TEXNH
CRAFTSMEN, CRAFTSWOMEN
AND CRAFTSMANSHIP
IN THE AEGEAN BRONZE AGE

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A LM IA POTTERY KILN AT KOMMOS, CRETE

1. Excavation and Structure of the Kiln (JWS)

During the past few years, at Kommos in Southern Crete, we have revealed a well-preserved pottery kiln of Late Minoan IA date (Pl. CXVIIa-b and CXVIIIa). The kiln lies in the southern area of the site, south of the later Greek Sanctuary. ¹

During early LM IA a huge structure, faced by coursed ashlar, was built over an earlier Middle Minoan building in that area. We have dubbed the later Building T. T was characterized by spaces for storage and, perhaps, administration. Like the Minoan palaces, it featured a huge central court. Spacious stoas ran along the north and south ends of the court. For some unknown reason, after a relatively short period of use, T was abandoned within LM IA.

Both stoas were to become centers for industrial production. Still during LM IA, a pottery kiln was built next to the southern wall of the South Stoa (Pl. CXVIIa-b and CXVIIIa). Presumably the colonnade had collapsed by the time that the kiln was set in. During LM IB, the North Stoa was used for metallurgical activities.

The kiln area in the South Stoa was excavated in stages. In the process we found a portion of the southern ashlar wall of the stoa collapsed into and upon the kiln's western end, where the firing pit was located. The blocks were removed, and the final form of the kiln was revealed, with four clay-lined channels sloping up from the firing pit, which was found partially filled with ash. Scattered around the kiln was an extensive pottery dump.

The kiln's exterior measurements are about 3.50 m east-west by 2.50 m north-south. Its entrance, from the west (seen in Pl. CXVIIb), was 0.50 m wide, with three steps, two of which were plastered. Unlike the rough rubble exterior, the interior was finely plastered with clay, including the firing pit, the channels, and the upper surfaces between the channels.

The channels were excavated with care. In all of them burned red clay and pottery were found, especially conical cups (Pl. CXVIIIb). Near the firing pit were small coalesced masses of clay and ash and numerous irregular stone slabs. As viewed from the firing pit (Pl. CXVIIIc), the fill of material is clear, as is a clay lining renewal that became separated from the side of the channel.

The kiln is of an MM III-LM I type most recently studied by Doniert Evely,² namely one with a roughly oval firing pit with channels radiating out from it, in plan rather like a hand, the channels being the separated fingers. Examples have been found, for instance, at Aghia Triada by Doro Levi and Clelia Laviosa, and at Knossos by Peter Warren.³

These kilns must have had some form of covering, whether permanent or temporary, otherwise selective reduction would not have been achieved, as was the case in this kiln in the production of dark-on-light pottery. We believe that some of the burnt clay and clay plaster, as well as some of the smaller

¹ The excavation has taken place under the auspices of the American School of Classical Studies at Athens, with the cooperation of the Greek Antiquities Service, and with the backing of the Social Sciences and Humanities Research Council of Canada (Grants 411.88.0020-X6 and 410.94.1091), the Institute for Aegean Prehistory, The University of Toronto, and Lorne Wickerson. Our intention is to follow up this preliminary statement with a more thorough study.
² D. EVELY, Minoan Crafts, Tools and Techniques, an Introduction, II (SIMA 92:2, in press) 298-312.
stone slabs found within the channels, may be from the superstructure of the kiln. The covering would have been tall enough to allow for larger vases such as amphorae and pithoi, fragments of which were found in the dump, to fit upright.

There are a number of problems in any reconstruction. One is whether there was an intermediate wall between the firing pit and the channels. At Kommos, at least, there is no evidence for one. At Aghia Triada the excavators have restored such a wall.4

Another question relates to the placement of pottery in the kiln. At Aghia Triada, on the basis of remains of a grate at the far end of the channels, the excavators have restored a floor on which the pottery was placed.5 Was there such a floor at Kommos? On the one hand, the top of one of the walls between channels in the kiln (Pl. CXVIIb at a) is smoothly surfaced with plaster, presumably showing that all of the channels and the walls between them were evenly plastered and therefore complete surfaces. Thus the pottery to be fired may have been placed only on the three walls between channels, and perhaps within the channels themselves.

One can argue, however, that this would have been a very inefficient method, and that the slabs found within the channels, as well as some of the plaster fragments and burnt clay, belonged to a temporary floor of some kind. Some of the slabs used for the grate of the LM III kiln at Stylos, excavated by Kostis Davaras, for instance, are about the same size as ours.6 If such a floor existed at Kommos, it has not left any impressions or identifiable fragments.

2. The Pottery from the Kiln and the Dump7 (AVDM)

A large mass of about 26,000 potsherds weighing over 450 kg was found in and around the kiln, covering a large part of the South Stoa of Building T and spilling onto the courtyard (Pl. CXIXa). The size of the deposit, the presence of more than 300 ceramic wasters, the strikingly fresh condition of the pottery, and the repetitiveness of fabrics, shapes, and decoration lead us to think that the deposit represents the waste of the kiln operation. Even though the restorable vases are common household shapes, the absence of mendable cooking pots, lamps, and braziers indicates that it is not an ordinary household assemblage.

Only a preliminary study of this material has been conducted. Over 1,100 vases are estimated to be present in the deposit. This estimate is largely based on countable diagnostic features such as spouts, handles, and bases. Of these vases, 56% consist of conical cups (Pl. CXXa-d), 15% of other cup types and bowls, and 20% of bridge-spouted jars, juglets, and rhyta (Pl. CXIXb). Cup types include teacups (Pl. CXXe), straight-sided cups, bell cups, and medium-coarse side-spouted cups. Convex-flaring kalathoi make up most of the bowls. There are a few medium-coarse semiglobular and conical bowls, but no fine convex-sided specimens. The only jug types represented are collar-necked jugs (Pl. CXXf) and ewers. Rhyta are rare, representing 2% of the kiln material; globular rhyta outweigh piriform examples. Furthermore, 6% of the kiln deposit consists of oval-mouthed amphorae (Pl. CXXg), and the remaining 3% of basins, jars, pithoi, and fine pedestal bases. The latter bases may belong to pedestal cups (Pl. GXXh).8 The percentages of most functional categories correspond remarkably well to their relative

5 LEVI and LAVIOSA (supra n. 3) especially figs. 5, 9; DI VITA et al. (supra n. 4) fig. 204.
6 K. DAVARAS, "Μινωική κεραμική κάμινος εξ Στόλου Χανίων," *AE* (1973) 75-80.
7 A fuller description and analysis of this material will be presented in a forthcoming article on the kiln and its pottery by J.W. SHAW, A. VAN DE MOORTEL, P.M. DAY, and V KILIKOGLOU.
8 For comparable examples of fine pedestal bases, see J.A. SAKELLARAKIS and E. SAPOUNA-SAKELLARAKI, *Archaios* (1991) 144, fig. 121; A. LEMBESI, "Ιερό Ερμή και Αφροδίτη στη Συμή Βιάννου", *PAE* 1976 (1979) pl. 224a; "Ιερό Ερμή και Αφροδίτη στη Συμή Βιάννου", *PAE* 1984 (1991) 455, fig. 6; "Ιερό Ερμή και Αφροδίτη στη Συμή Βιάννου" *PAE* 1985 (1990) pl. 134b;
frequencies in Neopalatial domestic deposits at Kommos. Only amphorae are about twice as frequent. Either they broke more often during firing than other vases, or else more were produced than were needed in the household. Since Kommos was a port town, it is likely that a surplus of amphorae was produced for trade.

The decorative repertoire of the kiln pottery is surprisingly simple. Vase shapes which could be expected to carry elaborate painted ornament, such as teacups, straight-sided cups, bowls, and pouring vessels, often are either unpainted or dark-monochrome coated, and only 27% are light-on-dark patterned (Pl. CXIXe). Decorative motifs mostly are limited to thick, retorted spirals, except on kalathoi, which carry reed and arc patterns.

Even though the bulk of the decorated pottery in this assemblage belongs to the light-on-dark tradition, the deposit as a whole differs in many respects from Middle Minoan pottery deposits at Kommos, and fits a date in mid to late LM IA. This date is indicated in the first place by the finding, in the kiln mound, of a lustrous dark-on-light patterned fine bowl datable to LM IA (Pl. CXXIa). The soft, buff fabric of this in-and-out bowl suggests that it postdates the beginning of that phase at Kommos, and its decoration -especially its band of stubby leaves- place it near the middle of LM IA. Also the presence of a few lustrous dark-on-light patterned fragmentary vases mixed in with the kiln dump supports a mid to late LM IA date for the kiln's lifetime (Pl. CXXIb-i). Several of the fragments again have soft, buff fabrics (Pl. CXXIb-e), and the prevalence of tortoise-shell ripple patterns is indicative of advanced LM IA. On the other hand, the spiral motifs and plant designs would fit either the advanced or final LM IA stages distinguished at the site. The absence among this pottery of dark-on-light motifs restricted to

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10 As a result of recent excavations, we now distinguish three chronological stages in the LM IA phase at Kommos. The evidence for these is still largely unpublished. Our early LM IA stage roughly corresponds to the Transitional MM III/LM IA stage defined by P.P. BETANCOURT, Kommos II, The Final Neolithic through Middle Minoan Pottery (1990) 42-46, and to the beginning of Warren's MM IIIIB-LM IA transitional stage, recognized in Knossos and elsewhere: P. WARREN and V. HANKEY, Aegean Bronze Age Chronology (1989) 6165; P. WARREN, "A New Minoan Deposit from Knossos, c. 1600 B.C., and Its Wider Relations," BSA 86 (1991) 332-340. Our advanced LM IA stage also has affinities with Warren's transitional stage and must overlap with it to a large degree. The final stage of LM IA at Kommos shows many correspondences with Warren's mature LM IA stage, identified at Knossos and elsewhere: WARREN and HANKEY, op.cit., 72-75. The following rough synchronisms are proposed:

<table>
<thead>
<tr>
<th>Kommos</th>
<th>Knossos</th>
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<tbody>
<tr>
<td>Early LM IA</td>
<td>Beginning of &quot;Transitional MM IIIIB/LM IA&quot;</td>
</tr>
<tr>
<td>Advanced LM IA</td>
<td>Remainder of &quot;Transitional MM IIIIB/LM IA&quot; and perhaps interval of unknown duration</td>
</tr>
<tr>
<td>Final LM IA</td>
<td>Mature LM IA</td>
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More complete descriptions of the LM IA stages at Kommos and their correspondences with LM IA subdivisions made elsewhere will be published in our forthcoming article (see n. 7).

Most of the decoration of bowl C 9908 fits an advanced LM IA date, but its foliate band is paralleled only in final LM IA at Kommos. Since the bowl predates the kiln, and many kiln vases are datable to advanced LM IA, a date late in advanced LM IA, or near the middle of LM IA, is most likely for the bowl. In-and-out bowls continue to be found in final LM IA at Kommos. They also occur in mature LM IA at Knossos, but rarely: M.R. POPHAM, The Minoan Unexplored Mansion at Knossos (1984) 157.

11 Because of their rarity in the dump and their diversity, it is highly unlikely that these lustrous dark-on-light patterned fragments had been fired in the kiln.

12 See n. 10. The crocus pattern (Pl. CXXIe) is closely paralleled on a final LM IA in-and-out bowl from Building T (C 6448/C 7508) but a vine leaf pattern resembling this motif already occurs on an advanced LM IA bowl from House X (C 9744).
final LM IA, such as multiple horizontal wavy lines and blob-tailed running spirals, suggests that the kiln went out of use well before the end of the final stage of the local LM IA ceramic sequence. In Knossian terms, the life span of the kiln would have encompassed parts of the "Transitional MM IIIB/LM IA" and mature LM IA stages.13

The evidence from the kiln pottery itself conforms to this dating. The total lack of dark-ground polychromy and the poverty of white-painted motifs contrast with the more richly decorated MM III pottery assemblage. The fact that most of the dark paint employed has fired to bright red and brown colors also differs from MM III practices, when black-browns and dark reds were the norm (Pl. CXXIIA).14 Monochrome-coated conical cups and cups with hooked light-on-dark spirals of the types found in the dump do not occur in Kommos before LM IA (Pl. CXXc-d). Also significant is the absence of small, unpainted conical cups with flattened rims, and of small crudely made medium-coarse bridge-sprouted jars, both types that were typical during the MM III and early LM IA stages at Kommos.15 Instead, small unpainted conical cups with rounded rims are the most common conical cup type. Those with convex sides and partially incurving rims are typical for advanced LM IA contexts at Kommos (Pl. CXXa), and those with straight sides and rims do not occur before final LM IA (Pl. CXXb). The fact that both varieties are present in the dump indicates that it was formed in these two LM IA stages. This conclusion is further supported by evidence from other vessel types. The almost carinated profile of the teacups (Pl. CXXe) is closely paralleled by two examples from an advanced LM IA context in House X at Kommos. The rarity of teacups and the absence of fine convex-sided bowls in the dump agrees with an advanced as well as a final LM IA date, because from advanced LM IA on, many teacups and all fine bowls were painted in the new, lustrous dark-on-light scheme and not in the dark-ground tradition of the kiln vases. The relative rarity of the straight-sided cups contrasts with their prominence in MM III and early LM IA and heralds their demise at Kommos by the end of LM IA. Also indicative of an advanced and final LM IA date is the presence of collar-necked jugs in the dump (Pl. CXXf). This jug type does not appear before advanced LM IA at Kommos, or before mature LM IA elsewhere.16 Finally, the occurrence of amphorae with simple plant motifs rendered in dark paint on a fine pale buff slip shows that the deposit continued into final LM IA, because this form of decoration is only attested in that stage at Kommos (Pl. CXXg).

Seen in a larger context, the Kommos kiln evidently went out of use either not long before, or at about the same time as, the volcanic eruption at Thera, which is generally accepted to have taken place shortly before the end of LM IA.17 As at Akrotiri, the light-on-dark tradition at Kommos persisted for some time after its disappearance at Knossos, until well into the second half of the LM IA period.18 The abandonment of the Kommos kiln is likely to have coincided with the end of the light-on-dark pottery production at the site. By LM III this decorative tradition has as good as vanished from ceramic assemblages at Kommos.

Attention needs to be drawn, finally, to 65 slab fragments which have been found throughout the deposit. It is estimated that at least 18 different slabs are represented. A few must belong to square or rectangular slabs, and at least one to a semicircular slab (Pl. CXXIib). Many fragments have curved rims, and may be part of either circular or semicircular slabs (Pl. CXXIc). All are made of a coarse red fabric covered with a fine buff slip, polished in at least some cases. Two curved slabs also have a fine clay layer

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13 See n. 10.
14 Cf. BETANGOURT (supra n. 10) 45.
15 BETANCOURT (supra n. 10) 42, nn. 799, 836, 1842.
adhering to their top and bottom surfaces (Pl. CXXIIc). The possibility may be raised that the curved fragments belonged to circular clay bats placed on potters' wheelheads. They are about double the size of and thicker than the largest Minoan bats previously known: about 0.65 m in diameter as opposed to 0.30 m, and 0.025 to 0.03 m in thickness as opposed to 0.023 m. A possible explanation for their large size may be simply that they were used on potters' wheels outfitted with short vertical axles. Ethnographic and archaeological evidence, as well as experimental data gathered by Evely, suggest that such low wheels needed wheelheads or bats of this large size in order to acquire sufficient momentum for throwing pottery. A cylindrical hole has been found in the contemporary ground surface about 4 m west of the Kommos kiln. The hole is 0.20 m in diameter and 0.10 m in depth and would have been large enough to house the pivot stone for a low potter's wheel. No other evidence for the presence of a potter's workshop at this spot has been found, however, and so this reconstruction must remain tentative.

In sum, this kiln produced a range of pottery shapes for household use and perhaps also amphorae for trade. There is no evidence that cooking pots, lamps or braziers were fired in this kiln. Its operation can be dated to parts of the advanced and final LM I stages at Kommos, roughly corresponding to the end of "transitional MM IIIB-LM IA" and part of "mature LM IA," as these stages have recently been defined elsewhere on Crete. In terms of its decoration, it belongs to the end of the light-on-dark tradition. There is tentative evidence that the pottery was thrown on a low wheel, perhaps located just west of the kiln.

Future research on the kiln pottery will focus on aspects of technology as well as on the organization of pottery production at Kommos, and the wider economic implications of this activity. Since this is the first time in Minoan Crete that a substantial corpus of ceramic products has been found in direct association with the facility in which it was fired, we are given the unprecedented opportunity to document in terms of fabric preparation, decoration and manufacturing technology, the identifying characteristics of a tradition of pottery production of which the location is known. Once this tradition has been defined, we can study the distribution of its products and those of other production traditions in consumer assemblages at Kommos, and so reach a better understanding of the economic system through which pottery was distributed. Moreover, comparisons of the kiln pottery with earlier and later pottery at Kommos may allow us to identify the ancestors and successors, respectively, of the local LM IA production tradition. This, in turn, will make possible the study of production and consumption patterns over a longer time period. Specifically, in terms of recent Italian proposals that in LM IA the administrative seat of the area moved from Phaistos to Aghia Triada, and that the latter site may have come under the control of Knossos, it would be interesting to investigate whether significant changes took place in the production and consumption of pottery at that time.

3. Pottery Analysis (PMD and VK)

The discovery of the kiln at Kommos provides an excellent opportunity for scientific techniques of analysis to investigate what is a certain production assemblage. Therefore a total of 57 samples were analyzed by instrumental neutron activation analysis (INAA) and thin-section petrography. Of these a selection has been examined further by scanning electron microscopy (SEM) and x-ray diffraction.

20 Cf. EVELY (supra n. 19) 112-117.
22 Recently, petrographic analyses have shown that large groups of pottery at main Minoan sites are imported from a variety of production centers: D.E. WILSON and P.M. DAY, "Ceramic Regionalism in Prepalatial Central Crete. The Mesara Imports at EM I to EM IIA Knossos," BSA 89 (1994) 1-87; P.M. DAY, E. KIRIATZI, and D.E. WILSON (work in progress). Acknowledging the extent of pottery exchange involves searching anew for production locations for basic compositional information; kiln assemblages provide such a chance.
aim of such analyses was to characterise, in mineralogical and chemical terms, the ceramic fabrics produced in the kiln and to provide an account of the technology used in their production. These analyses will be published in full elsewhere.  

Thin-section analysis has produced a restricted number of fabric groups, which correlate both with the coarseness of the pottery and with the temperature range at which they were fired. In petrographic terms, these groups are compatible with fabrics described in previous work in the area, with a general source for their non-plastics in rocks of the the ophiolite series and schist/gneiss. These are present in the foothills of the Asteroussia Mountains on the south side of the Mesara Plain and, in smaller deposits, in the foothills of Psiloritis to the north of the Plain. Similar fabrics are present in Early, Middle, and Late Minoan fabrics of the Mesara as well as Early Minoan fabrics of the Asteroussia. Some vessels contain frequent wellrounded sand grains as the dominant non-plastics within a fine clay matrix. These are interpreted as being sand temper added by the potter and conform to a long-lived tradition of paste formation in south-central Crete during the Bronze Age.

We may list six petrographic groups, all of which are closely related.

1. Coarse sand-tempered fabric, which occurs in basins and large storage jars.
2. A medium-coarse fabric, which occurs in ewers, jugs, and oval-mouthed amphorae.
4. A fine calcareous fabric, with a relatively inactive micromass, appearing in cups, bridge-spouted jars, and other small vessels.
5. As Group 4, but with an active micromass, which suggests a lower firing temperature. Many members of this group are unpainted vessels in the same shapes as Group 4.
6. The only fabric which differs from this pattern, in that it does not have marl as a base clay, appears in two samples from clay bats. These are formed from a coarse red clay, which nevertheless has a similar mineralogy to the sand grains in the above fabric.

These analyses show clearly the specific choice of different clay pastes according to the size of the vessel, with the larger vessels having a correspondingly coarser fabric. With the exception of Group 6, such choices should be linked to the requirements of the forming, firing, and use of the vessel and reflect variations on a basic choice of raw materials and a repeated recipe. Group 6 comprises samples of unknown shapes that have an apparently non-calcareous red clay, which may have been used for its refractory properties. The groupings based on variation in the optical activity of the micromass suggest differences in the firing temperature exploited for different vessel types at a single production site.

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24 SHAW et al. (supra n. 7).
27 We are indebted to P. Betancourt, K. Branigan, F. Carinci, N. Dimopoulou, V La Rosa, A. Vasilakis, and L.V. Watrous for permission to study and sample pottery which has been used as comparative material in this study.
28 For other examples of this paste tradition, see T.M. WHITELAW, P.M. DAY, E. KIRIATZI, D.E. WILSON, and V. KILIKOGLOU, this volume; and P.M. DAY, D.E. WILSON, and E. KIRIATZI, this volume. For a discussion of sand tempering see WILSON and DAY (supra n. 23) 52.
29 As we have analysed a kiln load of known provenance, this is to be expected. The fabric differences may, however, demonstrate the choice of different raw materials according to shape and reflect the firing conditions undergone by vessels of different types.
30 These samples have been identified macroscopically as wasters.
31 For a definition of optical activity, see LK. WHITBREAD, Greek Transport Amphorae. A Petrological and Archaeological Study (Fitch Laboratory Occasional Paper 4, British School at Athens, 1955) 382.
SEM makes a valuable contribution to understanding firing atmosphere and temperature, adding substantial detail to the indications from ceramic petrography. The different modes of firing seem to be correlated, to some extent, with the type of decoration used on the vessel: this can be demonstrated with reference to the unpainted vessels, the light-on-dark vessels, and the monochrome vessels.

Three unpainted conical cups were analysed by SEM and reveal a remarkable consistency in microstructure. Their estimated firing temperature is 700-800°C. In stark contrast, the three light-on-dark vessels sampled produce an estimated firing temperature for two samples (both kathaoi) of 1000-1080°C and for the other sample (a bridge-spouted jar) of 850-1050°C. At first it might seem likely that such a difference in firing temperature is due to the need to vitrify an iron-rich painted black surface, in the case of the light-on-dark vessels. This may well be the case, but it remains to be seen whether other factors such as the size of the vessel and its intended use also have a bearing on the firing temperature. In the third category, monochrome vessels, it was found that the conical cups had a firing temperature of 800-850°C, and the two ewers were fired to 1050-1080°C.

Overall, from the SEM analysis, we may observe that there was a clear difference in firing temperature between the unpainted small vessels and the painted larger vessels; the latter being fired to a higher temperature. Furthermore, the quality of the black paint was poor, with inclusions in the paint layer and bloating of the surface very common. It might be thought that this is due to the fact that we are examining what the potters threw away, but similar pottery in contexts not associated with kilns does not seem to be different in quality. What is clear, however, is that the variance in firing temperature between different vessel types is not fortuitous, but reflects the use of firing temperatures appropriate to shape and decoration. This, combined with the choice of paste recipes, provides a testimony to technical competence and decisions taken by the potter. Such awareness can only increase our understanding of the Minoan potters' craft in the Bronze Age.

As this is a unique opportunity to characterize a kiln group from Bronze Age Crete, and as there have been problems recently in reassessing chemical control groups for the area, the kiln material has been analysed also by INAA in order to provide a control group for Kommos that is clearly of material produced rather than consumed at the site.

The elements measured were Sm, Lu, U, Yb, As, Sb, Na, La, Ce, Th, Cr, Hf, Cs, Tb, Sc, Rb, Fe, Ta, Co, and Eu. The whole data set was examined in terms of its overall variation. It was found that Na, Cs, and Rb contributed about 75% each to the total variation, while the rest of the elements contributed between 10% and 35%. These three elements are alkalines, known in geochemistry to be relatively mobile, and we are probably dealing with variation induced by conditions prevalent in the burial environment - most probably due to the influence of the proximity of sea water. After compensating for this effect, cluster analysis revealed that with the exception of the two clay bars, the samples grouped together. Those two samples outside the main cluster had also been separated by thin-section analysis. We therefore have an excellent complementary picture from the three analytical techniques, with a new, reliable control group for the Western Mesara.

Examination of petrographic fabrics from the kiln is providing interesting comparisons with other archaeological pottery around the island. Perhaps one of the most striking similarities is between certain
transport stirrup jars found elsewhere in Central Crete and oval mouthed amphorae from the Kommos kiln. Further work will shed light on the materials exploited, the technology used, and the location of pottery production in the Mesara, although it is clear from this and other work that the area holds a special place in the production of ceramics in Bronze Age Crete. The analysis of the Kommos kiln pottery will add to this emerging picture.

4. Conclusion

This kiln makes a significant contribution to our knowledge. First, because it can be shown to have been used exclusively for pottery production, it resolves the question about the primary use of such structures within which, it has been argued in the past, pottery, lime, and even faience, glass, and metals may have been produced. Secondly, while most kilns have been found relatively empty of pottery and without an extensive dump around them, at Kommos we have an unusual sampling of the variety of pottery produced at a specific center of production. Thirdly, through petrology and SEM examination it was found that fabric recipes and firing temperature variations were selected according to the size and type of vessel to be produced. Such integrated studies of typology and technology will provide a new base, a fulcrum, for identifying and understanding regional wares.

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Aleydis Van de MOORTEL
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LIST OF ILLUSTRATIONS

Pl. CXVIIa  The South Stoa of Building T at Kommos, with the kiln built against its southern wall, from the southeast. Taylor Dabney.

Pl. CXVIIb  The Kommos kiln after excavation, from the west. Taylor Dabney.

Pl. CXVIIIa The Kommos kiln, from the northwest. Taylor Dabney.

Pl. CXVIIIb  Channel 3 (the third from the north) during excavation, showing pottery and small stone slabs, from the west. At a the surface of the platform between channels is smoothly plastered. Joseph W. Shaw.

Pl. CXVIIIc  Western end of Channel 3, showing accumulated plaster bits, burned earth, and stone slabs before removal, from the west. At a is a plastering renewal that has become separated from the channel wall. Joseph W. Shaw.

Pl. CXIXa  Plan of the kiln dump. The kiln dump is represented by the pattern-filled areas. Aleydis Van de Moortel and Giuliana Bianco.

Pl. CXIXb  Estimated frequencies of vase shapes in the kiln and the dump (N = 1,158). Aleydis Van de Moortel.

Pl. CXIXc  Estimated frequencies of decorative schemes of 365 cups and pouring vessels from the kiln and dump, excluding conical cups, bell cups, and medium-coarse side-spouted cups. Aleydis Van de Moortel.

Pl. CXX  Vases from the kiln and dump. Julia Pfaff.
   a) Conical cup C 10 110
   b) Conical cup C 10308
   c) Conical cup C 10166
   d) Conical cup C 8929
   e) Teacup C 8937
   f) Collar-necked jug C 9935
   g) Oval-mouthed amphora C 10597
   h) Fine pedestal base C 8947

Pl. CXXI  Lustrous dark-on-light patterned vases: a) found in the kiln mound; b-i) associated with the kiln dump. Julia Pfaff.
   a) Bowl C 9908
   b) Teacup C 9983
   c) Teacup C 10290
   d) Bridge-spouted jar C 9437
   e) Bridge-spouted jar? C 9982
   f) Closed vessel G 9993
   g) Closed vessel C 10320
   h) Closed vessel C 10137
   i) Stirrup jar? C 9444

Pl. CXXII  a) Frequencies of dark paint colors noted on an estimated 317 vases. Aleydis Van de Moortel.
   b) Slab fragment C 10599. Julia Pfaff.
   c) Slab fragment C 8935; crosshatching indicates clay remains adhering to surface. Julia Pfaff.
CXIX

KILN DUMP - top pails

- Top elevations

- Pie chart showing:
  - Conical cups: 56%
  - Other cups: 6%
  - Bowls: 9%
  - Bridge-spouted jars: 10%
  - Jugs: 8%
  - Rhyta: 2%
  - Oval-mouthed amphorae: 6%
  - Others: 3%

- Pie chart showing:
  - Light-on-dark: 27%
  - Dark-on-light (non-lustrous): 2%
  - Dark monochrome: 40%
  - Unpainted: 31%