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ΗΡΑΚΛΕΙΟ 2000
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THE SHORT-NECKED AMPHORA
OF THE POST-PALATIAL MESARA

Renewed excavations from 1991 to 1994 at the Minoan harbor town of Kommos, located a couple of miles north of the modern resort town of Matala at the west end of the Mesara Plain of southern Crete, have focussed on greater exposure of the monumental public buildings in the southern portion of the site, partially underlying the area later occupied by a rural Greek sanctuary. The uppermost and latest of these large structures, termed Building P by the excavators, is the largest construction of the LM III period so far known from any site on Crete, measuring roughly 38.50 meters east-west by 39.60 meters north-south. Subdivided into a series of six long galleries, wide open at their western ends but otherwise apparently altogether lacking means of access, whether from the exterior or between the individual galleries, this massive structure has been persuasively identified as a ship-storage facility, a prehistoric predecessor and functional analogue of the even more imposing Venetian arsenals that are so prominent a feature of the waterfronts at the north Cretan ports of Heraklion and Khania.

The recent excavations have dramatically improved our understanding of Building P. We now know with virtual certainty its exterior dimensions, as well as much more about its internal arrangements. We have copious evidence for its construction date in early LM IIIA2 as well as

* For many helpful suggestions about additions to the text as well as to the bibliography, I am grateful to A. Van de Moortel, J. W. Shaw, and L. Cole who are, however, in no way responsible for errors of both omission and commission that may remain. For the invitation to work on the Minoan pottery from the southern area at Kommos, in particular that excavated since 1991, and for all their support, stimulation, and kindness over the past half-dozen years, I am especially indebted to J. W. and M. C. Shaw.
1. For the most recently published preliminary report, in which the goals of the latest series of excavations at the site are clearly spelled out, see J. W. Shaw and M. C. Shaw, «Excavations at Kommos (Crete) during 1986-1992», Hesperia 62 (1993) 129-190, esp. 161-188.
2. For the basic dimensions, plan, and dating of Building P, see Shaw and Shaw (supra n. 1) 187-188.
for the date of its abandonment before the end of LM IIIB. Thanks to the complete excavation of one of its enormous galleries, that called P3 since it is the third from the north, we know something of the range of subsidiary architectural features such as hearths and ovens that were installed at various times within the galleries. We are also able to comment on the range of ceramic types found in the building’s fill, both those from above its final floors and those from strata in between earlier and later floors. Not surprisingly, in view of the building’s function as a shipshed, the overwhelming bulk of the pottery consists of fragmentary transport containers, together with substantial quantities of cooking pottery that was probably used in conjunction with the built-in hearths and ovens mentioned earlier. Plain and decorated tablewares also occur in this debris, but in noticeably smaller proportions than in the contemporary houses of the town excavated on the slopes and summit of the hill just to the north.

By far the most common single vessel type found in every portion of every gallery within Building P that has so far been excavated is a thick-walled, rim-handled transport container that Vance Watrous has appropriately christened the «short-necked amphora»3. Medium coarse in their fabric and almost invariably undecorated during the LM IIIA2 and LM IIIB periods of use of Building P, these amphoras have a distinctive shape (Figs. 1-4): the body is markedly elongated and slim in its proportions, either ovoid or, if exhibiting a shallow reverse curve just above the base, piriform; the base is flat, often although not always featuring a pronounced bevel at its edge; the neck is short and usually flares outward rather abruptly to a simple rim that is typically only slightly distorted by the upper attachment of the handles; in other words, though not perfectly round-mouthed, these amphoras just as clearly do not have the elliptical mouth outline and higher neck that characterize the earlier oval-mouthed amphora; the two thickened vertical strap handles are relatively short and robust, and run from mid-shoulder to rim, their tops rising very slightly above the level of the rim proper so as to prevent a simple flat lid from covering the mouth effectively. Given their size, these vases are remarkably similar in their basic dimensions, and they were clearly produced so as to conform to a single notional size. Rim diameters range between 11 and 12.5 centimeters; the minimum diameter of the neck opening typically varies between 8 and just over 9 centimeters; maximum diameters fall between 23.5 and 27.5 centimeters, base diameters between 11 and 14.5 centimeters. The heights of three completely restorable examples range between 39.5 and 42 centimeters. The capacity of the most fully preserved example has been measured by Watrous: it contained 9.3 liters of liquid or 7.75 kilograms of barley4.

Aside from being produced to quite narrowly standardized shape and size specifications, this distinctive amphora type was made from what appear to have been no more than two or three visually distinct fabrics. One of these has a markedly sandy feel, contains copious quantities of gold mica platelets as well as featuring lumps of lime exploded at the surface, and has a reddish yellow (in Munsell terms) fracture; a second contains abundant dark reddish brown phyllite and some white quartz, lacks mica or grains of lime exploded at the surface, and has a

3. For the original definition of the type, see L. V. Watrous, Kommos III: The Late Bronze Age Pottery (Princeton 1992) 135, 144. He publishes six examples of the type, including both whole and fragmentary specimens, from LM IIIA2 (ibid., 40 no. 702, 60 nos. 1011 and 1015, pls. 16, 25, figs. 30, 42), LM IIIA2-B (ibid., 75 no. 1273, fig. 47), and LM IIIB (ibid., 90 no. 1584, 97 no. 1677, pls. 40, 43, figs. 59, 63) residential contexts at the site. Two additional examples from Galleries P1 and P3 have been partially published by Shaw and Shaw (supra n. 1) 167 and n. 98 [C9276], 172 and n. 110 [C9662], pl. 33a.

4. Watrous (supra n. 3) 135. The measurement ranges cited here for rim, neck, maximum, and base diameters are based on those of thirteen examples of the shape inventoried from ten or more different excavation contexts at Kommos.
pink (again in Munsell terms) fracture. Examples of the shape in both these fabrics typically have casually wiped, non-lustrous exterior surfaces and are only rarely supplied with a slip and an accompanying light burnish. Wet fingerprints are frequently visible on the exterior or the interior of the neck, from handling of the vessels subsequent to their final shaping but prior to their actual firing. Provided with thick vessel walls on which the wheelmarks are still very prominent on the interior, such amphoras are estimated to have weighed roughly 3.8 kilograms when empty, thus a little over 13 kilograms when full of a liquid with the density of water. They appear to have been manufactured in a two-step process: the base and conical flaring lower body would have been thrown separately from the ellipsoidal upper body; the join between these two parts is marked by an abrupt thickening in the lower body wall on the more fully preserved specimens where additional clay was added, primarily on the interior, to strengthen the join (Figs. 1-3). This two-part construction technique is reasonably common on other locally produced large LM III shapes including cooking pots and decorated amphoroid kraters and transport stirrup jars; to what extent this is a feature that may distinguish regional production throughout the LM III Mesara remains to be established. The handles of the amphoras would also have been added separately, of course, but the neck and rim appear to have been thrown as part of the body rather than being yet another separately produced piece, as the more markedly offset necks on LM III jugs, amphoras, and hydrias ordinarily are.

The standardized shape, dimensions, and production technique of these amphoras, as well as their lack of decoration, all suggest mass production. This impression is supported by the quantities in which vessels of this form have been found in the ruins of Building P. Between 20% and 30% of the pottery by sherd counts, and slightly over 50% of the pottery by weight, from use levels of Building P at the east end of Gallery P2 and near the west entrance of Gallery PS can be assigned with confidence to short-necked amphoras. Given the size of the galleries - each some 5.60 meters in width and 37 meters long except for the somewhat narrower Gallery P6, thus each with a surface area of ca. 200 square meters - and given the depth of the use fills in each, the quantities of short-necked amphora fragments that can be estimated to lie in situ in the building's ruins represent the equivalent, in terms of their weight and the numbers of rims, handles, and bases recovered, of between 100 and 200 complete vessels. This may not seem like a very large number when considered in the context of the enormous size of the building in question. But it must be remembered that this pottery consists almost exclusively of highly fragmentary; only occasionally mendable vessels. That is, what have been recovered are for the most part discarded bits and pieces of transport containers, not broken but largely restorable storage vessels. Building P may have functioned as a warehouse for trade goods as well as for the ships that carried these, but the short-necked amphoras recovered from it have not been found complete, stacked up or aligned in long rows as storage vessels. Rather, they have been recovered as fragments, presumably representative of the breakage incurred as they were loaded and unloaded, much like the fragments of bottles to be found associated with wineries, distilleries, breweries, and bottling plants of the 19th and earlier 20th centuries before plastic, aluminum, and even paper replaced

5. This estimate is based upon counts of short-necked amphora feature fragments (rims, handles, and bases) as well as upon weights of all identifiable short-necked amphora sherds from LM IIIA2 and LM IIIB levels at the east end of Gallery P2 (Trenches 77A, 93E, and 94B), from which in excess of 4000 sherds weighing over 95 kilograms were recovered. A much smaller quantity of material (over 700 sherds weighing over 11 kilograms) from Gallery P5 (Trench 89C) was analysed in a similar fashion and produced closely comparable results. Although similar counts have not yet been conducted for excavation units in Galleries P1, P3, P4, and P6, all of these have certainly produced the copious quantities of short-necked amphora fragments that appear to be typical of the LM IIIA2 and LM IIIB strata throughout Building P.
glass as the preferred materials for containers of liquids. We therefore imagine that the few hundreds of short-necked amphoras that remain in Building P's galleries reflect an original production of this shape in the thousands.

Some of the short-necked amphora fragments from Gallery P3 have been found with clumps of dark red material, tentatively identified as haematite, adhering to, and in several cases staining, their interior surfaces. We presume this material is indicative of the contents of at least some of these transport containers, but whether this iron-rich mineral was the primary substance contained in some amphoras (in the form, for example, of red ochre to be used as a pigment) or else merely a residue of some sort is uncertain. Large fragments of several other amphoras were found in secondary use as crude baking pans in one of the semisubterranean LM IIIB ovens in the same gallery. A similar concentration of amphora sherds in a hearth at that gallery's southeast corner may likewise represent recycling of large amphora fragments. In both these instances, amphoras may have been reused in ways for which they were not originally designed, simply because damaged or fragmentary specimens were readily available in large quantities.

Some short-necked amphoras also exhibit dark brown staining on their exterior surfaces. Where best preserved, this staining occasionally takes the form of patches of tiny dots or short dashes (Fig. 3). It has been suggested that these stains may represent the negative impressions of nets; that is, the light-colored clay ground between the stained dots or dashes would mark where the lattice of a net pressed up against the amphora had kept its surface from being solidly coated with the staining agent. This interpretation of the dotted staining is intriguing for the insight it provides into how at least some of these amphoras may have been carried (i.e. in nets), but we cannot as yet suggest with any confidence what substance or process the stain itself may represent. It is possible that the stain may be the remains of resin or pitch used to caulk the hulls of the ships that were stored in the galleries over the winter months, although if this were the case, it is unclear why the stain should appear only on vessel exteriors rather than principally on interiors. Moreover, close examination of the surfaces on which the staining appears suggests that the stain was probably applied prior to the vessels' firing, in which case this peculiar feature must be viewed as part of the production process of these vases rather than a consequence of their usage.

Close parallels for these Komman short-necked amphoras of LM IIIA2 and LM IIIB date have yet to be published from other important Minoan sites. Preliminary consultation of excavators at Ayia Triadha, Khania, Knossos, and Malia indicates that this extremely common Komman ceramic type is rare at these sites, in some cases possibly even unattested. These facts strongly suggest that such amphoras are local products, peculiar not only to the Mesara but within that region to the harbor town of Kommos. No examples of this particular shape have

6. Shaw and Shaw (supra n. 1) 171, 188.
7. Shaw and Shaw (supra n. 1) 173, pl. 38b.
8. Shaw and Shaw (supra n. 1) 171-172, pl. 37b.
9. We owe this suggestion to Prof. M. Bietak who had an opportunity to see the best example of this staining on the amphora C9836 during a visit to Kommos during the summer of 1993. There is no evidence for any abrasion of the vessel surface on those areas of the amphora bodies characterized by such dots. The dots themselves do not have the same appearance as the iron-based clay slip regularly used to execute dark-on-light painted ornament on pottery throughout the MM and LM periods at Kommos.
10. I am grateful to C. Pulak for pointing out to me that pitch for caulking ship hulls would be a substance to be expected in a ship-storage facility like Building P.
11. Watrous (supra n. 3) 135, followed by Shaw and Shaw (supra n. 1) 188, suggested that the short-necked amphoras found at Kommos were produced in north-central Crete, possibly at Knossos, but their fabrics indicate
yet been identified at any eastern Mediterranean site outside of Crete either, although thousands of them are likely to have been shipped out of Kommos during the four or five generations during which the type appears to have flourished. It was in containers of this type that much of the agricultural wealth of the Mesara, by far the largest plain on Crete, was evidently exported. If amphoras of this type can be identified elsewhere, it should soon be possible to make significant progress in reconstructing a major exchange network of the 14th and 13th centuries B.C.

During this particular period, the principal ceramic forms used for the overseas transport of bulk produce in the eastern Mediterranean were the so-called «Canaanite jar» characteristic of the Levant and Cyprus and the «domestic stirrup jar», Furumark's shape 164, typical of the southern Aegean. Fragmentary and whole examples of both these shapes have been found in quantity at Kommos, indicative of the important role played by this site in Levant-Aegean commerce during this era. Perhaps significantly, however, the numbers of Canaanite jar and transport stirrup jar fragments found within Building P are relatively small. Both of these distinctive shapes had been circulating within the Aegean since at least the later Late Minoan IA period, as finds at Akrotiri on Thera, as well as at a number of other sites, clearly demonstrate. Petrological analyses of the stirrup jars have shown that examples of this kind of transport container were being produced in south-central Crete in the LM III period and probably even earlier. Why, then, was an apparently new form of transport vessel, the short-necked amphora, put into service in seemingly large quantities at Kommos during the LM IIIA2 and LM IIIB periods?

that they could equally well have been produced in the south-central part of the island (P. Day, pers. comm. July 1995).

12. Watrous has identified some fragments found at Enkomi as possibly belonging to a shape closely comparable or perhaps even identical to the Kormian short-necked amphora [(supra n. 3) 135; see also Shaw and Shaw (supra n. 1) 188-189, n. 163]. In the absence of profile drawings of the relevant pieces from Enkomi, it is impossible either to confirm or deny this suggestion. One of the principal goals of the present paper is to alert excavators at Israel, and Egypt, to be on the lookout for thick-walled fragments of plain rim-handled amphoras having slim bodies and rounded shoulders that might belong to examples of the Kormian short-necked variety.

13. No examples of the Kormian short-necked amphora have been found on the Ulu Burun wreck, now dated to the late 14th century B.C. (C. Pulac, pers. comm. May 1996). Although the cargo of this vessel include large numbers of other forms of transport vessels, notably Canaanite jars, large medium coarse stirrup jars, and Cypriot pithoi, the fact that it was sailing into the Aegean from the east when it sank provides a simple explanation for the absence of short-necked amphoras: if any of these had been on board, they would have had to have been recycled containers, as the large stirrup jars evidently were (P. Day, pers. comm. April 1996).

Kormian short-necked amphoras have rim diameters of roughly the same size as Canaanite jars, both having rim diameters one-and-a-half to two times the size of those typical of transport stirrup jars of FS 164 type. The last appear to have been designed with the aim of shipping exclusively liquid contents, whereas the Canaanite jars and oval-mouthed as well as short-necked amphoras were more flexible in their usage, as the contents of the Ulu Burun jars demonstrate so conclusively. Short-necked amphoras would presumably have been sealed with lumps of clay crudely modelled as stoppers and held in place by strings (cf. J. L. Davis, Keos V: Aiyia Irini: Period V (Mainz 1986) 60 AA-106, 100, pls. 37, 68 for such a stopper from a late Middle Bronze Age oval-mouthed amphora; Watrous (supra n. 3) 75 no. 1283, 87 no. 1524, pls. 29, 38 for such stoppers from stirrup jars of FS 164 type: ibid., 88 no. 1526, pl. 38 for a possible chaff-tempered stopper fragment from a LM IIIB short-necked amphora).

One way of responding to this question is to concentrate on the form's functional characteristics. The short-necked amphora has a rim diameter essentially the same as that of a Canaanite jar but is considerably smaller overall, in addition to being much thicker-walled and hence more robust. A short-necked amphora would thus have held less than half of what a Canaanite jar could have, but would have been more readily portable as well as more resistant to breakage. In comparison to the typical transport stirrup jar, the short-necked amphora is once again smaller, though not so strikingly. In the case of this comparison, it is the amphora's wider mouth, which can easily accommodate the insertion of a hand, that distinguishes the amphora from the stirrup jar: while stirrup jars seem designed principally for the transport of liquid produce, short-necked amphoras would appear to have been more flexible in the range of produce that they could have contained. Thus from a purely functional point of view, the short-necked amphora represents a genuine alternative to either of the two dominant transport containers of interregional commerce in the eastern Mediterranean during the 14th and 13th centuries B.C.

Another approach to explaining the appearance of the short-necked amphora may be suggested on the basis of what has been learned about its history during the past several years of excavation at Kommos. During the later use of Building P in the LM IIIB period, this shape appears to have been produced exclusively as an undecorated type. In strata of early LM IIIA2 date underlying the earliest floors of Building P's southern galleries, fragments of a painted ancestor of the shape have been found. Its morphology and decoration provide further clues concerning the possible rationale behind the shape's invention. The best preserved example of this painted ancestor, from below the first floor of Gallery PS (Fig. 5)\(^{14}\), shows that as originally conceived, the shortnecked amphora featured the angular shoulder of a Canaanite jar and the broad horizontal wavy band in the belly zone typical of central Cretan domestic stirrup jars\(^{15}\). Just as significant is the fact that extensive excavation of the uninterrupted sequence of LM IA through LM IIIB levels at Kommos has shown that the short-necked amphora makes its initial appearance in the ceramic record in early LM IIIA2, in levels roughly contemporary with the initial construction of Building P that cannot be far removed in time from the destruction of the palace at Knossos so amply documented in 1970 by M. Popham\(^{16}\).

The following historical reconstruction of the circumstances in which the short-necked amphora came into being as the principal locally produced transport vessel of the post-palatial Mesara

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14. C9063, consisting of fragments from Tr. 87B Pails 115, 116, 116D, and 118, Tr. 91B Pail 52, Tr. 93A Pails IB, 4, SA, 6, 7, and 10, and Tr. 95B Pail 121.
15. The horizontal wavy band is rare, if perhaps not altogether unattested, on examples of the domestic stirrup jar FS 164 considered to have been produced in either west Crete or east Crete, according to H. Haskell (pers. comm., May 1996). For a detailed examination of all aspects of the large stirrup jars used for bulk transport during the Aegean Late Bronze Age, see H. W. Haskell, R. E. Jones, P. M. Day, H. W. Catling, and J. T. Killen, *Transport Stirrup Jars of the Bronze Age Aegean and Cyprus* [forthcoming]. For a recent assessment of the role of Canaanite jars in trade between the Levant and the Aegean during the Late Bronze Age, see A. Leonard, Jr. «"Canaanite Jar" and the Late Bronze Age Aegeo-Levantine Wine Trade», in P. E. McGovern, S. J. Fleming, and S. H. Katz (eds.), *The Origins and Ancient History of Wine (Food and Nutrition in History and Anthropology vol. 11)* (Gordon and Breach 1995) 233-254.
16. M. R. Popham, *The Destruction of the Palace at Knossos: Pottery of the Late Minoan IIIA Period* (Göteborg 1970). Preliminary analysis of the stratigraphy and architecture of Building P suggests that the building was originally constructed as a two-gallery unit (Galleries P1-P2 at the north), to which the southern four galleries were subsequently attached. Thus the painted short-necked amphora fragments from LM IIIA2 levels below the first floors of the southern four galleries (e.g. above n. 14) are likely to be contemporary with the initial use of the northern two.
may therefore-be suggested. With the destruction of the palace at Knossos early in the LM IIIA2 period, the Mesara established its independence of Knossos for the first time since it had come under Knossian suzerainty early in the Neopalatial era, at least two and a half centuries earlier. The ruling authority of the newly independent Mesara resided at Ayia Triadha and may have ruled from an enormous megaroid structure built over the earlier Neopalatial villas. This authority had other monumental buildings constructed, both at Ayia Triadha, in the form of the impressive two-storeyed «Stoa of the Agora» and several additional buildings, and at Kommos, in the form of the shipshed we have called Building P. As a further mark of its independence, this new polity in the Mesara began to ship the agricultural surplus that was the basis of its wealth in a new form of transport vessel. In its basic form, this new container was simply a version of the oval-mouthed amphora that had been the principal transport vessel of the Protopalatial period in the Mesara, perhaps the last time when this region, with its capital then at Phaistos, had constituted a state independent of Knossos. The new kind of oval-mouthed amphora at first mimicked the other dominant transport containers of the period by aping the carinated shoulder of the Canaanite jar and the wavy-band decoration of the central Cretan stirrup jar. But by the time of Building P’s later use in the LM IIIB period, the ruling authority at Ayia Triadha felt securely enough established to abandon such imitation, and the short-necked amphora became round-shouldered and plain, identifiable purely by its shape as the container of products from the Mesara rather than from northern Crete or the Levant.


18. For recent assessments of Kommos' trade with regions outside of Crete in the Late Bronze Age, see Watrous (supra n. 3) 169-183; A. B. Knapp and J. F. Cherry, Provenience Studies and Bronze Age Cyprus, Production, Exchange and Politico-Economic Change (Madison 1994) 138-141.
Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.
Fig. 5.