

HESPERIA

THE JOURNAL OF THE AMERICAN SCHOOL
OF CLASSICAL STUDIES AT ATHENS

VOLUME 83
2014



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HESPERIA

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MT. LYKAION EXCAVATION AND SURVEY PROJECT, PART 1 THE UPPER SANCTUARY

ABSTRACT

This is the first report on the excavation and survey project at the Peloponnesian Sanctuary of Zeus on Mt. Lykaion, Arcadia. During 2004 and 2005, topographical, architectural, geological, geophysical, and historical surveys were conducted. From 2006 to 2010, survey work continued, along with the excavation of the upper and lower levels of the sanctuary. This report focuses on the altar and *temenos* areas in the upper level of the site. Excavation of the ash altar revealed evidence of a Mycenaean mountaintop shrine, and yielded the largest assemblage of Mycenaean ceramics yet known from Arcadia. There are also signs of activity at the altar from the Final Neolithic, Early Helladic, and Middle Helladic periods. The votives and burned animal bones suggest continuity of cult from the Late Helladic through to the Late Classical period.

The Mt. Lykaion Excavation and Survey Project is an international, multidisciplinary, scientific investigation at the Sanctuary of Zeus on Mt. Lykaion in the Peloponnese (Fig. 1).¹ Since its inception in 2004, this project has built on the foundations laid by the Archaeological Society of Athens, which conducted limited excavations at the site over 100 years ago.

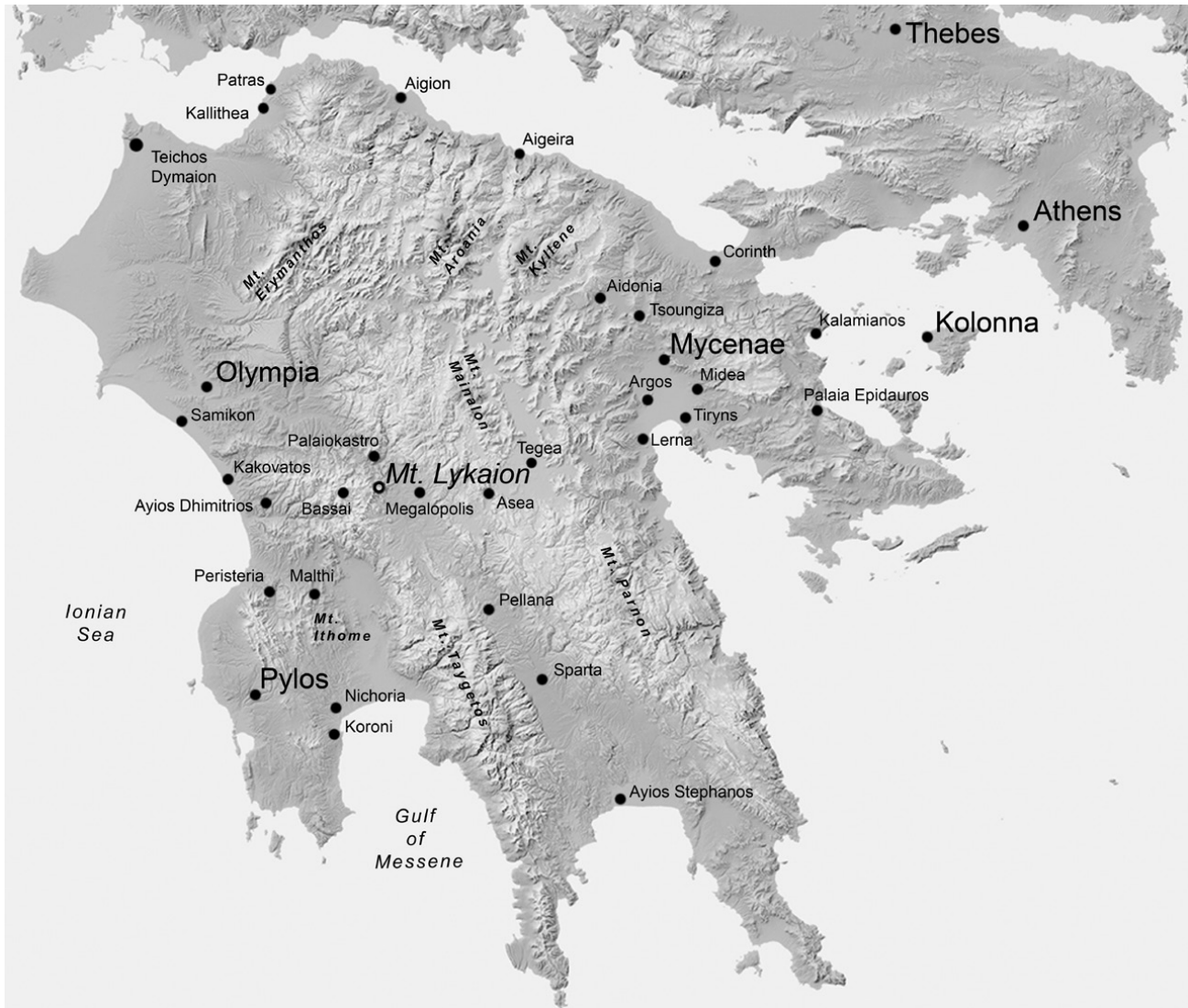
1. The Mt. Lykaion Excavation and Survey Project was carried out with the permission of the Greek Ministry of Culture and under the auspices of the American School of Classical Studies at Athens (ASCSA). Between 2006 and 2010 the project was a *synergasia* between the Greek Archaeological Service, 39th Ephorate in Tripolis, Michalis Petropoulos, ephor, and the ASCSA. During the summers of 2011–2014 we conducted study seasons under ephor Anna Karapanagiotou. We are most grateful for the assistance of the ASCSA, especially the successive directors Stephen Tracy and Jack Davis, as well as Maria Pilali, former

administrator, and Ioanna Damanaki, administrator. The codirectors of the project were Michalis Petropoulos of the 39th Ephorate, David Romano of the University of Pennsylvania Museum of Archaeology and Anthropology, and Mary Voyatzis of the University of Arizona. Our *synergates* was Anastasia Panagiotopoulou of the Archaeological Institute of the Peloponnese. Between 2004 and 2005 the project was run as a *synergasia* between the 5th Ephorate of Arcadia and Laconia, the University of Pennsylvania Museum of Archaeology and Anthropology, the University of Arizona, and the village of Ano Karyes, with Anastasia Panagiotopoulou as

ephor. Christina L. Kolb drew all the pottery profiles and object drawings. Full acknowledgments appear at the end of this article.

The following abbreviations are used: LN = Late Neolithic, FN = Final Neolithic, EH = Early Helladic, MH = Middle Helladic, LH = Late Helladic, LM = Late Minoan, PG = Protogeometric, LG = Late Geometric, FM = Furumark motif, FS = Furumark shape, and SU = stratigraphic unit.

The lower sanctuary excavations, “Mt. Lykaion Excavation and Survey Project, Part 2: The Lower Sanctuary,” will be published in the second issue of *Hesperia* 84 (2015).



The sanctuary is located high in the Arcadian mountains, near the modern and ancient boundaries where the districts of Arcadia, Messenia, and Elis meet. Pausanias's statement (8.38.7) that most of the Peloponnese can be seen from the altar remains true today. There is a clear line of sight to the west, to the Temple of Apollo Epikourios at Bassai, to the coast of the Ionian Sea near modern Kyparissia, and further north to the plain of Elis, and to the island of Zakynthos. To the south, the Gulf of Messene is visible, as is the Messenian peninsula as far as Koroni. Also to the south are Mt. Ithome, Mt. Taygetos (the highest mountain in the Peloponnese at 2,407 m), and Mt. Parnon. To the east, the altar overlooks ancient (and modern) Megalopolis and Mt. Mainalon (the highest mountain in Arcadia at 1,986 m). To the north, in Achaia, one can see Mt. Erymanthos (2,224 m), and to the northeast Mt. Aroania (2,109 m) and Mt. Kyllene (2,376 m). Many lesser peaks are also visible.

Figure 1. Map of the Peloponnese, showing Mt. Lykaion and other key sites. D. G. Romano, M. Pihokker, and A. Mayer, after a map by E. Gaba, Wikimedia Commons

ANCIENT REFERENCES TO MT. LYKAIION

There is ample evidence that the site on Mt. Lykaion was the great Parthasian sanctuary of Zeus Lykaios, which became the major cult center of the Arcadian Federation.² It was known for athletic contests held in honor of Zeus,³ and also for its impressive open-air ash altar, where some sources record that human sacrifice took place.⁴ Kallimachos, writing in the 3rd century B.C., suggested in his *Hymn to Zeus* that Mt. Lykaion was the Arcadian birthplace of Zeus,⁵ and Pausanias (8.36.3) refers to the Cave of Rhea on Mt. Lykaion. According to Pausanias (8.2.1), Lykaon was the son of Pelasgos, who founded the city of Lykosoura, and established both the cult of Zeus Lykaios and the Lykaion Games. Lykaon's sons founded other cities, but his grandson Arkas introduced agriculture and gave his name to the region of Arcadia and to its inhabitants (8.3.1–4.1).⁶ The Lykaion Games became well known and were mentioned by Pindar, Pliny, and Plutarch, as well as Pausanias.⁷

Pausanias is a key source, providing significant information about the layout of the Sanctuary of Zeus at Mt. Lykaion, as well as the activities that took place there. He describes the *temenos* in the upper sanctuary as a mysterious place (8.38.6):

τὸ δὲ ὄρος παρέχεται τὸ Λύκαιον καὶ ἄλλα ἐς θαῦμα καὶ μάλιστα τὸδε. τέμενός ἐστιν ἐν αὐτῷ Λυκαίου Διός, ἔσοδος δὲ οὐκ ἔστιν ἐς αὐτὸ ἀνθρώποις· ὑπεριδόντα δὲ τοῦ νόμου καὶ ἐσελθόντα ἀνάγκη πᾶσα αὐτὸν ἐνιαυτοῦ πρόσω μὴ βιῶναι. καὶ τάδε ἔτι ἐλέγετο, τὰ ἐντὸς τοῦ τεμένους γενόμενα ὁμοίως πάντα καὶ θηρία καὶ ἀνθρώπους οὐ παρέχεσθαι σκιάν· καὶ διὰ τοῦτο ἐς τὸ τέμενος θηρίου καταφεύγοντος οὐκ ἐθέλει οἱ συνεσπίπτειν ὁ κυνηγέτης, ἀλλὰ ὑπομένων ἐκτὸς καὶ ὄρων τὸ θηρίον οὐδεμίαν ἀπ' αὐτοῦ θεᾶται σκιάν. χρόνον μὲν δὴ τὸν ἴσον ἔπεισί τε ὁ ἥλιος τὸν ἐν τῷ οὐρανῷ καρκίνον καὶ ἐν Συήνῃ τῇ πρὸ Αἰθιοπίας οὔτε ἀπὸ δένδρων οὔτε ἀπὸ τῶν ζῶων γενέσθαι σκιάν ἔστι· τὸ δὲ ἐν τῷ Λυκαίῳ τέμενος τὸ αὐτὸ ἐς τὰς σκιὰς αἰεὶ τε καὶ ἐπὶ πασῶν πέπονθε τῶν ὥρων.

Among the marvels of Mount Lycaeus the most wonderful is this. On it is a precinct of Lycaean Zeus, into which people are not allowed to enter. If anyone takes no notice of the rule and enters, he must inevitably live no longer than a year. A legend, moreover, was current that everything alike within the precinct, whether beast or man, cast no shadow. For this reason when a beast takes refuge in the precinct, the hunter will not rush in after it, but remains outside, and though he sees the beast can behold no shadow. In Syene also just on this side of Aethiopia neither tree nor creature casts a shadow so long as the sun is in the constellation of the Crab, but the precinct on Mount Lycaeus affects shadows in the same way always and at every season.⁸

Pausanias goes on to describe the impressive ash altar (8.38.7):

ἔστι δὲ ἐπὶ τῇ ἄκρᾳ τῇ ἀνωτάτῳ τοῦ ὄρους γῆς χῶμα, Διὸς τοῦ Λυκαίου βωμός, καὶ ἡ Πελοπόννησος τὰ πολλὰ ἐστιν ἀπ' αὐτοῦ

2. Jost 1985, pp. 183–185. Jost is currently writing a comprehensive synthesis of all the literary references related to the Sanctuary of Zeus on Mt. Lykaion, which will be included in our full publication of the site.

3. Jost 1996, pp. 226–227.

4. Paus. 8.38.5–7; Theophr. in Porph. *Abst.* 2.27; Pseudo-Plato, *Mimos* 315c. For further discussion, see Burkert 1983, pp. 84–93.

5. Callim. *Hymn* 1.5–14.

6. Nielsen 1999, pp. 32–36.

7. Pind. *Nem.* 10.45, *Ol.* 7.84; Plin. *HN* 7.205; Plut. *Caes.* 61; Paus. 8.2.1.

8. Translations of Pausanias are those of W. H. S. Jones, Cambridge, Mass. [1935] 1979.

σύνοπτος: πρὸ δὲ τοῦ βωμοῦ κίονες δύο ὡς ἐπὶ ἀνίσχοντα ἐστή-
 κασιν ἥλιον, ἀετοὶ δὲ ἐπ' αὐτοῖς ἐπίχρυσοι τὰ γε ἔτι παλαιότερα
 ἐπεποιήντο. ἐπὶ τοῦτου τοῦ βωμοῦ τῷ Λυκαίῳ Διὶ θύουσιν ἐν ἀπορ-
 ρήτῳ: πολυπραγμονῆσαι δὲ οὐ μοι τὰ ἐς τὴν θυσίαν ἡδὺ ἦν, ἐχέτω
 δὲ ὡς ἔχει καὶ ὡς ἔσχεν ἐξ ἀρχῆς.

On the highest point of the mountain is a mound of earth, form-
 ing an altar of Zeus Lycaeus, and from it most of the Peloponnesus
 can be seen. Before the altar on the east stand two pillars, on which
 there were of old gilded eagles. On this altar they sacrifice in secret
 to Lycaean Zeus. I was reluctant to pry into the details of the sacri-
 fice; let them be as they are and were from the beginning.

From Pausanias we also learn about Agno fountain and the great
 volume of water that flowed from the spring at the sanctuary site (8.38.3):

ταῖς Νύμφαις δὲ ὀνόματα, ὑφ' ὧν τὸν Δία τραφήναι λέγουσι,
 τίθενται Θεισόαν καὶ Νέδαν καὶ Ἄγνώ· καὶ ἀπὸ μὲν τῆς Θεισόας
 πόλις ὠκεῖτο ἐν τῇ Παρρασίᾳ, τὰ δὲ ἐπ' ἐμοῦ μοίρας τῆς Μεγαλο-
 πολιτιδός ἐστιν ἡ Θεισόα κώμη· τῆς Νέδας δὲ ὁ ποταμὸς το ὄνομα
 ἔσχηκε· τῆς δὲ Ἄγνοῦς, ἡ ἐν τῷ ὄρει τῷ Λυκαίῳ πηγή κατὰ τὰ αὐτὰ
 ποταμῷ τῷ Ἰστρῷ πέφυκεν ἴσον παρέχεσθαι τὸ ὕδωρ ἐν χειμῶνι
 ὁμοίως καὶ ἐν ὥρᾳ θέρους.

The nymphs, by whom they say that Zeus was reared, they call
 Theisoa, Neda, and Hagno. After Theisoa was named a city in
 Parrhasia; Theisoa today is a village in the district of Megalopolis.
 From Neda the river Neda takes its name; from Hagno a spring on
 Mount Lycaeus, which like the Danube flows with an equal volume
 of water in winter just as in the season of summer.

In addition, Pausanias mentions the Lykaion Games and describes the
 key elements of the lower sanctuary—such as the Sanctuary of Pan, the
 hippodrome, and the stadium—in this way (8.38.5):

ἔστι δὲ ἐν τῷ Λυκαίῳ Πανός τε ἱερὸν καὶ περὶ αὐτὸ ἄλλος δένδρων
 καὶ ἵπποδρόμος τε καὶ πρὸ αὐτοῦ στάδιον: τὸ δὲ ἀρχαῖον τῶν
 Λυκαίων ἦγον τὸν ἀγῶνα ἐνταῦθα. ἔστι δὲ αὐτόθι καὶ ἀνδριάντων
 βάθρα, οὐκ ἐπόντων ἔτι ἀνδριάντων: ἐλεγείων δὲ ἐπὶ τῶν βάθρων
 ἐνὶ Ἀστυνάκτος φησιν εἶναι τὴν εἰκόνα, τὸν δὲ Ἀστυνάκτα εἶναι
 γένος τῶν ἀπὸ Ἀρκάδος.

There is on Mount Lycaeus a Sanctuary of Pan, and a grove of trees
 around it, with a racecourse, in front of which is a running-track.
 Of old they used to hold here the Lycaean games. Here there are
 also bases of statues, with now no statues on them. On one of the
 bases an elegiac inscription declares that the statue was a portrait of
 Astyanax, and that Astyanax was of the race of Arceas.⁹

Finally, Pausanias's assertions that this was the place where Rhea bore
 Zeus (8.36.3) and where he was raised, instead of on Crete (8.38.2), give
 us a sense of the great antiquity associated with Mt. Lykaion:

καὶ τεκεῖν μὲν συγχωροῦσιν αὐτήν ἐν μοίρᾳ τινὶ τοῦ Λυκαίου,
 τὴν δὲ ἐς τὸν Κρόνον ἀπάτην καὶ ἀντὶ τοῦ παιδὸς τὴν λεγομένην

9. The first part is more accurately translated, "There is on Mt. Lykaion a Sanctuary of Pan, and around it, a grove of trees and a hippodrome, and in front of it, a stadium." Our investigations in this area are described in Part 2 of this article (see n. 1, above).

ὑπὸ Ἑλλήνων ἀντίδοσιν τοῦ λίθου γενέσθαι φασὶν ἐνταῦθα. ἔστι δὲ πρὸς τῇ κορυφῇ τοῦ ὄρους σπήλαιον τῆς Ῥέας, καὶ ἐς αὐτὸ ὅτι μὴ γυναιξὶ μόναις ἱεραῖς τῆς θεοῦ ἀνθρώπων γε οὐδενὶ ἐσελθεῖν ἔστι τῶν ἄλλων. . . . ἐν ἀριστερᾷ δὲ τοῦ ἱεροῦ τῆς Δεσποίνης τὸ ὄρος ἐστὶ τὸ Λύκαιον: καλοῦσι δὲ αὐτὸ καὶ Ὀλυμπον καὶ Ἱεράν γε ἕτεροι τῶν Ἀρκάδων κορυφῆν. τραφῆναι δὲ τὸν Δία φασὶν ἐν τῷ ὄρει τούτῳ: καὶ χώρα τέ ἐστιν ἐν τῷ Λυκαίῳ Κρητέα καλουμένη—αὕτη δὲ ἡ Κρητέα ἐστὶν ἐξ ἀριστερᾶς Ἀπόλλωνος ἄλλους ἐπίκλησιν Παρρασίου—καὶ τὴν Κρήτην, ἔνθα ὁ Κρητῶν ἔχει λόγος τραφῆναι Δία, τὸ χωρίον τοῦτο εἶναι καὶ οὐ [διὰ] τὴν νῆσον ἀμφισβητοῦσιν οἱ Ἀρκάδες.

They allow that she gave birth to her son on some part of Mount Lycaeüs, but they claim that here Cronus was deceived, and here took place the substitution of a stone for the child that is spoken of in the Greek legend. On the summit of the mountain is Rhea's Cave, into which no human beings may enter save only the women who are sacred to the goddess. . . . On the left of the Sanctuary of the Mistress is Mount Lycaeüs. Some Arcadians call it Olympus, and others Sacred Peak. On it, they say, Zeus was reared. There is a place on Mount Lycaeüs called Cretea, on the left of the grove of Apollo surnamed Parrhasian. The Arcadians claim that the Crete, where the Cretan story has it that Zeus was reared, was this place and not the island.

The ancient texts in general, and Pausanias in particular, played a critical role in inspiring and guiding the Greek excavations of the Sanctuary of Zeus on Mt. Lykaion at the turn of the century. Now, after our multiyear, interdisciplinary investigations at the site, we recognize that these texts contain more than just a kernel of truth in their detailed descriptions of the layout of the site, the importance and fame of Mt. Lykaion in ancient Greece, and the great antiquity of its cult.

GOALS OF THE CURRENT PROJECT

During the summers of 2004 and 2005, preliminary investigations were initiated, including the clearing of the site and the commencement of various surveys: architectural (with documentation of all aboveground monuments and buildings), topographical, geological, geophysical, and historical. During the 2006–2010 seasons, these surveys continued while archaeological excavations were conducted in both the upper and lower parts of the sanctuary (Fig. 2). Study seasons held in 2011–2014 provided an opportunity for specialists to study and catalogue the finds in our apotheke in Tripolis.

The objectives of the project were as follows: (1) to learn about the origins, nature, and development of the cult of Zeus on Mt. Lykaion; (2) to glean more information about the pilgrims who traveled to the site and worshipped Zeus, as well as the athletes who participated in the contests; (3) to examine the possible origins of athletic competitions at the sanctuary and how they were incorporated into the cult; (4) to explore the relationship of this

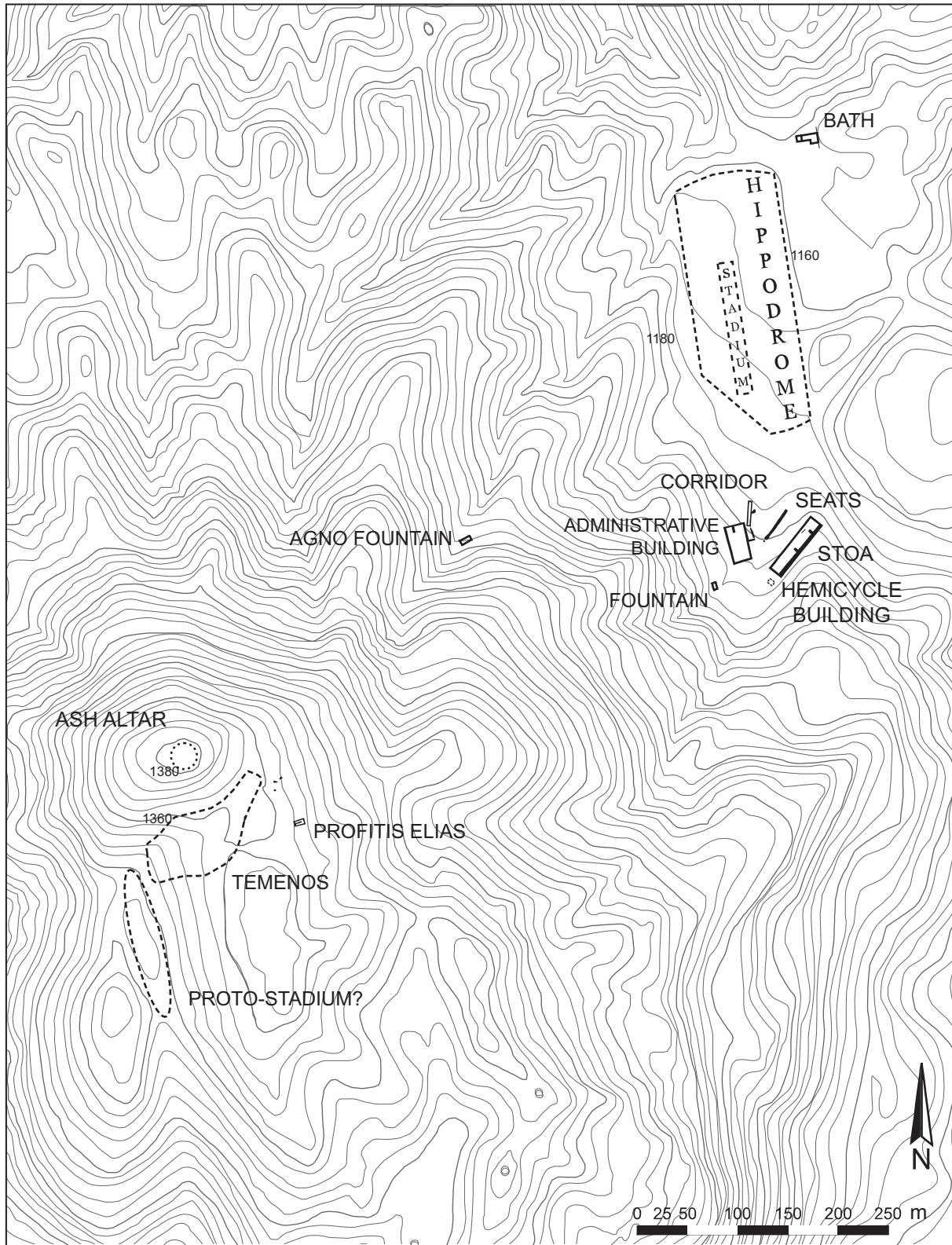


Figure 2. Map of the upper and lower parts of the sanctuary at Mt. Lykaion. A. Insua, M. Pihokker, and E. Rodríguez-Alvarez

sanctuary to the comparable Sanctuary of Zeus at Olympia, just 22 miles away; (5) to identify and date more precisely the extant buildings, structures, and areas found in the early-20th-century excavations conducted by Kourouniotis, including the ash altar, *temenos*, hippodrome, stadium, bathhouse, fountains, *xenon* (or administrative building), stoa, seating area, monument bases, and “hemicycle” building; (6) to determine the role of geology in the location of the sanctuary and in its built structures and monuments; and (7) to explore how the sanctuary was related to the Arcadian communities that supported it. During the 2004 season we defined the additional objective of establishing a heritage park in southwest Arcadia, northern Messenia, and southeastern Elis, which would incorporate Mt. Lykaion and other regional ancient sanctuaries, cities, and historic sites of all periods.

This report presents the results of the 2004–2010 excavation and survey seasons conducted at the site in the upper part of the sanctuary.¹⁰ Brief summaries of the scientific analyses are included as appendixes: Appendix 1 deals with the geophysical survey of the site, Appendix 2 with the geology of the area, Appendix 3 with the micromorphology, Appendix 4 with the palaeobotanical analyses, and Appendix 5 with the faunal analyses.

EARLY INVESTIGATIONS

The Sanctuary of Zeus on Mt. Lykaion was first excavated by Kontopoulos and later by Kourouniotis, both of the Archaeological Society of Athens.¹¹ These early investigations identified and uncovered various features of the sanctuary, including the mound of ash comprising an altar on the southern peak of the mountain, at 1,382 masl, and a *temenos* (sacred precinct), 24 m below, both in the upper level of the sanctuary. In the lower part of the sanctuary, Kourouniotis also found the hippodrome, stadium, bathhouse, two fountains, a stoa, seats (which face an open area), and a building that he identified as a *xenon*, or hostel, but that we call an administrative building (Fig. 2).¹² We have also identified a “corridor” that is a partially subterranean passageway which leads from the area of the administrative building toward the hippodrome and stadium. In the late 1990s Spyropoulos, then ephor of Laconia and Arcadia, dug trenches in the altar, *temenos*, and lower sanctuary.¹³

EARLY WORK AT THE ASH ALTAR

On the southern peak of Mt. Lykaion, Kontopoulos dug one shallow trench in 1897.¹⁴ Six years later Kourouniotis excavated five trenches (4.5 × 2 m each) at the top of the altar. He determined that it was about 30 m in diameter at the top and about 1.5 m deep, and noted that the soil was thin, dark, and ashy, full of burned bones and stones.¹⁵ The approximate locations of the Kourouniotis trenches have been surveyed and appear on our drawing of the altar (Fig. 3).¹⁶

The pottery identified by Kourouniotis from the ash altar included small phialai and skyphoi, with solid black gloss, typical of the 5th and 4th centuries B.C.¹⁷ He also uncovered a number of terracotta lamp fragments

10. For a brief report of our work through 2009, see Romano and Voyatzis 2010.

11. Kontopoulos 1898; Kourouniotis 1903; 1904a; 1904b, cols. 162–178; 1905.

12. Kourouniotis 1909.

13. The trenches of Spyropoulos have not yet been published.

14. Kontopoulos 1898.

15. Kourouniotis 1904a, col. 164.

16. In addition to these six trenches we also surveyed a trench excavated by the former ephor Spyropoulos in the late 1990s.

17. Kourouniotis 1904a, cols. 164–166.

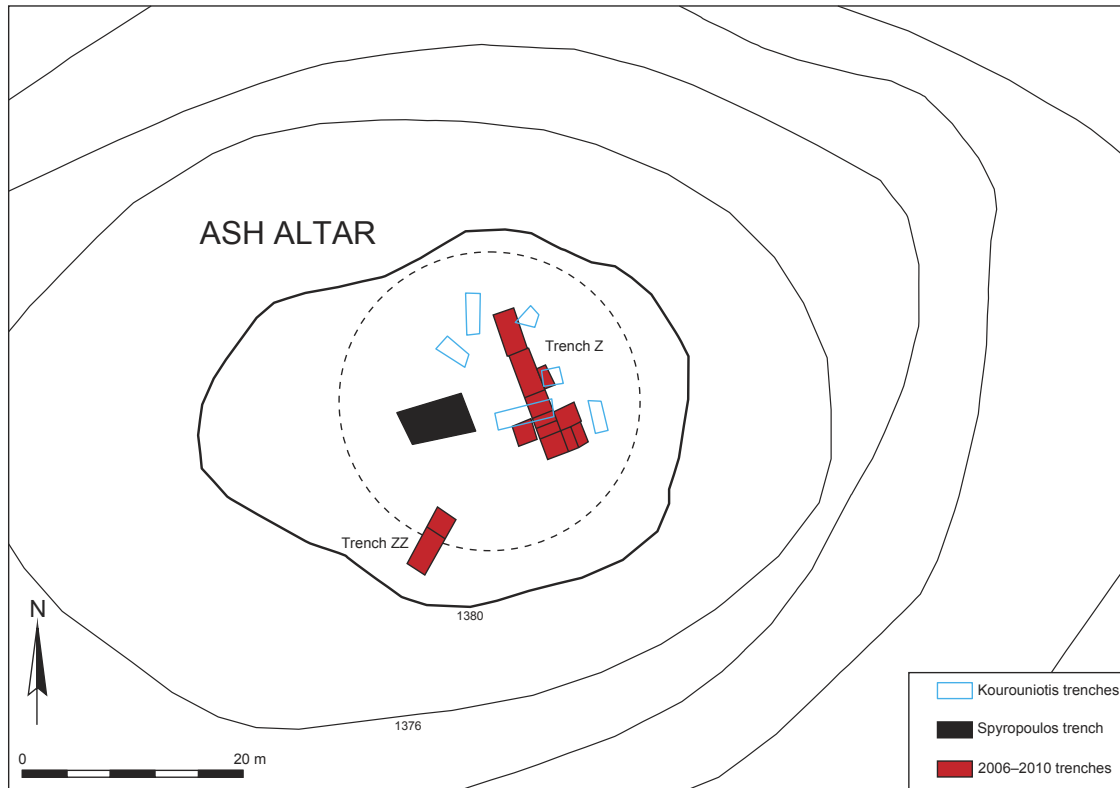


Figure 3. Altar trenches. A. Insua, M. Pihokker, E. Rodriguez-Alvarez, and A. Mayer

as well as many roof tiles, some with stamped inscriptions of probable 4th-century B.C. date.¹⁸ In addition, he unearthed an Archaic iron knife, some bronze rings, an iron key, a 4th-century B.C. terracotta bird figurine, an Archaic coin from Aigina, an Arcadian League coin, and two miniature bronze tripod cauldrons. The smaller of these is made in one piece, while the larger one has separate legs slotted in at the rim; Kourouniotis dated them to the 7th century B.C.¹⁹

EARLY WORK IN THE AREA OF THE TEMENOS

In the region in front of the *temenos*, about 24 m below the altar, Kourouniotis excavated in an area where Kontopoulos had also briefly dug, and found two column bases (which Kourouniotis identified as the foundations of the columns originally crowned by golden eagles mentioned in Pausanias 8.38.7; see Figs. 2, 4).²⁰ On the southern base Kourouniotis reerected a column drum found lower down the mountainside.²¹ Based on the ancient texts and his investigations, Kourouniotis placed the entrance to the sacred enclosure at this eastern end of the *temenos*. He also determined that there was no door or fence surrounding the *temenos*, and proposed that a small house may have existed inside it for use by the priest, for the storage of votives, or for the shelter of strangers or fugitives.²²

Kourouniotis identified a long line of low stones parallel to the south side of the peak of the hill on which the altar stands, and within 55 m of its edge. This line of rocks, which he believed to be ancient and not part

18. Kourouniotis 1904a, cols. 164–166; Jost 1985, p. 180.

19. Kourouniotis 1904a, col. 166.

20. Kourouniotis 1904a, col. 151; Cook 1914, pp. 81–86; Jost 1985, p. 181.

21. Kourouniotis 1904a, cols. 173–174, fig. 7.

22. Kourouniotis 1904a, col. 155. Even today there is a religious festival that takes place in this vicinity at the church of Prophitis Elias every July 20, but today the *temenos* is used as a parking lot for the people attending the service.



Figure 4. *Temenos*, column bases, and altar mound, view from east. D. G. Romano

of modern reconstruction by local communities, followed the slope of the plateau and could be seen for up to 120 m in his day. He therefore concluded that the ancient *temenos* was 55 m wide and at least 120 m long.²³

When Kourouniotis excavated at the eastern edge of the *temenos*, 10 m to the west of the bases, he found black, greasy earth, but no bones. The composition of this soil was taken to indicate that it had been soaked with animal blood, and Kourouniotis concluded that this area had been associated with the slaughter of animals before the burned sacrifice. A number of figurines were uncovered here as well.

Kourouniotis also excavated in the area of the stone column bases in front of the *temenos*, completing Kontopoulos's work in this part of the site. He found more statuettes in the vicinity of the north stone base at its eastern side. Near the south base, he uncovered two coins.²⁴

Trenches with a total area of 60 m² were opened inside the area of the *temenos*, but yielded virtually nothing except some iron objects and roof tiles in the southern area.²⁵ This lack of finds may accord well with Pausanias's description (8.38.6) of the *temenos* as an *abatōn*, where no man walked for fear of death within a year.²⁶

Kourouniotis found nine complete bronze statuettes in front of the *temenos*, together with a few pieces of a tenth, as well as the bases from other similar statuettes, and a bronze eagle. Many of these figurines were uncovered in the area 10 m to the west of the column bases. They include two 5th-century B.C. bronze figurines of Hermes found close to one

23. Kourouniotis 1904a, col. 161. See the discussion below regarding the current investigations of the *temenos* relative to Kourouniotis's, and also Fig. 33, which shows our recent trenches.

24. Kourouniotis 1904a, col. 173,

fig. 5:2, 3. The silver coins are of the 5th century B.C.: an Arcadian League coin and a coin of Argos.

25. Kourouniotis 1904a, col. 171. Spyropoulos also dug a trench in the *temenos* in the late 1990s, but no report of this work has appeared.

26. Jost (1985, pp. 255–258) argues that none of the ancient authors who discuss the *abatōn* make the connection between the prohibition to enter the *abatōn* and the references to human sacrifice at the altar up above.

another: one wearing a cloak, chlamys, and conical hat, and one raising his right arm and wearing a chlamys and petasos; the legs of the latter are covered in lead.²⁷ In addition, bronze jewelry, a bronze plaque, a double iron link, and many roof tiles were found at the same level. Interestingly, no pottery was reported from here.²⁸

In this same area and in the vicinity of the column bases were also found a bronze two-headed snake, a bronze askos, two silver coins, an inscribed bronze greave of 5th-century B.C. date, and some 10 engraved rings, one of bronze and the rest of iron.²⁹ The askos may have been a vessel used to bring the wine for the ritual libations at the site. Of these objects, only the greave had a votive inscription, which dedicated it to Lykaion Zeus and Athena (*IG V 2*, line 551).

In the vicinity of the northern base, Kourouniotis found a nude figure of Zeus holding a thunderbolt in his right hand and an eagle perched on his left; this is the earliest object he found as it likely dates to the late 7th century B.C. This piece was originally attached to a larger vessel, probably a tripod cauldron.³⁰ Other figures of Zeus, all of bronze, include an image of Zeus "Ithomatas" of early-6th-century B.C. date; an Archaic seated Zeus (540–530 B.C.); a statuette of Zeus in a himation on a square plinth; a hand of Zeus holding a lightning rod (5th century B.C.); a foot, presumably of Zeus (5th century B.C.); and a miniature eagle (5th century B.C.).³¹

Between the late 19th century, when these early excavations were carried out, and the current project, the only other scientific investigation at Mt. Lykaion occurred in 1996, when Romano conducted a computerized architectural and topographical survey there.³² That work has provided an important foundation for our project and has helped to guide our objectives and goals.

THE ASH ALTAR OF ZEUS

Between 2007 and 2010 we excavated trench Z in the ash altar; by the end of our work the dimensions of this trench were 14 × 2 m, with some side extensions (Figs. 3, 5). During 2009 and 2010 a second trench, trench ZZ, was excavated approximately 10 m to the southwest (Fig. 3). The pottery found in this trench was very fragmentary and, therefore, generally was not selected for the preliminary catalogues that follow. The character of trench ZZ will be discussed below on p. 625.

Although the modern level of the ground surface of the ash altar is relatively flat, the depth of the sediment covering the mountain summit in trench Z, between ground surface and bedrock, varied considerably from the

27. Kourouniotis 1904a, cols. 199–203, figs. 20–22, pl. 9; Lamb 1925–1926, p. 145, nos. 39, 40.

28. Kourouniotis 1904a, cols. 171, 196–197, 203–204, fig. 20, pls. 9, 10.

29. Kourouniotis 1904a, cols. 173, 179–214, figs. 5:2, 3, 27–29; Jost 1985, p. 181.

30. Kourouniotis 1904a, cols. 180–

184, figs. 8–10; Lamb 1925–1926, p. 140, no. 17; Mylonas 1946; Jost 1985, p. 252, no. 1; Zolotnikova 2005, p. 111.

31. Kourouniotis 1904a, cols. 184–185, figs. 11–19; Lamb 1925–1926, pp. 143–146, nos. 29, 30, 43; Jost 1985, p. 252, nos. 2–5.

32. Romano 1997, 2005.

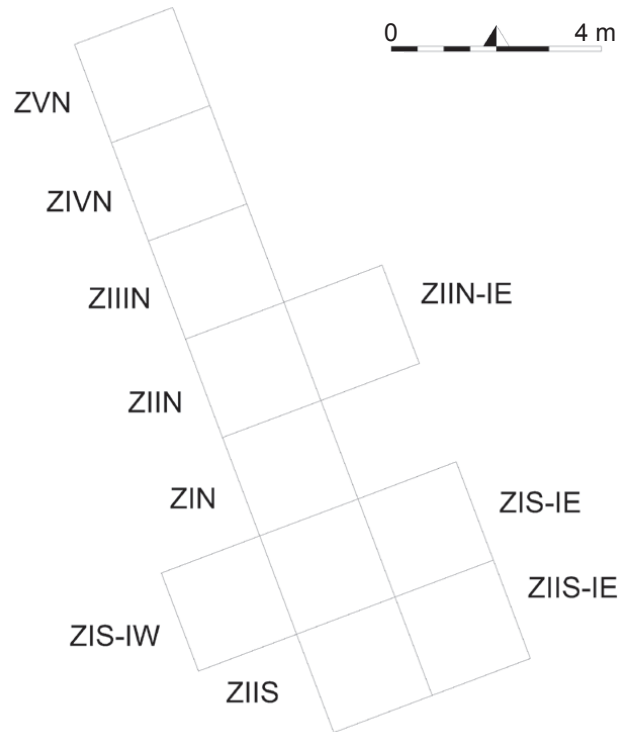


Figure 5. Schematic plan of trench Z with side extensions. M. Pihokker

southern portion of the trench, where the sediment is 1.50 m, to its northern part, where it is only 0.60 m. This is likely due to the upward slope of the bedrock of the mountaintop from south to north; at the northern limit of trench Z, the bedrock is higher and the fill above it is shallower. From our investigations it is clear that the entire southern peak of the mountain, an area of approximately 700 m², is covered in ash and pulverized bone from burned animal sacrifice.³³

Our exploration of the altar began in a 2 × 2 m trench at the southern end of trench Z. In the top 0.70 m of excavated sediment, we found a mix of ashy, greasy, black soil with stones of varying sizes, some very large to the north, but with mixed stratigraphic levels. The lower 0.80 m yielded more clearly defined stratified levels, and also contained large stones. At the bottom we uncovered the irregular stone bedrock of the mountain. We expanded the trench to the north and found essentially the same pattern, with more clearly stratified levels in the lower part of the trench (Figs. 5, 6), though with some variation at the northern top of the altar (see p. 591, below).

On the basis of our preliminary study it appears that the latest material found in trench Z can be dated to the late 4th century B.C.,³⁴ and the earliest to the FN period; there was also EH, MH, and LH pottery uncovered in most levels of trench Z, from the upper layers down to bedrock. The heaviest concentration of prehistoric material, however, was found immediately above bedrock.

Much of the trench Z deposit is characterized by large quantities of limestone blocks of varying sizes in a sedimentary matrix of highly fragmented bone mixed with ash (see Appendix 3). Interspersed in this mixture are pottery sherds, some terracotta figurines, and various metal

33. See Appendix 3, for a summary of the results of the micromorphology analyses. See Appendix 2, for a summary of the geological survey that has been ongoing since 2004 on the southern peak of Mt. Lykaion. Davis has determined that the steep topography of the mountain played a role in its importance, and he has identified the existence of faulting in the area of the altar.

34. Several fragments of Hellenistic pottery have been identified from trench Z during our recent study seasons, so it may well be that some activity continued into this period at the altar. As we complete our study of the ceramics, we shall investigate this possibility further.

dedications. Some roof-tile fragments have also been found in this mix. There are several important areas of interest within trench Z, and we describe those in detail together with their finds.

AREA OF INTENSE BURNING, FEATURE Z3

Feature Z3, in the southern end of trench Z, is defined as an area of intense burning marked by a dense concentration of fire-cracked rock, packed with gray ash and bone (Fig. 7). It is bordered to the south by a jumble of large limestone rocks haphazardly placed there in antiquity, with cultural material beneath.³⁵ Many of the large rocks in the jumble show evidence of significant exposure to heat, since their surfaces have turned chalky and fragments of fire-cracked rock lie interspersed among and beneath them. The elevation of the area of intense burning within the southern part of trench Z is roughly 0.40–0.70 m below the present ground surface and approximately 0.70–1.00 m above bedrock.

The size of the “area of intense burning” is roughly 1.4–1.6 m north–south and 0.85–0.90 m wide, with a portion of the area extending into unexcavated deposits to the west (Fig. 7:b). The burn center was filled with about 0.30 m of ash above and among the fire-cracked rocks. Charcoal and charred seeds have been recovered from the screening and flotation of this fill, along with compacted ash and large amounts of burned animal bone fragments.³⁶ The soil beneath these rocks was brown and loamy in texture, and represented a clear change from the soil above it.³⁷

Some significant finds associated with the area of intense burning in Z3 include the following: a large, nearly complete miniature bronze tripod cauldron with flat circular handles (109), an iron knife (115), a bronze tripod leg (MTL 72), and a mixture of pottery ranging in date from the FN through the Classical periods (including LH, PG, and Archaic sherds).

Our preliminary interpretation of this feature is that it represents a locus of repeated episodes of burning or offering of burned animal sacrifice, beginning in the 10th century B.C. and continuing over the course of many centuries into the Archaic and Classical periods. Although there is earlier, prehistoric material found here, the earliest secure date comes from the lowest basket within the feature, containing PG sherds (e.g., 92) and no apparent later material. In the future we hope to recover more information about the extent of this area of intense burning.

35. Kourouniotis (1904a, cols. 164–169) describes similar finds of large rocks, ash, and bone in his report of his excavations at the altar.

36. For more details about the results of the palaeobotanical samples and burned animal bones, see Appendixes 4 and 5, respectively. We note that no evidence of human bones has been found in the area of intense burning or anywhere else on the altar, despite the ancient references; see n. 4, above.

37. Feature Z3 includes baskets Z15, Z18, Z21, Z48, Z52, and Z60.

CONCENTRATION OF PREHISTORIC MATERIAL

A heavy concentration of prehistoric pottery appeared in trench Z immediately above bedrock for a length of approximately 10 m, in SU 7 (Fig. 8). The evidence suggests continued use from at least LH IIB through LH IIIC and into the Iron Age. The greatest amount of prehistoric pottery is Mycenaean, but there are also quantities of FN, EH, and MH pottery. This concentration of prehistoric pottery is found primarily in layers that are characterized as “brownish gray silty” and “brownish clayey.” These layers also contain large quantities of highly fragmented and mostly burned animal bones of sheep and goat. Hundreds of Mycenaean kylikes have



a



b

Figure 7. Feature Z3: (a) before excavation, view from east; (b) showing signs of intense burning, view from south. Photos A. Rohn

been recovered here, together with various other examples of Mycenaean pottery, discussed in greater detail below (10–83).

A small series of “Features” containing clusters of pottery were found along the western scarp of trench ZIIN (a 2-m-long section of the 14-m-long trench; Figs. 5, 6) on bedrock level. These are small, undisturbed deposits containing Mycenaean pottery sherds and animal bones. The pottery appears similar in nature and date to the periods represented by the pottery from the rest of the bedrock level (with a predominance of LH IIIA2–LH IIIB types), but the animal bones from a few of these deposits are unburned and of a different nature from the other bones found.

Significant finds associated with the concentration of Mycenaean pottery in SU 7 include terracotta animal and human figurines of LH date (100–103), discussed below. In general, these finds are consistent with the sorts of materials found in Mycenaean cult centers, such as at Mycenae, Tiryns, Pylos, Phylakopi, Maleatas, and Asine.³⁸

38. Taylour 1970; 1983, pp. 43–64; Lambrinoudakis 1981; Rutkowski 1986, pp. 169–199; Whittaker 1997, pp. 163–183, table 5; Marakas 2010, pp. 91–93.



Figure 8. Kylikes found in situ in trench Z. Photo A. Rohn

ARCHITECTURAL FEATURE 1

A series of long, flat stones, some with a north–south orientation, were found in situ on bedrock at the highest point of trench Z toward the northern end in ZIIIN and ZIVN (Fig. 6).³⁹ The stones appear to have been deliberately placed at this location (Fig. 9) and may have served as a platform for Mycenaean offerings, such as terracotta animal figurines

Figure 9. Architectural Feature 1. Photo D. G. Romano



39. The baskets that exposed elements of the feature include 85, 88, 98, 99, 113, 115, 128, 129, 136, 145, and 147.

(e.g., 100, which was found nearby). LH pottery (43) and large amounts of Early Iron Age pottery were also found in association with this feature. The stratigraphy and finds from this area are very significant and are currently under study. Fragments of a coarse cooking vessel were uncovered in this vicinity, sandwiched between the flat stones of the feature, and may be as early as MH III/LH I (9). We hope that future investigations will illuminate the nature, date, and function of this intriguing feature.

POTTERY FROM THE ALTAR

Based on our preliminary analysis of the pottery from trench Z, we can say that it consists of material ranging in date from FN through Late Classical,⁴⁰ with a surprisingly large amount of LH material. This pottery is currently under study, but our impressions are that the FN, EH, MH, and LH pottery is dispersed throughout many levels (with the greatest concentration in the lowest layers). These results are particularly important since, in the previously excavated trenches of the altar, Kourouniotis identified only much later pottery dated to the 5th and 4th centuries B.C.⁴¹

FINAL NEOLITHIC POTTERY

Approximately 400 sherds were tentatively identified as Neolithic, coming from most stratigraphic units in the altar.⁴² In addition, one quadruped figurine from trench Z was identified as Neolithic. The catalogued sherds so far include 20 rim fragments, two bases, two handles, and two body fragments. The average size of the sherds ranges from 0.02 × 0.03 m to 0.02 × 0.05 m. The rims come from small bowls (1), collared bowls, or flaring carinated bowls. One is a collar fragment from a jar or other restricted form. One of the bases appears to be from a pithos or pithoid jar (2). The other is a flat, slightly concave or “dimpled” base that belongs to a small bowl or cup. The two catalogued body sherds preserve surface decoration. One body sherd comes from the center of a dark-slipped bowl with interior pattern-burnished decoration, typical of LN II/FN (3). Most of these sherds have parallels in the Period I material from the settlement of Ayios Dhimitrios (45 km to the west), from the LN II/FN stratum at that site.⁴³

The FN sherds are coated with a dark gray, greasy residue that, in the majority of cases, has not yet been removed by cleaning in water; they await a specialist’s attention.

The most common fabric is a coarse paste that is dark on the surface and at the core. The nonplastic inclusions are numerous, packed together, and tend to be black/dark gray, and large (up to 5 mm in length). The dense inclusions and probably the low firing temperature cause the sherds to disintegrate when immersed in water—another characteristic typical of LN II/FN ceramics. It is not yet clear whether the sherds were directly exposed to secondary fire in the altar.

The sherds are extremely worn on their surfaces, but traces of slip and burnishing are visible on most of the rims. Pattern burnishing is visible on the interior of a dark gray bowl fragment, and faint traces of incised decoration are present on two rim sherds.

40. The Archaic and Classical pottery is currently being studied by Ann Steiner.

41. Kourouniotis 1904a, cols. 164–166.

42. This analysis of the Neolithic pottery represents a summary prepared by Susan Petrakis; the Neolithic catalogue is her work.

43. Zachos 2008, pp. 16–48.

All of this material, including the figurine, is typical of household assemblages at Neolithic habitation sites, but it is very unlikely that there was a settlement on the peak of this windswept mountain.⁴⁴

It is interesting in this regard to look again at the ancient texts and recall that Pausanias (8.2.1) credits Lykaon, the son of Pelasgos, with founding the city of Lykosoura, as well as the cult of Lykaion Zeus and the Lykaion Games. Pausanias goes on to say that the sons of Lykaon founded other Arcadian cities, but it was his grandson Arkas who introduced the cultivation of crops and gave his name to the region and its inhabitants. The FN ceramic evidence from the altar is significant because it shows solid evidence for activity in this region of Arcadia during this formative period.

CATALOGUE

- 1 Rim of small bowl Fig. 10
 Z-134-Neo-14. Bedrock layer (SU 7) ZIIN-IE.
 P.H. 0.014; p.W. 0.026; Th. body 0.005, rim 0.007 m.
 Rim, thickened on both sides, with start of upper body. Fabric: dense with sandy texture, visible nonplastics are silver (< 1 mm) and dark gray (2–4 mm). Exterior has spalled. Exterior: 5YR 6/4 light reddish brown. Interior: 5YR 6/4 light reddish brown. Core: 5YR 4/1 dark gray. Preserved surface unslipped, with decoration of an incised dot and oblique line beneath rim. Edge of folded rim visible on unslipped interior.
 FN
- 2 Base of pithoid jar Fig. 10
 Z-36-Neo-11. Bedrock layer (SU 7) ZIIS.
 P.H. 0.021; p.W. 0.069; Th. 0.013; Diam. ca. 0.280 m.
 Flaring, slightly raised base and start of body. Fabric: hard and dense, many visible nonplastics range from 3–8 mm in size, and are silver, gray, dark red, light brown, and orange in color. Exterior: 5YR 7/6–6/6 reddish yellow. Interior: 10YR 4/1 dark gray. Core: 10YR 4/2 dark grayish brown. Possible traces of dark brown slip(?) on exterior of foot. Interior surface blackened and shiny, apparently from secondary exposure to fire. Large, blocky nonplastics protrude through surface of interior.
 FN
- 3 Body fragment of bowl Fig. 10
 Z-139-Neo-17. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.033; p.W. 0.029; Th. 0.006–0.009 m.
 Fabric: fine paste with many visible nonplastics, texture smooth and crumbly. Nonplastics range in size from < 1 mm (silver) to 2–6 mm (reddish brown and black), and are angular and blocky. Exterior: 10R 4/8 red to 10YR 2.5/1 reddish black. Interior burnished areas: 5YR 6/4 light reddish brown and 5YR 2.5/1 black. Core: 5YR 2.5/1 black. Exterior surface slipped and undecorated. Interior surface has pattern-burnished triangle and traces of other pattern-burnished linear elements.
 FN

44. See Howell (1992), who discusses the FN evidence from Nichoria and elsewhere in the Peloponnese. He suggests that FN evidence from mountainous Arcadian sites (like Asea), as well as

from open sites near the sea (such as Nichoria), would fit a theory of transhumance, with communities and their flocks moving to the mountains of Arcadia in the summer and to the coasts in

the winter. Such a situation may explain the FN sherds from Mt. Lykaion as well, but we believe the settlement may have been somewhere nearby on the mountainside and not on the mountaintop.

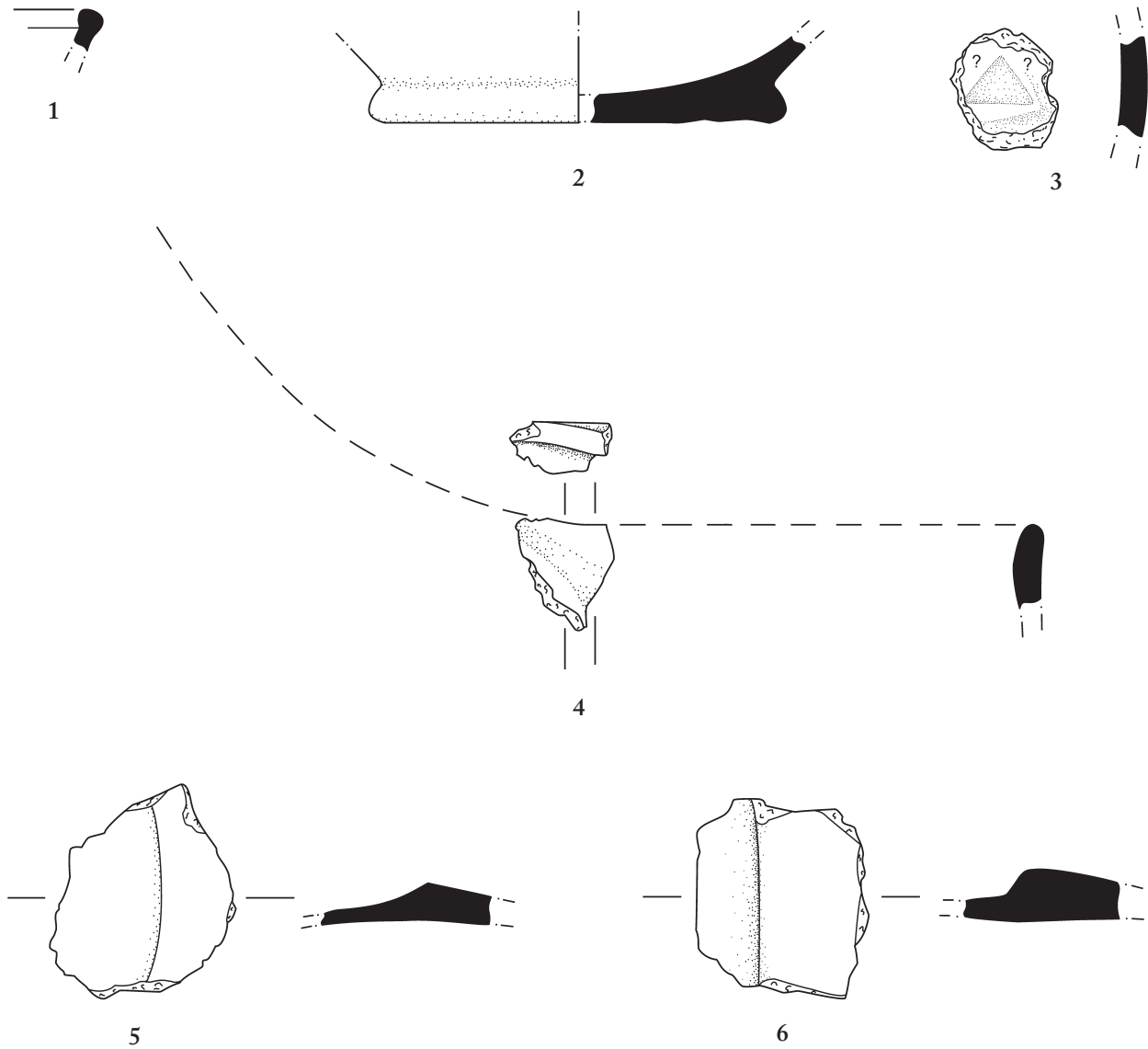


Figure 10. FN sherds 1–3; EH sherds 4–6. Scale 1:2

EARLY HELLADIC POTTERY

Forsén has catalogued a small number (23) of EH pottery sherds from the ash altar.⁴⁵ They are found in most levels, but especially in the bedrock layers.

The shape, repertoire, fabric, and surface finish of most of the catalogued sherds likely represent the final of three Early Bronze Age phases, EH III. No less than 12 of these 23 (i.e., slightly more than 50%) represent medium coarse-ware bowls or wide-mouthed jars that are either unpainted and burnished or unburnished, or solidly painted and burnished or unburnished. Among these 12 there might be part of a narrow-necked jar. Usually the exterior is painted and the interior is either plain or burnished. The fragmentary and worn state of the sherds makes it very difficult to be more specific about the shapes.

Of the remaining 11 Early Bronze Age sherds there is at least one that Forsén believes is a rim fragment of a sauceboat (4), and possibly one horizontal handle from another. They were found on bedrock level

45. This analysis of the EH pottery represents Jeannette Forsén's summary; the EH catalogue is her work.

in trench Z. These two sherds are of EH II date, and are made of thinner, finer fabric—differing in that respect from the rest of the Early Bronze Age assemblage.⁴⁶

Two rim and bottom fragments of medium coarse plain ware may represent “baking pans” or hearths of varied dimensions, between 0.22 and 0.40 m in diameter, but here the fragmentary state makes size estimates problematic.⁴⁷ The rims lack any kind of decoration (5, 6). These two sherds came from bedrock level in trench Z and should be dated to the EH I or EH II period.

Overall, these sherds represent an ordinary household assemblage of EH date.

CATALOGUE

- 4 Sauceboat rim Fig. 10
 Z-92-EH2. Bedrock layer (SU 7) ZIIN.
 P.H. 0.031; p.W. 0.029; Th. 0.007 m.
 Fabric: fine ware, unevenly fired, dark gray core. Exterior slipped, fired brown (7.5YR 5/2), burnished. Interior slipped, fired red (10R 4/6), burnished to gloss.
 Late EH II
- 5 Baking-pan or hearth rim Fig. 10
 Z-92-EH1. Bedrock layer (SU 7) ZIIN.
 P.H. 0.061; p.W. 0.054; Th. 0.005–0.010; Diam. 0.220 m.
 Lip of rim is not preserved. Fabric: medium ware, unevenly fired, mottled light gray to pink (7.5YR 7/1–7/4), with a brown core. Plain.
 EH I or II
- 6 Baking-pan or hearth rim Fig. 10
 Z-137-EH1. Bedrock layer (SU 7A) ZVN.
 P.H. 0.054; p.W. 0.054; Th. 0.005–0.015; Diam. ca. 0.400 m.
 Lip of rim is not preserved. Fabric: medium ware, unevenly fired, mottled red to light brown upper surface (2.5YR 5/6 to 7.5YR 6/4), reddish yellow underside (5YR 6/6), with a reddish gray core (5YR 5/2). Plain.
 EH I or II

MIDDLE HELLADIC POTTERY

Middle Helladic Arcadia is little explored, and consequently the pottery of this period is not easily recognized. Nordquist has, however, identified some possible MH fragments from the altar levels.⁴⁸ She notes that there are very few MH imports among the sherds from Mt. Lykaion that display fabrics characteristic of the Gray Minyan or matt-painted wares known from other areas in the Peloponnese such as the Argolid.⁴⁹ Two sherds that may be of Lustrous Decorated fine ware were noted.⁵⁰ Instead, coarse

46. See *Lerna* IV, pp. 584–592.

47. *Lerna* IV, pp. 556–559; Pullen 2011, pp. 191–192.

48. This analysis of the MH pottery is a summary by Gullög Nordquist; the MH catalogue is her work.

49. An overview of the MH matt-painted pottery is found in Buck 1964. Since then, many studies of decorated and Minyan pottery have appeared. Zerner, Zerner, and Winder 1993 is useful for pottery in trade. See also

Felten, Gauss, and Smetana 2007; Philippa-Touchais et al. 2010, pp. 551–647, for recent discussions. For Gray Minyan, see Pavuk 2010.

50. Zerner 1978, pp. 166–170; 1986, pp. 66–67.

local fabrics dominate, and are often difficult to distinguish from coarse sherds of other periods. Some local MH wares can now be defined, most prominently a reddish coarse/semicoarse, rather gritty fabric with burned clay inclusions, used, for example, in the well-known later MH goblets or stemmed bowls; typical examples are the fragment of a goblet with incised decoration (7) and another goblet fragment of a similar (or even the same) vase.⁵¹ A third sherd from a mixed level also seems to belong to this group.

MH coarse ware is not well studied except for the Aiginetan ware, and further work is needed in order to establish this and other fabric descriptions. It should be noted that no fragments of MH Aiginetan pottery have been observed at Mt. Lykaion. Another MH piece consists of a flat-based cup, probably with one vertical handle, of which two nonjoining fragments were found, likely from the same vase (8). It has a coarse burnished surface. One of the fragments is from a rim with a thick band-handle attached to both sides of rim. Traces of fire can be seen on the exterior of the vessel. A large rim fragment of a cooking pot (9), found between the flat stones of Architectural Feature 1, may belong to the same group of fabrics as mentioned above, and thus be as early as the transition from MH III to LH I. This local fabric, however, may have been long-lived, and the piece could be later.⁵² It shows some similarities to coarse-ware pottery sherds from Midea.⁵³ But this fragment needs further study, taking into account technology and possible joins.

CATALOGUE

7 Goblet Fig. 11

C-Z-49-MH1. Basket 49 (SU 15) ZIN.

P.H. 0.095; Th. 0.005–0.007 m.

Fragment of goblet with a rounded conical body, and neck. Handmade, probably coiled. Fabric: semicoarse, gritty, well fired, with several angular dark red inclusions (up to 0.0025 m), some small to medium angular white (lime?, up to 0.0015 m), occasional round gray (up to 0.0015 m), and very small black. A few tiny sparkly bits. Core: 2.5YR 5/6–4/6 red. Surfaces: 2.5YR 4/2–4/6 weak red to red. Smoothed exterior and interior. Decorated with two parallel lines incised with a rather square tool.

MH III

8 Cup with handle Fig. 11

C-Z-57-41. Bedrock layer (SU 7) ZIS.

Diam. base 0.035, est. Diam. rim 0.090 m.

Flat base, rim, and vertical handle fragments, probably from same or similar handmade cup (in two parts). Fabric: coarse burnished with a few large dark red (stone) inclusions (up to ca. 0.003 m), some medium gray (up to 0.002 m), and several smaller rounded black. Core: 2.5YR N3/0–3/2 very dark gray to dusky red. Surfaces: exterior 2.5YR 3/2–4/4; interior 2.5YR 3/2–3/3 dusky red to reddish brown. Smoothed interior. Traces of burnishing. Secondarily fired exterior?

MH I–II

9 Cooking jar rim Fig. 11

C-Z-136-MH1. Basket 136 (SU 10) ZIVN.

P.H. ca. 0.12; Diam. rim ca. 0.17 m.

51. For goblets from Asine, see Dietz 1980, p. 80, figs. 37–42, 44, 45 (from grave 1971-3); Nordquist 1987, pp. 47–54.

52. Possible parallels from Tsoungiza (Thomas 2005, pp. 522–523, fig. 31) suggest an even later date, LH IIIA2–B.

53. Walberg 2007, figs. 174:2019, 175:2030. These vessels have a more carinated interior, but show similarities in their rim profiles and handles.

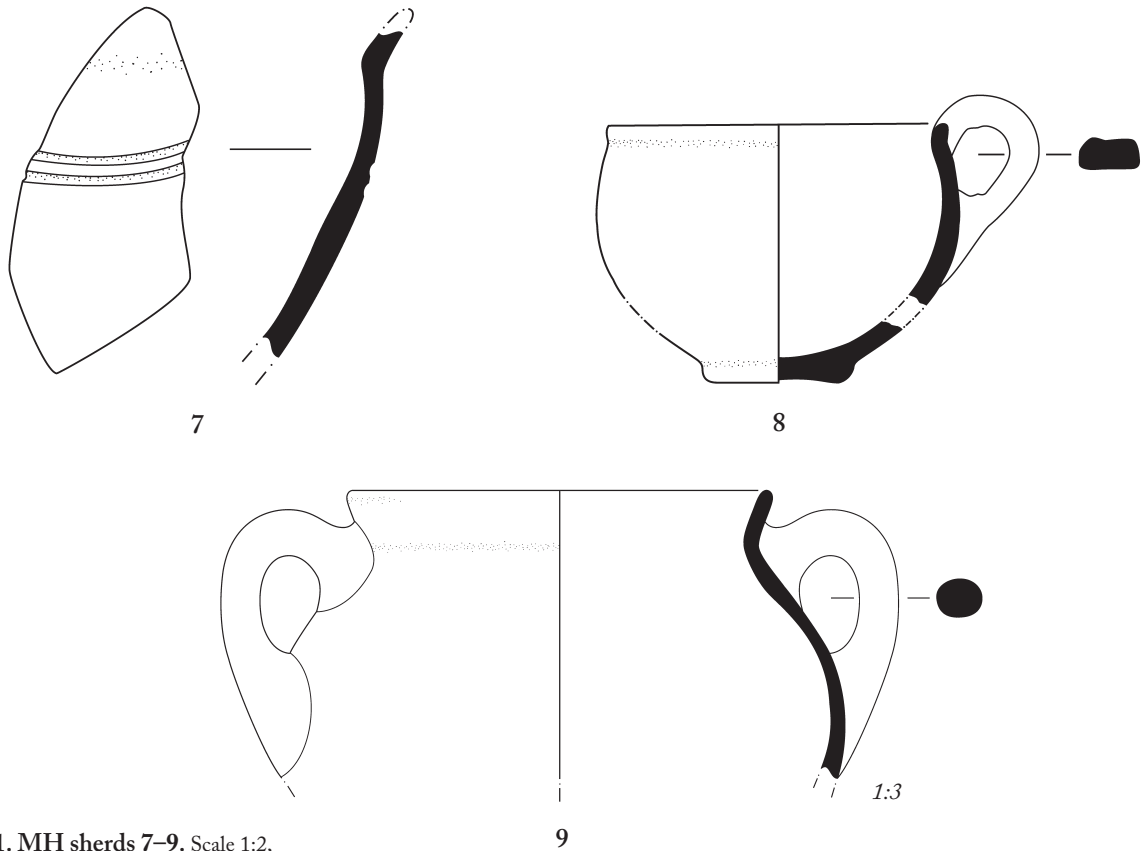


Figure 11. MH sherds 7–9. Scale 1:2, except where indicated

Fragment of rounded rim and body of cooking vessel with vertical round handle. Handmade, probably coiled. Fabric: coarse and gritty, well fired, with many large angular dark reddish brown inclusions (up to 0.005 m, grog?), many small round black, occasional large to very large angular gray (up to 0.004–0.005 m, but very uneven in size), some small white and some small sparkly bits. Core: 5YR 4/2–4/3 dark reddish gray to reddish brown. Biscuit and surfaces: 5YR 6/8–5/8 reddish yellow to yellowish red; surfaces are very worn.

Late MH III

MYCENAEAN THROUGH EARLY IRON AGE POTTERY

Directly on top of bedrock in trench Z is a Mycenaean level (SU 7), which consists of several hundreds of sherds of LH IIB through LH IIIC types, including many open shapes, especially kylikes.⁵⁴ Grading into the layers immediately above the Mycenaean layer we also have a significant presence of Early Iron Age ceramics (Submycenaean, as well as PG, including Messenian and Laconian “Dark Age” pottery). Above this we can identify

54. Up until now, there has been very little published evidence for Mycenaean pottery from Arcadia. Mountjoy devotes a few pages, and no illustrations, to the region in volume I of her massive work on regional Mycenaean pottery (1999, pp. 294–299). Howell’s survey of Arcadia

(1970, pp. 113–116) also notes some sites with examples of Mycenaean pottery. Over a dozen LH sherds (LH IIIA–LH IIIC) were recently found at the sanctuary of Athena Alea at Tegea; see Voyatzis’s pottery chapter in Nordquist, Voyatzis, and Østby 2014, pp. 197–202. A couple of

LH IIIC sherds were also uncovered at Tegea in the French excavations at the site; see Dugas 1921, p. 403; Voyatzis 1990, pp. 64–65, pl. 1. The recent discovery of Mycenaean cemeteries in Arcadia along the Alpeios River, in the deme of Heraia, is mentioned in Salavoura 2008, pp. 79–80.

LG sherds. The ceramics continue with Archaic and Classical types in the upper levels, but in some cases, the later material is mixed into the lower levels. All this pottery has been found together with animal bone fragments, consisting mostly of burned sheep and goat femurs and tailbones.⁵⁵ Thus there appears to be continuous use of the ash altar for ritual purposes from at least the LH IIB period, if not earlier, through the Classical period.⁵⁶

The LH sherds from the altar are currently under study, but we present our tentative conclusions here.⁵⁷ Of the material catalogued so far (mostly from the bedrock level, but also mixed in the upper layers), there seems to be a preponderance of LH IIIA2 to LH IIIB kylikes. These are typically unpainted, of rounded (FS 256/257 and FS 264/265) and angular (FS 267) types (14–17, 19–22, 28–38, 40–68). Some pieces are earlier and may be from goblets of LH IIB to LH IIIA1 date (10–12, 69, 70). Some of the vessels are decorated with standard Mycenaean motifs, such as a curved-stem spiral (FM 49; 13), an octopus (FM 21; 19), and volute flower (FM 18A; 20). Others have monochrome paint on the interior and exterior, such as 17. Angular kylikes, primarily unpainted, but some with monochrome paint on the interior and exterior, were found in abundance (28–38, 40–43). The shapes and decorations of some examples (such as 20, 26, and 41–43) suggest a possible connection with Laconian LH that merits further exploration.⁵⁸ Other open shapes include one-handled bowls (FS 283; 23, 24, 26), stemmed bowls (FS 304?; 13, 71, 72), a dipper (FS 236; 79), deep bowls (FS 285; 27, 74), and mugs (76–78). Closed shapes include decorated askoi (bird-shaped ritual vessels, FS 194; 80, 81), a possible feeding bottle (82), and stirrup-jar fragments (e.g., 83).

The clay of the Mycenaean pottery from Mt. Lykaion is varied. There are numerous examples with very pale brown, reddish yellow, and pink fabrics. Pale yellow clay is also common, but these pieces are often of very fine quality and may have been imported to the site. In addition, there are a relatively small number of LH sherds with a light red fabric. Some of the LH sherds have a very recognizable slip, usually of very pale brown color with a pink or reddish yellow core. All of this material is currently being studied, catalogued, and analyzed, so a more complete picture of the nature and significance of the fabrics will be provided in the final publication.⁵⁹

One may also observe a change in the nature of the pottery found on bedrock in the northern part of trench Z in ZV (see Figs. 5, 6). Whereas the

55. Britt Starkovich is currently studying all the faunal remains. See below and Appendix 5 for a preliminary summary.

56. Carbon-14 dating has been conducted on samples of calcined animal bone fragments from all levels from the lower half of the ash altar, through NSF Grant no. 1125523. The earliest burned animal bone goes back to the Mycenaean period. See pp. 614–615, below.

57. The analysis of the LH and Early Iron Age pottery is being conducted by Voyatzis. We are most

grateful to Cynthia Shelmerdine and Kim Shelton for visiting us in the field and looking at a selection of our LH material, and for their willingness to review the catalogue entries of the Mycenaean pottery provided here. We have benefited enormously from their guidance and advice, but take full responsibility for all errors.

58. See chapter 6 (“The Late Hellenic Pottery”) by Mountjoy in Tylour and Janko 2008, pp. 299–387, for LH pottery from Ayios Stephanos, especially for the LH IIIA2 material. See also

Mountjoy 1999, pp. 272–274, fig. 91.

59. A ceramic analysis project has recently been completed at the Fitch Laboratory at the British School at Athens on 100 Mt. Lykaion sherds, including 30 LH sherds. It is our hope that these chemical and petrographic analyses will help us to distinguish the local pieces from the imports and to better understand the nature and broader regional significance of this pottery. The catalogue is the work of Mary Voyatzis.

sherds from most of the bedrock baskets reveal a concentration of Mycenaean ceramics, especially toward the southern end of the trench (Figs. 12–22), at the north (top) of the altar, beyond Architectural Feature 1, the character of the ceramic assemblage found on bedrock is noticeably later in date. It consists largely of Submycenaean or Early Iron Age material, much of it similar to Messenian “Dark Age I” ceramics (84–90).⁶⁰ These are preliminary observations, which require much more study to confirm, but the difference is striking enough to mention now.⁶¹

A key to understanding the pottery sequence at Mt. Lykaion is recognizing the ceramics that date from the end of the Bronze Age and the beginning of the Iron Age. There is virtually no information about this phase from elsewhere in Arcadia, so we must look to neighboring regions to fill in the gap.⁶² From Olympia the pottery from the Altis, especially from the area of the black ashy soil in and around the Pelopeion, can now be shown to begin in the 11th century B.C. and is identified as Submycenaean and Early Iron Age, of West Greek type.⁶³ The ceramics from western Achaia may also provide valuable information and parallels for Mt. Lykaion.⁶⁴ As Moschos has shown for the ceramic development in Achaia, the pottery evolved quite naturally from LH IIIC, into Submycenaean, with the latter phase continuing and overlapping with the Early PG phase known from other parts of Greece.⁶⁵ As we continue to study the pottery from the altar of Zeus on Mt. Lykaion, we hope to gain a better understanding of the development of the local ceramics here during the 11th and 10th centuries, but what we now recognize is LH IIIC (such as 27, 40, 74, 76), Submycenaean/Messenian Dark Age I (84–90), and PG (92). There is also later evidence for Messenian “Dark Age II” and Laconian “Dark Age” pottery (91) prior to LG.⁶⁶

The significance of the discovery of the large cache of Mycenaean pottery from the ash altar at the Sanctuary of Zeus on Mt. Lykaion must be stressed. It not only helps to identify a previously unknown Mycenaean cult place here, but it also seems to demonstrate continuous cult activity from the end of the Bronze Age into the Early Iron Age, and represents the largest collection of Mycenaean pottery yet known from the entire region of Arcadia. Once it is fully studied and published, this material will fill a gap in our knowledge of LH ceramics in the Peloponnese.

60. For more information on Messenian Dark Age pottery, see Coulson 1986; McDonald, Coulson, and Rosser 1983, pp. 61–259. We are grateful to Dr. Birgitta Eder for coming to our apotheke in Tripolis and looking at our Early Iron Age ceramics. She provided helpful comments and guidance to assist us in analyzing our pottery, as well as comparisons with the Early Iron Age material from Olympia, which we plan to explore further.

61. A possible explanation for the difference in ceramic material may be that the focal area of use on

the summit varied in location during different time periods.

62. Except for the largely unpublished pottery from the cemetery at Palaiokastro (with significant amounts of predominantly LH IIIC Middle–Late ceramics). See, e.g., Demakopoulou and Crowel 1998; Mountjoy 1999, pp. 294–299.

63. Kyrieleis 2006, pp. 193–197; Eder 2009.

64. Moschos 2009, pp. 235–288.

65. Moschos 2009, pp. 237–239.

66. Laconian “Dark Age” (or Early Iron Age) pottery is best represented at

sanctuaries in Laconia; see Coulson 1985. The skyphos 91 is similar to, but slightly smaller than, examples in Coulson’s Type E2 category (pp. 41–43, figs. 3, 4). Recently a large amount of Early Iron Age ceramic material resembling Laconian “Dark Age” pottery has been uncovered at another Arcadian site, the Sanctuary of Athena Alea at Tegea. See Voyatzis 2005, pp. 469–471, fig. 2; see also Voyatzis’s pottery chapter in Nordquist, Voyatzis, and Østby 2014, pp. 224–258, 571–587.

CATALOGUE

- 10 Goblet Fig. 12
 C-Z-36-03. Bedrock layer (SU 7) ZIIS.
 P.H. 0.019; p.W. 0.051; Diam. 0.110 m.
 Sharply offset rim sherd; FS 254. Fabric: 2.5Y 8/2 pale yellow. Unpainted.
 LH IIB
- 11 Goblet Fig. 12
 C-Z-142-03. Bedrock layer (SU 7) ZIIIN.
 Everted rim: p.H. 0.020; p.W. 0.029; Diam. 0.130; body sherds: (a) p.H. 0.025; p.W. 0.037; (b) p.H. 0.0628; p.W. 0.045 m.
 Rim and two body sherds; FS 255. Fabric: 2.5Y 8/3 pale yellow. Monochrome black paint on interior and exterior.
 LH IIIA1
- 12 Goblet Fig. 12
 C-Z-97-09. Bedrock layer (SU 7) ZIIN.
 P.H. 0.049; p.W. 0.055; Diam. 0.170 m.
 Everted lip and part of bowl; FS 255. Fabric: 7.5YR 7/6 reddish yellow. Unpainted.
 LH IIB-LH IIIA1
- 13 Stemmed bowl Fig. 12
 C-Z-130-03. Layer above bedrock level (SU 12) ZIIIN-IE.
 P.H. 0.050; p.W. 0.073; Diam. 0.180 m.
 Rim sherd; FS 304(?). Fabric: 10YR 8/3 very pale brown. Decorated with wide exterior rim band in dark paint and curved-stem spiral (FM 49) below. Monochrome interior.
 LH IIIA2
- 14 Kylix Fig. 12
 C-Z-36-01. Bedrock layer (SU 7) ZIIS.
 P.H. 0.035; p.W. 0.045; Diam. 0.120 m.
 Short rounded rim sherd; FS 264. Fabric: 2.5Y 8/3 pale yellow. Unpainted.
 LH IIIA2
- 15 Kylix Fig. 12
 C-Z-139-06. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.053; p.W. 0.077; Diam. 0.140 m.
 Rounded rim sherd; FS 264. Fabric: 7.5YR 8/4 pink. Unpainted.
 LH IIIA2
- 16 Kylix Fig. 12
 C-Z-139-03. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.041; p.W. 0.045; Diam. 0.120 m.
 Short everted rim sherd; FS 264/257. Fabric: 7.5YR 8/6 reddish yellow. Possible trace of orange paint on exterior.
 LH IIIA2
- 17 Kylix Fig. 12
 C-Z-57-02. Bedrock layer (SU 7) ZIS.
 P.H. 0.035; p.W. 0.065; Diam. 0.100 m.

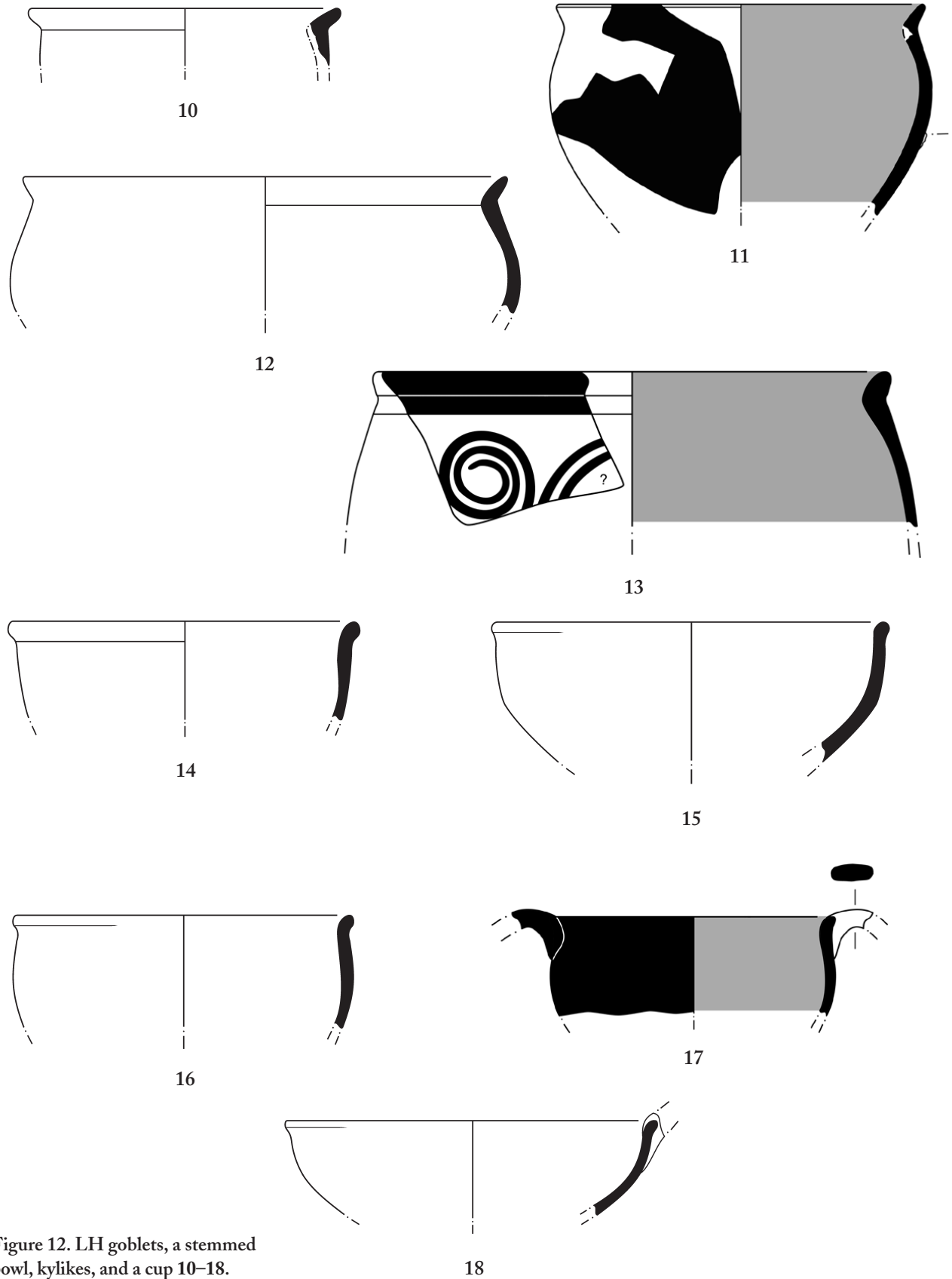


Figure 12. LH goblets, a stemmed bowl, kylikes, and a cup 10–18.
Scale 1:2

Rim sherd plus top of vertical strap (or oval strap) handle; FS 264. Fabric: 7.5YR 8/4 pink. Monochrome dark paint on interior and exterior.
LH IIIA2

18 Shallow cup Fig. 12

C-Z-139-24. Bedrock layer (SU 7) ZIS-IE.

P.H. 0.040; p.W. 0.065; Diam. 0.130 m.

Rounded rim and small part of vertical handle; FS 220. Fabric: 10YR 8/3 very pale brown. Unpainted.

LH IIIA2

19 Kylix Fig. 13

C-Z-931-01. Scarp cleaning, trench Z.

P.H. 0.054; p.W. 0.066; Diam. 0.180 m.

Short everted rim sherd; FS 257. Interior and exterior rim band in reddish brown paint. Wavy line on exterior, with added white paint (FM 21, octopus).

LH IIIA2

20 Kylix Fig. 13

C-Z-142-04. Bedrock layer (SU 7) ZIIIN.

P.H. 0.0546; p.W. 0.065; Diam. 0.160 m.

Two joining pieces of rounded rim; FS 257. Fabric: 10YR 8/4 very pale brown. Exterior and interior rim band; volute flower (FM 18A) below.

LH IIIA2

21 Kylix Fig. 13

C-Z-139-23. Bedrock layer (SU 7) ZIS-IE.

P.H. 0.041; p.W. 0.066; Diam. 0.160 m.

Everted rim sherd with part of vertical handle; FS 264. Fabric: 10YR 8/4 very pale brown. No paint visible on interior or exterior.

LH IIIA2

22 Kylix Fig. 13

C-Z-139-22. Bedrock layer (SU 7) ZIS-IE.

P.H. 0.042; p.W. 0.057; Diam. 0.100 m.

Two joining rim sherds; FS 264/265. Fabric: 10YR 8/3 very pale brown. No apparent painted decoration.

LH IIIA2

23 One-handled bowl Fig. 14

C-Z-149-01. Bedrock layer (SU 7) ZIS-IE.

P.H. 0.041; p.W. 0.041; Diam. 0.130 m.

Rim sherd; FS 283. Fabric: 10YR 8/2 very pale brown. Decorated with a thick band of paint at rim and a thin horizontal wavy band below. Paint: 5YR 5/6 yellowish red. Interior painted with a thick horizontal band at lip.

LH IIIA2

24 One-handled bowl Fig. 14

C-Z-134-06. Bedrock layer (SU 7) ZIIN-IE.

P.H. 0.043; p.W. 0.440; Diam. 0.110 m.

Rim sherd with base of horizontal handle and a boss or mammary below rim; FS 283. Fabric: 10YR 8/2 very pale brown. Three vertical bands in orange paint on exterior (FM 64, foliate band?). Horizontal orange band on interior of rim.

LH IIIA2

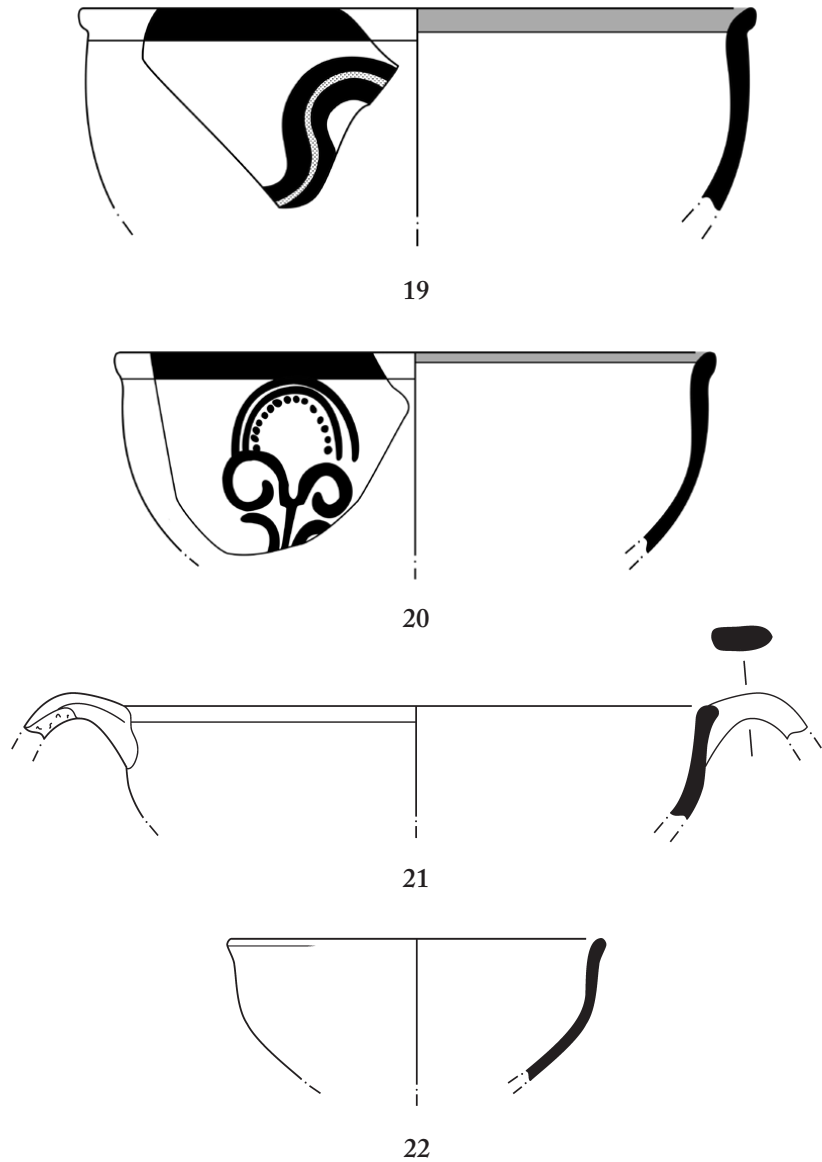


Figure 13. LH kylikes 19–22.
Scale 1:2

25 Truncated stemmed bowl(?)

Fig. 14

C-Z-57-73. Bedrock layer (SU 7) ZIS.

P.H. 0.068; Diam. rim 0.090, base 0.038 m.

Many fragments from rounded rim, raised concave base, two horizontal handles, and body of small bowl. Fabric: 10YR 8/3 very pale brown. Decorated with horizontal band below rim, traces of a wavy band (reconstructed with dotted lines in drawing), and three thin horizontal bands below. Interior has horizontal band below rim and on lower body.

LH IIIA2

26 One-handled or small stemmed bowl

Fig. 14

C-Z-57-03. Bedrock layer (SU 7) ZIS.

P.H. 0.044; p.W. 0.045; Diam. 0.100 m.

Rim sherd; FS 283 or 303. Fabric: 7.5YR 7/4 pink. Decorated with a horizontal band at rim and a wavy band below (FM 53). Paint: 5YR 5/8 yellowish red. Monochrome interior.

LH IIIA2

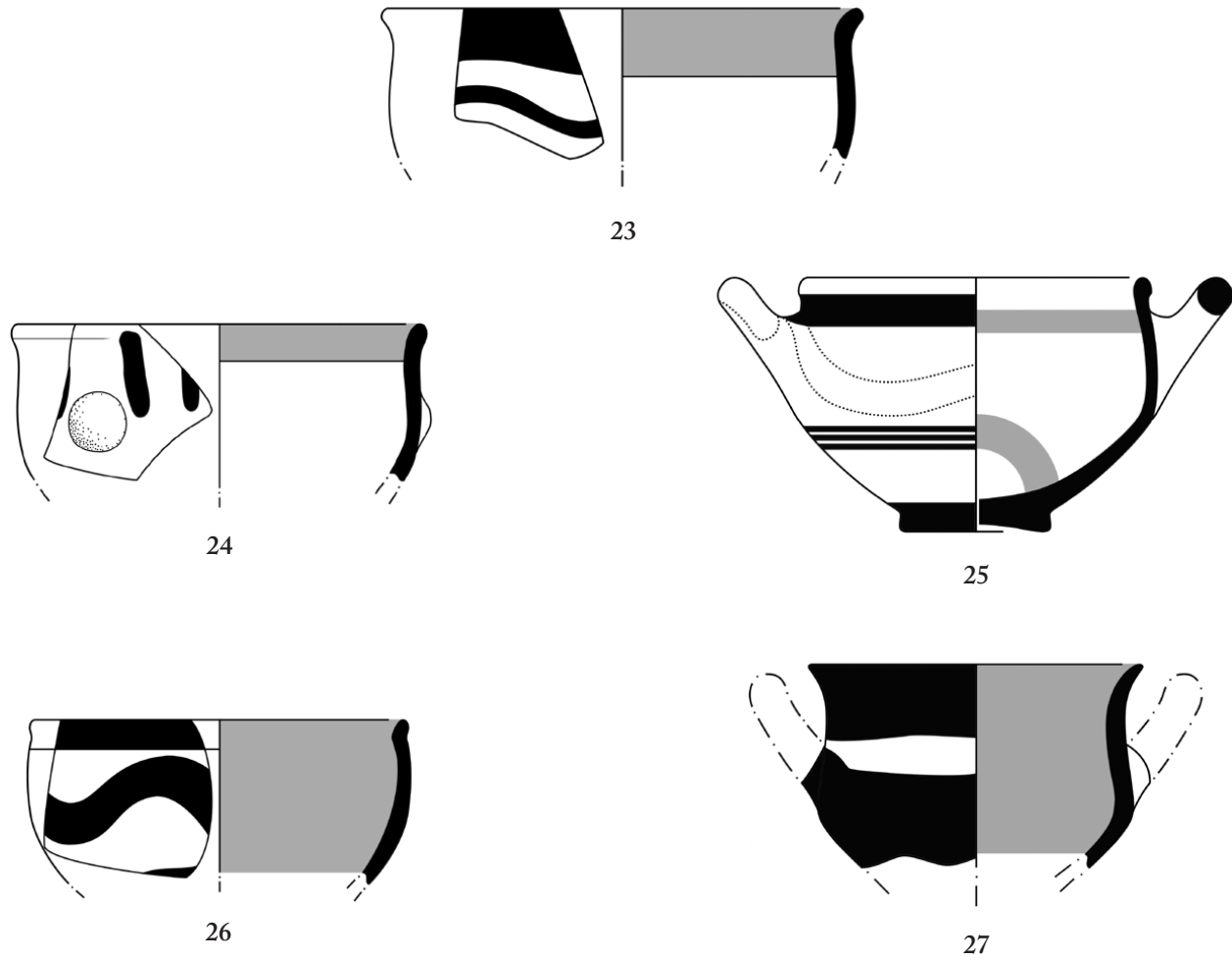


Figure 14. LH one-handled, stemmed, and deep bowls 23–27. Scale 1:2

27 Deep bowl

C-Z-57-64. Bedrock layer (SU 7) ZIS.
P.H. 0.087; p.W. 0.052; Diam. 0.090 m.

Two large joining rim sherds, with small piece of horizontal handle; FS 285.
Fabric: 10YR 8/3 very pale brown. Monochrome black streaky paint on interior and exterior with reserved band at handle zone.

LH IIIC Late

28 Angular kylix

C-Z-57-05. Bedrock layer (SU 7) ZIS.
P.H. rim 0.044; p.W. 0.049; Diam. 0.115 m.

Three joining sherds of flaring rim with vertical oval strap handle; FS 267.
Fabric: 10YR 8/3 very pale brown. Unpainted.

LH IIIA2–LHIIIB

29 Angular kylix

C-Z-148-09. Bedrock layer (SU 7) ZIS-IE.
P.H. 0.040; p.W. 0.056; Diam. 0.120 m.

Rounded rim with vertical oval strap handle; FS 267. Fabric: 5YR 8/4 pink.
Unpainted.

LH IIIA2–LHIIIB

Fig. 15

Fig. 15

- 30 Angular kylix Fig. 15
 C-Z-36-02. Bedrock layer (SU 7) ZIIS.
 P.H. 0.030; p.W. 0.052; Diam. 0.110 m.
 Flaring rim sherd; FS 267. Fabric: 2.5Y 8/2 pale yellow. Unpainted.
 LH IIIA2–LHIIIB
- 31 Angular kylix Fig. 15
 C-Z-57-04. Bedrock layer (SU 7) ZIS.
 P.H. 0.043; p.W. 0.057; Diam. 0.110 m.
 Everted rim sherd; FS 267. Fabric: 5YR 8/4 pink. Not clear if there is any
 paint on interior or exterior.
 LH IIIB
- 32 Angular kylix Fig. 15
 C-Z-134-02. Bedrock layer (SU 7) ZIIN-IE.
 P.H. 0.041; p.W. 0.068; Diam. 0.110 m.
 Large flaring rim sherd; FS 267. Fabric: 10YR 8/3 very pale brown, with
 reddish yellow core (7.5 YR 7/6). Unpainted.
 LH IIIB
- 33 Angular kylix Fig. 15
 C-Z-139-35. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.052; p.W. 0.057; Diam. 0.120 m.
 Rim and body sherd; FS 267. Fabric: 10YR 8/4 very pale brown. Unpainted.
 LH IIIB
- 34 Angular kylix Fig. 15
 C-Z-59-07. Bedrock layer (SU 7) ZIS.
 P.H. 0.032; p.W. 0.020; Diam. 0.090 m.
 Rim sherd; FS 267. Fabric: 5YR 8/4 pink. Unpainted.
 LH IIIB
- 35 Angular kylix Fig. 15
 C-Z-134-01. Bedrock layer (SU 7) ZIIN-IE.
 P.H. 0.028; p.W. 0.048; Diam. 0.090 m.
 Rounded rim sherd; FS 267. Fabric: 10YR 7/3 very pale brown. Unpainted.
 LH IIIA2–LH IIIB
- 36 Angular kylix Fig. 15
 C-Z-148-05. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.025; p.W. 0.054; Diam. 0.100 m.
 Short everted rim sherd; FS 267. Fabric: 2.5Y 8/4 pale yellow. Unpainted.
 LH IIIA2
- 37 Angular kylix Fig. 15
 C-Z-148-06. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.026; p.W. 0.048; Diam. 0.090 m.
 Short everted rim sherd; FS 267. Fabric: 2.5Y 8/3 pale yellow. Unpainted.
 LH IIIA2
- 38 Angular kylix Fig. 15
 C-Z-97-02. Bedrock layer (SU 7) ZIIN.
 P.H. 0.029; p.W. 0.045; Diam. 0.100 m.

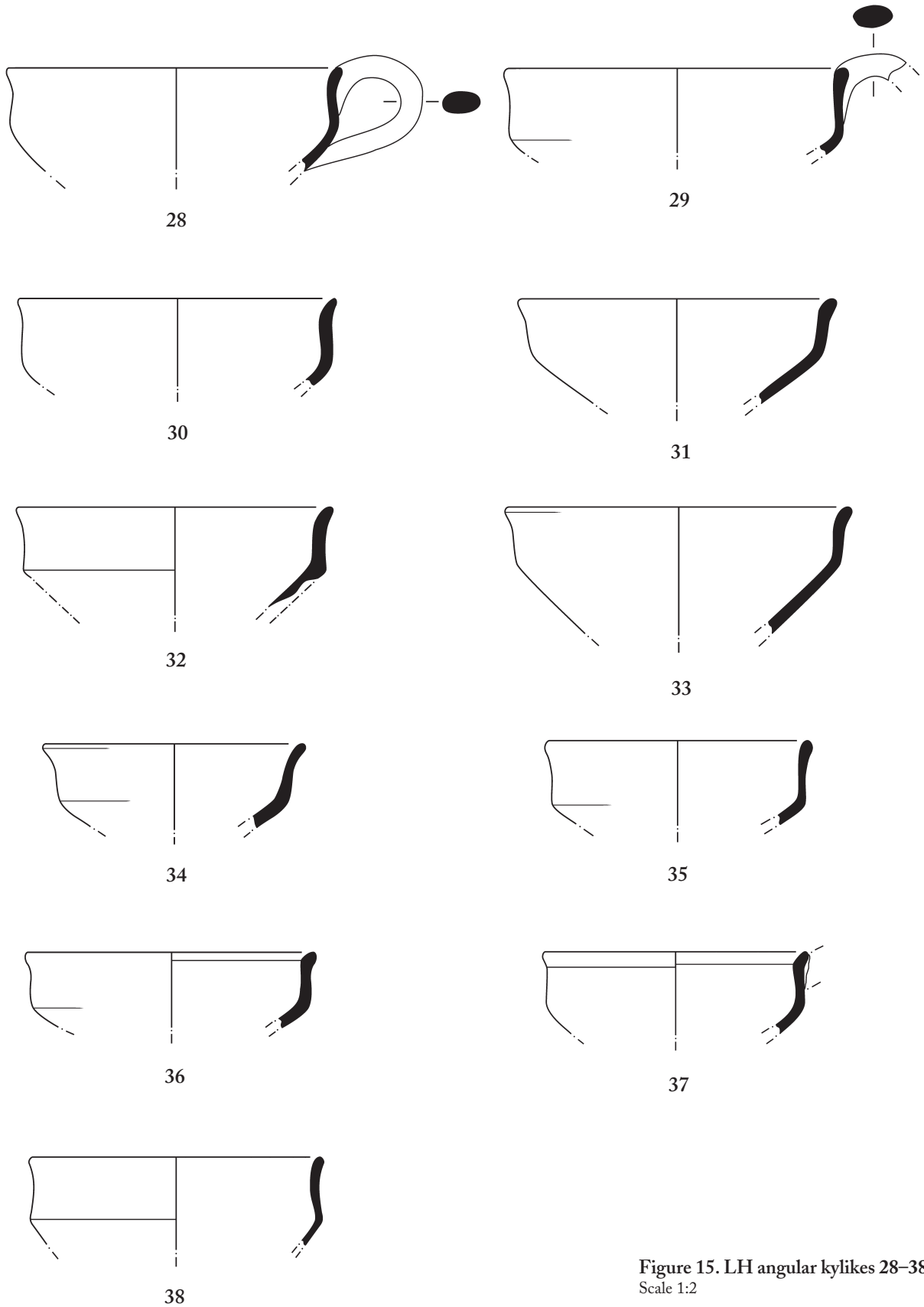


Figure 15. LH angular kylikes 28–38.
Scale 1:2

Small rounded rim sherd; FS 267. Fabric: 10YR 8/3 very pale brown. Unpainted.

LH IIIB

- 39 Shallow angular bowl Fig. 16

C-Z-139-01. Bedrock layer (SU 7) ZIS-IE.

P.H. 0.038; p.W. 0.052; Diam. 0.160 m.

Rounded rim sherd; FS 295. Fabric: 5YR 7/8 reddish yellow. Unpainted.

LH IIIA2–LH IIIB

- 40 Angular kylix or carinated cup Fig. 16

C-Z-142-01. Bedrock layer (SU 7) ZIIIN.

P.H. 0.028; p.W. 0.028; Diam. 0.100 m.

Rim sherd with concave sides; FS 267 or FS 240(?). Fabric: 7.5YR 8/4 pink. Unpainted.

LH IIIC Early(?)

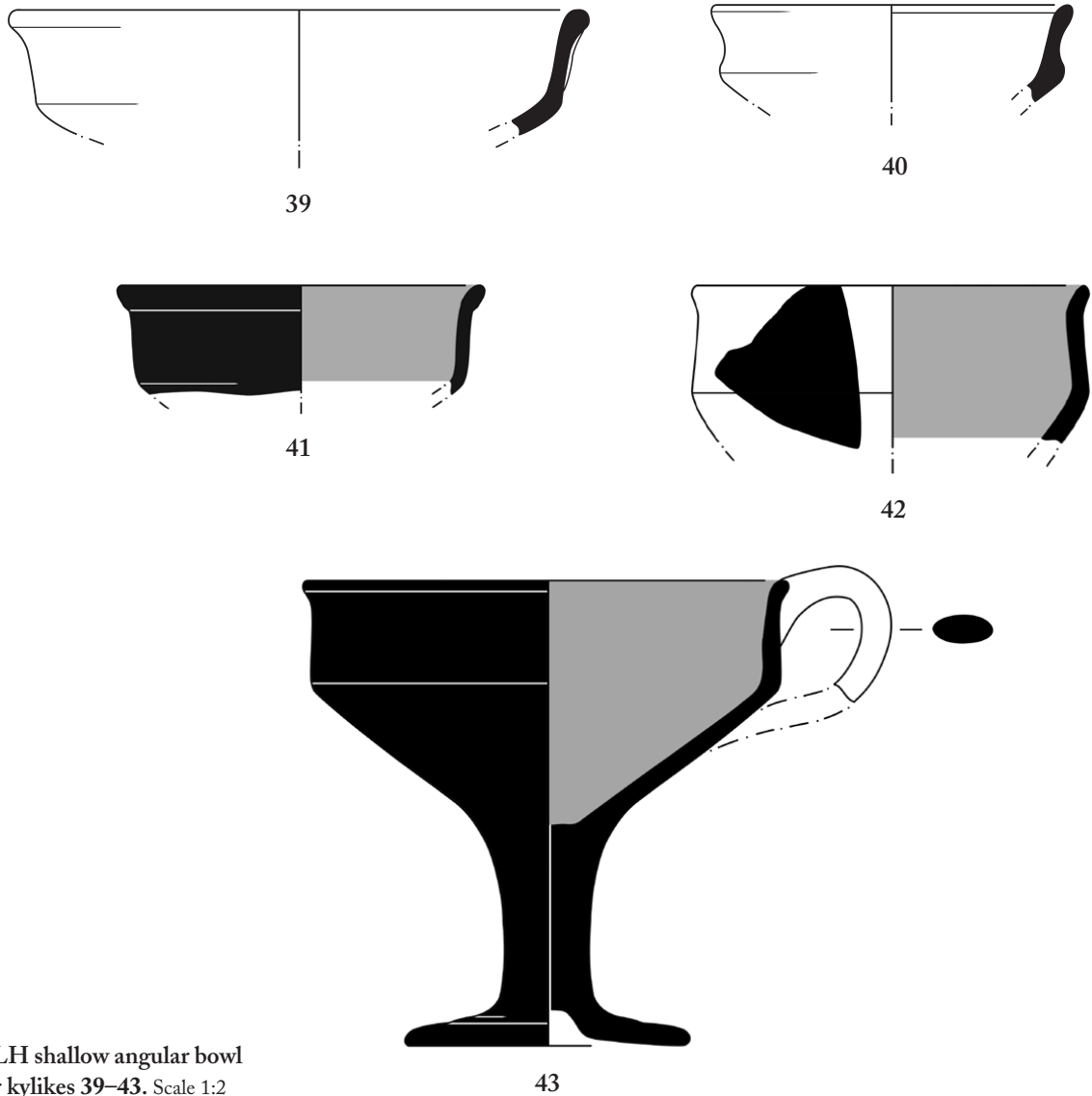


Figure 16. LH shallow angular bowl and angular kylikes 39–43. Scale 1:2

- 41 Angular kylix Fig. 16
 C-Z-97-08. Bedrock layer (SU 7) ZIIN.
 P.H. 0.029; p.W. 0.050; Diam. 0.100 m.
 Rounded rim sherd; FS 267. Fabric: 7.5YR 7/6 reddish yellow. Monochrome red paint interior and exterior. Paint: 2.5YR 5/8 red.
 LH IIIA2
- 42 Angular kylix Fig. 16
 C-Z-58-03. Bedrock layer (SU 7) ZIN.
 P.H. 0.047; p.W. 0.041; Diam. 0.110 m.
 Everted rim sherd; FS 267. Fabric: 7.5YR 8/3 pink. Monochrome orange paint on interior and exterior.
 LH IIIA2
- 43 Angular kylix Fig. 16
 C-Z-99-01. Level just above bedrock layer (SU 10) ZIIIN.
 P.H. 0.039; p.W. 0.049; Diam. rim 0.135, base 0.078 m.
 Many sherds from same vessel allowing for restoration, including large rim, parts of vertical handle, stem, and base fragments; FS 267. Fabric: 7.5YR 8/6 reddish yellow. Monochrome paint on exterior and interior. Paint: 5YR 5/8 yellowish red.
 LH IIIA2
- 44 Kylix foot Fig. 17
 C-Z-148-26. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.027; Diam. 0.064 m.
 Complete small foot with a shallow dome underneath. Fabric: 7.5 YR 8/4 pink. Unpainted.
 LH IIIB
- 45 Kylix foot Fig. 17
 C-Z-148-23. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.041; Diam. 0.070 m.
 Half of a small convex foot, with a shallow dome underneath, plus part of stem. Fabric: 7.5YR 7/6 reddish yellow. Unpainted.
 LH IIIA2-LH IIIB
- 46 Kylix foot Fig. 17
 C-Z-148-19. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.028; Diam. 0.084 m.
 Convex foot with shallow dome underneath, plus part of stem. Fabric: 7.5YR 7/4 reddish yellow. Unpainted.
 LH IIIA2-LH IIIB
- 47 Kylix foot Fig. 17
 C-Z-139-30. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.047; Diam. 0.095 m.
 Convex foot with dome underneath. Fabric: 10YR 8/3 very pale brown. Unpainted.
 LH IIIA2-LH IIIB
- 48 Kylix foot Fig. 17
 C-Z-139-26. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.062; Diam. 0.080 m.

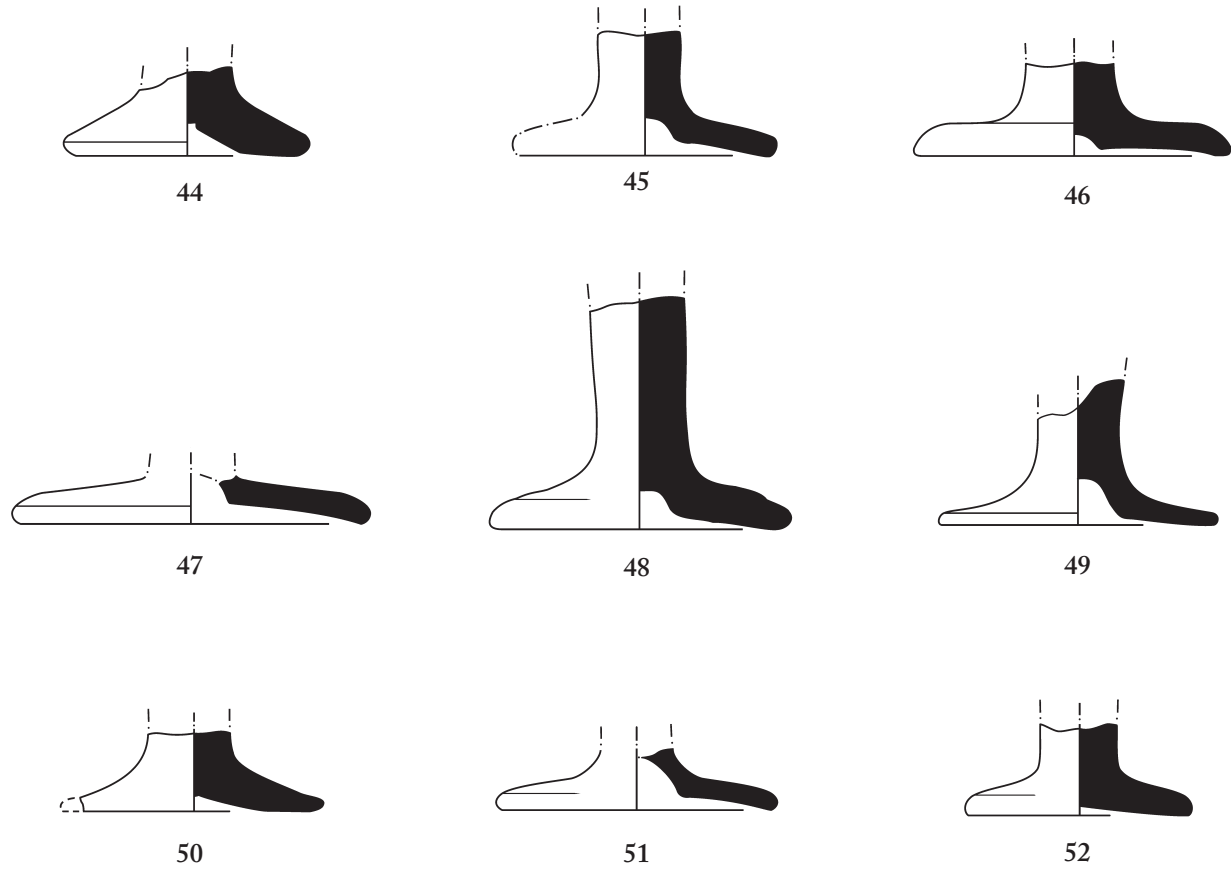


Figure 17. LH kylix feet 44–52.
Scale 1:2

Two nonjoining pieces of stem and foot of convex kylix with shallow dome underneath. Fabric: 7.5YR 8/4 pink (exterior); 5YR 6/8 reddish yellow (interior). Unpainted.

LH IIIA2–LH IIIB

49 Kylix foot

Fig. 17

C-Z-139-20. Bedrock layer (SU 7) ZIS-IE.

P.H. 0.040; Diam. 0.074 m.

Six pieces broken from flat foot with high dome underneath; part of stem survives. Fabric: 2.5Y 8/3 pale yellow. Unpainted.

LH IIIA2

50 Kylix foot

Fig. 17

C-Z-139-17. Bedrock layer (SU 7) ZIS-IE.

P.H. 0.022; Diam. 0.070 m.

Small foot with very shallow dome underneath. Fabric: 7.5YR 8/6 reddish yellow. Unpainted.

LH IIIB

51 Kylix foot

Fig. 17

C-Z-139-15. Bedrock layer (SU 7) ZIS-IE.

P.H. 0.022; Diam. 0.075 m.

Convex foot with high dome underneath. Fabric: 10 YR 8/4 very pale brown. Unpainted.

LH IIIA2

- 52 Kylix foot Fig. 17
C-Z-139-14. Bedrock layer (SU 7) ZIS-IE.
P.H. 0.027; Diam. 0.060 m.
Small foot with very slight dome underneath, and part of stem. Fabric: 5YR 7/8 reddish yellow. Unpainted.
LH III B
- 53 Kylix foot Fig. 18
C-Z-92-08. Bedrock layer (SU 7) ZIIN.
P.H. 0.042; Diam. 0.100 m.
Large, flat foot fragment with part of a high dome visible underneath. Fabric: 10YR 8/2 very pale brown. Unpainted.
LH IIIA2-LH III B
- 54 Kylix foot Fig. 18
C-Z-57-32. Bedrock layer (SU 7) ZIS.
P.H. 0.047; Diam. 0.082 m.
Two joining sherds from a convex foot with a high dome underneath and part of stem. Fabric: 2.5Y 8/3 pale yellow. Appears to be undecorated.
LH IIIA2
- 55 Kylix foot Fig. 18
C-Z-57-31. Bedrock layer (SU 7) ZIS.
P.H. 0.0405; Diam. 0.074 m.
Fragment from a flat foot with a fairly high dome underneath. Fabric: 7.5YR 7/6 reddish yellow. No apparent paint.
LH IIIA2-LH III B
- 56 Kylix foot Fig. 18
C-Z-57-30. Bedrock layer (SU 7) ZIS.
P.H. 0.029; Diam. 0.068 m.
Somewhat conical foot with a high dome underneath. Fabric: 10YR 8/4 very pale brown. No paint visible.
LH IIIA2-LH III B
- 57 Kylix foot Fig. 18
C-Z-33-20. Level just above bedrock layer (SU 16) ZIIS.
P.H. 0.025; Diam. 0.060 m.
Small, concave foot with fairly high dome underneath, and part of stem, in two joining pieces. Fabric: 7.5YR 8/4 pink (exterior); 7.5 YR 6/6 reddish yellow (interior). No paint visible.
LH IIIA2-LH III B
- 58 Kylix foot Fig. 18
C-Z-36-16. Bedrock layer (SU 7) ZIIS.
P.H. 0.027; Diam. 0.065 m.
Convex foot. No paint visible.
LH IIIA2
- 59 Kylix foot Fig. 18
C-Z-57-17. Bedrock layer (SU 7) ZIS.
P.H. 0.070; Diam. 0.063 m.

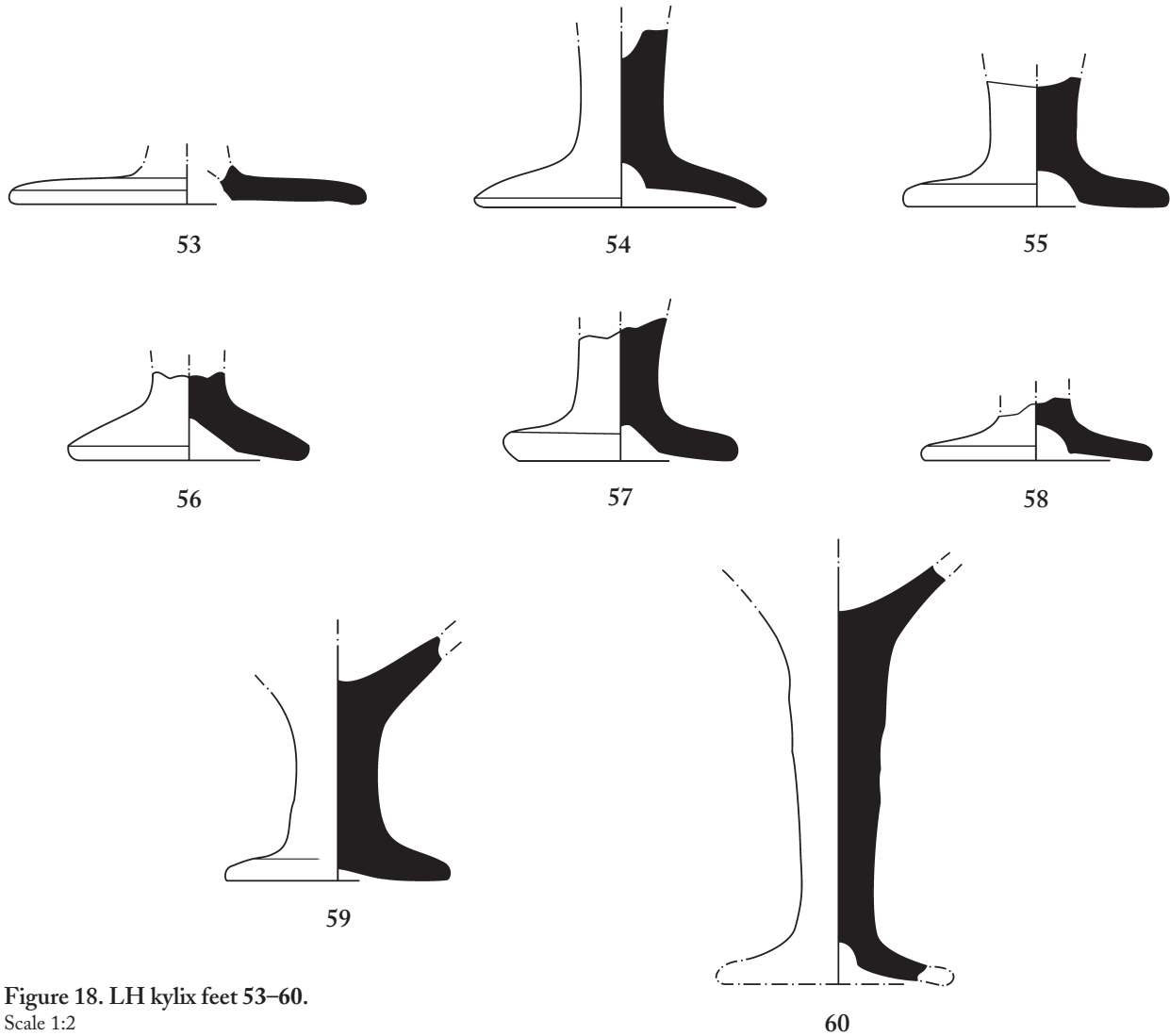


Figure 18. LH kylix feet 53–60.
Scale 1:2

Very well-preserved small foot with very shallow dome underneath; full stem and part of bowl. Fabric: 7.5YR 8/4 pink. No paint.
LH IIIB

60 Kylix foot Fig. 18
C-Z-57-20. Bedrock layer (SU 7) ZIS.
P.H. 0.116 m.
Very long stem, part of bowl, and high dome from underside of a convex disk.
Fabric: 7.5YR 8/4 pink; 5YR 7/8 reddish yellow (underside of base). No paint.
LH IIIA2

61 Kylix foot Fig. 19
C-Z-148-17. Bedrock layer (SU 7) ZIS-IE.
P.H. 0.012; Diam. 0.100 m.
Convex foot fragment with area missing underneath (not clear if originally domed or concave). Fabric: 7.5YR 8/4 pink. Red concentric bands on exterior.
Paint: 2.5YR 4/8 dark red.
LH IIIA2

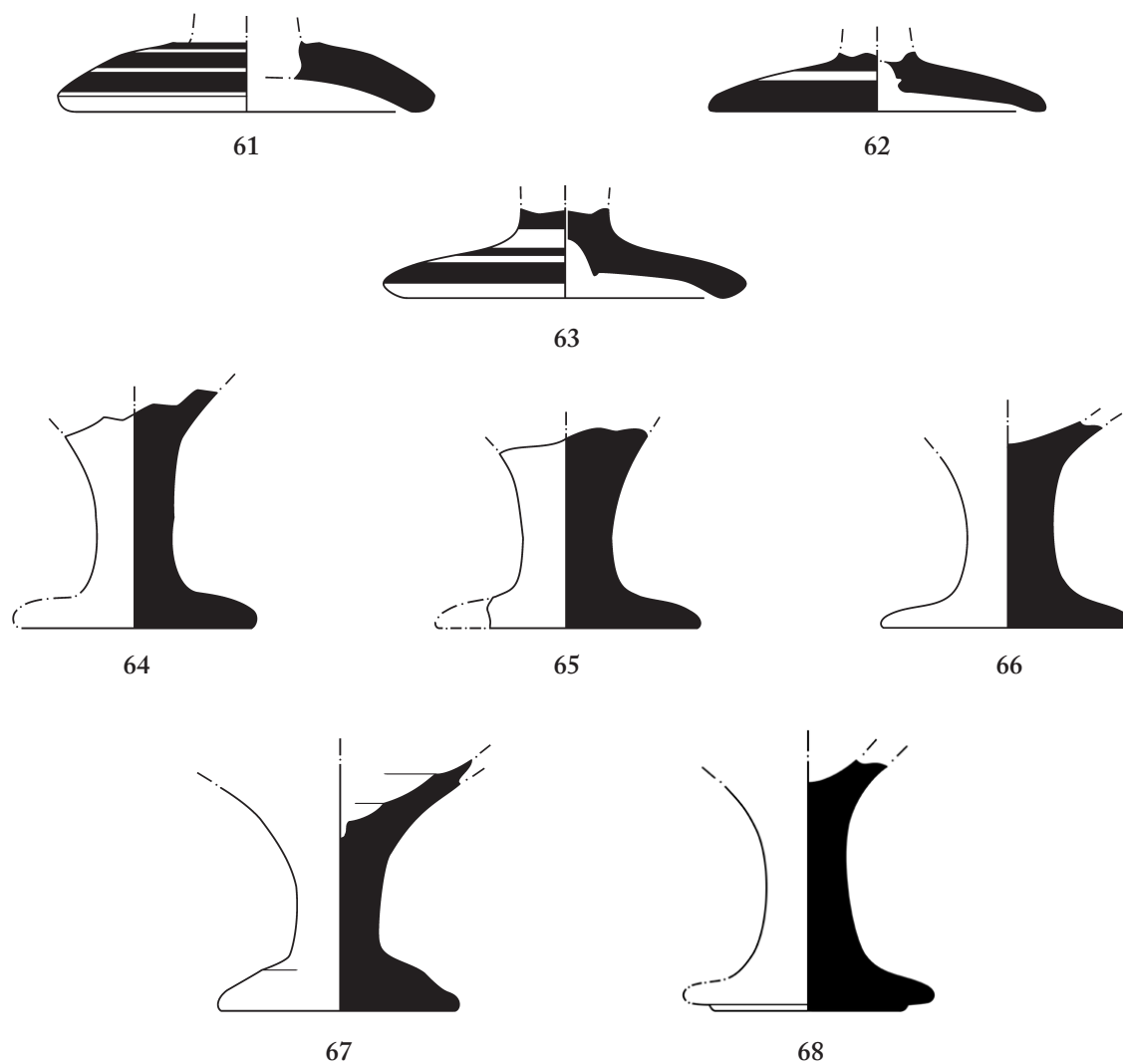


Figure 19. LH kylix feet 61–68.
Scale 1:2

62 Kylix foot

Fig. 19

C-Z-134-10. Bedrock layer (SU 7) ZIIN-IE.
P.H. 0.013; Diam. 0.090 m.
Part of convex foot with high dome underneath. Fabric: 10YR 8/2 very pale brown. Brown concentric bands on exterior.
LH IIIA2

63 Kylix foot

Fig. 19

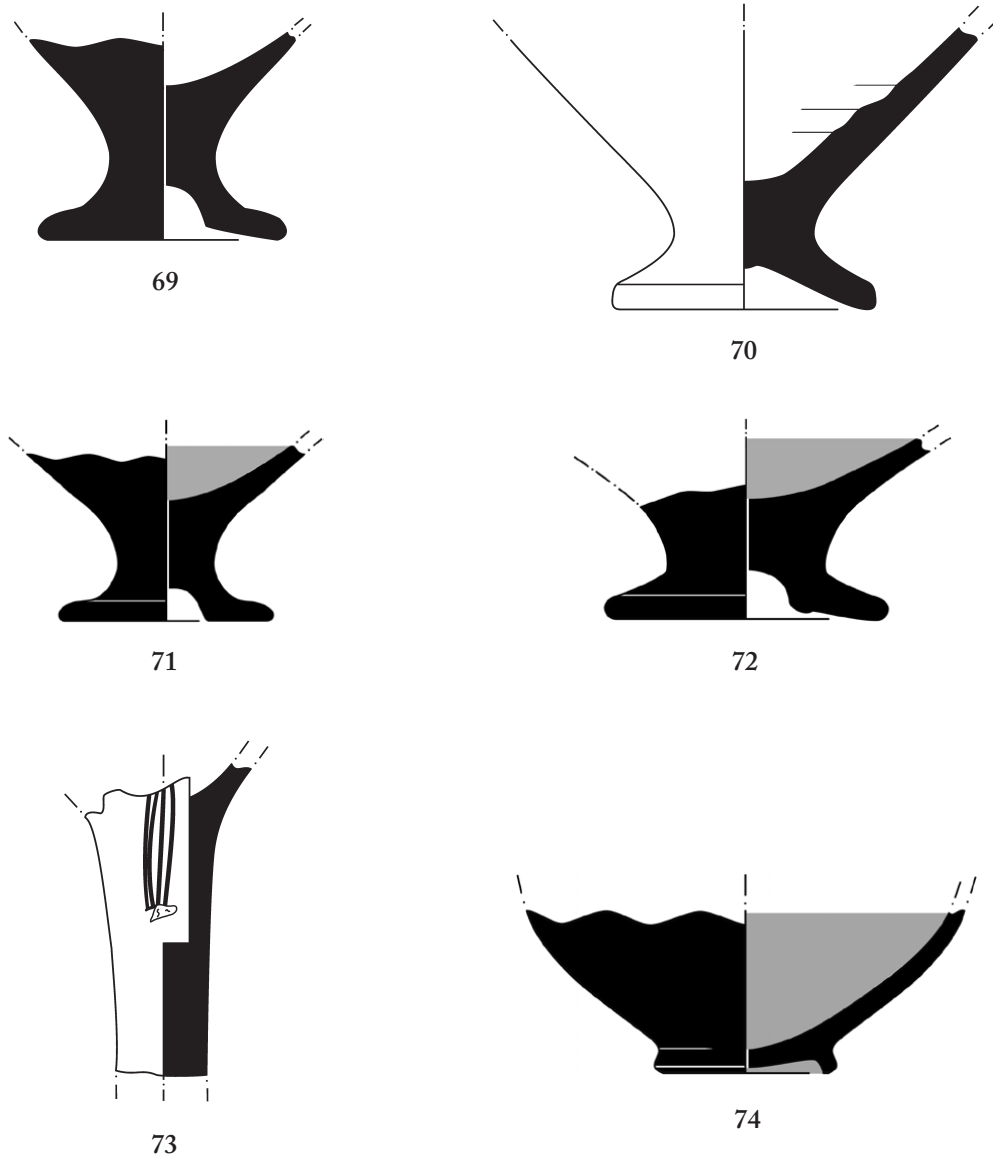
C-Z-33-21. Level just above bedrock layer (SU 16) ZIIS.
P.H. 0.022; Diam. 0.097 m.
Very large convex foot with high dome. Fabric: 2.5Y 8/3 pale yellow. Brown concentric bands on exterior.
LH IIIA2

64 Kylix foot

Fig. 19

C-Z-36-13. Bedrock layer (SU 7) ZIIS.
P.H. 0.066; Diam. 0.060 m.
Flat string-cut base, all of stem, and lower part of bowl, probably from angular kylix; FS 267. Fabric: 7.5YR 8/4 reddish yellow. Unpainted.
LH IIIB–LH IIIC Early

- 65 Kylix foot Fig. 19
 C-Z-148-16. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.057; Diam. 0.064 m.
 Flat string-cut base with deep concentric incisions on underside, and full stem, probably from angular kylix; FS 267. Fabric: 10YR 8/4 very pale brown. Unpainted.
 LH IIIB-LH IIIC Early
- 66 Kylix foot Fig. 19
 C-Z-139-33. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.057; Diam. 0.065 m.
 Complete, flat string-cut base and stem, probably from angular kylix; FS 267. Fabric: 7.5YR 8/4 pink. Unpainted.
 LH IIIB-LH IIIC Early
- 67 Kylix foot Fig. 19
 C-Z-57-28. Bedrock layer (SU 7) ZIS.
 P.H. 0.067; Diam. 0.064 m.
 Two joining fragments from a flat string-cut base with complete stem and part of bowl, probably from angular kylix; FS 267. Fabric: 2.5Y 8/2 pale yellow. Unpainted; surface uneven.
 LH IIIB-LH IIIC Early
- 68 Kylix foot Fig. 19
 C-Z-57-50. Bedrock layer (SU 7) ZIS.
 P.H. 0.068; Diam. 0.066, disk 0.050 m.
 Flat, string-cut base with stem, and bottom of bowl, probably from angular kylix; FS 267. Appears to have second disk of clay, slightly smaller in diameter, underneath base. Fabric: 2.5Y 8/2 pale yellow. Unpainted.
 LH IIIB-LH IIIC Early
- 69 Stemmed bowl or goblet Fig. 20
 C-Z-148-24. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.051; Diam. 0.065 m.
 Convex foot fragment with high dome underneath and full stem. Fabric: 10YR 8/4 very pale brown. Monochrome paint on exterior, ranging in color from yellow red to dark brown. Unclear if painted on interior.
 LH IIIA1-III A2
- 70 Ephyraean(?) goblet Fig. 20
 C-Z-142-06. Bedrock layer (SU 7) ZIIIN.
 P.H. 0.081; Diam. 0.070 m.
 High concave foot and part of bowl are well preserved; FS 254. Fabric: 7.5YR 8/4 pink. Appears to have polished pale yellow slip covering interior and exterior surface. Slip: 2.5Y 8/2 pale yellow.
 LH IIB-LH IIIA1
- 71 Stemmed bowl Fig. 20
 C-Z-57-25. Bedrock layer (SU 7) ZIS.
 P.H. 0.043; Diam. 0.057 m.
 Very well-preserved convex foot with high dome underneath, stem, and part of bowl. Fabric: 7.5YR 8/4 pink. Monochrome paint on interior and exterior. Paint: 5YR 3/2 dark reddish brown.
 LH IIIA2



72 Stemmed bowl

C-Z-57-24. Bedrock layer (SU 7) ZIS.

P.H. 0.037; Diam. base 0.075; p.H. 0.030; p.W. 0.046 m.

Two joining sherds from convex foot with high dome underneath, and part of bowl. Fabric: 7.5YR 8/6 reddish yellow. Monochrome paint on exterior and interior. Paint: 5YR 6/8 reddish yellow.

LH IIIA2

73 Kylix stem

C-Z-57-18. Bedrock layer (SU 7) ZIS.

P.H. 0.087 m.

Stem tapers slightly downward, with no base remaining; FS 258A (*Zygouries* type). Fabric: 7.5YR 8/4 pink. Upper part painted (in orange paint) with four thin, vertical lines on one side, which are joined at their lower ends: tendrils of flower (FM 18B) or tails of whorl shell (FM 23).

LH IIIB1

Fig. 20

Figure 20. LH goblet and stemmed bowl feet, kylix stem, and deep bowl base 69–74. Scale 1:2

Fig. 20

- 74 Deep bowl Fig. 20
 C-Z-93-37. Bedrock layer (SU 7) ZIN.
 P.H. 0.038; Diam. 0.046 m.
 Ring base and body in two joining parts; FS 285. Fabric: 10YR 8/3 very pale brown. Traces of paint visible on base exterior, interior, and on underside.
 LH IIIC Early–Middle
- 75 Spouted cup Fig. 21
 C-Z-924-01. West scarp cleaning, ZIN.
 P.H. 0.058; p.W. 0.107; Diam. 0.110 m.
 Rim, short spout, and part of body from semiglobular vessel, with evidence for horizontal handle below rim; FS 249(?). Fabric: 5YR 7/6 reddish yellow. No paint visible.
 LH IIIA2
- 76 Spouted mug Fig. 21
 C-Z-57-01. Bedrock layer (SU 7) ZIS.
 P.H. 0.061; p.W. 0.058; Diam. rim 0.072, base 0.061 m.
 Two joining pieces including rim and spout; handle and parts of upper body missing; FS 252. Fabric: 2.5Y 8/3 pale yellow. Monochrome brown paint on interior and exterior, with reserved lower part.
 LH IIIC Early
- 77 Mug Fig. 21
 C-Z-148-08. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.059; p.W. 0.025; Diam. rim 0.060 m.
 Rim, vertical handle, and body preserved; FS 226. Fabric: 2.5Y 8/2 pale yellow. Possible paint?
 LH IIIC Early
- 78 Mug Fig. 21
 C-Z-929-01. East scarp cleaning, ZIIN.
 P.H. 0.052; p.W. 0.047; Diam. 0.070 m.
 Part of base preserved, convex body, with vertical handle; FS 226. Fabric: 2.5Y 8/3 pale yellow. Orange paint visible on handle and body. Paint: 5YR 6/8 reddish yellow.
 LH IIIB
- 79 Dipper Fig. 21
 C-Z-139-13. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.029; p.W. 0.052; Diam. rim 0.065 m.
 Small rim and shallow semiglobular body with trace of high vertical handle; FS 236. Fabric: 10YR 8/4 very pale brown. Unpainted.
 LH IIIA2–LH IIIB
- 80 Askos Fig. 22
 C-Z-148-31. Bedrock layer (SU 7) ZIS-IE.
 P.H. 0.077; p.W. 0.047; p.L. 0.105; Diam. base 0.031 m.
 Complete with a horizontal strap handle and flat base; pointed tail at one end and large opening at the other; FS 194. Fabric: 5Y 8/2 pale yellow. Painted with broad brown stripes horizontally along body and ladder pattern on handle.
 LH IIIA2–LH IIIB

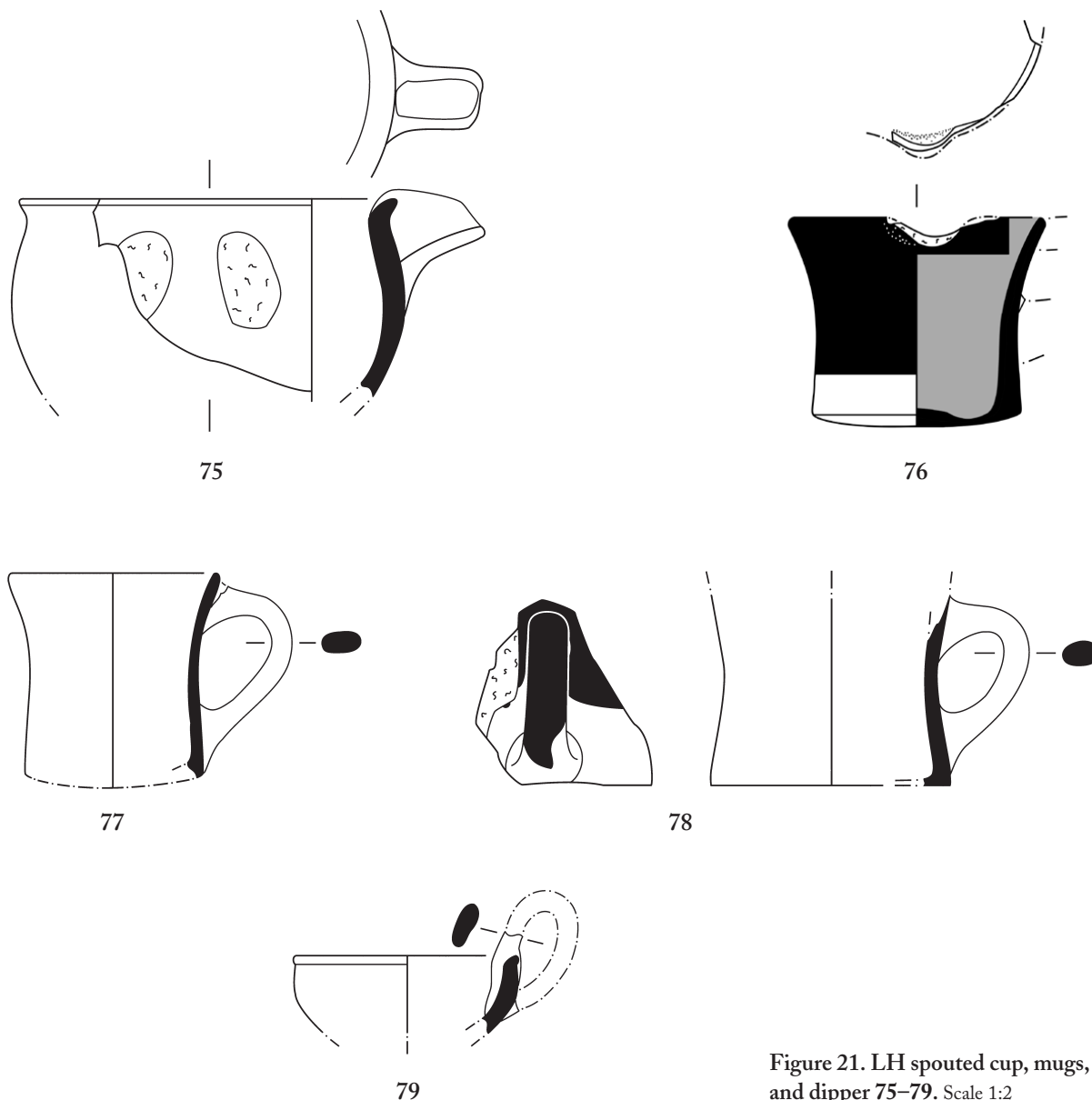


Figure 21. LH spouted cup, mugs, and dipper 75–79. Scale 1:2

81 Askos

Fig. 22

C-Z-148-32. Bedrock layer (SU 7) ZIS-IE.

P.H. 0.052; p.W. 0.044; p.L. 0.083; Diam. base 0.028 m.

Askos in two joining parts, with flat base, missing handle; FS 194. Fabric: 7.5YR 8/4 pink. Four thick brown bands on each side, extending diagonally down toward base. Paint: 7.5YR 3/2 dark brown.

LH IIIB

82 Feeding bottle

Fig. 22

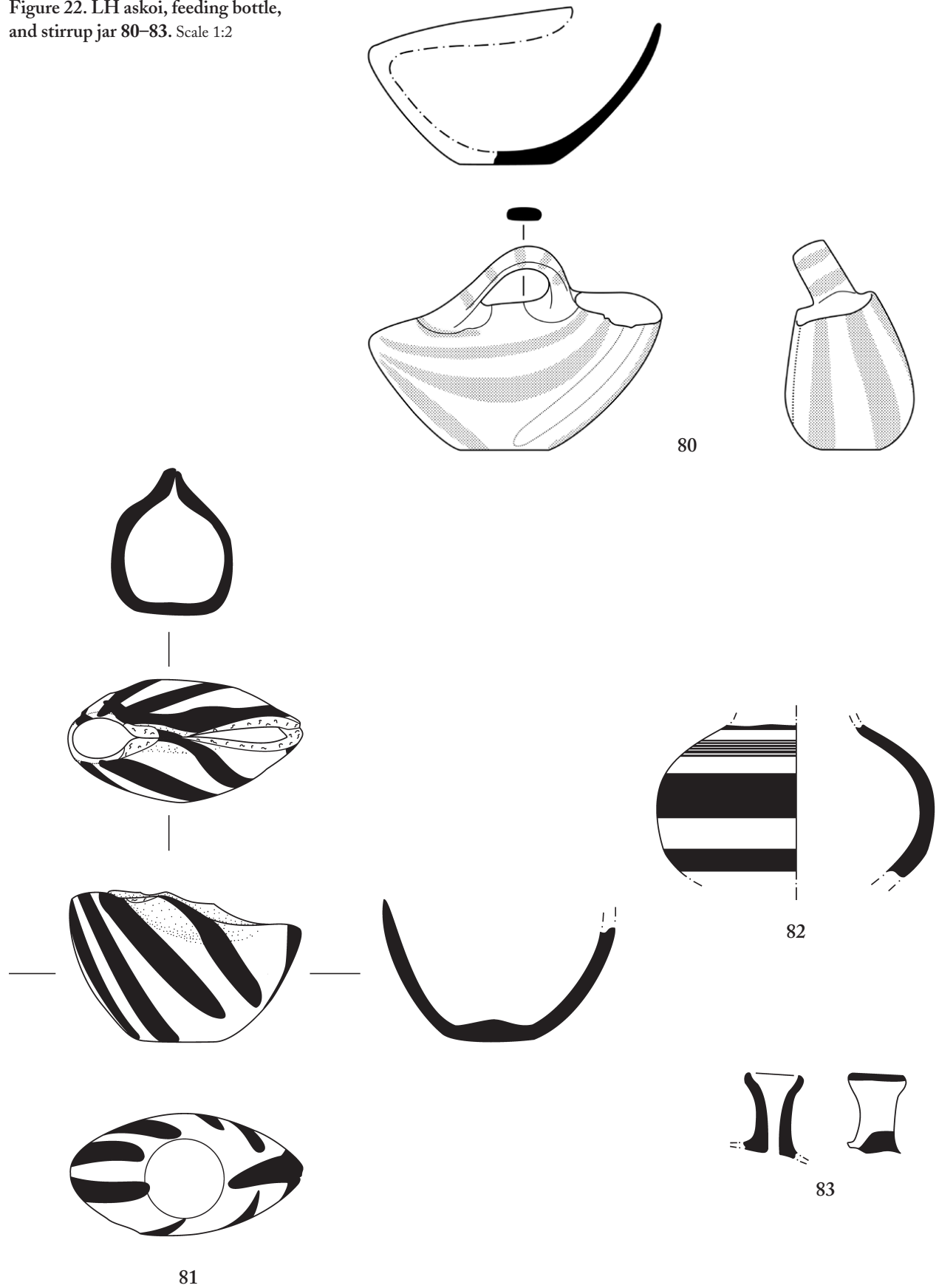
C-Z-33-16. Level just above bedrock layer (SU 16) ZIIS.

Body fragments: (a) P.H. 0.039; p.W. 0.056; (b) p.H. 0.028; p.W. 0.059; (c) p.H. 0.027; p.W. 0.045 m.

Body area in three pieces; FS 160. Fabric: 10YR 8/3 very pale brown. Decorated with thick and thin horizontal bands. Interior unpainted.

LH IIIB

Figure 22. LH askoi, feeding bottle, and stirrup jar 80–83. Scale 1:2



- 83 Stirrup jar spout Fig. 22
 C-Z-33-11. Level just above bedrock layer (SU 16) ZIIS.
 P.H. 0.029; p.W. 0.024; Diam. rim 0.021 m.
 Short spout fragment. Fabric: 2.5Y 8/3 pale yellow. Rings of brownish paint
 at base and at rim. Paint: 7.5YR 4/6 strong brown.
 LH IIIB
- 84 Deep bowl/skyphos Fig. 23
 C-Z-137-20. Bedrock layer (SU 7A) ZVN.
 P.H. 0.025; p.W. 0.036; Diam. 0.120 m.
 Rim with flaring lip. Fabric: 7.5YR 8/4 pink. Fairly shiny black monochrome
 paint on interior and exterior with a reserved band below the interior lip.
 Submycenaean/Messenian Dark Age
- 85 Skyphos Fig. 23
 C-Z-137-01. Bedrock layer (SU 7A) ZVN.
 (a) P.H. 0.037; p.W. 0.050; Diam. 0.150; (b) p.H. 0.0255; p.W. 0.041 m.
 Two rim sherds, quite thick. Fabric: 7.5YR 8/6 reddish yellow. Monochrome
 paint on interior (5YR 5/8 yellowish red) and exterior (5YR 4/6 yellowish red).
 Messenian Dark Age
- 86 Skyphos Fig. 23
 C-Z-137-04. Bedrock layer (SU 7A) ZVN.
 P.H. 0.038; p.W. 0.069; Diam. 0.150 m.
 Rim sherd from an open vessel with a bell shape. Fabric: 10 YR 8/4 very pale
 brown. Monochrome dark paint on interior and exterior.
 Messenian Dark Age
- 87 Skyphos Fig. 23
 C-Z-137-16. Bedrock layer (SU 7A) ZVN.
 P.H. 0.034; p.W. 0.060; Diam. 0.043 m.
 Conical base. Fabric: 2.5Y 8/3 pale yellow. Monochrome paint on interior
 and exterior (very worn). Paint: 10YR 4/2 dark grayish brown.
 Messenian Dark Age
- 88 Deep bowl/skyphos Fig. 23
 C-Z-137-18. Bedrock layer (SU 7A) ZVN.
 P.H. 0.029; p.W. 0.041; Diam. 0.060 m.
 Conical base. Fabric: 7.5YR 7/6 reddish yellow (exterior), 7.5 YR 7/4 pink
 (interior). Monochrome paint on interior and exterior. Paint: 2.5YR 4/8 dark red.
 Submycenaean/Messenian Dark Age
- 89 Skyphos Fig. 23
 C-Z-137-19. Bedrock layer (SU 7A) ZVN.
 P.H. 0.032; p.W. 0.055; Diam. 0.040 m.
 Small conical base. Fabric: 7.5YR 8/4 pink. Monochrome paint on interior
 and exterior. Paint: 5 YR 5/8 yellowish red.
 Submycenaean/Messenian Dark Age
- 90 Skyphos Fig. 23
 C-Z-137-27. Bedrock layer (SU 7A) ZVN.
 P.H. 0.026; p.W. 0.053; Diam. 0.043 m.

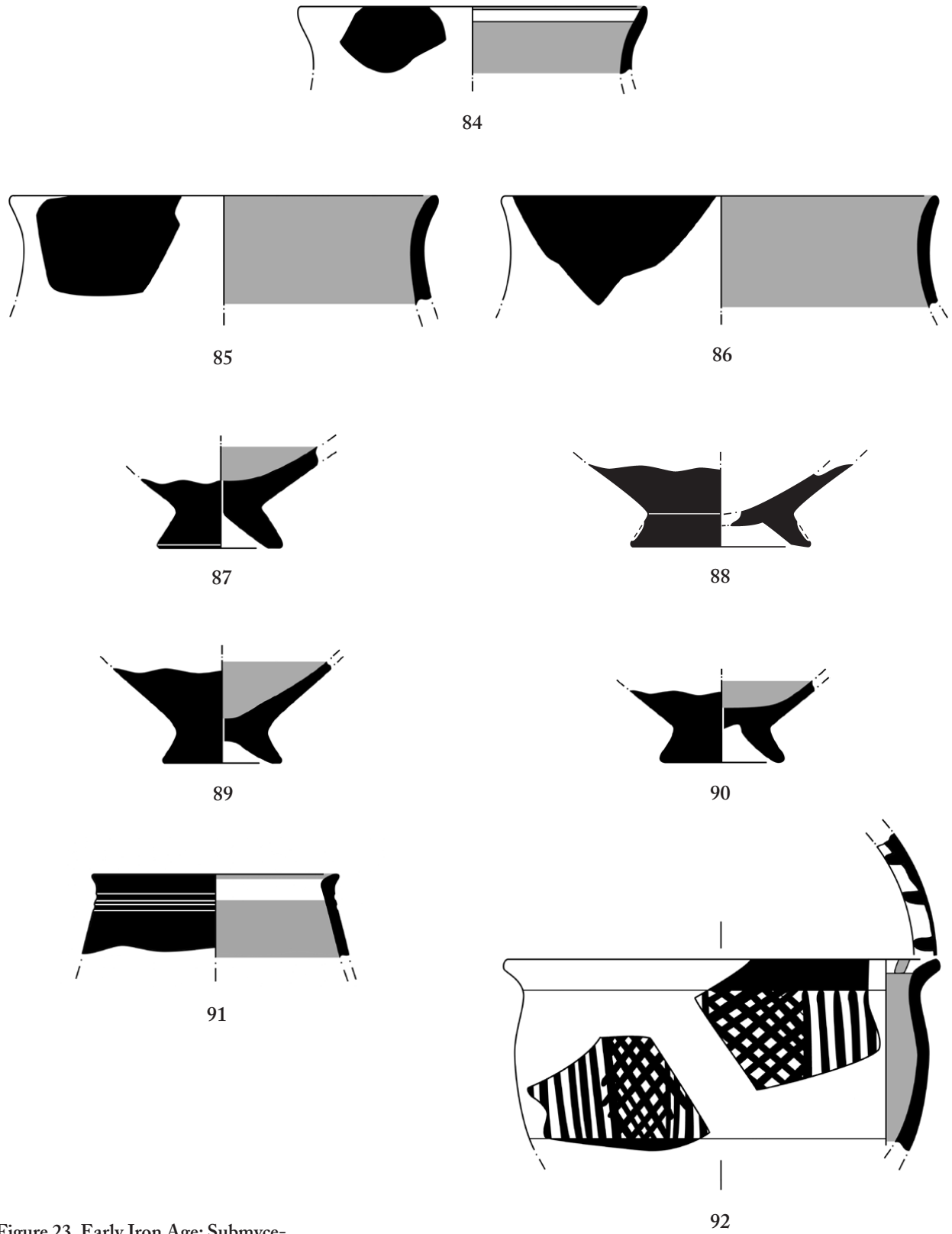


Figure 23. Early Iron Age: Submycenaean, Dark Age, and PG sherds
84-92. Scale 1:2

Small conical base. Fabric: 7.5YR 8/4 pink. Monochrome dark paint on exterior and interior.

Submycenaean/Messenian Dark Age

91 Carinated skyphos Fig. 23

C-Z-30-05. Near fire-cracked rock area (SU 15) Z IIS.

P.H. 0.028; p.W. 0.027; Diam. 0.080 m.

Short everted rim with two horizontal grooves below. Fabric: 7.5YR 8/3 pink. Shiny monochrome dark paint on interior and exterior, with a reserved band below rim interior.

Laconian Dark Age/PG

92 Skyphos Fig. 23

C-Z-60-04. In lower fire-cracked rock area (Feature Z3) ZIS. Two other fragments from Z33 (SU 16) and Z30 (SU 15) ZIIS.

Rim sherds: (a) p.H. 0.040, p.W. 0.064, Diam. 0.150; (b) p.H. 0.020, p.W. 0.046; body sherd: p.H. 0.040, p.W. 0.062 m.

Two nonjoining rim fragments with an offset lip, and one body sherd. Fabric: 10 YR8/3 very pale brown. Decorated with hatched panels flanked by vertical bands below horizontal band at rim. Short painted stripes on surface of offset lip.

Late PG

MINIATURE POTTERY

Over 700 fragments of miniature pottery have been identified in our excavations from trench Z, and another 24 from trench ZZ (Fig. 24).⁶⁷ This material has been uncovered from most levels of the altar and is currently being studied by Hammond. Shapes include miniature aryballoi, jugs, cups, skyphoi, kotylai, kraters, lakaina, and bowls. Very few examples of miniature pots were found at bedrock level, though we note that there are a few handmade Mycenaean types present. In general, the largest concentrations of miniature pottery come from the higher levels in the ash altar. The great number of miniatures found in the altar is significant, as is the range of shapes represented. Some of the miniatures were selected for chemical residue analysis, which may shed some light on their contents. The dedication of miniature pottery is known from many ancient Greek sanctuary sites, and we hope that the analysis of the Mt. Lykaion corpus will ultimately produce a better understanding of the chronology, typology, place of manufacture, and function of these vessels—both at Mt. Lykaion and in the broader region.⁶⁸

CATALOGUE

93 Kotyle Fig. 24

C-Z-55-300. Basket 55 (SU 2) ZIIS-IE.

P.H. 0.014; p.W. 0.026; Th. rim 0.002, handle 0.004; est. Diam. 0.040 m.

Rim sherd of a fine, wheelmade kotyle with horizontal handle attached at rim. Fabric: 2.5Y 8/1 white. Interior with alternating painted and reserved bands, monochrome below. Exterior with black band below handle, handle painted black.

67. This section represents a summary of Leslie Hammond's overview of the miniature pottery from the altar; the catalogue is her work. Specific dates for these pots await further study.

68. See Hammond 1998.

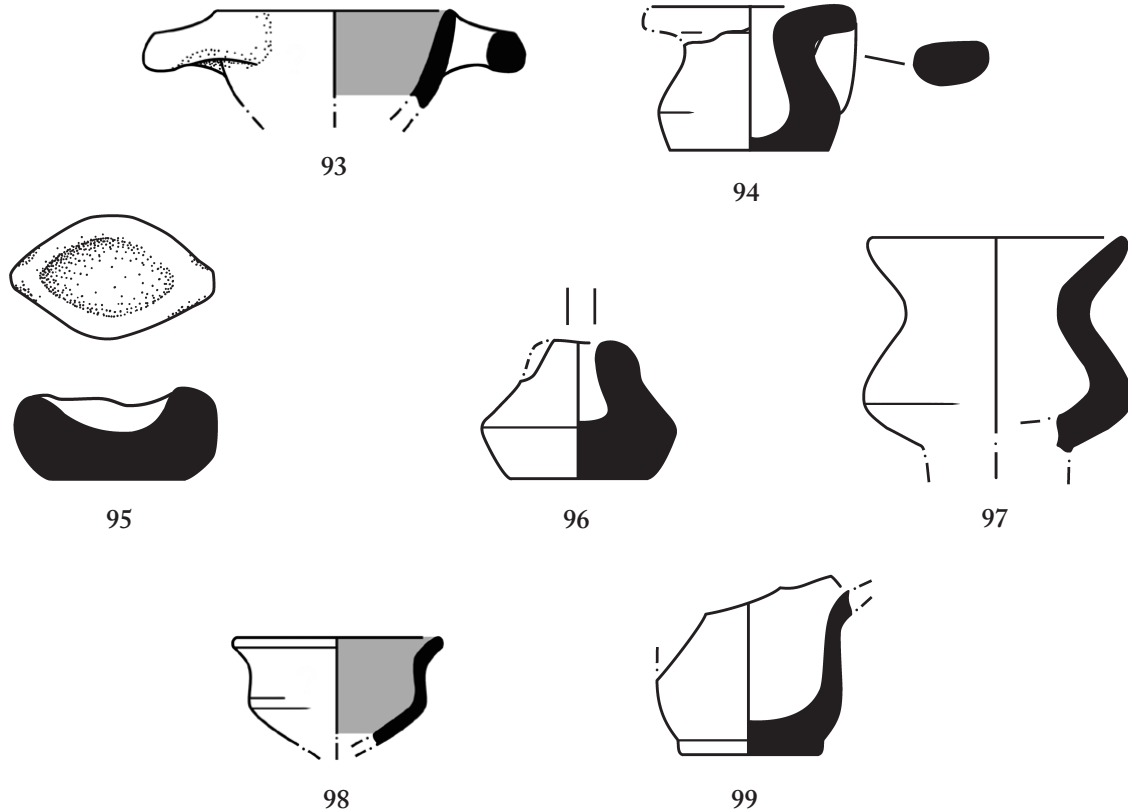


Figure 24. Miniature pottery 93–99.
Scale 1:1

- 94 Aryballos Fig. 24
C-Z-73-300. Basket 73 (SU 2) ZIIN.
P.H. 0.020; p.W. handle at top 0.011, handle at bottom 0.010, rim 0.015;
Diam. base 0.021, rim 0.030 m.
Complete profile of a semicoarse, wheelmade aryballos with flat but uneven bottom and tiny hole at center. The wide lower body constricts to neck and flaring rim. A vertical handle attached at widest part of body to rim. Traces of burning on one side. Fabric: 5YR 5/6 yellowish red. Exterior preserves traces of what was probably a monochrome reddish brown paint.
- 95 Lamp Fig. 24
C-Z-50-300. Basket Z 50 (SU 1) ZIIS-IE.
P.H. 0.011; p.W. 0.016; p.L. 0.027 m.
Complete, semicoarse, handmade lamp in the shape of a canoe with a flat bottom and pinched ends. Traces of burning. Fabric: 2.5Y 7/3 pale yellow. No decoration preserved.
- 96 Jug Fig. 24
C-ZZ-9-300. Basket ZZ 9 (SU 3).
P.H. 0.0185; Diam. base 0.021, lower body 0.026 m.
Base of a semicoarse, wheelmade jug with a flat base and wide lower body. Traces of burning on base. Fabric: 10YR 7/3 very pale brown. Exterior preserves traces of what was probably a monochrome paint, 5YR 6/6 reddish yellow.

97 Kantharos Fig. 24

C-Z-62-300. Cleaning basket ZIS.

P.H. 0.0285; p.W. lower body 0.032, rim 0.025; Diam. rim ca. 0.034 m.

Flaring rim sherd of a fine, wheelmade kantharos with wide lower body. Fabric: 2.5Y 8/2 pale yellow. Interior and exterior preserve traces of what was probably a monochrome paint, 2.5Y 3/1 very dark gray.

98 Carinated krater Fig. 24

C-Z-34-300. Basket 34 (SU 3) ZIS.

P.H. 0.016; p.W. at carination 0.013; Th. rim 0.001; Diam. rim ca. 0.030 m.

Flaring rim of a fine, wheelmade krater with a carination at midbody. Fabric: 2.5Y 8/2 pale yellow. Interior and exterior preserve traces of what were probably alternating bands of paint, N 2.5 black and 5YR 6/8 reddish yellow.

99 Krater Fig. 24

C-Z-10-300. Basket 10 (SU 2) ZIIS.

P.H. 0.023; Diam. body 0.027, base 0.022 m.

Flat ring base of a fine, wheelmade krater. The wide lower body constricts to neck and flaring rim. Handle attached at midbody. Fabric: 2.5Y 7/4 pale yellow. Interior and exterior preserve trace of paint at rim, 7.5YR 5/6 strong brown. Interior body below rim and exterior base preserve traces of what was probably a monochrome black paint.

ANIMAL BONES FROM THE ALTAR

In her study of the huge volume of faunal remains from the ash altar (see Appendix 5), Starkovich has determined that the great majority of animal bone from all levels, including the lowest bedrock level, consists of heavily burned femurs, patellas, and tails of sheep and goat, found together with a variety of drinking vessels. It is especially significant that the same kind of burned animal bones were found in the lowest level, together with the abundance of Mycenaean pottery described above, as such consistency suggests a continuity of practice through the centuries.

It is notable, however, that a very small percentage of the animal bones from the bedrock level has a different character from that described above. The bones found in the so-called Features in parts of ZIIN on bedrock (containing small undisturbed clusters of Mycenaean pottery) have lower incidences of burning, a wider representation of bone elements, and variation in the composition of the species represented, compared with the rest of the altar trench. Slightly more pig remains are represented in these contexts as well. The sample sizes of the animal bones from these Features are extremely small in comparison to those from the other parts of the bedrock. In any case, we shall continue to study the nature and significance of these Features and the variation in the faunal remains, since they suggest some heterogeneity of practice in the Mycenaean period.

Starkovich, a National Science Foundation postdoctoral researcher at the University of Arizona, has recently conducted C¹⁴ dating of samples of the heavily burned (calcined) faunal remains (femurs), along with seeds and

charcoal, from a 0.25 × 0.25 m column in the lower half of the ash altar. The results of this project to date have yielded calibrated dates of 1527 ± 97 B.C., 1468 ± 54 B.C., and 1332 ± 52 B.C. from the lowest bedrock level. The C¹⁴ dates continue through 589 B.C. in the higher Archaic layers. The calcined bones with the earliest dates come from basket 139 on bedrock (SU 7) in the southern part of trench Z, ZIS-IE (see Fig. 5). The pottery from this basket is Mycenaean in date, with broken kylikes of LH IIIA2–LH IIIB predominating.⁶⁹ Some of the C¹⁴-dated bone from the layer immediately above the Mycenaean level dates to the 10th century B.C. and was found in association with PG pottery. This C¹⁴ work is ongoing, and we plan to do further analyses in the future, including dating the unburned bone from the Features on the bedrock layer. In any case, the results so far confirm that the practice of offering burned animal sacrifices to the gods goes back to the Mycenaean period at Mt. Lykaion.⁷⁰

SMALL FINDS FROM THE ALTAR

Since 2007 we have uncovered a wealth of votive offerings from the altar, mostly of very small size. There are terracotta figurines (100–103) and a rock-crystal lentoid seal (104) of Late Bronze Age date. Later material includes about 40 miniature bronze tripod cauldrons (105–109), a small bronze hand holding a silver thunderbolt broken from a statuette (110), and many bronze sheet fragments. Objects of lead include wreaths (e.g., 111) and a miniature lead kouros (112). Many iron objects have been uncovered, such as double axes (113), two spits (114), a knife (115), a few pins and rings, and a couple of fragments possibly from miniature tripod cauldrons. Also found were bone beads, terracotta lamps, glass vessel fragments, stone tools, and dozens of coins (see Fig. 29).

These finds range in date from LM/LH II (the lentoid seal) through Late Classical (the terracotta lamps). Many of the terracotta objects are Mycenaean animal and human figurines, which likely reflect the LH phase of the cult. The iron double axes and bronze miniature tripod cauldrons indicate Early Iron Age activity at the site. The lead wreaths are probably from the 7th century B.C., and the lead miniature kouros is Archaic in date. The bronze hand of Zeus is most likely Late Archaic or early 5th century B.C., based on its similarity to the one Kourouniotis found at the turn of the 19th century.⁷¹ A general discussion of some of the more diagnostic pieces follows below.

69. Two presentations have been made on this subject to date; one at a radiocarbon conference in Paris by Starkovich, Hodgins, Voyatzis, and Romano in July 2012 (Starkovich et al. 2013); the other at the January 2013 AIA/ APA meetings in Seattle by Romano, Voyatzis, Starkovich, and Hodgins. These results have recently been published; see Starkovich et al. 2013.

70. For discussions about when this practice began, see Burkert 1985, pp. 60–64; Nikoloudis 2001; Hamilakis and Konsolaki 2004; Stocker and Davis 2004. There is also some evidence for burned pig bones at Eleusis on the platform in front of Megaron B, found in association with LH IIB–LH IIIA1 pottery (M. Cosmopoulos, pers. comm.). See also Whittaker

(2006–2007), who summarizes the Mycenaean evidence but then discounts its significance. It may well be that more evidence for burned animal sacrifices during the Mycenaean period will become known as sites are further studied and published.

71. Kourouniotis 1904a, cols. 193–194, fig. 16. The small finds catalogues are the work of Mary Voyatzis.

BRONZE AGE SMALL FINDS

Significant Bronze Age finds from the altar consist of the aforementioned terracotta animal and human figurine fragments (100–103) and the two Mycenaean askoi (80, 81), as well as the Minoan rock-crystal lentoid sealstone depicting a bull (104). The terracotta animal figurines include a number of pieces of LH IIIA–LH IIIB types. One is a bull figurine with vertical and horizontal linear painted bands of decoration, probably of LH IIIB “Spine Type”(?) (100). There is another bull figurine of LH IIIA2 type painted with wavy lines (101). There is also a terracotta fragment from the hind legs of a “Linear 2” type animal figurine with a painted band visible (102).⁷² The human figurines are fragmentary, but we can identify a possible hollow psi-type figurine of LH IIIA2–IIIB date (103) and a head from a phi figurine.⁷³

The rock-crystal lentoid seal (104) depicts an impressive bull figurine in profile with a frontal head. It is likely LM II in date, and is probably from Crete.⁷⁴ Although it was found in an unstratified context in a burrow hole in the southern part of the altar, it could mark the beginning of sustained ritual activity there, since LH II pottery has also been identified at the site.

CATALOGUE

100 Terracotta animal figurine Fig. 25

MTL 328. Basket Z 99 (SU 10) ZIIIN.

P.H. 0.068; p.L. 0.086; Diam. body cylinder 0.015 m.

Very good condition, missing rear part of body. Bull figurine of “Spine Type,” with long, thin cylindrical body and long snout. Fabric: 10YR 8/4 very pale brown. Painted with vertical bands all around torso with long strip along top of back, neck, and head; painted bands also on head, neck, snout, and leg.

LH IIIB

101 Terracotta animal figurine Fig. 25

MTL 209. Basket Z 71 (SU 1) ZIIIN.

P.H. 0.025; p.L. 0.047; Diam. torso 0.019 m.

Very good condition, missing front of body and lower rear legs. Torso and rear part of bull with small, clipped tail. Fabric: 7.5YR 8/6 reddish yellow. Decorated with at least six wavy lines in brownish orange paint.

LH IIIA2

102 Terracotta animal figurine Fig. 25

MTL 98. Basket Z 33 (SU 16) ZIIS.

P.H. 0.035; p.W. 0.025; p.L. 0.050; Diam. torso 0.017 m.

Good condition, missing front legs and head. Back legs and small tail of “Linear Type” quadruped. Fabric: 7.5YR 7/6 reddish yellow. Linear decoration in brown paint.

LH IIIA2–LH IIIB

103 Terracotta human figurine base Fig. 25

MTL 139. Basket Z 36 (SU 7) ZIIS.

P.H. 0.019; Diam. base 0.041 m.

72. See French 1971, pp. 151–159, fig. 11, for animal figurines.

73. See French 1971, pp. 126–128, for hollow female figurines.

74. For parallels, see Krzyszkowska 2005, pp. 147–148, figs. 265, 268; *CMS 1* (Athens), for two Cretan seals in the collection of the National Archaeological Museum, pp. 523, 524, nos. 495, 496. We are very grateful to Robert Koehl for his assistance in identifying parallels for this seal.

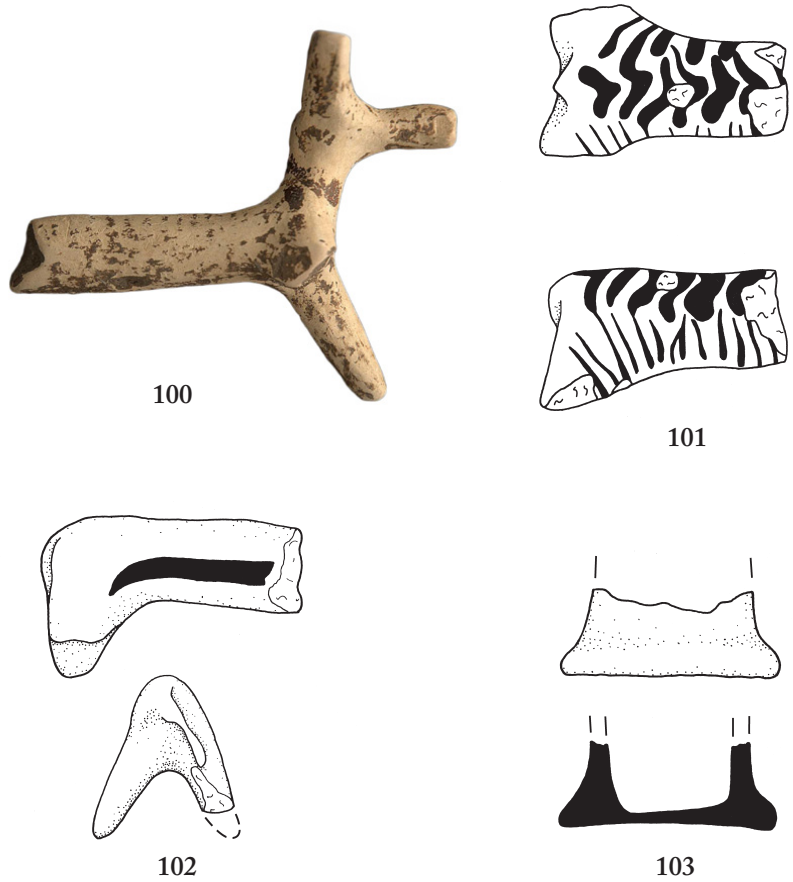


Figure 25. Terracotta animal and human figurines 100–103. Scale 2:3. Photo E. Ferguson

Good condition, with upper body missing and surface worn. Circular flat base and slightly concave sides from a hollow figurine, maybe a proto-phi or naturalistic type. Fabric: 10YR 8/3 very pale brown. No paint.

LH IIIA

104 Lentoid sealstone

Fig. 26

MTL 37. From mole burrow in ZIIS.

P.H. 0.021; p.W 0.020; Th. 0.011 m.

Very good condition, worn surface. Rock-crystal lentoid seal pierced horizontally, depicting a bull in profile, with a frontal head; front haunches are worn away. Back is smooth.

LM IB–LM II

Figure 26. Rock-crystal lentoid sealstone 104: drawing on left from mold; those on right from seal itself. Scale as indicated. Photo E. Ferguson



MINIATURE BRONZE TRIPOD CAULDRONS

The miniature bronze tripod cauldrons from Mt. Lykaion are of particular interest since there is no other site that has produced such distinctively tiny tripods. In fact, to our knowledge, miniature tripods of this kind are known from only a small number of other sites, with the greatest number and variety found at the Sanctuary of Zeus at Olympia. Olympia also produced large numbers of full-scale bronze tripod cauldrons, but at Mt. Lykaion, only extremely small miniatures have been uncovered. Kourouniotis found two such tripods in his excavation of the altar,⁷⁵ and we have unearthed at least 40 more.

At least 33 miniature tripods or fragments were unearthed in trench Z (106–109) and seven were found in trench ZZ, one of which was uncovered in a 7th-century layer near bedrock (105). Those from trench Z were recovered from nearly all levels, from below the surface to under the fire-cracked rock layer; only the lowest Mycenaean level above bedrock produced no examples. With respect to their earliest appearance, there is one miniature bronze tripod and a portion of another from basket 51 in SU 16, a level that dates to the Late PG period (10th century B.C.). Although these pieces are tiny, it could be argued that their presence in this layer suggests that the practice of dedicating miniature tripod cauldrons began at Mt. Lykaion as early as the late 10th century B.C. Based on their discovery in other levels, it is likely that miniature tripod cauldrons continued to be offered at the site into the 7th century B.C.

At Olympia, large numbers of miniature tripod cauldrons were unearthed in the area south of the Heraion, especially in the region of the later Pelopeion, in a deep black layer of ashy soil. Many were also found southwest of the Metroon, and some under the building rubble on the south face of the Zeus temple, as well as near the Byzantine church in a black layer. Finally, miniature tripod cauldrons were recovered (together with large ones) in the fill forming the banks of the stadium.⁷⁶ Hundreds of miniature bronze tripod cauldrons were excavated from these various spots at Olympia; they were either moldmade or cut from thin bronze sheet, while those found at Mt. Lykaion were all made from bronze sheet. The Olympian tripods were found together with masses of other terracotta and bronze votives and likely date to the 8th century B.C., though it is difficult to date them more accurately given the lack of stratigraphy at Olympia.

CATALOGUE

- 105 Bronze miniature tripod Fig. 27
 MTL 402. Basket ZZ 13.
 P.L. leg 0.007; p.W. leg at top ca. 0.008; Diam. ca. 0.014 m.
 Excellent condition, complete, except for the tip of one leg. Tiny bronze tripod with deep bowl and three triangular-shaped legs that reach a point at ends.
 8th century B.C.
- 106 Bronze miniature tripod Fig. 27
 MTL 70. Basket Z 23 (SU 15) ZIIS.
 P.L. leg 0.031; p.W. leg 0.006; Diam. 0.026 m.
 Very good condition, complete with one leg broken off, but preserved, other two legs folded underneath. Bowl made of bronze sheet with three flat rectangular legs.
 8th century B.C.

75. Kourouniotis 1904a, cols. 166–169, figs. 3, 4.

76. *Olympia* IV, pp. 3–6, pl. 27; see also Kyrieleis 2006, pp. 27–35, 132–134, for miniature tripods found more recently in the Pelopeion vicinity.

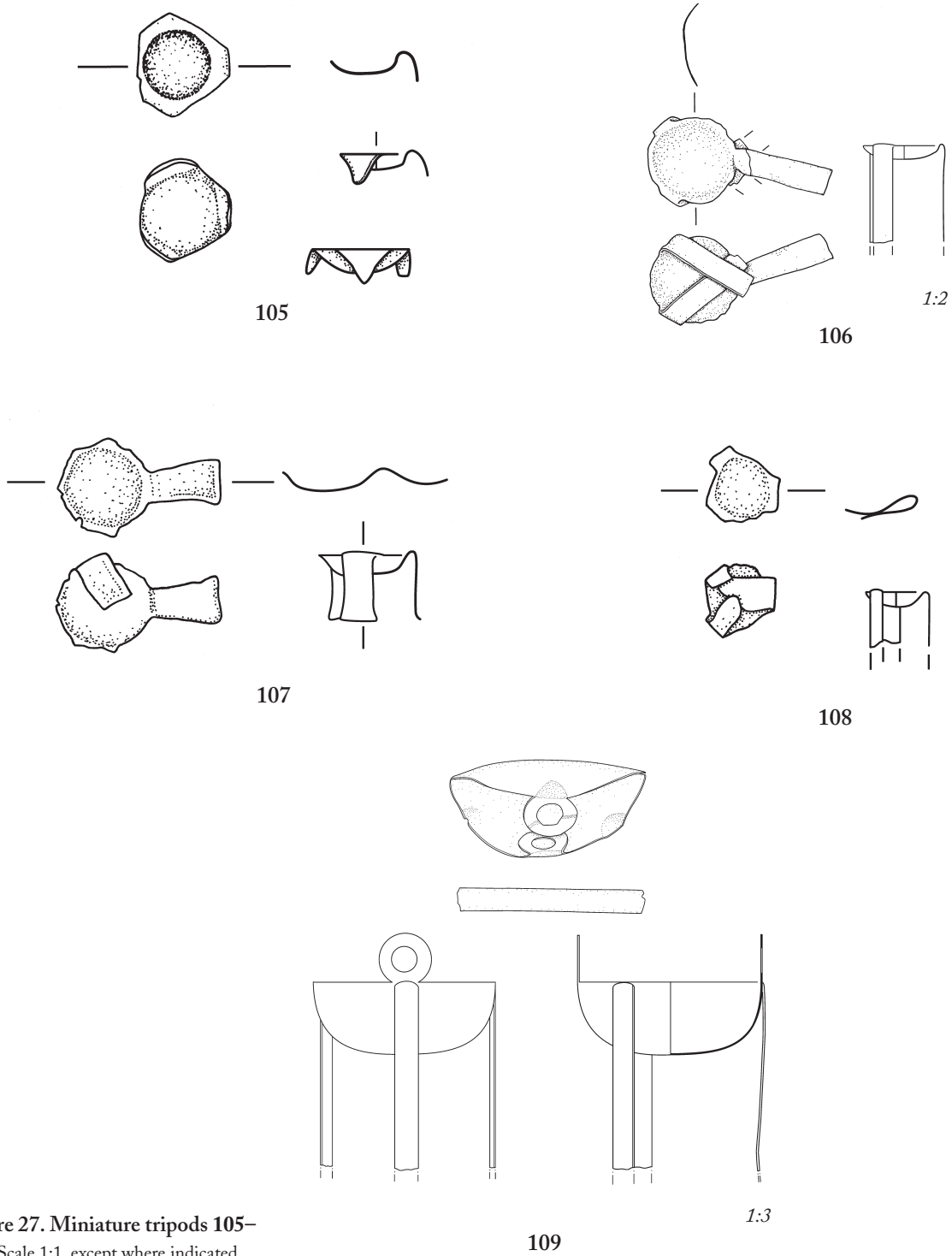


Figure 27. Miniature tripods 105–109. Scale 1:1, except where indicated

107 Bronze miniature tripod

MTL 85. Basket Z 28 (cleaning of ZIIS).

P.L. leg 0.011; p.W. leg 0.006; Diam. 0.013 m.

Good condition with one leg missing, another broken, and the third out-stretched. Very tiny cauldron of thin bronze sheet with shallow basin and rectangular, flat legs.

8th century B.C.

Fig. 27

108 Bronze miniature tripod Fig. 27

MTL 172. Basket Z 50 (SU 1) ZIIS-IE.

P.L. leg 0.010; p.W. 0.004–0.005; Diam. ca. 0.010 m.

Good condition, worn surface, all three legs bent backward and one crumbled.

Very tiny tripod of thin bronze sheet with shallow bowl and three ribbon legs.

8th century B.C.

109 Bronze miniature tripod Fig. 27

MTL 178. Basket Z 52 (Feature 3) ZIS.

P.H. 0.112; p.L. leg 0.088; p.W. 0.011; Diam. ca. 0.085 m.

Very good condition, complete basin, flattened, with flat, circular handles; one of the tall flat legs survives (as a separate piece).

8th century B.C.

BRONZE, LEAD, AND IRON VOTIVES

A number of lead votives were recovered from the altar, including 11 lead wreaths (nine from trench Z and two from trench ZZ; 111), a small kouros figurine (112), a lead cross-shaped object, and a number of fragments of lead waste from the apparent local manufacture of lead votives. Objects of lead were extremely popular at Laconian sites, especially the Sanctuary of Artemis Orthia, where hundreds of thousands were uncovered.⁷⁷ They were also found at many other sanctuary sites, including some in Arcadia, such as Mavriki, Tegea, and Bassai.⁷⁸ The lead wreaths are typically dated to the 7th century B.C.⁷⁹ The lead kouros is likely from the late 7th to early 6th century B.C.⁸⁰

The iron double-ax fragment (113) was uncovered in a layer directly on top of the Mycenaean level, and can likely be dated to the 10th century (basket Z 33). Although much of the material from this layer is LH, and includes kylix and stirrup-jar fragments, it also contains some possible Laconian PG sherds (91) and a Late PG skyphos fragment (92).⁸¹

CATALOGUE

110 Bronze hand of Zeus(?) Fig. 28

MTL 90. Basket Z 31 (SU 1) ZIS.

P.W. 0.011; p.L. 0.016 m.

Excellent condition, with complete hand and wrist preserved; rod clenched in hand is clipped. Small hollow right hand and wrist from a bronze figurine (Zeus?) with fingers clenched around a silver rolled sheet, presumably a lightning rod. Fingers and knuckles visible.

Late Archaic

111 Lead wreath Fig. 28

MTL 94. Basket Z 32 (SU 2) ZIS.

P.L. 0.023; Diam. wreath 0.015; Th. 0.002 m.

Good condition, top of handle broken and spikes chipped, accretion on surface. Small moldmade lead wreath with broken handle and about 10 broken spikes going around circumference. Flat, smooth back.

7th century B.C.

77. Dawkins 1929, pp. 249–284, pls. 179–200 (Lead I–VI). For a summary of the distribution of lead figurines in Laconia and elsewhere, see Boss 2000, pp. 3–14.

78. Voyatzis 1990, p. 124, pl. 62; see also the chapter on small finds from Tegea in Nordquist, Voyatzis, and Østby 2014, pp. 163–262.

79. Dawkins 1929, pp. 254, 263, 269–270, 277–279; Boss 2000, pp. 112–115, 214–216.

80. Voyatzis 1990, p. 124, pl. 62:B11; see a similar (but larger) example of a lead kouros from Samos in Boss 2000, p. 223, fig. 131.

81. A possible parallel for the Late PG sherd can be found in Tiryns; see Lemos 2002, pl. 56:7.

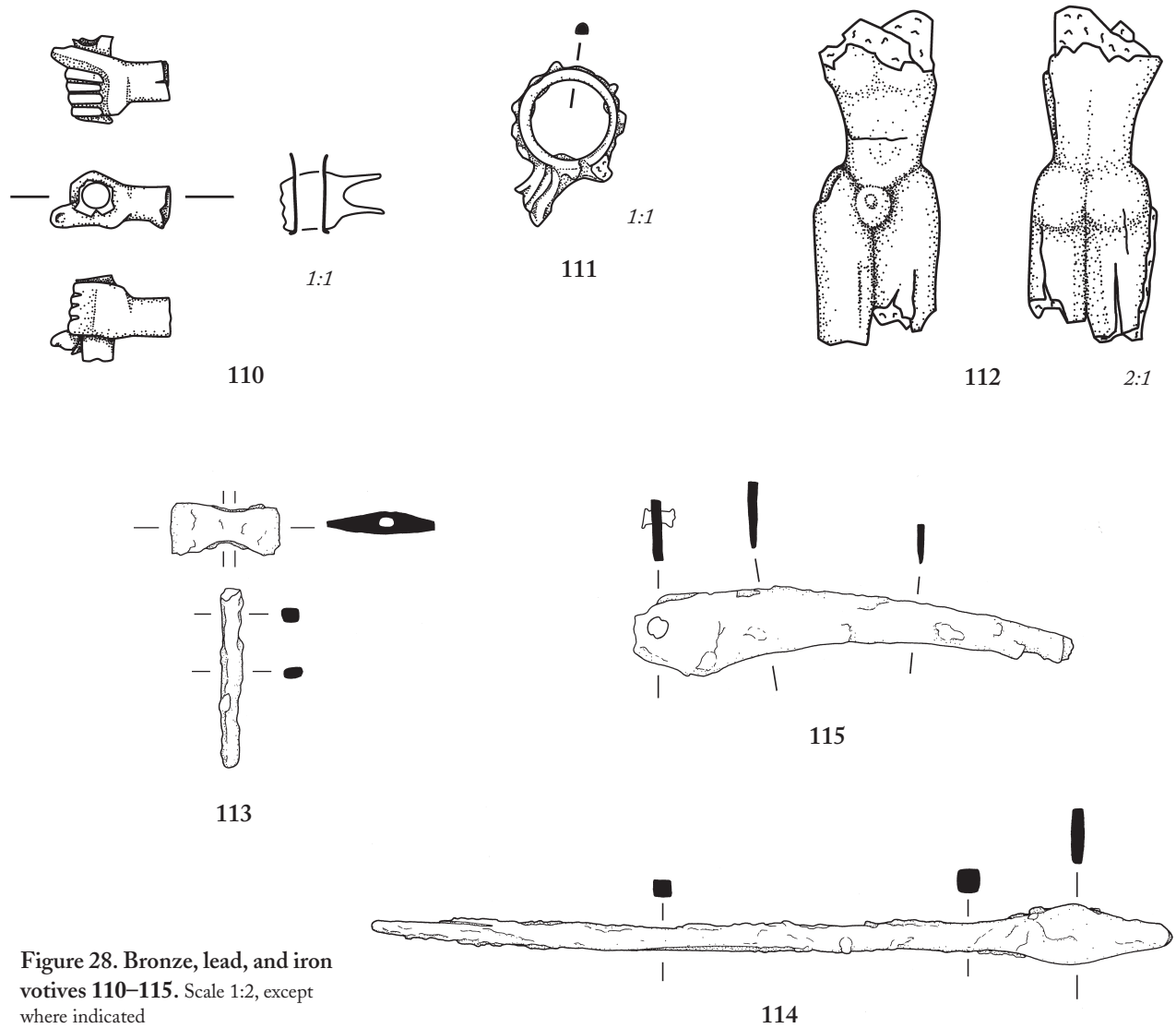


Figure 28. Bronze, lead, and iron votives 110–115. Scale 1:2, except where indicated

112 Lead miniature kouros

Fig. 28

MTL 61. Basket Z 17 (SU 15) ZIIS.

P.W. 0.0085; p.L. 0.023; Th. 0.004 m.

Very good condition, torso and upper legs of figure well preserved. Small, nude, male figure of Daedalic style with genitals visible, marked waist, and rounded buttocks.

7th century B.C.

113 Iron double ax

Fig. 28

MTL 106. Basket Z 33 (SU 16) ZIIS.

Ax: p.L. 0.008; p.W. 0.031; Th. 0.007; rod: p.L. 0.051; p.W. 0.014 m.

Very good condition, in two parts, very corroded surface. Heavy iron double ax with hole pierced vertically all the way through center. Rod has rectangular section and seems to belong to it.

10th century B.C.

114 Iron spit Fig. 28

MTL 69. Basket Z 23 (SU 15).

P.W. 0.008; p.L. 0.230 m.

Excellent condition, tip chipped and top broken. Long, heavy iron rod with rectangular section and point at end, probably from a spit.

No precise date

115 Iron knife Fig. 28

MTL 196. Basket Z 60 (Feature Z3) ZIS.

P.W. 0.0233; p.L. 0.122 m.

Very good condition, nearly complete with tip missing and surface corroded. Long flat blade with a slight curve; upper end is thicker and wider and has a rivet.

Archaic

BONE OBJECTS

Some objects of bone were also unearthed in the altar excavations, including bone beads and a possible fragment of a bone flute. The beads are tiny and pierced. The larger one has an image of a running winged figure on one side and a frontal bull's head on the other. It is from basket Z 78, a mixed layer. The possible flute fragment consists of a long piece of worked bone with a very smooth surface. It was found in basket Z 30, in the lower fire-cracked rock level, and may be of Archaic date. Examples of bone flutes are known from the Artemis Orthia Sanctuary in Sparta from the second half of the 7th century B.C.⁸²

TERRACOTTA AND GLASS OBJECTS

Fragments broken from terracotta lamps were found in various layers in trench Z. Other terracotta objects include at least seven tiny pierced beads. Small pieces of colored glass were unearthed from the altar, including about half a dozen fragments from glass vessels, many blue in color. They likely reflect Classical phases of use at the site. One piece of glass, MTL 365, found in a mixed layer, consists of a piece broken from a core-formed glass vessel, decorated with yellow and blue horizontal bands.

COINS

The recent excavations in the altar yielded 33 coins (32 in trench Z and one in trench ZZ).⁸³ Of these, six were of bronze and 27 of silver. They include 12 Arcadian League coins (e.g., 116), six Aiginetan coins, two from Olympia/Elis (e.g., 117), four from Mantinea (e.g., 118), three from Sikyon, and one each from Corinth, Phocis, Delphi, Phokaia, Thebes, and Argos. These coins were found in many layers of trench Z; three of the Arcadian League examples were found in some of Kourouniotis's backfill trench, basket Z43. Kourouniotis also published some coins in his excavation of the altar, including an Aiginetan coin and an Arcadian League coin.⁸⁴ The coins were found in mixed layers throughout the altar and range in date from the 6th through the 4th centuries B.C.

82. Dawkins 1929, pp. 236–237, pls. CLXI, CLXII.

83. Many thanks are due to Barbara Burrell and to Orestes Zervos for preliminary identifications of the 44 coins from the Mt. Lykaion Excavation and Survey Project. In addition to the 33 coins from the altar, 11 were uncovered in the lower sanctuary.

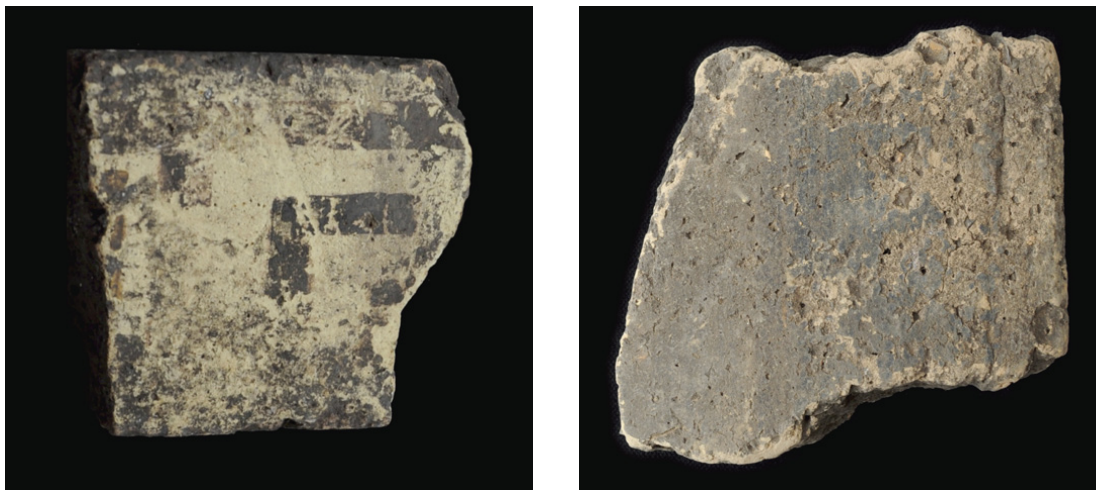
84. Kourouniotis 1904a, cols. 166–167.

CATALOGUE

- 116 Arcadian League coin Fig. 29
 MTL 32. Basket Z 10 (SU 2) ZIIS.
 Weight 2.947 g.
 Silver Arcadian League triobol/hemidrachm. Obverse: Zeus seated left. Reverse: female head of "Phyrgillan" type 1, facing left.
 429–420 B.C.
- 117 Elean coin Fig. 29
 MTL 86. Basket Z 25 (cleaning basket) ZIIS.
 Weight 2.571 g.
 Silver Elis/Olympia triobol/hemidrachm. Obverse: head of Hera facing right with narrow *stephane*. Reverse: eagle with wings standing left on rocks with head facing right.
 359–324 B.C.
- 118 Mantineian coin Fig. 29
 MTL 216. Basket Z 70 (SU 2) ZIIN.
 Weight 0.862 g.
 Silver Mantinea obol. Obverse: bear head facing right. Reverse: acorn within incuse square.
 499–470 B.C.



Figure 29. Arcadian League coin 116, Elean coin 117, Mantineian coin 118. Scale 2:1. Photos E. Fergason



TERRACOTTA ROOF TILES

Many thousands of terracotta tile fragments were excavated at the Sanctuary of Zeus on Mt. Lykaion.⁸⁵ Surprising amounts of terracotta tile were found in many levels of the ash altar, although not on the bedrock layer. Sapirstein has tentatively concluded that the upper sanctuary contained the remains of two roofs, one Corinthian (119) and one Laconian (120). Almost all of the fragments originated from the trenches in the ash altar, and very few from the *temenos* trenches below, suggesting to Sapirstein that the roofs belonged to two small buildings on the southern peak or perhaps roofed phases of a single building, such as a naiskos. The Corinthian roof was probably installed by the mid-5th century B.C.⁸⁶ Only the red- and black-painted cover and pan tiles of the Laconian roof are preserved, with little indication of their date. Other than these tile fragments, there are no other architectural fragments or foundations on the peak or in the *temenos* below.⁸⁷

CATALOGUE

119 Corinthian eaves pan tile

Fig. 30

MTL 274. Basket Z 78 (SU 2) ZIIIN.

P.L. 0.059; p.W. 0.048; Th. 0.050 m.

Well-fired, gritty fabric, reddish-yellow core with pale yellow surface; 10%–15% temper content, 1 mm nodules of mudstone predominant. Small fragment from the front of an eaves pan tile. Face decorated with a crossed meander pattern in faded black paint. At the left break, a red vertical line is preserved, probably the frame of a checkered panel between the arms of the meander.

5th century B.C., second quarter(?)

120 Laconian cover tile

Fig. 30

T4C14-Z045. Basket Z 45 (SU 3) ZIN.

P.L. 0.091; p.W. 0.086; Th. 0.019 m.

Well-fired, fine fabric, reddish yellow throughout; 3%–5% temper content, nodules up to 9 mm, mudstone most common. Rim of a Laconian cover tile. Top surface painted black, with dull gloss.

No precise date

Figure 30. Corinthian tile fragment 119, Laconian tile fragment 120.

Scale 1:1 (119); 2:3 (120). Photos P. Sapirstein

85. The tile fragments are currently being studied by Philip Sapirstein. This section represents a summary of his results to date; the catalogue is his work.

86. For parallels, see Winter 1971, pp. 75–77, 79, 81–82, n. 163.

87. Alternatively, we suggest that the tile fragments may have been brought up to the ash altar from elsewhere for leveling, covering, or stabilization purposes.



Figure 31. Trench ZZ, looking southwest. Photo G. H. Davis

TRENCH ZZ

Another area of investigation of the altar (trench ZZ) was dug approximately 10 m to the southwest of trench Z. The location of the trench was selected in order to explore the extent of the intense burning on the mountaintop and in order to determine where the altar meets the side slope. The trench dimension was 2×6 m and the greatest depth was 1.80 m (Fig. 31). Trench ZZ is characterized by significant numbers of densely packed, large rocks, hugging the side of the slope (Fig. 32). The stones range in size from



Figure 32. Trench ZZ. Photo G. H. Davis

approximately $0.30 \times 0.20 \times 0.20$ m to $1.00 \times 0.60 \times 0.40$ m and may have been put into place as a retaining wall for the altar after centuries of use. Pottery found at the bedrock level was highly fragmentary and worn; the date of the pottery suggests that the large stones were put in place on the bedrock possibly by the end of the 7th century B.C. The northern half of trench ZZ was characterized by the presence of black ash, similar to the ash from trench Z; as mentioned, several miniature bronze tripod cauldrons were found there (e.g., 105). The area of large stones continued on the surface to the northwest, as well as toward the south, suggesting a possible function as a sort of retaining system for a large portion of the altar.

AREA OF THE TEMENOS

Figure 33 depicts the southern peak of Mt. Lykaion, showing the location of the altar of Zeus relative to the area identified as the *temenos* by Kourouniotis in his early excavations at the site. In 2006 and 2007 we excavated six trenches down to bedrock (labeled T, U, V, W, X, and Y) in the vicinity of the *temenos*, in a total area of 56 m², and found virtually nothing in any of them.⁸⁸ Several of these trenches were selected as areas of interest on the basis of remote sensing work that was undertaken by Sarris in 2005 (see Appendix 1). In each case, these “areas of interest” were found to consist of regular or fairly regular bands of bedrock, not manmade features.⁸⁹

It is generally understood that there would have been a path connecting the lower sanctuary with the upper sanctuary at Mt. Lykaion. Although the route cannot yet be attested archaeologically, there are some clues as to the possible path. In the area of the *temenos*, Kourouniotis suggested that the stone bases would originally have supported the two columns topped with the gilded eagles, and these would have marked the eastern entrance to the *temenos*.⁹⁰ A second possibility, resulting from the remote sensing work of Sarris (see Appendix 1), is that there may have been a pathway in use at some point in the sanctuary’s lifetime that started in the north along the east side of the southern peak of the mountain. In either case it is likely that the route between the lower and the upper sanctuaries would have passed by the Agno fountain (see p. 630, below) approximately halfway between the two parts of the site (Fig. 2).

It is curious that we found virtually no objects at all in our excavations in and around the *temenos*. We opened many trenches, including one (trench U) very near the area excavated by Kourouniotis just to the west of the northern column base, but found only bedrock. As mentioned above, Kourouniotis’s discovery of statuettes depicting Zeus in this vicinity is not surprising, given the fact that Zeus was worshipped at the altar. He also uncovered figurines depicting Hermes. While these finds may initially seem puzzling, they may be understood as appropriate offerings since Hermes was so closely connected with Arcadia and shepherds.⁹¹ The findspots of many of these statuettes, moreover, just outside the *temenos* (near the northern base), as well as at the boundary of the *temenos*, may also reflect Hermes’ known role as god of boundaries.⁹²

The other figures found by Kourouniotis at the boundary of the *temenos* include a bronze youth, which may also depict Hermes, and a bronze statuette of a runner.⁹³ The runner would be a highly appropriate

Figure 33 (opposite). Map of *temenos* in relation to the ash altar and the proto-stadium. A. Insua, M. Pihokker, E. Rodriguez-Alvarez, and A. Mayer

88. The trenches depicted in Figure 33 include the approximate location of Kourouniotis’s trenches on the altar, those of Spyropoulos on the altar and in the *temenos*, and those of the current investigators. The 39th Ephorate dug trench X.

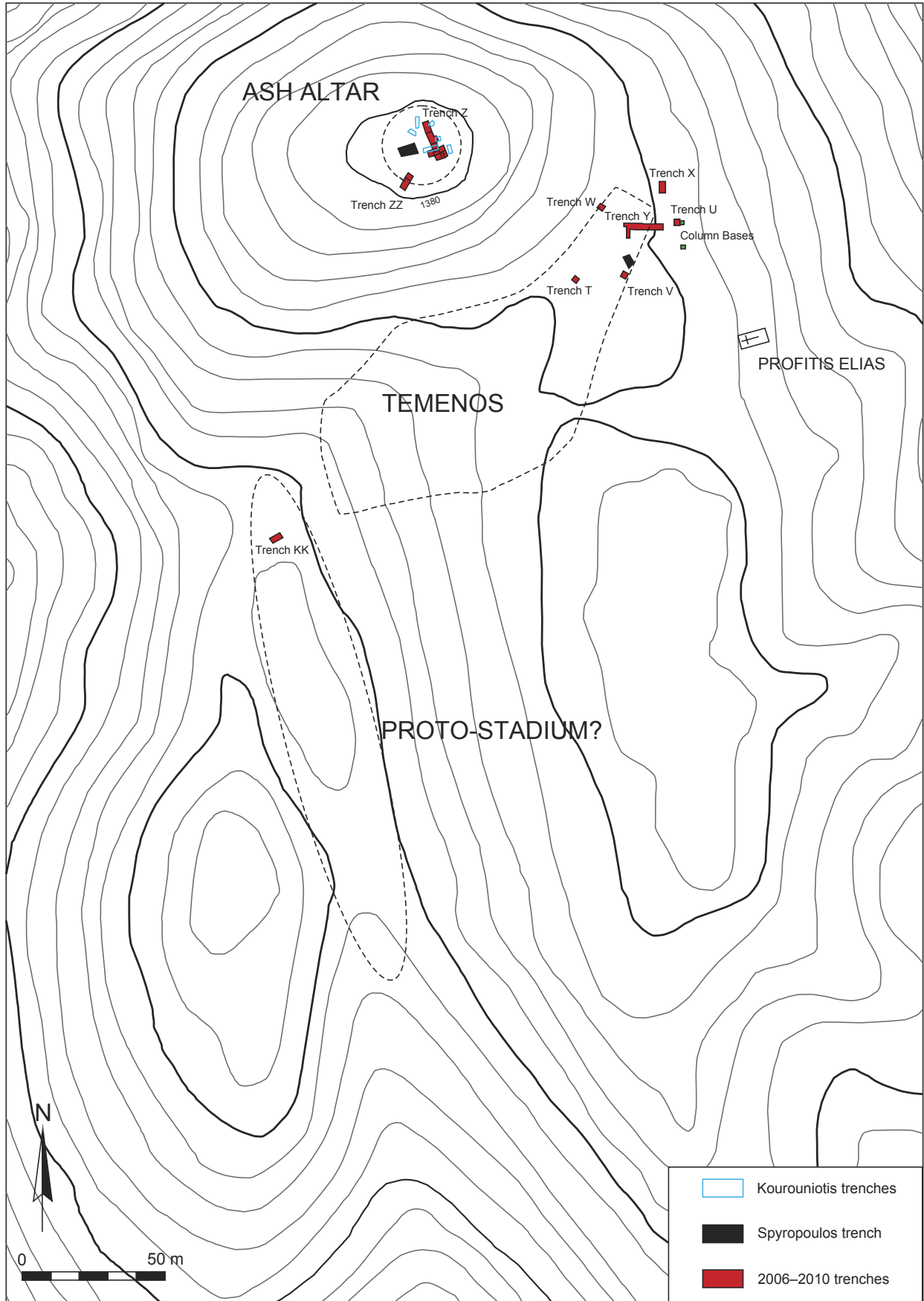
89. The amount of earth covering the bedrock was fairly shallow in most trenches. Unlike the surface of the altar, the modern surface in the area of the *temenos* preserved no indications of exactly where Kourouniotis dug his trenches. For the modern-day festival of Profitis Elias each July 20, the area of the *temenos* is used as a parking facility for the morning church service. In preparation for this event, the modern dirt roadway that connects the lower sanctuary with the upper sanctuary is graded, as is much of the area of the *temenos* near the church. This activity has modified to a certain extent the ground surface of the *temenos* and has also caused movement of the low stones that once bordered it.

90. This is also indicated on the plan of Sinn 2007, p. 183, fig. 6.

91. For statuettes of Hermes from Arcadia generally, see Lamb 1925–1926.

92. See Cook 1914, p. 84, n. 1, who wondered if there might have been a cult of Hermes on the spot where the statuettes of Hermes were found on Mt. Lykaion.

93. Kourouniotis 1904a, cols. 203–210, figs. 23–26, pl. 10; Lamb 1925–1926, p. 145, no. 41.



offering, given the fact that the Lykaion Games took place in the stadium in the lower sanctuary of the site. There is also a possibility that the earlier contests were held close to the altar near the southern summit of the mountain (see below).

It is unclear why we found virtually nothing in trench U during our recent campaign. Perhaps the regular modern use of the *temenos* and its vicinity for the annual festival at the chapel of Profitis Elias (see n. 89, above) may have resulted in the disappearance of any remaining movable finds.

INTERPRETATION: ALTAR AND TEMENOS

The southern peak of Mt. Lykaion was clearly a significant cult place in the Mycenaean period, from LH IIB through LH IIIC. Over 70 years ago, based on literary references and the physical appearance of the altar, Mylonas argued that the component parts of the Lykaion shrine (two columns topped by eagles, with a mound of earth between them) had close parallels in Minoan and Mycenaean iconography. He therefore suggested that the ash altar and columns below represented a primitive, possibly pre-Mycenaean, shrine that had survived into the historic period.⁹⁴ At this stage in our work, we can say that Mylonas's intuition was somehow prescient, as we now have strong archaeological evidence for a previously unknown Mycenaean mountaintop cult center at Mt. Lykaion. The large number of drinking vessels (kylikes, goblets, cups, and stemmed bowls) suggest that feasting activity took place at the site.⁹⁵ The faunal analysis (see Appendix 5) also indicates that the ritual practice of *thysia* may well have taken place at the site starting in Mycenaean times; to date there is limited evidence from just a few other sites for this ritual during the Bronze Age.⁹⁶ There are also very strong indications that the cult continued to be practiced there, as shown by the examples of LH IIIC Late, Submycenaean, and PG fragments of pottery (including regional PG sherds, Messenian and Laconian Dark Age pottery) spanning the 11th through the 9th centuries B.C., and continuing into later periods. In addition, the iron double ax and a couple of the simple bronze tripod cauldrons appear to date to the 10th century B.C.

We have identified LG pottery and documented the dedication of many miniature bronze tripod cauldrons and of other bronzes, lead and bone objects, and Proto-Corinthian pottery, a practice that likely continued into the 7th century B.C. From the middle of the 7th century B.C. onward, there seems to be a reorganization of the altar, to judge from the evidence for a retaining system to its west, together with the high concentration of fire-cracked rock with Archaic pottery and offerings. The dedications from the 5th and 4th centuries B.C. are considerable, but by the 3rd century there is little evidence of activity.

The FN, EH, and MH remains from the altar are currently under study, so we cannot at this stage say that there is continuous use from the FN period. It seems more likely to us that there was intermittent use until

94. Mylonas 1943. At the time of Mylonas's writing, the earliest secure date from the altar was the 7th century B.C., based on Kourouniotis's (1904b) excavation report.

95. Wright 2004.

96. See n. 70, above.

LH II. In any case, the evidence for continuity of cult from the Mycenaean period into the Early Iron Age and to the 4th century B.C.—a phenomenon attested at only a few sites in the Greek world—is strong at Mt. Lykaion.⁹⁷ As we continue to study the material from Mt. Lykaion, and with future investigations at the site, we hope to clarify the questions related to continuity and to provide specific details of the nature of the cult activity and rituals in each of the periods.

In terms of the *temenos*, although Kourouniotis wrote with conviction about its location and perimeter, its precise area, in fact, remains uncertain. It is likely, however, that the region around the two column bases, as well as that immediately to the west, which Kourouniotis identified as a presacrificial area, were not part of the *temenos* but just outside of it. Our excavation results confirm such an interpretation (Fig. 33). The majority of the area considered by Kourouniotis to be the *temenos* is flat and lies at the base of the southern peak of the mountain. There is, however, an outcropping of rock in a portion of this region, which has been identified as a small limestone quarry.⁹⁸ The approximate area of the *temenos* described by Kourouniotis and indicated on our plan is 6,438 m², with a perimeter of 363 m. When we began our research at the site in 2003, the partial line of low stones found by Kourouniotis at the base of the southern peak of the mountain was still visible. These stones may have been the remains of the *temenos* boundary wall.

AREA IMMEDIATELY SOUTH OF THE ALTAR AND TEMENOS

Approximately 130 m to the southwest of the southern peak of the altar, and at an elevation 48 m below it, is a long, flat terrace, bordered to the east and west by the rising slopes of the mountainside (Fig. 33). Above it is the ash altar. The area is approximately 150 × 12 m, running in a north–south direction and varying in slope by only 0.15 m from end to end (Fig. 34).⁹⁹ This terrace, formed as the result of a geological fault,¹⁰⁰ continues to the south and down the slope of the mountain for some distance. It may have served as a southern approach to the southern peak of the mountain in antiquity, a possible processional way. There is another small ancient quarry at the south end of this level area.

It is conceivable that this mountain terrace was used for the athletic contests of the Lykaion Games, as a sort of proto-stadium, prior to the construction of the facilities in the lower sanctuary. The flat terrace could have been a suitable *dromos*, and the slopes could have provided an area for spectators.

97. Dickinson 1994, pp. 219–237; Coldstream 2003, pp. 327–332; Morgan 2003, pp. 107–119; Marakas 2010, p. 79. The sanctuaries of Dionysos at Ayia Irini on Kea and of Apollo and Artemis at Kalapodi

have yielded plausible evidence for continuity of cult from the Mycenaean period through the Early Iron Age and beyond.

98. This identification was made by Romano and confirmed by G. H. Davis

(pers. comm.).

99. The elevation at the northern point of the terrace is 1334.909 m. and at the southern extreme 1334.731 m.

100. G. H. Davis (pers. comm.).



Figure 34. Proto-stadium, view from north. Photo D. G. Romano

During the 2010 season, a 2×4 m trench (KK) was dug into the terrace. Although no clear surface appeared in the trench, there was a clay level (SU 3) that included a small amount of undiagnostic pottery, tile, and charcoal approximately 1 m below the modern surface level.

AGNO FOUNTAIN

Situated approximately halfway between the upper and lower levels of the sanctuary is the Agno spring described by Pausanias (8.38.3). This spring was investigated by Kourouniotis, who described the location as “Anemorahi” or “Fatoureiko,” where there was a small fountain called Korites. In 1996 Romano located the spring at about 1,234 masl, or nearly 145 m below the ash altar, and surveyed the visible architectural remains there.¹⁰¹ As part of the current campaign, colleagues from the 39th Ephorate did some preliminary work at this fountain, basically clearing the area for our survey (Fig. 35). As the Agno fountain was approximately halfway between the upper and lower sanctuaries, it must have been an important stop on the ancient route between the two locations.

CONCLUSIONS

Prior to our scientific investigations at Mt. Lykaion, the site was known only from tantalizing references in the ancient literary texts, early traveler accounts and drawings, and from the brief excavation campaigns conducted by Kontopoulos and Kourouniotis at the turn of the 20th century. The earliest

101. For the location and recent investigation of the Agno fountain, see Romano 2005.



Figure 35. Survey drawing of Agno fountain, showing the spread of its architectural blocks across the hillside. Mt. Lykaion Excavation and Survey Project

evidence found by Kourouniotis dated to the 7th century B.C., but most of his discoveries were from the 5th to 4th centuries B.C. Our investigations at the altar have yielded important new finds (of pottery, burned animal bones, and votives) that indicate that this mountaintop shrine dates at least to the Mycenaean period and that it appears to have been used continuously until the Late Classical period. The evidence further suggests that ritual activity was occurring at the ash altar on Mt. Lykaion centuries before it began at Olympia, which lies only 22 miles away. Given the similarities between these two sites—both were sacred to Zeus, both had distinctive ash altars, and both held athletic contests—the relationship of the two sanctuaries needs to be further explored.

We have presented here a preliminary analysis of the evidence uncovered to date in the upper sanctuary, including some of the results of the scientific analyses, in order to show the nature and scope of the material remains. It is clear that many new avenues of inquiry have opened up as a result of our first campaign on Mt. Lykaion, and that after the study of the finds already uncovered and the completion of the scientific analyses currently underway, further investigation will be warranted.

The significance of the great abundance of prehistoric pottery, especially of the FN period, also needs to be further explored. It remains unclear what the nature of this early activity was at Mt. Lykaion. The EH and MH ceramics likewise reveal earlier phases of activity in this region than were previously known. As we study the material further, we hope to better understand if the evidence is continuous from FN through LH, or if it reflects intermittent activity.

The evidence for a Mycenaean cult center at Mt. Lykaion must be understood within the larger context of Late Bronze Age Greece. Our

knowledge of this period (in terms of the palatial power centers, the variety of cult places, and the extent of the spheres of influence of Mycenaean culture) is becoming more refined and nuanced as excavations and research continue in the Greek world. The location of what appears to be a significant mountaintop shrine in the west-central Peloponnese invites us to consider the nature of its relationship with palatial centers or other Mycenaean communities in the region.

The indications for continuity of cult at the ash altar also need to be understood within the larger context of recent discoveries at Late Bronze Age and Early Iron Age sites in Greece. Although this topic has been hotly debated in the scholarship, there is growing evidence from a number of sanctuaries in the Greek world that encourages us to reexamine the question. There are strong indications that the practice of *thysia* (offering of burned animal sacrifices) began as early as the Mycenaean period at Mt. Lykaion and other sites (such as Pylos). It may ultimately prove to be the case that key aspects of Greek ritual and religion can be firmly traced back to the Mycenaean period.

There is continuous activity at the altar into the Protogeometric and Geometric periods, but it is during the 7th century B.C. that there appears to have been a significant expansion at the site in both the lower and upper parts of the sanctuary. In the lower area there is evidence for 7th-century activity in the vicinity of the later seats, although its exact nature is unclear. We hope that future investigations will illuminate this phase. In the ash altar, there may also have been a major reorganization in the 7th century B.C., as evidenced by the building of a retaining system and increased activity in terms of burned offerings and dedications. This activity in the upper sanctuary continues to be strong through the Late Classical period.

The Mt. Lykaion Excavation and Survey Project has produced important new results, and promises to continue to provide critical information to help us better understand numerous aspects of ancient Greek ritual and cult practice, as well as developments in Arcadia from prehistoric times onward. We plan to continue our investigation of this region with a renewed excavation program at Mt. Lykaion.

ACKNOWLEDGMENTS

The Greek Archaeological Service Representatives for the years 2006–2011 included the following: M. Petropoulos, A. Karapanagiotou, S. Fritzi-
las, G. Grigorakakis, N. Lyra, V. Papadopoulos, A. Sarandopoulou, and L. Souchliris.

Throughout all the years of our work, the Cultural Society of Ano Karyes, Arcadia, with the successive presidents K. Karagiannis and C. Koumoundouros, assisted the team with logistical and other local support. We are also grateful for the support of the University of Pennsylvania Museum of Archaeology and Anthropology and its successive directors, J. Sabloff, R. Leventhal, and R. Hodges. Research and laboratory space was provided by the Archaeological Mapping Lab of the museum's Mediterranean Section.

We are grateful to Nicholas and Athena Karabots and the Karabots Foundation of Fort Washington, Pennsylvania, as well as to Annette Merle-Smith of Princeton, New Jersey, for long-term and significant leadership support of the project. We also thank the 1984 Foundation, the Samuel H. Kress Foundation, the Wallace Foundation, the Niarchos Program for the Promotion of Hellenic Culture at the University of Pennsylvania, The Arete Foundation, and INSTAP for important support. In June 2011 we received NSF Grant #1125523, "Ritual Formation Processes at Bronze Age Mt. Lykaion," for scientific study and analysis from 2011 to 2013. In addition, we have received institutional support from the University of Pennsylvania and the University of Arizona, as well as from over 40 individual donors, including the Friends of Mt. Lykaion. The following donors are given special thanks for their financial contributions: Arch and Laura Brown, Cummins Catherwood, J. Garfield De Marco, Dorothy Dinsmoor, Betty Edmonson, Harry George, Susan Horsey, Edward and Josie Hueber, Thomas Keating, Brian Kelly, John Medveckis, Jamie Musselman, Sallie Naylor, Terry and Carolyn O'Connor, James H. Ottaway Jr., George Papanicolaou, Jeremiah and Mary Anne Reedy, Jay and Gretchen Riley, Cita Scott, Heather Sigworth, and Angel Voyatzis.

Scientific consultants who assisted us during the years of survey and excavation, and in the preparation of this report, include E. Barnes (human osteology), B. Burrell (numismatics), C. Cassios (forestry and environmental studies), G. H. Davis (geology), M. Davison (cultural landscape), T. Fenn (metallurgy), J. Forsén (EH pottery), P. Jordan (architecture), A. Koh (chemical residue analysis), K. Lynn (database and website), E. Margaritis (palaeobotany), T. Marx (Dark Age pottery), S. Mentzer (micromorphology), B. Morehouse (cultural landscape), G. Munsch (architectural conservation), P. Nickerson (geosciences), G. Nordquist (MH pottery), S. Petrakis (FN pottery), Y. Pikoulas (history), A. Rohn (stratigraphic analysis), I. B. Romano (monument bases), S. Rotroff (Hellenistic pottery), P. Sapirstein (roof tiles), A. Sarris (geophysics and remote sensing), N. Stapp (GIS and database), B. Starkovich (faunal remains), O. Tolba (topographical survey), X. Valle (architecture), and O. Zervos (numismatics).

The field staff for the years 2004–2010 included the following: A. Panagiotopoulou (director, 2004–2005), M. Petropoulos (director, 2006–2010), D. G. Romano (field director, 2004–2010), M. E. Voyatzis (director of finds, 2004–2010), L. Hammond (registrar, 2006–2010), S. Linn (assistant registrar, 2009–2010, and registrar, 2011–2014), T. Moreno (conservator, 2006–2012), K. Ragan (assistant conservator, 2008–2009), J. Tubman (assistant conservator, 2010–2011), Dawn Lohnas (assistant conservator, 2011), L. Kain (artist, 2006–2010), C. Kolb (artist, 2011–2014), E. Ferguson (photography, 2010–2011), E. Rodriguez-Alvarez (photography, 2012–2014), C. Stackowicz (photography, 2011), O. Tolba (assistant field director, topographical survey 2004–2005), T. Fenn (assistant field director, topographical survey 2006), A. Insua (assistant field director, topographical survey 2007–2008), P. Griffith (assistant field director, topographical survey 2009), J. Weiland (assistant field director, topographical survey 2010), E. Graff (assistant field director, excavation 2010).

Trench supervisors included E. Barnes, A. Belis, J. Benton, D. Bloy, A. Chain, G. H. Davis, D. Diffendale, C. Gieske, E. Graff, M. Gupta, K. Mahoney, K. McBride, A. Plopper, A. Rohn, J. R. Son, A. Stoimenoff, S. Ward, C. Zois. Their observations, notes, and reports are the basis for some of the text of this report.

Student assistants from all of the years included the following: D. Amoroso-O'Connor, A. Basa, N. Bauer, M. Baumann, S. Beckmann, A. Belis, J. Benton, H. Cadwalader, E. Coco, T. De Armond, L. Dreyfuss, J. Dwyer, M. Fresquez, J. Gates, E. Giarelli, J. Gieske, N. Gleason, R. Goossen, L. Gottschalk, M. Gupta, F. Hodgins, H. Kelly, N. Kendall, E. Kleinkauf, C. Kron, S. Lawrenz, A. Lessie, A. Lim, N. Lirou, K. McBride, K. Meyers, G. Milonas, B. Moore, C. Moser, R. Moskowitz, J. Nabel, E. Nijland, N. Pasterfield, M. Pihokker, A. Plopper, B. Rolla, G. Stoehr, A. Stoimenoff, C. Teuchler, M. Tseng, S. Ward, D. Whipp, J. Weiland, K. Wilson, B. Winnick, and K. Yares.

Architecture and landscape architecture students, both undergraduate and graduate, from the University of Pennsylvania worked on the architectural documentation project during the years 2004–2011. They included C. Antiporda, J. Bayuk, A. Beyer, P. Biswas, G. Burkett, M. Gardiner, J. Hong, R. Hughes, M. Jankowsky, P. Jordan, E. Katzenstein, J. Lee, R. Lyng (University of Arizona), S. B. McKay, J. McCandlish, R. Ruedig, B. Schmelzner, O. Tarricone, X. Valle, and X. Yang. Many of the graduate students were partially funded by the Samuel H. Kress Foundation. P. Jordan served as assistant field director for architectural studies in 2007 and 2008, and X. Valle as assistant field director for architectural studies in 2008–2011.

The household management team included M. Davis (2004, 2009–2010), T. DiMaggio (2007), A. Evans (2008), E. Evans (2008), S. McBride (2009–2010), N. Mueller (2009), B. Pouloupoulou (2004–2011), and N. Tallmon (2010). The operations team included T. Keating (2009–2010) and R. Lenigk (2010).

The workmen who participated in the field project during the years 2004–2010 included N. Aggelopoulos, G. Aglamisis, A. Christeas, A. Gianopoulos, P. Halvas, K. Konstantiannis, A. Kontoes, V. Kontoes, I. Korolis, K. Kostogiannis, I. Livadis, G. Manoussos, G. Markolephas, A. Markopoulos, and C. Tzevelekos.

For assistance with the editing and layout of the figures and in the general preparation of the manuscript we warmly thank Natalie Gleason. For general production assistance we thank Matt Pihokker and Emilio Rodriguez-Alvarez.

The project has maintained a website since 2003 (<http://lykaionexcavation.org>). The Parrhasian Heritage Park has its own website (<http://parrhasianheritagepark.org>).

APPENDIX 1

GEOPHYSICAL PROSPECTION

The geophysical survey at Mt. Lykaion was carried out in two campaigns in 2005 and 2007. More than 17,000 m² were covered in different sections of the site in the vicinity of the bath, stadium, hippodrome, *xenon* (administrative building), *temenos*, and altar, through the employment of the following techniques: magnetic (fluxgate gradiometers), soil resistance (twin probe array with multiplexer for measuring at three different depths up to about 1.5 m below the surface), and GPR (NogginPLUS with 250 and 450 MHz antennas). Upon processing the data, the various geophysical maps were rectified and were imported to a GIS platform to be used in correlation with the rest of the survey and excavation results.

Geophysical measurements carried out in the area of the steps (seats) and the stoa were much smoother than those conducted in the area of the *xenon*, which were loaded with increased levels of noise (especially in the case of the soil resistance data), probably caused by dispersed building blocks that have fallen from the architectural features of the site due to soil erosion and cultivation activities. A number of linear features correlated to building residues have been identified to the west of the *xenon*. Intense magnetic signals (-80 to 190 nT/m) were registered in the area of the steps and the stoa. One of them is located exactly in the middle of the interior of the stoa, and the other is found just outside its southwest corner. A couple more linear features are suggested between the steps and the west wall of the stoa, running in a direction parallel to them. Further evidence of wall structures was provided by the radargrams, which are in close correlation with the magnetic anomalies. GPR slices suggested that most of these underground reflectors appear about 30 cm below the surface of the ground. A few of these features were investigated through trenches DD, F, M, L, and O.

A number of isolated high-intensity anomalies that extended within a region of 15 × 10 m were identified by magnetic techniques to the north of the end of the asphalt road (southern end of the stadium), suggesting the presence of metal fragments (the nature of the material was verified by the subsequent trial excavations in trenches A and C). These fragments have been left by the modern use of the site. About 10 m to the west of this region, in trench HH, the surface of the hippodrome floor was revealed.

Similar compaction of the clay soil was found at about 1.7–2.0 m below the modern surface and right above the bedrock in trenches A and B. On the other hand, the area that extends to the north side of the hippodrome (up to the downhill cliff of the terrace) and expands further to the east, extending south of the bath, produced a number of pronounced anomalies especially evident in the vertical magnetic gradient data. Still, the nature of the particular anomalies, especially in the upper terrace of the hippodrome, must be approached with caution, as the GPR slices indicated that most of the information context from the particular area is contained within the first meter below the surface, and it be—as was shown in other sections of the hippodrome—that some of the features that appear in the geophysical maps are caused by the anomalous intrusions of the bedrock, which can be close to the surface.

At the northern end of the hippodrome plateau, linear segments suggest a rectangular complex aligned southwest–northeast, with dimensions ca. 37×17 m. The southwest side is outlined by a semicircular, convex-shaped feature with a diameter of 10 m. More structural remains are also suggested toward the northwest side of the region. Moving to the south, at the lower terrace of the hippodrome region, two extreme vertical magnetic gradient anomalies ranging from -99 to 180 nT/m are recorded. The larger one, of rectangular shape (dimensions ca. 13×11 m), probably denotes the traces of a rectangular building. Located about 140 m away from the bath complex and extending north–south for more than 28 m, these intense magnetic anomalies may signify the presence of a burned collapsed building.

Moving east to an even lower plateau that extends south of the bath, magnetic data revealed a few intense magnetic anomalies, some of which, however, exist close to the terrace wall that separates the two different levels. More than four rectangular-like anomalies, with dimensions ca. 11×4 m, were recognized in the region, and due to their close proximity to the bath installation, they may be related to it. One of them is oriented parallel to the bath just a few meters away from it, and was confirmed by the multiplexed soil-resistance measurements, which indicated that the features lie within the upper layers below the current surface.

Finally, geophysical techniques were applied to areas close to the top of Mt. Lykaion. An area of $1,380$ m² was scanned by both soil-resistance and magnetic techniques in the area of the *temenos*, within a sloping terrace that has seen a number of modern interventions, including the leveling of the ground, the construction of a dirt road, and the fencing of an area for the confinement of animals. The ground has been so modified that there was no evidence of the location of the excavation trenches made by Kourouniotis early in the last century. Geophysical data indicated a few small linear or curvilinear features of fragmentary character (most of which follow the iso-elevation lines of the sloping terrace), as well as high resistance values and high levels of magnetic noise. All six test trenches that were dug, covering an area of 52 m², hit upon the bedrock and resulted in almost no finds. Similar were the GPR results along the narrow strip that leads to the hill of the altar at the peak of Mt. Lykaion from the southwest. Most of the identified dispersed reflectors were located within the upper layers

of the subsurface, and they may have been caused either by outcrops of the bedrock or by rocks that had fallen from the sloping sides of the hill.

The geophysical prospection of the altar at the top of Mt. Lykaion also resulted in fuzzy images. The past excavation trenches and the construction of a datum point introduced high levels of noise to the geophysical signals. Still, toward the east section of the top, magnetic readings indicated areas with high magnetic values probably correlated to the location of the past excavation trenches, exposed soil, and other metal artifacts (as was verified by the large amount of pottery and metal finds that came out of trench Z). High soil-resistance values, reaching up to 480 Ohms, which were slightly displaced with respect to the high magnetic readings, were also noticed, and were probably caused by the loosened soil matrix of the disturbed earth. It was left to the most recent excavations to shed light on this section of the site, where the finds provided evidence for the usage of the altar beginning in the 4th millennium B.C.

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APPENDIX 2

SUMMARY OF GEOLOGICAL ACCOMPLISHMENTS, 2004–2011

The structures and activity areas at the Sanctuary of Zeus on Mt. Lykaion are located in ways that bear a direct and compelling relationship to the area's geology, tectonics, and landscape.¹⁰² The height and steep topography of the mountain undoubtedly contributed to its being considered powerful; to this may be added the fact that earthquakes and ground displacements due to faulting are a part of the active dynamics of Mt. Lykaion and its environs.¹⁰³ A major low-angle thrust fault, now no longer active, virtually separates the landscapes of the upper and lower sanctuaries, and from this fault springs fresh water.¹⁰⁴ Thus the fountain house, stoa, and Agno fountain are all located along the trace of this fault; even the ancient pathways appear to follow this fault trace, which provides a solid “footwall” foundation and a source of water for travelers. The anomalously large flat expanse of land that became the hippodrome site owes its geomorphic origin to the combination of bedrock structure and orientation, local stream-drainage and erosion history, and minor fill.¹⁰⁵ Blocks in the walls of built structures were quarried from a particular limestone formation in the area, the same formation exploited in the construction of the Temple of Apollo Epikourios at Bassai.

A prime candidate for the mythological birth cave of Zeus is located within 2 km of the lower sanctuary and occupies the very hinge of a large impressive fold structure (an anticline), which is more than 800 m in height. Limestone beds within the fold display outcrop-scale geologic structures that will likely emerge as a type locality for quasi-flexural folding.¹⁰⁶

The interrelationships of surface geological mapping, subsurface geological structure, and geoarchaeology have been captured by Davis and others in powerful 3D models and 3D animations (based on Davis's detailed geological mapping); the resulting visualization framework will be helpful to non-geologists investigating Mt. Lykaion.¹⁰⁷

102. Davis 2009b, pp. 36–38; 2010.
103. Davis 2008; 2009b, pp. 3, 7, 31–36.
104. Davis 2009b, pp. 17–19.
105. Davis 2009b, p. 37.
106. Davis 2009a, 2014.
107. Davis et al. 2009; Similox-Tohon et al. 2009; Similox-Tohon et al. 2011.

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APPENDIX 3

THE MICROMORPHOLOGY OF MT. LYKAION, 2006–2010

BACKGROUND AND AIMS

Micromorphological and geochemical analyses of the archaeological and natural sediments at Mt. Lykaion were initiated in the lower part of the sanctuary in 2006 and in the upper part of the sanctuary in 2007. Sampling and analyses were conducted by Susan Mentzer, except in 2009 when samples were collected by Arvey Basa. The main goals were to (1) characterize the natural sediments and soils present on the mountain slopes and summit, (2) identify anthropogenic sediments and the human activities that contributed to their formation, and (3) determine how soil-forming processes and other postdepositional alterations impacted the preservation of archaeological features. In the upper part of the sanctuary, the sediments were compared to nearby soil profiles in order to reconstruct the local environment as it existed prior to the period in which the altar was used.

METHODS

Micromorphology, or the petrographic study of undisturbed sediments in thin section, is frequently employed to reconstruct the formation processes of archaeological sites.¹⁰⁸ The technique has proven especially useful for the identification of anthropogenic combustion features and the taphonomic processes that contribute to their morphology and composition in excavation;¹⁰⁹ hence, its utilization here in the study of the Mt. Lykaion altar sediments. Micromorphology has also been utilized in a number of additional contexts within Greece, including Neolithic, Bronze Age, and Classical Greek habitation and sanctuary sites.¹¹⁰ Following methods outlined by Goldberg and Macphail,¹¹¹ oriented blocks of intact sediment were collected from exposed profiles and wrapped in packing tape or plaster. Loose sediment samples were collected in parallel, or along vertical transects for additional geochemical analyses. The sediment blocks were oven-dried, impregnated with polyester resin, cured, and sliced with a rock saw to fit one or more 5 × 7 cm petrographic thin sections.

The thin sections were analyzed in low magnification using a flatbed scanner and stereomicroscope, and at moderate to high magnifications

108. Courty, Goldberg, and Macphail 1989.

109. Mentzer, forthcoming.

110. Bookidis et al. 1999, pp. 45–49; French and Whitelaw 1999; Karkanas 2006; Karkanas and Efstratiou 2009.

111. Goldberg and Macphail 2003.

using a petrographic microscope equipped with plane-polarized light, cross-polarized light, and blue light fluorescence, as well as a scanning electron microscope (SEM). Using criteria outlined by Stoops,¹¹² the composition, texture, related distribution, fabric, sedimentary microstructure, and pedofeatures were described for each sample. In combination, these observations can be used to understand the formation of archaeological, geological, and pedological (soil) layers within the samples and to identify postdepositional processes that impact their expression today. Analyses of loose sediment samples collected in parallel with the micromorphological blocks included measurements of the abundance of calcium carbonate and plant-available phosphorus, and measurements of the sediment pH.¹¹³ These analyses provided additional information about the composition of the sediments, the state of preservation of the calcareous component of the ashy deposits, and the impact of human activity on the character of the sediments.

Twenty-four sample blocks were collected from the lower sanctuary between 2006 and 2010. Twenty-eight sample blocks were collected from the upper part of the sanctuary and nearby soils between 2007 and 2010. Some preliminary results of the ongoing analyses are described below.

RESULTS: UPPER SANCTUARY

Analyses of blocks and loose samples collected from trench Z helped to refine the descriptions of the sedimentary units identified in the field and provided high-resolution information about the composition of key archaeological features.

The lowermost sedimentary units in the field range in color and texture from reddish and clay-rich just above the bedrock to the “brownish clayey” and “brownish gray silty” sediment that is associated with the concentrations of prehistoric pottery. In thin section, these sediments contain very abundant geogenic materials, with less abundant inclusions of anthropogenic material. The geogenic fraction consists of gravel- and sand-sized fragments of chert and silt-sized grains of quartz in a matrix of clay that ranges in color from red to brown. Anthropogenic materials include sand-sized fragments of burned bone, charcoal, and fat-derived char. Compositional similarities between the geogenic materials in these units and nearby soils, as well as the presence of secondary features such as clay void coatings and iron oxide nodules, suggest that the natural sediment that was present on the mountain summit prior to human activity was a thin, red Mediterranean soil.

The sediment associated with the “area of intense burning” (Feature Z3) was described in the field as gray in color, silty in texture, and “packed with gray ash.” In thin section, this deposit is massive, and almost entirely anthropogenic in origin. The gravel-sized materials include angular fragments of limestone and fragments of calcined bone. Calcined bone is the primary component of the sand-sized grain fraction, while the silt fraction is composed of a mixture of fragments of calcined bone and rhomb-shaped aggregates of calcite crystals. This latter material is the calcareous component of wood ashes¹¹⁴ and constitutes the majority of the sedimentary matrix. The rhombic morphologies visible in thin section and in SEM secondary

112. Stoops 2003, pp. 1–184.

113. Dreimanis 1962; Mehlich 1984.

114. Canti 2003.

electron images indicate that the wood ashes are very well preserved. Both the wood ashes and the abundant sand- and silt-sized fragments of calcined bone contribute to the gray color of this deposit in the field. Sand-sized fragments of charcoal and fat-derived char are also present. Geogenic materials other than limestone fragments are exceptionally rare and include silt-sized grains of quartz.

The upper portion of the sequence, which in the field was described as “ashy, greasy black soil,” also contains a significant amount of anthropogenic material. Gravel-sized materials include fragments of limestone and calcined bone. Fragments of calcined bone make up the majority of the sand-sized fraction. The fine sedimentary matrix is variable in composition and fabric. From 30 to 70 cm depth, the matrix contains wood ashes mixed with finely comminuted fragments of charcoal, fat-derived char, and organic material. Above 30 cm depth, wood ashes are absent. Relative to Feature Z3, these sediments are more porous, with the silt- and sand-sized materials forming aggregates (fecal pellets). The high-resolution analyses suggest that the abundant charcoal and fat-derived char may be responsible for the greasy feel of the sediment, and its black color in the field. “Ashy” sediments, identified in the field by white to gray inclusions, include both wood ashes (below 30 cm depth) and fragments of burned bone.

The micromorphological analyses indicate that the present distribution of burned materials within the altar is partially a result of postdepositional processes, specifically the dissolution of calcium carbonate and reworking of fine materials by insects and small animals. Measurements of abundance of calcium carbonate in loose sediment samples collected along several vertical transects suggest that calcite dissolution occurred in the upper 30 cm. As described above, micromorphological samples collected from the ground surface and up to 30 cm depth contain few calcareous ashes, while fragments of limestone exhibit features indicative of chemical dissolution. Below 30 cm depth, ashes are present and secondary carbonates form pendants and coatings on limestone and bone fragments. Many samples contain microscopic evidence of bioturbation, including tubular burrows and fecal pellets containing calcined bone and ash mixed with organic material. These features are especially abundant in samples collected from the upper portion of the sequence.

In sum, the preliminary results of the micromorphological study of the altar sediments confirm that the majority of the sediment covering the mountain summit is anthropogenic in origin, and is derived from the intentional burning of animal bone and other materials.

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APPENDIX 4

ARCHAEOBOTANICAL DATA

Archaeobotanical analyses were carried out at the Sanctuary of Zeus on Mt. Lykaion during the 2008–2010 seasons, with samples taken from both the upper and lower parts of the sanctuary. The analysis work was conducted at the Fitch Laboratory at the British School at Athens.

From the upper sanctuary, many samples were analyzed from trench Z, producing interesting results. There is evidence for grain offerings beginning at the bedrock level of the altar and continuing up into the higher levels. In a bedrock (Mycenaean) level in ZIIN (basket 92) and in ZIS-IE (basket 139) there is evidence for barley grains. In a number of the baskets (Z 92, Z 97, Z 86) the cereals are distorted from the high firing temperatures and are difficult to identify.

The plant remains observed from samples from other parts of the altar (column B6 in ZIE-IS, basket 123) have a “glassy” appearance due to their exposure to high temperatures. It is clear that the predominant species found in all levels of the altar is barley. Greater quantities of barley are seen in ZIS-IE, column A8, basket 132 (the PG layer above the bedrock level), and ZIS-IE, column A5, basket 123 (Archaic level). Other species such as grape and fig (represented both by seeds and by parts of whole fruits), grass pea, small fragments of nut shells, which cannot be further identified, and bread wheat occasionally also occur.

The material does not reveal an especially great diversity in species, nor are they found in very large quantities. However, what we have found is very important, as this is a very unique type of site. The limited evidence of charcoal from the altar could indicate that the botanical remains were not burned using wood or other material in situ, as wood charcoal would have been preserved in greater quantities. In addition, according to the archaeozoological analysis (see Appendix 5), the animal bones found in the altar were heavily burned, in temperatures that reached up to 800°C. On the basis of such data, the archaeobotanical remains appear to have been separate offerings of burned food, distinct from the animal sacrifice, as the heat needed to char the bones to such a degree would turn the plant remains to ash; they could not be preserved at such high temperatures. It therefore appears that the burning of the animal bones and the burning of the plant remains could represent two different episodes of ritual at the

altar. In ritual contexts, the deposition of already charred plant remains (as opposed to burning in situ) has been suggested for burial contexts at the Bronze Age sites of Petras, Argos, Kirrha, and Tsikalario at Naxos.¹¹⁵ However, further analysis is required to identify this aspect more clearly at the altar of Mt. Lykaion.

115. Margaritis, forthcoming.

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APPENDIX 5

PRELIMINARY FAUNAL REPORT

The focus of the analysis of the faunal materials from the 2007–2011 field seasons at Mt. Lykaion was on two areas of the mountaintop ash altar in trench Z. The first was the entire stratigraphic sequence from a 2 × 2 m unit (ZIIS) (see Figs. 5, 6). This unit was chosen because it is from the deepest area of the altar, and it contains all of the observed stratigraphic units. A total of 17 baskets from six stratigraphic layers and one feature were studied, yielding 10,603 identified specimens.¹¹⁶ The second analyzed area is comprised of multiple Features, as well as the baskets that make up the stratigraphic layer SU 7. SU 7 is the lowest layer, which lies directly on top of bedrock across the altar, and includes the lowest basket of ZIIS at the southern end of trench Z (see Fig. 6). It is quite thin in many areas of the site, but it is associated with deposits of unburned sediments and somewhat lower incidences of burned bone in a small part (ZIIN).¹¹⁷ Twenty baskets, including three Features, were analyzed from SU 7, for a total of 1,730 identified specimens. For analytical purposes the baskets were collapsed into stratigraphic layers defined by Belis and Diffendale.¹¹⁸

A major goal of the faunal analysis of the ash altar is to understand changes in the way animals were used in a ritual context at Mt. Lykaion over time. During the use life of the site, it may be expected that rituals involving the animals changed, perhaps in the form of the species chosen for sacrifice, the age of animals sacrificed, the parts of the animals that were offered, the degree to which the elements were burned, or whether they were burned at all. A lack of such change may be indicative of cultural continuity, at least in terms of ritual behavior. It must be cautioned that the stratigraphic integrity of the site continues to be verified through ongoing geoarchaeological studies and radiometric dating, which would allow us to confidently interpret similarities or differences in the faunal remains through the sequence.

The faunal materials from each basket were sorted for identifiability, then the identifiable fraction and the total bone from each basket was weighed. Skeletal specimens were assigned to genus and species, family, or body-size categories. In the case of sheep and goat bones, it is often difficult to distinguish the specific species, even with the help of a comparative

116. Following Rohn (2008, pp. 2–3), revised by Belis and Diffendale (2010, pp. 4–9).

117. Belis and Diffendale 2010, p. 6.

118. Belis and Diffendale 2010, pp. 4–9.

collection, so the two are combined in this study. The degree of fragmentation and deformation from burning likewise makes species-specific identifications nearly impossible in this study. Faunal fragments were also identified according to their anatomical element of the skeleton. Terminology for basic counting units follows Grayson and Lyman, and the coding of elements, portion-of-element, age criteria, and taphonomic variables follow Stiner.¹¹⁹ Other observations were recorded for each specimen, including fusion state in the case of bones, wear stages for mandibular teeth, presence of burning damage and burning intensity stages following Stiner et al., and bone surface damage from human and environmental factors.¹²⁰

Fragmentation rates are exceptionally high in trench Z and identifiability is low, with about 10% by weight of the remains being identifiable to species or element. Despite this, the Mt. Lykaion faunas provide valuable insight into ritual behaviors throughout the use of the site.

The dominant species in the ZIIS series is sheep/goat, comprising 94%–98% of the identifiable fraction of each basket. Domesticated pig and cattle were identified in trace amounts, as were a few intrusive wild microfaunal taxa (rodents, lizards, and amphibians). There is very little variation between the different stratigraphic layers in ZIIS when it comes to species representation.

The overwhelming majority (98%) of remains from all layers in unit ZIIS are burned. Burn frequencies exclude intrusive small animals, which are unburned in all cases. There is no trend in the amount of burning through the sequence. Over 85% of the bones in ZIIS were partially to completely calcined, indicating direct or prolonged exposure to temperatures over 650°C, which causes a change in the crystalline structure of the bone.¹²¹ This severe degree of burning likely came from remains being burned while partially or completely defleshed, from repeated burning events in the same areas of the site, or some combination of the two scenarios.

A fairly low frequency of butchery damage (cuts, hacks, or impact damage) was recorded from the ZIIS series. This is largely due to the condition of the bone; burning causes spalling and cracking that often obscures cuts and other damage. Butchery damage was observed on 0.4%–4.3% of the identifiable remains, depending on the stratigraphic unit. There are no temporal trends in the frequency of cut or hack marks. Many of the hack marks and impact fractures on the Mt. Lykaion assemblage are on the distal femur where the upper hind leg was dismembered from the lower leg bones. In some cases, the femur was snapped at the articulation of the hip joint where the leg was torn from the pelvis.

A range of skeletal elements are represented for sheep/goat, pig, and cattle, though most are from the thighs (femurs and patellas) or tails (caudal vertebrae) of sheep/goats. There are no major differences in the representation of elements through the stratigraphic layers. Square ZIIS contains a total of 957 femurs and 1,743 patellas, from at least 874 individuals (the calculations from element to individuals in this case is not simple division, as different baskets were evaluated through the unit). It must be cautioned that the term “individuals” is something of a misnomer, since selective portions of animals were brought to the site. The total of 611 caudal vertebrae

119. Grayson 1984, pp. 16–48; Lyman 1994, pp. 100–102; Stiner 1994, p. 19; 2005, pp. 237–240.

120. Stiner et al. 1995, p. 226; see also Fisher 1995, pp. 12–46.

121. Shipman, Foster, and Schoeninger 1984, p. 320.

represents at least 163 animals, depending on the number of tail vertebrae in the particular breed being offered.

Potential side bias for sheep/goat elements was evaluated, based on femurs and patellas. Two stratigraphic layers (SU 7 and SU 17) display a slight bias toward right elements, and one (SU 2) has a mild left-side bias. Further statistical analyses must be conducted to determine if this is a product of sample size, or if there are true biases in these layers. SU 17 has the largest disparity between left and right elements (1:1.28), so it has the greatest potential for a true bias. The fact that there is no set bias through the layers indicates that this was not a practice that persisted through the years, if it occurred at all.

Age at death for animals can be determined by the fusion of long-bone ends, which occurs at a known, predictable rate.¹²² In this assemblage, all fusion data come from femurs. There do not appear to be any changes in preference for the age at which animals were slaughtered through the ZIIS sequence. In all layers, the majority (69%–89%) of the animals offered at the site were younger than three years of age at death. At Mt. Lykaion, there is a clear preference for older juvenile sheep/goats for offerings. These animals would have nearly reached their maximum size, while still being at a prime age for eating.

Within layer SU 7, there is a significant difference between the faunal remains uncovered in baskets all along bedrock and those uncovered in areas defined as Features, in ZIIN (see Fig. 5). In general, the represented species in the Features are the same as in ZIIS, with domesticated sheep/goat, pigs, and cattle, as well as intrusive small animals. In the nonfeature areas, sheep/goat dominate the baskets, making up 70%–97% of the identifiable remains. The Features have a different representation of species than the rest of SU 7, though the sample sizes are small. The frequency of sheep/goat in the Features is much lower (18%–57%), and pig is more well represented (13%) than in the rest of the altar deposits.

Burning frequencies for bones in the Features in SU 7 are entirely different from the majority in the ZIIS series, ranging from 13% to 87% burned, depending on the individual feature (though these faunal remains represent a very tiny minority of the total animal bone from bedrock). Specimens from the nonfeature areas on bedrock (SU 7) display frequencies of burning similar to those observed in the entire unit ZIIS. The frequency of butchery damage on the SU 7 samples is similar to that found throughout the ZIIS stratigraphic sequence. In general, butchery damage was rarely identified, probably because of the burned, cracked condition of the bone. Frequencies of cut marks are likewise low in the Features.

In terms of the body parts represented in SU 7, there is a range of elements belonging to different species, but the vast majority of the remains are sheep/goat femurs, patellas, and caudal vertebrae, particularly from the nonfeature areas. In all, SU 7 contains 166 femurs and 182 patellas, from at least 90 individuals. Seventy-eight caudal vertebrae represent approximately 14 individuals.

There is a significant difference between the elements found in the Feature baskets of SU 7 and the rest of SU 7. This is true for sheep/goat as well as pig. Most notably, elements other than femurs and patellas are

122. Silver 1969, pp. 283–287; Reitz and Wing 1999, pp. 75–76.

represented in higher numbers in the Features. This difference either reflects the fact that more of the whole animal (sheep or goat) was offered on these occasions or that portions other than thighs and tails were sacrificed. More pig elements were recovered from the Features, though the numbers are still extremely small. Interestingly, no pig femurs, patellas, or caudal vertebrae were recorded from any of the other baskets from SU 7. Pig is represented in these units by cranial fragments (including teeth) and phalanges. Differences in the frequency of pig remains as well as the represented elements between the SU 7 Features and later stratigraphic layers indicate a difference in which animals and elements were appropriate for offerings in earlier and later phases of site use.

Sheep/goat element side bias was also evaluated for SU 7, with results similar to those found for unit ZIIS. There is no evidence for side bias in the femurs or patellas from any of the baskets from SU 7. The sample sizes from the Feature areas are too small to determine whether or not right or left elements were preferentially offered. Because more axial elements are represented in the Features from SU 7, offerings in earlier periods probably focused more on whole animals, as opposed to a particular side of the body.

Age-at-death data are similar for SU 7 and ZIIS. Most animals offered in the nonfeature units of layer SU 7 were younger than three years of age at death (78%). Additional age data must be noted for the Features. One contains a fetal or neonate sheep/goat. The remains of this individual are unburned, and the skeleton is more complete than most of the other faunas found at the site. It is possible that the animal died naturally on the mountaintop, or that a young kid or lamb was sacrificed in a different ritual tradition than is found in later periods. Two additional Features contain at least one juvenile pig skull each, from individuals younger than six weeks of age, based on tooth eruption. Again, these remains are unburned, but are from only a specific body part, so it is likely that they were brought to the site intentionally.

Overall, the faunal sequence from the ash altar at Mt. Lykaion is marked by extreme homogeneity through the stratigraphic layers, and across the site. For the most part, the faunal remains are made up almost entirely of the upper hind legs and tails of sheep or goats, with very small amounts of pig and cattle. The remains are extremely burned and fragmented in all baskets. Frequencies of fragmentation and burning are probably related, because as bone is more heavily burned it becomes brittle and breaks easily with trampling and further deposition.¹²³ No clear side bias was apparent through the sequence, though at least one layer may indicate a slight bias. In general, sheep or goats chosen for sacrifice were younger than 36 months. It is unclear to what extent the ash altar sediments are mixed, though the presence of small, burrowing creatures indicates that there is some degree of disturbance. Micromorphological and other geoarchaeological work should help identify potential mixing.

The faunal materials from the Features in stratigraphic layer SU 7, in ZIIN (which represent a very small sample of the entire layer) are an exception to the patterns described above. The Features lie directly on top of bedrock (as do all the baskets of SU 7) and are distinct in their formation, as the sediments and artifacts found within them are mostly unburned. The

123. Stiner et al. 1995, pp. 229–230.

faunal remains from these contexts have lower incidences of burning, a wider representation of elements, and a difference in the composition of species. Specifically, slightly more pig remains are found in Feature contexts. The ages of animals found in the Features also differ from other areas of the altar, with the presence of a fetal or neonate sheep/goat and two pig crania. The samples sizes from the Features are extremely small compared with the overlying layers at the site, yet they are still informative and distinct.

The faunal sequence at Mt. Lykaion offers one of the longest records of ritual behavior in Greece. Although there is some heterogeneity represented in the faunal material from the lowest, bedrock level, the great majority of the bones were burned fragments from goat and sheep, representing continuity of ritual practices, at least in terms of the treatment of animals, for over 1,000 years. Ongoing dating at the site will shed light on its range of use, and continued analysis of cultural remains will provide a broader context within which the faunal remains can be interpreted.

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REFERENCES

- Belis, A., and D. P. Diffendale. 2010. "Mt. Lykaion Excavation and Survey Project: Trench Z 2010 Final Report," unpublished.
- Bookidis, N., J. Hansen, L. Snyder, and P. Goldberg. 1999. "Dining in the Sanctuary of Demeter and Kore at Corinth," *Hesperia* 68, pp. 1–54.
- Boss, M. 2000. *Lakonische Votivgaben aus Blei* (AERIA-Buch 1), Würzburg.
- Buck, R. J. 1964. "Middle Helladic Mattpainted Pottery," *Hesperia* 33, pp. 231–313.
- Burkert, W. 1983. *Homo Necans: The Anthropology of Ancient Greek Sacrificial Ritual and Myth*, trans. P. Bing, Berkeley.
- . 1985. *Greek Religion*, trans. J. Raffan, Cambridge, Mass.
- Canti, M. G. 2003. "Aspects of the Chemical and Microscopic Characteristics of Plant Ashes Found in Archaeological Soils," *Catena* 54, pp. 339–361.
- Coldstream, J. N. 2003. *Geometric Greece: 900–700 B.C.*, 2nd ed., London.
- Cook, A. B. 1914. *Zeus, God of the Bright Sky*, Cambridge.
- Coulson, W. D. E. 1985. "The Dark Age Pottery of Sparta," *BSA* 80, pp. 29–84.
- . 1986. *The Dark Age Pottery of Messenia* (SIMA-PB 43), Göteborg.
- Courty, M. A., P. Goldberg, and R. I. Macphail. 1989. *Soils and Micromorphology in Archaeology* (Cambridge Manuals in Archaeology), Cambridge.
- Davis, G. H. 2008. "Peculiar Active-Tectonic Landscape within the Sanctuary of Zeus at Mt. Lykaion (Peloponnese, Greece)," *Eos: Transactions of the American Geophysical Union, Fall Meeting Supplement*, vol. 89, no. 53, abstract T21B-1944.
- . 2009a. "Fold Mechanisms and Disharmony in 'Zeus' Anticline, Mt. Lykaion, Peloponnese, Greece," *Geological Society of America, Abstracts with Programs*, vol. 41, no. 7, p. 569.
- . 2009b. "Geology of the Sanctuary of Zeus, Mount Lykaion, Southern Peloponnese, Greece, and Field Guide," in *Geology of the Sanctuary of Zeus, Mount Lykaion, Southern Peloponnese, Greece*, ed. G. H. Davis, *Journal of the Virtual Explorer*, pp. 1–58; <http://virtualexplorer.com.au/journal/2009/33>.
- . 2010. "Geoarchaeology of the Sanctuary of Zeus, Mt. Lykaion, Peloponnese, Greece," *Geological Society of America, Abstracts with Programs*, vol. 42, no. 5, p. 29.
- . 2014. "Quasi-Flexural Folding of Pseudo-Bedding," *Geological Society of America Bulletin* 126, pp. 680–701.
- Davis, G. H., M. A. Reifschneider, F. Borraccini, and D. Similox-Tohon. 2009. "Iterative Geologic Mapping and 3D Structural Modeling to Identify Spatial Inconsistencies and Create Accurate Visualization Framework for Geoarchaeological Interpretations: Mt. Lykaion (Greece) Sanctuary of Zeus Case Study: Part 1, Mapping," *Geological Society of America, Abstracts with Programs*, vol. 41, no. 7, p. 167.
- Dawkins, R. M., ed. 1929. *The Sanctuary of Artemis Orthia at Sparta: Excavated and Described by Members of the British School at Athens, 1906–1910* (Society for the Promotion of Hellenic Studies, Suppl. Paper 5), London.
- Demakopoulou, K., and J. H. Crowel. 1998. "Some Mycenaean Tombs at Palaiokastros, Arcadia," *BSA* 93, pp. 269–283.
- Dickinson, O. T. P. K. 1994. *The Aegean Bronze Age* (Cambridge World Archaeology), Cambridge.
- Dietz, S. 1980. *Asine II: Results of the Excavations East of the Acropolis, 1970–1974*, Fasc. 2, *The Middle Helladic Cemetery, the Middle Helladic and Early Mycenaean Deposits* (*ActaAth* 4°, 24), Stockholm.
- Dreimanis, A. 1962. "Quantitative Gasometric Determination of Calcite and Dolomite by Using Chittick Apparatus," *Journal of Sedimentary Petrology* 32, pp. 520–529.
- Dugas, C. 1921. "Le sanctuaire d'Athéna Alea à Tégée avant le IV siècle," *BCH* 45, pp. 335–435.
- Eder, B. 2009. "The Late Bronze Age/Early Iron Age Transition in Western Greece: Submycenaean Studies," in *LH IIIC Chronology and Synchronisms III: LH IIIC Late and the Transition to the Early Iron Age. Proceedings of the International Workshop Held at the Austrian Academy of Sciences at Vienna, February 23 and 24, 2007*, ed. S. Deger-Jalkotzy and A. E. Bächle, Vienna, pp. 133–149.
- Felten, F., W. Gaus, and R. Smetana, eds. 2007. *Middle Helladic Pottery and Synchronisms. Proceedings of the International Workshop Held at Salzburg, October 31st–November 2nd, 2004* (Ägina-Kolonna, Forschungen und Ergebnisse; Contributions to the Chronology of the Eastern Mediterranean 14), Vienna.
- Fisher, J. W., Jr. 1995. "Bone Surface Modifications in Zooarchaeology," *Journal of Archaeological Method and Theory* 2, pp. 7–68.
- French, C. A. I., and T. M. Whitelaw. 1999. "Soil Erosion, Agricultural Terracing, and Site Formation Processes at Markiani, Amorgos, Greece: The Micromorphological Perspective," *Geoarchaeology* 14, pp. 151–189.
- French, E. B. 1971. "The Development of Mycenaean Terracotta Figurines," *BSA* 66, pp. 101–187.
- Goldberg, P., and R. I. Macphail. 2003. "Short Contribution: Strategies and Techniques in Collecting Micromorphology Samples," *Geoarchaeology* 18, pp. 571–578.
- Grayson, D. K. 1984. *Quantitative Zooarchaeology: Topics in the Analysis of Archaeological Faunas* (Studies in Archaeological Science), Orlando.
- Hamilakis, Y., and E. Konsolaki. 2004. "Pigs for the Gods: Burnt Animal Sacrifices as Embodied Rituals at a Mycenaean Sanctuary," *OJA* 23, pp. 135–151.
- Hammond, L. 1998. "The Miniature Votive Vessels from the Sanctuary of

- Athena Alea at Tegea" (diss. Univ. of Missouri–Columbia).
- Howell, R. 1970. "A Survey of Eastern Arcadia in Prehistory," *BSA* 65, pp. 79–127.
- . 1992. "Final Neolithic Phase," in *Excavations at Nichoria in Southwest Greece 2: The Bronze Age Occupation*, ed. W. A. McDonald and N. C. Wilkie, Minneapolis, pp. 8–14.
- Jost, M. 1985. *Sanctuaires et cultes d'Arcadie* (Études péloponnésiques 9), Paris.
- . 1996. "The Distribution of Sanctuaries in Civic Space in Arcadia," in *Placing the Gods: Sanctuaries and Sacred Space in Ancient Greece*, ed. S. E. Alcock and R. Osborne, Oxford, pp. 217–230.
- Karkanas, P. 2006. "Late Neolithic Household Activities in Marginal Areas: The Micromorphological Evidence from the Kouveleiki Caves, Peloponnese, Greece," *JAS* 33, pp. 1628–1641.
- Karkanas, P., and N. Efstratiou. 2009. "Floor Sequences in Neolithic Makri, Greece: Micromorphology Reveals Cycles of Renovation," *Antiquity* 83, pp. 955–967.
- Kontopoulos, K. 1898. *Prakt* 1898, pp. 17–18.
- Kourouniotis, K. 1903. "Ἀνασκαφή Λυκαίου," *Prakt* 1903, pp. 50–52.
- . 1904a. "Ἀνασκαφή Λυκαίου," *ArchEph* 1904, cols. 153–214.
- . 1904b. "Ἀνασκαφή Λυκαίου," *Prakt* 1904, pp. 32–34.
- . 1905. "Κατάλογοι Λυκαίων," *ArchEph* 1905, pp. 161–178.
- . 1909. "Ἀνασκαφή Λυκαίου," *Prakt* 1909, pp. 185–200.
- Krzyszowska, O. 2005. *Aegean Seals: An Introduction* (BICS Suppl. 85), London.
- Kyrieleis, H. 2006. *Anfänge und Frühzeit des Heiligtums von Olympia: Die Ausgrabungen am Pelopion 1987–1996* (*OIForsch* 31), Berlin.
- Lamb, W. 1925–1926. "Arcadian Bronze Statuettes," *BSA* 27, pp. 133–148.
- Lambrinoudakis, V. 1981. "Remains of the Mycenaean Period in the Sanctuary of Apollon Maleatas," in *Sanctuaries and Cults in the Aegean Bronze Age. Proceedings of the First International Symposium at the Swedish Institute in Athens, 12–13 May 1980* (*ActaAth* 4^e, 28), ed. R. Hägg and N. Marinatos, Stockholm, pp. 59–65.
- Lemos, I. S. 2002. *The Protogeometric Aegean: The Archaeology of the Late Eleventh and Tenth Centuries B.C.* (Oxford Monographs on Classical Archaeology), Oxford.
- Lerna IV = M. H. Wiencke, *The Architecture, Pottery, and Stratification of Lerna III (Lerna: A Preclassical Site in the Argolid IV)*, Princeton 2000.
- Lyman, R. L. 1994. *Vertebrate Taphonomy* (Cambridge Manuals in Archaeology), Cambridge.
- Marakas, G. 2010. *Ritual Practice between the Late Bronze Age and Protogeometric Periods of Greece* (*BAR-IS* 2145), Oxford.
- Margaritis, E. Forthcoming. "Acts of Destruction and Acts of Preservation: Plants in the Ritual Landscape of Prehistoric Greece," in *PHYSIS: L'environnement naturel et la relation homme-milieu dans le monde égéen protohistorique. Actes de la 14^e Rencontre Égéenne Internationale, Paris, Institut National d'Histoire de l'Art, 11–14 décembre 2012* (*Aegaeum* 37), ed. G. Touchais, R. Laffineur, and F. Rougemont, Liège.
- McDonald, W. A., W. D. E. Coulson, and J. Rosser. 1983. *Excavations at Nichoria in Southwest Greece 3: Dark Age and Byzantine Occupation*, Minneapolis.
- Mehlich, A. 1984. "Mehlich 3 Soil Test Extractant: A Modification of Mehlich 2 Extractant," *Communications in Soil Science and Plant Analysis* 15, pp. 1409–1416.
- Mentzer, S. M. Forthcoming. "Microarchaeological Approaches to the Identification and Interpretation of Combustion Features in Prehistoric Archaeological Sites," *Journal of Archaeological Method and Theory*.
- Morgan, C. 2003. *Early Greek States beyond the Polis*, New York.
- Moschos, I. 2009. "Western Achaea during the Succeeding LH IIIC Late Period—The Final Mycenaean Phase and the Submycenaean Period," in *LH III C Chronology and Synchronisms III: LH III C Late and*

- the Transition to the Early Iron Age. Proceedings of the International Workshop Held at the Austrian Academy of Sciences at Vienna, February 23 and 24, 2007* (DenkschrWien 384), ed. S. Deger-Jalkotzy and A. E. Bächle, Vienna, pp. 235–238.
- Mountjoy, P. A. 1999. *Regional Mycenaean Decorated Pottery*, Rahden.
- Mylonas, G. E. 1943. “The Lykaian Altar of Zeus,” in *Classical Studies in Honor of William Abbott Oldfather*, Urbana, Ill., pp. 122–133.
- . 1946. “The Eagle of Zeus,” *CJ* 41, pp. 203–207.
- Nielsen, T. H. 1999. “The Concept of Arkadia—The People, Their Land, and Their Organization,” in *Defining Ancient Arkadia. Symposium, April 1–4, 1998* (Acts of the Copenhagen Polis Centre 6), ed. T. H. Nielsen and J. Roy, Copenhagen, pp. 16–79.
- Nikoloudis, S. 2001. “Animal Sacrifice in the Mycenaean World,” *JPR* 15, pp. 11–28.
- Nordquist, G. 1987. *A Middle Helladic Village: Asine in the Argolid*, Uppsala.
- Nordquist, G., M. E. Voyatzis, and E. Østby. 2014. *Tegea I: Investigations in the Temple of Athena Alea, 1991–1994* (Papers and Monographs from the Norwegian Institute at Athens 3), Athens.
- Olympia IV* = A. Fürtwangler, *Die Bronzen und die übrigen kleineren Funde von Olympia (Olympia: Die Ergebnisse der von dem deutschen Reich veranstalteten Ausgrabung IV)*, Berlin.
- Østby, E., ed. 2005. *Ancient Arcadia: Papers from the Third International Seminar on Ancient Arcadia, Held at the Norwegian Institute at Athens, 7–10 May 2002*, Athens.
- Pavuk, P. 2010. “Minyan or Not: The Second Millennium Grey Ware in Western Anatolia and Its Relation to Mainland Greece,” in *MESOHELLADIKA: The Greek Mainland in the Middle Bronze Age* (BCH Suppl. 52), ed. A. Philippa-Touchais, G. Touchais, S. Voutsaki, and J. C. Wright, Athens, pp. 931–943.
- Philippa-Touchais, A., G. Touchais, S. Voutsaki, and J. C. Wright, eds. 2010. *MESOHELLADIKA: The Greek Mainland in the Middle Bronze Age* (BCH Suppl. 52), Athens.
- Pullen, D. 2011. *The Early Bronze Age Village on Tsoungiza Hill (NVAP 1)*, Princeton.
- Reitz, E. J., and E. S. Wing. 1999. *Zooarchaeology*, Cambridge.
- Rohn, A. H. 2008. “Mt. Lykaion Excavation and Survey Project: Altar of Zeus, Trench Z,” unpublished.
- Romano, D. G. 1997. “Topographical and Architectural Survey of the Sanctuary of Zeus on Mt. Lykaion, Arcadia,” *AJA* 101, p. 374 (abstract).
- . 2005. “A New Topographical and Architectural Survey of the Sanctuary of Zeus at Mt. Lykaion,” in *Østby* 2005, pp. 381–396.
- Romano, D. G., and M. E. Voyatzis. 2010. “Excavating at the Birthplace of Zeus,” *Expedition* 52, pp. 9–21.
- Rutkowski, B. 1986. *The Cult Places of the Aegean*, New Haven.
- Salavoura, E. 2008. “Ρίπη, Στρατή, και ηνεμόεσσα Ενίσπη: Η ομηρική τριάδα-φάντασμα της Αρκαδίας,” in *Ιστορίες για την Αρχαία Αρκαδία: Proceedings of the International Symposium in Honor of James Roy: 50 Χρόνια Αρκάς, 1958–2008, May 9, 2008*, ed. Y. Pikoulas, Stemnitsa, pp. 73–90.
- Shipman, P., G. Foster, and M. Schoeninger. 1984. “Burnt Bones and Teeth: An Experimental Study of Color, Morphology, Crystal Structure, and Shrinkage,” *JAS* 11, pp. 307–325.
- Silver, I. A. 1969. “The Ageing of Domestic Animals,” in *Science in Archaeology: A Survey in Progress and Research*, ed. D. R. Brothwell and E. S. Higgs, New York, pp. 283–302.
- Similox-Tohon, D., S. Clelland, A. Moccia, and G. H. Davis. 2011. “3D Structural Model Building—The Mt. Lykaion (Greece) Sanctuary of Zeus Case Study,” *Geological Society of America, Abstracts with Programs*, vol. 43, no. 5, p. 302.
- Similox-Tohon, D., A. Scherrenberg, S. Clelland, and G. H. Davis. 2009. “Iterative Geologic Mapping and 3D Structural Modeling to Identify Spatial Inconsistencies and Create Accurate Visualization Framework for Geoarchaeological Interpretations: Mt. Lykaion (Greece) Sanctuary of Zeus Case Study: Part 2, Modeling,” *Geological Society of America, Abstracts with Programs*, vol. 41, no. 7, p. 168.
- Sinn, U. 2007. “Die Ίερὰ κορηφή der Arkader: Zur sakralen Topographie des Zeus-Heiligtums im Lykaion,” in *Αμύμονα Έργα: Τιμητικός τόμος για τον καθηγητή Βασίλη Κ. Λαμπρινουδάκη* (Αρχαιολογία 5), ed. E. Simantoni-Bournia, A. A. Laimou, L. G. Mendoni, and N. Kourou, Athens, pp. 177–188.
- Starkovich, B. M., G. W. L. Hodgins, M. E. Voyatzis, and D. G. Romano. 2013. “Dating Gods: Radiocarbon Dates from the Sanctuary of Zeus on Mt. Lykaion (Arcadia, Greece),” in *Proceedings of the 21st International Radiocarbon Conference, Paris, July 2012 (Radiocarbon 55)*, ed. A. J. T. Jull and C. Hatté, pp. 501–513.
- Stiner, M. C. 1994. *Honor among Thieves: A Zooarchaeological Study of Neandertal Ecology*, Princeton.
- . 2005. *The Faunas of Hayonim Cave, Israel: A 200,000-Year Record of Paleolithic Diet, Demography, and Society (BASPR 48)*, Cambridge.
- Stiner, M. C., S. Weiner, O. Bar-Yosef, and S. L. Kuhn. 1995. “Differential Burning, Fragmentation, and Preservation of Archaeological Bone,” *JAS* 22, pp. 223–237.
- Stocker, S. R., and J. L. Davis. 2004. “Animal Sacrifice, Archives, and Feasting at the Palace of Nestor,” in *The Mycenaean Feast (Hesperia 73)*, ed. J. C. Wright, Princeton, pp. 59–76.
- Stoops, G. 2003. *Guidelines for Analysis and Description of Soil and Regolith Thin Sections*, Madison.
- Taylour, W. D. 1970. “New Light on Mycenaean Religion,” *Antiquity* 44, pp. 270–280.
- . 1983. *The Mycenaean*, rev. ed., London.
- Taylour, W. D., and R. Janko. 2008. *Ayios Stephanos: Excavations at a Bronze Age and Medieval Settlement in Southern Laconia (BSA Suppl. 44)*, London.

- Thomas, P. 2005. "A Deposit of Late Helladic IIIB1 Pottery from Tsoungiza," *Hesperia* 74, pp. 451–573.
- Voyatzis, M. E. 1990. *The Early Sanctuary of Athena Alea at Tegea and Other Archaic Sanctuaries in Arcadia* (SIMA-PB 97), Göteborg.
- . 2005. "Pottery at the Crossroads: Ceramic Trends in Southeast Arcadia," in Østby 2005, pp. 467–482.
- Walberg, G. 2007. *Midea: The Megaron Complex and Shrine Area: Excavations on the Lower Terraces 1994–1997* (Prehistory Monographs 20), Philadelphia.
- Whittaker, H. 1997. *Mycenaean Cult Buildings: A Study of Their Architecture and Function in the Context of the Aegean and the Eastern Mediterranean* (Monographs from the Norwegian Institute at Athens 1), Bergen.
- . 2006–2007. "Burnt Animal Sacrifice in Mycenaean Cult: A Review of the Evidence," *OpAth* 31–32, pp. 183–190.
- Winter, F. E. 1971. *Greek Fortifications*, Toronto.
- Wright, J. C. 2004. "A Survey of Evidence for Feasting in Mycenaean Society," in *The Mycenaean Feast* (*Hesperia* 73), ed. J. C. Wright, Princeton, pp. 13–58.
- Zachos, K. L. 2008. *Ayios Dhimitrios: A Prehistoric Settlement in the Southwestern Peloponnese: The Neolithic and Early Helladic Periods* (BAR-IS 1770), Oxford.
- Zerner, C. W. 1978. "The Beginning of the Middle Helladic Period at Lerna" (diss. Univ. of Cincinnati).
- . 1986. "Middle Helladic and Late Helladic I Pottery from Lerna," *Hydra* 2, 58–74.
- Zerner, C. W., P. Zerner, and P. Windler, eds. 1993. *Wace and Blegen: Pottery as Evidence for Trade in the Aegean Bronze Age, 1939–1989: Proceedings of the International Conference Held at the American School of Classical Studies at Athens, Athens, December 2–3, 1989*, Amsterdam.
- Zolotnikova, O. 2005. "The Cult of Zeus Lykaion," in Østby 2005, pp. 105–119.

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