

THE SHIPSHEDS OF SICILIAN NAXOS: A SECOND PRELIMINARY REPORT (2003–6)¹

NAXOS WAS the first Greek colony in Sicily, founded in 734 BC by settlers from Chalcis in Euboea and Naxos in the Cyclades (Hellanicus *FGrH* 4 F 82; Thuc. 6. 3. 1.). Its primacy and the special status of its altar of Apollo Archegetes continued to be recognized by the Sicilian Greeks (Thuc. vi. 3. 1). It lies on the east coast, south of Messina, at the natural landing-point for ships sailing west to Sicily.

The port area containing the shipsheds was located to the north of the city centre, on the bay protected by Punta Schisò.² The shipsheds were found c.160 m inland from the current coastline at the northern edge of the city on the east slope of the Larunchi hill. Like the hill, they clearly lay inside the fortification walls (FIG. 1).³

They are built on the orientation of the fifth-century city street grid, 36 m north of and parallel to one of the main east–west streets (plateia C), with their back wall running parallel to a main north–south cross street, stenopos 6, and 1.50 m from it (FIGS. 1–2). It may well have been the orientation of the shipsheds which determined the orientation of the street grid (particularly in the light of the discovery of an early phase of the shipsheds, of the turn of the sixth/fifth century; see below).⁴ Evidence for the relationship between the shipsheds and the stenopos has been destroyed by Late Roman construction in the area, including street levels found on the bedrock, continuing the general line of the ancient stenopos and certainly crossing the Roman *mansio* (Pelagatti 1993, 285).

A fourth slipway on the south side of the site seemed to decrease the space left (Blackman and Lentini 2006b, 549 and FIG. 3) for the assumed site of the agora (FIG. 1),⁵ but the most recent excavations have confirmed that the fourth was the last shipshed and that another major public building lay close by. In the final days of the excavation the question of the

¹ The excavations were directed by Lentini (then director of the Archaeological Service of the Soprintendenza of Messina), and benefited from generous EU funding (POR Sicilia 2000–6 project). Blackman was present throughout; Pakkanen joined the excavation in 2005, and prepared the reconstruction plans, computer model, and roof reconstruction (FIGS. 53–5 & Plans 1–2). All three contributed to this second report. Francesco Muscolino, Pinella Laudani and Paola Barbieri helped in supervising the excavation. Sveva Savelli helped in study of the material; Concetta Marano in plotting and drawing the plan (FIG. 7) and sections; and Pussia Siciliano in drawing the sima (FIG. 46). Topographic survey was carried out by Gaetano Cucinotta. Carmelo Ricciardo and Lidia Signorino helped in the administration of the project. We thank them all warmly for their support. We also wish to thank the staff of the Museum of Naxos: notably Sebastiano Testa Fralia for the logistic organization of the excavation; A. Marano for cleaning and conservation of artefacts; Giuseppe Mercurio for work on plans and drawings (e.g. B29) and Giuseppe Smirolfo for IT assistance. We also

thank Neil Leeder and Vishnu Ramoutar of the Ioannou Centre for Classical and Byzantine Studies, Oxford, for IT assistance. Last but not least, we owe warm thanks to the referees of this article, who provided so many valuable comments and criticisms (almost all of which we have accepted), and did not wish to retain anonymity: Jim Coulton and Alan Johnston.

² There was probably also a small harbour or landing-place to the south of the city, east of the mouth of the Torrente Santa Venera, but none on the SE or east side of Punta Schisò: Blackman 2004, 54–5.

³ Confirmed by the 2005 discovery of a long stretch of proteichisma NW of the shipsheds and just west of the modern primary school.

⁴ Blackman and Lentini 2006b, 548–9, quoting Martin's suggestion that the same was true of Rhodes, and FIGS. 3–4; earlier version: Blackman and Lentini 2003, FIGS. 3–4.

⁵ Lentini 2004b, FIG. on p. 28; 1993–4, 1008–12, FIGS. 1–2, pl. cii.1; 1998, 77–8, FIGS. 9–10; cf. Blackman and Lentini 2003, 388–9.

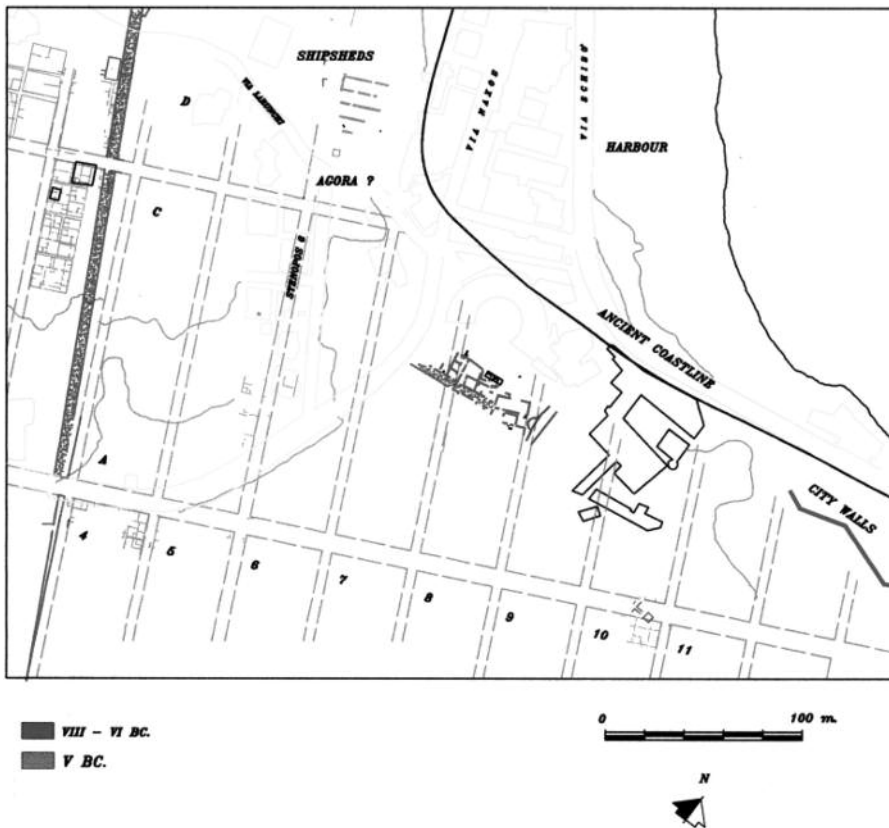


FIG. 1. Plan of north part of city.

southern limits of the site was resolved: a stretch of roughly cobbled passage (only 1.80 m wide) was found outside wall 5 (FIG. 3), and beyond it an impressive terrace wall made of large, well-jointed polygonal blocks, indicating a major public building to the south (FIG. 4).

This reconfirms the possibility of a contiguous agora, as at Thasos (Grandjean and Salviat 2006, 52–7 for the port; 62–78 for the agora). Unlike at Thasos, however, there is a distinct rise in the ground level, and an agora in this location would have been connected rather with the commercial port, which we have already suggested lay at the end of plateia C. The agora would have occupied at least the area between the shipsheds and this plateia. This latest discovery of the polygonal terrace wall defines better the relationship between the two important areas of the ancient city, civic and military. The narrow passage between the two complexes was not a major traffic artery, and would seem to be connected rather with the needs of the shipsheds; however, in the short stretch excavated of wall 5 no door was found opening into the passage (FIG. 3).⁶ The area between was heavily overbuilt in the Late Roman period, and the passage was rearranged as a storeroom for dolia (FIG. 5).

⁶ Coulton (pers. comm.) suggests that it perhaps served mainly for drainage of roof water from the shipsheds and from any building to the south.



FIG. 2. View of stenopos 6 from the south.

The dockyard clearly had only four covered slipways—surprisingly few, but perhaps appropriate for the small fleet of a medium-sized city, which was never a maritime power. The presumed location of the harbourside (front end) of the shipsheds means that, in the fifth century BC, the coastline was *c.*50 m farther inland than the previously assumed line of the ancient coast.⁷ The then sea level was therefore probably *c.*2 m above the present one (Blackman and Lentini 2003, 408–9 with references).

The area of the ancient city's northern harbour was identified by Pelagatti (1981, 302–3), but no harbour structures were found. Much of the site occupied by the shipsheds was uncovered in the excavations of 1981–3. The suggested identification as shipsheds of the

⁷ Lentini 2001, 14 FIG. 1; Blackman and Lentini 2003, 389–90, FIGS. 1–2; Lentini 2004b, FIG. on p. 28; Blackman and Lentini 2006b, FIG. 4.



FIG. 3. Stretch of roughly cobbled passage between wall 5 and the polygonal terrace wall.

structures underlying buildings of the Roman *mansio* (*floruit* third–fourth centuries AD)⁸ was confirmed by test trenches made by Blackman and Lentini in 1998–2000, followed in 2001 by excavation of shipshed 1 and the discovery of shipshed 4, described in our first preliminary report (Blackman and Lentini 2003). Four further excavation seasons were carried out in the shipsheds in 2003–6, and this second preliminary report summarizes the results of those seasons.

⁸ The suggestion was made first by P. Pomey and then independently by Blackman: Lentini 1998, 78; see already Lentini 1993–4, 1009–10 and FIGS. 1–2 (plans showing

porto?, *arsenale?*, *agora?*); Blackman 1997–8, 471–4; De Angelis 2000–1, 174.



FIG. 4. Detail of polygonal terrace wall.

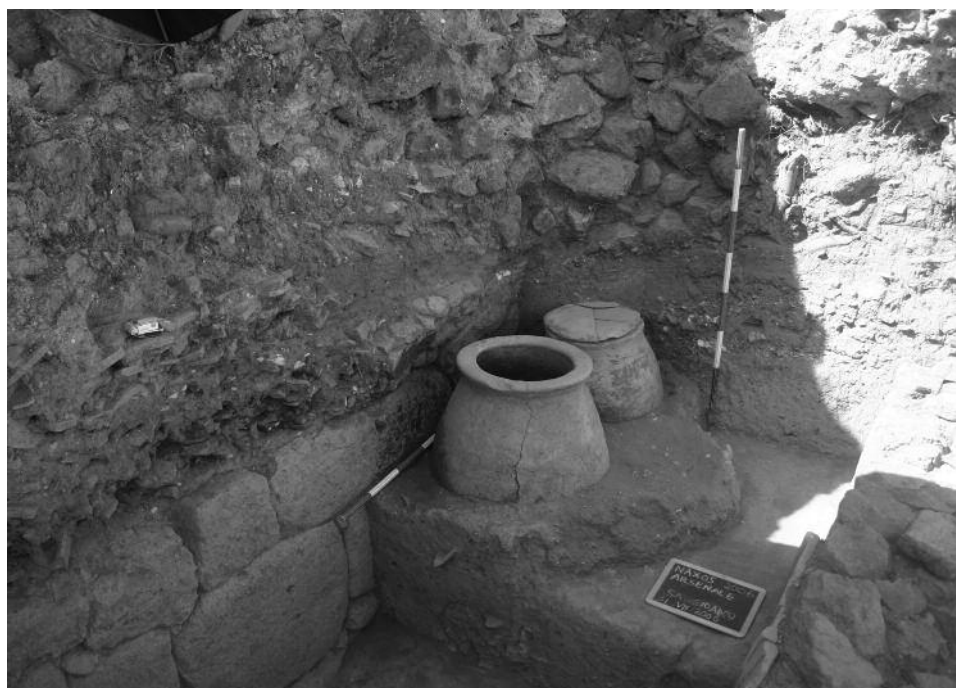


FIG. 5. Storeroom for *dolia* created in the cobbled passage in the Late Roman period.

THE SHIPSHEDS (FIGS. 6–7)

The excavation *in extenso* of shipsheds 2, 3, and 4 in 2003–6 was crucial for defining the chronology and answering many of the questions raised by the earlier excavation in shipshed 1. It gave a clear idea of the entire construction—with the remarkable first discovery of ramps of sand—and it showed also the close structural similarities between slipways 1 and 2, and slipways 3 and 4.

THE WALLS

The facings of walls 1–4 are made of largish blocks of tufa, though wall 5 includes also non-volcanic stones; all walls are unusually thick (over 1.1 m) and the filling between the facings is of rubble and clay. The facing blocks are more or less irregular and the joints are not tight. All five long walls are preserved to a height of at least 1.1 m, and the back west wall to a height of up to 0.75 m in shipsheds 1–2.

The northernmost wall 1 was clearly the exterior side wall, 1.12 m thick (Blackman and Lentini 2003, 397); it is at least 34.7 m long (*ibid.* 392), but it was not possible to excavate its full length to the harbour edge. It consists of a continuous socle of tufa masonry with a descending series of coursed polygonal blocks, forming stretches of wall *c.*6.8 m long (maximum preserved height 1.18 m) and separated by doorways 1.50/1.53 m wide, one with



FIG. 6. General view of shipsheds from the east.



FIG. 8. Wall 1, from the north, with walls 2–4 behind.

10). Wall 4 is on average 1.20 m wide, but the foundations of its lower eastward extension are wider: *c.* 1.50 m (FIG. 11). The short revealed length of wall 5 is similar in width to wall 1 (1.12 m) (FIG. 12). Wall 2 reaches a maximum height of 1.48 m, wall 3 of 1.33 m, and wall 4 of 1.05 m.

The walls present different construction techniques, which most probably partially reflect different chronological phases and partially indicate different functions within the building. Wall 1 is coursed polygonal and the rest are all irregular polygonal (FIG. 8). Wall 3 is made of larger polygonal blocks, similar to those used on the west side of the city's fortifications (FIG. 10). The layout of the walls is also possibly diverse: wall 1 (above all) and also the western, upslope part of wall 2 consist of separate descending stretches (FIG. 9), while walls 3 and 4 seem to be more continuous, but since even wall 1 has places where the top course is missing, this is possibly only a matter of worse preservation of some walls. There is not sufficient evidence to determine the system used in wall 5 (polygonal with small stones, not all of volcanic stone) (FIG. 12). The back wall of the sheds (at least, the part that survives) is a retaining wall with polygonal facing (cf. below, FIG. 22).

There are several clues for the material used in the upper parts of the walls that supported



FIG. 9. Walls 2–3, from the south: wall 3 in the foreground, then ramp 2, then wall 2 (and wall 1 behind).

the roof. Because the surviving parts of wall 1 were built in at least five descending sections with their top surfaces fairly level (height *c.* 1.10–1.20 m: cf. Blackman and Lentini 2003, 411 FIG. 27), their upper parts would appear to have been, not of stone, but rather of a more perishable material such as mudbrick. No remains of columns were found, and no postholes have been found in the surviving walls (*ibid.* 2003, 399). If there were timber supports above the low walls, they would need to have gone into the top of them for a sufficient depth for the structure to be stable. Alternatively, the stone walls could have been a socle for stone or mudbrick piers, but this is very unlikely: the preserved walls are too high and there are no Greek parallels for such a construction technique. The most likely possibility is that the walls above the socles were solidly made of mudbrick or light rubble.⁹ The first alternative is supported by traces of mudbrick which have been found in all the shipsheds, notably no. 3.¹⁰ If light rubble had been used, traces of it would certainly have been discovered during the excavations since it is not soluble like mudbrick. Wall 1 and the western part of wall 2 with their flat upper courses are well adapted to carrying directly an upper wall in mudbrick with

⁹ On the difficulty of determining the material above a dressed stone wall in stoai, see Coulton 1976, 143.

¹⁰ After the collapse of the roof most traces of the

mudbricks would have easily been washed to the sea by rainwater.



FIG. 10. Wall 3, from the south, with wall 2 behind.

a reinforcing wooden frame;¹¹ the rest of wall 2 and walls 3 and 4 were also possibly originally laid out with separate stretches to receive wooden horizontal supports, if they were indeed considered necessary.¹² For solid walls of mudbrick there are parallels in the Punic area—one thinks of Kition shipsheds and possibly Carthage—and it was the standard Greek solution for reducing costs also in monumental architecture.¹³ The unusual thickness of the stone socles probably reflect the height of the wall: for example, the barrack building of the Fort at Phylla has a socle thickness of 0.52–0.75 m with a reconstructed wall height of c.3 m; the same

¹¹ The preservation of wall 2 is not as good as that of wall 1, largely owing to Late Roman building activity at the site.

¹² Since mudbricks are a very flexible building material, there is no need for the stone socle to be level, as is e.g. demonstrated by the preserved section of the Athenian city wall at Kerameikos (Ohly 1965, FIGS. 50–1) and the barrack building at Phylla (Building 3; Coulton 2002, 9–20, 29). For the use of mudbricks with timber supports, see Martin 1965, 63–5; for a reconstruction of a stone socle and mudbrick wall with timber supports, see Schwandner 1999, 530. It is also possible that the top surfaces of walls 3 and 4 could have been destroyed during the later use of the site.

¹³ For Greek parallels, see the section below on the reconstruction of the complex. It has been estimated that a skilled brickmaker and his assistant could build up to 20 m³ of solid wall in a day, while a stone-cutter probably could only manage one-twentieth of this (Wright 2005, 99); in addition, depending on the distance from how far away the clay and tufa needed to be transported, clay was often significantly cheaper than stone: when mudbrick was used the quarry costs and possibly also transport costs of stone, often more significant than the final work at the site, would have been saved (the accounts from Didyma show that the cost of erecting and finalising a column of the Hellenistic temple of Apollo were only a third of the overall costs: Martin 1965, 170–2).



FIG. 11. Wall 4, from the north.

dimensions for the temple of Hera at Olympia are 1.18 m and *c.*8 m.¹⁴ Any system of solid walls would have reduced the light in the slipways, which were already rather narrow and cramped, and so we will return to the question of lighting later.

Almost certainly the openings in wall 1 were doorways (from the evidence of a pivot hole); the upper part was therefore continuous in the final phase. The outer face of wall 5 was more irregular than that of wall 1: perhaps for this reason and to protect the wall foot from erosion by water coming off the roof, a revetment of roof-tiles was placed vertically against its base ('splash protection': FIG. 13), in the final phase; they are of the same dimensions as the pantiles used in the shipsheds. The rest of the construction of wall 5 seems earlier.

¹⁴ Phylla: Coulton 2002, 29 (the reconstructed wall height is partially based on the known door widths but also on structural and practical grounds); Olympia: Adler *et al.* 1892, pls. 18, 21 (wall thickness, column height); Dörpfeld 1935, pl. 5 (reconstructed cella wall height based on known column height and estimated entablature height and roof angle: 5.22 m + *c.*2.8 m (measured from plate) \approx *c.*8.0 m). Coulton comments that the Phylla barrack building (*c.*500 BC) also provides other more or less close parallels for the shipshed

complex at Naxos: a Corinthian tiled roof without decoration on a semi-monumental, functional public building (comparable to the later roof at Naxos); arrangements of tiles after abandonment; preponderance of simple drinking cups; cups with owner graffiti (only single letters) in a context of communal military living; and even a triangular arrow-head, which confirms the character of the building: SF 15; cf. Coulton 2002, 9–20, 29–39, 57–60, 87, 91–98, 112, 114.



FIG. 12. Wall 5, from the north.

LENGTH AND WIDTH OF SLIPWAYS (FIG. 7)

It was not possible to excavate the slipways for their full length to the harbourside owing to overlying modern buildings. The maximum length of the slipways excavated is 34.7 m (Blackman and Lentini 2003, 392). If there was one further harbourside stretch of wall 1 of the same length as the three stretches to its west, then the minimum internal length of slipway 1 would have been *c.*40 m; if there were two further stretches, the minimum length would have been *c.*48 m.¹⁵ The average clear widths of slipways 1 and 2 (5.42 and 5.24 m respectively) are slightly narrower than those of slipways 3 and 4 (5.64 and 5.74 m respectively).¹⁶ (See Plans 1–2.)

SHIPSLED 1

The details of our excavation of this shipshed were given already in our first preliminary report, and we do not repeat them here, except for points where our interpretations there are confirmed or modified by later discoveries.

¹⁵ The average length of the wall stretch in wall 1 is 8.3 m including the door opening, and 6.8 m without it.

¹⁶ A new survey of the walls was carried out in 2006 with a laser-equipped total station: a point cloud was measured on the vertical surfaces of each wall, and the measurement sets were analysed using ArcMap GIS program. For shipshed 1 the average of ten width

measurements was 5.42 m and the range 5.36–5.45 m; for shipshed 2 the same values were 5.24 m and 5.17–5.33 m (10 measurements); for shipshed 3, 5.64 m and 5.59–5.70 m (8 measurements); and for shipshed 4, 5.74 m and 5.71–5.76 m (3 measurements). The dimensions are slightly different from the preliminary data published in Blackman and Lentini 2003, 405.



FIG. 13. Wall 5, from the south, with tile cladding.

The floor of shipshed 1 has been excavated down to bedrock that finishes *c.*6.7 m from the back wall. It is not completely clear whether it had a central ramp, but this possibility is suggested by a small length (*c.*1.6 m) of narrow wall of small stones¹⁷ that begins *c.*1.5 m from the back wall. If it was the retaining wall of a ramp positioned centrally in the shed, the ramp would have been just over 3 m wide internally and *c.*4.5 m wide externally.

In shipshed 1 there is part of what appears to be a platform (*c.*1.18 m wide), running along the back wall (Blackman and Lentini 2003, 403 and FIG. 19). Because a relatively rich deposit of pottery, with a noticeable number of drinking vessels, was found towards the back of the shed, we had suggested that the back 5–6 m of the shed was a *taverna* (ibid. 402–4; Lentini and Blackman, forthcoming b). No such concentrated evidence for drinking has been found in shipsheds 2–4, so the suggestion remains in consideration; but in other respects the interpretation of this part of shipshed 1 needs to be reviewed in comparison with shipshed 2 (FIG. 14). The latter has a solid platform at the back, sand ramp with retaining walls and paved side-passages (cf. below, FIGS. 18–20). Both shipsheds had a back wall *c.*0.75 m high.

SHIPSHEDS 2–4

In 2003–4 two more slipways (nos 2–3) were excavated *in extenso*.¹⁸ Here the surprising discovery was made of ramps of sand in the upper part of the slipways, apparently continued lower down by cobbled ramps (FIGS. 15–17). The sand ramps were built on the bedrock, and

¹⁷ Blackman and Lentini 2003, 409 FIG. 25 (first interpreted as a bench: 403 and FIG. 19).

¹⁸ For an initial summary of the results see Blackman and Lentini 2006a; Blackman in De Angelis 2007, 157–8.



FIG. 14. Western part of slipway 1 (from SW): in the foreground, the platform; on the left, possible remains of the retaining-wall of a (now lost) central ramp of sand.



FIG. 15. Central ramp of sand in the upslope part of slipway 2, from the east.



FIG. 16. Slipway 2, from the west.



FIG. 17. Cobbled paving of the downslope part of slipway 2.



FIG. 18. Paved side-passage on slipway 2.

retained by low stone retaining walls; the ramps were resurfaced and the retaining walls raised from time to time during the fifth century BC (FIG. 15). A fine stretch of paving *c.*1 m wide was found on the south side of shipshed 2, between the retaining wall of the ramp and the main shipshed dividing wall 3 (FIG. 18). The ramp is preserved for over 16 m, and ends just *before* a platform 1.80 m wide, at the back of the shipshed; and its south retaining wall and the paved side-passage end *at* the eastern edge of this platform (FIGS. 18–20). A damaged platform was found at the back of shipshed 1 in 2001, but we are now able to reconstruct the back end of shipshed 1 by analogy with shipshed 2, where the situation is clearer, despite the damage caused by late Roman pits and stone-robbing (FIG. 16).

A striking feature of the sequence of sand ramps is that in the later (last?) phase(s) they are no longer central and 3.50–3.65 m wide but narrower (2.20/2.35–2.60/2.70 m) and displaced by about 40 cm to the south; in shipshed 2 but not 3, the south retaining wall remains on the same line, and it is the north retaining wall which is displaced (FIGS. 7, 15). In shipshed 2 the gradient of the sand ramp appears to be 1 : 9 (*c.*6.3°), and of the cobbled ramp 1 : 25 (*c.*2.3°), but both figures must be taken with caution.

Close similarities between slipways 1 and 2 were already clear in 2003–4, and close similarities between slipways 3 and 4 emerged in the 2005–6 seasons. In the upslope (western) parts of shipsheds 3 and 4 a remarkably similar arrangement was found (FIG. 21), different from that in shipsheds 1 and 2. The back wall of shipshed 3 had suffered greatly

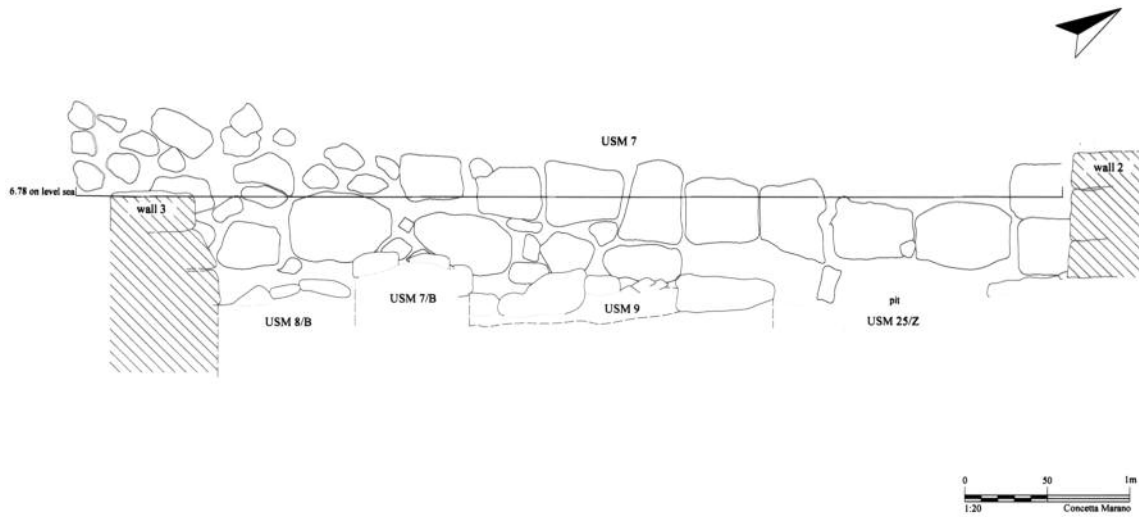


FIG. 19. Section (south/north) of west end of slipway 2.



FIG. 20. Shipshed 2 platform, from the north.



FIG. 21. Western part of slipways 3–4, from the south.

from later stone-robbing; this may also have removed the back platform, but it is possible that no platform was built; in the back wall there is a gap in the inner facing which suggests a doorway (FIG. 22). Shipshed 4 had a platform with possibly a stepped back wall (FIG. 23). The retaining walls of the ramp in shipshed 3 swing up and narrow into a curving end, adapted to the stern of a ship, in the last two of three phases (FIGS. 24–5). This discovery made it possible to reconstruct the more puzzling remains in shipshed 4: one apparent difference here is that in an earlier phase the retaining wall ends at a straight cross-wall on a line 3.41 m east of the platform: it is the back wall of the earlier ramp, 2.40 m east of the curving back wall of the later ramp (cf. FIGS. 26–7). The same may also be the case in shipshed 3. The ramps may thus have been extended *c.*2.40 m upslope (westwards) in their last phase(s), at the same time as the main walls of shipsheds 3 and 4 were perhaps moved back to the line of the back walls of shipsheds 1 and 2 (the western end of walls 3 and 4 is of poorer quality and almost without foundations: FIGS. 22, 28).¹⁹ Alternatively, the back wall of all four shipsheds was moved back at the same time (see below: ‘Chronology’); this hypothesis is accepted for the reconstruction plan of phase 1 (Plan 1).

At the back of shipshed 4, under deep Roman levels (at least four phases between the late

¹⁹ The pottery finds are not discussed in detail in this report, but it is important to note that the pottery of the

late 6th/first half of 5th cc. comes above all from slipway 3 (see below: ‘Chronology’).



FIG. 22. Back wall of slipway 3, with ramp 3 and western end of walls 3 and 4, from the east.



FIG. 23. Head of ramp, platform and possibly stepped back wall of slipway 4, from the north.



FIG. 24. Curving end of central ramp of slipway 3, with 'hearth' and Late Roman pit.



FIG. 25. Phases of curving end of central ramp of slipway 3, from the north.



FIG. 26. NW corner of straight cross-wall ending the central ramp in the earlier phase of slipway 4, from NE.

third and early eighth centuries AD), the clearest evidence was found for the final phase of the fifth-century BC dockyard: a mass of fallen tiles of the end of the century and considerable traces of burning and ash—perhaps the first indications of a violent destruction of the dockyard (FIG. 29). Little was preserved of the lower parts of shipsheds 3 and 4, but both clearly had sand ramps, in shipshed 3 with side walls and cobbling farther downslope to the east.²⁰

In the overlying level in shipshed 4 a large number of fragments of Graeco-Italic wine amphorae indicate use of the compartment as a store-room in the fourth (third?) century BC. This could explain the disappearance of the underlying ramp.

HAULING AND SLIPPING

In shipshed 1 a shallow rock-cut longitudinal depression was identified by us as a groundway, and a cross-cutting at the top end of the depression as a slot for a timber sleeper (Blackman

²⁰ In shipshed 4 (Trench AD), below the level of the missing ramp, a stratum was identified containing LGII

and sub-Geometric pottery. This will be discussed in a later report.



FIG. 27. Curving end of central ramp of slipway 4, final phase, from the west.



FIG. 28. Western end of wall 3, from the south.



FIG. 29. Level with traces of burning and ash found on slipway 4, from the south.

and Lentini 2003, 404, 393 FIG. 6). A number of doorways in both walls 1 and 2 lining Slipway 1 have a pair of rock-cut pits or postholes (ibid. 393–4 and FIGS. 6–7; Blackman 2003, 89 and FIG. 14. 9). Some were clearly made to hold roughly squared vertical timbers. We suggested earlier that these might have served as ‘buffers’ to hold the ship steady when it was hauled along the slipway. Alternatively, they may have been for capstans, but we acknowledged that these would be more likely farther up the slipway (Blackman 2003, 89; Blackman and Lentini 2003, 394). No similar evidence has been found in the other walls, which have little trace of doorways (only one in wall 3); and no clear evidence of hauling-equipment was found on any of the slipways or on the platforms behind. We assume that timber groundways were laid on the bedrock, sand or cobbles, but the carbonised remains of timbers that were found are not definitely from groundways rather than from the roof.

A remarkable feature of ramps 3 and 4 was the upswing at the rear, so that the ship would have ‘nestled’ against it when slipped, and the curving upper end that would have provided more working space for the crew. One thinks of the ramps at Oiniadai (Kolonas 1989–90; Blackman *et al.* forthcoming), with the difference that the latter are rock-cut. As we have said, the sand ramps were preserved for a maximum of over 16 m (slipway 2), continued

downslope (eastwards) by cobbled ramps (slipways 2 and 3). It is possible that the sand ramps continued some way farther down on top of the cobbling, but this cannot be proved or disproved on the evidence that we have obtained from the excavation.²¹ In Plan 2 the continuous lines show the certain remains of the side-walls of ramps; the dashed lines are a certain reconstruction; and the dotted lines are hypothetical, indicating ramps of uncertain form continuing to a length of 35 m—the probable minimum length for slipping a trireme.

THE ROOF

The shipsheds had a tiled roof with a shallow slope, probably with a separate, horizontally ridged roof over slipways 1–2 and 3–4, descending in steps from west to east.²² The evidence allows us to reconstruct two roofs, corresponding to the two phases of the building: the later, of the second half of the fifth century, of Corinthian type; the earlier, of the end of the sixth century/first quarter of the fifth century, of Sicilian type. This was the most important discovery of the 2005 season.

CORINTHIAN TYPE ROOF

That the *neorion* of Naxos had a roof is certain: proof of this is provided by the sand ramps, which could not have been preserved in the open air. Another proof is the large quantity of fallen tiles found along all the slipways.

In 2001 in shipshed 4, a mass of fallen tiles was found along the inner side of wall 5, both pantiles and pentagonal cover-tiles which belong to the latest roof. It was possible to reconstruct a pantile of 84.50 × 55.7 cm, with flanges 6.5 cm high and 5.5 cm wide. The module as well as the weight of the tile are very large. The roofs of the fifth-century houses at Naxos generally have tiles *c.* 70 × 40 cm. Pentagonal cover-tiles are attested in the town, but in much smaller quantity than the cylindrical (Blackman and Lentini 2003, 414). Fragments of pentagonal cover-tiles and of equally large pantiles are also attested elsewhere in the shipsheds, in smaller quantity. Such data may be incomplete, but allow us to restore a roof of Corinthian type, but with cylindrical ridge tiles—the only ones so far found in the dockyard. For this type of roof we have so far found no evidence of any type of decoration.

SICILIAN TYPE ROOF

A considerable number of antefixes, a small quantity of architectural terracottas, and in addition a large number of cover-tiles, all discovered in all slipways, attest an earlier phase of the dockyard roof of Sicilian type. Crucial evidence for this was provided by discoveries in slipway 3. In its upper part, between the top of the sand ramp and the back wall of the shipshed, in a small irregular pit, two fine examples were found of Silenos antefixes (**A1–2**) (FIG. 30) of the earlier ‘plaque’ type (FIG. 31; cf. Pelagatti 1965, 80–89 and 1977, 51–12, pl. i. 1–4); and not far away, almost against wall 3 and close to the north-west corner of the shipshed, a strange alignment emerged: it started with a lateral geison (**B2g**) with remains of

²¹ The disturbed remains from the lower excavated part of slipway 3 are still under study.

²² Blackman and Lentini 2003, 397 FIG. 24 shows an alternative reconstruction of a ridged roof over each slipway: the important point that we wished to illustrate

was the additional clear width which would be provided by timber roof supports rather than a solid wall of the same thickness as the socle (though we now consider the timber post alternative unlikely); Blackman 2004; see below, Pakkanen’s reconstruction.

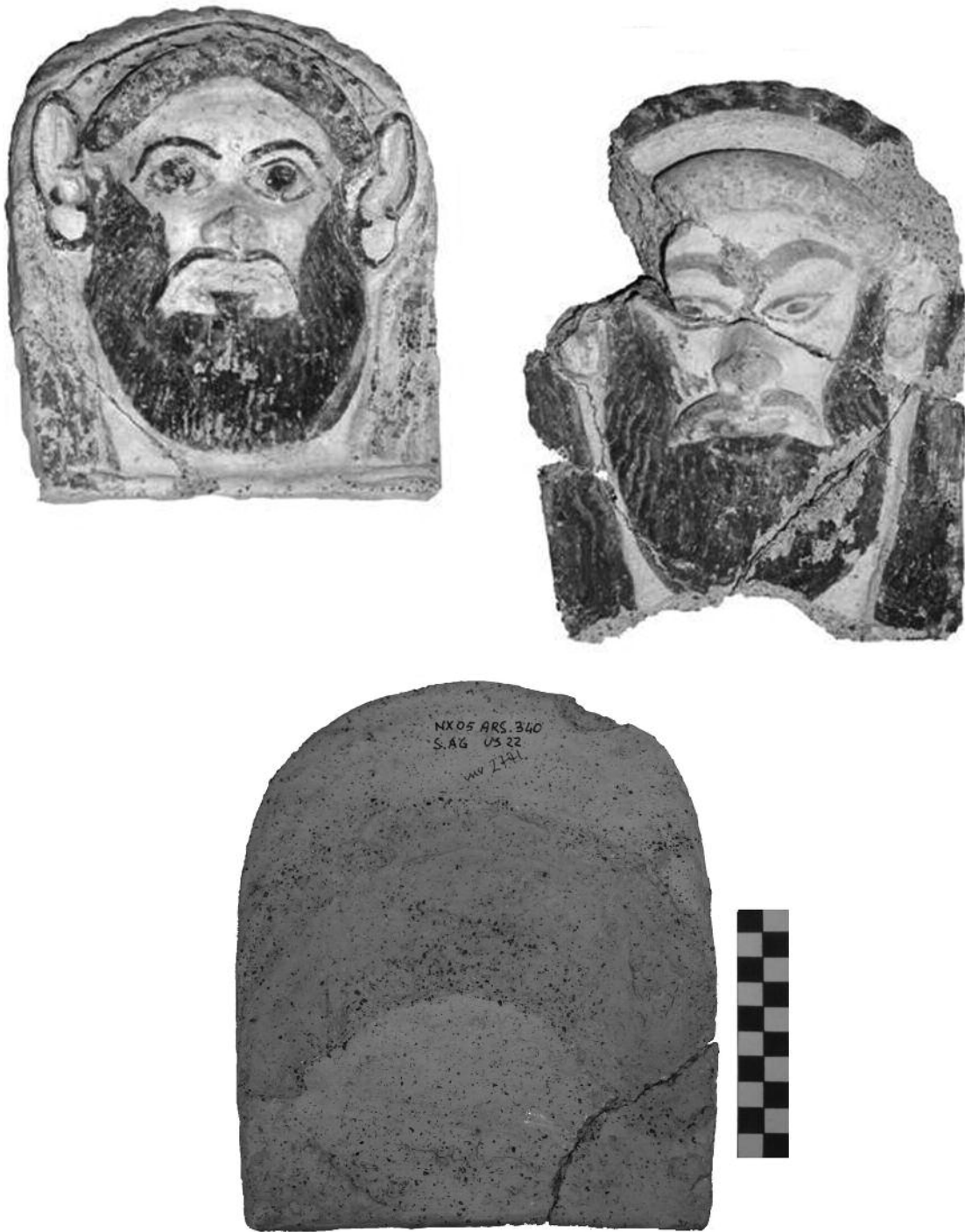


FIG. 30. (a) Type A Silenos-mask antefixes A1–2 from slipway 3; (b) Antefix A1, rear view.



FIG. 31. Antefixes **A1** and **A2** found buried in a pit in the upper part of slipway 3.



FIG. 32. View from the south-east of the strange alignment composed of cover-tiles (**C40-7**) at the foot of wall 3 in slipway 3.

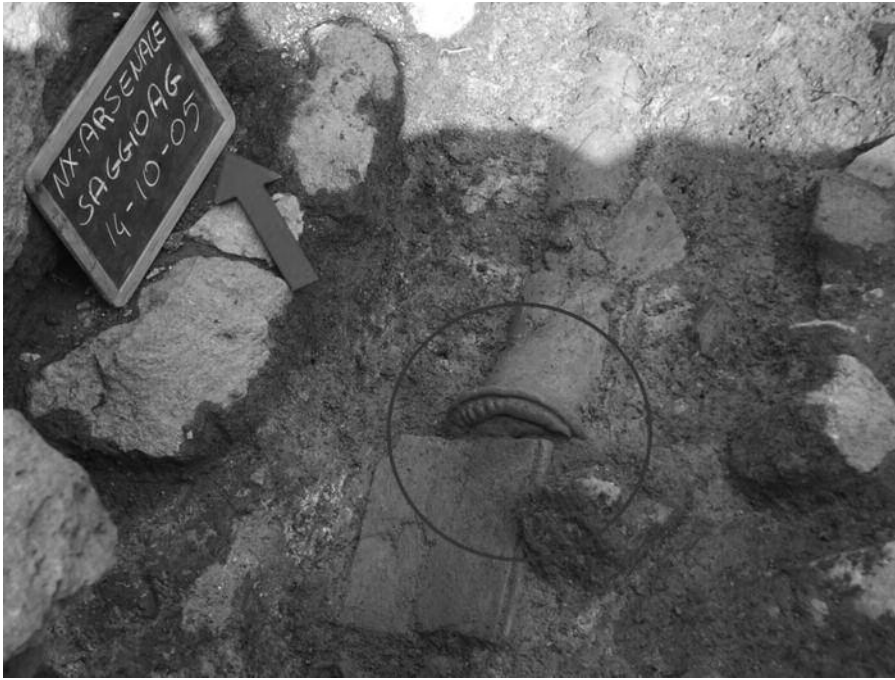


FIG. 33. End of the alignment, formed by a fragmentary geison (**B29**) and a Gorgoneion (**A15**).



FIG. 34. Detail of Gorgoneion **A15**, as found.



FIG. 35. Detail of Gorgoneion **A18**, buried in pit close to the southern side of ramp 3, from the east.



FIG. 36. Fragment of Gorgoneion **A19**, found close to a cover-tile of the alignment.



FIG. 37. Another fragment of Gorgoneion **A19**, laid against a cover-tile, very close to the end of the alignment.

decoration, continued with pairs of long cylindrical cover-tiles (**C40-7**) placed one on top of the other (FIG. 32), and terminated in an unusual tile bearing a perfectly preserved Gorgon antefix (**A15**) (FIGS. 33-4).

In slipway 3 the find contexts of Gorgoneia **A18** and the lower fragments of **A19** are notable. The first was discovered inside a pit dug very close to the southern side of the upper sand ramp (FIG. 35); the fragments of the second one were located along the edge of the cover-tile alignment (FIGS. 36-7).

Our initial reaction was to suppose that the whole complex related to remains, devoutly buried, of the roof of a building preceding the dockyard; but now, after more careful examination, we think it possible to attribute this evidence to an earlier phase of the dockyard, datable to the late sixth century. We must, however, point out that the level contains material from the late sixth to early fifth century.

CATALOGUE

The following catalogue contains architectural materials discovered during the excavation campaigns conducted between 2001 and 2006. Surprising in view of the context in which they

were found, since antefixes, and more generally architectural terracottas from similar harbour installations, are rare,²³ the repertoire comprises the following groups:

- (A) antefixes (**A1–28**),
- (B) architectural revetments (**B29–39**),
- (C) cover-tiles (**C40–7**) and ridge cover-tile (**C48**).

(A) ANTEFIXES

When the first examples were found in 2001, we were surprised and somewhat puzzled; now, in the light of the repertory that has been collected, we see that they constitute an essential element for the reconstruction of the earliest phase of the roof.

Of the twenty-eight antefixes recovered by the excavations, fourteen are of Silenos-masks (**A1–14**) and thirteen of Gorgon-masks (**A15–27**): thus an almost equal number. One sole example (**A28**) is of plaque type with indecipherable traces of its decoration in brown paint (perhaps a palmette?). The type is represented in Naxos by very few examples, some with obscene representations of Silenos.²⁴

The antefixes are attested in almost equal quantities within the slipways, with the exception of slipway 4, where only two antefixes were found (**A25–6**). Six antefixes were found in slipway 1 (**A6–8**, **A16**, **A21**, **A22**), eight in slipway 2 (**A3**, **A9**, **A10**, **A12–14**, **A23–4**) and eight in slipway 3 (**A1**, **A2**, **A4**, **A11**, **A15**, **A18–20**). Antefixes **A5** and **A27** were recovered, on the other hand, from the area adjacent to the northern elevation of wall 1: an area probably used as an open-air slipway (Blackman and Lentini 2003, 394); and **A17** was found outside the dockyard, far behind the back wall, in the area corresponding to slipway 4.

The distribution of the antefixes on the ground, like that of the architectural revetments described below, with its slightly greater concentration in slipways 2 and 3, may provide useful information about the character of the first roof.

Antefixes of Silenos-mask type

The Silenos-mask was very popular at Naxos from the end of the sixth century BC, and represents the image most widely used in antefixes, one of the more particular creative products of the colony.

The link between Silenoi and Dionysos is clearly shown by the coinage of the city. The crouching Silenos on the famous tetradrachm (Cahn 1944, 42–9, 55–6, pl. iii. 54, R45) is associated with the head of Dionysos on the obverse—traditional image at this centre of viticulture. The importance of the cult of the god in the city, and the mythological origins of Silenoi, traced back to the island of Naxos (Hedreen 1992, 67–103), are useful arguments in favour of the Cycladic roots of the colony (Guarducci 1985, 22; Pugliese Carratelli 1992, 403–4). Mount Etna, which would have dominated the landscape of the ancient colony, may be an additional reason for the wide distribution of the image of Silenos in the colony, since a link between Silenos and Mt. Etna has been highlighted convincingly through the representations of the daemon on the coins of Katane and Naxos by Gitler in the catalogue of a recent exhibition in Jerusalem (De Gallatay and Gitler 2004, 17–18).²⁵ A lesser-known

²³ Cf. Cavallari 1891, 64 for a palmette antefix (Museum of Syracuse N8475) from the Syracuse dockyard.

²⁴ Lentini 1995, FIGS. 1–3, 7–9 with direct comparison with some specimens from Gela (Winter 1993, 279).

²⁵ On that link, and generally on the importance of Mt.



FIG. 38. Type A Silenos-mask antefixes A3-5.



FIG. 39. Type C Silenos-mask antefixes **A10** and **A13**.



No. A6



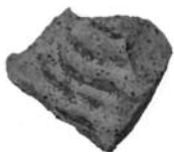
No. A11



No. A7



No. A12



No. A8



FIG. 40. Type B (A6-9) and Type C (A11, A12, A14) Silenos-mask antefixes.

tradition portrays Silenos as the old servant of Polyphemos, the one-eyed Cyclops who lived in a large cave at the foot of Mt. Etna, an individual character in Euripides' satyr-play *The Cyclops*.²⁶

Types A–C of Pelagatti's classification are attested. The frequent repairs evidently required by the dockyard roof provide a plausible explanation of this, and may be regarded as indicating a second or intermediate phase of the roof, with types B and C Silenos antefixes along the eaves.

Type B of the first decades of fifth century BC is represented by four examples (**A6–A9**), three from slipway 1 and one from slipway 2 (FIG. 40), and type C, datable to the central years of the fifth century BC, by six (**A10–14**), mostly from slipway 2 (FIGS. 39–40).²⁷ **A13** is notable for its brilliant colours, whereas **A10** is representative of the type because of its mouth with partly open lips, showing the teeth, in an animal-like grin (FIG. 39). The number of antefixes belonging to the earlier type A is limited: only five examples out of an overall fourteen, of which three (**A1–2**, **A4**) (FIGS. 30, 38) are from slipway 3, one (**A3**) from slipway 2 (FIG. 38) and one (**A5**) from the immediately adjacent area to the north of the dockyard (FIG. 38). It is noteworthy that the specimens of type A are concentrated in slipway 3. They seem to be attributable to the earliest phase of the roof, which probably dates to the late sixth century BC. To judge from the external appearance of their fabric and from their technique, characterized by a thick cream-coloured slip and by brilliant polychromy, antefixes **A1–5** (FIGS. 30, 38) would seem to be products of a single workshop at Naxos, even if they probably do not derive from the same mould. The appearance of the clay is very close to that of the lateral geison **B29**.²⁸

In quality and state of conservation, **A1–2** are exceptional among the antefixes of Silenos-mask type so far discovered in Naxos (FIG. 30).²⁹ Found, as we have seen, almost intact within a small pit at the foot of the rear wall of the building (FIG. 31), in clear association with a late-archaic level, the two specimens seem to belong to the earliest production of the type; their evident links with East Greek terracotta sculpture are corroborated by their close affinity, as Pelagatti (1977, 52) has pointed out, with the terracotta mask from Samos in the British Museum (Higgins 1954, 142, no. 523); and the head of a Silenos from Thasos may be a parallel, despite its grotesque features (Grandjean and Salviat 2000, 248, no. 5, FIG. 175). The shape of the antefix itself, in the form of a rectangular plaque tapering towards its base, and with the mask crowned by a flange (FIG. 30 *b*) surmounting the attachment to the cover-tile, clearly shows the Ionic derivation of the type. The two specimens **A1–2** attest better than any others the fundamental role that vivid polychromy played in the figural representation; it is only thanks to the colours that minor, but distinctive variations are produced in the facial features. Great attention is also devoted to the adornment, disc earring, and taenia, which continuously change and probably made it possible to distinguish each mask from the next on the same roof. This distinctive character agrees with the 'portrayal' of the Silenos-masks as adorned with polychrome make-up, provided by the one fragment (F 78a Radt, 11–12) of

Etna in the myth, see also Caruso 2007, 140.

²⁶ He speaks the prologos (1–40), and is the father of the Satyrs who form the chorus (27).

²⁷ Pelagatti 1965, 89–96, nos. 15–32 (type B), 33–6 (type C). For type C, see also Pelagatti 1977, 53–4, pl. II.1–2; Lentini 1996, 646, no. 183 (specimen with well-preserved polychromy).

²⁸ No laboratory analyses have been conducted yet; they would be very useful.

²⁹ Of the c.30 examples of type A Silenos antefixes so far found, only very few specimens preserve the polychromy. Among them we point out an example from a votive context of the late 6th c. BC (Lentini 1996, 639–40, no. 59), which is very close to our **A2**.

Aeschylus' satyr-play *Theoroi and Isthmiastai*, which Marconi (2005, 77) has recently highlighted precisely in relation to the Sicilian Silenos antefixes.³⁰

Gorgon-mask antefixes of 'flanking snakes' type

The discovery of Gorgon-mask antefixes, and their quantity, represents a novel feature in the architectural terracotta decoration of Naxos, where the figure of Silenos has tended to predominate. Abundant evidence of the Gorgoneion, used both as ridge-beam revetment and more frequently as ridge-tile ornament and central akroterion, had been provided by the urban and suburban sanctuaries of the colony and to a lesser degree in the habitation area too.³¹ The evidence regarding regular antefixes with Gorgoneia, by contrast, had so far been meagre, and so the discovery of Gorgon-mask antefixes on the dockyard site represents a significant addition to our knowledge of the type. Altogether thirteen antefixes with Gorgoneia, whether complete or fragmentary, have been found within the slipways of the dockyard. They can be divided into at least two types, and one variant, all characterized by flanking snakes. The discoveries made in the upper zone of slipway 3 were particularly important for differentiating and dating both types. The stratigraphic data from within the slipway—antefixes **A15**, **A18**, and **A19** belonging to the same level—would suggest a parallel use of the two types, although type 2 probably commences earlier.

The repertoire thus created provides an opportunity to re-examine the typology of Gorgon-mask antefixes of the type with 'S-shaped serpents' (Van Buren 1923, 81) or 'flanking snakes' (Kentfield 1990, 268). The type has recently been defined anew by Pelagatti (2006, 438–41) in a perceptive study, on the basis of the fragments from Naxos and, significantly, from Francavilla di Sicilia, in the Alcantara valley, the natural hinterland of the colony.

It is important to start by saying that the types so far defined show close affinities with those of Magna Graecia and more particularly with the series of Gorgoneia from Taras, from which they probably derive.³² The problem of what role Naxian workshops played in the diffusion in Sicily of this type of Gorgoneion with S-shaped snakes, remains open. It would seem to have been a leading one, to judge from the diffusion of the type that Pelagatti (2006, 440) has described.

Type 1 is represented only by the intact specimen **A15** (FIG. 41) and by the fragmentary antefix **A16**. Of the types so far defined it is probably the latest, as suggested by its form: it is distinguished by an almost circular plaque and by a compact hairstyle, animated by a thick convex wave representing the row of curls framing the smooth and unwrinkled ogival brow (FIG. 41). There are many analogies with Silenos antefix type A in the treatment of the hair, and, as with the Silenos, the polychromy is required for the Gorgon's characterization, as well as the tongue.

The round face, contoured along the lower margin by a black painted line (beard?), is

³⁰ However, we do not agree on the low chronology of the beginning of earlier Naxian type A Silenos antefixes to be after Aeschylus' first stay in Sicily, i.e. post 478 BC. This chronology seems to conflict with the archaeological evidence from Naxos dated to the last decade of the 6th c. BC. The few examples of Silenos antefixes of type A from the 5th-c.-BC levels of the city may indicate the end of the type.

³¹ Lentini 2006, 423–5, FIGS. 41.41–3 (fr. of archaic, wide, probably round, pedimental gorgoneion from

sanctuary beyond the Santa Venera stream); Pelagatti 1984–5, 680–3, FIGS. 1–2, pl. cxxxviii.1 (early classical gorgoneion of ridge tile from urban shrine F). At least eight unpublished examples of ridge tile gorgoneia come from the sanctuary beyond the Santa Venera stream; another example of 'Corona of Snakes' type comes from the town (stenopos 11), from recent excavations (Lentini forthcoming).

³² Van Buren 1923, 81, 137–144, FIGS. 55–61; Laviosa 1954, 229–43 (antefixes from Taras).



No. A15



FIG. 41. Gorgoneion **A15** (front and side views, and detail of the snake).

represented with a short section of neck; unusually the nose is almost regular. The pronounced crescent eyebrows and large contoured almond eyes, shown in slight relief, are painted dark brown (FIG. 41).³³ The mouth seems rather open in a smile, despite the short fangs which do not protrude over the lip. Also, the pendent tongue is slightly projecting and its rendering is naturalistic. Nothing is frightening in this Gorgon except the snakes.

The snakes are the characteristic feature of the type. The Gorgon-mask is flanked, and its rotundity accentuated, by the coils of two matching pairs of snakes. The upper pair rears perpendicularly to the sides of the face; the heads are turned horizontally below the small, very schematic ears and protrude slightly from the edge of the plaque. The lower pair, by contrast, is smaller: the facing heads are flat and triangular; the coiled bodies are horizontally arranged at the base of the plaque, closing the composition. The representation of the more prominent upper pair of snakes is precise and meticulous: their bodies are larger, tubular, and flecked in black. Many details of the treatment of the head can be deduced from **A15**, where the triangular shape of the head of the snake to the left is well preserved, retaining its minute and vivid characterization (FIG. 41). It is shown frontally, in contrast to bearded snakes current in this type of antefix.³⁴

Type 2 is characterized by a semi-elliptical plaque and is probably slightly earlier than type 1 (figs 42–3). Most of the specimens discovered in the dockyard (**A18–27**), and distributed in all its slipways, belong to this type. But the appearance of type 2 remains hypothetical as regards the hair arranged round the forehead, because of the generally fragmentary state of the items and since **A18** was found almost intact, but is broken off round the top of the head, and so lacks this part of the hairstyle (FIG. 42).³⁵

The type has been conjecturally—combining elements of **A18** (FIG. 42) with **A19**, **A21**, and **A23** (FIG. 43)—restored with spiral or corkscrew curls arranged, with central parting, in two superimposed rows round the forehead, and falling to the sides of the neck in four short tresses indicated by vertical rows of ‘bead-locks’.

As is well shown by **A18** (FIG. 42), the type is in general distinguished by the more plastic treatment of the face, which is characterized by the usual furrowed brow, in some cases emphasized by black paint (for example, **A21**, **A25**) (FIG. 43), by large well-delineated eyes, by a squat nose with dilated nostrils, and by a broad grinning mouth with gnashed teeth, short fangs, and pendent tongue. The general aspect is frightening and more orthodox than type 1, perfectly in line with the character. The two snakes, one on either side, are coiled vertically; their lower part is wound round—or rather superimposed over—the hair, while their upper part lies horizontally with the head placed below the Gorgon’s ears which are pricked up and represented in a naturalistic manner as shown by examples **A19** and **A23** (FIG. 43).

An example from past excavations carried out in the area outside the dockyard to the west is in size and modelling very close to **A19** (FIG. 44).³⁶ It may give a precise indication of the snakes portrayed with head in profile clearly protruding from the slab (FIG. 43a).

³³ The Gorgon antefix from Naxos inv. 450 of ‘serpentelli a 8’ type of Pelagatti’s classification (2006, FIG. 43. 9) can undoubtedly be associated with type 1. This example, a fragment of the upper part of the mask, in fact shows an almost complete identity with **A15**. The fragments of Gorgon antefix inv. 572, 573 (Pelagatti 2006, FIG. 43.10a–b), on the other hand, are attributable to the later type 2 with single snakes at the sides and hair in beaded strands hanging down on either side.

³⁴ See e.g. a specimen from Camarina (Van Buren 1923, 142, no. 26).

³⁵ It is important to point out the identity of diameter and technique between the cover-tiles of **A15** and **A18** and **C40–4**, and more particularly **C43** (FIG. 47): evidence that confirms that these elements belong to the same roof (cf. below, p. 00).

³⁶ Inv. 2499. Naxos 1989, Trench Q9 /45. H. (max.) 10.5; W. (max.) 11.2; Th. 1.5.



No. A 17



No. A18

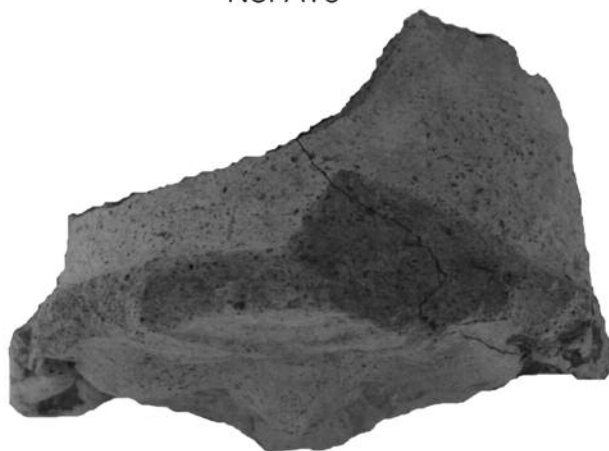


Fig. 42

FIG. 42. Gorgoneia **A17** (front view) and **A18** (front view and view from above).



No. A19



No. A25



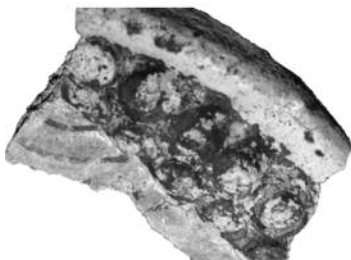
No. A26



No. A23



No. A27



No. A20



No. A24

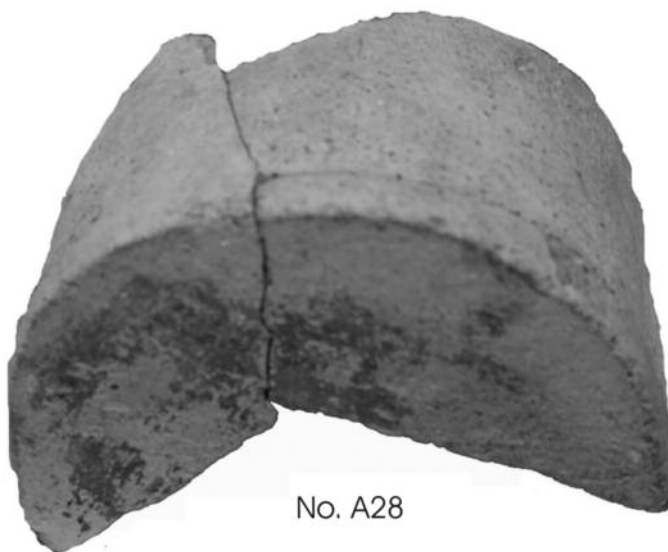


No. A19

FIG. 43. Type 2 Gorgoneia flanked by single S-shaped snakes (A19-21, A23-7).



Gorgoneion fragment inv. 2499



No. A28

FIG. 44. Antefix found in 1989 west of the dockyard and slab type antefix **A28**.

The fragmentary antefix **A17** (FIG. 42) is particularly important because it may be considered a variant of type 1 and well illustrates the transition from type 2; for this reason it is included in the catalogue, although it comes from outside the dockyard. The technique and surface quality of the fabric are similar to those found in **A15**. The uniqueness of **A17**, otherwise very similar to **A15** in its modelling, consists in the hairstyle that crowns the flat and unwrinkled brow. Both the spiral curls and the compact mass of hair furrowed by radiate incisions co-exist in it. The closest comparison for this hairstyle is furnished by a specimen in the Museum of Syracuse, of uncertain provenance (acquired by Paolo Orsi), which Pelagatti (2006, 440, FIG. 43. 13) has recently indicated as the prototype of the ‘so-called Francavilla di Sicilia’ variant. Though the smallness of the fragment makes it difficult to trace it back to a bearded type resembling that attested at Francavilla di Sicilia, **A17** undoubtedly remains indicative of Naxian production of the type.

(B–C) ARCHITECTURAL REVETMENTS AND TILES

As with the antefixes, the distribution pattern of the architectural terracottas in the Naxos dockyard is almost uniform, with five fragments (**B29**, **B32–5**) from slipway 3, four (**B36–9**) from slipway 2, and two (**B30–1**) from slipway 1 (FIGS. 45–6). Slipway 4 alone yielded no specimen of architectural terracotta.

The geison revetment fragment **B29**, with its plaque that retains its complete width, belongs to the lateral revetment (FIG. 45). On the basis of its decoration, a single guilloche with large ten-petal rosette inside the dentate ring of the crossing, which is closely matched at Naxos by examples from the south-western sanctuary (Ciurcina 1977, 76, no. 7, pl. iv. 3), it is possible to reconstruct the vertical plaque with a lower double roll *c.*24 cm high (FIG. 44). The minimum gradient of the roof can be measured as 18° (see the profile of the revetment in FIG. 45).

Geison **B29** differs greatly in technique and in decoration from the other geison fragments **B30–8**, but this apparent disparity would not necessarily preclude their belonging to the same roof.

Examples **B30–8** are characterized by a double guilloche with solid disc with central dot at the crossing and lotus with probably six petals (FIG. 46). Fragment **B31** is slightly different because of the cross drawn inside the disc (FIG. 46). By visual examination one can distinguish two different fabrics: one characterized by a reddish micaceous clay with volcanic particles, the other by a yellowish-grey clay without mica and with ground grains of lavic stone. The slip always consists of a wash of levigated clay.

From the fragments—most belong to the lower part with only **B38** (FIG. 46) belonging to the upper part—it is possible to reconstruct a plaque with upper single roll and lower double roll. On the basis of the decoration, its height can be calculated at *c.*27 cm (FIG. 46); so it would have been close in size to **B29**. On the other hand, there is nothing to show or to determine to what revetment these plaques might have belonged, whether lateral or frontal. There are some clues, however, that would seem to favour the hypothesis that **B30–8** belonged to the raking geison revetment of the pediment of the same roof to which **B29** belonged. In this regard it may be pointed out that the combination in the same roof of lateral geison revetment with single guilloche and a raking geison with double guilloche is attested elsewhere at Naxos (Lentini 1997, 129, FIGS. 4–5). The close resemblance in technique observable between fragments **B30**, **B33–7**, and **B39**, the latter probably identifiable with a fragment of raking sima (FIG. 47), is consistent with such an hypothesis. In spite of the fragmentary nature of **B39**, at least part of its

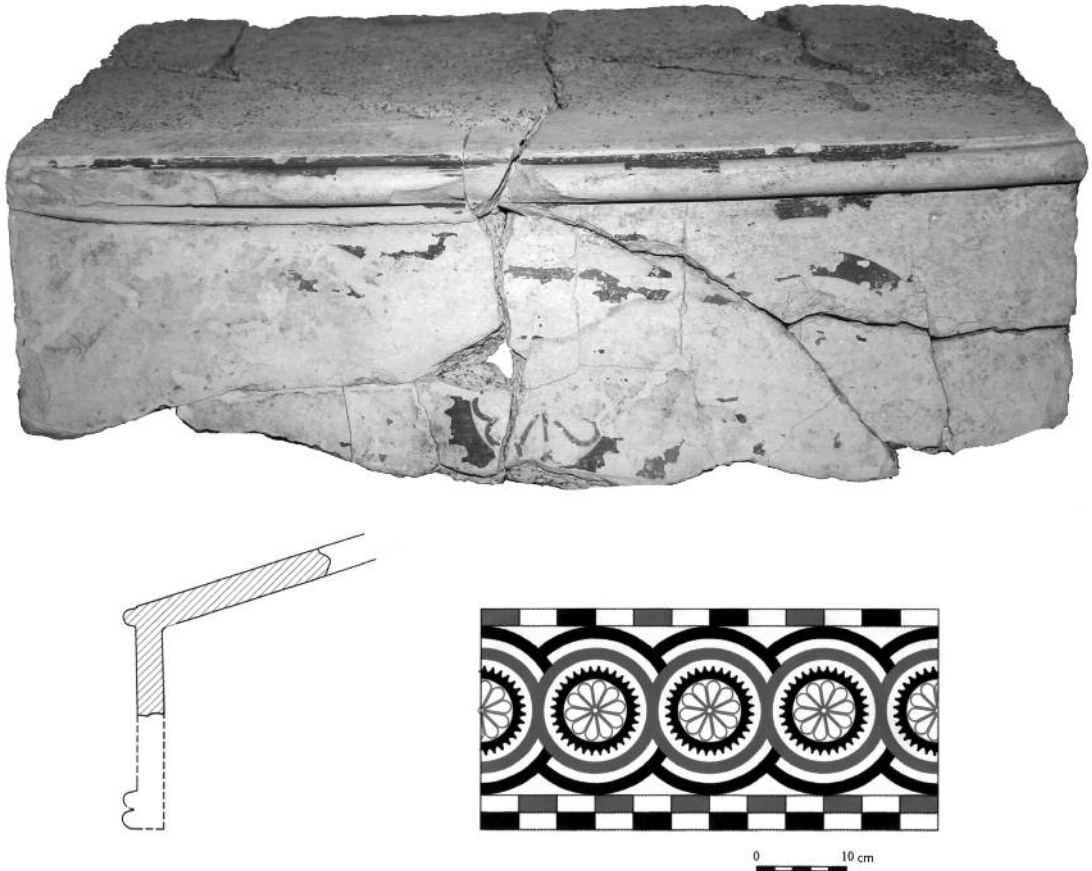


FIG. 45. Lateral geison **B29** with single guilloche (view, profile and drawing).

decoration can be reconstructed: on the upper fascia, interlocking black crossing meander framing red panels with reserved quatrefoil inside, and on the cavetto, a frieze of lyre-shaped leaves with lotus flower buds springing from small volutes or more probably palmettes inserted in the interstices (FIG. 47). The sophisticated frieze pattern (Wikander 1986, 20–1) is widespread on the Naxian terracottas. The closest parallels are, in fact, at Naxos with some fragmentary specimens from the south-western sanctuary (Ciurcina 1977, 75, no. 6 pl. iv. 2, and esp. 79, nos. 30–1, ix. 3–4), and more generally with an earlier complete raking sima from the same sanctuary (Ciurcina 1977, 76, pl. v. 2–3; Wikander 1986, 40, no. 44, FIG. 11). The type could be contemporaneous with the Ionicizing open-work anthemion sima.³⁷ The more general parallels with the pedimental sima of the second type of Temple B at Himera and above all with a lateral sima from Monte San Mauro,³⁸ would suggest a dating of the sima from the dockyard to the late sixth century BC.

³⁷ Pelagatti 1964, 161–2, FIGS. 36, 38–9; Ciurcina 1977, 78, no. 27, pl. VIII; Winter 1993, 277. On the sima's Ionicizing character: Barletta 1983, 23, 27; contra: Wikander 1986, 25.

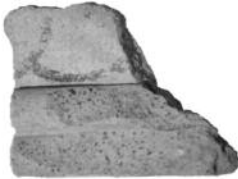
³⁸ Wikander 1986, 37, no. 20, FIG. 9 (Himera), 39, no. 35, FIG. 10 (Monte S. Mauro). These simas belong to phase 3 (550–480 BC) of Winter's classification (1993, 276).



No. B30



No. B31



No. B32



No. B33



No. B34



No. B35



No B36



No. B37



No. B38

FIG. 46. Fragments of raking (?) geisa **B30-8** with double guilloche (with profile and drawing of **B30**).



No. B39

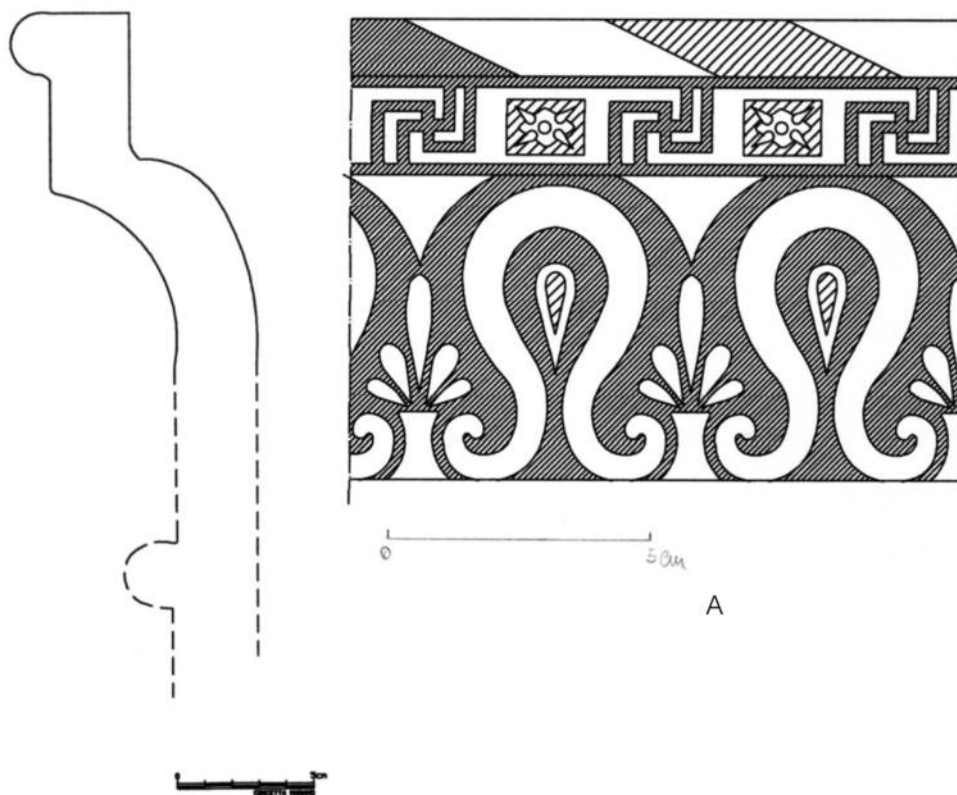


FIG. 47. Fragments of pedimental sima **B39** (view, profile, and drawing).

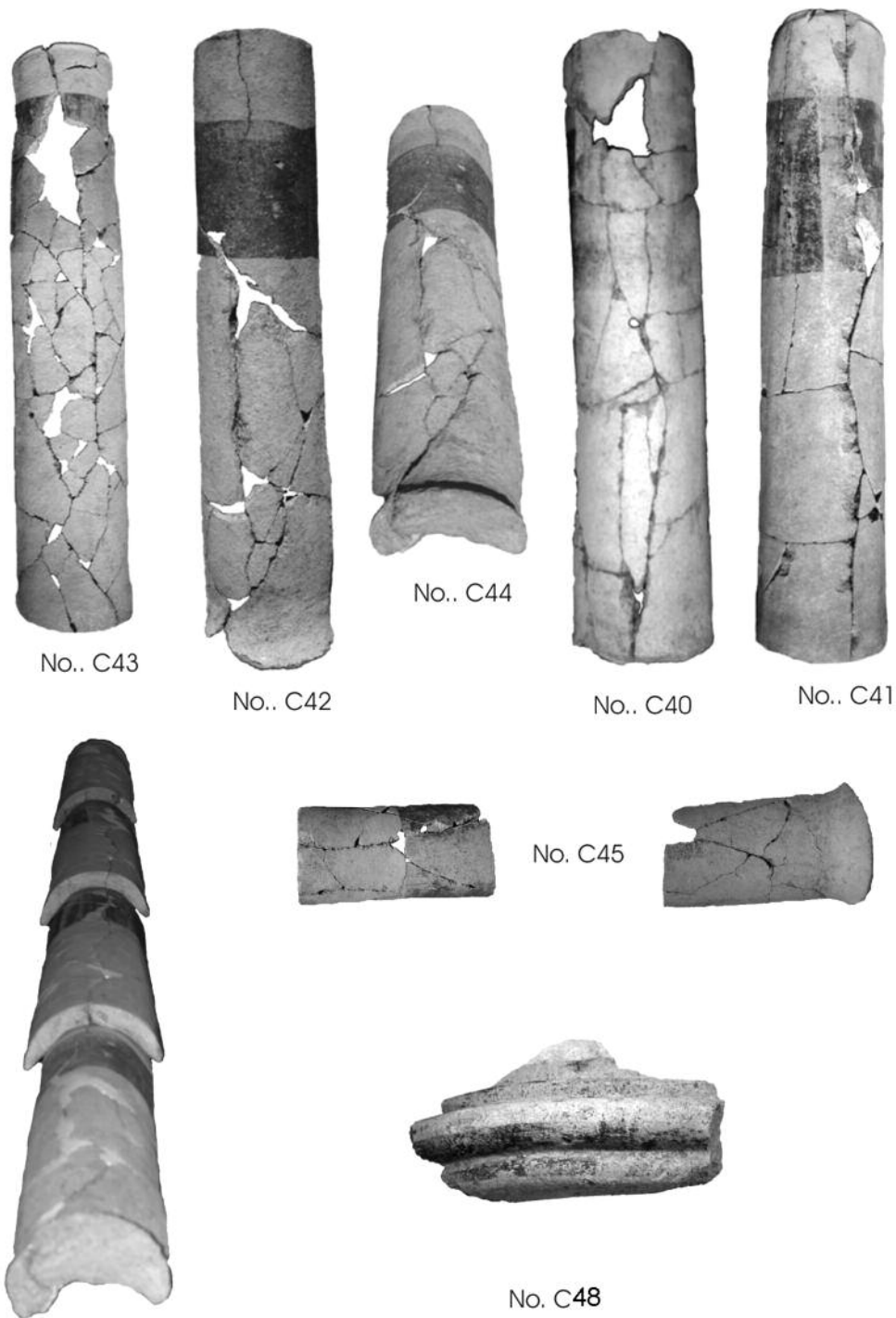


FIG. 48. Cover-tiles (C40-5), combination of cover-tiles C40+41+42+44 superimposed, and ridge-tile (C48).

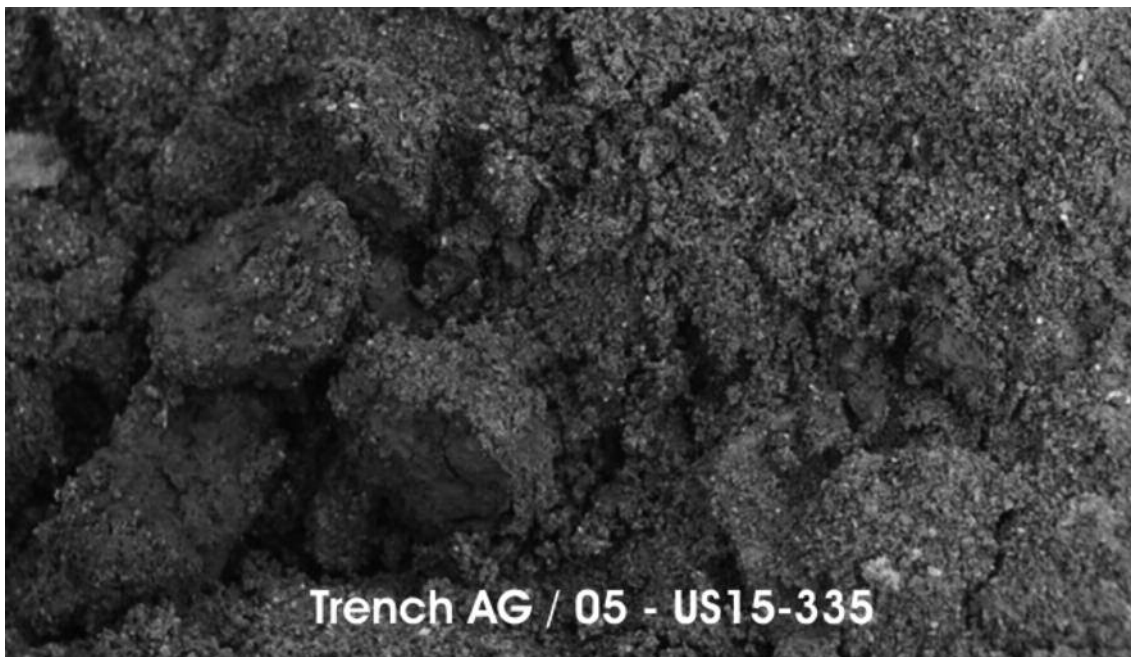


FIG. 49. Red pigment from ramp 3.



FIG. 50. Red-burnt area at the head of ramp 3.

The painted cover-tiles **C40–7** are cylindrical in form with a narrow diameter in relation to their length. Undoubtedly they belong to the same roof, as is shown by their dimensions and by FIG. 48, where **C40–2** and **C44** are easily superimposed. The remains of the antefix slab on **C43** and those of the attachment strip to the slab on **C44** may identify them with eaves-tiles. Their length is shorter than that of **C40–2**: 71 cm against $8\frac{3}{4}$ cm.

They were all discovered in the upper part of slipway 3 in a deposit (FIGS. 32, 35) that is, as we have seen, puzzling in many respects, but that confirms their belonging to the same roof as the antefixes with Gorgoneion **A15**, **A18–19** (FIGS. 41–3) and those with Silenos-masks **A1–2** (FIG. 30), as well as the above-mentioned geison revetment plaque **B29** (FIGS. 32–3, 45).

This excavation context leaves no doubt that all these terracotta fragments belong to the same roof. The (truly unusual) association of Silenos-mask with Gorgon-mask antefixes on the eaves of the long sides of the same roof would thus be attested for the first time at Naxos. The almost exact numerical parity between the examples of the two types of antefix discovered—fourteen of the Silenos-mask type, thirteen with Gorgoneia—would be consistent with such an association. In the reconstruction (see below, p. 00; FIG. 56) we have chosen the more gracious and benevolent Gorgoneion **A15**, because of its good preservation and because of its remote likeness to the maiden-companions of the Silenoi—the Maenads.

On the basis of the length of the complete specimens **C40–2** we may reconstruct a very long pan-tile, very close in size to that used in the dockyard's second, Corinthian roof (cf. above, p. 00).

The painted strip on the tiles is an indication of the colour of the roof surfaces, as at Morgantina (Kentfield 1990, pl. 43 *b*). Apart from the tiles **C40–7**, numerous fragments of similarly painted roof-tiles were found within all the slipways. The sides of the ridge-tiles also seem to have been painted brown, to judge by some fragments like **C55** (FIG. 48), whereas no example of painted eaves pan-tile has been found among the large quantity of tile fragments found within the dockyard building. No further decoration on the roof sides would therefore seem to have accompanied the antefixes, contrary to what is commonly attested in Sicily and at Naxos itself (Winter 1993, 280).

A. ANTEFIXES

Silenos-masks

Type A

A1 Inv. 2771 (FIG. 30)

Slipway 3, Trench AG/2005. US 22/340.

Complete with fragment of left corner rejoined. Well-preserved polychromy.

H. 19.5; W. (max.) 16.5, (base) 15; Th. 1.9/2.7. Cover-tile D. (ext.) 16, (int.) 14; W. (joining strip) 6.8.

Hard, light beige clay, with many coarse volcanic particles. On the surface cream slip applied by brush on the levigated clay wash. Black and diluted black glazes. Made from fresh mould.

Head curved on a rectangular slab, with thick hair coming out from taenia, round the short forehead, dark-painted, strongly arched brows, round eyes outlined in black, squat nose, long horse's ears with ear-ring of the ring type with short pendant, dark flowing beard indicated by rippling lines. Long, straight moustache on the mouth with full lips. Wavy incisions on the long hair on the sides of the mask and on the beard. On the taenia a chain of triangles outlined in black with central dots.

Late 6th c. BC.

A2 Inv. 2772 (FIG. 30 *a*)

Same provenance as **A1**.

Restored from five fragments, missing small parts of the slab base and of the right ear with the corresponding upper part of the hair. Well-preserved polychromy.

H. 19.5; W. (max.) 16; Th. 1.9/3.2.

Hard pinkish clay with many coarse volcanic particles and with a levigated clay wash on the surface. Dark brown and reddish glazes. Made from fresh mould.

Head similar to **A1** except for the oblique eyes, outlined in black, with a divergent squint. No decoration on the taenia; disk earrings with central bar.

A3 Inv. 2773 (FIG. 38)

Slipway 2, Trench Z/2004. US 37.

Fragment preserving right part of mask with remains of the hair and the beard, and with right ear and eye, mouth. Nose damaged. Well-preserved polychromy.

H. (max. pres.) 14; W. 10; Th. 1.4/1.9.

Greyish pink clay with many coarse volcanic particles and with cream slip on the surface. Black and reddish glazes. Made from fresh mould.

Type B

A6 Inv. M 502 (FIG. 40)

Slipway 1, Trench G/2001. US 2/133.

H. 10; W. 15.7; Th. 3.2/3.7.

Blackman and Lentini 2003, 428, no. 48.

A7 Inv. M 496 (FIG. 40)

Slipway 1, Trench F/2001. US 21/79.

H. 7.7; W. 6.8; Th. 1.2/2.2.

Blackman and Lentini 2003, 428, no. 49, FIG. 42 (B3 type).

A8 Inv. M 497 (FIG. 40)

Same provenance as **A7**

Fragment of beard (left side).

Thick hair, arched brow and round eye as **A1**. Disk ear-ring with wheel motif outlined in red. Red glazed taenia and lips.

A4 Inv. 2778 (FIG. 38)

Slipway 3, Trench AK/2006. US 2/1.

Fragment preserving upper part of head with badly preserved remains of eyes, right ear, and right cheek-bone. Traces of ash on surface. Badly preserved polychromy.

H. (max. pres.) 10; W. 15; Th. 1.6/2.00.

Pink-violet clay with many volcanic coarse particles and remains of cream slip. Black fugitive glaze. Made from fresh mould. Series of black glazed crosses on taenia.

A5 Inv. 2779 (FIG. 38)

Open-air slipway, Trench L/2001. US 3/28.

Fragment of left part of slab bottom with remains of hair, beard, and left ear lobe.

H. (max. pres.) 6.8; W. 5.3; Th. 2.1/2.2.

Hard pinkish-beige clay with traces of cream slip. From mould.

Black beard, red painted hair. Disk ear-ring with central bar, as **A2**.

H. 4.7; W. 4.7; Th. 2.2.

Pale orange clay with volcanic particles.

C. mid-5th c. BC.

A9 Inv. 2784 (FIG. 40)

Slipway 2, Trench Z/2004. US 8/37.

Fragment of central part of beard.

H. 6.7; W. 12.5; Th. 1.3/2.

Greyish-white clay with many coarse volcanic particles; levigated clay wash on the surface. Beard indicated by radiate strands (type B3). C. mid-5th c. BC.

Type C

A10 Inv. 2785 (FIG. 39)

Slipway 2, Trench P/2003. US 33/37

Lower half of moulded mask restored from 2 fragments, preserving nose/mouth/beard.

H. max. preserved 9.2; W. 13.4; Th. 1.2/1.5. Pale orange clay with fine volcanic particles; levigated clay wash on surface. Traces of black glaze. From fresh mould.

Round beard indicated by rippled radiate strands, long, straight moustache on semi-open mouth with prominent lower lip, and visible teeth.

Mid-5th c. BC.

A11 Inv. 1947 (FIG. 40)

Slipway 3, Trench 26/1983-5

Fragment of cover-tile with remains of edge of beard, solid mass of hair below raised flange, and pointed asinine left ear of the Silenos-mask.

H. (max. pres.) 5; W. (mask) 9.3; L. (max. pres.) 14.8; D. 11.5.

Pale orange clay with many fine volcanic particles and levigated clay wash.

Lentini 1982, FIGS. 6-7.

A12 Inv. 2781 (FIG. 40)

Slipway 2, Trench U/2004. US61/130.

Cranium with remains of hair and with beginning of cover-tile. Surface abraded.

H. (max. pres.) 9.2; W. 13.4; Th. (max.) (mask) 4.2, (cover tile) 1.8; L. 6.7.

Pale orange clay with coarse ground grains of volcanic stone; levigated clay wash on surface.

Solid, flat mass of hair with receding hairline round the forehead with two deep curving wrinkles, strongly arched brows indicated by couple of incisions, very pointed asinine ear. On the cover-tile's interior surface a graffito, incised after firing, with five bars forming a sign similar to a trademark.

A13 Inv. 2782 (FIG. 39)

Slipway 2, Trench U/2004. US 57/83.

Upper half of mask with beginning of cover-tile. Well-preserved polychromy.

H. (max. pres.) 13.4; W. 12.7; Th. (mask) 1.5/4.2, (cover-tile 1.8); L.6.7; D. (ext.) 16, (int.) 13.

Pinkish-red clay with coarse volcanic particles; levigated clay wash on surface. Black and reddish glazes. From fresh mould. Mask applied directly to the end of cover-tile with raised flange round the solid, flat mass of hair with receding hairline round the forehead; small, very pointed asinine ears, high, wrinkled forehead and small almond eyes set obliquely below frowning brows. Red glazed interior of ears, black glazed hair, eyes and brows.

A14 Inv. 2783 (FIG. 40)

Slipway 2, Trench P/2003. US 27/32.

Fragment of upper part with remains of left ear and beginning of cover-tile.

H. 15.4; W. 11; Th. 2.2/3.6.

Hard pinkish-white clay with coarse ground grains of volcanic stone. Purified clay wash on the surface. Remains of black glaze.

Gorgoneia with flanking snakes

Type 1 flanked by pairs of snakes

A15 Inv. 2774 (FIG. 41)

Slipway 3, Trench AG/2005. US 19 /358.

H. 18.5; W. (max.) 20; Th. 1.5/2.5. Cover-tile L. 31; D. 16.4 (ext.) 12.8 (int.); Th. 1.5.

Complete with long stretch of the cover-tile.

From fresh mould. Well-preserved polychromy.

Hard pinkish-beige clay with many fine volcanic particles; greenish-cream slip on the surface. Black and red glazes.

The gorgoneion covers almost the whole field, leaving only a very narrow border around, and with a raised flange which gives the effect of a crown over the hair. The hair projects over a low flat forehead in a thick mass rippled by a wide convex wave. Black sharp-ridged eyebrows almost meet over the straight nose with slightly spreading nostrils. The slightly squinting staring eyes are horizontally set, almond-shaped and outlined in black, with black pupils. The mouth slightly recessed and outlined by a narrow red rim. The teeth are small and regular, but at each side of the mouth is a pair of very pointed fangs. The pendent tongue covers the whole chin. A black painted line (beard?) runs round the cheeks and the chin. The red painted ears are placed high and extremely schematic. At each side an S-shaped snake stands out against a solid background which extends beyond the snake's head. At the bottom of the slab two smaller snakes confront each other.

Late 6th c. BC.

A16 Inv. M 499

Slipway 1, Trench F. US 21/57.

H. (max.) 15.3; W. 9/8; Th. 2.7.

Blackman and Lentini 2003, 428, no. 47, FIG. 41.

Type 1 variant

A17 Inv. 2786 (FIG. 42)

Trench AE/2005 from W of dockyard back wall. US 2/284.

Fragment of upper part of mask with remains of cover-tile joint on the back. Traces of ash on the surface.

H. (max. pres.) 6.7; W. 13.1; Th. 2.6.

Brown-reddish clay with fine volcanic particles and with cream slip. Traces of black and red glazes.

The hair is arranged in a projecting mass divided into locks by radiate grooves, and with a row of spiral curls round the flat forehead.

Late 6th c. BC.

Type 2 flanked by single S-shaped snakes

A18 Inv. 2775 (FIG. 42)

Slipway 3. Trench AG/2005. US 20/345.

Missing: hair, large part of right snake; broken away: head of left snake and large part of the lower slab sides; preserved: the beginning of cover-tile directly joined to the slab. The joint may have been surrounded by a raised flange on which the hair is probably arranged in rows of curls (cf. **A19**).

H max. preserved 14.5; W. (max.) 20/1; Th. 1.3/2 (mask). D. 16.5 (ext.)/12 (int.); Th. 1.7 (cover tile).

Hard pale greyish-pink clay with fine volcanic particles. Greenish-cream slip on the surface. Only traces of black and red glazes. From a fresh mould.

Gorgoneion with quadrangular head slab. The face is round with triangular wrinkled forehead. Very plastic arched brows almost meet at the ridge of the squat nose with spreading nostrils. Large round eyes between plastic almond-shaped lids set obliquely. The cheeks are puffy, the recessed mouth has a narrow line in relief to indicate the red-painted lips; pointed fangs slightly protrude from the corners and long pendent tongue covers almost the whole chin. On each side, remains of disk ear-rings painted in red and an S-shaped snake, and below, traces of hair in beaded tresses hang down as far as the lower edge of the slab.

Late 6th c. BC.

A19 Inv. 2776 (FIG. 43)

Slipway 3, Trench AG/2005. US 15/338a + US 15/337b.+ US 20/345.

Recomposed from two fragments belonging together but not joined, with large part of hair surrounding the forehead and remains of cover-tile (*a*); and four fragments preserving the lower part of the mask (*b*).

H. max. preserved 6.7; W. 20.5; Th. 1.4/2.4 (a); H. 5; D. 18/19 (raised flange); 16.5 (cover-tile); Th. 2.3/2.5 (b).

Hard pale red clay with fine volcanic particles. Remains of cream slip on surface. Black and red glazes.

On a raised flange the hair is arranged in a double row of spiral curls around the forehead which was low and triangular. As with **A18** the recessed mouth is surrounded by a line in relief and the pairs of fangs slightly protrude from the corners and the tongue completely covers the chin. On each side remains of lower part of S-shaped snake and below four beaded braids on the right side (on the left only 3 remain) hang down to the lower edge of the slab, which has no border in relief to finish it off. Remains of the upper part of left ear pricked up.

A20 Inv. 2787 (FIG. 43)

Slipway 3, Trench AK/2006. US 12/5.

Gorgoneion fragment preserving only three beaded braids hanging down on the left side. H. (pres.) 5.5; W. 4.1; Th. 1.7.

Pale pink clay with fine volcanic particles and cream slip on the surface. Black glaze.

A21 inv. M 501 (FIG. 43)

Slipway 1, Trench F/2001. US 26/123.

H. (max.) 10.3; W. 7.5; Th. 1.5.

Blackman and Lentini 2003, 428, no. 45, FIG. 39.

A22 Inv. M 500

Slipway 1, Trench F/2001. US 21/62.

H. (max.) 9.8; W. (max.) 10.2; Th. 2.5.

Blackman and Lentini 2003, 428, no. 46, FIG. 40.

A23 Inv. 2788 (FIG. 43)

Slipway 2, Trench U/2004. US 8/11.

Gorgoneion fragment preserving upper left part with the left ear and remains of beginning of cover-tile.

H. (max. pres.) 6.4; W. (mask) 11; L. 4.8; Th. (cover-tile) 1.8.

Hard pale orange clay with fine volcanic particles. Red glaze.

Very similar in technique to **A19** with traces of red glaze on the curls.

A24 Inv. 2789 (FIG. 43)

Slipway 2, Trench AB/2005. US10/162.

Gorgoneion fragment preserving lower part of mask with mouth, chin, neck, and lower part of nose.

H. max. 9.8; W. 13; Th. 1.3/2.00.

Hard pale orange clay with fine volcanic particles. Reddish-brown glaze. Surface abraded.

A25 Inv. 2790 (FIG. 43)

Slipway 4, Trench ad/2005. US 21/355.

Gorgoneion fragment preserving upper left side of mask with hair, forehead, and left eye.

H. (max. pres.) 5.6; W. 6; Th. 2.5.

Greyish-white clay with fine volcanic particles. Cream slip on the surface with evident traces of burning.

Close to **A21** in the rendering of the wrinkles outlined in black.

A26 Inv. 2791 (FIG. 43)

Slipway 4, Trench AC/2005. US /322.

Lower Gorgoneion fragment preserving the four beaded tresses hanging down on right side.

H. 3; W. 5.1; Th. 1.00.

Pale pink clay with fine volcanic particles; cream slip on the surface. Black glaze.

A27 Inv. 2792 (FIG. 43)

Open-air slipway, Trench I/2001. US 7/101.

Lower Gorgoneion fragment preserving four beaded tresses hanging down on left side.

H. 6.7; W. 3.00; Th. 2.5.

Pale orange—brownish clay with fine volcanic particles; cream slip on the surface. Black glaze.

*Antefix plaque type with painted decoration***A28** Inv. 2793 (FIG. 44)

Slipway 3, Trench AG/2005. US 19/313 + US 27/320

Fragment of slab with part of cover-tile.

H (max. pres.) 11; D. 15.9. Th. 1.5 (slab).
L.10 (cover tile).

Hard pale orange clay with fine volcanic particles. Clay wash on surface. Brownish glaze.

Indecipherable traces of its decoration in brown paint (perhaps a palmette?)

B. ARCHITECTURAL REVETMENTS

*Geisa***B29** Inv. M 515 (FIG. 45)

Lateral geison revetment.

Slipway 3, Trench AG/2005. US 19a/357.

Upper part of lateral geison revetment plaque preserved complete; upper horizontal plaque at angle of 108° with plain vertical plaque. Fugitive decoration.

L. 51; H. (pres.) 13 (can be reconstructed as 24 including upper and lower rolls); Th. (plain vertical plaque) 3.1, 3.1 (soffit); H. 22. Greyish-white clay with many volcanic particles; thick cream slip on surface. Black and red glazes.

Short horizontal strokes alternately black and red on the upper roll; on the plain vertical plaque remains of single guilloche with probably two strands, large central dentate ring with rosette inside with probably ten rounded petals (five preserved, painted in red outline).

Late 6th c. BC.

lotus with probably six petals. Lower edge surface painted in black.

Late 6th c. BC.

B31 Inv. M 506 (FIG. 46)

Raking geison revetment (?).

Slipway 1, Trench A/1998. Level 7/8.

Fragment of lower right side of plain vertical plaque missing lower double roll.

H. (max. pres.) 16; W. 11; Th. 2.6.

Pale yellow clay with many volcanic particles; cream slip on surface. Black and red glazes. Remains of double guilloche to left with disk with cross inside and lotus with six petals

B32 Inv. M 508 (FIG. 46)

Raking geison revetment (?).

Slipway 3, Trench AG/2005. US 20/346.

Fragment of lower part of plain vertical plaque with double roll .

H. (max. pres.) 9.5; W. 7.5; Th. 1.8.

Pale yellow clay with ground grains of volcanic stone; cream slip on the surface. Black and red glazes.

Traces of the lower strand of the guilloche.

B30 Inv. M 495 (FIG. 46)

Raking geison revetment (?).

Slipway 1, Trench F/2001. US 27/165.

Fragment of lower right side of plain vertical plaque with double roll.

H. (max. pres.) 13; W. 10.6; Th. 2.00.

Bright red micaceous clay with many volcanic particles; cream slip on surface. Black and red glazes.

Traces of diagonal band on double roll; on plain vertical plaque remains of double guilloche with two strands, solid central disks,

B33 Inv. M 509 (FIG. 46)

Raking geison revetment (?).

Slipway 3, Trench AG/2005. US 20/344.

Same preservation as fragment **B30**.

H. (max. pres.) 10; W. 13; Th. 2.00.

Bright red micaceous clay with many volcanic particles; cream slip on the surface. Black and red glazes.

Same technique and decoration with double guilloche with lotus as **B30**

B34 Inv. M 510 (FIG. 46)

Raking geison revetment (?).

Slipway 3, Trench AG/2005. US 4/382 + US 10/383.

Lower part of plain vertical plaque with double roll restored from two fragments.

H. (max. pres.) 11.5; W. 21; Th. 1.9

Bright red micaceous clay with many volcanic particles; cream slip on the surface. Black and red glazes.

Same technique and decoration with double guilloche with lotus as **B30**.

B35 Inv. M 525 (FIG. 46)

Raking geison revetment (?).

Slipway 3, Trench AG/2005. US 22/316.

Lower part of plain vertical plaque with double roll.

H. 7.8; W. 9.5; Th. 2.00.

Same bright red micaceous clay as **B30** with strong traces of burning on the surface.

B36 Inv. M 511 (FIG. 46)

Raking geison revetment (?).

Slipway 2, Trench U/2004. US 11/15.

Fragment of double roll with remains of the plain plaque.

Sima

B39. Inv. M 513 (FIG. 47)

Raking sima.

Slipway 2, Trench P/2003. US 45/66.

Edge of upper part restored from two fragments (*a-b*) belonging to the same piece, but not joining.

(*a*, roll and fascia) H. 6.3; W. 23.3; Th. 2.7;

(*b*, cavetto) H. 4.4; W. 12; Th. 2.9.

Pale pink clay with fine volcanic particles; cream slip on the surface. Black and red glazes.

Very near to the profile of the Geloan Treasury (Wikander 1986, 50-1, no. 88 FIG.

H. (max. pres.) 7.5; W. 9.5; Th. 1.8.

Bright red micaceous clay with many fine volcanic particles; cream slip on the surface. Black and red glazes. Same technique and decoration as **B30**.

Diagonal band on double roll.

B37 Inv. M 512 (FIG. 46)

Raking geison revetment (?).

Slipway 2, Trench S/2003. US 11/10.

Fragment of lower part of plain vertical plaque.

H. (max. pres.) 10; W. 8.2; Th. 2.00.

Bright red micaceous clay with many volcanic particles; cream slip on the surface. Black and red glazes.

Same technique and decoration with double guilloche with lotus as **B30**.

Remains of lower guilloche with traces of a plain disk and two petals of central lotus

B38 Inv. M 514 (FIG. 46)

Raking geison revetment (?).

Slipway 2, Trench P/2004. US 2/94.

H. 5; W. 7.5; 2.00.

Greyish clay with ground grains of volcanic stone and cream slip.

Upper part of plain plaque with only one roll. Remains of one strand of guilloche. On the roll, traces of painted band.

6, 14) with wide and sharp fascia and deeply concave cavetto. Diagonal band on the roll, interlocking crossing meander framing panels with quatrefoil inside on the fascia; on the cavetto, faint remains of the frieze of lyre-shaped leaves with probably palmettes inserted in the interstices.

On the back surface of the upper fascia is a graffito, incised after firing; a dotted theta.

c. cover-tiles

C40 Inv. M 516 (FIG. 48)

Cover-tile

Slipway 3, Trench AG/2005. US 19/370, 355.

Complete; restored from many fragments.

L. 82.5; D. 17.5/16; Th. 2.00/2.05.

Pale greyish-yellow clay with coarse ground grains of volcanic stone; with levigated clay wash on the surface. Brownish glaze.

Cylindrical in form with two different diameters: wider at the top, narrower at the bottom; with broad flat edge. Broad black band (W. 21) painted at one end.

C41 Inv. M 517 (FIG. 48)

Cover-tile.

Same provenance as **C 40**.

Complete; restored from many fragments.

L. 84.6; D. 18.5/16; Th. 2.00/3.5.

Reddish-pink clay with fine volcanic particles; levigated clay wash on the surface. Brownish glaze.

Broad black band (W. 23.5).

C42 Inv. M 518 (FIG. 48)

Cover-tile.

Same provenance as **C 40**.

Complete; restored from many fragments.

L. 84.5; D. 18/15.5; Th. 2.00/3.00.

Same clay and technique as **C 41**.

Broad black band (W. 20.5).

C43 Inv. M 519 (FIG. 48)

Eaves tile.

Same provenance as **C 40**.

Complete with remains of antefix slab.

Restored from many fragments.

L. 72; D. 15.5/14; Th. 2.00/3.00.

Same clay and technique as **C 40**.

Broad black band (W. 15).

C44 Inv. M 520 (FIG. 48)

Eaves tile.

Same provenance as **C 40**.

Complete with slight remains of attachment strip to the antefix slab. Restored from many fragments.

L. 71; D. 17.5/15; Th. 2.00/3.00.

Same clay and technique as **C 40**.

Broad black band (W. 18).

C45 Inv. M 521 (FIG. 48)

Cover-tile.

Same provenance as **C 40**.

Two fragments (A–B) of the same tile, but not joining.

(A) L. 43; D. 15; Th. 1.5; (B) L. 24; D. 16; Th. 2.00.

Same clay and technique as **C 40**.

Broad black band (W. 14.5).

C46 Inv. M 522

Cover-tile.

Same provenance as **C 40**.

Fragment of one end.

L. 43; D. 15.5/16.5; Th. 1.5.

Same clay and technique as **C 40**.

Broad black band (W. 20).

C47 Inv. M 523

Cover-tile.

Same provenance as **C 40**.

Fragment with a raised ring relief at the point where the diameter reduces.

L. 27; D. 16; Th. 1.5.

Same clay and technique as **C 40**.

Two broad black bands of different widths (14 and 8).

C48 Inv. 524 (FIG. 48)

Ridge cover-tile

Slipway 3, Trench S/2004—US 28.

Fragment of edge with remains of cover-tile.

Orange-reddish clay with ground grains of volcanic stone, clay wash on the surface. Black glaze.

L. (max.) 12.5; W. (max.) 22; Th. 3/1.5.

On the edge, black strip; on the wide convex roll, groups of thick vertical strokes in black paint.

OTHER FINDS

Patches of red colouring were found in 2004 in shipshed 3, on the surface of the middle phase of ramp of the three phases identified, and on the bedrock of the southern side passage, c.6.80 m from the back wall. One sample has been analysed and identified as haematite: we now have the first certain ancient sample of red paint from a shipshed. Clearly ships were being painted in these shipsheds: at the stern (and bow) there would have been more room to paint the sides of the hull because of the ship's 'cut-up' or stern upswing (Blackman and Lentini 2006a, 196). The biocidal properties of haematite, like those of ruddle, must have been known to ancient shipbuilders, so that they were used as anti-fouling as well as colouring agents. Haematite was used on Ship C at Pisa (first century BC/AD); and there is the fascinating possibility of similar use of haematite already in the Late Minoan period.³⁹

Much more evidence of pigments was found in 2005, in both shipsheds 3 and 4 (FIG. 49). Traces of what seems to be the same red paint (but not yet analysed) were also found adhering to the inside of some amphora body sherds, and were presumably the contents of the amphorae. The sherds are of West Greek amphorae (MGS II type).⁴⁰ At the back of shipshed 4 some of these sherds were found close to patches of red paint on the ground. At the head of ramp 3 was a small red-burnt area lined with a circle of stones—perhaps where the paint was heated (FIG. 50). Could this have caused a local fire at the top of shipsheds 3 and 4? Also found was the first evidence of blue pigment (FIG. 51); the sample has not yet been analysed.

Provisional conclusions from a preliminary study of the pottery agree with the preliminary evidence of the roofing. Very abundant, especially in shipsheds 2 and 3, are black glazed vases (mostly cups), datable within the first half of the fifth century, and mostly Attic (see above, n. 19). Recent analysis of the finds of transport amphorae came to the same conclusions: it identified two groups of amphorae, the first datable to the late sixth/ first half of the fifth century, and the second to the second half of the fifth century BC.⁴¹ The large number of transport amphorae is surprising in a dockyard. They were mostly for wine, and though many may have been reused (for water, above all), they provide good evidence for wine consumption in the dockyard, or in the ships that used it. The evidence seems to agree with the considerable number of drinking vessels—skyphoi and stemless cups—some with graffiti.

GRAFFITI

Three graffiti were found during the emergency excavations of 1981 and 1983, but the majority were found in 2001 (Blackman and Lentini 2003, 402–4, 414–18 nos. 18–21), with a very few more in 2003–6. The main group came almost entirely from a mid- to later fifth-century phase at the back of shipshed no. 1. The surprising feature of the finds in this area was

³⁹ Pisa: Ship C, the oared ship named *Gull*, was painted white (cerussite) and red (haematite); Colombini and others 2006, and references there. Haematite was found in LM III B 'short-necked' amphorae in Building P at Kommos; its use was not immediately clear, but it now provides further support for the interpretation of Building P as an early form of shipshed. We are grateful for ongoing discussion with J. W. and M. C. Shaw.

⁴⁰ A convincing parallel is the cargo of the wreck of Tekta_ Burnu (Carlson 2003, 588–9), including East

Greek amphorae containing resins not intended for human consumption. Amphorae with a resinous lining and containing red pigment have been found in the Athenian Agora (Lawall 2002, 416–19). Ruddle was being transported in amphorae in the Roman period (found on a Roman wreck off Mljet in Croatia: Radi-Rossi 2005).

⁴¹ 2001: trenches F and G: Blackman and Lentini 2003, 403, 412, 423–6, 413 FIG. 29, 415–18 FIGS. 30–5; recent analysis: Lentini and Blackman, forthcoming b; finds of amphorae, perhaps for water: Lentini *et al.* 2006, 97–100.



FIG. 51. Blue pigment from ramp 3.

the large number of BG (mainly Attic) drinking vessels, predominantly cups and skyphoi, and fifteen graffiti, of which nine are trademarks. To the remaining six we can add the three graffiti from the earlier excavations, already published (Τιτάβο φάλη, Αρχικλῆς, and Εὐδράμων). It is now clear that the Tittabo graffito was found lower down the same shipshed (1), while the other two were found in the upper part of shipshed 3. Tittabo seems to be an exclamatory (feminine) nominative; Archikles and Eudramon are in the nominative, probably simply owners of the cups.

A drinking context is clear for two of the finds of 2001: first, a χαρῆ scratched in deliberate disorder on the inside of a BG stemless cup, datable to the late fifth century; the disordered letters convey the effect of wine. A claim of ownership is clear on the outside of the base of an Attic BG cup-skyphos of the mid-fifth century: [Τ]ερίλλο ἐμὶ καὶ μό[νον κείνός μ'] ἔχ[ει] (vel sim.). One wonders whether this could refer to *the* Terillos, tyrant of Himera in 480 BC. Terillos wanted his cup for himself. Perhaps Terillos, like Archikles and Eudramon, performed naval duties, and had each their own identifiable cup.

The other four graffiti consist of a name and patronymic in the nominative. Δεξίλης Ἄνθο is inscribed *inside* (rare for owner's names) a BG 'Bolsal' cup, dated 440–425 BC; this would fit a drinking context, but the same name and patronymic, Δεξίλης Ἄνθο, are inscribed on the wall of a West Greek transport amphora sherd, with distinctly earlier letter forms, which does not relate to drinking. The same is true of the graffito Ἡγέστρατος Τελεσάρχου (probably the same man) inscribed on already broken sherds from the wall of a West Greek transport

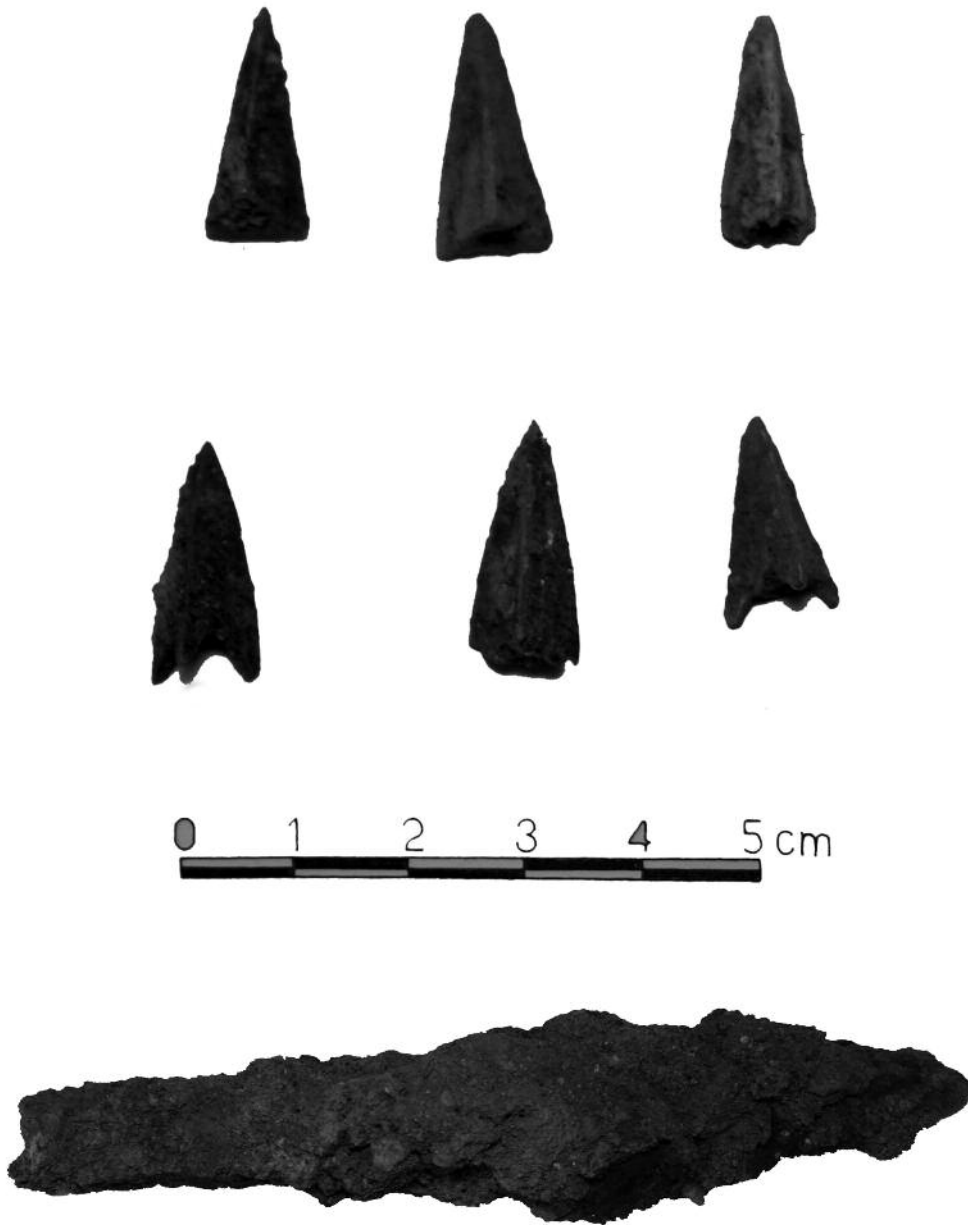


FIG. 52. Arrow-heads and a spear-head.

amphora and of a jug. The last three, possibly four, graffiti certainly meet the criteria for ostraka in the wider sense, since they take account of the 'framework' of the sherd; presence of two pairs of the same name suggests a voting rather than an allotment procedure.

Drinking and naval activity have never been incompatible: compare the stone prows from

the Casa del Navarca at Segesta, the stucco prows from Solunto, and Petronius, *Sat.* 30. 1–2. Activity at Naxos may have been more modest. Possible local dockyard contexts are: (i) celebration of success in slipping operations—a complicated and strenuous activity, but rather routine; (ii) drinking on guard duty—dockyard guards are well attested, and Archilochos made night duty guarding a ship bearable with good-quality wine (fr. 4 West; cf. fr. 2); (iii) simply drinking at the end of a tour of duty; any of which could have been combined with gaming.

For the simple names on cups we must think also of ownership by crew members, who may have received a wine ration (they may have dropped cups as they did arrows or at least arrowheads in the Naxos shipsheds); and for the *ostraka* some form of selection procedure must be considered: possibly, granted the context, allocation of naval duties, or quite possibly ostracism, now attested widely outside Athens: Cyrene, Megara, the Tauric Chersonese, and perhaps Argos.⁴²

ARROW-HEADS

A surprising find is a scatter of fifty bronze arrow-heads (and two iron spear-heads) (FIG. 52). They have not yet been fully studied or analysed, and detailed publication will follow. They are trilobate and fall into two main categories: with or without barbs. Most are from shipshed 3, and some from shipsheds 2 and 4; none from shipshed 1. Their exact distribution remains to be studied, but they all appear to be, not from the destruction stratum at the south end of the site, but from well stratified levels of use of the ramps. How they reached their findspot is an interesting question, still under study; but we can at least say that they derive much more probably from the warships housed in the shipsheds than from any hostile attack on land.

CHRONOLOGY

The surviving shipsheds are built on the exact orientation of the city grid plan of c.470 BC (Blackman and Lentini 2006b, FIG. 4), and we dated their construction to this period or earlier, on the basis of the ceramic evidence (Blackman and Lentini 2003, 403, 409, 428, 435). We suggested that the final phase of construction (including wall 1) may be attributed to the restored democracy, when the Naxian exiles returned from Leontinoi (461/0 BC: *ibid.* 435).

One assured earlier phase of construction on the site had already been discovered in 2001 in shipshed 1: this was associated with pits partly underlying wall 1 and on the same orientation. A row of seven rectangular rock-cut pits contained pottery from early Archaic (seventh century) and, from the lower levels, Archaic to the mid-fifth century BC, from the upper levels, the former dating the earlier phase and the latter giving a good indication of the date of wall 1 (*ibid.* 409, 393 FIG. 6, 399 FIG. 14, 411 FIG. 27). We have already acknowledged that there may have been an earlier phase of shipsheds on the site (*ibid.* 409).

In the 2003–6 seasons the evidence for an earlier phase has been confirmed. We cannot say precisely whether the earlier dockyard had the same dimensions as the later, but it seems likely; and it had the same basic orientation. A relevant indication is the varied building

⁴² For the drinking context, see Lentini and Blackman, forthcoming b; cf. Prag 2006. These graffiti were presented on a poster at the 13th International Congress

of Greek and Latin Epigraphy in Oxford, September 2007, and will be published separately in full. We have benefited greatly from the comments of Alan Johnston.

technique of the main walls of the shipsheds: especially wall 3, which adopts a version of the polygonal technique very similar to the construction technique of the city wall with very large blocks. Walls 2, 4, and 5 are also polygonal, but built of smaller individual blocks than wall 3 and very probably contemporary with it. Wall 3 is also wider, probably because it needed to accommodate a drainage channel in addition to roof timbers;⁴³ and wall 1 is more regular.

The row of pits mentioned above was probably intended to house vertical timbers, which we can now less hesitantly interpret as evidence for the north façade of the archaic phase of the dockyard; there may have been pits also under wall 2, but the evidence there is less clear. The earlier phase most probably had three slipways (2–4) with solid walls, and one (1) with an open colonnade on its north side. See the reconstruction plans for phases 1 and 2 (plans 1–2).

The fact that the earlier phase has the same orientation is significant for the date of the city grid, as we mentioned in our introduction (see p. 1 and n. 4). There are slight deviations from the common orientation: in the back wall of shipshed 4 in at least the final phase, and in the north-west corner of shipshed 1 (but this may be the result of later rebuilding).

The back wall of shipsheds 3–4 clearly moved back westwards in the final phase: the evidence of the material finds is confirmed by the study of walls 3 and 4. Whether the back wall of shipsheds 1–2 moved back at the same time is not certain: the evidence is not absolutely clear, either way, but it is worth pointing out that the line of pits beneath wall 1 terminates well to the east of the northward projection of the likely line of the phase 1 back wall of shipsheds 3–4 (see Plan 1); and looking for the evidence in shipshed 2 would involve the destruction of the fragile remains of the sand ramp and paved side-passage of the final phase. We therefore conclude that there was probably a common line to the back wall of all four shipsheds, in both phases.

We must of course emphasize that the ramps had rather a ‘life of their own’ within the shipshed walls; we compare the off-centre narrowing of the ramps in the last years of the second phase. Ramps 3–4 do seem slightly longer than ramp 2 (and probably ramp 1). The explanation could be minor, that a new system of curving ramp heads was being tried out in shipsheds 3–4; or it could be major, that ramps 3–4 were for longer ships. The two suggested explanations are not mutually exclusive.

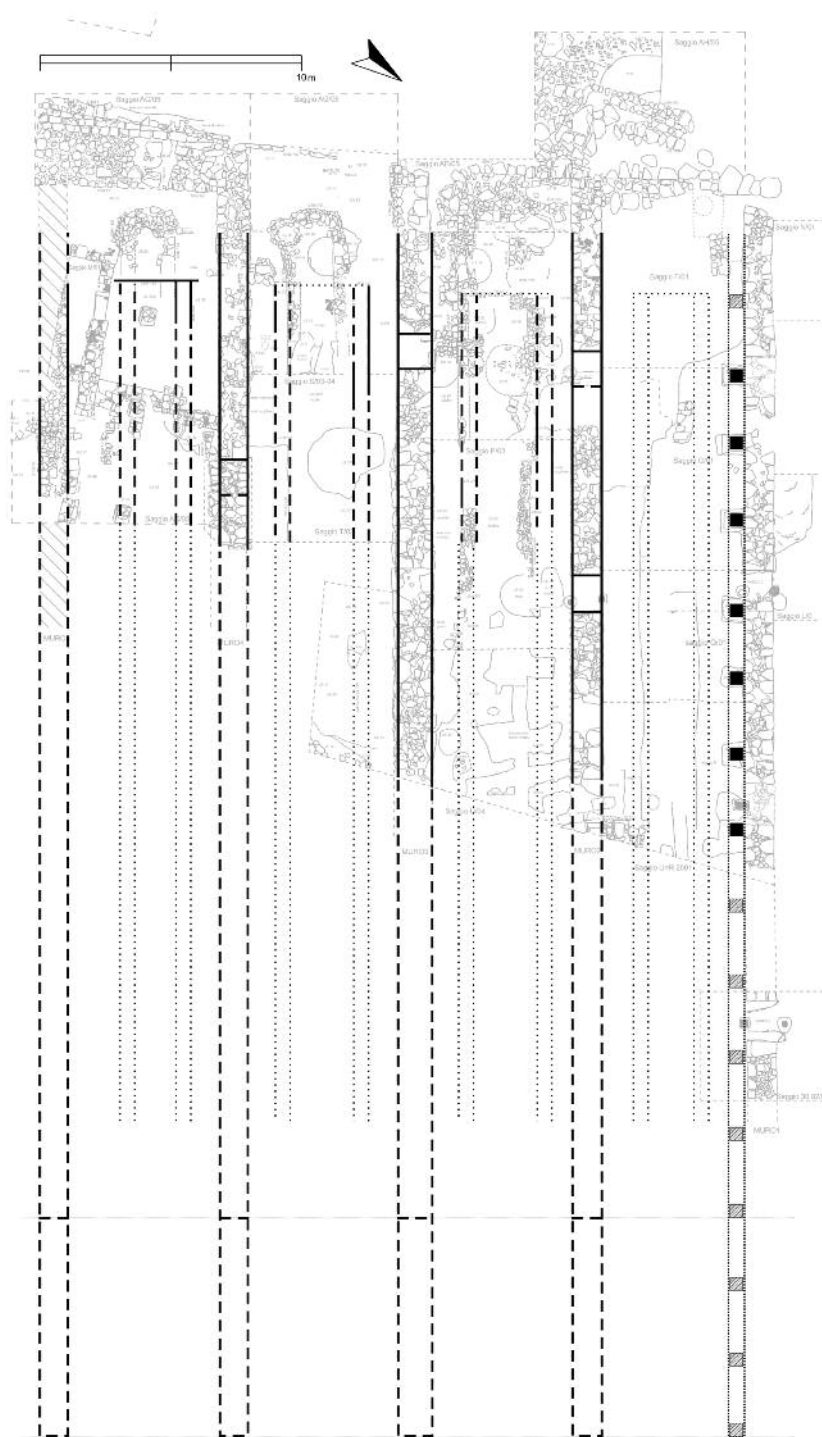
For the backward move of the back wall we are inclined to look for external factors: e.g. earth movements which caused a relative rise in sea level. Possibly there was a need to house longer ships in all the shipsheds after 460; but the shipshed width remained the same.

Two earlier cuttings in the rock in shipshed 1, T2 and T3, pre-date the last phase of the shipsheds, and seem to be unrelated (Blackman and Lentini 2003, 402, 393 FIG. 6, 401 FIG. 17, 402 FIG. 18, 405 FIG. 21).

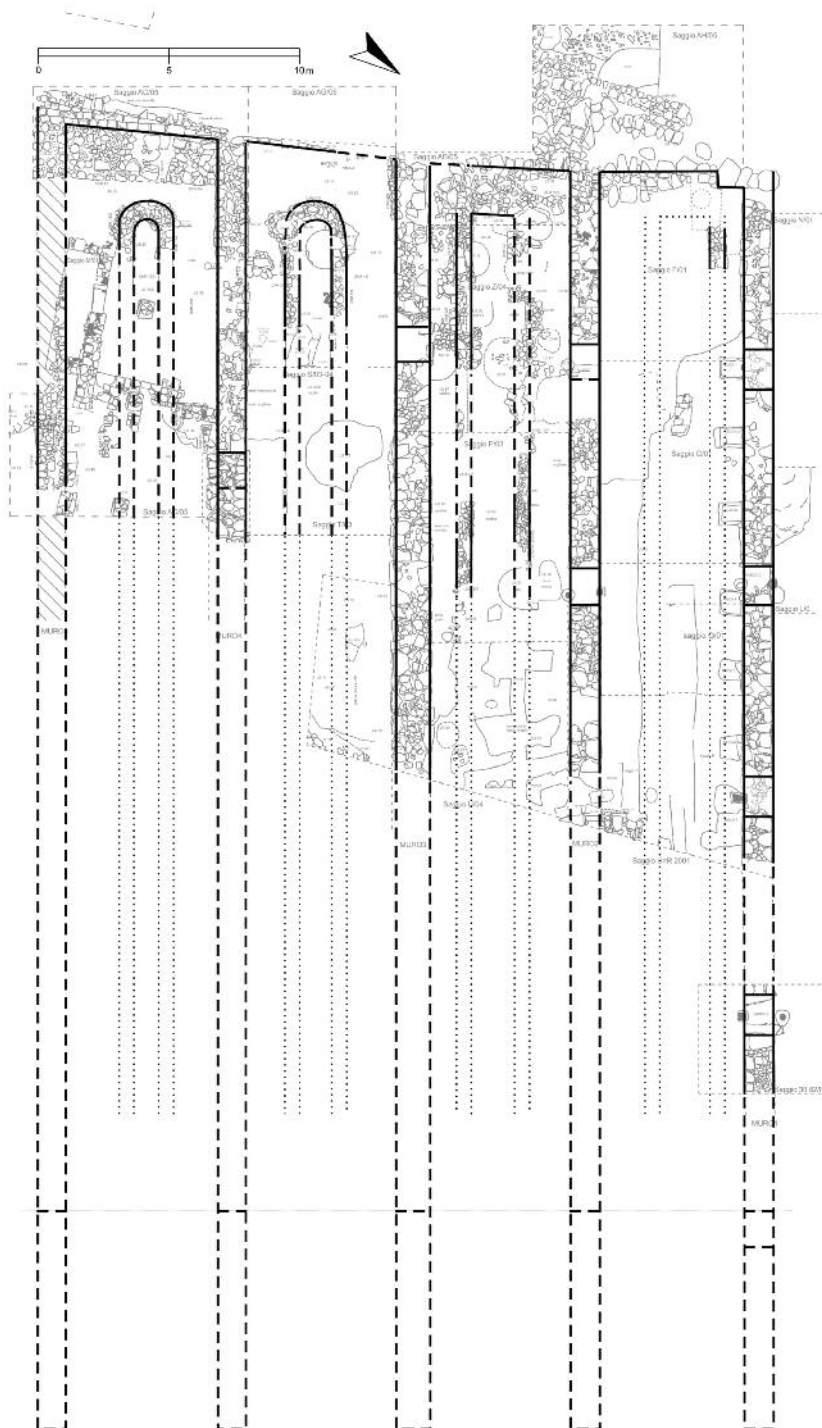
A surprise discovery in 2005 was a burial (an adult male) inserted into the south-west corner of shipshed 2 (FIG. 53), and dated by an unguentarium at its foot to the mid-fourth

⁴³ One of the shipshed walls in Place Villeneuve-Bargemon at Marseille is substantially wider than the other two preserved low walls east of it: this could be an indication that it is an end wall or that it carried a drainage channel and had a similar function to wall 3. On a second alternative there would have existed at least one wall further to the west; this would also mean that not all the documented ramp timbers were discovered *in situ*. A

wider central wall with a drainage channel would also make the reconstruction of a ridge roof covering two slipways a more likely alternative than the one used in the model at the Musée d’Histoire de Marseille, with ridge roofs covering single slipways. For preliminary discussions, see Hesnard 1999a, 37–9 and 1999b; for an illustration of the model, see Hesnard *et al.* 2001, FIG. 10.



Plan 1. Reconstructed plan superimposed on 2005 state plan: phase 1.



Plan 2. Reconstructed plan superimposed on 2005 state plan: phase 2.



FIG. 53. Later burial in the south-west corner of shipshed 2.

century BC: this evidence confirms that the area was by then no longer in use as a dockyard. Use of the shipsheds is assumed to have terminated with the destruction of the city by Dionysios I of Syracuse in 403 BC (Blackman and Lentini 2003, 390).

Later, the shipsheds were covered by Roman housing, in the late third century AD.⁴⁴ Occupation of the area continued until the eighth century.

SHIPSHEDS AS MONUMENTAL ARCHITECTURE

The chronology and reconstructions of the Naxian shipsheds presented here might be regarded by some scholars of Greek architecture as controversial, and so it is worthwhile to consider why it might be useful to analyse shipsheds in relation to other monumental architecture and not 'just' in the category of utilitarian and military buildings.⁴⁵

The most obvious monumental characteristic of the shipsheds is their scale. The typical temples of the colony are approximately as wide as a single slipway but only one third of their

⁴⁴ 2001 season: Blackman and Lentini 2003, 396, 397–8 FIGS. 11–3; we owe the dating of the Roman levels to John Hayes.

⁴⁵ Demosthenes (13. 28) already lists shipsheds among other public buildings such as temples, propylaia, and stoai which all beautify a city.

length:⁴⁶ the total plan area of the complex consisting of four slipways is therefore more than ten times the area of a single temple. In this case, the very large size is of course not a result of building more imposing architecture than is required but rather due to the function of the complex:⁴⁷ a single slipway needs to provide space for both a ship and at least some limited space to carry out works on the hull, and the number of sheds is determined by the size of the fleet which requires housing over the non-sailing period. The sheer size of the Naxian complex requires it to be classified as monumental architecture, but as we have seen above, especially in relation to its roof decoration of the first phase, it also makes use of other aspects of the architectural language typical of Sicilian monumental building.

In civic contexts the dissemination of the stoa as a building type from sanctuaries to the agora during the Archaic period is quite well documented: the great majority of early stoai were built in sanctuaries, but a number of cases show that the type was also used in secular contexts throughout the Greek world from Sicily (Megara Hyblaia) and Africa (Kyrene) to mainland Greece (Sikyon and Athens) already before the fifth century BC (Coulton 1976, 37–8). The use of stone as building material in early stoai is quite limited, but there are two known archaic buildings with a full stone entablature: the Stoa of the Naxians and the Stoa Basileios at Athens (ibid. 37). Even though the traditional date of the latter structure's construction (or more likely reconstruction) in the Classical Agora has recently been shown to be problematic, the architectural members of its superstructure can quite safely be dated as archaic.⁴⁸ What is important from the point of view of this study is that the stoa shows that the architectural language first developed to monumentalize sacred architecture could also be used in secular contexts: the beginnings of this change are already visible in the archaic period. This is not very surprising considering that the function of monumental architecture in the sanctuary and the agora are partly the same:⁴⁹ in both cases the buildings are expressions of the importance of the polis and the power of its ruler or ruling class. Very little difference can be detected in the building programmes of the various city-states regardless whether they were governed as tyrannies, aristocracies, or democracies.⁵⁰

⁴⁶ The sizes of two recently excavated temples are typical: Tempio H is 7.35 m wide and 15.40 m long, Tempio I 6.60 m wide and 14.75 m long; Lentini 1998, 89–91.

⁴⁷ Hansen and Fischer-Hansen (1994, 23 n. 2) use the Bouleuterion at Miletos as an example of building an unnecessarily large civic building: the auditorium could have seated 1,200–1,500 people, but it is unlikely that the Council would have had more than 500 members.

⁴⁸ The discrepancy between the architectural date (mid-6th c. BC) and the date of the archaeological material (500–480 BC) associated with the construction of the Stoa Basileios has been recently dealt with by placing the original building programme in the late 6th c. and explaining the more recent material as a result of extensive repairs after the Persian sack (Camp 1986, 53, 100). However, we think that the discrepancy can best be reconciled by the hypothesis that the building was first built in the archaic Agora to the east of the Acropolis and then later moved to the classical one: we cannot see that the attribution of the flat mid-6th-c. 16-fluted Doric

capitals to the *in situ* 16-fluted shafts of the building could be seriously questioned. For the date of the architecture, see Shear 1971, 243–50 and Camp 1986, 53, even though it now seems that the most likely date for placing the lithos and building the stoa at its current site is after 480 BC (Papadopoulos 2003, 289–91). For an earlier suggestion that the stoa was moved, see Pakkanen 2002.

⁴⁹ A stoa in the agora could also have a religious function, such as the Stoa Basileios as the seat of the archon basileus at Athens: see Aristotle, *Ath. Pol.* 57. 1–2.

⁵⁰ Akragas is a good example: in the city a policy of encircling the whole city by major temples was instigated in 480 BC by the tyrant Theron, and it was funded initially from the spoils of the battle of Himera. After the expulsion of Theron's son in 472 BC, a limited democracy was established but the building policy of the tyrants was continued, even intensified. On the historical sources, the tyrants and the democracy, see de Waele 1971, 50–61, 109–31; for a recent synopsis of the temples at Akragas, see Mertens 2006, 381–99.

THE RECONSTRUCTION

This section studies the comparative material for the use of wooden posts, rectangular pits for uprights, and mudbrick in Greek architecture. In addition to comparanda for reconstructing the shipshed complex at Naxos with various fairly unique features, some particular aspects—such as lighting and water drainage from the roof—of the three-dimensional computer model are also briefly discussed.

WOODEN POSTS AND COLUMNS

Making use of wooden posts and columns is quite common in archaic Greek architecture. The cuttings used to raise and position wooden columns are preserved in several early temples, including the archaic temple of Athena Alea at Tegea and the temple of Hera at Olympia.⁵¹ In recent scholarship there has been a tendency to question the earlier reconstructions of Geometric and Early Archaic peripteral temples with wooden columns, leaving few relatively certain cases such as the eighth-century temple of Artemis at Ephesos, and the seventh-century temples at Ano Mazaraki and the Argive Heraion (see e.g. Mallwitz 1981; Billot 1990, 95–102; Barletta 2001, 32–9).

The fourth-century stoa at Molykreon provides a possible, though later, parallel for how the north façade of the archaic shipshed complex at Naxos could be reconstructed. At Molykreon the wooden posts were placed on stone base-slabs: the partly dressed top surface indicates that the posts were square, not circular, and had a section of *c.*0.60 m × 0.60 m. The interaxial distance between the posts is 2.55 m.⁵² It is very likely that equivalent structures existed elsewhere but because they were built of less durable materials they have not survived.⁵³

POST-HOLES AND PITS FOR WOODEN UPRIGHTS

The rectangular pits partly under wall 1 of the Naxian shipsheds have Greek parallels elsewhere. The rectangular cuttings east of the Panathenaic Way in the Athenian Agora have been interpreted as sockets for the uprights of temporary or semi-permanent wooden stands, *ikria*, erected for the spectators at the festival.⁵⁴ A series of rectangular pits and postholes in the Kerameikos were very probably cut for the same purpose.⁵⁵

In general, cutting a post-pit for a wooden upright seems to have been rather untypical of Greek monumental building; instead, there is a clear preference for placing a stone slab below any wooden supports. Since digging post-pits is a standard solution in wooden architecture in more forested regions and other periods,⁵⁶ the ancient Greek preference is

⁵¹ Dörpfeld and Schleif 1935, 179–83; in addition to Tegea and Olympia, Dörpfeld and Schleif discuss reused blocks from the old temple of Apollo at Delphi. E. Østby (1986, n. 34) notices similar cuttings at Kalapodi.

⁵² Orlandos 1924–5, parat. 63; Coulton 1976, 143, 261.

⁵³ Coulton 1976, 144 draws attention to two 3rd-c. parallels, one at the Asklepieion at Kos and the other at Thebes in Phthiotis.

⁵⁴ Thompson 1960, 332; Thompson and Wycherley 1972, 126–7; the dimensions of the cuttings are unfortunately not given.

⁵⁵ The largely rectangular pits are approximately 1 by 1 m in plan and have a depth of more than 1 m: Ohly 1965,

309–10, FIGS. 15, 17. For further probable pits for uprights in the area, see Gruben 1969, 36–8; Hoepfner 1976, 16–20. The Protogeometric Toumba building at Lefkandi demonstrates that the size of the pit is directly related to the depth of the pit rather than to the size of the post: the pits for the veranda pits have a width of 0.5–0.7 m and depth of *c.*0.6 m, and the maximum imprint of the rectangular post is 0.30 m × 0.10 m; the central posts were circular with a diameter of 0.18–0.25 m, but the pits were *c.*1.45 in diameter and had a depth of *c.*1.4 m; Coulton 1993, 38, 41.

⁵⁶ For parallels in Roman monumental building in Britain, see e.g. the Roman tower at Nanstallon, Cornwall (post-pits 0.9 × 1.4 m and 1.0 m deep; 1.5 × 1.1 m and 0.9

quite possibly due to the relative expense and rarity of large wooden posts: they are still cheaper than stone columns, and the stone supports stop the ground moisture from penetrating the material and slow down the decay.

There are several possible factors which could have contributed towards employing this unusual practice at Naxos:

1. The use of post-pits is relatively widespread in Sicilian and South-Italian indigenous buildings: the closest parallels are in the Motta sanctuary at Francavilla Marittima near Sybaris, where the seventh-century BC buildings with large wooden posts were replaced in the sixth century by structures with stone socles. In particular, the post-pits of the first phase of Building III are partially covered by the later walls, providing a strikingly close analogy to the north wall of the Naxos complex.⁵⁷
2. Since the shed complex is built on a slope towards the sea, the architect could have wished to introduce stronger uprights than just wooden columns standing on stone slabs. Digging holes for the posts would have made the north façade as a whole more resistant to shear forces towards the sea. A sloping entablature and roof is the only factor which could have created a real shear force in the structure. This does not necessarily mean that the roof was actually built as one continuous slope; we cannot necessarily expect that the archaic architect understood the nature of the forces in question and that the general sloping appearance of a stepped roof was for him enough for the extra precautions to be taken. Partly buried posts would also provide better resistance to expected earthquakes than traditional wooden columns on slabs. Coulton has also pointed out that digging post pits allows the uprights to give further stiffness to the building compared to posts standing on base slabs which can only support downward vertical loads. Partially buried posts also resist the lifting forces created by strong winds which could otherwise have damaged the roof.⁵⁸
3. Since the area around Mt. Etna and the Peloritani Mountains above Taormina were known in antiquity for their timber resources,⁵⁹ it was perhaps not regarded as necessary to protect the posts from moisture as well as would have been deemed necessary in other parts of the Greek world.

USE OF MUDBRICK IN GREEK MONUMENTAL ARCHITECTURE

Mudbrick was widely used in Greece both in monumental and domestic architecture, and the range includes temples, altars, civic buildings, royal palaces, defensive structures, and private

m deep; 0.6 × 1.2 m and 1.4 m deep: Fox and Ravenhill 1972, 64–6); gate towers at Hayton Fort (pits 1.0 × 0.7 m, depth 0.8–1.0 m; diameter of the upright reported as 0.20 m: Johnson 1978, 65); first timber phase of the Silchester Amphitheatre (dimensions in plan 0.8–1.3 m, depth 0.5–1.1 m; size of posts from 0.22 × 0.26 m to 0.28 × 0.4 m: Fulford 1989, 19–26). For a more modern example of deep square holes for major structural timbers, see Kelso 1984.

⁵⁷ Mertens and Schläger 1983; Mertens 2006, 50–1. Building with wooden uprights was a widespread practice

in South Italy and Sicily, and it is also attested at Leontinoi close to Naxos: see Mertens 2006, 18–23 for further examples.

⁵⁸ A good parallel is provided by the Toumba building at Lefkandi: Coulton 1993, 38–42, 47–8.

⁵⁹ Diod. Sic. xiv. 42. 4–5; Athenaios v. 206f. Hodge 1960, 38–42 argues that the large open spans in Sicilian and South Italian architecture are due to the use of roof trusses, but as Coulton 1976, 162–4 points out, the more likely explanation is the availability of better timbers than in mainland Greece.

homes.⁶⁰ Protected from water by a roof and layer of whitewash it is also a durable building material: the walls of South Stoa I in the Athenian Agora were built of mudbrick with a stone socle, and the structure was in use from *c.*430–420 BC to *c.*150 BC when it was replaced by South Stoa II.⁶¹

The stoai with long back walls provide the best parallel to the reconstruction we have adopted here for the later phase of the Naxian shipshed with closed side walls: Coulton lists ten Greek stoai with certain or likely mudbrick walls above a stone socle, ranging from the Archaic to the Hellenistic period.⁶² The preserved stone socle of the Archaic Tempietto H at Naxos gives a rather close parallel to the polygonal masonry of the earlier walls of the shipshed complex, and the uniform height of the socle indicates that the most likely reconstruction of the upper walls is with mudbrick or rubble (Lentini 1998, 89–90, FIGS. 20, 23, 26).

THREE-DIMENSIONAL COMPUTER RECONSTRUCTION OF SHIPSHED COMPLEX

The computer model of the final phase of the shipshed complex has been produced using AutoCAD (FIG. 54). The figure presents an isometric view from the north-east with shipsheds 1 and 2 covered by roof tiles and 3 and 4 with the probable layout of the roof timbers exposed. The roof is reconstructed in three descending steps, and the dimensions of the Corinthian cover and pantiles are based on the excavated examples (Blackman and Lentini 2003, 414, FIGS. 36–8). The fit of the reconstruction on the archaeological remains and the probable scale of the shed complex compared to the preserved architecture is illustrated in FIG. 55: the top westernmost section of shipsheds 1 and 2 is superimposed on the photograph of the site taken in 2005.

Walls 1, 2, 4, and 5 are reconstructed as stepped in line with the roof, but since wall 3 needs to carry a gutter in addition to the roof timbers, it would have needed to be continuously sloping.⁶³ There is some evidence for the reconstructed stepped roof at Naxos: if it too was longitudinally sloping, the tiles at the edges would have needed to have been moulded into angles different from 90 degrees to accommodate both the slope from the roof ridge and towards the sea.⁶⁴ No angled tiles have been identified at Naxos, and the terracotta geison of the first phase of the sheds shows no signs of being adapted for a continuous slope (FIG. 56). Since the upper parts of the walls were most probably solidly made of mudbrick, the stepped roofs have the advantage of allowing more light into the cramped interiors of the sheds. The

⁶⁰ For thorough surveys on the use of mudbrick and references to textual and archaeological material, see Martin 1965, 46–63; Orlandos 1966, 51–66.

⁶¹ Because the two stoai are on slightly different orientation, the west and east sides of the earlier stoa are fairly well preserved, including the stretch of mudbrick wall: Camp 1986, 122–4.

⁶² Coulton 1976, 143; South Stoa at Didyma (*c.*600 BC), South Stoa I at Athens (*c.*430–420 BC), Stoa A at Kalaureia (late 5th *c.* BC), Oropos (*c.*360 BC), Stoa IV at Argos (4th *c.* BC), the ‘Bouleuterion’ at Mantineaia (4th *c.* BC?), Stoa of Kotys at Epidauros (3rd century BC), East Stoa at Thermon (probably *c.*275–216 BC), Stoa at Kassope (*c.*230 BC), and East Stoa by the Gymnasium at Olympia (2nd *c.* BC).

⁶³ Coulton has pointed out that in the case of Naxos it

might also be possible to reconstruct a single stepped ridged roof covering all four slipways with the ridge over wall 3: the major advantage of this reconstruction would be eliminating the roof valley between slipways 2 and 3 which could have potentially been a problem in heavy rain. However, such a solution would not have been viable for shipshed complexes with more than four adjacent slipways such as at Zea (see Dragatsis 1885, esp. pl. 2).

⁶⁴ Cf. esp. the angled tile from the Zea shipsheds; the tile is published by Mette Schaldemose in Hallager *et al.* 2006, 48 no. 18; Schaldemose 2007. Henrik Gerding has extensively discussed the roof-tile shapes at the edges of continuously sloping roofs (Ancient Shipsheds in the Mediterranean: John Morrison Memorial Conference, Oxford 2–3 April 2005); cf. Gerding in Blackman *et al.* forthcoming.

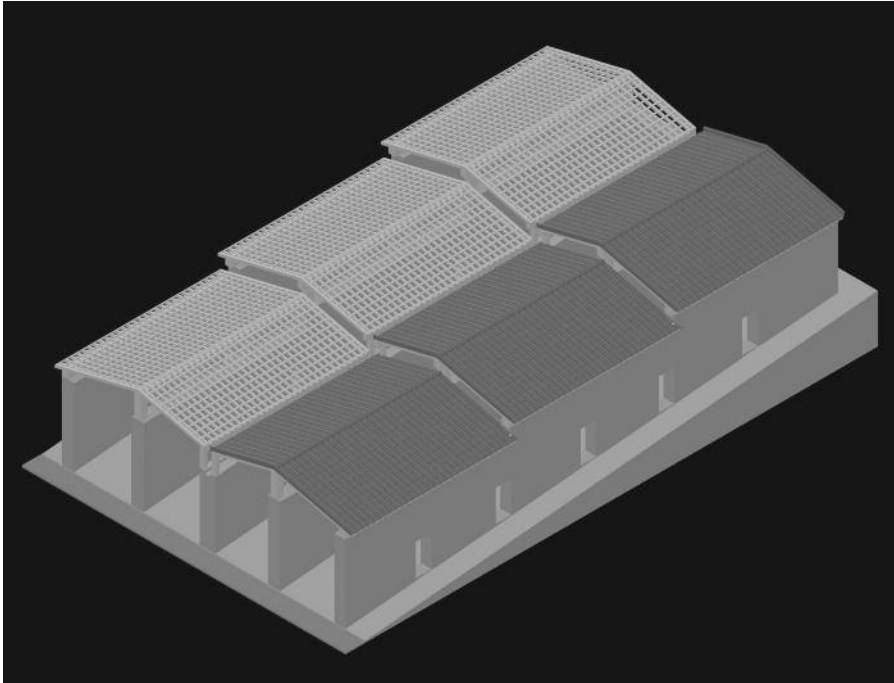


FIG. 54. Computer model of the final phase of the shipshed complex.



FIG. 55. Reconstruction of the north-west part of the shipshed complex superimposed on a 2005 photograph of the site.

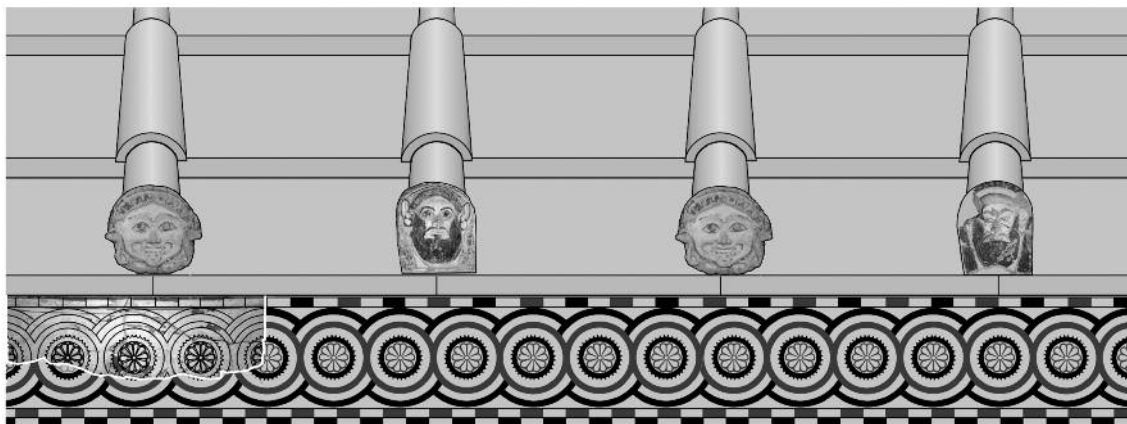


FIG. 56 Reconstruction of the roof, first phase, with alternating Gorgon and Silenos-mask antefixes.

amount of available natural light could have been further increased by leaving the back wall of the complex open at the top.

CONCLUSIONS

The data from the excavation are still under study; but they clearly show the existence of two roofing systems: the first, with antefixes, datable to the first years of the fifth century BC, at the latest; and the second, of mixed type without decoration, datable to the second half of the fifth century BC. On the basis of the Type B and C Silenos antefixes, a partial restoration of the first roof before the mid-fifth century may be suggested. The building phases of the dockyard are now more clearly defined.

There are several reasons why the shipshed complex at Naxos should have been built as ostentatiously as possible: its site on the harbour lies just next to the most likely location of the agora, and due to the height of its roof it would have been clearly visible from there. It would have been among the first monuments anybody arriving from the sea would see; owing to its size it was already among the most expensive building projects, and so additional architectural decoration would not have made much of a difference to the overall expenditure; and even at times when the fleet was out at sea it would have been a constant reminder of the naval power of the polis.

Museo Archeologico di Naxos
Centre for the Study of Ancient Documents, University of Oxford
Royal Holloway, University of London

MARIA COSTANZA LENTINI
 DAVID BLACKMAN
 JARI PAKKANEN

BIBLIOGRAPHY

- Adler, F., Borrmann, R., Dorpfeld, W., Graeber, Fr. and Graef, P. 1892. *Die Baudenkmäler von Olympia* (Olympia 2; Berlin).
- Barletta, B. A. 1983. *Ionic Influence in Archaic Sicily: The Monumental Art* (SIMA Pocketbook 23; Göteborg).
- 2001. *The Origins of the Greek Architectural Orders* (Cambridge).
- Billot, M.-F. 1990. 'Terres cuites architecturales d'Argos et d'Épidaure: notes de typologie et d'histoire', *Hesperia*, 59, 95–139.
- Blackman, D.J. 1997–8. 'Naxos 1998: trireme shipsheds', *Kokalos*, 43–4, ii. 1. 471–4.
- 2002. 'New researches on the ancient port of Naxos (1998–99)', in Tzalas, H. (ed.), *Tropis VII: 7th International Symposium on Ship Construction in Antiquity, Pylos 1999* (Athens), 131–7.
- 2003. 'Progress in the study of ancient shipsheds: a review', in Beltrame, C. (ed.), *Boats, Ships and Shipyards: Proceedings of the Ninth International Symposium on Boat and Ship Archaeology, Venice 2000* (Oxford), 81–90.
- 2004. 'The ports of the two cities of Naxos', in Lentini 2004a, 50–5.
- and Lentini, M.C. 2003. 'The shipsheds of Sicilian Naxos, researches 1998–2001: A preliminary report', *BSA* 98, 387–435.
- — 2006a. 'An ancient Greek dockyard in Sicily', in Hafner, A, Niffeler, U, and Ruoff, U. (eds), *Die neue Sicht: Unterwasserarchäologie und Geschichtsbild: Akten des 2. Internationalen Kongresses für Unterwasserarchäologie, Rüschtikon bei Zürich, 21.–24. Oktober 2004* (Antiqua, 40; Basel), 193–7.
- — 2006b. 'The port of Sicilian Naxos and the ancient urban landscape', in *Common Ground: Archaeology, Art, Science and Humanities. Proceedings of the 16th International Congress of Classical Archaeology*, Boston, August 23–26, 2003 (Oxford), 546–50.
- — (forthcoming a). 'The dockyard in Sicilian Naxos', in Tzalas, H. (ed.) *Tropis VIII: 8th International Symposium on Ship Construction in Antiquity, Ydra 2002* (Athens).
- — (forthcoming b). 'Further research on the dockyard of Sicilian Naxos', in Tzalas, H. (ed.), *Tropis IX: 9th International Symposium on Ship Construction in Antiquity, Ayia Napa 2005* (Athens).
- Rankov, N.B., Baika, K., Gerding, H., McKenzie, J. and Pakkanen, J. (forthcoming). *Shipsheds of the Ancient Mediterranean* (Cambridge).
- Cahn, H.A. 1944. *Die Münzen der sizilischen Stadt Naxos* (Basel).
- Camp, J.M. 1986. *The Athenian Agora: Excavations in the Heart of Classical Athens* (London).
- Carlson, D.N. 2003. 'The Classical Greek shipwreck at Tektaş Burnu, Turkey', *AJA* 107, 581–600.
- Caruso, F. 2007. 'L'arco del Tartaro, colonna del cielo: Immagini del mito e della leggenda nella regione etnea', in Privitera F. and La Rosa V. (eds.), *In ima tartara: preistoria e leggenda delle grotte etnee* (Palermo), 139–60.
- Cavallari, F.S. 1891. *Appendice alla topografia archeologica di Siracusa* (Turin).
- Ciurcina, C. 1977. 'Nuovi rivestimenti fittili da Naxos e da altri centri della Sicilia Orientale', in *Il tempio greco in Sicilia*, 66–81.
- Colombini, M.P., Giachi, G., Modugno, F., Pallechi, P., and Ribechini, E.. 2006. 'La pittura e

- i trattamenti di impermeabilizzazione sullo scafo dell'Alkedo', in Camilli, A. *et al.*, *Pisa: un viaggio nel mare dell'antichità* (Milan), 26–8.
- Coulton, J.J. 1976. *The Architectural Development of the Greek Stoa* (Oxford).
- 1993. 'The Toumba Building: description and analysis of the architecture', in Popham, M.R., Calligas, P.G., and Sackett, L.H. (eds) with Coulton, J. and Catling, H.W., *The Protoegeometric Building at Toumba, Part 2: The Excavation, Architecture and Finds* (BSA Supp. 23; London), 33–70.
- (ed.) 2002. *The Fort at Phylla, Vrachos: Excavations and Researches at a Late Archaic Fort in Central Euboea* (BSA Supp. 33; London).
- De Angelis, F. 2000–1. 'Archaeology in Sicily 1996–2000', *AR* 47, 174.
- 2007. 'Archaeology in Sicily 2001–5', *AR* 53, 157–8.
- De Gallatay, F. and Gitler, H. 2004. *The Coin of Coins: A World Premiere* (The Israel Museum exhibition catalogue; Jerusalem).
- Dörpfeld, W. 1935. *Alt-Olympia*, ii (Berlin).
- and Schleif, H. 1935. 'Baubeschreibung des Heraions', *Alt-Olympia*, i (Berlin), 125–89.
- Dragatsis, I. Ch. 1885. "Ἐκθεσις περὶ τῶν ἐν Πειραιεῖ ἀνασκαφῶν", *PAE* 1885, 63–71.
- Edlund-Berry, I., Greco, G., and Kentfield, J. (eds.) 2006. *Deliciae fictiles III: Architectural Terracottas in Ancient Italy: New Discoveries and Interpretation, Proceedings of International Conference Held at the American Academy in Rome, November 7–8, 2002* (Oxford).
- Fox, A. and W. Ravenhill 1972. 'The Roman Fort at Nanstallon, Cornwall', *Britannia*, 3, 56–111.
- Fulford, M. 1989. *The Silchester Amphitheatre. Excavations of 1979–85* (Britannia Monograph Series 10; London).
- Grandjean, Y. and Salviat, F. 2006. *Guide de Thasos*, 2nd edn. rev. (Paris).
- Gruben, G. 1969. 'Untersuchungen am Dipylon 1964–1966', *AA* 31–40.
- Guarducci, M. 1985. 'Una nuova dea a Naxos in Sicilia e gli antichi legami fra la Naxos siceliota e l'omonima isola delle Cicladi', *MEFRA* 97, 7–34.
- Hallager, E. *et al.* 2006. *Science and Art: Present Activities at the Danish Institute at Athens* (Athens).
- Hansen, M.H. and Fischer-Hansen, T. 1994. 'Monumental political architecture in Archaic and Classical Greek poleis: evidence and historical significance', in Whitehead, D. (ed.), *From Political Architecture to Stephanus Byzantium: Sources for the Ancient Greek Polis* (Historia Einzelschriften, 87; Stuttgart), 23–90.
- Hedreen, G.M. 1992. *Silens in Attic Black-Figure Vase-Painting: Myth and Performance* (Ann Arbor).
- Hesnard, A. 1999a. 'Le port', in Hesnard, A., Moliner, M., Conche, F. and Bouiron, M. (eds.), *Parcours de villes. Marseille: 10 ans d'archéologie, 2600 ans d'histoire* (Aix-en-Provence), 17–76.
- 1999b. 'Le port', in Hermary, A., Hesnard, A. and Tréziny, H. (eds.), *Marseille grecque. 600–49 av.J.-C.: La cité phocéenne* (Paris), 125–30.
- Bernardi, P. and Maurel, C. 2001. 'La topographie du port de Marseille de la fondation de la cité à la fin du Moyen Âge', in Bouiron, M. and Tréziny, H. (eds.), *Marseille. Trames et paysages urbains de Gyptis au Roi René. Actes du colloque international d'archéologie, Marseille, 3–5 Novembre 1999* (Études Massaliètes 7; Aix-en-Provence), 159–202.
- Higgins, R.A. 1954. *Catalogue of Terracottas in the Department of Greek and Roman Antiquities, British Museum*, 3 vols. (London).
- Hodge, A.T. 1960. *The Woodwork of Greek Roofs* (Cambridge).

- Hoepfner, W. 1976. *Das Pompeion und seine Nachfolgebauten* (Kerameikos 10; Berlin).
- Il tempio greco in Sicilia: architettura e culti. Atti della 1a Riunione scientifica della Scuola di perfezionamento in archeologia classica dell'Università di Catania (Siracusa, 24-27 novembre 1976)* = *Cronache di archeologia e di storia d'arte*, 16 (1977).
- Johnson, S. 1978. 'Excavations at Hayton Roman Fort, 1975', *Britannia*, 9, 57-114.
- Kelso, W.M. 1984. *Kingsmill Plantations, 1619-1800: Archaeology of Country Life in Colonial Virginia* (San Diego).
- Kentfield, J. F. 1990. 'An East Greek master coroplast at Late Archaic Morgantina', in Winter, N. (ed.), *Proceedings of the First International Conference on Archaic Greek Architectural Terracottas, December 2-4 = 1988, Hesperia*, 59, 265-74.
- Kolonas, L. 1989-90. "Ανασκαφή Οϊνιαδῶν: τὰ νεώρια", *Αρχαιολογία*, 6, 153-8.
- Laviosa, C. 1954. 'Le antefisse fittili di Taranto', *ArchClass* 6, 217-50.
- Lawall, M. 2002. 'Notes from the tins 2: research in the Stoa of Attalos', *Hesperia*, 71, 415-33.
- Lentini, M.C. 1983. 'Naxos: muri a pettine di epoc.classica', *BC.Sicilia* 3, 181-5.
- 1993-4. 'Nuove esplorazioni a Naxos (SCAVI 1989-94)', *Kokalos*, 39-40, ii. 1. 1001-25.
- 1995. 'Il culto di Dioniso a Naxos: due antefisse dipinte con figure di Sileni', *BdA* 92, 49-56.
- 1996. Entries 66, 59, 61, and 183 in Pugliese Caratelli, G. (ed.), *I greci in Occidente* (Milano), 639-40, 646.
- 1997. 'Nuovi rivestimenti architettonici di età arcaica a Naxos dal santuario ad Ovest del Santa Venera', in Lulof, P.S. and Moormann, E.M. (eds.), *Deliciae Fictiles II: Proceedings of the Second International Conference on Architectural Terracottas from Italy, Netherlands Institute, Rome, 12-13 June 1996* (Amsterdam), 123-34.
- 1998. 'Le ultime esplorazioni a Naxos (1983-1995)', in ead. (ed.), *Naxos a quarant'anni dall'inizio degli scavi: atti della tavola rotonda Giardini Naxos 26-27 ottobre 1995* (Messina), 71-100.
- (ed.) 2001. *Naxos di Sicilia in età romana e bizantina ed evidenze dai peloritani, Catalogo Mostra Archeologica. Museo di Naxos (3 dicembre 1999-3 gennaio 2000)* (Bari).
- (ed.) 2004a, *Le due città di Naxos: atti del Seminario di Studi Giardini Naxos 29-31 Ottobre 2000* (Florence).
- 2004b. 'L'abitato proto-arcaico di Naxos di Sicilia (scavi 1998-1999)', in ead. 2004a, 28-39.
- 2006. 'Terrecotte plastiche dai santuari di Naxos di Sicilia', in Edlund-Berry *et al.* 2006, 407-25.
- (forthcoming). 'Naxos tra Egeo e Sicilia. Ricerche nel più antico abitato coloniale (scavi 2003-2006)', in *Immagine e immagini della Sicilia Antica e moderna e delle altre isole del Mediterraneo*, Atti del Workshop "G. Nenci", Erice 12-16 ottobre 2006.
- and Blackman, D.J. (forthcoming a). 'Ultime ricerche nell'arsenale di Naxos di Sicilia', *Atti del Workshop su ricoveri per navi militari nei porti del Mediterraneo antico e medievale, Ravello novembre 2005*.
- — (forthcoming b). 'Bevendo sulla nave', in Palermo D. and others, *Cibo per gli uomini, cibo per gli dei: archeologia del pasto rituale. Atti della Riunione Scientific. Piazza Armerina, 4-8 maggio 2005*.
- — (forthcoming c). 'I neoria di Naxos in Sicilia', *AC* 2008.
- — (forthcoming d). 'Naxos in Sicily', appendix in Blackman *et al.* forthcoming.

- Savelli, S. and Blackman, D.J. 2006. 'Amphorae from the slipways of the ancient dockyard of Naxos in Sicily', in *In Poseidons Reich XI: Transportkeramik: ein Massenartikel als Schlüssel zur Wirtschafts- und Handelsgeschichte der antiken Welt* (DEGUWA Conference, Frankfurt 17–19 February 2006) = *Skyllis* 7, 96–104.
- Mallwitz, A. 1981. 'Kritisches zur Architektur Griechenlands im 8. und 7. Jahrhundert', *AA*, 599–642.
- Marconi, C. 2005. 'I *Theoroi* di Eschilo e le antefisse sileniche siceliote', *Sicilia Antiqua*, 2, 75–92.
- Martin, R. 1965. *Manuel d'architecture grecque*, i: *Matériaux et techniques* (Paris).
- Mertens, D. 2006. *Städte und Bauten der Westgriechen von der Kolonisationszeit bis zur Krise um 400 vor Christus* (Munich).
- and Schläger, H. 1980–2. 'Die Bauten auf der Motta', *AttiMemMagnaGr* 21–3, 143–71.
- Ohly, D. 1965. 'Kerameikos-Grabung Tätigkeitsbericht 1956–1961', *AA*, 278–375.
- Orlandos, A.K. 1924–5. 'Ανασκαφαί ἐν Μολυκρείῳ τῆς Αἰτολίας', *ADelt* 9, parart. 55–64.
- 1966. *Les Matériaux de construction et la technique architecturale des anciens Grecs*, i (Paris).
- Østby, E. 1986. 'The Archaic temple of Athena Alea at Tegea', *Op.Ath.* 16, 75–102.
- Pakkanen, J. 2002. Review of John M. Camp, *The Archaeology of Athens* (New Haven and London, 2001), *Antiquity*, 76, 1160–1.
- Papadopoulos, J.K. 2003. *Ceramicus Redivivus: The Early Iron Age Potters' Field in the Area of the Classical Athenian Agora* (Hesperia Supp. 31; Athens).
- Pelagatti, P. 1964. 'Naxos. Relazione preliminare delle campagne di scavo 1961–1964', *BdA* 49, 149–65.
- 1965. 'Antefisse sileniche siceliote', *Cronache di archeologia e di storia d'arte*, 4, 79–98.
- 1976–7. 'L'attività della Soprintendenza alle Antichità della Sicilia Orientale, Parte 1', *Kokalos*, 22–3, ii. 1. 519–50.
- 1977. 'Sacelli e nuovi materiali architettonici da Naxos, Monte San Mauro e Camarina', in *Il tempio greco in Sicilia*, 42–65.
- 1981. 'Bilancio degli scavi di Naxos per l'VIII e il VII sec. a. C.', *ASA* 59, n.s. 43, 291–311.
- 1984–5. 'Ricerche nel quartiere orientale di Naxos e nell'agorà di Camarina', *Kokalos*, 30–1, ii. 2. 679–94.
- 1993. 'Nasso: storia della ricerca archeologica', *Bibliografia Topografica della Colonizzazione Greca in Italia*, xii (Pisa and Rome), 268–312.
- 2006. 'Tipi inediti o rari di antefisse arcaiche tra Sicilia e Magna Grecia: soggetti e culti', in Edlund-Berry *et al.* 2006, 433–51.
- Prag, J.R.W. 2006. 'Cave navem', *CQ*, n.s. 56. 2. 538–47.
- Pugliese Caratelli, G. 1992. 'I santuari panellenici e le *apoikiai* in Occidente', *PP* 47, 401–10.
- Radić-Rossi, I. 2005. 'The Mljet shipwreck, Croatia: Roman glass from the sea', *Minerva*, 16. 3. 33–5.
- Schaldehose, M. 2007. 'The Zea shipshed: new remarks on a tile deposit and other related finds', in Hallager, E. and Jensen, J.T. (eds.) *Proc. Danish Inst. at Athens*, 5, 89–100.
- Schwandner, E.-L. 1999. 'Konstruktion und Material', in W. Hoepfner (ed.), *Geschichte des Wohnens*, i: 5000 v. Chr.–500 n. Chr. *Vorgeschichte — Frühgeschichte — Antike* (Stuttgart), 525–36.
- Shear, F.L. 1970. 'The Athenian Agora: the excavations of 1970', *Hesperia*, 40, 241–79.
- Thompson, H.A. 1960. 'Activities in the Athenian Agora: 1959', *Hesperia*, 29, 327–68.

- and Wycherley, R.E. 1972. *The Agora of Athens: The History, Shape and Uses of an Ancient City Center* (The Athenian Agora 14; Princeton).
- Van Buren, E. D. 1923. *Archaic Fictile Revetments in Sicily and Magna Graecia* (New York and London; repr. Washington, DC, 1973).
- Waele, J.A. de 1971. *Acragas Graeca: Die historische Topographie des griechischen Akragas auf Sizilien, i: Historischer Teil* (Archeologische Studiën van het Nederlands Historisch Instituut te Rome 3; 's-Gravenhage).
- Wikander, C. 1986. *Sicilian Architectural Terracottas: A Reappraisal* (Skrifter utgivna av Svenska Institutet i Rom 8°, 15; Stockholm)
- Winter, N.A. 1993. *Greek Architectural Terracottas from the Prehistoric to the End of the Archaic Period* (Oxford).
- Wright, G.R.H. 2005. *Ancient Building Technology*, ii: *Materials*, pt. 1: *Text* (Technology and Change in History 7. 1; Leiden and Boston).