of Toronto and its petrographic description has been published elsewhere (Poursat & Knappett 2005: 16-17). When possible, inferences about provenance are made for the putative conical cup imports, by comparison to descriptions published for the site of Malia as well as for neighbouring and more far-flung areas of Crete. These interpretations are preliminary in character and await further investigation in the months to come.

Sherds from 39 conical cups were selected for petrographic analysis and transported to the INSTAP Study Centre for sampling. Thin sections were manufactured at the Fitch Laboratory of the British School at Athens. They were described according to a modified version of the thin section description system that was developed by Whitbread (Whitbread 1995). The analysis led to the identification of nine fabric groups. Their full petrographic description allowed to reach a more interpretative discussion in terms of composition, technology and suggestion of (isolated) sources of imports, see section 2. Many of the groups display clear technological connections and indicate that the Neopalatial LM I phase sees real differences from the previous MM III and following LM IIIA2/B phases. Preliminary conclusions are given in section 3.
LBA petrographic groups for conical cups at Sissi. General description and comments

2.1. ‘Maliote’ red/orange fabrics

2.1.1. Fabric I. Orange ferromagnesian fabric with clastic and low-grade metamorphic inclusions (Fig. 8.1 & 8.2)

Samples 1, 2, 3, 4, 5, 6, 8, 10, 11, 22, 24, 25

This is the main fabric group among the LM I conical cup assemblage; it stands out as the most standardized as well. All samples are clearly unified by their well-compacted groundmass and their reddish orange to orangeish yellow (XPL), light orange/brown (PPL) matrix colours. The medium to high optical activity of the groundmass is indicative of a medium temperature of firing.

The matrix is characterized by its fair concentration of muscovite mica laths and red translucent to bright orange ferromagnesian minerals (the latest might come from the alteration of biotite mica). The aplastic fraction is characterized by the predominance of quartz crystals and arenite rock fragments with straight extinction, against a lesser amount of rounded golden/yellow phyllosilicates, muscovite micaschists and slightly-metamorphized iron-rich sandstones. These characteristics are particularly interesting to consider in regards to the almost exclusive presence of angular arenites in Fabric IV, but also to the sole fine quartz crystals that are evenly spread through Fabric II. One can think of different forming options at the start of a quartz-bearing buff micaceous material and a terra rossa which naturally contains partially metamorphized quartz/mica rocks, terrigenous clastic fragments and a lesser amount of phyllites. It can already be underlined that the compositional characteristics of this terra rossa clay seem to match those observed for the Sissi Kefali samples.

The combination of partially metamorphized quartz/mica rocks and terrigenous clastic fragments has previously been encountered among the Maliote ceramic repertoire. Although ‘not [being] particularly common at Malia’, it was described as rendering a regional source fairly possible at Postpalatial Quartier Nu (Knappett unpublished). Such a characteristic has also been described at Protopalatial Quartier Mu (Poursat & Knappett : 18-20, pl. 69, Fabric 2C). The high content in oxidized ferromagnesian minerals in the matrix also is compatible with the terra rossa from the broader Malia-Sissi region. The recurrent observation among the 12 conical cup samples of a few feldspars with perthitic texture, as well as rare altered olivine and pyroxene, rounded basalts and granitic rocks does not seem obviously compatible with a local production, but such weathered inclusions do appear in the clays sampled by C. Knappett in a road-cut in the area of the Sissi Kefali. The idea of alluviums carried from the South Coast region via the Selinari Gorge is worth further investigation. For this purpose, geological sampling will take place at the entrance of the gorge and in the terra rossa earth neighboring the Kefali. Still, for the moment being, it may be assumed that Fabric I is of local production.

The better-balance between sedimentary v/s (very) low-metamorphic rock fragments that was observed for some of the samples, but also the higher homogeneity in their matrix colours and optical activity have given grounds for the creation of two sub-groups within Fabric I. Samples 1, 2, 3, 4, 10, 11 (A) attest of a higher level of standardization than samples 5, 6, 8, 22, 24, 25 (B). Such a differentiation seems to be more likely the result of an incomplete mixing of the two raw clays rather than being due to some firing effect.

In labelling this standardized Neopalatial fabric as ‘Fabric I’ irrespective of the MM III – LM IIIA2/B chronological order, my aim was to give attention to a series of characteristics that can be used as a reference to technical and compositional changes or a continuum throughout the Late Bronze Age. This will allow for a fuller evaluation of how this specific recipe could have developed from previous practices and how it survived in the Postpalatial period through adaptations in raw material selection and forming techniques.
2.1.2. Fabric II. Yellowish orange micaceous fabric with quartz crystals and clay pellets (Fig. 8.3 & 8.4)

Samples 15, 19, 21, 30, 32, 33, 39

This fabric is attested in each of the periods under study, but it is more particularly tied to the MM III phase; the two later remnants of the recipe are outliers. The matrix bears strong similarities to Fabric I but three characteristics support the gathering of the samples as a separate group. (1) The matrix is homogeneous, well-compacted, highly optically active and displays a loosely-distributed aplastic fraction, (2) the inclusions show almost systematically a unimodal-size repartition and (3) their mineralogy is very consistent throughout the samples. It is largely dominated by sub-rounded to rounded small angular quartz with straight extinction and somewhat altered borders. Coarse micaschists, chert, slates and sandstone are few and randomly distributed.

Matrix colour and texture have given grounds for internal division within Fabric II. Subgroup A (30, 32, 33) is much more yellow/silver in XPL colour than Subgroup B (15, 19, 21, 39) and it displays a higher concentration in muscovite mica laths. Quartz inclusions and mudstones are finer-grained than in B and evenly distributed throughout the section. Subgroup B is yellow/orange in XPL colour, and the groundmass displays fewer orange micas as well as ferromagnesian minerals which were conspicuous feature in Fabric I.

Sample 39 varies from yellow/silver to orangeish/reddish XPL colours from borders to core, which indicates undeniable similarity in the compositional features throughout the fabric group. One could suggest some (unintentional?) differences in firing conditions that have oxidized the mica laths in subgroup B and increased the opaqueness of the fine pellets in subgroup A.

The textural concentration features bear close similarities to those identified in Fabric I. They indicate the use of the same types of clays as previously described, and one might think of the use of levigated *terra rossa* in the case of Fabric II in contrast to the almost semi-coarse, probably raw red earth in LM I Fabric I. The orange-coloured sample 15 is so silty and compacted in texture that it could bring further evidence of levigation at some stage of the *chaîne opératoire*, while the extraction of a lentil of much purer clay within the *terra rossa* beds also remains a possible explanation. The fine rounded quartz crystals are much more common in the buff-coloured tcfs and must belong to this latter clay component, which was seemingly unprocessed.

As is the case for Fabric I, there is nothing to pretend that Fabric II is anything other than local. The matrix texture and microstructure are similar in all respects to those of Fabric I.

2.1.3. Fabric III. Orange ferromagnesian fabric with clastic and argillaceous inclusions (Fig. 8.5)

Samples 34, 37

The matrix of Fabric III bears once again close similarities to that of Fabric I. But its tighter mineralogical range of inclusions, its high concentration in oxidized iron-rich minerals, corroborated by the fact that it is an exclusively Postpalatial sample group, all prompt recognition as an independent fabric-type.

The groundmass is characterized by its fine grain, its bright orange XPL colour, its high optical activity and its peculiar concentration in muscovite and orange ferromagnesian silts. Matrix colours suggest firing to moderate temperatures in an oxidizing atmosphere. The absence of any buff-coloured textural concentration feature is also outstanding: no apparent sign of clay mixing has remained.

The aplastic fraction is predominantly composed of mono- and polycrystalline quartz with straight extinction, as well as sandstones with iron-rich red inclusions that are well-sorted and regularly distributed through the section. The near-absence of phyllosilicates among the aplastic fraction stand apart from Fabric I.

The particularly sharp angularity of the sedimentary inclusions is also noteworthy. It raises a remote possibility that some (iron-rich) quartzite has been mechanically crushed and added as a temper of the *terra rossa* clay-base, but the comparison to Fabric I characteristics makes it more probable that there was some heterogeneity within one and the same clay bed exploited through time (i.e. layers with less mature alluviums). It is tempting to conclude that some trends in potting practices persisted through the disappearance of the palatial systems. Fabric III could more particularly illustrate the general technological improvement towards the end of the Late Bronze Age.
2.1.4. **Fabric IV. Silty ferromagnesian red fabric with terrigenous clastic and alluvial inclusions (Fig. 8.6)**

Samples 40, 42, 43, 44

This group is exclusively Postpalatial in date and matches the broader potting practice as evidenced for the LM I period in several regards. The iron-rich matrix is well attested here, as well as the straight extinction quartz, arenite and iron-rich quartzite inclusions. Textural concentration features replicate those described in Fabric I and reflect the mixture of a red clay with some buff micaeous material. Nevertheless, other characteristics point towards a lesser level of clay processing than in Fabric I – owing to the continuum of inclusion sizes and the siltier texture of the matrix – and to the possible adoption of other raw material choices or tempering practices – given the amount of more mature alluvial sediments.

Fabric IV groundmass is full of ferromagnesian and silicate silts which directionality defines the general flow of the matrix, but which visibility is locally altered by an optically inactive brown textural patching. The resulting darker XPL colours and low optical activity of the groundmass are also typical of these Postpalatial samples and suggest a higher firing temperature than the LM I recipe. The preferred orientation of the voids, micromass and aplastic components is more obvious and systematic than during the previous MM III and LM I phases.

The predominantly clastic inclusions are found alongside eclectic rounded minerals and rocks that are present in different concentrations from sample to sample and which display a lesser sorting as well as a broader range of shapes and granulometries. The rounded and somewhat strained quartz is obviously of mature alluvial origin, as do the rounded fragments of chert, metasiltstones, golden/yellow slates (coarse fraction) and weathered alkali feldspars with perthitic texture (fine fraction); the latter might be the by-products of the disintegration of plutonic rocks. It is difficult to determine if these rocks and minerals represent an intentional temper or if they are naturally present in one of the clay component. In any case it is interesting to stress the link with the mineralogical characteristics of Fabric V. Some further geological sampling in the ancient streambeds belting the Kefali will aim to determine the possible link between those mature alluviums and a clay turning dark brown and isotropic when higher-fired.

2.2. **Alluvial-sand fabrics**

2.2.1. **Fabric V. Red ferromagnesian fabric with alluvial sand inclusions (Fig. 8.7)**

Samples 16, 18, 23, 27, 28, 36, 41

This group belongs to the Middle Minoan III and Late Minoan III periods and no LM I example was identified. It stands apart from the main group of the ‘Maliote fabrics’ because of the mineralogy and alluvial origin of the aplastic fraction of the samples, and their lesser content in coarse inclusions. The groundmass is however closely related to those of the Maliote Fabrics because of its mineralogical composition, some of its optical properties and the combined (but not exclusive) occurrence of (common) red and (much rarer) buff tcfs. Apparent differences in matrix texture suggest that Fabric V has been prepared with specific additional materials.

The fabric is high-fired and the presence of rare micritic aggregates and crystallitic b-fabric concentrations do prove the addition of some microcrystalline calcareous component to the red (predominant) clay base. Other major differences with Fabric I lie in the water-worn aspect of the chert, quartz and alkali feldspar crystals and in the near absence of terrigeneous clastic inclusions, but the group remains loosely-tied in terms of the relative concentrations, granulometries and angularity of those types of rock and crystal fragments. Similarly, the clay-processing techniques are obviously systematically the same among the Fabric V samples, while distinctive trends in the groundmass textural characteristics justify the creation of two subgroups. Indeed, there is an obvious continuum between the predominance of high amount of silts conferring a microlithic appearance of the matrix (subgroup A: 16, 23, 36, 41) and a much smoother texture due to whorls, banding and cloudy patching of an oxidized deep red component (subgroup B: 18, 27, 28). It remains impossible to substantiate whether these variations correspond to the potters’ conscious choices. In the current state of research, one may only conclude the very weak standardization within the fabric group.

The lack of any LM I sample is worth stressing here and it appears that the mixing of a red clay with some
alluvial brown clay or sediments occurred as early as the MM III phase – be it the practice of a single unit of
production or of several workshops located in the same area. This practice drops or ceases during the LM I period
when choices crystallize around a distinct, well-standardized recipe. It reappears more commonly again during the
Postpalatial period.

Such mineralogical characteristics do not fit the Maliote usual raw material choices for pottery production,
even if the absence of any optical activity, the silty texture and the orange/brown (XPL)-reddish brown (PPL)
colours of the groundmass have well been recognized among local productions at Malia Quartier Mu. They were
qualified as features specific to conical cups but lacking from other vessel types (Poursat & Knappett 2005: 18)
which could prove the local origin of Fabric V. Moreover, the overall sediment process from which the ceramic
aplastic materials come from is reminiscent of what has been observed for a one-off pithos of local production
at Quartier Mu (Poursat & Knappett 1997: 16). For this pithos, roundedness and strained aspect of the inclusions
are said to match the South Coast tradition of alluvial tempering. Finally, Fabric V shares several features with
Fabric VI which, as we will see, might not be of local production. It may be worth considering that we have here
an indication for local Maliote resources being processed according to another region’s potting technique.

2.2.2. Fabric VI. Brown calcareous fabric with alluvial sand inclusions (Fig. 8.8)

Samples 9, 7, 12

These three LM I samples stand out from the previous group because of the dark reddish brown XPL colour,
textural and optical properties of their groundmass. Extended zones of an optically inactive b-crystallitic greenish
grey fabric, as well as micritic dust and aggregates are heterogeneously spread through the section. Those features
definitely prove the addition of some calcareous component to the red clay-base and a high-firing temperature
of the paste. Isolated bioclasts are also sparsely observed, a clue which tempts one to exclude any possibility of
local origin for this low-calcareous Fabric VI; it rather raises the possibility of a Knossian production. The reddish
brown amorphous ferruginous dots, the micritic aggregates and the crystallitic b-fabric concentrations are also well-
distinct from the red and buff clay pellets identified in the ‘Maliote’ fabrics. They definitively suggest a different
mineralogical composition for the raw clays selected in the production of Fabric VI.

The aplastic fraction is characterized by the large predominance of sub-rounded alkali feldspars and quartz
crystals that seem to be water-worn; rounded cryptocrystalline grey mudstones are also common. Some of the
rounded quartz and feldspar crystals display euhedral to subhedral shapes and might be the by-products of alluvial
erosion of an igneous (plutonic) geological environment. In contrast, the angular clastic/phyllitic inclusions
that predominate among the ‘Maliote’ fabrics are very few here; only a lesser concentration of phyllosilicates is
observed. As proposed in the previous section, the stream-sand tempering technique of the South Coast/Mesara
region may offer some path for further investigation, especially in consideration of the longevity of this practice
through the main part of the Bronze Age (Day, Relaki & Faber 2006). The occurrence of microfossils in some of
the Messara ceramics sampled at Malia Quartier Mu is also noteworthy (Poursat & Knappett 1997: 37) but other
comparanda are necessary to gather more convincing clues for provenance ascription.

2.3. Dark red oxidized fabrics

2.3.1. Fabric VII. Dark red fabric with phyllite (Fig. 8.9)

Sample 26

This fabric group is represented by a single sample among the MM III conical cups. The fabric is semi-fine
to semi-coarse, highly phyllich in composition and seems to be well-fired. The very homogeneous texture, dark
colour and lack of birefringence of the matrix are quite distinct from what is reported for the main group of Malia
Mu red fabrics. A putative sub-grouping is well evoked for Maliote samples that display a much greyer core and
lack any optical activity (Poursat & Knappett 2005: 19). Those samples are related to the red/orange alluvial non-
calcareous clay sampled at Sissi. This clay has proved from refiring tests to be optically active and red-orange in
XPL colour when heated at 900°C, but to change to a deep red colour which is no longer optically active at higher temperatures; it also displays many planar voids when highly fired. However, the main discrepancy between the Sissi Fabric VII and the subgroup of archaeological samples from Malia Quarter Mu lies in the lack of striation of the groundmass, the absence of planar voids, and in the random orientations of inclusions. The aplastic component of Fabric VII is also distinctive in its continuum of granulometries from silty to coarse, an observation which makes the idea of tempering difficult to demonstrate conclusively.

The predominance of silver/grey phyllites and golden/yellow slates against the red/orange varieties of these rocks provides further paths of inquiry for provenance ascription. Indeed, analyses led on other sites of Eastern Crete have made the description of physical properties of the phyllites a first criterion before going into more details about technology and provenance of the fabrics. A broad range of ceramic fabrics containing phyllite fragments in a variety of colours is reported at Mochlos. This phyllosilicate component varies from golden-brown to grey-yellow and purple-silver tinges, a mineralogical diversity which is reflected in the local colluvium, alluvium and terrace fill sediments (Nodarou 2010: 4). Some Mochlos conical cups from the Neopalatial period are characterized by a moderate concentration in biotite mica laths in their matrix and by the predominance of grey-yellow muscovite-rich slates and phyllites in their aplastic fraction (Evershed 2000: 44, “Fabric A”). One Postpalatial coarse red fabric (Fabric 1d) is described as standing out from the local fabrics because of the lesser concentration of yellow-brown phyllites against the predominance of the silver-grey variety, which seems to be rarer in the vicinity. The exact provenance remains uncertain but the hypothesis of an import from Far Eastern Crete has been proposed (Nodarou 2010: 8).

2.3.2. Fabric VIII. Dark red fabric with quartz crystals (Fig. 8.10)

Sample 35
This LM IIIA2/B outlier displays very specific features under the polarizing microscope. This is a very homogeneous and totally oxidized red fabric showing no colour variation towards the sherd walls. The aplastic fraction consists primarily of angular quartz fragments that are evenly distributed through the section. Bimodal size-distribution is not obvious; there is a continuum from very fine to semi-fine granulometries. Micaschists, micasandstones, chert and golden/yellow phyllosilicates are very sparse and confined to the finest grain sizes.

These inclusions are not very diagnostic in terms of origin. Fabric VIII does share some mineralogical characteristics with the main group of semi-fine red fabrics at MM II Quartier Mu, but the near absence of other types of inclusions than quartz, combined with the total absence of optical activity of the fabric, the high homogeneity of the clay-base and the very dark PPL-XPL colours of the groundmass suggest widening the geographic scope of inquiry. A similar fabric is reported on three consumption sites in Far Eastern Crete and has traditionally been thought to belong to imports from the so-called ‘Palaikastro workshop’. This is the case for several semi-fine drinking vessels such as pulled-rim bowls, kylikes, bowls and a deep cup from Postpalatial Mochlos (Nodarou 2010: 11) and for pulled-rim bowls, amphorae and transport jars from Chrysokamino and Petras (Noradou 2007: 80).

The ‘Palaikastro workshop’ (ibid.) is known already during the Neopalatial period as an important and dynamic centre in East Crete for the production of fine table wares connected with the consumption of liquids; the typical pink quartz-bearing paste was first described by P. Day under the microscope (Day 1995: 161-162). However, petrographical tests that were later published for the conical cups consumed at Palaikastro have made criteria for provenance ascription more difficult. Owing to the coexistence of buff and pink calcareous fabrics at the sides of red non-calcareous pastes, results indicate that several workshops seem actually to develop in the vicinity with specific but still closely related production techniques (Doherty 2007). Even at importation sites such as Mochlos, variations in colour and composition among the typologically diversified ‘Palaikastro’ drinking vessels indicate the existence of a range of recipes at the start of the same mineral resources (Nodarou 2010: 11). Further comparisons between sample 35 and thin sections selected on-site at Palaikastro would allow further conclusions here.
2.4. Calcareous fabric

2.4.1. Fabric IX. Very fine calcareous fabric with red clay pellets (Fig. 8.11)

Sample 14, 20

This Neopalatial fabric does not look like anything else that has so far been described for the Maliote ceramic production. It stands out by the (near-)absence of optical activity and wackestone texture of the matrix, by the quartzic nature of the aplastic fraction and by the occurrence of clay pellets as the only coarse (plastic) feature within the micromass.

The two hand-specimens are pale buff in colour despite of their iron content. This characteristic must be the result of a firing process which has been described elsewhere for macroscopically buff fabrics containing both calcareous material and iron-rich clay (Doherty 2007: 161). Buff colour has developed during firing due to the behaviour of calcareous material: this has combined with the iron liberated from the breakdown of the clays and has inhibited the development of high concentrations of red iron oxides in the paste – the colour of the matrix is therefore buff while the iron-rich clay pellets have oxidized.

The red textural concentration features are pure and of subsilt-grained texture, two characteristics that stand in contrast to the usual terra rossa clay pellets encountered in the ‘Maliote’ fabrics. This remark leads one to identify a highly plastic state of the terra rossa clay-base as well as quartz crystals naturally imbedded in the calcareous component of Fabric IX. This latter characteristic fits what has been described for Neogene clays in Crete (Hein et al. 2004). The idea of an intimate mixing between two clays is reinforced by the apparent striation of the matrix and by the very fine grain of the micromass, which also suggests some levigation process. The mixing of terra rossa and Neogene clays with the aim of improving the workability of the clay body is a process which is still employed by modern potters at Kentri in Eastern Crete (Blitzer 1984).

The closest parallel which is published for Fabric IX is represented by vessels connected with drinking liquids from Postpalatial Petras and Mochlos (Nodarou 2007; Nodarou 2010: pl 3E). They are considered by petrographers to be imports from Central Crete. However, the lack of any microfauna in Fabric IX is also compatible with the exploitation of a Neogene clay from the earliest depositional stages in Crete. Indeed, an archaeometric analysis of clay deposits led in Central and Eastern parts of the island has indicated that sedimentation environment evolves from fluvio-lacustrine to marine between the Middle Miocene and the Pleistocene – the latter environment involving plentiful fossil material in contrast to the previous one (Hein et al. 2004: 369). The closest possible source of calcareous clay in the Malia region is reported as Middle Miocene in date and fluvio-lacustrine in origin (Papavassiliou 1989) and the lack of any bioclast has been observed in calcareous archaeological fabrics from the artisans’ quarter at Malia Quartier Mu (Poursat & Knappett 2005: 28). Fabric IX would then rather reflect different potting practice within the Malia-Sissi region, with the reproduction of the levigation process and the selection of (Middle Miocene) calcareous clay that was used as a ‘plastic temper’.

3. Conclusions

Petrographic analysis led to the definition of nine fabric groups among the 39 Neo- and Postpalatial conical cup samples. Their distribution is summarized in Table 8.1. The clearest result of the analysis is the coexistence of two broad traditions of raw material selection, forming and firing techniques within the Malia Plain during the Late Bronze Age.
8. Petrographic analysis of three Neopalatial and Postpalatial conical cup assemblages

Fabrics I, II, III and IV share close mineralogical, optical and textural features between them and with the Protopalatial petrographic groups at Malia; those features allow to gather them under the common label ‘regional Maliote red fabrics’. The samples make up two thirds of our conical cup sample and the analysis has shown that this grouping follows to some extent a chronological organization – Fabric I being mostly LM I in date; Fabric II is mainly tied to the MM III phase; Fabrics III and IV are LMIIIA2/B. It remains to be determined to what extent those variations might reflect the natural heterogeneity of a single clay bed exploited through time but these variations must, at least in part, represent different expressions and degrees of accomplishments of a specific chaîne opératoire. The process systematically involves (1) a terra rossa clay, (2) some buff micaceous plastic material with quartz inclusions, (3) terrigenous clastic rock fragments (which might be natural components of the terra rossa clay).

This chaîne opératoire is well-standardized during the MM II phase among the Protopalatial workshops of Malia Quartier Mu, and is largely replicated at the apogee of the Neopalatial period at Sissi (LM I Fabric I). One could be tempted to see the domination of the (First and Second) Palaces of Malia over the Plain as a possible causal effect, but more clues have to be gathered with a wider sampling on-site. Only partial reproduction of the same recipe can be found at Sissi during the MM III phase, which still ‘remains difficult to define satisfactorily by archaeology’ (Driessen & MacDonald 1997: 12; Knappett & Collar 2007). The process then either excludes any clastic tempering or more probably includes some levigation of the terra rossa, and in any case it lacks consistency in firing techniques (Fabric II). The MM III ceramic phase sees the diversification of potting practices and raw material choices, the break being clear-cut with the LM I recipe. Likewise, the picture of new directions and a lesser time input are to be observed during the LM IIIA2/B phase. During both periods, conceivable options crystallize around the addition of alluvial material (Fabric V), the lesser refinement of raw clays (Fabric IV) and/or the possible extraction of other terra rossa beds (Fabric III). Fabric IV also fits in the line of a general improvement of the potting traditions which is reported for the end of the Late Bronze Age.

Fabric V also shares specific mineralogical characters with three LM I cups which microstructure and matrix texture are well-distinct from the ‘red Maliote’ fabrics and may point towards a South Coast provenance (Fabric VI). The situation seems to be the adoption of a specific practice during the MM III and LM IIIA2/B phases at Sissi, in contrast to a (possible) import activity at the height of the Neopalatial period. Each of the ‘alluvial’ fabric and ‘red Maliote’ recipe must involve its specific cultural background, which suggests the coexistence of two potting traditions linked to distinct workshops within the plain.

Tab. 8.1. DISTRIBUTION OF THE CONICAL CUP FABRICS BETWEEN THE THREE CERAMIC PHASES UNDER STUDY (FL. LIARD)

<table>
<thead>
<tr>
<th>Neopalatial - MM III</th>
<th>Neopalatial - LM I</th>
<th>Postpalatial LM IIIA2/B</th>
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<tbody>
<tr>
<td>Fabric I</td>
<td>Fabric II</td>
<td>Fabric III</td>
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<tr>
<td>Fabric III</td>
<td>Fabric IV</td>
<td>Fabric V</td>
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<td>Fabric VI</td>
<td>Fabric VII</td>
<td>Fabric VIII</td>
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<td>Fabric VIII</td>
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<tr>
<th>Neopalatial - MM III</th>
<th>Neopalatial - LM I</th>
<th>Postpalatial LM IIIA2/B</th>
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<tr>
<td>Fabric I</td>
<td>Fabric II</td>
<td>Fabric III</td>
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<td>Fabric III</td>
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<td>Fabric VIII</td>
<td>Fabric IX</td>
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As far as we can see, other lesser-attested fabrics reflect the same pattern. The Fabrics VII and VIII outliers have not been identified among the LM I samples. Be they imports or isolated local products, they reinforce the idea of the diversification in production and consumption practices at different stages of the site history.

Finally, further tests are required to ascertain the provenance of Fabrics VI, VII, VIII and IX. Additional analysis on an array of functional ceramic types might pattern the settlement of Sissi as taking an active part in the exchange networks that have been defined for Eastern Crete (Day 1995; Nodarou 2007; Nodarou 2010) with, maybe, people bringing with them conical cups from further afield.

4. References

- Papavassiliou 1989 = Papavassiliou C., Γεωλογικός Χάρτης της Ελλάδος Άγιος Νικόλαος (IGME : Athens).
8. Petrographic analysis of three Neopalatial and Postpalatial conical cup assemblages

Fig. 8.1. **Fabric IA, Sample 3, XPL, Field of View 7 mm (Fl. Liard)**

Fig. 8.2. **Fabric IB, Sample 8, XPL, Field of View 7 mm (Fl. Liard)**
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Fig. 8.3.  Fabric IIA, sample 33. XPL, field of view 7 mm (Fl. Liard)

Fig. 8.4.  Fabric IIB, sample 21. XPL, field of view 7 mm (Fl. Liard)
8. Petrographic analysis of three Neopalatial and Postpalatial conical cup assemblages

Fig. 8.5. **Fabric III, Sample 37. XPL, Field of View 7 mm (Fl. Liard)**

Fig. 8.6. **Fabric IV, Sample 43. XPL, Field of View 7 mm (Fl. Liard)**
Fig. 8.7. Fabric V, sample 28. XPL, field of view 7 mm (Fl. Liard)

Fig. 8.8. Fabric VI, sample 7. XPL, field of view 7 mm (Fl. Liard)
8. Petrographic analysis of three Neopalatial and Postpalatial conical cup assemblages

Fig. 8.9. Fabric VII, sample 26. XPL, field of view 7 mm (Fl. Liard)

Fig. 8.10. Fabric VIII, sample 35, XPL, field of view 7 mm (Fl. Liard)
Fig. 8.11.  

**Fabric IX, sample 14. XPL, field of view 7 mm (Fl. Liard)**
8. Petrographic analysis of three Neopalatial and Postpalatial conical cup assemblages
1. **Introduction**

The study of the shell assemblage from the Kefali hill at Sissi commenced in 2009 and continued in the following two seasons (2010 and 2011). During the first study season, the shell sub-assemblages excavated in 2007-2008 were assessed, while the 2010 and 2011 study seasons prioritized the analysis of shells from Building E and Building CD, respectively. In total, 343 excavation units from Zones 1-6 have been studied, which have produced 4858 specimens of 68 different species of marine molluscs, crabs, sea-urchins and land snails.

The present report discusses ca. 70% of the material studied thus far deriving from ca. 21% of all excavation units from uncontaminated deposits. It presents the nature of the Sissi shell assemblage from Buildings CD and E as a whole, then discusses the material from each building separately. Finally, a coarse spatial analysis is attempted with the aim to shedding light on issues, such as species selection, gathering practices and overall molluscan and shell use, including food consumption habits. Pending full morphological, typological and spatio-temporal analysis of the whole shell assemblage, the following discussion is preliminary.

2. **Methods of recovery and material analysis**

The shell assemblage discussed here was recovered by hand collecting in the trench and dry-sieving during excavation. Collection of shells was careful and rigorous, as indicated by the presence of small intact specimens, as well as of shell fragments smaller than 0.5 cm. The context of the material was accurately documented by trench supervisors. All shells were cleaned prior to analysis.

Identification of taxon/species was accomplished using handbooks on the marine molluscs of the Mediterranean and Aegean Sea (Delamotte & Vardala-Theodorou 1994; Poppe & Goto 1991, 1993) and on terrestrial snails (Abbott 1989; Pfleger 1999), as well as through comparison with specimens from a reference collection of contemporary marine fauna from the area. Nomenclature follows the CLEMAN database (Check List on European Marine Molluscs).

Each item was examined both macroscopically and at low-power magnification (x5, x10, x20) for its condition (i.e. wear, state of preservation) and presence of evidence for human processing (marks from mollusc extraction or other modification). The recording of relevant variables allowed detailed taphonomic analysis of the material. Worked shells and specimens with natural modifications were also observed with a hand-lens to identify processes of modification and methods of manufacture, as well as whether wear was related to use and/or post-depositional processes. These examples were identified to species level, while their plan and longitudinal sections and other additional features (e.g. perforations) were measured (length, width). Additionally, surface treatment (e.g. grinding), indications of working (e.g. cuts, perforations) and other marks on shells were recorded. Documentation of the material included digital photography of specimens.

Quantification of specimens involved calculation of the Number of Identified Specimens (NISP), the Minimum Number of Individuals (MNI), the Number of Intact specimens (NI) and the Number of Fragments (NF). Recording of variables and subsequent analysis of collected data were undertaken using an especially designed database for shell analysis (Ostreadb) (Veropoulidou 2011a). Statistical analysis of the resulting datasets was conducted using SPSS. Presence, absence, fluctuations and relative abundance of different species were compared between deposits to explore spatial differences. The density of shells according to NISP and MNI per 1m$^3$ of excavated soil has not

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2 Detailed description of the methods of analysis and some preliminary results can be found in Sissi II: 211-218.
3 It should be stressed that the study of material from heavy residue samples is expected to significantly revise the numbers of shells and possibly the proportions of species in both Buildings.
been calculated yet, and thus statistically valid comparisons between Sissi and other sites must await the final publication of the material.

3. Composition of the shell assemblage from Buildings CD and E

The shell assemblage discussed here derives from 241 excavation units (Table 9.1), ca. 35% of the total number of units excavated in Building CD (2007-2010) and ca. 60% of the total number of units excavated in Building E (2007-2010). These units are distributed in 67 deposits, 61 of which were considered by the excavators to be of LM III date; another two deposits date to EM (?) and four deposits to MM II. More specifically, shells come from 28 floor level deposits, 9 fill deposits, 22 destruction and tumble deposits, and 8 pits, thus representing a good cross-section of different types of depositional contexts.

<table>
<thead>
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<td>144</td>
<td>241</td>
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<tr>
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<td>18</td>
<td>29</td>
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<tr>
<td>Deposits</td>
<td>25</td>
<td>42</td>
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**Character of deposits**

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<th>Building CD</th>
<th>Building E</th>
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<td>17</td>
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<td>Pits</td>
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Tab. 9.1. **Origin of the shell assemblages from Buildings CD and E**

In total, the assemblage comprises 3574 shells (5.141 kg), of which 3173 are the remains of marine molluscs, sea-urchins and crabs (4.938 kg) (Table 9.2). Shells are moderately to highly worn as a result of both pre- and post-depositional processes. There are also 401 remains of land snails (0.203 kg), of which 39% of their total MNI (n=157) are most likely to be modern intrusions (e.g. A. candidissima, E. vermiculata, R. decollata, Z. detrata) due to their pristine state of preservation, based on the assessment of their colour, translucency and absence of bleaching (cf. Peacock et al. 2005). The state of preservation (i.e. whitish, bleached colour) of the rest (60.8% of total MNI, n=244) indicates that they are pre-modern (e.g. F. trizona rumelica, E. montana, Th. pisana). Based on their ecological requirements, some of pre-modern snail species could have used the settlement as their habitat, while the others could have been transported by the inhabitants along with materials from the coast (e.g. Th. pisana) or wooded areas (e.g. E. montana).

The marine shell assemblage demonstrates high taxonomic variation; there are 42 different marine species, of which 57% belongs to the class of Gastropods (24 species), 38% (16 species) to Bivalves and there is also one species of sea-urchin and one of crab (Table 9.2, Fig. 9.1). There are no remains of tusk-shells or cuttlefish. Species representation is comparable to that observed in other Bronze Age Cretan sites (e.g. Karali 1999; Reese 1995, 2011, in press; Shackleton 1972; Veropoulidou 2005; Veropoulidou & Vasilakis in press). The assemblage is characterized by a low diversity\(^4\) (H\(^\prime\)=0.036), due to the dominance of only five species out of the 42. Additionally, it shows very low equitability (V\(^\prime\)=0.01) as the number of individuals is distributed unequally across all identified species. Therefore, shell gatherers focused on the collection of few particular species, namely three congeneric species of limpets (P. caerulea, P. ulyssiponensis, P. lusitanica) that inhabit the same ecological niche and were probably gathered indiscriminately, one top-shell (M. turbinata) and a purple-shell (H. trunculus); these altogether make up 53% of the total MNI.

---

\(^4\) Diversity is the relative importance of species present at the assemblage, while equitability is the evenness with which the species are used (for calculating diversity and equitability see Reitz & Wing 1999: 233-235).
<table>
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<tr>
<th>No</th>
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<th>MNI</th>
<th>NF</th>
<th>NI</th>
<th>MW</th>
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<td>1</td>
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Subtotal (marine) | 3173 | 1860 | 1181 | 1511 | 2.58

1 Land snail | 7 | 2 | 5 | 1 | 2.3
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<td>3</td>
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<td>Common garden snail</td>
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<td>7</td>
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<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>Shiny glass snail</td>
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</table>

**Subtotal (land snails)** | 401 | 326 | 75 | 255 | 2.02 |

**Grand total** | 3574 | 2186 | 1256 | 1766 | 2.4 |

**Tab. 9.2.** List of species found in Buildings CD and E in alphabetical order (bivalves=1-16, gastropods=17-42), including quantities (NISP, MNI, NF, NI), mean wear (MW, 1: low, 2: moderate, 3: high) and common English names. The habitat column indicates where species lives; the first character refers to substrate (R: rocky, S: sandy, A: both) and the second to depth of water (S: shallow, D: deep, A: both).
3.1. Gathering practices

Locations of mollusc collection are inferred by the composition of species index and the environmental parameters of each species. All studied shells are marine Mediterranean species still encountered at the present rocky coastal environment of Kefali hill. Therefore, we can assume that the seascape has not undergone any significant changes in qualitative terms since the Bronze Age; the inhabitants of Kefali hill must have obtained the molluscs locally, not very far from the settlement.

The majority of seashells of the assemblage (23 species, 86% of the total MNI) live on hard substrates; 75% of the total MNI come from shallow areas (e.g. *Patella* spp., *M. turbinata, P. lividus*), while the remaining 11% come from deeper areas (e.g. *F. lignaria, P. striata, C. mediterraneus*). Therefore, people exploited mainly easily accessible points, i.e. from the splash zone up to 1-2 m depth.

Whether limpets (and most probably top-shells) were collected from dry and/or submerged spots can be extrapolated from metrical data of the height of limpets and the occurrence of specimens with chipped or damaged lip that results from the force to prise the molluscs off the rock, where they firmly attach during low tide (Buchanan 1988: 16-17). Metrical data show a great dispersion of sizes, but in average limpet shells are medium to large (Table 8.3), while the frequency of specimens with chipped or damaged lip is low (15.5%). Thus, limpets were mostly gathered during high tide or from areas below the low tide line, where they move for search of food and thus are easily spotted and detached, without damaging the shell. According to past ethnographic examples (Waselkov 1987: 96-97) and present practices (Luchesi 2006: 106-107), they can be detached from the rocks either with minimal or no equipment at all, i.e. with a stick, a kind of spatula (cf. Pollard 1994; Becker 2008; Forbes 1976: 134) or bare hands.

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<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Range</th>
<th>Total</th>
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<td>.50</td>
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<td>.80</td>
<td>68</td>
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Tab. 9.3. **Heights statistics (cm)** of the three species of limpets

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5 The exact characteristics of the coastal environment cannot be established exclusively on the basis of observations regarding the shell assemblage and there is not yet a published geoarchaeological study for the area. It is assumed that the general characteristics of the present seascape, i.e. a coast dominated by steep cliffs and mixed rocky, gravel and sandy substrates, have not changed dramatically.
The distribution of different in height limpets, and therefore amount of molluscan flesh, is uneven in Buildings CD and E (Fig. 9.2). Ca. 35% are specimens small in size in each case; the majority (56%) of limpets from Building CD are medium to large in size, while the majority (40%) of limpets from Building E are medium to small in size. This picture could emerge from the exploitation of different coastal regimes, but a scenario of gatherers of different age (cf. Bird & Bird Bliege 2000; Claassen 1991) is also plausible. These issues will be further explored after the analysis of the whole shell assemblage has been completed, but on present evidence we can observe high selectivity in the species gathered and the procurement only of limpets and top-shells which are fresh and thus suitable for food consumption.

Gathering practices of a more opportunistic character, however, must have been followed at sandy areas, which provided 18 different species (14% of the total MNI) and a high occurrence (11%) of beach- and water-worn shells. From this environmental niche, the main species collected was purple-shell (11%, *H. trunculus*). The usual equipment for catching purple-shells is baited traps (Ruscillo 2005: 101-103) and fishing nets (Veropoulidou, field notes), where various species may interfere and become part of the prey. Other species which appear to have been occasionally collected from such habitats include crabs (*C. pagurus*) and two horn-shells (*C. vulgatum, C. rupestre*); these were probably collected with bare hands.

The exploitation of deep sea habitats (<2.5m) appears to have been rare, as the small percentage of relevant specimens indicates (7% of the total MNI); there diving and/or the use of a boat and a dredge are usually needed (Waselkov 1987: 96-99). Off-shore gathering was pursued for the collection of particular species, such as *Sp. gaederopus, C. mediterraneus* and possibly large in size and fresh *Charonia sp.* (cf. *tritonis*) that might have been used in more “special” contexts (cf. Reese 1983, 1990, Veropoulidou 2011b).

### 3.2. Molluscan and shell consumption practices

The vast majority of shells from Buildings CD and E belong to edible species (cf. Davidson 1981) and more or less were found in discrete groups, associated with occupation debris, while there are some groups associated with hearths and material culture related to food consumption. Taking into account the spatial distribution of remains and comparative data from other Minoan and Aegean sites (e.g. Reese 1995, 2011, in press; Shackleton 1972; Veropoulidou 2011a; Veropoulidou & Vasilakis in press), 13 different species (e.g. limpets, top-shell, sea-urchin,
crab, Noah’s ark, and horn-shell) and at least the 84% of the total MNI may be safely assumed to represent remains of food consumption.

As regards food preparation and consumption methods, relevant data are extrapolated from limpets and top-shells. The high occurrence of limpets (45%) with scorch marks and/or a recrystallised and decolorized outer surface indicates that molluscs were roasted for a short period of time in the coals of the fire. On the other hand, the low occurrence of scorched top-shells implies that other cooking methods were also employed, such as boiling and/or steaming. There is also a small amount (5%) of top-shells, whose lip has been removed while trying to extract the mollusc, but it is difficult to discern whether the meat was raw or heavily cooked.

As regards other molluscan remains, all three species associated with the manufacture of purple dye in the Aegean (H. trunculus, B. brandaris, St. haemostoma) are present in the assemblage and make up 11% of the total MNI. The vast majority of specimens has been collected alive, thus being suitable for dye production. Their fragmented state is consistent with purple-dye manufacture and it is comparable with what has been observed in other Bronze Age Cretan sites (Apostolakou 2008; Reese 1987, 1995, 2010, 2011, in press; Ruscillo 2000; Veropoulidou 2005). Their low numbers do not allow us to infer systematic production of dye on site, but rather the possibility of small scale in situ production (cf. Becker 2008; Veropoulidou 2011a; Veropoulidou et al. 2008), accompanied by subsequent removal of production waste. Another possibility is that dye was produced off-site and some crushed shells were brought to the settlement for secondary use, such as temper for ceramics (Rice 1987), while also possible is the use of burnt shell powder to produce white paint (Carannante 2011) and lime used in plaster features (Brysbaert 2007). These possibilities will be further explored in the future.

The remaining 5% comprises shells that might have been collected by accident (e.g. grooved helmet, striped Venus, hairy ark), brought to the site alongside materials from the beach (seaweed, sand) or as curios for decorative (e.g. cowrie shell, cone) and other special purposes (e.g. trumpet triton). The presence of the latter species in some deposits, sometimes along with artefacts of evidently symbolic nature, may be viewed as a reference to the symbolic meaning of water and/or the seascapes and the tasks performed there (Veropoulidou forthcoming).

The corpus of worked shells comprises only twelve examples, namely six perforated specimens (four with artificial and two with natural holes), five specimens possibly used as expedient tools and one specimen possibly used as a musical instrument. The rarity of perforated shells is of great interest, as several perforated specimens have been found at Neolithic Knossos (Veropoulidou in prep.) and other Bronze Age Cretan sites, such as Kommos (Reese 1995), Mochlos (Reese in press), but not in the neighbouring Quartier Mu at Malia (Karali, pers. com.). Artificial perforations are rather small (0.3-0.7 cm), jagged and uneven, indicating that they have been created with gouging, which can be performed with any pointed tool. It is interesting that the hole does not look completely finished, as the protruding jagged areas have not been smoothed off. Additionally, the area in and around the perforation has not acquired a rounder or smoother appearance, but the jagged edges have created natural furrows and resting places for the string, which exhibit minimal shine. Therefore, perforated shells must have been strung, but the low degree of wear poses difficulties in inferring whether the shells had been worn or just threaded through. As regards shells with natural perforations, one (C. mediterraneus, Room 5.5) exhibits use-wear around the perforation, namely a glassy polish, while the other (H. trunculus, Room 5.6) does not appear to have been strung or worn.
On the top of the hill, a large building complex has been revealed, Building CD (Sissi I: 113-138; Sissi II: 83-141). The study of architecture and stratigraphy is advanced enough and has provided a list of fills, destruction and floor deposits for study (Table 9.1). The shell assemblage discussed here comes from 11 spaces, namely 4.5, 4.7-4.10, 4.13-4.18 (Fig. 9.3). There are two deposits in Room 4.5 and two deposits in Room 4.14 that date to MM II; other floor deposits are tentatively dated to LM III and destruction deposits are dated to LM IIIB.

In total, the assemblage comprises 1392 shells (2.091 kg), of which 1214 are the remains of marine molluscs, crabs and sea-urchins (2.008 kg) (Tables 9.2 & 9.4). There are also 178 remains of ten different taxa of land snails (0.083 kg), of which 23% (n=29) of the total MNI are considered to be modern intrusions due to their pristine condition of preservation, while the remaining (n=96) are considered to be pre-modern.

Marine remains are in a moderate state of preservation with most specimens being moderately worn. In floor
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Deposits (Rooms 4.5, 4.7, 4.8, 4.14, 4.15), mostly scorched specimens, as well as limpets with a crystallised outer surface demonstrate a high degree of wear, namely the alteration of internal cohesion of the shell structure (cf. Claassen 1998: 61-66). In the same deposits, the ratio of intact to fragmented specimens is 1:2. The above are a result of pre-depositional processes, probably the cooking of molluscs in direct contact with fire and foot traffic, respectively. Land snails are a rare finding in floor deposits, as it is expected in roofed spaces. The only exception is the MM II floor deposit in Room 4.5 that demonstrates high taxonomic variation (5 different species) and concentration of specimens (MNI: 9, 7%); this accumulation of land snails suggests prolonged abandonment before next occupation.

Marine shells from fill deposits (Rooms 4.8-4.10) demonstrate also a moderate degree of wear, as well as an equal ratio of fragmentation, while the remains of land snails are scarce, suggesting that filling up of these rooms must have been a single rapid event, a proposition also corroborated by the remarks of the excavator (Sissi II: 114). Conversely, the younger fill dated to MM II in Room 4.5 is characterised by a high taxonomic variation of land snails (5 species) and a high concentration of specimens (MNI: 21, 17%), thus implying that the deposit accumulated over a longer period of time.

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Tab. 9.4. List of species found in Buildings CD and E in alphabetical order (bivalves=1-16, gastropods=17-42), including quantities (NISP, MNI, NF, NI), weight (W in gr.) and mean wear (MW, 1: low, 2: moderate, 3: high)

Finally, marine shells from destruction deposits demonstrate a higher degree of wear and the ratio of intact to fragments is 1:3, due to movements and pressure. These deposits also demonstrate high taxonomic variation of land snails and 50% (n=63) of their total MNI (tumble in 4.7: 32 MNI; MM II fill in 4.5: 21 MNI; destruction on LM III floor in 4.14: 10 MNI). The above indicate a prolonged exposure of the material to the natural elements and subsequent disturbance before final burial.

The marine assemblage demonstrates high taxonomic variation, with 35 different species (12 bivalves, 21 gastropods, 1 sea-urchin, and 1 crab). However, the assemblage is dominated by the remains of the three species of limpets and the top-shells, which make up 84% of total MNI (n=551). They are found as discrete concentrations and display particular modifications, such as scorching and a crystallised surface from roasting, probably representing rubbish from several food consumption events. Other species occasionally consumed as food are crabs, sea-urchins and Noah’s arks. Combinations of these species are encountered in most deposits, and in all Rooms of the Building CD, though the amount excavated in each deposit fluctuates considerably (MNI from 4 to 291).

The highest concentration (48% of total MNI, n=266) of food remains (limpets, top-shells, crabs) was found in
the latest fill deposit that covered the floor in Room 4.8. Most of the remains were associated with a hearth in the western part of the room, where also rodent bones and charred plant remains (Livarda, pers. comm.) were found along with a quern for plant processing (Tsoraki, this volume). The fragmentary state of the limpets and top-shells is probably the result of trampling and thus suggests heavy human traffic. In the same room, there is another accumulation of food remains (MNI=22), which were found associated with the earlier pebble floor.

Other significant accumulations of food remains were found in the floor deposit in Room 4.15 (MNI=48), in the MM II fill deposit in Room 4.5 (MNI=20), as well as in the fill deposits in Rooms 4.17, 4.18 and 4.9 (MNI=50, 55 and 48 respectively). In the latter, soil samples from the outlet of a built drain produced charred remains of olives, barley, grapes, and lentils (A. Livarda, pers. comm.). Thus, at least in these rooms there is positive evidence for food preparation and/or consumption and subsequent discard.

All three species of shells suitable for purple-dye extraction were found fragmented in most of the studied deposits, but as previously stated their low numbers do not allow us to infer systematic production of dye in Building CD.

The remaining shells, collected either for decorative purposes (e.g. B. corneum, F. lignaria) or for more symbolic reasons (e.g. C. mediterraneus, Charonia sp.), were found distributed unevenly in studied deposits. Some specimens were found in the LM IIIB fill above the floor in Room 4.9 along with several artefacts, such as vessels, needles, stone tools, possibly fallen from above (Sissi I: 136-137), as well as in the fill in Room 4.18, where an open vessel with octopus decoration was also found (Sissi II: 134).

Some Charonia sp. fragments were found in a niche between walls C1 and D11 (Sissi I: 133-134), possibly representing a ‘foundation’ deposit. Such deposits are not unknown in Bronze Age sites in Crete (Reese 1990, in press) and there are more examples from the Kefali hill (e.g. Sissi I: 160, in zone 6). Additionally, a Ch. tritonis individual, probably collected water worn, was found in the fill in Room 4.10; it is large in size (height: 20+cm, width: 15cm), in good condition and its three final whorls had been intentionally removed. Considering that it is open from both sides (upper part and aperture), it seems reasonable to suggest that it might have been used as a wind musical instrument (cf. Reese 1990). There is also an individual of the species C. rustica, which was collected beach-worn and bore a natural perforation due to wave and sand activity (destruction deposit of MM date in Room 4.14). The glossy shine in the periphery of the hole probably resulted from loose threading, implying its use as a pendant. Finally, a fragment of the species P. ulyssepionensis must have been used as an ‘expedient’ tool, as it is ground at the upper surface (subfloor in Room 4.13).

5. Building E (Zone 5)

South of Building CD, another large building complex has been unearthed, Building E (Sissi I: 139-156; Sissi II: 143-162). The study of architecture and stratigraphy is quite advanced and has provided a list of fills, destruction and floor deposits for study (Table 9.1). The shell assemblage discussed here comes from 18 spaces, of which three are open (South Space, North Area, Room 5.10) while the rest are roofed rooms making up Building E (5.1-5.9, 5.11-5.16, Fig. 8.4). As regards open areas, shells were found in four pits in the South Space (FE011, FE013, FE014, FE015), one of possible EM date and another dated to LM IIIB. In the eastern part of the North Area there is one deposit possibly fallen from the southern façade of Building CD (Pit FE087), which dates to LM IIIA1/2 and in the western limit of the North Area there is another deposit that dates to LM I and is characterised by the presence of at least 84 conical cups. All other deposits are tentatively dated to LM III and some floor deposits (in Rooms 5.10-5.14) date to LM IIIA2 or early LM IIIB. It is worth mentioning a pit (FE081) in Room 5.10 that bears evidence of gradual filling from MM II to LM IIIA2.

In total, the assemblage from this building comprises 2183 shells (3.051 kg), of which 1959 are the remains of marine molluscs, crabs and sea-urchins (2.930 kg) (Table 9.4). There are also 223 specimens of 14 different taxa of land snails (0.120 kg), of which 5.5% (n=11) of the total MNI are considered to be modern intrusions due to their good condition of preservation. The remaining (MNI=190) are considered to be pre-modern.

Marine remains are in a moderate state of preservation, with most specimens being highly worn due to both pre- and post-depositional processes. Shells in floor deposits (Rooms 5.1-5.5, 5.8) are moderately worn and only scorched and fragmented limpets and top-shells, as well as limpets with a crystallised outer surface, demonstrate a higher degree of wear, as such examples are more amenable to dissolution of the shell structure. This has
resulted from pre-depositional processes, probably the roasting of molluscs. In these deposits, the ratio of intact to fragmented shells is in average 1.2:1, suggesting moderate trampling.

Land snails are rare in floor deposits, apart from few remains in four deposits [Room 5.4 (floor level I), Room 5.8 (FE040 and floor level II), Room 5.11 (floor level)], where land snails are pre-modern. It is interesting to note a deposit in Room 5.8 (floor level II), where along with high taxonomic variation (6 species), 17% of the total MNI of land snails (n=34) has been found. Based on the ecological requirements of the species best represented in this assemblage (MNI=25), namely *C. virgata*, *Poiretia sp.* and *F. trizona rumelica* that are xerophiles preferring chalky ground or short grass, it may be suggested that they inhabited this area after its abandonment and before its next occupation. The remaining snails must have been transported to the settlement along with materials from wooded areas and the coast (MNI=7, *E. Montana* and *Th. pisana*, respectively). Another deposit worth mentioning is in Room 5.11, which displays medium taxonomic variation (4 species) and high concentration of land snails (20% of total MNI, n=41). This accumulation of land snails suggests prolonged abandonment before final deposition.

Marine shells from destruction deposits (Rooms 5.1-5.6 and 5.12-5.16) also display a moderate to high degree of wear, while the average ratio of intact to fragmented shells is 1.8:1 and the remains of land snails are scarce, indicating rapid deposition and lack of disturbance. Exceptions are the destruction deposits in Rooms 5.3 and 5.13, where high taxonomic variation of land snails (6 and 7 species, respectively) is accompanied by significant accumulations of specimens (MNI=14, 23, respectively), thus implying a prolonged exposure on the surface before burial.

Fig. 9.4. PLAN OF BUILDING E WITH NUMBERED SPACES
The marine assemblage demonstrates high taxonomic variation consisting of 34 different species (11 bivalves, 21 gastropods, one sea-urchin and one crab) (Tables 9.2 & 9.4). The assemblage is characterised by the predomination of the three species of limpets and top-shells (77% of total MNI, n=922), which represent the remains of several meals. Scorched shells and limpets with crystallised surface suggest that molluscs were roasted before consumption. Only 4% of the total NISP might represent remains of food consumed raw. These species are encountered in most deposits and in all Rooms in Building E, but in different proportions (MNI from 12 to 281). There are also some remains of crabs, horn-shells, sea-urchins and Noah’s arks that seem to have been also consumed as food, though only occasionally.

Shells are distributed unevenly in deposits; at least in eight deposits there were significant accumulations of shells (>5%, MNI >50 out of the total 1180), mainly the remains of several food consumption events. A prominent example (19.5% of total MNI, n=230) of food remains (limpets, top-shells, crabs, horn-shells) was found in the intermediate floor deposit in Room 5.8 near a kernos, an upside-down mortar with a grinding tool and several conical cups (Sissi II: 150-151), a context that might relate to food preparation and/or consumption. Apart from the usual food remains, of particular interest is the concentration of 18 specimens of C. mediterraneus shells (Sissi II: 215)6, which have been gathered alive. Given that cone is a venomous mollusc, it might have been used for medical purposes or consumed as a ‘special’ food or ingredient. Additionally, there is a significant accumulation of shells (NISP=17) that was probably used for decorative (e.g. F. lignaria) or ritual purposes (e.g. Charonia sp.).

Another interesting accumulation of molluscan food debris was found in a LM IIIIA2 or early LM IIIB1 destruction deposit in Room 5.12 (MNI: 6%, n=76). In the same deposit, there was also a small amount of crushed purple-shells, a perforated P. caerulea individual, as well as a part of a trumpet triton, a cowrie shell, and some cones (NISP=8). The latter could have been used for decorative purposes, and some of them were probably displayed or stored on the shelf that had fallen during the destruction (Sissi II: 149).

Other meaningful accumulations of molluscan food debris were found in the destruction deposit in Room 5.3 (5% of total MNI, n=57) along with a perforated P. caerulea individual and a concentration of decorative shells (NISP=18), in the floor deposit in Room 5.6 (4% of total MNI, n=52), as well as in the floor deposit (4% of total MNI, n=51) and in the LM III A2 pit (FE081) in Room 5.10 (2% of total MNI, n=25). The floor level in Room 5.10 was full of ceramics, ash and animal bones in large amounts, while the pit had been filled with bones, shells, drinking vessels and pottery (Sissi II: 154-155). The context of deposition allows us to suggest that shells represent the remains of one or several meals consumed along with animal meat. In the same context, there was also a fair number of shells (NISP=12) suitable for decorative (e.g. C. rustica) or other ritual purposes (e.g. C. mediterraneus, Charonia sp.).

The excavation of the LM IIIA2 or early LM IIIB destruction layers in Room 5.13 produced a significant amount of molluscan food remains; 3% (n=39) of the total MNI was found in the destruction layer of the lower floor and 4% (n=47) of the total MNI was found in the destruction layer of the upper floor. In the former, there was also a tripod cooking pot, a grindstone, grinders and several vessels that relate to food preparation (Sissi II: 152-153); thus the presence of a number of shells representing remains of consumption events supports the interpretation of this space by the excavator as a food preparation and/or consumption area. In the latter, the accumulation of molluscan food remains is accompanied by some shells for decorative purposes (NISP=18, e.g. B. corneum, C. mediterraneus, F. lignaria), a P. caerulea individual probably used as an expedient tool, and objects of more ‘symbolic’ character, such as a painted larnax, a poppy rhyton and a snake tube (Sissi II: 152-153).

At the open area north of Building E, the finds around and above the LM IIIA2-LM IIIB2 pit (FE087) provide significant evidence for the consumption of food, as an interesting amount of molluscan food remains (4% of total MNI, n=51) along with fine drinking vessels, a seal stone, a fragment of a bull figurine and other artefacts were found. As previously noted, this deposit was probably dumped there after the clearance of a destruction event in Building CD.

The last significant accumulation of molluscan food remains was found in the LM IIIA2 or early LM IIIB floor deposit in Room 5.11 (2% of total MNI, n=36). In this context, a concentration of decorative shells (NISP=18), as well as the highest accumulation of crushed purple-shells (NISP=71, MNI=35) were also uncovered. Other interesting accumulations of crushed purple-shells were found in the LM I deposit of conical cups (MNI=25) at

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6 Note that 16 specimens are mentioned in the previous publication; in 2011 summer study season, another bag with shells from the same deposit containing two more cones was found during re-organization of finds.
9. Sissi: The Shell Assemblages. Preliminary results from Building CD and Building E

the open North Area and in the intermediate floor level in Room 5.8 (MNI=14).

The remaining shells, collected for decorative (e.g. *B. corneum, F. lignaria*) or ritual purposes (e.g. *C. mediterraneus, Ch. tritonis*), were found distributed unevenly in the Rooms in Building E. There are also few shells that have been worked, such as three perforated individuals of the species *P. caerulea*, which were found in destruction fills in Rooms 5.2, 5.3 and 5.12. There is also one individual of the species *C. mediterraneus* (floor level in Room 5.05) and one of the species *H. trunculus* (destruction deposit in Room 5.06), which were collected during beach-combing as ready to use artefacts; the former bears a natural perforation due to beach rolling, while the latter bears a hole drilled by another *H. trunculus* (cf. Peharda & Morton 2006). Use-wear analysis suggests that all the above perforated specimens, apart from *H. trunculus*, must have been worn as pendants. Additionally, there are four examples that probably represent expedient tools, one *P. ulyssiponensis* with ground lip (destruction layer in Room 5.4), one *P. caerulea* with a flaked lip (destruction layer in Room 5.13) and two *Sp. gaederopus*, of which the ventral side of the valve is flaked (Pit FE011 in South Space) (cf. Veropoulidou 2011b).

6. Some preliminary remarks

The vast majority of shells from Buildings CD and E were gathered from the sea-shore, where procurement methods are simple and do not require any significant effort or time investment. However, an array of variables (species ecological requirements, size, variety, presence of worn-shells) suggests that different methods were employed in each environmental niche and for the procurement of particular species. Moreover, the focus on only some species from the great variety offered indicates selectivity and might be taken as evidence of specialized gathering practices, at least as regards food procurement. These strategies are also attested at other sites in Bronze Age Crete and the Aegean (Veropoulidou 2011a; Veropoulidou & Vasilakis in press).

The season of molluscan gathering has not been determined, but according to Greek ethnographic case studies (Forbes 1976) and the few relevant archaeological studies (Deith & Shackleton 1988) gathering of limpets and other marine molluscs is a year-round activity that may culminate in the summer7. It is not possible at this stage to provide a definite answer, but it is hoped that the completion of shell analysis and possibly the integration of results from the analysis of all environmental material will help clarify this matter. The scale of the activity is difficult to be discerned on the basis of only a sample, but present data suggest that gathering of molluscs was undertaken on a small scale and added variety to the diet and providing raw materials for both mundane and ritual activities.

The lack of differences in patterns of consumption of molluscan food remains between the two buildings implies commonly shared food habits and dietary practices characterized by the same foodstuffs and ingredients in cuisine. Moreover, the fact that the particular species of shells, charred plant remains and animal bones were found mixed suggests that there were no discriminations between foodstuffs. Finally, the spatial distribution of molluscan food remains in both buildings suggests that molluscs were consumed as food in both domestic and more communal occasions, a pattern also observed at other Aegean sites (cf. Veropoulidou 2011a).

7. Acknowledgements

I would like to thank Quentin Letesson and Maud Devolder for the detailed descriptions of Buildings CD and E respectively, as well as for always being available to provide data and helpful remarks. I also thank Simon Jusseret for the Cretan geoarchaeological references, Charlotte Langohr for her help in the organisation of the material in the apothiki, Irene Kritikopoulos and the students for their assistance with shell washing. Many thanks go to Valasia Isaakidou for editing the English text and to Nikos Valasiadis for processing the images. Last but not least, I would like to thank Jan Driessen for entrusting me with the study of the shells and for his excellent collaboration.

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7 It should be noted that this is contradicted by the widely held view that limpets, as other shell-food, should be avoided from late spring to early autumn (Wright 2009).
8. References

• Veropoulidou & Vasilakis in press = R. Veropoulidou and A. Vasilakis, Exploring the Role of Mollusces in Diet: Preliminary Results from the Shell Assemblage of the Prepalatial Trypiti, Southern Crete, in A. Matala, N. Galanidou and N. Ksyrotys (eds), *Fish and Seafood: Anthropological and Nutritional Perspectives*, in press.
10. Ground stone technologies at the Bronze Age settlement of Sissi

Preliminary Results

Christina Tsoraki

1. Introduction

The first study season of the Sissi ground stone assemblage commenced in June 2011 and focused mainly on material recovered during the 2010 excavation campaign, but also on a small number of objects recovered during the 2011 campaign. In total, 276 objects were studied, 73 of which exhibit no manufacturing or use wear and thus have not been included in the following analysis. The remaining 203 objects were recorded in detail in terms of technological characteristics and wear patterns. In the following sections the nature of the Sissi ground stone assemblage will be presented as a whole and some initial observations on the spatial distribution of these objects will be discussed.

2. Establishing a research and methodological framework

Drawing upon the concepts of the chaîne opératoire and object biographies, the aim of this study was to elucidate the choices made during the different stages of the life cycle of ground stone objects, from the acquisition of raw material, to production, use and final discard (cf. Tsoraki 2008). Emphasis is placed on procurement strategies (quarrying of primary outcrops or collection of secondary deposits such as material from river beds) and the form in which specimens entered the site (as unworked nodules or (semi-)finished products), stages and character of production (e.g. on-site production), object types and contexts of use and discard.

To address these issues a range of qualitative and quantitative attributes were recorded for each object: metrical attributes (length, width, thickness, weight, inner and outer diameter of perforations, and dimensions of use-faces) for both complete and incomplete objects; rock types including information on grain size and textural characteristics; information on typology and technology (reduction sequences, manufacturing techniques and wear, percentage of naturally weathered surfaces); morphological characteristics; attributes that relate to the use history of these artefacts [primary and secondary use (reuse), number of use-faces, degree and type of wear, modification/maintenance of use-faces, fragmentation patterns]; qualitative attributes (colour, degree of polishing) as well as contextual information. The analysis included the study of ground stone objects, unworked nodules and waste by-products.

Drawing upon typological schemes employed by other researchers in mainland Greece and Crete (Warren 1969; Runnels 1981; Evely 1993; Blitzer 1995), Anatolia and Near East (Wright 1992a; 1992b) and other areas (Adams 2002), a generic classification system was applied in the study of the Sissi ground stone assemblage in an attempt to avoid functionally specific terms (e.g. grinding slab instead of millstone which might imply the exclusive use of the tool in food-processing activities). Following Adams (2002), the classification of the material is mainly ‘activity-based’. General object categories were created based either on the shape of the object (e.g. edge tools) or on the character of the activity the tool was used for (e.g. percussive tools), judging from the wear patterns. The classification of artefacts according to their shape is not taken to indicate function. Following Adams (2002), wear

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1 Honorary Research Fellow, University of Sheffield, UK.
2 During the 2011 excavation campaign, material from different zones was rapidly assessed as well as objects still in situ were recorded, but these are not included in this report. References to some of these objects from Zone 3 are made in the relevant section.
3 Stone has been used extensively as building material at Sissi. A rapid assessment of the types of stone used for the construction of walls suggests that limestone and quartzite cobbles of different sizes were employed for construction purposes. These rock types also prevail within the ground stone assemblage. In that respect it is important to assess whether naturally weathered rocks found on site were brought to the site to be used as tools (hammerstones, grinders etc.) or as building material, or potentially for both practices indiscriminately. The detailed study of building materials by the architectural specialist will shed more light on this issue.
patterns, identified macroscopically, enabled the classification of artefacts and the identification of possible tool use(s). For instance, percussive marks (impact fractures - Adams 2002: 30) on use-faces would indicate percussive activities, such as use as a hammerstone, while the presence of striations and sheen was regarded as evidence of smoothing/grinding activities.

The identification of manufacturing and use wear was based on the macroscopic examination of all objects with a hand-lens (8-15x magnification) under artificial light. The colour of rocks was recorded using the Munsell Soil Colour Chart instead of rock colour charts to ensure comparability of results with other ground stone studies conducted in Greece.

3. Preliminary results of the ground stone analysis

3.1. Typological classification

The assemblage was divided into eight general object categories, each further divided into sub-categories. Artefacts that could not be attributed to any of these categories were recorded as indeterminate (n=41) (Table 10.1):

<table>
<thead>
<tr>
<th>General Object Categories</th>
<th>Zone</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>percussive tools</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>% within Zone</td>
<td>15.4%</td>
<td>3.6%</td>
</tr>
<tr>
<td>grinding/abrasive tools</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>% within Zone</td>
<td>53.8%</td>
<td>23.8%</td>
</tr>
<tr>
<td>ornaments</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>% within Zone</td>
<td>.0%</td>
<td>2.4%</td>
</tr>
<tr>
<td>stone vases</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>% within Zone</td>
<td>.0%</td>
<td>10.7%</td>
</tr>
<tr>
<td>multiple-use tools</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>% within Zone</td>
<td>.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>miscellaneous</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>% within Zone</td>
<td>7.7%</td>
<td>4.8%</td>
</tr>
<tr>
<td>debitage/cores/nodes</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>% within Zone</td>
<td>7.7%</td>
<td>26.2%</td>
</tr>
<tr>
<td>indeterminate</td>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td>% within Zone</td>
<td>15.4%</td>
<td>22.6%</td>
</tr>
<tr>
<td>Count</td>
<td>13</td>
<td>84</td>
</tr>
<tr>
<td>% within Zone</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Tab. 10.1. The frequency of the recorded ground stone artefacts in Zones 2-6

A. Edge tools: this category includes tools with one sharp working edge, deliberately modified mainly via abrasion. Based on morphological criteria such as the profile of the cutting edge, these tools are divided into axes, adzes and chisels (cf. Wright 1992a; Stroulia 2010; Tsoraki 2011a). A very small number of axes/adzes have been identified at Sissi and these mainly come from the excavation campaigns prior to 2010. None of these tools has been studied at this stage and hence they do not appear in the tables and following discussion.

B. Percussive tools: tools that have been used with forceful strokes against other surfaces in order to remove unwanted material. These implements are characterised by percussive damage on one or both ends that usually takes the form of impact fractures and flake scars. Based on the character of the percussive wear (e.g. shallow or deep impact fractures), heavily dependent on the force of the applied stroke, a distinction can be made between hammerstones and pounders (i.e. percussive tools that have been used with less force resulting in more uniform wear). Twenty six examples have been identified at Sissi thus far; they are mainly ovate or spherical in plan view and ovate in section with convex use-faces. The complete examples range between 55.54–228.00 mm in length,
45.60–117.62 mm in width, 36.32–109.18 mm in thickness, and 154-3100 g in weight. This category seems to correspond to Blitzer Type 1, Implements with Pecked and Battered Ends (Blitzer 1995: 425-426).

Fig. 10.1. (A) RECTANGULAR WHETSTONE (GS173/08-03-0463-OB001) FOUND IN ROOM 3.3 AND (B) DETAIL SHOWING THE LINEAR, MULTIDIRECTIONAL STRIATIONS VISIBLE ON THE USE-FACE OF THE WHETSTONE (CHR. PAPANIKOLOPOULOS)

C. Grinding/abrasive tools: this category comprises both handheld and stationary implements that exhibit mainly abrasive use-wear (strikations and/or smoothed areas with levelling of grains) on their use-faces. These implements are further subdivided into the following categories:

C.1. Abraders: tools with a rough texture that were employed in order to alter the contact surface by removing material through abrasion (cf. Adams 2002: 79-80). Among the abrading tools identified within the Sissi ground stone assemblage there is a number that are rectangular/sub-rectangular in shape with use-faces that exhibit abrasive wear (smooth abraded surfaces) and frequently shallow grooves or deep gouges (fig. 10.1). Their size ranges between 81-157 mm in length, 34-58 mm in width, 15-38 mm in thickness, and 96-536 g in weight. Similar tools occur in other Bronze Age assemblages in Crete and have been classified as ‘whetstones’ (Evely 1984: 226-229; Blitzer 1995:442; Carter 2004: 74). These tools have been frequently associated with the production of metal tools. The distinct shape of these tools, usually the result of deliberate modification, in addition to what it seems to be a preference for fine to medium grained rocks such as phyllite, sandstone and quartzite, makes these objects a coherent group that stands out in relation to other abrading tools of a more irregular shape. At this stage of the analysis the term ‘whetstone’ has been retained for this group of abrasive tools in order to facilitate comparisons with other published assemblages. Once the analysis of the Sissi ground stone assemblage is completed, the
10. Ground stone technologies at the Bronze Age settlement of Sissi. Preliminary Results

terminology will be refined based on the actual wear patterns and the size and type of the use-faces (e.g. abraders with flat working surface or V- or U-shaped grooves) encountered on the different abrading tools. Differences in the shape of the use-face are indicative of the possible uses tools were employed for. For instance, V-shaped grooves are formed during the working of tools with thin edges or with pointed ends such as awls and needles, whereas U-shaped ones relate to the working of bone or wooden shafts (Adams 2002: 82-91). This category corresponds to Blitzer Type 5 implements (Blitzer 1995: 441-442).

C.2. polishers/smoothing stones: tools with a smooth texture that exhibit smoothed use-faces with visible sheen (i.e. polish) as well as multiple striations as a result of abrasive and tribochemical interactions (Blitzer Type 16C, 1995: 478). They are unmodified small sized cobbles and pebbles, mainly of fine grained limestone, and range between 22-97 mm in length, 22-69 mm in width, 13-42 mm in thickness, and 20-459 g in weight. The majority have one use-face and judging from the development of the wear on the use-face they were used for polishing relatively small surfaces.

C.3. sub-cuboid polishers. They are distinguished by other polishing tools mainly by their regular form, frequently the result of intentional modification. Similar examples occur in various Bronze Age sites in Crete (Evely 1984; Carter 2004). Two examples have been identified at Sissi which are spherical in section with convex or use-flattened working faces. One is made of quartzite and the other example recovered in Zone 6 during the 2011 season is made of amphibolite. The quartzite implement, which survives complete, is 53.70 mm long, 54.73 mm wide, 48.79 mm thick and weighs 214 g. The use-face is 33.41mm long and 36.51 mm wide.

C.4. grinding slabs/querns: lower stationary grinding tools upon which a variety of substances such as grains, pigments, clay, acorns, and spices were ground and pulverised, most frequently in conjunction with an upper handheld tool (Wright 1992a; Blitzer Type 17, 1995: 479). Grinding slabs could have also been employed in the production of other artefacts such as ornaments and tools (Runnels 1981; Tsoraki 2008, 2011b; Stroulia 2010). The Sissi examples are mainly sub-rectangular/ovate in plan view, have one flat to slightly concave use-face and show variation in their dimensions. Variation in the size of these tools has implications for the character of the tools (movable or stationary), the location and organisation of the activities (flexible or fixed) and the scale of processing. In terms of raw materials, there is a preference for sedimentary rocks such as sandstone due to their gritty texture that enables the grinding process.

C.5. grinders: upper handheld tools used in conjunction with grinding slabs for grinding and pulverising activities (Wright 1992b; Blitzer Type 7, 1995: 451). Similar to lower grinding tools, there is a tendency to use sedimentary rocks such as different qualities of sandstone and limestone. These are mainly ovate/sub-rectangular in plan view, ovate/spherical or plano-convex in section with one flat or convex use-face. The dimensions of complete examples are 87-183 mm long, 59-116 mm wide and 37-72 mm thick and their weight ranges between 408-1555 g. Variation in the size of grinders has implications for the kinetics involved during use; for instance, some of these examples would have been operated by one hand possibly in rotary grinding or others would have required the use of both hands in reciprocal grinding (one-hand/two-hand manos, see Adams 2002). The wear damage encountered on the use-faces of these tools includes abrasive wear, levelling of grains and unidirectional (mainly perpendicular to long axis) or multidirectional striations.

C.6. mortars are lower, stationary tools with a basin/concavity within which a variety of substances were processed usually with a pestle or other percussive/abrasive tools5 (Blitzer Type 18, 1995: 481-482). Percussive (i.e. pitted surface) and/or abrasive wear are visible on the bottom and side walls of the use-faces indicative of crushing/pounding, stirring/mixing and grinding activities (Wright 1992b: 65; Adams 2002: 127). Among the examples identified at Sissi of great interest is the tripod mortar unearthed in Zone 5 (see Sissi II: 151, fig. 6.14). Although this object has not been studied yet, the characteristic three legs and the overall careful working make this specimen stand out within the ground stone assemblage as a whole. This object corresponds to MSV Type 45 (Warren 1969: 115-117).

C.7. pestles are handheld tools of usually elongated shape employed for pulverizing and grinding activities

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4 The direction (multidirectional/unidirectional) and the location (perpendicular to the long axis of the tool) of the striations are indicative of the kinetics involved during the grinding process.

5 Mortars could have been used in conjunction with stone or wooden pestles (Wright 1992).
frequently, but not always\(^6\), in conjunction with a lower stationary tool. Variations in size may be indicative of intended function with small sized pestles used for grinding, stirring and mixing activities, whereas larger and heavier pestles used for crushing activities. Pestles could have been used for the processing of food and non-food substances (e.g. pigments, clay) (Adams 2002: 138-142). To date, only two pestles have been identified within the Sissi ground stone assemblage (for a description see below).

D. Ornaments. Two sub-categories have been identified: beads and ‘conical buttons’ (cf. Evely 1984: 239). Similar to other Cretan assemblages, the Sissi examples are made of serpentine and steatite (see Gaignerot, this volume, fig. 4.12, and Jusseret, this volume, fig. 6.22).

E. Stone vases. Different types of stone vases have been identified at Sissi including bowls (bird’s nest bowls: MSV 3, blossom bowls: MSV 5), block vases/kernoi (MSV 4), lamps (MSV 24) and lids (MSV 27). Serpentine is the dominant raw material among the recorded examples, but also a possible example of calcite has been identified.

F. Miscellaneous artefacts. This category includes a small number of artefacts that do not fit in the previous categories:

F.1. rocks with natural perforations: these examples have natural surfaces that do not bear any visible manufacturing wear (Blitzer Type 12A, 1995: 467).

F.2. pitted/cupped stones: stones that have one or two opposed depressions (cupules) that were created by percussion and exhibit impact fractures. They could have been intended to be used as drill caps, but the lack of abrasive wear within the depressions (i.e. the impact fractures are not rounded and smoothed) does not support this. Other possibilities to explore are whether the percussive wear relate to use (e.g. anvils) (Adams 2002: 136; Antonovic 2006: 26, catalogue 65-74) or whether these objects represent a stage in the manufacture of other object types, where percussion was used in order to remove material prior to the drilling of the stone (e.g. perforated stone rings, see below). The depth of the concavities ranges between 5.96 mm and 8.67 mm and the diameter of the depression is ca. 29 mm. Their function is unclear and for this reason in the current study they are recorded according to a common characteristic they all share (depression) and not to their possible use.

F.3. perforated stone rings: intentionally modified cobbles that are circular in plan view and have a biconical perforation that is centrally located. Similar objects are documented throughout the Neolithic (Neolithic Knossos, Tsraki in prep.) and Bronze Age period in Crete (Warren 1972: 237-239; Blitzer 1995: 470, Type 12D; Carter 2004: 80, Type 22). Suggested uses include loomweights, net sinkers, or weights used in tandem with digging sticks (Blitzer 1995; Carter 2004). Variations mainly in the diameter of the perforation are attested between different assemblages, which may suggest different functions (compare for instance Blitzer 1995, Plate 8.72 and fig. 10.2, this chapter). The Sissi example is made of limestone and is broken in half (fig. 10.2).

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\(^6\) Cautionary tales are provided from ethnographic work, where reference is made to the use of pestles on various surfaces such as the ground. For instance, Adams (2002: 138) refers to an ethnographic example from the U.S. Southwest where stone pestles were used for crushing clay on a blanket.
G. Multiple-use tools: tools that have been used in more than one activity concurrently. Different use-faces have been employed for different activities and hence use in one task does not hinder use in another (*concomitant use*). This category includes the following sub-types: polisher/hammerstone, and grinder/pounder (fig. 10.3).

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**Fig. 10.3.** Grinder/pecking tool (GS 82/10-06-2059-OB002) from **Space 6.1**: A) Plan view of the tool where red arrows indicate the ridges of the ovate area created as a result of use against a flat surface. B) Detail of the regular pecking used to roughen the surface of the tool (B. Chan)

H. Debitage, cores and unworked nodules.

Excluding indeterminate cases, the vast majority of the objects recorded have been attributed to the grinding/abrasive category (43.8%), followed by percussive tools (16%) and multiple-use tools (13%) (Table 10.1). Grinders occur more frequently (ca. 10%), followed by pounders (ca. 8%) and grinding slabs/querns (ca. 7%). It should be stressed, however, that, once the analysis of the whole ground stone assemblage is completed, the proportions of the various object categories as well as the frequency of objects in the different zones will be significantly revised.

### 3.2. Raw material procurement and use

A range of metamorphic, igneous and sedimentary rocks were encountered in the Sissi assemblage. Excluding indeterminate cases, sedimentary and metamorphic rocks (51.8% and 45.9% respectively) occur more frequently than igneous ones (1.8%) (fig. 10.4), with limestone of different qualities (ca. 26%) and quartzite (23%) constituting the primary rock types exploited at Bronze Age Sissi, followed by sandstone of different qualities (ca. 16%). Among the recorded igneous specimens there are two pieces of pumice that have been modified through use (fig. 10.5). Unworked pumice lumps of different sizes, however, are very frequently encountered in different levels and in different Zones, with the largest concentration occurring in Zone 3 (see *Sissi I*: 97-98; Gaignerot & Driessen

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7 This type of use contrasts with *sequential use* (Adams 2002: 24); this term refers to the reuse of tools in an activity that does not permit the tool to function any longer in its primary use. In this case the same use-face is used for the different activities.
During 2011 a preliminary assessment of the pumice from the 2010 season was undertaken with the aim to identify all possible worked material. Pumice from all contexts was weighed and the average dimensions were recorded.

The nature of the geological resources employed for the production of stone objects was assessed by recording the presence or absence of naturally weathered surfaces on artefacts. This could shed light on procurement method(s) (quarrying of primary outcrops or collection of secondary deposits) and the form in which specimens entered the site (as unworked nodules or (semi-)finished products).

The analysis of weathering coverage on artefacts has shown that more than 60% of the assemblage has more than 50% of weathered surfaces still visible and ca. 10% of ground stone artefacts have no or less than 25% of weathered surfaces. The frequency of weathered surfaces is mirrored in both sedimentary and metamorphic rocks, though steatite and serpentinite specimens (both metamorphic rocks) tend to have no weathered surfaces on their surfaces, as is also the case for the unique example of the medium to coarse-grained igneous rock (possibly microgranite or granodiorite).

The relative frequency of weathered surfaces, however, is heavily affected by the extent of manufacture and/or use. Thus ground stone artefacts with no weathered surfaces belong to formal object categories (i.e. the pestles from Zone 3, stone vases and ornaments) that acquired their form through a more rigid manufacturing sequence of steps.

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8 I would like to thank Florence Gaignerot-Driessen for giving me access to her unpublished work.
In all, the high percentage of weathering in addition to the presence of unworked nodules in the form of water-worn material suggests that secondary deposits from river beds and/or the nearby beach (pebbles/cobbles/boulders) had been employed extensively as raw materials for the ground stone assemblage at Sissi. The production of certain objects such as the production of stone vases, on the other hand, seems to have relied on the exploitation of primary sources. This is in line with results from other sites in Bronze Age Crete (e.g. Warren 1969). Thus far, no blocks from primary sources or other unworked material of an adequate size (e.g. see Carter 2004: 114 where large serpentinite cobbles were unearthed at Mochlos) have been identified within the Sissi assemblage during the analysis, which raises issues regarding the on-site production of stone vases at Sissi (see section on production).

Overall, the Sissi assemblage is comprised predominantly of raw materials that are available in the immediate or nearby vicinity of the settlement. These include grey limestone and quartzite. Despite the principal reliance on local resources, raw materials that originate from regional sources within Crete (e.g. serpentinite, steatite and possible microgranite/granodiorite) or even further afield are also encountered, albeit in very limited numbers. These materials occur at the site only in a worked form which suggests that they entered the site as finished objects. The objects may have been acquired either through direct procurement or through exchange networks. In either scenario the acquisition of these objects may have been incorporated within other procurement practices that were at work at Sissi (e.g. obsidian procurement).

For the production of grinding tools sedimentary rocks (sandstone and limestone of different qualities) tend to be used more frequently, followed by metamorphic quartzite. When the various categories of grinding tools are considered, the abrasive capacities of sandstone were sought after for upper and lower grinding tools. Abraders were made of fine to medium grained sandstone, quartzite and pumice, while for polishing tools raw materials with less abrasive texture such as fine-grained limestone and marble were chosen. In the case of percussive tools, mainly metamorphic rocks and in particular quartzite were employed; quartzite specimens due to their physical properties would have been able to withstand impact force efficiently. Serpentinite and steatite was used for formal objects and in particular for stone vases, ornaments as well as for a small-sized pestle. An issue to explore is whether the serpentinite used for the above categories corresponds to the type of serpentinite used for seal stones (e.g. seal stone 10-06-2055-0B002 in Space 6.1-see Sissi II: 171) or whether different varieties of serpentinite were used for different types of objects.

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9 This suggestion may need to be revised once the whole ground stone assemblage is studied.
3.3. Production processes

The Sissi ground stone assemblage can be divided into tools that do not bear any evidence of deliberate modification prior to use and thus represent expedient tools or *outils a posteriori* (Wright 1992: 57, fn 38), and others, such as stone vases, grinding slabs, mortars, pestles and ornaments, that have been deliberately modified to acquire their specific shape and surface finish and thus represent formal object categories. Seven manufacturing techniques have been recorded (flaking, pecking, hammering, grinding, polishing, incising and drilling), while a combination of these techniques (e.g. pecking and grinding) is also attested in a few cases.

Percussive tools are mainly water-worn cobbles that exhibit damage on one or both ends and with no modification of the natural weathered surfaces prior to use. In the case of perforated rings modification is limited to the area of the central perforation. The opening of the perforation was a two-stage process: initially direct percussion was applied on both faces to create a central depression and remove unwanted material, and then abrasion was used to complete the operation.

Similar to grinding tools from other Aegean sites (cf. Runnels 1981; Tsoraki 2008), the Sissi grinding slabs and grinders (upper and lower grinding tools) have received minimal modification with manufacturing evidence limited to the preparation of the active use-face by pecking (as seen in GS82/10-06-2059-OB002, fig.10.3) and the margins (pecking and/or hammering), while the rest of the tool surface was left untreated. Some examples, however, have been shaped further; for instance, in the case of GS4/10-05-1929-OB008 one margin of the grinding tool has been modified by percussion flaking in order to create a hand grip, a comfort feature that would allow for better and more comfortable handling of the tool during use (fig. 10.6). Maintenance activities are attested occasionally on grinding tools: use-faces that through use have become too smooth to function efficiently have been re-pecked in order to retain the abrasive capacity of the tool.

Overall, the rather minimal modification level encountered in the above implements contrasts greatly with pestles, stone vases and ornaments where natural surfaces have been completely modified through a more thorough manufacturing process. In these cases, grinding and polishing are the most frequent techniques visible on the surface of the objects, which have erased traces of the earlier stages of manufacture (e.g. pecking for shaping).

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Fig. 10.6. A. Grinding tool (GS4/10-05-1929-OB008) with hand grip (comfort feature) on margin. B. Detail of margin that has been modified by percussion flaking (C. Tsoraki/B. Chan)

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10 During the recording of the ground stone assemblage a unique number that consists of the letters GS (ground stone) and a number was allocated to each object. Throughout the discussion of the material both the GS no and the excavation object no. are given together.
As mentioned above, no blocks from primary sources have been unearthed at Sissi. If this is corroborated by the analysis of the remaining finds, it would suggest that not all stages of the production of stone vases took place on site; rather, the initial stages of the production/shaping of raw material took place off-site and stone vases entered Sissi potentially as rough-outs or at a semi-finished state or even as finished objects. Similarly, the presence of the igneous pestle (GS152/11-03-0559-OB001) with the faceted profile found in Room 3.6 — a find thus far unique within the assemblage — points towards the exchange of finished objects between different communities and regions of Crete or further afield. The pestle is made of a medium to coarse-grained igneous rock and, similar to the serpentinite pestle, is also of non-local origin. This finely worked example survives complete and its overall dimensions are 83.97 x 50.54 x 50.77 mm and weighs 264 g (fig. 10.7). The pestle is conical in shape and polygonal in section; the body of the tool has been nicely shaped through grinding and eight facets form on the body. The facets are not exactly of the same width, the majority being around 16.30 mm, while a couple are narrower. Both ends have been used: the use-face at the wider end is slightly convex and has pounding wear and smoothed grains, while on the body next to the use-face there is a negative removal from a flake detached possibly during use. The narrower end has a more convex use face with mainly pounding wear and a flake removal on the body. Overall, this example stands out not only because of its rarity, but also in terms of its raw material and the careful working which contrasts greatly with the mainly expedient use of local materials for tools that have been modified mainly through use and have not undergone different stages of manufacture. It is clearly a more elaborate example. Examples of finely worked pestles are known from Neopalatial contexts at Knossos, Palaikastro, Gournia and Mochlos (cf. Evely 1984; Carter 2004: 65). Emphasis on the aesthetic properties of these implements, either in

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11 Another possibility to explore is whether some of the stone vases, especially those found in Postpalatial levels, had in fact been manufactured in earlier periods and continued to be used in later periods (cf. Warren 1969: 190-191).

12 According to Blitzer (1995: 477) ‘in contrast to their frequent use in the Bronze Age Greek mainland and the Cyclades, intentionally shaped stone pestles are not common implements in Bronze Age Crete’. If this holds true, then the origin of the pestle might be sought outside Crete. Based on the form and dimensions of pestles found in the Unexplored Mansion, Evely (1984: 225-226) suggested that, in some cases, these were reworked bore cores from stone vase manufacture.
terms of colour patterning or in the quality of the finishing, has been highlighted in other cases as well (cf. Evely 1984).

A similar suggestion for the exchange of finished objects could be made for the tripod mortar found in Zone 5 (Sissi II: 151, fig. 6.14). Overall, tripod mortars are not well represented within Cretan sites, with ca. 25 currently known examples, deriving mainly from sites in North-central and Eastern Crete (Warren 1969: 115-117; Carter 2004: 77 and references therein). Warren, following Buchholz, refers to this type of mortars as 'Syro-Palestinian tripod mortars' (1969: 115) and the prevailing opinion is that the majority of the examples found in Crete are Aegean imports (Evely 1993: 112; Carter 2004: 77).

3.4. Use/Reuse

The majority of the ground stone implements have been moderately used and less than 4% of tools had been heavily used or worn out as suggested by the degree of wear and the number of use-faces on each object. Secondary use/reuse of ground stone objects occurs rather rarely at Sissi and it materialises mainly in the incorporation of large-size grinding tools in constructions/walls as building materials (e.g. large quern set in the wall/stone platform in room 3.2 with the concave use-face facing upwards, fig. 10.8 & Sissi II: 126, fig. 5.60).

Fig. 10.8. LARGE-SIZED QuERN SET IN THE WALL/STONE PLATFORM IN ROOM 3.2 WITH THE CONCAVE USE-FACE FACING UPWARDS (C. TΣORAKI)
3.5. **Preservation**

The condition of the ground stone artefacts was recorded in order to assess possible use and discard practices; for instance, the presence of burning could either be the result of the use of stone for heat retention for possible cooking activities\(^\text{13}\) (e.g. fire-cracked natural pebbles and cobbles) or could be indicative of discard practices (e.g. deliberate or accidental destruction). Overall, ground stone objects survive in good condition and ca. 50% of the objects survive complete. Grinding slabs tend to be found broken, with the length being the main incomplete dimension. This type of fragmentation is as expected for large-sized objects. This contrasts to the condition of smaller-sized objects such as polishers that survive complete. Use or destruction with fire of ground stone objects does not seem to have played an important role at Sissi as less than 3% of objects show evidence of burning.

With the exception of a few complete or almost complete examples (cf. *Sissi II*: 78, fig. 4.11g), stone vases survive most often in a fragmentary state (body fragments). A preliminary assessment of the stone vase assemblage suggests that these fragments are completely polished and seem to belong to finished vases that were broken during use or during various destruction events, and not to vases that broke accidentally during manufacture.

4. **Preliminary observations on the spatial distribution of ground stone objects**

Analysis of the spatial distribution of ground stone artefacts is of great importance as this type of analysis may shed light on the nature of activities that took place in different contexts (e.g. internal vs. external areas), while it can also provide insights into the organisation of food preparation and craft production. The following sections will concentrate on material from particular contexts, the study of which is more advanced. Since the study of the ground stone assemblage is incomplete, the following results are mostly tentative in nature.

4.1. **Building BC (Zone 2)**

<table>
<thead>
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<th>Object Category</th>
<th>2.12</th>
<th>2.6</th>
<th>2.8</th>
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<th>NW of wall B33</th>
<th>Total</th>
</tr>
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<td>1</td>
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<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>percussive-pounder</td>
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<td>0</td>
<td>0</td>
<td>1</td>
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<td>1</td>
</tr>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>grinding/abrasive-grinding slab</td>
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<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>grind/abras-grind. slab or grinder</td>
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<td>1</td>
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</tr>
<tr>
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<td>1</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>13</td>
</tr>
</tbody>
</table>

Tab. 10.2. **The distribution of the recorded ground stone objects within building BC**

\(^{13}\) Fire-cracked rocks or potboilers may occur in food preparation areas such as ‘kitchens’ in close proximity to fire installations/thermal structures such as hearths and ovens. The use of hot stone technology for different type of cooking has been documented ethnographically (Adams 2002).
Thirteen objects have been studied from Zone 2, including upper (grinder) and lower grinding (querns/grinding slabs) tools, percussive tools, a cobbled with a natural perforation and an unworked cobbled of sandstone. In addition, a large boulder of schist, with no apparent use wear, has been recorded (Space 2.8). As the original surface of the boulder does not survive, it is not possible to assess whether this had in fact been used in some manner prior to discard (Table 10.2). In terms of raw materials, mainly sedimentary rocks (sandstone of different qualities, limestone, conglomerate) and quartzite have been used. The ground stone tools show minimal effort in their production: the grinding tools have been coarsely shaped with flaking/hammering along their margins with most emphasis placed on roughening the use-face of the tools through pecking and occasionally maintaining the surface roughness by re-pecking the use-face (e.g. GS125/10-02-1298-OB001). The majority of the artefacts survive incomplete and were lightly or moderately used prior to their discard as suggested by the degree of wear, number of use-faces (most objects have only one use-face) and lack of repeated maintenance episodes. Although ground stone assemblages only provide very coarse resolution as chronological indicators, the tools from Zone 2 show similarities with other LMI assemblages in Crete (e.g. Mochlos-Carter pers.com), which corroborates the dating suggested by the pottery. The studied material comes mainly from Spaces 2.6 and 2.8 and one object from Space 2.1214 (Table 10.2).

Space 2.6 gave a complete grinder (GS131/10-02-1260-OB001) with a convex use-face with overall dimensions 101.05 x 75.13 x 45.32 mm and a grinding slab/quern (GS133/10-02-1289-OB002) with one concave use-face that survives incomplete. Based on the morphological characteristics of these tools, it is very likely that these had in fact been used together as part of a toolkit. According to the excavator (Sissi II: 71), Space 2.6 was used as a dumping place; if indeed the ground stone tools from this space relate to the dumping activities that took place there, it is interesting then that the tools were discarded although they had not yet reached a worn-out state but instead they could have continued to be used or recycled, if required. Two further grinding tools were found in Space 2.8: a quartzite (GS125/10-02-1298-OB001) and a sandstone quern (GS126/10-02-1295-OB001) that both have only one concave use-face and survive incomplete. Both tools have moderate wear. The fact that grinding tools have been found in different areas of the building suggests that possibly grinding activities were performed in more than one room within one building. Interestingly, however, grinding tools and potentially grinding activities tend to concentrate in the North-east part of Building BC, where also the circular ammouda gourna/possible mortar (09-02-1235-FE001) was found in the north corner of Space 2.9. In fact this space gave a possible hammer/pestle that could have been used in conjunction with this gourna/mortar. A possibility to explore is whether the different spaces in the building were associated with different types of grinding activities (e.g. food processing vs. processing of clay and minerals). This needs to be considered in relation to the excavator’s suggestion that at the later stages of its use-life Space 2.8 was used as a food preparation area, an interpretation that is corroborated by the presence of a hearth and two tripod cooking pots among others large vases (Sissi II: 73). This interpretation will be further explored in conjunction with the results of the environmental analysis.

In addition to the grinding tools, Space 2.8 gave also a water-worn limestone cobbled with a natural perforation (GS124/10-02-1288-OB001), the diameter of which is 22 mm. This implement has natural surfaces that do not bear any visible wear. The natural perforation was most likely the reason this was brought to the site. As an isolated artefact, it is hard to suggest what function it fulfilled. The presence, however, of naturally perforated stones in this area needs to be considered in relation to the loom-weights and other perforated objects unearthed within Building BC and Spaces 2.6 and 2.8 in particular. Naturally perforated stones – commonly encountered in various Bronze Age sites such as Kommos (Blitzer 1995: 467-468) – could have been intentionally brought to the settlement to be used as loom-weights or as other types of weights. It is not very clear, however, how well this particular object could have worked as a type of weight and especially as a loom-weight due to its irregular shape and off-centre perforation, although use as a fishing weight is a possibility.

4.2. Building CD (Zone 3)

The study of the Zone 3 ground stone assemblage is the most extensive to date as material from all previous

14 According to the excavation report of this zone (Sissi II: 78) a range of stone objects have been recovered within Space 2.12 that have not been analysed yet and thus are not included in this report.
excavation seasons has been assessed. In addition, material that was found in situ and is still on site has been assessed and is included in this report.

One of the striking features of this zone is the relative large number of unusual raw materials such as the serpentinite pestle, the igneous (pink granodiorite/microgranite?) pestle, the phyllite whetstone, steatite ‘button’, and an indeterminate metamorphic rock of black-blue colour used as a whetstone/abrader.

### 4.2.1. Room 3.8/The Shrine

Two spaces have been identified north of Room 3.8 (i.e. Room 3.9 & 3.10) which contained a concentration of water-worn pebbles and cobbles, small fragments of shell and a crab pincer (Sissi II: 89). Pebbles and cobbles were also present in Room 3.8, a sample of which was collected during excavation. They seem to be natural water-worn rocks of different sizes, colours and geologies (e.g. quartz, limestone/marble, quartzite, sandstone with well cemented grains). Within Room 3.8 a triangular stone has been found near wall C27, which has been interpreted as an offering table or a platform by the excavator (Sissi II: 92). Upon visual inspection of this stone, apart from a couple of flake removals on one margin, no other manufacturing and/or use-wear was detected. In the space between the wall and the triangular stone three kalathoi have been found in situ and inside one of them a percussive tool made of limestone was found (GS189/09-03-0514-OB006) (Sissi II: 89). The tool was moderately used on one end for pounding. This room also contained an object made of schist that due to burning has become very friable (GS192/09-03-0514-OB010) and a stone vase fragment (body) (GS200/09-03-0506-OB002) that shows no evidence for burning.

Within Room 3.8 and against the West wall (C14) a double gourna made of ammoida, which has two circular concavities (depressions) (C27) was located (fig. 10.9). Due to weathering, the walls of the gourna do not survive complete and the original depth of the concavities cannot be measured. During the excavation scattered bone and shell fragments were identified in the area around the double gourna, which the excavator interpreted as the remains of offerings that were prepared in this room (Sissi II: 89). Interestingly, in this area next to the gourna a pounding tool made of quartzite was found that has pounding wear on both ends and survives in a good condition (GS 187/09-03-0513-SA004). Thus, this pounder could have been moderately used in conjunction with the gourna for crushing bone and shells.

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**Fig. 10.9.** DOUBLE GOURNA (C27) WITH TWO CIRCULAR CONCAVITIES LOCATED IN ROOM 3.8 (C. TSORAKI)

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15 This object was found in an area where traces of burnt earth and burnt pottery were encountered together with a fragment of a triton shell, a jug, a stirrup jar and a fragmentary vase (Sissi II: 89).
Overall, the ground stone assemblage from Room 3.8 suggests a very limited range of activities taking place there, mainly pounding ones, which fits well with the presence of crushed shells and bone found in this space. This contrasts with the assemblage from the nearby rooms where a wider range of activities seems to be represented (grinding, coarser abrasion, finer polishing, pounding). This together with the unique character of the rest of the finds recovered from Room 3.8 (see Sissi II: 89-92) clearly highlights the distinct function of the room within Building CD. The high occurrence of water-worn pebbles and cobbles raises the issue whether in fact natural rocks were intentionally deposited within this room perhaps as part of a ritual act. The deposition of water-worn pebbles in this context when seen together with the triton shells, other shell fragments and the crab pincer may be viewed as a deliberate act referencing the water/sea\(^16\) (see also Veropoulidou, this volume).

### 4.2.2. Room 3.1/The Hall

Room 3.1, sited on the summit of the Kefali hill, represents the central space of Building CD. This room contained a relative large number of ground stone objects of both portable and stationary character, the latter used in connection with other fixed structures. Among the interesting contexts within Zone 3/Building CD is the bin (C31) located in the south-west corner of Room 3.1. The bin contained twelve objects that are mainly water-worn cobbles and pebbles of various sizes and mainly made of quartzite and limestone (fig. 10.10). The vast majority, with a couple of exceptions, survive complete and do not show clear evidence for use. This may suggest that these objects had been used lightly as polishers and/or abraders and thus this light use did not alter the texture of their surface. Another possibility to explore is whether this assemblage of cobbles and pebbles potentially represents the storage of raw materials and objects for future use (raw material reserve). Storing, however, material that exists in large numbers in the immediate vicinity of the settlement seems rather puzzling. This raises the possibility whether the storage of the natural water-worn rocks was not intended for strictly functional reasons, but instead this act may be seen in relation to the presence of natural pebbles and cobbles that have been deposited within Room 3.8.

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\(^{16}\) The deposition of a unique assemblage of ecofacts and artefacts including a large number of seashells and fish vertebrae within the two cists of the Temple Repositories has been interpreted by E. Hatzaki as an act of structured deposition with ritual connotations (Hatzaki 2009).
Among the material stored within this feature the only implements that show clearer evidence for use is a rectangular abrader with light wear (GS 110/10-03-0533-OB011), a cobble with pecking on its margin (GS 115/10-03-0533-OB002) and a small sized pestle (GS 111/10-03-0533-OB007). The latter stands out in terms of raw material (made of serpentine which has been used almost exclusively for stone vases and seal stones), object type (pestles are very rare at Sissi) and degree of wear (both ends have been used relatively heavily and in fact part of the tool use-face was detached due to use).

In close proximity to this constructed bin (C31), another feature (C34) is located that consists of two slabs: one is made of ammouda and has a circular shallow depression/concavity and the other slab is made of limestone (sidheropetra). Overall, the former tool is well shaped with pecking and chiseling marks visible on its margins. The depression, which is not centrally located, is 185 mm wide and 29.83 mm deep (maximum depth). The interior of the concavity was pecked and the bottom of the concavity has both abrasive (it is smoothed in places) and pounding wear from use. The slab next to it has an uneven surface and looks natural. The excavator has interpreted them as a worktop/working surface and a seat (Sissi II: 96). At this stage it is not possible to link the material stored in the bin with the possible function of this feature, with the exception possibly of the serpentine pestle and the slab with the circular depression.

Another feature that was revealed in this room is a semi-circular stone structure (C30) built against Wall C18 which was interpreted as a possible pot-stand (Sissi II: 96). This structure seems to have been used in connection with a stone tool made of conglomerate that has a centrally located circular concavity that is 24.62 mm deep and ca 152-157 mm wide (fig. 10.11). The tool has been used for a grinding activity rather than a pounding one as the wear in the interior of the concavity suggests (i.e. smoothed grains that are levelled). This tool, that seems to have rested on the wall, functioned as a shallow mortar and is part of a stationary grinding structure. Pottery vessels placed in the pot-stand would have facilitated the collection of the processed substance during processing. Yet, it should be pointed out that the small size of the concavity would have allowed only for small quantities of material (organic or inorganic) to be processed at a time. It is worth considering whether its use was meant for products that were not used or consumed in large quantities and/or not regularly. The stationary character of this installation would have ramifications for the organisation and use of this space.

Fig. 10.11. SHALLOW MORTAR FOUND IN ROOM 3.1 IN RELATION TO A SEMI-CIRCULAR STRUCTURE (C30) (AFTER REPOSITIONING) (C. TSORAKI)
4.2.3. Room 3.6

One of the issues that was explored with regards to the material from this zone was whether Room 3.6 may have been used as a workshop (possibly of stone vases) due to the nature of the materials recovered from this area thus far. Indeed, the ground stone assemblage from this room and Zone 3 as a whole presents some variability in assemblage composition (in terms of the object types, raw materials and activities represented) when compared to other buildings/zones.

One of the expectations was that if this space (Room 3.6 along with Room 3.4, 3.3 and the area between Rooms 3.3 and 3.4) was a stone-working area there would be a considerable amount of discarded stone debris, possible roughouts and unfinished objects or rejected material that fractured during manufacture along with finished objects and blocks of raw material (as is the case, for instance, at the Atelier des Sceaux at Quartier Mu, Poursat 1996: 103-110). Room 3.6, however, was characterised by the lack of manufacturing debris, also confirmed by the absence of micro-debitage in the flotation samples taken from this room, the processing of which did not show any higher concentration of stone fragments, or the presence of unusual rocks. Overall, these samples did not stand out in any way from other flotation samples and no unusual quantities of other materials, seeds, charcoal, or shells were noted (Livarda & Environmental team, pers. comm.). The evidence for the occurrence of manufacturing debris in the area adjacent to Room 3.6 is equally very limited: only one bore core (GS 174/08-03-0451-OB006) was found in Room 3.3. Yet, the limited presence of manufacturing waste by-products was noted in the Artisan’s Quarter at Neopalatial Mochlos as well as in other Minoan and Egyptian workshops (Warren 1969: 157-158; Carter 2004: 82). A possibility to explore is whether this space was intentionally cleaned out regularly which would have resulted in the dumping of the waste perhaps in an external area.

Another element to consider with regards to the use of this area as a workshop is the type of tools present. Room 3.6 has the largest concentration of abrading and polishing tools of any other room in this building. This concentration suggests that these tools were in fact part of an abrasive/smoothing/polishing toolkit employed for a continuum of abrasive activities (from coarser to finer degree of abrasion, an equivalent of the varying degrees of the abrasiveness of modern sandpaper). Further polishing tools have been found in the area between Room 3.3 and 3.4 (GS163/08-03-0486-OB002; GS169/08-03-0482-OB002), in Room 3.3 (GS171/08-03-0454-OB003) along with a grinder (GS179/08-03-0454-OB002) and a rectangular whetstone (GS173/08-03-0463-OB001) made of phyllite (fig. 10.1). Interestingly, however, no drill-guides17 or other tools, traditionally linked with stone vase production such as spherical/sub-cuboid rotary grinders, have been found in this area of the building (see for instance Carter 2004: 82 for a possible toolkit used in the production of stone vases in Building A, Room 1 at Mochlos).

This emphasis on abrasive activities needs to be considered in tandem with the large amount of pumice stored in pithoi in this area (Room 3.6 and space between Room 3.3 and 3.4) that has already been discussed by the excavator (Sissi I: 97-98; Gaignerot & Driessen 2012). Pumice, a volcanic rock, is well known for its abrasive properties19 and has been used as an abrasive in prehistoric Crete either in a nodular form (Evely 1993; Blitzer 1995; Neolithic19 and Bronze Age Knossos, pers. observation), or in powdered form. Thus far, a quick assessment of the recovered pumice highlights the very small number of pumice nodules with evidence for use in abrasive activities (i.e. nodules bearing grooves, etc). The vast majority of the pumice assemblage does not show any evidence for deliberate modification through use and survives in an unworked state; this raises the possibility that pumice was collected and stored in order to be used in a powdered form after it had been processed.

In addition to these tools and the pumice nodules, a small number of stone vase fragments have been recovered from this area along with a serpentinite Mycenaean ‘button’, a steatite bead (GS159-11/03/0570/OB001) and the finely worked pestle (see Gaignerot, this volume). It should be noted that none of these objects represents unfinished or semi-finished objects.

17 According to Carter (2004: 72) drill-guides are defined as ‘cobbles with a straight-edged channel of semi-circular profile worn into their surfaces, the result of the stone’s contact with a turning drill-shaft’.

18 Apart from its abrasive capacities, pumice also has insulating properties while its light-weight also makes it useful for construction purposes (see also Gaignerot & Driessen 2012).

19 The use of pumice for abrading activities is attested at Late and Final Neolithic levels at Knossos (Tsoraki in prep.).
10. Ground stone technologies at the Bronze Age settlement of Sissi. Preliminary Results

4.3. Building CD (Zone 4)

Excavations at Zone 4 have brought to light a series of rooms, which form part of the large building complex CD (Sissi I: 129-138; Sissi II: 103-141). Some of the excavated contexts provide interesting insights into the use and storage of grinding tools.

4.3.1. Room 4.8

One of the objects of great interest in this room is a quern (09-04-0747-OB001), which according to the excavator was part of an installation (D30) that consisted of a thick slab and a storage vessel (Sissi II: 114, fig. 5.40). The positioning of the quern – it was found lying upside down – may suggest that the quern was deliberately placed with its use-face facing downwards in order to protect the use-face during periods when the tool was not in use. This storage practice is well documented ethnographically (cf. Roux 1985). The vessel found next to the quern could have been used for the collection of the processed substances during the grinding activity, while the stone slab may have been used in order to keep the quern stable during use. The morphology of the quern (saddle quern with concave use-face along the long axis) possibly suggests food-processing. It should be noted that in this area the highest concentration of marine food remains was found (Veropoulidou, this volume) along with charred plant remains (Livarda, pers.com.). This hypothesis will be further explored in the future when the tool is subjected to detailed study and the study of the environmental samples is completed.

4.3.2. Room 4.13

Similar to Room 4.8, indications about storage practices of grinding tools are also offered from Room 4.13. This room, located to the east of Room 4.11, contained a ‘closet-like’ construction (D44), where a number of possible stone tools\textsuperscript{20} were stored together with a grinding slab and a terracotta slab (Sissi II: 127, fig. 5.63). Interestingly, the possible stone tools had been placed underneath the grinding slab which was positioned with the use-face facing downwards. As suggested previously, this particular configuration has been linked with storage practices intended to protect the use-face of grinding tools when these are not being used. The positioning of the tools taken together with the overall character of their placement suggests that D44 relates to the storage of grinding tools (cf. Sissi II: 127).

In summary, excavations in Building CD (Zones 3 & 4) brought to light more than 100 ground stone objects, debitage and unworked nodules. The preliminary results of the spatial analysis show an uneven distribution of finds within Building CD, as well as an uneven distribution of artefact types (and thus potentially activities represented), a picture that might change once the whole assemblage of this building is taken into consideration. There seems to be a concentration of objects in the southern part of the building and in rooms that are in close proximity to Room 3.8 (The Shrine). Interestingly, however, Room 3.8 contained only a few tools, and mainly a large number of natural pebbles. Room 3.6 has a larger concentration of abrading and polishing tools than any other room in this building, a concentration that suggests that these tools were in fact part of an abrasive/polishing toolkit. This emphasis on abrasive activities needs to be considered in relation to the vast quantities of pumice unearthed from this area (Sissi I: 97-98; Gaignerot & Driessen 2012). The use of this room for stone working will be further explored in the future.

Furthermore, evidence for the storage of grinding tools, along with fixed grinding installations and the numerous occurrences of gournas/basins found in various rooms within Building CD suggests that grinding activities were activities linked to the internal organisation of the building and would have played an important role in the way rooms and spaces would have been used. The processing of foodstuffs and liquids seems to have been performed within interior spaces of the building in order to facilitate possibly the organisation of particular events.

Overall, variation in objects and potentially activities between the different rooms of Building CD, if indeed confirmed, may suggest differences in the way the space was used where different set of activities were performed in particular areas. Whether this division of space may reflect further social and/or gendered divisions, is a question to be explored in more detail in the future.

\textsuperscript{20} As these tools were recovered in the 2009 excavation season, they have not been studied yet.
4.4. Zone 5 and Pit FE087

Sixty-four objects have been studied from Zone 5. This sub-assemblage comprises mainly grinding/abrasive tools (39.1%) – in particular grinders and grinding slabs/querns (ca. 27%) (fig. 10.4) – and percussive tools (26.6%). In fact, percussive tools occur more frequently within Zone 5 than in any other Zone, an observation which of course might change once the analysis of the whole ground stone assemblage is completed. Among the excavated contexts in this zone Pit FE087, located at the open area north of Building E, stands out due to the large amount of materials deposited within this context and the character of the deposition (Sissi II: 156-157; Devolder, this volume). This feature, dated to LM IIIA2 to LM IIIB, gave the largest concentration of ground stone objects (n=50) found at Sissi with the vast majority of the material (86%) deriving from the northern part of the pit and in particular from #1927 and #1929.

Percussive tools of different sizes and raw materials have been found in pit FE087. In terms of raw materials, quartzite is the predominant material used followed by limestone. Their dimensions range from ca. 61 mm to 228 mm in length, ca. 46 to 128 mm in width and ca. 36 to 88 mm in thickness and their weight ranges from 154 g to 3100 g. The large size and the weight of the percussive tools found in this context, as well as the wear patterns encountered on their use-faces suggest that these tools had been employed in percussive activities that required heavy impact force such as building/construction activities. Yet, the condition of the tools does not suggest heavily used or worn out tools. The majority of the objects survive in good condition (also none of these shows evidence for burning): they are complete, almost complete or more than 2/3 of the tool surface survives. This suggests that the percussive tools had in fact been used for a relatively short period of time prior to their discard, possibly for a single event. This seems to fit with further observations made for the particular context. According to the excavator, the pit contained material that was linked to the clearing of a destruction deposit possibly within Building CD which among others contained mudbricks, plaster, and tarazza fragments. The tools seemed to have been discarded together with the remains of the destruction deposit in a single discard event (Sissi II: 156-157; Devolder, this volume).

Apart from percussive tools the feature also contained grinding tools of different sizes. In fact, along the edges of the pit a large quern with a concave use-face has been found; this is the largest quern found on site to date and due to its size and weight it would have originally been used as a fixed/stationary grinding tool. Interestingly, along the margin of the tool that rests on the ground there is visible flaking (hinge fractures) that seems to have taken place after the tool was used (i.e. the flaking does not seem to relate to the manufacture/shaping of the tool but to a later stage of modification). This together with the fact that the use-face of the tool exhibits a very irregular breakage might suggest the dislocation of the tool from its original position (fig. 10.12). Similar to the percussive tools, grinding tools from this context also survive in good condition and have been used moderately.

![Fig. 10.12.](image)

A. LARGE QUERN FOUND ON THE EDGE OF PIT FE087 LYING ON ITS SIDE. B. DETAIL SHOWING FLAKING (HINGE FRACTURES) ALONG THE MARGIN OF THE QUERN (C. TSORAK)

Overall, the condition of the tools deposited in this context suggests that these were discarded when still in
usable condition and were by no means exhausted. This raises the possibility whether this act of discard represents a deliberate choice to take out of circulation a set of tools that had been previously associated with a particular event and thus were no longer deemed appropriate to be used in other activities. In that sense, the interpretation of this deposit in purely practical terms may not be sufficient and other parameters (e.g. social understandings and cultural proscriptions and prescriptions) that regulate the use and discard of material culture may need to be taken into consideration.

5. Acknowledgements

I would like to thank Frank Carpentier, Maud Devolder, Florence Gaignerot-Driessen, Simon Jusseret, Quentin Letesson and Ilse Schoep for providing important contextual information. Charlotte Langohr, Florence Liard and Irene Kritikopoulos are kindly thanked for organizing the ground stone assemblage in the Apothiki, Ben Chan for assisting with the photography of objects and all the students for washing the ground stone artefacts. Sincere thanks to Simon Jusseret for offering advice and making suggestions on raw material identification during the 2011 study season. The preliminary assessment of the pumice from the 2010 campaign was conducted by Pierre Baulain, Nathalja Calliauw, Sarah Geijsels and Anneleen Rummens, whom I would like to thank for their diligence, enthusiasm and all their hard work. Finally, I would like to thank Jan Driessen for entrusting me with the study of the ground stone assemblage and for his excellent collaboration.

6. References

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This volume

Between 2007 and 2011, the Belgian School at Athens undertook excavations on the Kefali or Buff hill, east of the village of Sissi, on the north coast of Crete, only a few kilometres east of Malia. The project has revealed the remains of a settlement and cemetery, used during different phases of the Bronze Age (2500-1200 B.C.). This volume details the results of the 2011 campaign, the last in our first 5-year programme. The work in the different zones is described and reports on Late Minoan pottery, petrographic analysis, shells and ground stone tools are attached.

The authors

The excavations were carried out by the Université catholique de Louvain under the direction of Prof. J. Driessen in collaboration with a team from the Katholieke Universiteit Leuven directed by Prof. I. Schoep. Most of the contributing authors (S. Déderix, M. Devolder, S. Jusseret, C. Langohr, Q. Letesson, F. Liard) are associated with the Université catholique de Louvain (INCal-CEMA-AEGIS), others (F. Carpentier) with the Katholieke Universiteit Leuven or other institutions such as Paris IV (F. Gauguier) and the CNRS (I. Crevecoeur) whereas R. Veropoulidou is a member of the Greek archaeological service.

The series AEGIS (Aegean Interdisciplinary Studies) attempts to make the results of new archaeological research on Aegean and especially Minoan societies available to the scientific and wider public at a rapid pace. Monographs, PhD dissertations, proceedings of scientific meetings and excavation reports complete each other to offer a general view of this time frame which is of primary importance to understand the ancient world and its historical, political, symbolic and social sequences.