

A New Topographical and Architectural Survey of the Sanctuary of Zeus at Mount Lykaion

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During the summer of 1996 a team from the Mediterranean Section of the University of Pennsylvania Museum of Archaeology and Anthropology undertook a computerized above-ground topographical and architectural survey of the sanctuary of Zeus at Mount Lykaion. The objective of the survey was to create, by means of an electronic total station survey, a new and highly accurate map of the above ground and visible architectural components of the sanctuary including the areas of the ash altar, the *temenos* and the bases for the columns of Zeus on the southern peak of Mount Lykaion. Also included were the monuments, buildings and structures of the high mountain plateau located below the southern peak, including the *xenon*, stoa, area of seats and statue bases, fountain houses, hippodrome, stadium and bath facility. The survey has been keyed to the 1 : 5000 topographical maps from the Geographical Service of the Greek Army (ΓΥΣ). The survey project has produced an accurate map of the sanctuary and has also generated questions and thoughts for future work.

During the summer of 1996 a team from the Mediterranean Section of the University of Pennsylvania Museum of Archaeology and Anthropology undertook a computerized above-ground topographical and architectural survey of the sanctuary of Zeus at Mount Lykaion.¹ This mountain-top sanctuary was famous

1. The work was undertaken with the permission of the Ephor of Antiquities of Arkadia and Lakonia, Dr. Theodoros Spyropoulos, whom I thank for his assistance. I also thank the Director of the American School of Classical Studies at the time, Professor William D.E. Coulson, for his encouragement and assistance with this project. From the Arcadian village of Ano Karyes, I would thank Mr. Nikos Kostopoulos who was extremely cordial and helpful and who was responsible for arranging various critical logistical aspects of the project. I thank Annette Merle-Smith of Princeton, New Jersey and the Women's Committee of the University of Pennsylvania Museum for financial support that made the work at Mount Lykaion possible. The survey team consisted of Ms. Demi Andrianou and Mr. Kostis Kourelis of the University of Pennsylvania, Mr. Osama Tolba of the Massachusetts Institute of Technology, Miss Katy

in antiquity for its ash altar and sacred *temenos* dedicated to Zeus. On a lower mountain plateau was the area where the Lykaion games were held. The purpose of this article is to describe the work that was done, to present several new maps of the sanctuary in the context of its topographical setting, and to pose several questions for future research.²

The objective of the survey was to create, by means of an electronic total station survey, a new and highly accurate map of the above ground and visible architectural components of the sanctuary of Zeus, specifically the area of the ash altar, the *temenos* and the bases for the columns of Zeus on the southern peak of Mount Lykaion, as well as the monuments and structures of the high mountain plateau located below the southern peak. This lower area is where Pausanias (8.38.5) tells us that the Lykaion games were held before his time. A further objective of the research project was to put the new survey drawings into the context of the landscape and topography of Mount Lykaion.³ (Fig. 1)

Methodology

The electronic total station survey was keyed to the topographical maps of the area in scale 1 : 5000 from the Geographical Service of the Greek army (ΓΥΣ). This meant that we were able to utilize the geodetic pins of the ΓΥΣ and the associated co-ordinate system for all our survey data. As a result our survey was oriented to true north and we were able to accurately associate the topographical features of the maps, including contour lines, with the surveyed monuments and structures.⁴ The electronic total station provides for a highly accurate topo-

Romano of the Episcopal Academy and the undersigned as Director. I thank the students for their long hours, hard work and dedication to the project.

2. My original interest in the mountain-top sanctuary is due to Professor Eugene Vanderpool of the American School of Classical Studies at Athens, who first introduced me to the site in 1976 and who generously shared with me his knowledge, notes and hand-drawn plans of the Zeus altar and the upland sanctuary. My University of Pennsylvania dissertation included a chapter on the evidence for a stadium on Mount Lykaion. See Romano 1981, 172-7.

3. During the past 15 years or so there has been considerable development at the site of the sanctuary of Zeus at Mount Lykaion. There is now a quadrennial summer recreation of aspects of the ancient Lykaion games, the Lykaia, for children and youth that attracts participants and tourists to the location. A portion of the area of the ancient hippodrome is now being used in the summer as a track for the modern Lykaion games and there is also a parking facility near the south end of the hippodrome. There is a paved road that leads almost all the way to the lower sanctuary and there exists a modest dirt road up to the ash altar.

4. For a discussion of the methods of such a survey see Romano and Schoenbrun 1993, 177-90. The 1 : 5000 maps that we digitized included portions of the Megalopolis series, 7207-4 and 7207-6. I thank the ΓΥΣ for permission to use the co-ordinates of the geodetic pins in this area.

graphical and architectural survey that generates location as well as orientation and distance for the diagnostic features of a building, structure or monument. During the course of several academic terms in Philadelphia, following the summer survey, aspects of the 1 : 5000 topographical maps of the surrounding area were digitized.⁵ The resulting survey of the buildings and structures together with the digitized 1 : 5000 map is shown as Fig. 2 and a digital terrain model of a slightly larger area is seen as Fig. 3.

Historical background

In the 19th century the sanctuary was observed, reported and drawn by several early travelers. Abel Blouet drew a sketch of the valley and included a detailed drawing and plan of one of the buildings at the southern end of the valley.⁶ A few years later Ernst Curtius drew a sketch of the site including the outline of a portion of the hippodrome.⁷ The sanctuary was investigated briefly in 1897 by K. Kontopoulos, of the Greek Archaeological Society, who dug a few trial trenches in the area of the altar and the hippodrome.⁸ In the early 20th century K. Kourouniotis, also of the Greek Archaeological Society, continued work at the site and uncovered in a series of campaigns a portion of the ash altar and the *temenos* at the southern peak of Mount Lykaion as well as the general outline of the sanctuary in the upland valley below the peak. At the lower site Kourouniotis revealed several noteworthy buildings, including a *xenon*, a stoa, two fountain houses and an exedra.⁹ In addition a series of blocks and stele beddings were found to the east of the stoa as well as 4 rows of seats which lie to the north of it. To the southwest of the stoa was found an exedra. Two fountain houses were found in the area of the upland valley, one close to the *xenon* and another approximately one quarter of the way to the ash altar.

5. I thank the Director of the University of Pennsylvania Museum, Dr. Jerry Sabloff and the Curator-in-Chief of the Mediterranean Section, Dr. Donald White for their support. We utilized the laboratory and the resources of the Corinth Computer Project in the Mediterranean Section of the museum for the mapping and analytical work of this research. For the support of the laboratory and the work of the Corinth Computer Project I thank the 1984 Foundation.

6. Blouet 1833, pl. 33.

7. Curtius 1851, pl. vii.

8. Kontopoulos 1898.

9. Kourouniotis 1903, 1904a, 1904b, and 1909.

Ancient testimonia

Our best source for the description of Mount Lykaion is Pausanias who in Book 8 gives us the following information:

Paus. 8.38.5:

“There is on Mount Lykaion a sanctuary of Pan and a grove of trees around it, and a hippodrome in front of which is a stadion. In former times they used to hold the Lykaion games here. Here there are also bases of statues, now with no statues on them. On one of the bases is an elegiac inscription that declares that the statue was a portrait of Astyanax of the race of Arkas.”

Paus. 8.38.6:

“Among the marvels of Mount Lykaion the most wonderful is this. On it is a *temenos* of Lykaian 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 one year.”

Paus. 8.38.9:

“On the highest point of the mountain is a mound of earth, forming an altar of Zeus Lykaios and from it most of the Peloponnesos 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 Lykaian Zeus. I was reluctant to pry into the details of the sacrifice; let them be as they are and were from the beginning.”
(Translation W.H.S. Jones, Loeb Classical Library.)

Area of the ash altar and temenos (Figs. 3 and 4)

The top of the altar of Zeus is 1383 m above sea level; in linear distance the altar is 510 m to the southwest of the *xenon* and in vertical distance approximately 200 m above the *xenon* and the lower sanctuary. The ash altar was the site of human sacrifice according to several ancient authors.¹⁰ The two extant column bases, once for the columns holding the golden eagles of Zeus, are located 100 m to the southeast of the summit of the ash altar and 20 m in vertical elevation below the top of the altar. The north-south axis between the two column bases is between 2-3 degrees west of north, which would create the likely orientation of the two columns as close to due east.¹¹ The *temenos* mentioned by Pausanias and

10. Pl. *Resp.* 8.565 d; in the Pseudo-Platonic *Minos*; Theophrastus (quoted in Porph. *Abst.* 2.27.2); Paus. 9.38.7. See for the religious traditions of the sanctuary the paper by O. Zolotnikova in this volume.

11. The exact orientation of the axis between the centers of the two column bases is N2°

excavated by Kourouniotis is an area to the south of the ash altar and to the west of the bases for the columns of Zeus, at an elevation of approximately 1364 m. It is a flat area and it has no other characteristic features in the modern day.¹² The excavator gives the measurement of the area as 120 x 55 m and having the outline of the area ringed with stones. I have indicated the approximate area as a rectangle on the accompanying Figs. 3, 4.¹³

On the high mountain plateau located below the ash altar are buildings and structures that are associated with the staging of the Lykaian games. The survey was carried out where we were able to measure the excavated foundations and architectural features visible above ground.

Xenon (Figs. 3 and 5)

The *xenon* was measured as 35.7 m north-south and 18.5 m east-west and having a north-south orientation of 13-16 degrees northwest.¹⁴ The northeast portion of the building is preserved to six courses of masonry. The entrance to the building appears to have been on the south. To the northeast of the building and at a lower elevation were surveyed two 'corridors' that appear to link the area of the *xenon* with an area to the northeast. It is not completely clear now where the original ground level was in this area.¹⁵

Stoa (Figs. 3 and 5)

The nearby stoa to the east was measured as at least 65 m long and 13 m deep although the original overall measurements of the building are difficult to determine.¹⁶ The orientation of the length of the stoa is 38 degrees northeast; the stoa would have faced northwest.¹⁷ The interior details of the building are not at all clear and many wall blocks and architectural members are found in the general area.

24° 30' W creating the orientation of the two columns N87°35'30" E. The distance between the centers of the two column bases is 8.51 m.

12. Kourouniotis 1904b, 159-62, fig. 1.

13. This area was not surveyed since the stone limits of the *temenos* were not visible.

14. Kourouniotis 1909, 192-6, figs. 10-2, indicates the dimensions of the building as 38 x 20 m.

15. Kourouniotis 1909, 193.

16. Kourouniotis 1909, 187-9, figs. 2-4, states that the stoa has a length of about 70 m but was originally longer because the place where the stoa and the stairs meet has been destroyed. He also mentions that the depth of the stoa is 11 m.

17. See Coulton 1976, 252-3. Coulton states incorrectly, I believe, that the stoa would have faced south.

Area of seats, statue bases and stele beddings (Figs. 3 and 5)

A series of four rows of seats with a maximum length of 38 m are located approximately 21 m to the north of the stoa and at a similar orientation of 35 degrees northeast.¹⁸ At the southwestern end of the steps, there is a slight and subtle curve of the seats toward the west from a more southwesterly orientation. Approximately 27 m to the northeast of the preserved end of the series of steps a group of stele beddings and cuttings were measured and were found to have approximately the same orientation as the steps. These stelai and statue bases come within approximately 5 m from the projected southern limit of the hippodrome. Kourouniotis also excavated a single row of seats to the north of the four rows of seats that would be immediately adjacent to the southeastern limit of the hippodrome. These lower seats were not visible during our survey.¹⁹

Fountain houses (Figs. 3 and 5)

Elements of the lower fountain A were surveyed, 30 m to the southwest of the *xenon* and were found to be 17 degrees northwest. The fountain associated with the one mentioned by Pausanias, Agno, is located 267 m from the northwest corner of the *xenon* and at an elevation of 1236 m, 60 m above the level of the buildings below and 140 m below the ash altar.²⁰

Hippodrome (Figs. 1, 3 and 5)

According to Pausanias (8.38.5) there exists in the upland valley of Mount Lykaion a hippodrome "in front of which" is a stadium. He adds that in former times they used to hold the Lykaion games here. It is clear even in the present day that the eastern long side of the hippodrome has been created by the building of a massive stepped retaining wall. The wall is 3-4 m high in places and stretches a distance of ca. 140 m north-south. Some elements of the same retaining system continue around the curved northern end of the hippodrome in the rough shape of an arc although the stone of the retaining wall is missing. On the west side of the hippodrome the artificial retaining system ends where the terrace of the

18. Kourouniotis 1909, 189-90.

19. Kourouniotis 1909, 189-90, fig. 6.

20. Kourouniotis 1909, 198-200, fig. 1.

21. Frazer 1913, 382, has a description of the remains of the hippodrome as well as the remains of a building to the north of the structure.

hippodrome meets the sloping hillside.²¹ Here there is a low hill that limits on the west side the flattened and available area for a hippodrome. At the south end of the terrace the leveled area approaches the stele beddings, the statue bases, the seats, and a point where there is a slight rise in elevation. The maximum north-south dimension of the hippodrome is 320 m and the maximum available width of the structure is 104 m. The orientation of the structure is 8-9 degrees north-west. Spectator facilities for the hippodrome would have consisted of the neighboring low hills that border the flat hippodrome terrace to the east, north and west.

In the modern day the artificially flat hippodrome has been terraced for farming purposes. As a result the ancient ground level of the hippodrome has been modified especially towards the northeast. It is possible that some of the monuments from the hippodrome may have been dragged downhill towards the east and the stepped retaining wall. In March 1979, during an earlier visit to the site, I recorded six tapering column drums that I found in the area of the hippodrome. Three were found near the north end of the retaining wall at the level of the base of the wall, one was found in the field to the east of the hippodrome retaining wall, and two additional column drums were found near the southeastern limit of the hippodrome near where the dirt road approaches it. Although it cannot be certain, these tapering column drums may have been used as component parts of the turning posts at the north and south ends of the hippodrome.²² No elements of starting facilities for the hippodrome have been recognized from the area of the hippodrome.

The hippodrome at Mount Lykaion is the only extant and visible hippodrome in the Greek world. The measurement of the size of the hippodrome is important and the fact that a stadium was probably located inside the limits of the hippodrome is, to my knowledge, unique in the Greek world.²³

Stadium (Figs. 1, 3, 5)

Pausanias (8.38.5) mentions that there is a stadium "in front of" the hippodrome, *καὶ ἵπποδρομὸς τε καὶ πρὸ αὐτοῦ στάδιον*, and Kourouniotis mentions that several stadium starting line blocks were observed towards the middle of the

22. I suggest this based on the find spots of the column drums and the fact that turning posts, *metae*, in Roman circuses were typically tapered. See Kourouniotis 1909, 190, fig. 7, where he discusses several columnar elements that may be related to the turning posts of the hippodrome.

23. For purposes of comparison, the arena of the Augustan circus at Bovillae, outside of Rome, measures approximately 328.5 m length and 60 m width. See Humphrey 1986, 561-6. In Roman times, circuses were also commonly used for Greek athletics. See for instance Humphrey 71-2.

hippodrome.²⁴ Blouet made the suggestion that a flat area to the northeast of the hippodrome may have been used as the stadium and he indicated this area on his drawing.²⁵ In 1956 Eugene Vanderpool reported seeing seven starting line blocks and during our survey in 1996 we were able to identify six of them. Four were found close together within 8.5 m, more or less in an east-west line within the interior space of the hippodrome.²⁶ Another two are found at a lower level on the embankment wall 60 m to the east and 16 m to the south. If the four closely spaced starting line blocks from the hippodrome terrace are near to their original position at the north end of the *dromos*, it may be possible to restore the *dromos* of the stadium to the south and within the area of the hippodrome. There is room for a stadium racecourse of approximately 170-180 m length and ca. 20 m width.²⁷ If correct, this would have meant that the racecourse for the horses would likely have had to run around the *dromos* of the stadium or at least around the starting line blocks. This would also have meant that one end of the *dromos* of the stadium would have come within approximately 40 m (presuming a length of ca. 180 m for the *dromos*) to the area of the seats and the stele beddings at the south end of the hippodrome terrace.²⁸

It is known from a series of inscriptions of the late 4th century B.C. concerning the Lykaion games that athletic and equestrian contests were held during the same festival year. For instance *IG V.2, 549*, dated to 320 B.C., records that victors in the Lykaion games were recorded in several equestrian events, the two and four horse chariot races and horse race as well as in a series of athletic events for boys and men.²⁹ This would suggest that the facility was used for equestrian as well as for athletic contests during the same days.

Bath facility (Figs. 1, 3, 5)

At the northeast end of the hippodrome and at the approximate level of the base of

24. Kourouniotis 1909, 190-2, fig. 8.

25. Blouet 1833, fig. 33.

26. Kourouniotis 1909, 190-2, fig. 8, discusses the stadium and several starting blocks.

27. The original length and width of the *dromos* of the stadium at Mount Lykaion is not known for certain. It could have been shorter than 170-180 m. The total length of the six known starting line blocks equals approximately 5 m.

28. This explanation would be in keeping with the description of Pausanias (8.38.6) if he was standing at the south end of the upland valley near the stoa, looking to the north and seeing the great expanse of the hippodrome in front of him. In this case the south end of the stadium *dromos* would have come fairly close to the south end of the hippodrome and the valley.

29. This would contradict the idea of Harris 1972, 163, that "a sill with grooves for runners' feet half-way along its length shows that after ceasing to be used for horse-racing it was adapted as a stadium". The inscription *IG V.2, 549* was found in the southern sector of the hippodrome.

the stepped retaining wall exists a building that is likely to have served at least partially as a bath building. Several elements of this structure, located about 35 m north of the northeast aspect of the hippodrome terrace, were surveyed. The eastern aspect of the building appears to be a large cistern whereas in the center of the building and at a higher level several large stone wash basins are still visible. The walls of the bath are constructed of polygonal masonry of the hard local limestone. The east-west length of the exposed structure is measured as 22.7 m and the north-south measurement is approximately 20 m.³⁰ The east-west length of the building appears to continue to the west, although this aspect of the building remains mostly below ground level.³¹ From the orientation of several surveyed walls within the bath it is clear that the orientation of the bath is within one degree of the north-south orientation of the nearby hippodrome.

Observations, conclusions and thoughts for future work

The current research has succeeded in creating an accurate map of the visible, above-ground structures and monuments of the mountain-top sanctuary of Zeus and the lower mountain plateau where the Lykaion games were held. The map is accurate with respect to orientation and location of the currently visible buildings and structures and in the context of the mountain topography of the site. Aspects of the same buildings and structures that are either underground or covered by vegetation have not been surveyed.

Based on the work of the completed survey it is possible to make a few observations about the layout of the upper and lower sanctuaries. On the southern peak of Mount Lykaion, at 1383 m above sea level, the area of the ash altar, the 120 x 55 m *temenos* to the south and the columns supporting the eagles of Zeus towards the east serve as a focal area for the cult. The stone bases for the columns supporting the golden eagles are oriented on an axis of 2-3 degrees north of east. There is a fairly flat mountain top plateau to the south of the ash altar and the *temenos* that extends for over 200 m. (Figs. 3, 4) It would be interesting to know what function, if any, this area had in the Zeus festival.

In the upland valley to the northeast of the ash altar, several of the buildings and structures of the sanctuary appear to have been planned with respect to other structures. For instance the *xenon* and the lower fountain A, the stoa and the stele beddings to the east and the stairs or seats to the north, all would seem

30. Kourouniotis 1909, 191-2, fig. 9.

31. The drawing from Blouet 1833, pl. 33, indicates that much more of the bath building was visible in the 19th century and that it should be approximately twice as long as what we have surveyed in the modern day. Blouet's drawing indicates a total length of the building of approximately 50 m.

to have been constructed in relation to one another. The hippodrome and the stadium appear not only to have been constructed with respect to each other but the *dromos* of the stadium appears to have been located within the space of the hippodrome. The size of the hippodrome, 320 x 104 m, is of great interest and importance since it is the only hippodrome anywhere in the Greek world that can actually be visualized and measured. The construction of the hippodrome terrace must have been a massive project involving the transport of large quantities of earth fill to level out the valley and build the stepped retaining wall to support the earth.

Pausanias (8.2.1) claims that the Lykaion games were older than the Panathenaic games in Athens, and Pindar in the 5th century makes several mentions of the Lykaion games.³² Pausanias says that these games used to be held at the mountain sanctuary, and in his description of the *agora* at Megalopolis (8.30.2-3) he mentions the sanctuary of Lykaian Zeus that is located there, although he says that there is no entrance into it.³³ Madeleine Jost has suggested that the sanctuary of Zeus had been transposed to Megalopolis probably at the same time as the synoecism of the city of Megalopolis in the 4th century (371-368 B.C.). She argues that this would not have been a transfer of the cult to the city but rather the creation of a 'doublet cult.'³⁴ It is known from the victor inscriptions found at the mountain location of the games that the festival continued at Mount Lykaion after the synoecism of Megalopolis, and it would be interesting to know how long they continued at the mountain sanctuary as well as when the cult of Zeus Lykaios began and what its relationship was to other Arkadian cults and communities.

A new program of excavation and research would be welcome at Mount Lykaion for a number of reasons. Such new research would lead to a better understanding of the history of the sanctuary, its origins and development into a major Greek sanctuary by the classical period. Renewed excavation would lead to further understanding of the dating and functions of the excavated buildings and structures as well as the possible discovery and excavation of additional ones. Geophysical techniques of remote sensing applied to the lower sanctuary might reveal the locations of buildings and structures that have not yet been discovered as well as further details of the buildings and structures that are already well known. Modern GIS and remote sensing studies might shed light on ancient routes of communication in and around the mountain sanctuary. A modern geological study of this part of Mount Lykaion could provide clues as to the possible reasons for the location of the sanctuary in this place. New excavations of the ash altar and

32. *Oi.* 7.153; *Oi.* 9.102; *Nem.* 10.48.

33. This situation is of course similar to the description of Pausanias above, 8.38.6: "the *temenos* of Lykaian Zeus into which people are not allowed to enter."

34. Jost 1994, 226-7.

subsequent scientific osteoanalysis of the bone fragments could produce further evidence as to whether human sacrifice was practiced at the sanctuary of Zeus.

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Altar of Zeus



Fig. 1. Photograph of the the upland valley as the location of the Lykaion Games with some of the buildings labeled. The altar of Zeus on the southern peak of Mount Lykaion is in the distance. (Photo: author.)

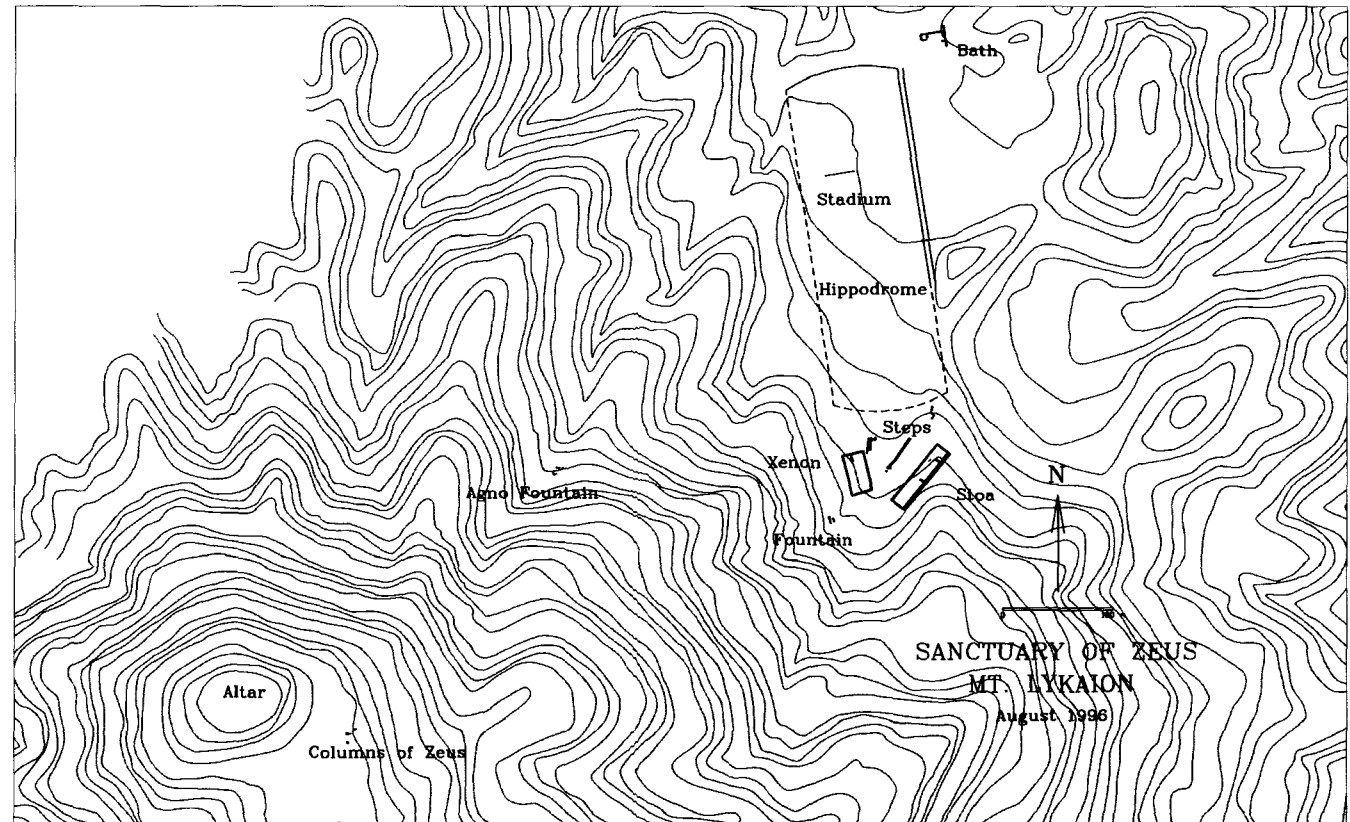


Fig. 2. Results of 1996 electronic total station survey of the sanctuary of Zeus and related structures together with the 1 : 5000 topographical map of the area. Contour lines are at 4 m. (Prepared by author.)

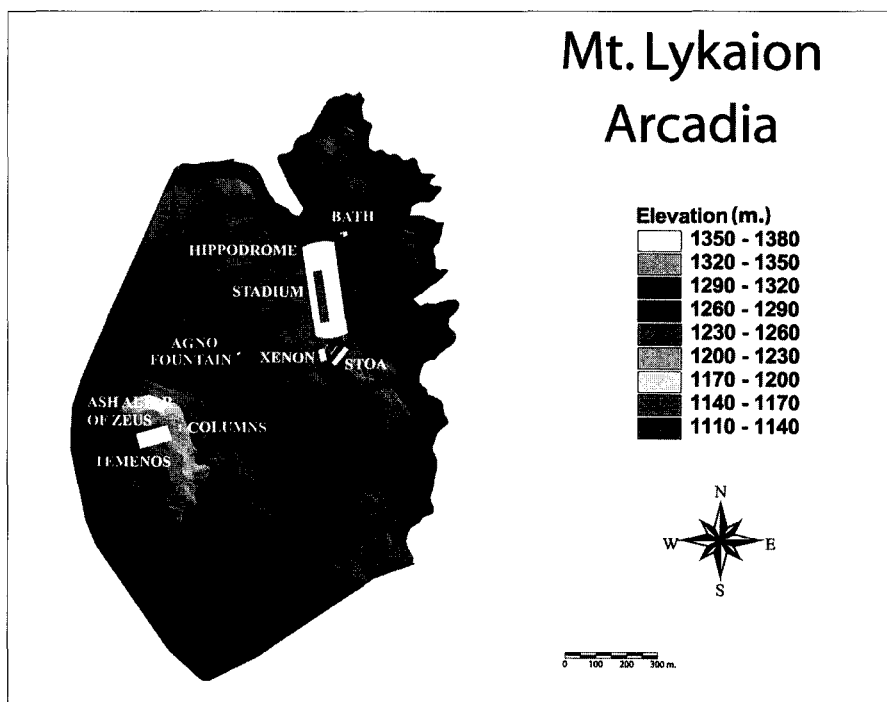
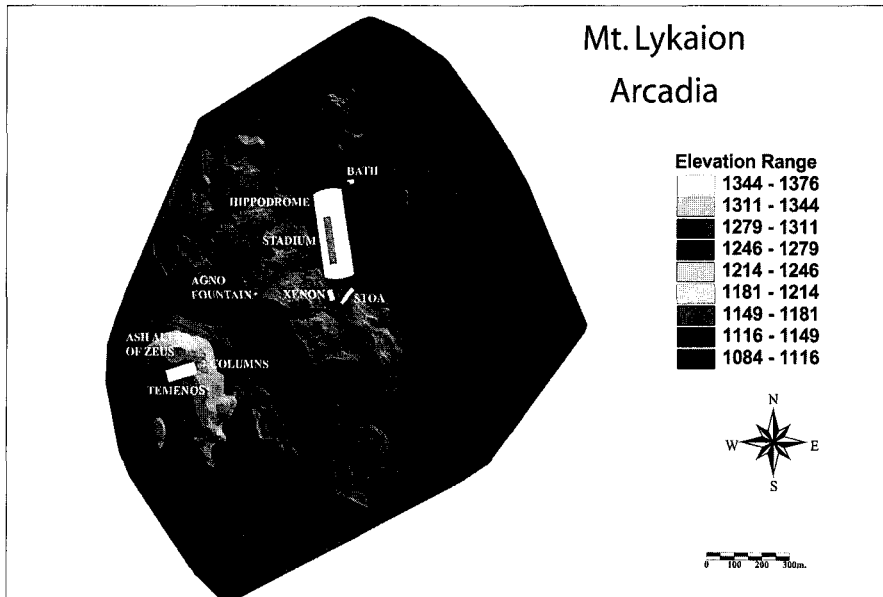


Fig. 3. Digital terrain model of Mount Lykaion illustrating the location of ash altar, hippodrome, Agno fountain, xenon and stoa. (Prepared by author.)

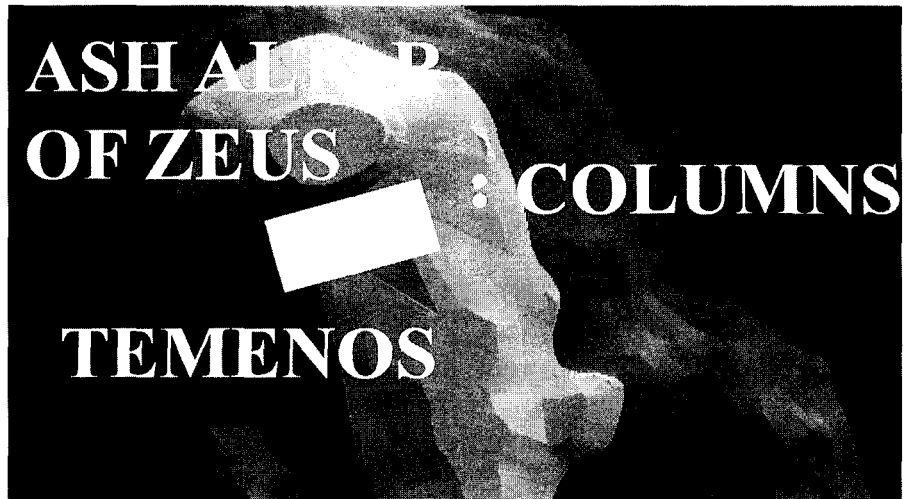


Fig. 4. Digital terrain model of area of the ash altar of Zeus with neighboring structures and monuments. (Prepared by author.)

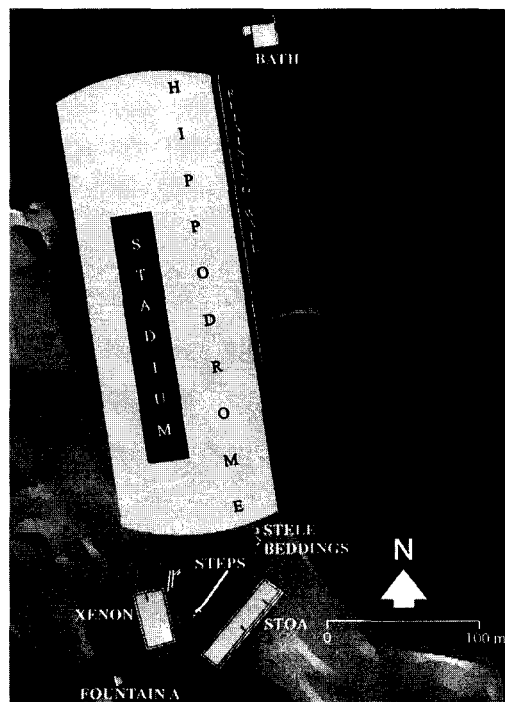


Fig. 5. Digital terrain model of upland valley on Mount Lykaion with surveyed structures and monuments. (Prepared by author.)