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The Makrakomi Archaeological Landscapes Project (MALP)

A preliminary report on investigations carried out in 2010–2012

Abstract*

In this article we provide a preliminary report of the work carried out between 2010 and 2012 as part of the Makrakomi Archaeological Landscapes Project (MALP). The programme of research is carried out in co-operation between the Swedish Institute at Athens and the 14th Ephorate of Prehistoric and Classical Antiquities at Lamia. The interdisciplinary project started in the summer of 2010, when a pilot survey was conducted in and around the hill of Profitis Elias, in the modern municipality of Makrakomi, where extensive traces of ancient fortifications are still visible. Systematic investigations have been conducted since 2011 as part of a five-year plan of research involving surface survey, geophysical survey and small-scale archaeological excavation as well as geomorphological investigation. The primary aim of MALP is to examine the archaeology and geomorphology of the western Spercheios Valley, within the modern municipality of Makrakomi in order to achieve a better understanding of antiquity in the region, which has previously received scant scholarly attention. Through the archaeological surface survey and architectural survey in 2011 and 2012 we have been able to record traces of what can be termed as a nucleated and structured settlement in an area known locally as Asteria, which is formed by the projecting ridges to the east of Profitis Elias. The surface scatters recorded in this area suggest that the town was primarily occupied from the late 4th century BC and throughout the Hellenistic period. The geophysical survey conducted between 2011 and 2012 similarly recorded data which point to the presence of multiple structures according to a regular grid system. The excavation carried out in the central part of Asteria also uncovered remains of a single domestic structure (Building A) which seems to have been in use during the Late Classical and Hellenistic periods. The combined data acquired through the programme of research is thus highly encouraging, and has effectively demonstrated the importance of systematic archaeological research in this understudied area of Central Greece.

* MALP is in great debt to Mr Nikolaos Raptis, the president of the cultural association of ex-Makrakomites, whose keen interest in the local history was a contributory cause to its genesis. A first appeal for systematic archaeological research in the area was carried out in 2008. The 14th Ephorate of Prehistoric and Classical Antiquities and its director Maria-Foteini Papakonstantinou, and the Swedish Institute at Athens and its then director Ann-Louise Schallin, together with Anton Bonnier, the grant-holder at the Institute at the time, as the field director for the Swedish team, agreed to the launching of a co-operative project. The programme has since been fortunate to have the support of the Municipality of Makrakomi, as well as that of local inhabitants, who contribute to its realization, and follow with interest the annual presentations of the work which are given during the field campaigns.

Introduction to the programme and its aims

BY MARIA-FOTEINI PAPAKONSTANTINOU & ARTO PENTTINEN

The Makrakomi Archaeological Landscapes Project, henceforth abbreviated as MALP, is carried out in co-operation between the Swedish Institute at Athens and the 14th Ephorate of Prehistoric and Classical Antiquities. The primary aim of MALP is to examine the archaeology and geomorphology of the western Spercheios Valley, within the modern municipality of Makrakomi.[1] Our wish is that the realization of the project will lead to a better understanding of antiquity in an area of mainland Greece which has previously received scant scholarly attention. Since 2011 intensive systematic archaeological research has been carried out in the area surrounding the hill of Profitis Elias, situated between the modern town of Makrakomi and the village of Platystomo. The work of the project carried out so far, within the framework of a five-year plan, has involved archaeological surface survey and architectural survey, utilizing GIS and modern GPS technology, as well as geophysical investigations and small-scale excavation.

1 Makrakomi was known as Varybobi or Varybopi until 1916.

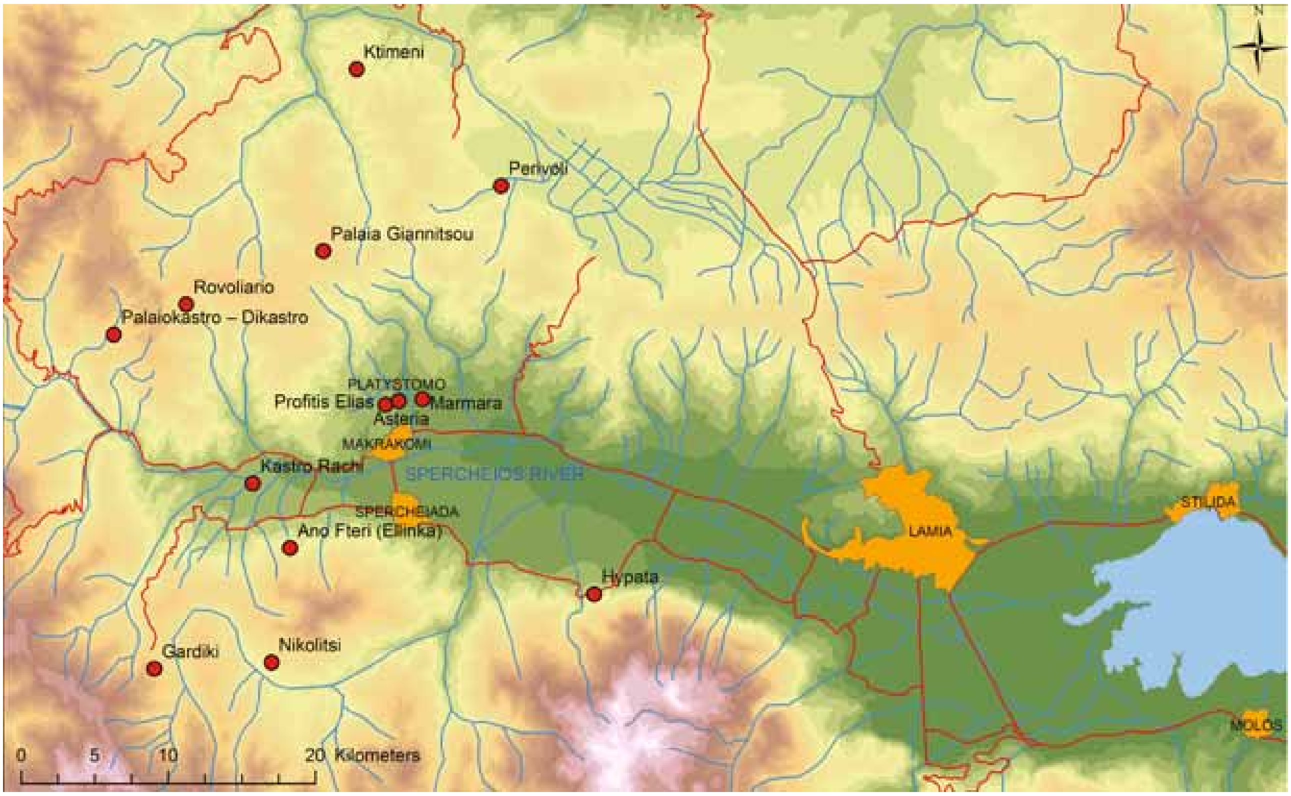

Fig. 1. The Spercheios Valley with archaeological sites mentioned in the introduction. By A. Bonnier.

Between 2013 and 2015 work in this area will continue, while other sites in the western Spercheios Valley will also be subject to more limited investigation in future campaigns.

The name given to the research project indicates that we wanted to approach the area as a composite of different landscapes in terms of geomorphology, history, and land use. Through a combination of different archaeological methods as well as geomorphological investigation we hope to gain a better picture of the settlement and landscape history of this area of the Spercheios Valley, particularly during the prehistoric and Greco-Roman periods.

This first preliminary report of the work carried out between 2010 and 2012 will deal with the pilot investigations of 2010, the geophysical survey in 2011–2012, the excavations in 2012, as well as the archaeological surface and architectural surveys which were conducted in 2011 and 2012. It should be stressed that this is a first report and the results presented here should be regarded as preliminary, awaiting the completion of the full programme of research which will be carried out within the framework of MALP.

Ainis and the Spercheios Valley

The Spercheios Valley (*Figs. 1–2*), named after the river which flows through it and empties into the Malian Gulf, forms a distinct geographical entity in central Greece, as it is bordered by a mountain range on either side: the Othrys mountains to the north and the Oiti range to the south. The two massifs meet at Tymphristos in the westernmost part of the Sper-

Fig. 2. View of the Spercheios Valley, from Profitis Elias, looking south-east. Photo: A. Bonnier.

cheios Valley. The valley acts as a strategic topographical border zone as it separates Thessaly from the mountainous area of central Greece towards its southern littoral by the Corinthian Gulf. Due to its geographical position, the Spercheios Valley was always a link between the southern mainland and the north of Greece, acting as a natural passage for armies and goods as well as ideas and cultural currents.

At our present knowledge, the valley was settled for the first time in the Neolithic period (6500–3300/3000 BC), with habitation and human activity continuing throughout the Bronze Age. The extent of prehistoric activity in the valley seems to reach its maximum in the Middle and Late Helladic periods.[2] In mythology the area has been associated with Achilles, and some modern readers have identified the western part of the Spercheios Valley as the centre of a Mycenaean kingdom belonging to Achilles.[3]

According to written sources the valley was inhabited by three distinct *ethne* by the 5th century BC: the Oitaioi in the south-east, the Malians in the middle of the valley, and the Ainians in the western part.[4] Due to the fragmentary nature of the written sources little is known of the geopolitical developments in the region during the Archaic and Classical periods. Some readings of Classical and post-Classical texts suggest that the Ainians settled in the valley after having migrated from either Epiros or Thessaly, though such migrations cannot be substantiated on the basis of the currently available evidence.[5] In any case, Ainis seems to have formed a consolidated polity and defined *ethnos* in the Spercheios Valley by at least the Classical period, if not earlier. Literary sources also suggest that the Spercheios Valley, including Ainis, was within the Thessalian political sphere of interest in the later 5th century BC.[6] Available literary and epigraphic evidence further indicates that Ainis was incorporated into the Aitolian League by the 270s BC, together with the other polities which were present in the Sperchieos Valley, and seems to have remained a part of the Aitolian sphere of influence until the middle of the 2nd century BC.[7]

The western part of Phthiotis and the region of Makrakomi-Sperchiada have not attracted much archaeological research to date: this is partly a consequence of the rather slow pace of construction in the area, limiting the extent of archaeological rescue work.[8] Fortification walls belonging to the Ainian *polis* of Hypata have been uncovered in modern Ypati. These walls were first constructed in the Early Hellenistic period, but were also rebuilt in later phases.[9]

A large number of other fortified sites have been recognized in Ainian territory, and a system of fortifications seems to have been established along important routes by the later 4th to early 3rd centuries BC.[10] The western part of the valley was protected by fort sites at Profitis Elias, Kastrorachi and Ano Fteri (Ellenika), whereas the passages in the north-west were controlled by fortifications at Palaiokastro—Dikastro, Rovoliario, and Palaia Giannitsou, with the latter having been identified as ancient Keimeni or Ktimeni. Another series of fortified enclosures have been identified at Marmara, Perivoli, Nikolitsi and Gardiki in the south-west, which controlled physical routes by the Inachos and Roustianiti rivers, routes that had to be blocked once Ainis had been incorporated into the Aitolian League, as they would allow hostile armies access to the heartland of Aitolia.[11]

The Ainian defensive system differed from those of the Malian *ethnos*, which invested in fortifications along the eastern slopes of the Orthys range, with the primary purpose of protecting the Malian centre at of Lamia. The two defensive systems were developed in Late Classical and Early Hellenistic times and remained in use until the Roman period. Their design was obviously determined by the diverging geomorphological features in the two areas. The common feature of these fortification networks seems to have been the ability to counter attacks from the north, where the Thessalians always kept an eye towards the south, and had as a result concentrated the populations (or settlements) to the mountainous areas.[12]

Except for the historical-topographical work, conducted by researchers like Vortsela, Stählin and Béquignon during the first half of the last century, in which the above mentioned

2 Dakoronia 1994, 233–242; Papakonstantinou 2008, 316–325; Dakoronia & Papakonstantinou 1995, 33–49; Papakonstantinou & Vouvalidis 2012 (in print); Papakonstantinou & Vouvalidis 2010 (in print); Papakonstantinou & Vouvalidis 2012 (in print).

3 Béquignon 1937, 125–143; Hope Simpson & Lazenby 1959, 102–105; Dakoronia 1990; Makrygiannis-Matapas 1979, 426; Adamis *et al*. 2006, 207–217. The latter two have identified the site of Profitis Elias and Asteria as the Homeric Fthia. Matapas also argued that some of the visible remains here can be "identified as" the palace of Achilles (Makrygiannis-Matapas 1979, 426, 435–436). This is referred to with some caution by Adamis (Adamis *et al*. 2006, 215–217), but the ongoing research within MALP does not support this hypothesis.

4 Hdt. 7.198.2; Thuc. 5.51.1–2.

5 Strabo 9.5.22; Stählin 2002, 347–377; Béquignon 1937, 144, 148–172, 345; Papakonstantinou 1995, 40–49.

6 Thuc. 3.93.3, 5.51.1; Béquignon 1937, 144; Decourt *et al*. 2004, 683. The effect of Thessalian interest in the area is difficult to assess in terms of salient political developments in Ainis. Coins struck with the name of the *ethnos* suggest that by the 4th century BC Ainis would have constituted a formal *koinon* (Decourt *et al*. 2004, 683–684).

7 Grainger 1999, 108–113, 534; Scholten 2000, 51–52.

8 Dakoronia 1987; Pantos 1992, 414–415; Papakonstantinou 1992, 194–195; Karantzali 2004 and Karantzali 2007; Papakonstantinou 2007.

9 For the identification of Hypata as an Ainian *polis* by the Classical period, see Decourt *et al*. 2004, 708, no. 420.

10 Béquignon 1937, 312–313; Papakonstantinou 1995, 42–43.

11 Pantos 1992, 414–415.

12 Béquignon 1937, 263–264.

fortifications are reported, there have been no systematic studies of the region, nor has its archaeology been included in any research programme more recently.

Profitis Elias

The fieldwork which was carried out between 2010 and 2012 was conducted on and more intensively in the close vicinity of the fortified site on Profitis Elias (or Kastro), which is surrounded by walls that enclose a fairly extensive area of approximately 8.50 hectares (*Figs. 3–4*). The site has been identified, albeit somewhat questionably, as the Ainian settlement of Makra Kome.[13]

The ruins on the two summits of the hill were described in detail by Yves Béquignon who visited the site in the 1920s.[14] Because of the thick vegetation, it was not possible for Béquignon to fully determine how the area was accessed in antiquity, although he did find possible traces of at least one gate in the west. The existence of an internal, NW–SE oriented wall in this area has also been suggested, which would have reinforced the defences around the gate. There may have

Fig. 3. The hill of Profitis Elias viewed from Asteria. Looking north-west. Photo: A. Bonnier.

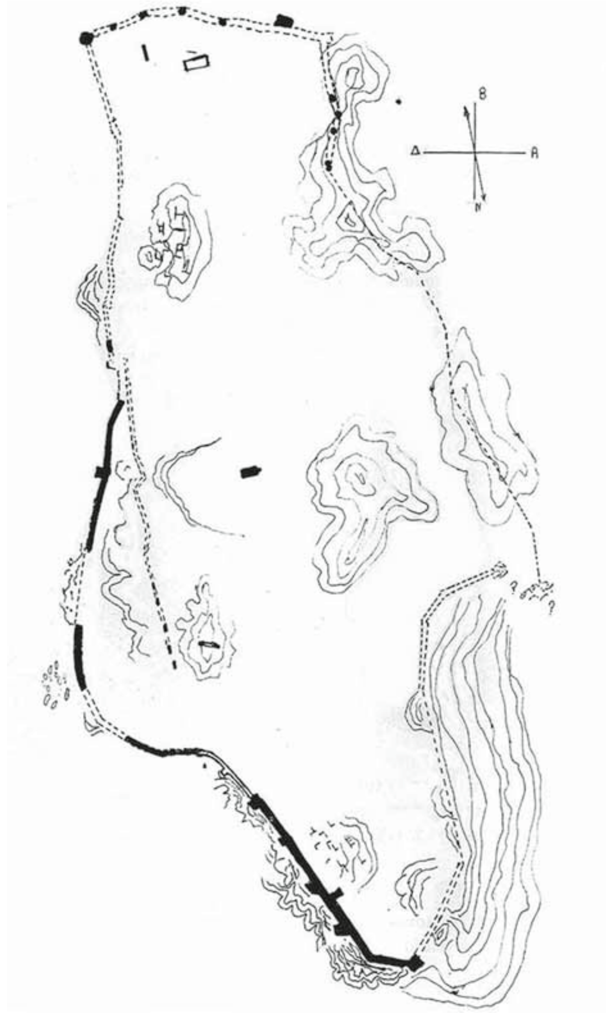

Fig. 4. Ground plan of the fortified area of Profitis Elias (after Béquignon 1937, fig. 15).

Fig. 5. View of a segment of the fortifications on the south-western part of the Profitis Elias hill. From north-west. Photo: R. Iversen Rönnlund.

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13 The name “Makra Kome” is mentioned only once in the sources (Livy 32.13.10–14, “*proximis prius evastatis circa Sperchias et Macran quam vocant Comen*”) with a reference to the arrival of the Aitolians to the Spercheios Valley in 198 BC. Marching from Ypati towards Thessaly they looted the surroundings of Sperchiada and Makra Kome. For a description of the ruins, see Vortselas 1907, 91; Stählin 2002, 375; Béquignon 1937, 320–321, who associates the name Makra Kome with the shape of the acropolis, while Roux (1954, 89) suggests that the name is derived from the shape of the settlement, which was elongated and extended *c.* 1.5 km in length.

14 Béquignon states that the fortification wall surrounded the summit at 380 metres above sea level (masl), and another one at 364 masl, and that the two summits are joined by a ridge. The fortification wall is today preserved to a length of 1,340 m (*Fig. 5*). Its preserved height is *c.* 2 m at places, and it is *c.* 1.60 m wide. Along the defensive line, foundations of a total of 13 rectangular towers can be found evenly spaced from each other. The fortification wall is built of the local, dark brown limestone in the irregular isodomic trapezoidal masonry. It is double-faced and has binders at even distances through the fill between the faces (Béquignon 1937, 316–319; see also Stählin 2002, 374–375).

been a symmetrically placed gate in the east, and possibly yet another somewhere to the south.

Stretches of the wall are still visible today, consisting of several courses of trapezoidal masonry as well as numerous towers (*Fig. 5*), though the surrounding vegetation can at times be dense which limits the access and visibility of the ancient fortifications in parts of the site. The construction of these fortifications has previously been placed in the late 4th century or early 3rd century BC, based on wall building techniques and not through associated datable artefacts such as potsherds, thus creating some obvious problems in terms of chronology.[15]

Such a date for the construction of these walls nevertheless seems probable given the similarity with other fortifications in the region as well as the date of the surface scatters recorded during the pilot survey in 2010. The physical location of the Profitis Elias site is especially important as regards the routes passing through the Orthrys Mountains into the Spercheios Valley from Thessaly, controlling movement through the Giannitsou Pass to the north and access to the Spercheios River to the south.

Very little modern overbuilding has occurred on the hill, apart from the chapel of Profitis Elias which was rebuilt after the destruction of an earlier chapel during the Second World War, and has generally not caused much visible disturbance on the archaeological site. An exception to this is a modern dirt road on the eastern/north-eastern slopes, running towards the chapel, which was annually bulldozed in order to facilitate access for visitors to religious celebrations. The bulldozing has resulted in erosion of the edges of the road banks and on the road surface itself, especially after heavy rains, thus exposing much ancient material, particularly in the upper part of the road.

Asteria

While the fortified area of Profitis Elias forms a distinct and visible archaeological site, traces of archaeological remains have previously been noted in the lower eastern slopes known locally as "Asteria",[16] which has been subject to much of the archaeological fieldwork carried out in 2011 and 2012. Asteria provides a fragmented archaeological environment, primarily composed of surface scatters of ancient material and scant structural traces, much due to modern agricultural activities in the area. The area of Asteria is formed by a series of low foothills connected to ridges which project from Profitis Elias, and it is surrounded by large open fields that extend east to the small river referred to simply as "Potamaki" (*Fig. 6*).

The land in this area is today primarily used for olive and pistachio cultivation, and a recognizable carpet of material such as tiles and potsherds is visible in many of the fields. We have been informed that extensive bulldozing was carried out in the 1970s and the result of these activities can be seen in the number of architectural blocks that have been pushed to the edges of the olive and pistachio groves, as modern field boundaries (*Fig. 7*). It is clear that Asteria is a heavily altered archaeological landscape and that the distribution of archaeological remains will have been affected by recent agricultural activities.

Brief test excavations were conducted in Asteria in the early 1970s, after a request for systematic archaeological research was put forward by the local community. The interest in the ensuing archaeological work was primarily based on the suggested association of the area with the mythical homeland of the Homeric hero Achilles. Local concern was thus directed at the possibility of recovering data which would confirm extensive Mycenaean habitation at the site. The excavations, nevertheless, confirmed that the visible archaeological remains belonged to the historical periods rather than prehistoric times, and the excavator suggested that the uncovered remains belonged to some type of military installation, built to overlook the routes from the Spercheios Valley to Thessaly.[17]

Archaeological remains have also been reported from an area known locally as "Marmara", further east of Asteria, where grave *stelai* and a bronze urn have been recorded.[18] Cemeteries have further been identified to the north, north-west and north-east of Asteria and the hill of Profitis Elias.[19] Both these remains and those excavated in Asteria in the 1970s suggest the presence of activity loci outside the fortification walls on Profitis Elias in the Late Classical and Hellenistic period.

MALP research so far and the future scope of the programme

Preliminary investigations of both the Profitis Elias hill site and Asteria were conducted in the summer of 2010. Investigation of surface artefacts and architectural studies were carried out in limited areas of both summits of Profitis Elias, defined as Areas A and B, as well as in Asteria, defined as Area C. A full report of the work carried out in 2010 is given below, but here it is enough to state that the results were highly promising for

15 Béquignon 1937, 316–322.
16 The name "Asteria", according to local informants, is derived from the original name, Sterea, i.e. "steria" or "stable", which may refer to the stable ground in the area. "Sta steria" would have morphed into Asteria over time.

17 Chourmoutziadis 1973–74, 516–517.
18 Roux 1954, 89–94; Spyropoulos 1971.
19 Roux 1954, see also Dakoronia 1977; Stamoudi 2000.

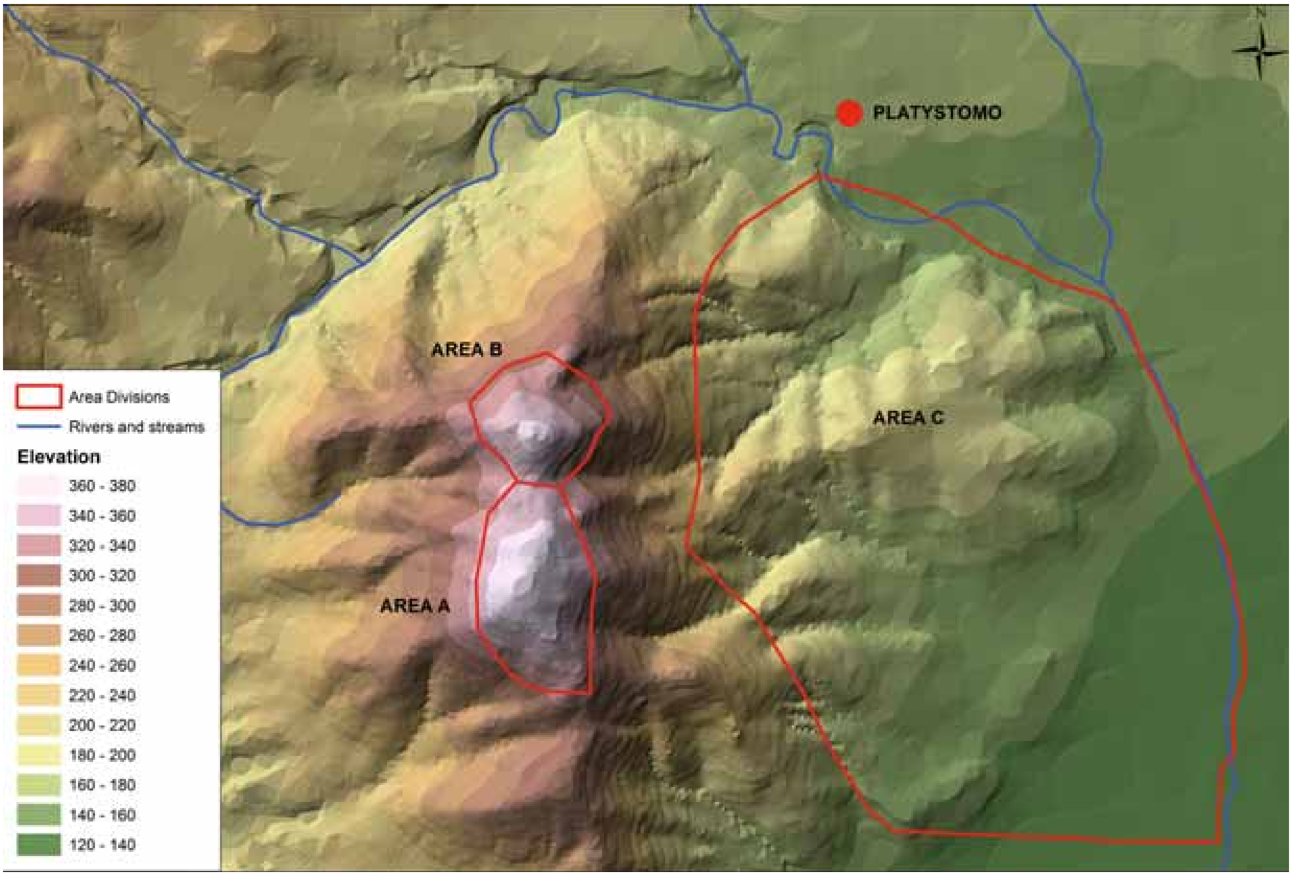

Fig. 6. Triangular irregular networks (TIN) surface and the divisions employed in the survey area (Profitis Elias = Area A & B; Asteria = Area C). By A. Bonnier.

Fig. 7. Stones pushed into field boundaries. Photo: H. Boman.

further systematic work in future campaigns. On Profitis Elias surface artefacts dating between the Classical and Late Hellenistic/Early Roman periods were recorded as well as structural remains within the area enclosed by the fortification walls. In Area C further surface scatters of archaeological material dating primarily to the Classical and Hellenistic periods were noted during the pilot campaign, indicating ancient activity and habitation on the outside of the two fortified hill summits.

On the basis of the results of the preliminary investigations in 2010, the Hellenic Ministry of Culture agreed to a five-year plan of a systematic research programme.[20] Much

[20] The programme is directed by Maria-Foteini Papakonstantinou, the director of the 14th Ephorate of Prehistoric and Classical Antiquities and deputy director of the 24th Ephorate of Byzantine Antiquities, and co-directed by Arto Penttinen, the present director of the Swedish Institute at Athens. From the Greek side, archaeologists Konstantina Psarogianni and Lambros Stavrogiannis from the 14th Ephorate of Prehistoric and Classical Antiquities also take part. The fieldwork by the Swedish team is led by Anton Bonnier from Gothenburg University while Monica

of the current report will be concerned with the work which was carried out as part of the archaeological surface survey in Asteria and the GPS-based architectural survey which was similarly carried out in 2011 and 2012, which covered parts of Profitis Elias and Asteria. The surface survey will continue in 2013 and 2014, including an extension of survey in Area C and gridded re-survey in parts of Area C which was covered by the first survey phase in 2011 and 2012.

In 2013 we also plan to conduct a more limited surface survey by the fortified site of Kastrorachi, which is situated further to the west within the Spercheios Valley. The aim of the survey at Kastrorachi is to test if we can note a similar pattern of extramural habitation during the Classical and/or Hellenistic periods. The architectural survey will also continue between 2013 and 2015, and will further examine and record architectural remains on Profitis Elias, in Asteria, at the site of Kastrorachi and at the fortified site of Ellenika by the modern village of Ano Fteri, which is located in elevated terrain to the south of the Spercheios River.

The current report also deals with the geophysical investigations which were carried out in Asteria in 2011 and 2012, and which provided further evidence of a nucleated structured settlement. On the basis of the results from the geophysical survey trial trenches were excavated in 2012, the results of which are further described below, and excavations will continue in future campaigns in Area C but potentially also on the summit of Profitis Elias.

The results of the investigations in 2011 and 2012 are encouraging and underline the importance, extent and nucleated character of the settlement, which now seems to have been an important Ainian centre in the upper part of the Spercheios Valley, from the Late Classical and throughout the Hellenistic period.

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Nilsson, the assistant director of the Swedish Institute at Athens and Henrik Boman from Stockholm University are among the participants. The geophysical prospection was conducted in 2011 by Gregory Tsokas, Professor at Aristotle University of Thessaloniki. The geomorphological investigations were conducted in the autumn of 2012 by a research team from the Department of Geology at Aristotle University of Thessaloniki under the direction of Professors Konstantinos Vouvalidis and Georgios Syrides.

Geophysical investigations in Area C (Asteria)

BY GREGORY N. TSOKAS, PANAGIOTIS I. TSOURLOS, ALEXANDROS STAMPOLIDIS, ILIAS FIKOS, GEORGIOS TASSIS, MARIA-FOTEINI PAPAKONSTANTINOU & KONSTANTINA PSAROGIANNI

In this section of the report we present the results and interpretations of the geophysical survey which was carried out in Asteria (Area C) in 2011 and 2012, in areas that had previously been covered by the surface survey in 2011 and where fieldwalking had revealed high densities of surface artefacts.[21] A variety of geophysical methods (resistivity mapping, total field or differential magnetometry, electrical tomography and Ground Probing Radar can be employed to explore the subsurface in order to detect and map concealed archaeological remains. The methodological choices depend on the particular archaeological, geological and geomorphological setting of the site. The contrast in the physical properties between the targets (buried ancient remains) and the hosting medium comprise the main weighting factor for the selection of the optimum prospecting method. The physical properties of the buried ancient structures should generate sufficient contrast for a readable signal to be produced on the ground surface.

In order to check the applicability of the magnetic method, measurements of magnetic susceptibility were carried out on the soil and on pieces of ancient masonry material exposed on the surface. They were performed using a Geoinstruments JH-8 κ-meter and they are shown in *Table 1*.

The readings of *Table 1* suggest that magnetic prospecting would not produce any useful results since the readings of masonry and soil do not contrast enough to clearly distinguish one from the other. Therefore, resistance mapping was carried out on three visits to the site between 2011–2012 (21–22 November, 16–18 January and 19–20 March). The area was divided into 20 × 20 m cells which are called "grids", following the standard procedure of geophysical surveys, and a finer grid was established in each cell using measuring tapes. The cells which were established on the ground were referenced

Table 1. Mean values of magnetic susceptibility measurements.

Material	*Number of samples*	*Mean value (S.I.)*
Topsoil	7	$30.7X10^{-5}$
Masonry material: limestone blocks and hewn stones	15	$31.3X10^{-5}$

21 The authors are indebted to the surveyor of the 14th Ephorate for Prehistoric and Classical Antiquities, Mrs Alexandra Tsonou, for the establishment of the geophysical grid on the ground surface and the subsequent very careful georeferencing.

using the Hellenic Geodetic Reference System 1987 (EGSA 1987).[22] Processing and interpretation of the data took place in the Laboratory of Exploration Geophysics at Aristotle University of Thessaloniki immediately after the fieldwork had been finished. Additionally, a number of resistivity tomographies were carried out on a small tract of land to assess their potential for future extensive use in the site.

Methods of the geophysical investigations

Both the resistance mapping and the electrical resistivity tomography (ERT), which were employed for the investigations in Asteria, comprise well established methods. For this reason, no detailed description will be given of these nowadays routine approaches for exploring the subsurface of archaeological sites. Resistance mapping is a method that allows the exploration of relatively large areas in short time periods.[23] The main aim is to convert the resistance or the resistivity distribution into an image which looks like the ground plan of the subsurface remains.[24] In other words, the geophysical image has to be an approximation of "the plan view of the ruins that would have been drawn if excavation had taken place".[25] The processed geophysical data transforms into an image which must therefore be comprehensible to archaeologists, land developers and others.

The "twin-probe" array, a modified version of the "pole-pole" array,[26] was used exclusively for the present work. A plethora of successful applications of the particular technique exists in the literature.[27]

Despite the success of resistance mapping in a range of environments, there are some deficiencies which led practitioners to seek ways of more advanced subsurface imaging.[28] The main drawback of the method is that it does not provide any information about the depth range of the targets. Further, different electrode arrays usually yield quantitatively different maps/images. Fortunately, the "twin-probe" array in general produces anomalies whose wavelength (width) matches well with the lateral dimensions of the subsurface structures that are causing them.[29]

Resistance mapping is carried out with constant and uniform spacings between the electrodes (probes) by transporting the measuring array as a rigid ensemble from one measuring position to the next. It is also possible to obtain a series of measurement profiles with increased electrode spacing in order to get an indication of the earth-resistivity variation of the studied area in both lateral and vertical directions. These measurements (called apparent resistivity measurements) do not provide a direct "image" of the subsurface. This is because the subsurface is usually inhomogeneous and anisotropic; therefore, the yielded resistivity does not correspond to any particular formation or structure within the sampled subsurface volume of each measurement. It is rather the integrated effect of the subsurface resistivities of the materials in the sampled space.

Methods have been developed in order to yield the true subsurface resistivity distribution from the resistivity measurements; however, these are mathematical techniques known as "inversion" which are capable of producing subsurface resistivity images. The greater the number of measurements the better the "inversion" result will be; thus, large amounts of measurements are needed, which implies the use of automated systems equipped with suitable multiplexers.

The combination of the automated measuring systems with the "inversion" algorithms is called "Electrical Resistivity Tomography" (ERT). The method was developed in the early 1990s and has been used extensively ever since for the exploration of archaeological sites.

Resistance mapping: data acquisition and processing

The area covered by the geophysical survey is shown in *Fig. 8* superimposed on the TIN-model of the full MALP survey area. A mesh of 20 × 20 m cells was established on the ground surface as shown in *Fig. 9*. Each cell is identified by two letters and a number. The corners of each cell were marked on the ground by wooden pegs. Then, a 1 × 1 m grid was created in each cell using measuring tapes. Measurements were thus taken along traverses spaced 1 m apart and stepwise at 1 m intervals.

The data were downloaded to a laptop in the field whenever eight grids (cells) were measured. This approach enabled a quick quality check of the data *in situ*. Additional checks

22 All MALP data from both the geophysical survey and the archaeological surface and architectural survey have been georeferenced using the EGSA 1987.
23 Resistance mapping is sometimes also called resistance or resistivity profiling, or DC profiling, or simply electrical method. The instrumentation needed is rather simple and commercial software exists for processing and interpretation of the data. It was the first method to be applied in the context of "archaeological prospection" (Clark 1990, 11).
24 Scollar *et al.* 1986, 623.
25 Tsokas *et al.* 2008, 8–385.
26 Aspinall & Lynam 1970, 67–75; Tsokas *et al.* 2008, 84.
27 Tsokas *et al.* 1994, 90.
28 Szymanski & Tsourlos 1993, 10.

29 Tsokas & Tsourlos 1997, 36.

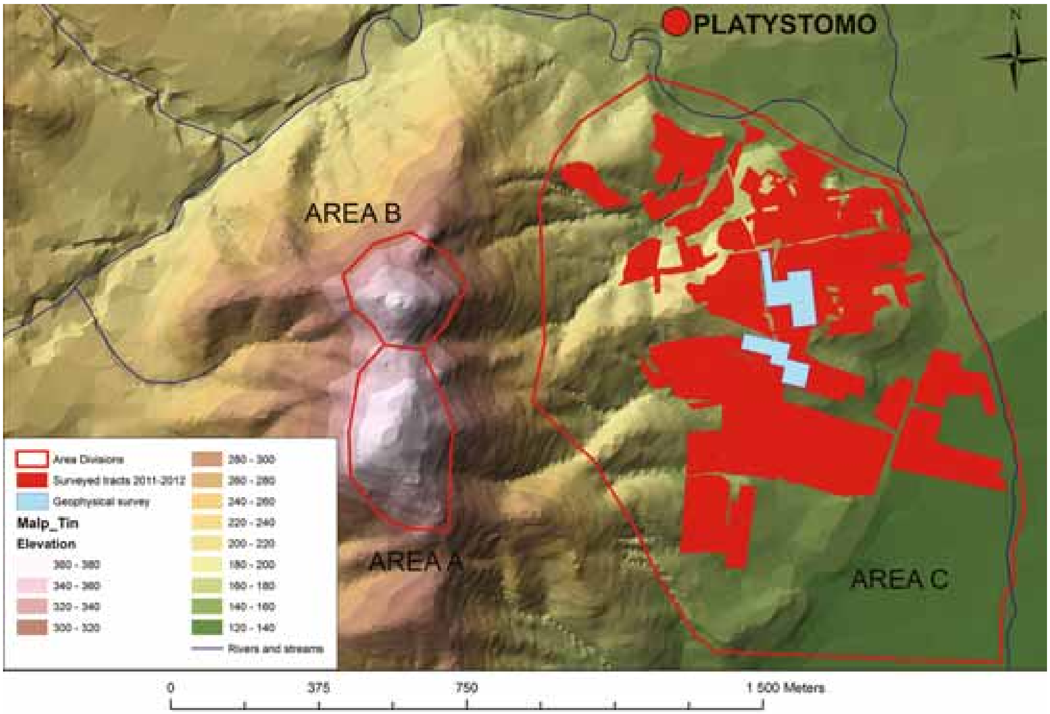
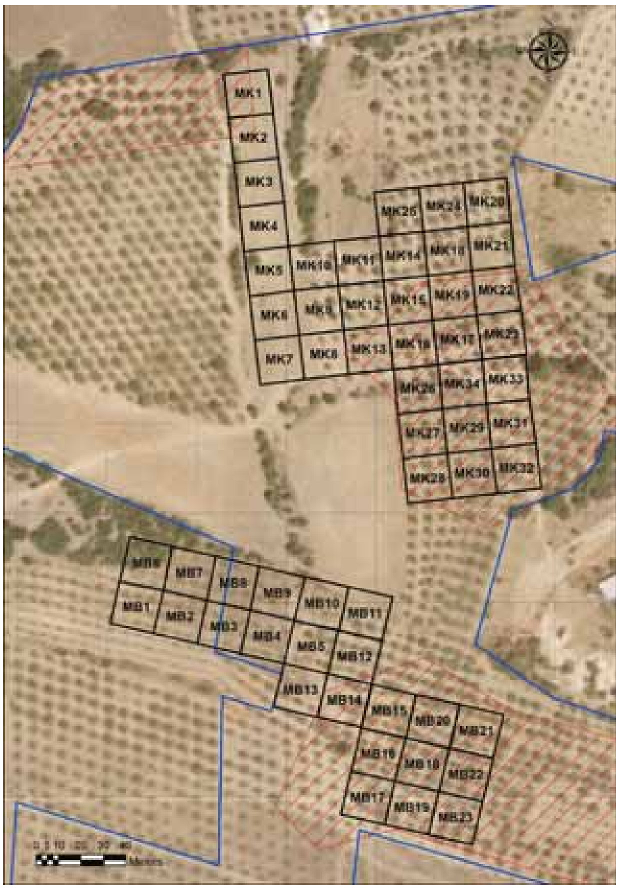


Fig. 8. The geophysical survey area. By A. Bonnier.

Fig. 9 (below). Layout of the 20 × 20 m squares (cells) established on the ground surface of the ancient settlement near Makrakomi. Outlined in red are those areas where the densities of surface sherds were high and where visible ancient remnants were found by the survey team of the Swedish Institute at Athens.



were performed at the end of each day of fieldwork and simultaneously the data underwent initial processing.

The main body of data processing was later carried out at the Laboratory of Exploration Geophysics in Thessaloniki. The processing sequence was established after various tests and included the following steps:

- Statistical analysis of the data.
- Despiking by median filter performed on 3 × 3 windows of the data.
- Edge match by stitching the sides of grids having relative dc shifts of the data.
- Interpolation both in the X and Y direction using cubic splines of the form sinX/X.[30]
- Compression of the dynamic range using the arctan function.
- Creation of greyscale images in order to have the result in a form which resembles the result that would have been pictured if excavation had taken place.[31]
- Transformation of the local coordinate system of each grid to the Hellenic Geodetic Reference System (1987), i.e., the mesh of the geophysical cells was georeferenced.

30 Scollar *et al*. 1986, 627.

31 Scollar *et al*. 1986, 623.

Fig. 10. Distribution of the resistance in the investigated area.

Fig. 11. Distribution of the resistance in the same area as in Figure 10 *after the application of Wallis filter.*

Results of resistance mapping

Figs. 10–11 show the spatial distribution of resistance in the surveyed area in the form of greyscale images. The images are identical, differing only in the application of the Wallis filter[32] for the production of the second one.

Alignments of positive anomalies (dark tones) are clearly observed almost everywhere. In some cases the alignments tend to create well-shaped closed rectangles, a fact that supports further their interpretation as caused by concealed ruins of ancient structures. The results show clearly a N–S and E–W preferential direction of alignment of the resistance anomalies. Presumably, these directions reflect the orientation of the ancient settlement or at least the orientation of the phase which is imaged in the electrical mapping.

There are doubts whether the rectangular anomaly shapes which appear at the south-western part are caused by buried ancient ruins or by the modern irrigation system. This is due to the orientation of the alignments at this particular bit of land, which follows a WNW–ESE direction identical to that of the olive groves and the alleys of the other trees. On the other hand, the N–S and E–W direction of the ancient settlement was observed in the excavations and it is pronounced in the northern part of the area covered by the geophysical investigation.

Though the principal ancient urban orientation is also present in the south-eastern part, it does not seem as pronounced as in the north. We interpret this fact as due to the poor condition of the ruins in this area, probably as a result of repeated ploughing or other recent agricultural activities.

32 Scollar *et al*. 1986, 630.

Fig. 12. The red rectangle at the upper part of the figure marks the area where the tomographies were carried out. The result of the resistance mapping as a greyscale image serves as background. The operation took place in cell MK33 of the mesh established on the ground surface for mapping.

Fig. 13. Parts of the instrumentation used for the conduct of the ERTs.

The layout of the resistivity tomographies

The resistivity tomographies were carried out in order to complement the picture inferred by the geophysical mapping, and to check the efficiency of the method in Asteria. We carried out a dense grid of 2-D parallel tomographic transects in a small tract of land in cell MK33 (*Fig. 9*) which is shown by a red rectangle in *Fig. 12* superimposed on the relevant part of the resistance map. The tomographic transects were arrayed in a W–E direction at 0.75 m intervals. Twenty four channels (electrodes) were employed for each tomography. Overall, 15 tomographies were carried out, each having a length of 17.25 m. *Fig. 13* shows a tomographic transect established on the ground surface and parts of the used instrumentation. In order to select the appropriate electrode array, the following factors had to be taken into account:

- The grid of tomographies aimed to produce an image of the subsurface resistivity distribution at relatively shallow depth. Earlier geophysical mapping had shown the presence of anomalies that form rectangular shapes which presumably reflect ruins; therefore, the depth range of the ruins had to be assessed and, if possible, the resistivity distribution at various depth slices determined. Further, if possible, a 3-D visualization had to be produced.
- Since shallow depths were investigated and antiquities were expected to be buried at the particular location tested, the resistivity was expected to vary laterally in an intense manner.

Taking into account the above considerations, the pole-dipole electrode array was chosen.[33] This electrode configuration

33 Parasnis 1997, 130.

mode has a very good signal to noise ratio and good lateral and vertical resolution.[34] The inter-probe spacing was set to 0.75 m (a=0.75 m) as mentioned above in order to achieve the desired depth penetration without sacrificing lateral resolution. The maximum dipole separation was set to n=8. The length of the measuring dipole was then doubled (2a) and n_{max} was again set to 8.[35]

Electrical resistivity tomography: data processing and interpretation

Each individual tomography was inverted using Tsourlos's algorithm.[36] This procedure resulted in 2-D images. Subsequently, the set of tomographic data was subjected to 3-D inversion according to the scheme published by Tsourlos and Ogilvy.[37]

Although the data acquisition cannot be considered as full 3-D in our case, it has been shown that only negligible imaging detail is lost provided that the inversion is performed using full 3-D algorithms.[38] In addition, the data must be collected along dense parallel traverses, ideally spaced at intervals equal to the spacing of the electrodes along the traverse. Both these constraints are fulfilled in our case.

The 3-D inversion scheme performs an iterative optimization based on a 3-D finite element modelling scheme. The algorithm is fully automated, self-correcting and performs smoothness constrained inversion.[39] The inversion procedure is accelerated by the use of a Quasi-Newton technique for updating the Jacobian matrix.

All inversions produced a low RMS error (less than 3%), indicative of the high data quality and of the high credibility of the results. The inversion results shown in *Fig. 14* effectively depict the "real" subsurface resistivity.

The resistivity distributions were inferred by the inversion of the data in the full 3-D context, i.e., the data was inverted by the full 3-D algorithm mentioned previously and the three-dimensional distribution of resistivities was assessed. Horizontal sections (slices) were subsequently extracted from the volume of resistivities.

The distribution of the resistivity in the subsurface at various depth levels (slices) is shown in *Fig. 14*. It is evident that high resistivities occur in a manner that creates clear alignments at depths less than 1.55 m where a resistive basement appears.

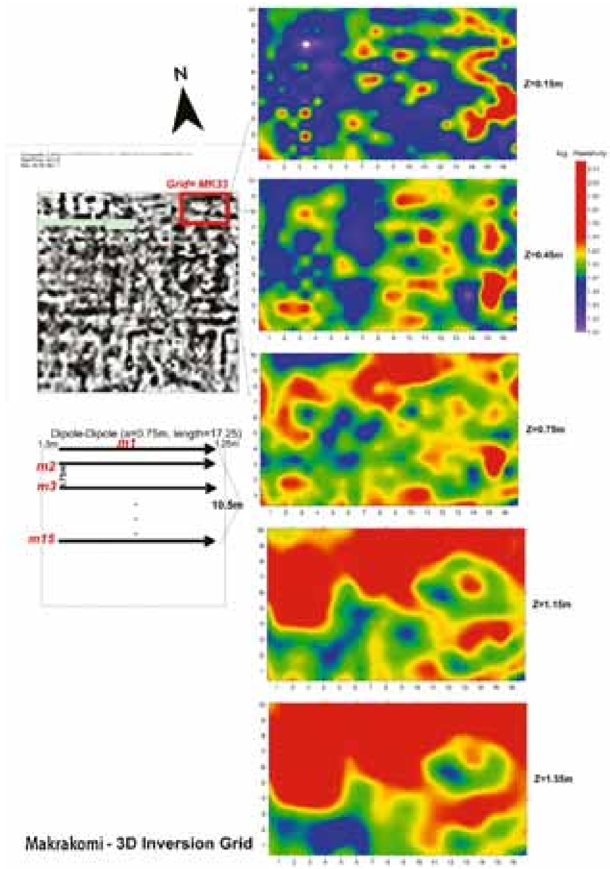


Fig. 14. The inferred resistivity distribution at various depth slices after the inversion of the data. The exact depth of each slice is marked at the right side of the relevant image.

Summary

Resistance mapping was carried out in an area of 22,000 m^2 in Asteria, where ancient wall traces and surface scatters have been recorded. Alignments of high resistances were encountered, forming closed geometrical shapes in many cases. They were interpreted as reflecting buried ancient ruins, mainly of foundation walls. A N–S, E–W-aligned plan was revealed, probably belonging to a structured settlement.

34 Ward 1990, 174–175.
35 The SYSCAL-IRIS resistivity meter with an automated switch was used. The multicore cables used are custom built by the Laboratory of Exploration Geophysics.
36 Tsourlos 1995, 242–265.
37 Tsourlos & Ogilvy 1999, 30–45.
38 Papadopoulos *et al*. 2006, 178–179.
39 Constable *et al*. 1987, 289–300.

Resistivity tomographies were also conducted as a test in a small segment of the survey area. They imaged the subsurface in the three-dimensional context and showed that the archaeological remains are lying at shallow depths, most likely less than 1.50 m.

The geophysical images must be seen as a dynamic element and their interpretation may be modified or augmented with new information after the excavations. In other words, final conclusions should be deferred until after the trial excavations are completed.

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A preliminary report of excavations in Area C (Asteria) in 2012

BY MARIA-FOTEINI PAPAKONSTANTINOU, LAMBROS STAVROGIANNIS & KONSTANTINA PSAROGIANNI

A small number of trenches were excavated in the central Asteria area in July 2012 by a team from the 14th Ephorate of Prehistoric and Classical Antiquities as part of the MALP.[40] The exact location of the excavation was chosen on the basis of the results from the geophysical investigation, carried out by Aristotle University of Thessaloniki in 2011 and 2012, and the surface survey and architectural survey conducted by the Swedish team in 2010 and 2011.[41] Both the archaeological survey and the geophysical investigations provided evidence of linear and square structures orientated E–W and N–S, which can be associated with the ancient settlement which would have existed in a series of natural and artificial terraces on the slopes and low ridges extending east from Profitis Elias.[42]

Excavations in Area C: Trenches A–B–C, House A

In the central part of Asteria (*Fig. 15*), east of the country road that crosses the region and where a large plateau is formed by

[40] For previous excavation and other investigations at Asteria and the adjacent area see Roux 1957, 89–94; Spyropoulos 1971, 238; Chourmouziadis 1973–1974, 516–517; Stamoudi 2000, 454. The excavations were carried out 7–31 July 2012 under the supervision of the authors of this report together with the permanent workers of the 14th Ephorate: Vassilios Kanellos, Athanasios Tselos and Konstantinos Galimanis. Volunteers from the Association of Active Citizens of Western Phthiotida, Efthimis Adamis, Georgia Kallergi, Eleni Anthopoulou, Georgios Kallioras, Maria Karastathi, Konstantina Karagianni, together with their President Nikolaos Kondogiannis, volunteered periodically. Angeliki Kanellou, a student at the Department of Archaeology, University of Thessaly, also participated in the excavations. Feature drawings were produced by Chryssoula Founda and find drawings were produced by Aikaterini Spanou. The geophysical grid on the ground surface and the careful georeferencing was carried out by the surveyor Alexandra Tsonou.

[41] See entries by Tsokas *et al*. and Bonnier, Nilsson & Boman in this report.

[42] These archaeological features seem to follow a hippodamic system (Hoepfner 2005, 275–281). For neighbouring cities such as Nea Halos and Falara, see Reinders 1988 and Dakoronia 1991, 75–88. For similar settlement development on successive terraces in Macedonia (Aiani, Aiges and Argilos) see Karamitrou-Mentesidi 1996, 27; Drougou 2001, 553; Bonias & Perreault 1996, 663–680.

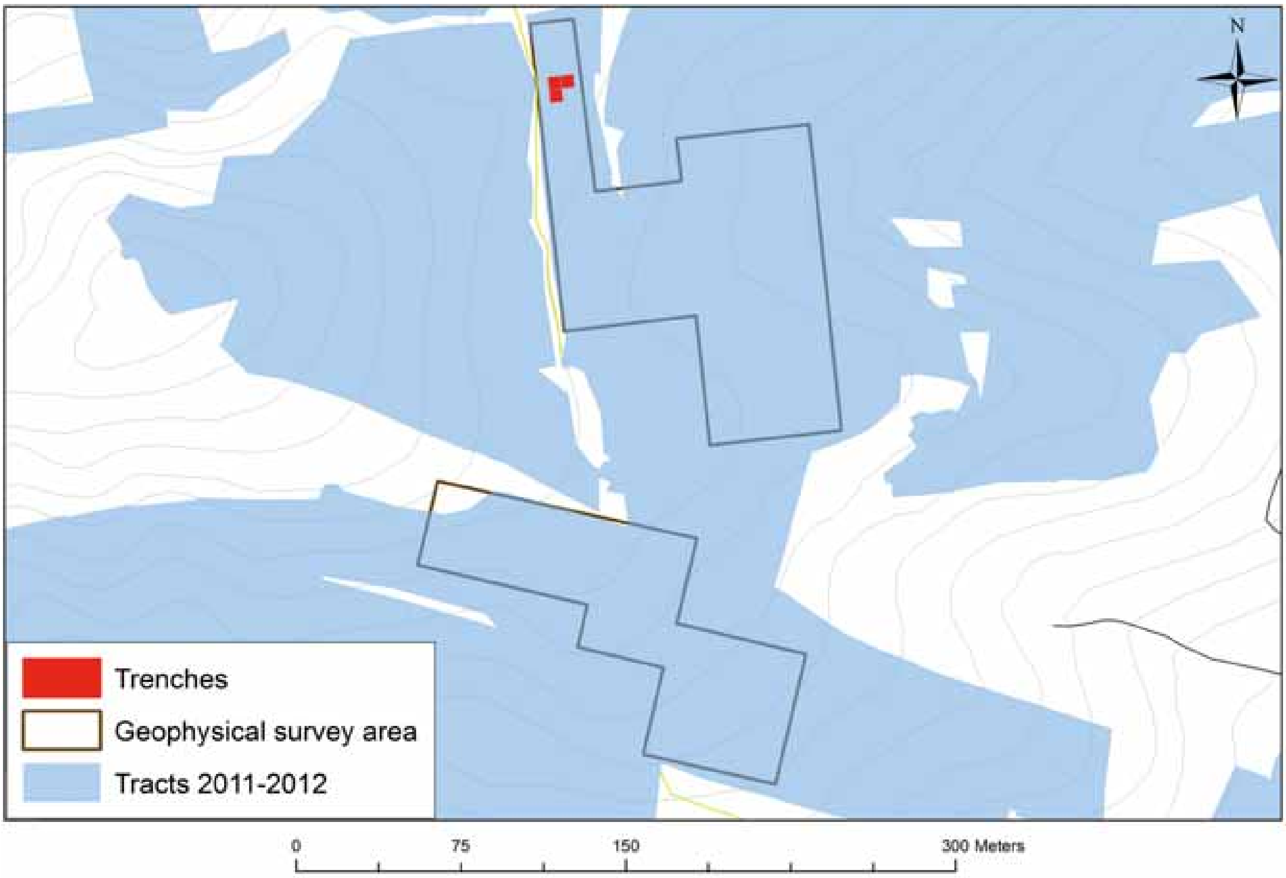


Fig. 15. Location of the excavated trenches in relation to the wider survey area. By A. Bonnier.

the ridges extending from Profitis Elias, three trenches were opened, each measuring 5 × 5 m.[43] The trenches were laid out in the area which also partly covers cell MK2 (20 × 20 m) of the geophysical mesh, which had produced clear evidence of buried structures or building remains (*Fig. 16*). The excavations that followed revealed building remains across most of the trenches and largely confirms the results of the geophysical investigation (*Figs. 17–19*).

The uncovered Walls 1–3 and 5 together define the outline of three rooms: the two adjacent Rooms I and II, aligned E–W, and Room III, located immediately south of Room II. Walls 1 and 3 seem to be external, and the structural remains may be identified as the north-western part of a House A, which was probably flanked by streets to the north and west. There is also further material evidence for the presence of roads flanking the structure. North of Wall 1 a layer of small stones, tiles and sherds was identified, which follows the natural inclination of the ground from west to east, and which should probably be interpreted as part of the road surface (*Fig. 20*).[44] Apart from tile fragments and broken potsherds we further recovered a stone axe, possibly prehistoric, from the road surface (*Fig. 21*). The excavations also revealed a second street, running north to south, which flanks the western part of the house and intersects with the other street by the north-western corner of the building. The road surface of this second street is, however, only sporadically preserved.

The walls are constructed with field stones as well as roughly worked medium to large stones arranged in two parallel rows with a filling of pebbles (*Fig. 22*).[45] All of the walls are set on bedrock at a depth of 0.30–1.00 m,[46] and the associated rooms have surfaces of packed earth, some of which can be identified as possible floors, sloping towards the east.

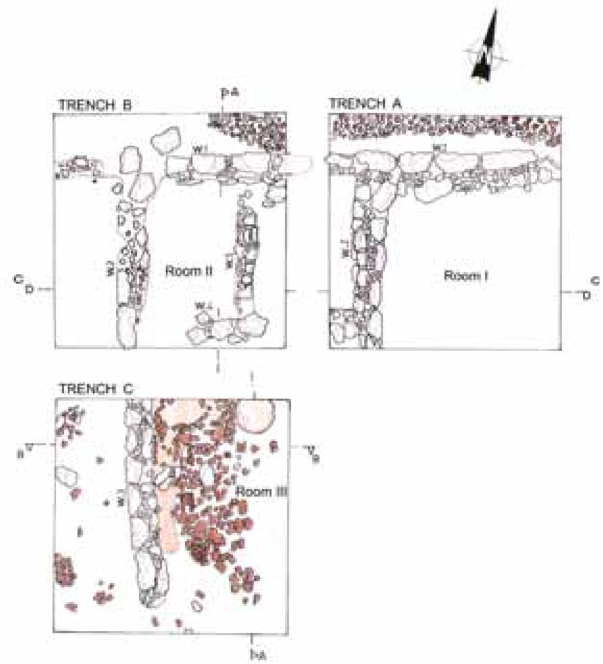
43 Baulks A–B and B–C have not yet been excavated.

44 This is a common composition of road surfaces which is known from other excavated sites, such as Petres at Florina (Adam-Veleni 1996, 5–6).

45 Reinders 1988, 114–119, figs. 73–75.

46 Measured from the soil surface at the north-western corner of Trench B (195.15 masl).

Fig. 16. Superimposition of the excavation ground plan on cell MK2 of the geophysical mesh.



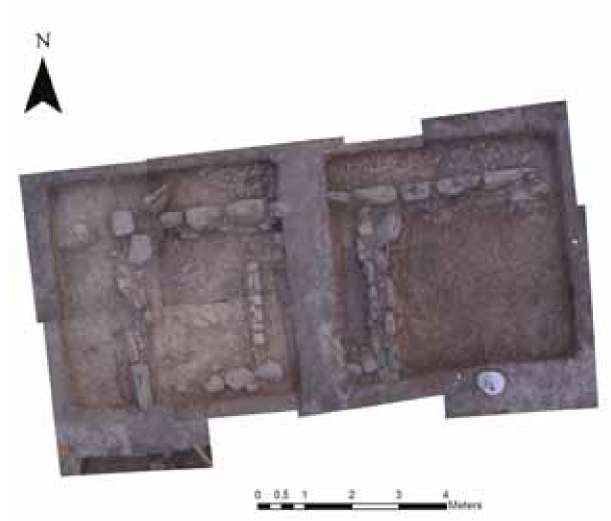


Fig. 18. Vertical photo montage of the trenches A and B. By J. Klange.

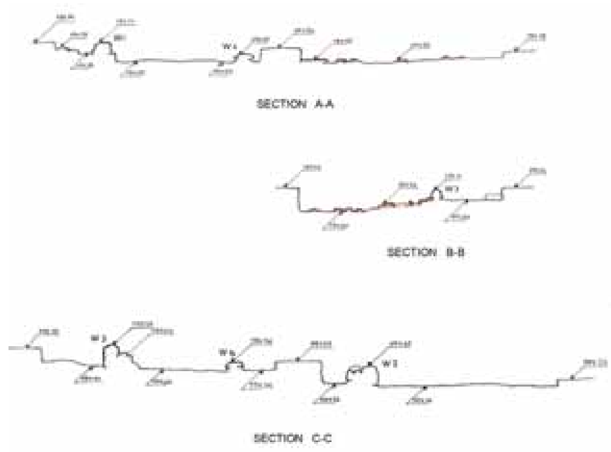


Fig. 19. Sections A–B–C. Drawing: C. Founda.

Fig. 17 (left). The layout of excavation trenches and the ground plan of the excavated parts of House A. Drawing: C. Founda.

The upper part of some of these walls was partly visible before excavation, and seems to have been damaged by previous agricultural activities in the field. The walls are preserved to a height of 0.20–0.55 m (*Fig. 19*), and constitute stone foundations that probably supported a mud brick superstructure.[47] Traces of mud brick were recorded in the filling of the rooms and in association with the large tile fragments, the width of which varies between 0.40 and 0.79 m, and which were recovered from the destruction layer in Room III.

47 Reinders & Prummel 2003, 3, 40.

Fig. 20. Trench A. Street layer composed of small stones, tiles and sherds north of the external Wall 1, looking east. Photo: L. Stavrogiannis.

To the right:

Fig. 21. Stone axe from the filling of the northern street. Photo: L. Stavrogiannis.

Fig. 22. Trench B, Room II, Walls 1, 3, 5 and 6, looking east. Photo: L. Stavrogiannis.

Fig. 23. Room III. Wall 3 and the destruction deposit, looking north. Photo: L. Stavrogiannis.

Room I, measuring 3.80 × 3.30 m within Trench A, is defined by Wall 1 to the north and Wall 2 to the west. Both Walls 1 and 2 appear to continue outside the limits of Trench A. Room II, measuring 2.99 × 2.90 m, is defined by Wall 1 to the north and Wall 2 to the east, Wall 3 to the west and Wall 4 to the south. The room is further divided into two compartments by a smaller, partly destroyed, cobble wall (Wall 5) which is oriented north–south and does not seem to be related to any of the external walls.

Fig. 24. Bowl found outside Room II, north of W1. Photo: L. Stavrogiannis.

Fig. 25. Profile drawing of bowl depicted in Figure 24. *Drawing: A. Spanou.*

Fig. 26. Plate with rouletting from Room I. Photo: L. Stavrogiannis.

Fig. 27. Profile drawing of plate depicted in Figure 26. *Drawing: A. Spanou.*

The western edge of Wall 4 is situated 3.50 m from Wall 2, and this was probably the entrance to Room II. In the filling of Rooms I and II scattered fragments of roof tiles were found together with traces of ash in the western corner of Room II. Room III, measuring 4.25 × 5.70 m within Trench C, is defined by Wall 4 to the north and Wall 3 to the west.

The interior of Room III is partly covered by a dense destruction layer composed of broken roof tiles mixed with mud brick, traces of burnt soil and fragments of pottery, including a large storage vessel (*Fig. 23*).[48] Within this room a large rounded stone feature was uncovered as well as a bronze coin with an inscription reading ΒΟΙΩΤΩΝ.[49] The large number of fragments from storage vessels in this section of the trench suggests that this room was at least partly used as a storage facility within the house.

A large amount of fragmentary plain and black glazed pottery was recovered from all of the rooms, including fragments of amphorae, kantharoi, skyphoi of bolsal type,[50] and bowls or salt cellars (*Figs. 24–25*),[51] as well as plates with rouletting and impressed palmette decoration (*Figs. 26–30*).[52] These finds date the excavated contexts quite clearly to the Late Classical and Early Hellenistic period. Loom weights and a single fragmentary clay spindle whorl (*Fig. 31*) were also uncovered during the course of the excavations, providing evidence of household activities and supporting the identification of domestic functions associated with the building.[53] In addition, an iron nail was found that may possibly originate from the roof of the building.[54]

Conclusions

The first season of excavation in 2012 supports the picture of a large structured settlement with domestic housing units in Area C/Asteria, suggested by the previous geophysical investigations and the archaeological surface survey. Superimposing the ground plan on the geophysical mesh, the alignments of the resistance anomalies in cell MK2 reflect the orientation

48 The listed finds came from the cleaning and not by the removal of the destruction layer, which will be done next year as a whole, after the full uncovering of the floor plan of Room III.
49 *BMC Central Greece*, 43, pl. VI, no. 12.

50 Sparkes, Talcott & Richter 1970, 274–275, nos. 556–558, pl. 24 (early 4th–middle 4th century BC).
51 Rotroff 1997, 70 (115 bis 5), figs. 135–136 (end of 4th century BC). Rotroff 1997, 347, no. 1088, fig. 65, pl. 79 (275–250 BC).
52 Rotroff 1997, 309, no. 637, fig. 46, pls. 60, 142, 145 (325–300 BC).
53 *Délos* XVIII, 270–271, figs. 310, 312.
54 The roof was probably covered with Laconian tiles, as is suggested by the fragmentary roof tiles recovered from the destruction layer within Room C, as well as the sporadic specimens in the filling of Rooms A and B.

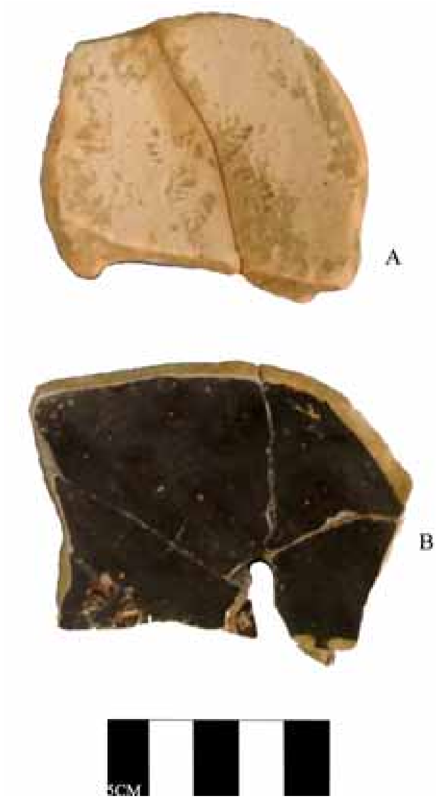


Fig. 28. Two plates with impressed decorations, from Room I. Photo: L. Stavrogiannis.

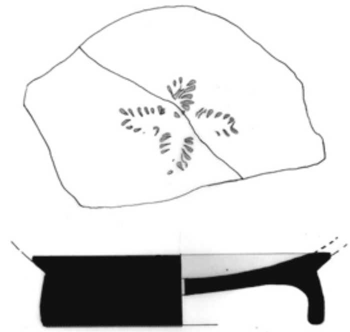


Fig. 29. Profile drawing of plate (A) depicted in Figure 28. *Drawing: A. Spanou.*

Fig. 30. Profile drawing of plate (B) depicted in Figure 28. *Drawing: A. Spanou.*

of the ancient urban complex and give further support to the layout of the settlement in well-shaped closed rectangles, according to a structured grid. The excavations will continue in the upcoming seasons of MALP in order to complete the plan of the revealed building, as well as to provide better resolution of the archaeological evidence in parts of the ancient settlement covered by the surface survey.

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Fig. 31. Fragmentary clay spindle whorl from Room II. Photo: L. Stavrogiannis.

The archaeological surface survey in the area of Areas A and B (Profitis Elias) and Area C (Asteria) 2010–2012

BY ANTON BONNIER, MONICA NILSSON & HENRIK BOMAN

The main objectives of the archaeological survey are to examine the spatial pattern, nature and chronology of ancient activity outside the fortification walls which surround the double summit of Profitis Elias.[55] Through integrated methods of surface survey and investigation of architectural surface traces we aim to build a better understanding of the extramural area and its role in the landscape. Originally the primary aim was to identify whether we could identify extramural sites on the eastern slopes, but as will be shown in this report much of the material can be related to a single settlement of Classical and Hellenistic date.

The primary focus of this report will be on the first phase of the surface survey carried out between 2011 and 2012, as well as the architectural survey carried out on the lower eastern slopes of the hill of Profitis Elias and Asteria. It should be stressed that the survey has not been completed and that the conclusions presented here may be altered once the full programme has come to an end, including a second phase of survey which will involve re-survey of high density areas as well as continued excavation in Asteria.

The pilot survey in 2010

(BY ANTON BONNIER)

The pilot investigations of 2010 were aimed at providing a first picture of artefact types and chronology, as well as to record initial indications of variations in densities of surface scatters in various parts of the research area. Due to differences in elevation and modern land use it was decided that the pilot investigations should be carried out in three smaller sectors of the Profitis Elias hill and Asteria. The area composed of the hill itself was divided into two sectors consisting of Area A, the southern summit where the modern chapel is situated as well as the bulldozed road which leads to it, and Area B, which consists of the northern summit. Finally, the fields on the lower eastern foothills (the Asteria area) were defined together as Area C (*Fig. 32*).

The dirt road leading towards the chapel of Profitis Elias proved to be an important segment of the archaeological landscape due to the presence of an extensive amount of archaeological material. Annual bulldozing together with erosion due to periods of heavy rainfall has continuously exposed a very large quantity of archaeological material, and the road could therefore be used as “test trench”, producing a large body of data which would allow for comparison with material from other parts of the site. The road was divided into a large number of small investigation units, covering the width of the road and measuring approximately five metres in length, and the full densities of surface material in these units were recorded using hand held tally counters (clickers), while all diagnostics were photographed and described.

In other areas of the site small units or “tracts”, usually no more than 10–15 m in length, were established on the basis of the local topography following features such as architectural remains or vegetation. The size of each tract also varied according to the number of walkers, but a five-metre distance between walkers was consistently used, apart from those investigated by the bulldozed road. All of these investigation units were digitized and information was continuously insert-

[55] In the first year, directors of the MALP project were Maria-Photeini Papakonstantinou of the 14th Ephorate of Prehistoric and Classical Antiquities in Lamia and Ann-Louise Schallin of the Swedish Institute at Athens. Arto Penttinen has since, in his capacity of director of the Swedish Institute, succeeded Schallin as representative of the Swedish partnership. Funding for the survey has been generously provided by Stiftelsen Enboms Donationsfond/Kungl. Vitterhets Historie och Antikvitets Akademien, Helge Ax:son Johnsons stiftelse, and Herbert och Karin Jacobssons Stiftelse. We are also very grateful towards Arkeologikonsult for providing us with free software (SiteWorks) which was used during the campaigns. The work of the pilot project was carried out in the last two weeks of August 2010. Participants of the pilot investigations were Anton Bonnier (then Stockholm University, now Gothenburg University), Monica Nilsson (Swedish Institute at Athens), Johan Klange (Arkeologikonsult, Stockholm), Nikoletta Koutsoukera (14th Ephorate of Prehistoric and Classical Antiquities) and Robin Iversen Rönnlund (Stockholm University). In 2010 the Municipality of Makrakomi provided two workmen for the clearing of vegetation at parts of the site and we also had much help from local volunteers; these included Nikolaos Raptis, Nikos Kontogiannis and Euthemis Adamis. During the 2011 and 2012 campaigns Anton Bonnier (Stockholm University/Gothenburg University) acted as field director while Monica Nilsson (Swedish Institute at Athens) was team leader for the surface survey and Henrik Boman (Stockholm University) was responsible for the architectural survey. Technical staff was Johan Klange (Arkeologikonsult, Stockholm), who was responsible for RTK-GPS measurements and processing in SiteWorks. Student participants in 2011 and 2012 included Ebba Bursell Haglund, Alexia Johansson, Rolf Johansson, Robin Iversen Rönnlund, Ingrid Berg, Axel Frejman and Helmut Sandeck (all students of Stockholm University). Lambros Stavrogiannis of the 14th Ephorate of Prehistoric and Classical Antiquities in Lamia also participated in the surface survey in 2011. In addition, we would like to express our deep gratefulness and many thanks to the people of the municipality of Makrakomi, and in particular to Mr Nikolaos Raptis, who has helped us with a number of practical matters throughout the campaigns.

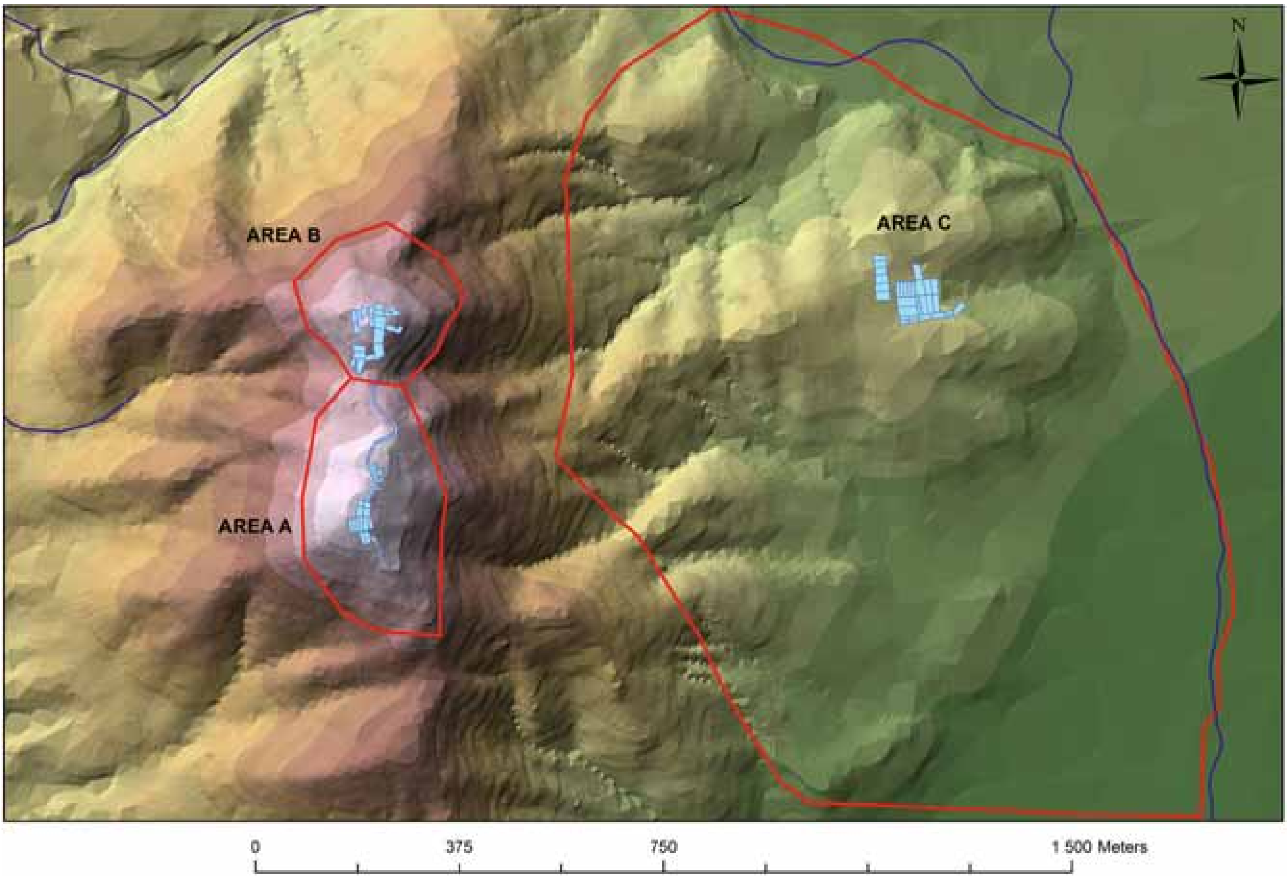

Fig. 32. Ground covered by the pilot survey in 2010. By A. Bonnier.

ed into a GIS programme during the course of the campaign, including information on material density, visibility, slope, and current land use.

In terms of the spatial distribution of surface finds the highest densities were recorded in connection to the total coverage units laid out on the bulldozed road, as well as in parts of Area C (*Fig. 33*). The high densities in Area C (Asteria) were especially interesting in terms of the patterns of ancient habitation. Apart from wall traces of ancient structures, a carpet of tile fragments and potsherds was noted in this part of the site. Many of these fields have been subject to recent ploughing and such activities will have brought a large amount of the material to the surface in recent years.

Elsewhere, in Area A and B, the densities are varied though they are generally lower, compared with the area of the road and Area C. The abundant finds from the bulldozed road suggests that material may be buried beneath the topsoil on the hill site, or that continuous erosion will have moved surface material towards the lower slopes. It is probable that both these factors may be used to explain the generally low densities of material in parts of Areas A and B. A further problem of recovering representative densities in these areas of the site can also partly be related to factors of visibility.[56] In sections of both hilltops, visibility is hampered by the presence of high grass and other forms of vegetation, which will have had an effect on the recorded density figures.

The surface material, which was examined in-field in all parts of the site during the short 2010 campaign, consisted primarily of coarse and fine pottery (*Fig. 34*), large quantities of tile fragments (including several fragments with traces red and black glaze), as well as smaller amounts of lithics and terracotta artefacts, and small fragments of ancient glass. Overall the documented material from all of the sectors points to primary activity from the late 4th century BC until the 2nd or 1st century BC. Ceramic finds of other periods, including recognizable early modern or modern pottery, were virtually

56 In the formal recording of the tracts during the pilot survey, a visibility index ranging between 1 to 5 (where 5 represents the highest and 1 the lowest) was consistently used for the recording of each tract.

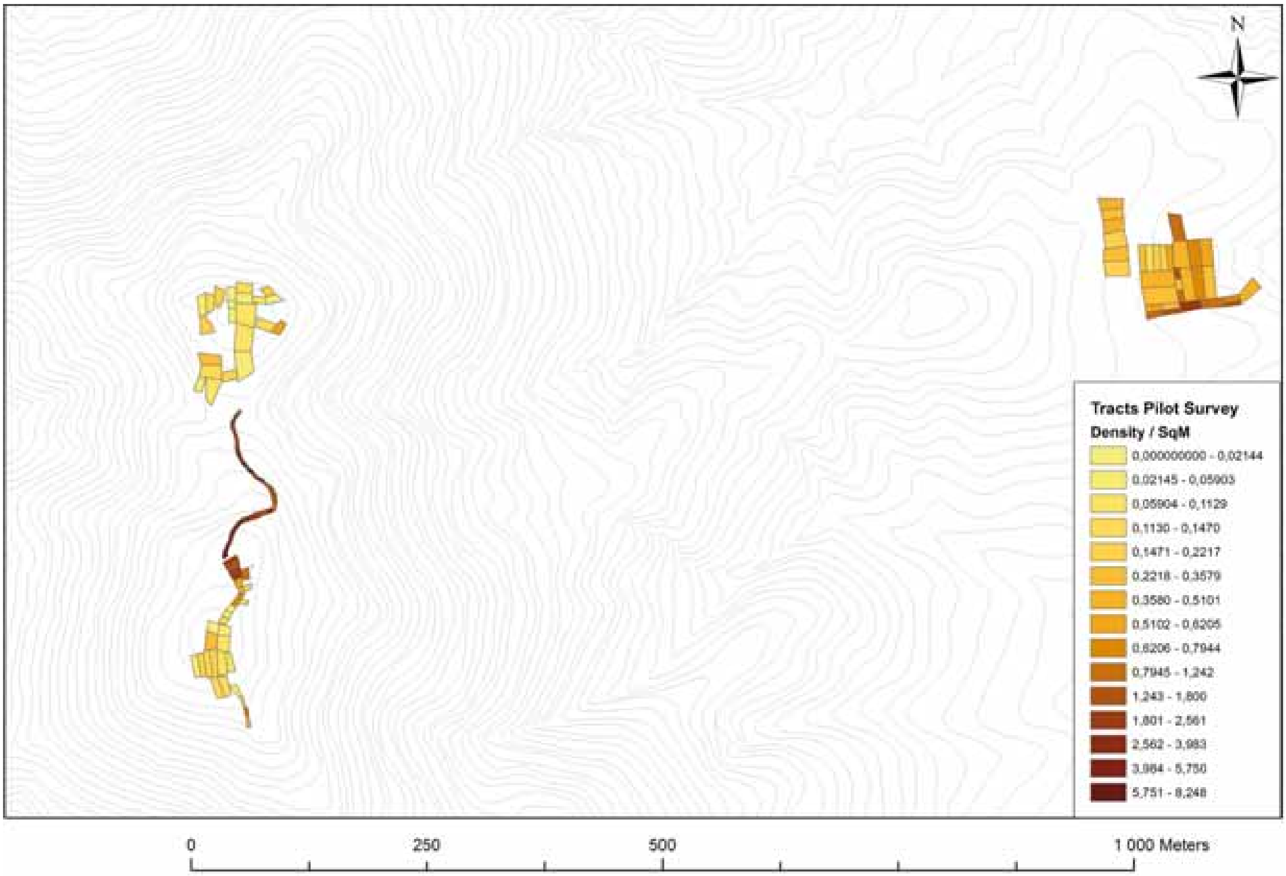

Fig. 33. Recorded densities of tracts in Areas A, B and C. By A. Bonnier.

Fig. 34. Example of Tract assemblage from Area C. Photo: M. Nilsson.

non-existent in all parts of the site, and the recorded densities seem to reflect the spread of primarily Late Classical and Hellenistic material as well as some small quantities of prehistoric lithics. Such lithic finds comprised one chert arrowhead (*Fig. 35*), which was recorded in Area B (Tract 1061), and two obsidian fragments documented in one of the fields in Area C (Tract 1097). Although these finds point to limited prehistoric activity they may not be used to indicate any large scale habitation on the hill itself.[57]

As part of the pilot season of 2010, architectural remains were studied on the two summits of

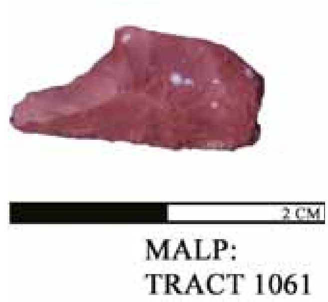

Fig. 35. Chert arrowhead (Tract 1061). Photo: M. Nilsson.

[57] Previous discussion has highlighted the problem of recognizing small-scale prehistoric habitation through surface survey, acting as "hidden landscapes", particularly on sites with more extensive scatters of historic Greco-Roman material (Bintliff *et al*. 1999; Bintliff *et al*. 2002, 261; Bintliff 2011). In terms of the material from the Profitis Elias hill we recognize the possibility of the lithics providing evidence of short lived small-scale habitation or other forms of activity during the prehistoric period. We believe, however, that the small number of lithics cannot be used to suggest the presence of an extensive and regionally significant settlement site.

Profitis Elias in order to provide a picture of habitation and activity within the fortification walls in Areas A and B. Visible walls were drawn and measured using a differential GPS, so that the drawings could be digitized and inserted into the GIS, together with information on the investigated tracts and material densities. Some of these structural traces were already noticed by Yves Béquignon in the early part of the 20th century, and probably represent houses which were placed within the fortified area of the acropolis. The thickness of vegetation and overgrowth renders it difficult to determine the full extent of survey potential and presents further problems in relation to the investigation of architectural traces. In some parts of the site the vegetation had to be cleared, bringing to light further wall stretches which could be drawn and measured. It was hoped that mapping some of these features would allow for some suggestions on the possible function of these buildings as well as give an initial idea of the extent of the structural environment within the acropolis walls in antiquity.

In several areas the recorded architectural features consist of solitary walls that cannot be used to reconstruct the presence of actual buildings. It is possible that at least some of these should be understood as ancient terrace walls, constructed to support other structures within the walled area, or to stabilise soil on the slopes of the two summits. There are also examples of wall traces that can quite confidently be defined as proper structures, rather than ancient terrace walls on the acropolis. In Area A, to the south/south-west of the chapel of Profitis Elias, a series of walls seems to form the outline of a large rectangular structure. The walls consist of a coursed line of small to medium sized stones, and seem to be structural rather than part of a terracing system.

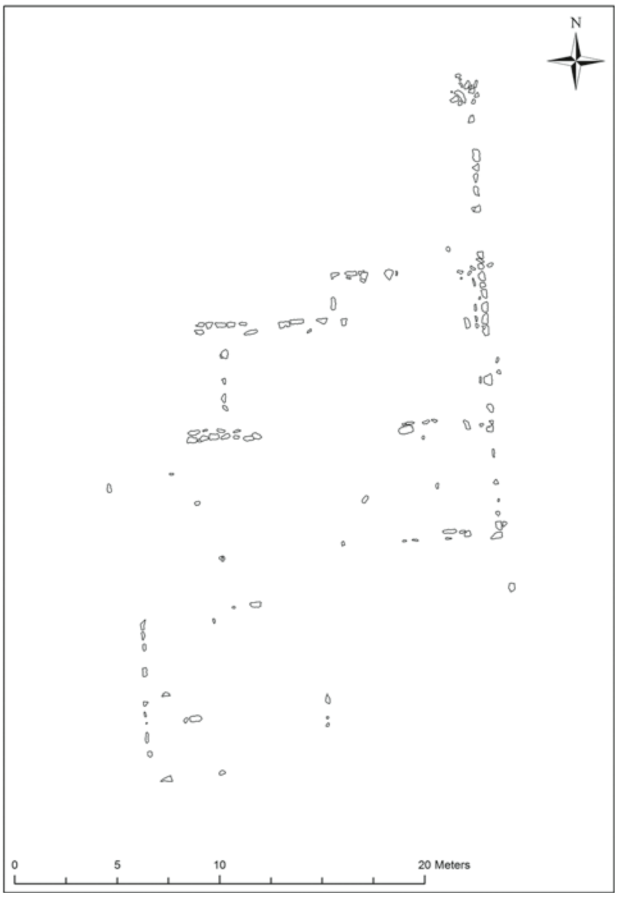

Fig. 36. Plan of the large structure in Area B, recorded in 2010. Plan by J. Klange & R. Iversen Rönnlund.

On the hilltop which makes up Area B several architectural features were recorded. The most substantial building in this area is located on the summit of the hill close to the northernmost part of the fortification walls, and it seems to be made up of several rooms, including a possible courtyard area, though such an interpretation must be regarded as highly preliminary (*Fig. 36*). Béquignon includes this building in his sketch map of Profitis Elias but refers to it simply as a rectangular structure. Our investigation shows that the structure must instead be understood as a much more extensive building, similar to Classical and Hellenistic domestic structures documented elsewhere.

The archaeological surface survey 2011–2012

(BY ANTON BONNIER)

The work carried out as part of the pilot survey provided us with an initial picture of the nature of surface material in various sectors of the Profitis Elias hill and its surroundings. It was decided that Area C/Asteria offered the most interesting point of departure for the intensive surface survey. This is due to the fact that the fortified hilltop had already been examined by 20th century topographers, while little was known of the nature of habitation and the presence of possible "sites" outside the fortification walls.[58]

Continued survey on the lower eastern slopes and foothills also presented us with a good opportunity to examine an an-

[58] The term site is not unproblematic given the previous scholarly discussion within landscape archaeology and surface survey. By sites we adhere to the common definition of a focus of archaeological material (or a "cultural anomaly") in a landscape made up of off-site archaeology (cf. Lolos *et al*. 2007, 268). When we started the surface survey in 2011 we had a very vague idea of the nature of ancient activity outside the fortified area and expected to find several different concentrations of surface material, but instead the survey between 2011 and 2012 has shown that we are primarily dealing with what seems to be one comparatively large nucleated settlement dating to the Late Classical and Hellenistic periods.

cient environment in the western Spercheios Valley, providing important information on a part of Central Greece which has previously not been the subject of extensive research. A strategy was subsequently designed where the lower slopes would be subject to a first survey phase aimed at recording notable concentrations of surface material as well as areas of off-site scatters.[59] This first phase of survey will be followed by a second re-survey phase which will be focused on a coverage of high density areas and areas with rapid changes of surface densities noted through the first phase survey, but which is not covered by the present report as this work has yet to be carried out.

SURVEY METHODOLOGIES

The methodology of the first phase survey was similar to that adopted during the pilot investigations, utilizing intensive fieldwalking and artefact level, "site-less", survey as well as investigations of architectural traces in the same area. Tracts were laid out on the basis of the number of walkers available and the local topography, current land use and the presence of modern field boundaries. A five-metre gap between each walker was consistently maintained during the survey and tracts did generally not exceed 60 m in length, though tracts were usually much smaller than this.

This method of fieldwalking will naturally result in a varying and irregular grid of tracts, but such a targetted approach was deemed necessary as changes in land use, slope and vegetation would have made a regular grid, laid out irrespectively of such landscape features, undesirable, as much contextual information on artefact densities would be lost.[60] The second phase survey, involving re-survey of high density areas, will instead be carried out according to a regular grid laid out within the different fields and previously established first phase tracts.[61]

A fieldwalking team usually composed of four or five walkers and a team leader covered approximately 48 hectares in 2011 and 2012 (*Figs. 37–38*). As in the pilot campaign, densities of surface material in the tracts were recorded using clickers, with walkers normally being placed at 5 m intervals. Surface material was recorded in swaths of two metres, right and left of each walker, resulting in a theoretical coverage of about 40% of the surface in each tract, and from which we could calculate full density values. Diagnostic feature sherds were washed, recorded, and photographed for each tract by the survey team, and subsequent in-field analysis was also performed by period specialists, but without these finds being collected from the fields.[62]

We found that this type of in-field recording of finds was highly suitable for the first phase of the survey as the recovered material had in many cases only recently surfaced, and therefore was not heavily worn or eroded, which made classification of finds from the photographs possible. The in-field recording strategy employed for the first phase survey was vital to the project as it allowed us to reduce costs involved in storage and in extensive post-fieldwork processing work, which is important for a research programme such as MALP which operates with a very small amount of funding and resources.[63] In-field recording would allow us to quickly produce an extensive first view of the material scatters present in the survey area, allowing us above all to trace overall surface densities of the major habitation and activity phases on the eastern slopes below the Profitis Elias hill. Had we carried out a gridded collection survey right from the start we would have had no chance of covering the full survey area, given the limited project resources, and we would not have been able to acquire the information of the surface archaeology which we now have.

The first phase survey would also have a very low impact on the archaeological landscapes, as no material would be removed from the survey area.[64] Tracts can thus be suitably rewalked during the second phase survey in order to test how the dispersal of surface artefacts changes during the course of one or two years, beyond the immediate impact of the survey

59 The correlation between off-site and on-site densities of archaeological surface material is a central focus of most modern survey projects. Through this approach sites are often identified in relation to the surrounding scatter of surface material at lower volumes but of similar date (see for example Bintliff & Snodgrass 1988; Wright *et al*. 1990, 604–608; Bintliff & Howard 1999; Bintliff *et al*. 2002; Bintliff, Snodgrass & Howard 2007, 15–37; Tartaron *et al*. 2006, 458; Caraher *et al*. 2006). The main cause of such off-site densities has been the subject of some debate (Bintliff & Snodgrass 1988; Alcock, Cherry & Davis 1994; Pettegrew 2001; 2002; Osborne 2001; Foxhall 2001; Bintliff *et al*. 2002). In the case of MALP we agree that manuring and more intense rubbish discard at the edges of settlements form the most likely explanation of the Classical and Hellenistic off-site material.

60 Such an approach has been adopted for other survey project in Greece, both in the past and more recently, such as the Zakynthos Archaeology Project (see for example van Wijngaarden *et al*. 2007; 2008; 2010), the Eastern Korinthia Archaeological Survey (Tartaron *et al*. 2006; Caraher *et al*. 2006), as well as the urban survey of the Vassiliko Plateau/Ancient Sikyon (but where regular gridding was used within the topographically determined tracts, see Lolos Gourley & Stewart 2007, 275–277).

61 Similar to site mode survey used in the EKAS survey of the eastern Corinthia (Tartaron *et al*. 2006, 468–469, 485–492).

62 This is very similar to the strategy employed by the EKAS for discovery unit (DUs) and off-site survey (Tartaron *et al*. 2006, 484–485).

63 For recent discussion on issues concerning sampling quantities and storage of finds in connection with intensive artefact survey in Greece, see Lolos, Gourley & Stewart 2007, 270–271.

64 The survey did, however, cause some direct impact on the dispersal of the material as feature sherds and diagnostic material was brought to the end of each tract for the in-field recording and analysis. Material was later dispersed in the tract where it was originally collected.

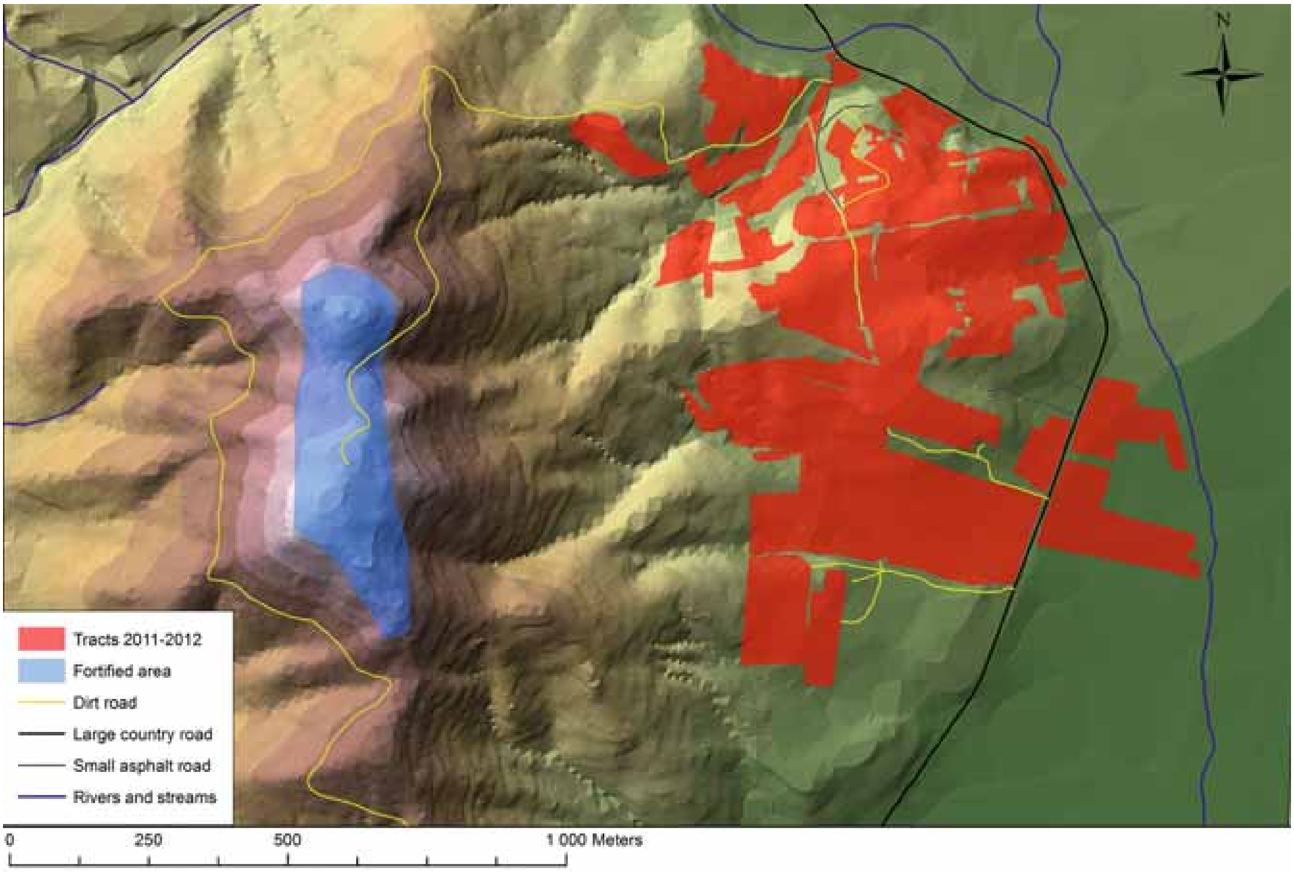

Fig. 37. Ground covered by the archaeological surface survey in 2011 and 2012. By A. Bonnier.

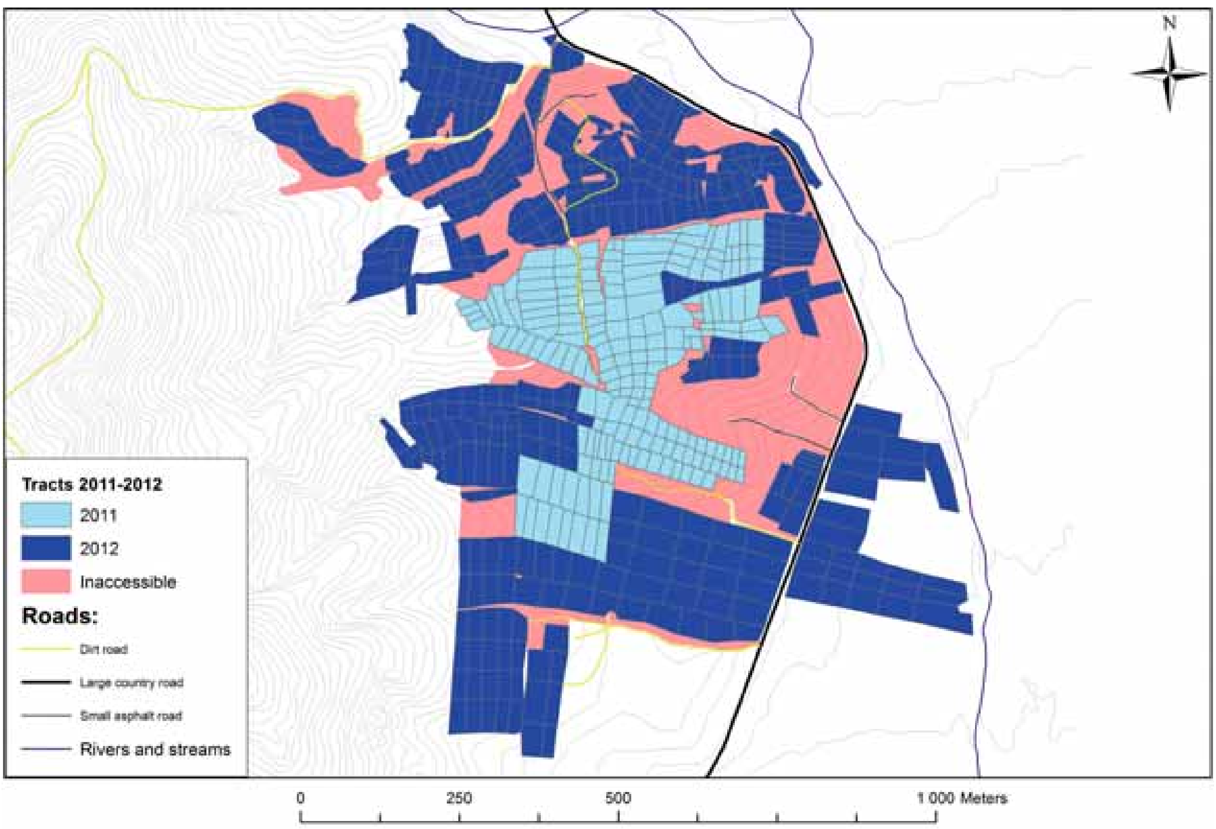

Fig. 38. Tracts walked in 2011 and 2012. Contours at 4 m intervals. By A. Bonnier.

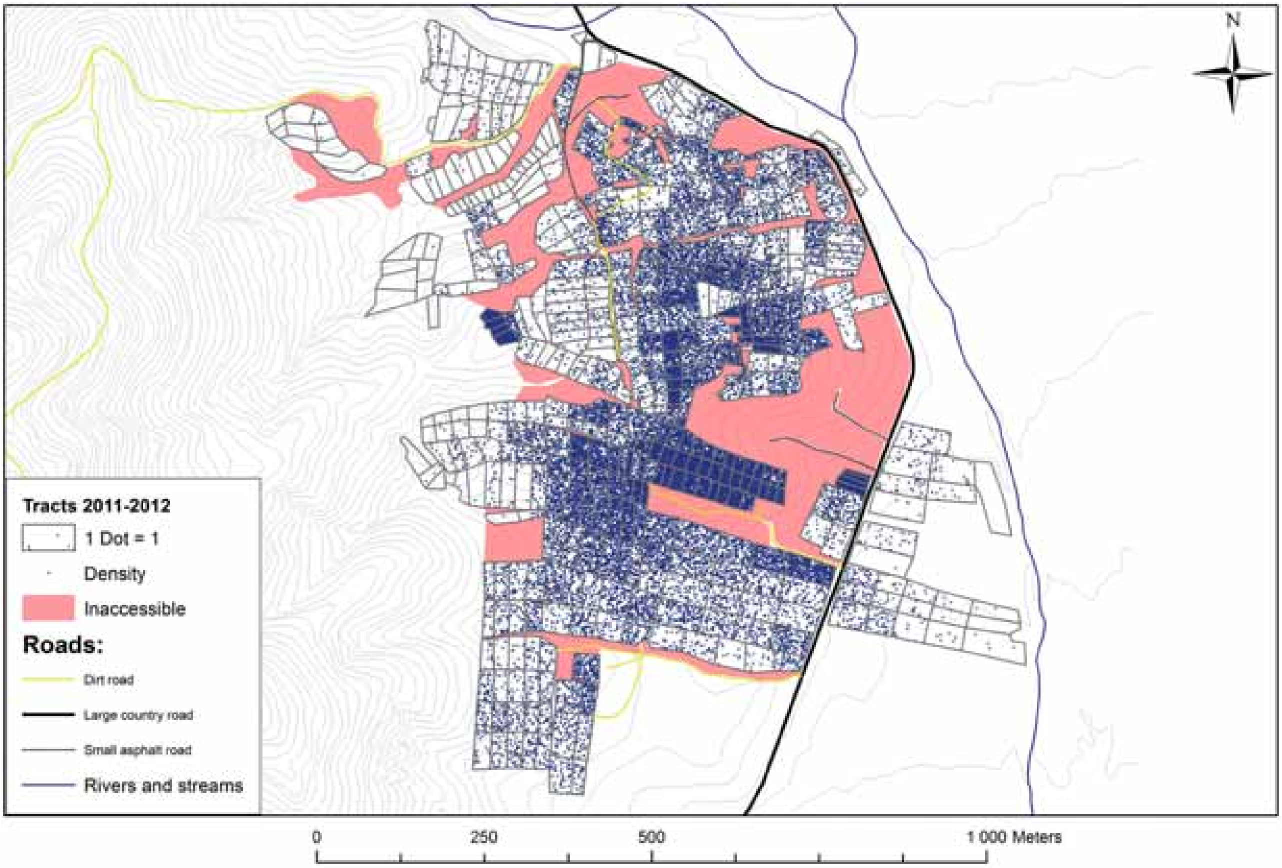

Fig. 39. Uncalibrated density map of tracts walked in 2011 and 2012. Contours at 4 m intervals. By A. Bonnier.

itself, as well as possible data variations between the first and second survey phase.

We realise that in-field recording of material is not unproblematic in light of recent discussions on survey methodologies and sampling strategies. In-field analysis of finds will for example not allow for extensive investigations of ceramic fabrics, which can be hugely important in terms of recognizing periods where the surface assemblages is primarily made up undiagnostic coarse wares, as well as chronological phases when habitation was present only on a small scale and which may drown in the scatters of material from periods represented in greater much volumes.[65] Fabrics can also be essential in providing information on local shapes and wares of the Greco-Roman periods but which are not paralleled in the well-known production range of important and well-studied production centres, such as Athens and Corinth for the Classical and Hellenistic periods.[66] Such fabric analyses are, however, often dependent on correlation with fabric references from diagnostic finds, usually from stratified contexts uncovered during excavation. Such reference material is generally lacking in terms of the western Spercheios Valley; this is obviously something which would have caused problems of interpretation even if we had conducted a full collection survey during the first phase.

It should be stressed that the in-field recording approach will be balanced and controlled by the excavations which are carried out within the scope of the programme as well as the second phase survey (even though the re-survey will not cover the full area investigated during the first phase). Hopefully the excavations will also be able to provide good stratified material through which we may compare recorded feature sherds and provide a reference collection for future fabric analysis.

Statistics were also compiled for artefact types recorded in each tract and walkers provided an approximation of the percentage of artefact categories that were clicked on the ground. The categories consisted of tiles, fine wares (i.e. fabrics with few visible inclusions and with surface decorations such as a glaze/slip or ribbing), coarse wares (i.e. plain and cooking

65 Cf. Bintliff *et al*. 1999; Bintliff 2011; 2012.
66 Cf. Moody *et al*. 2003; Lolos, Gourley & Stewart 2007, 281.

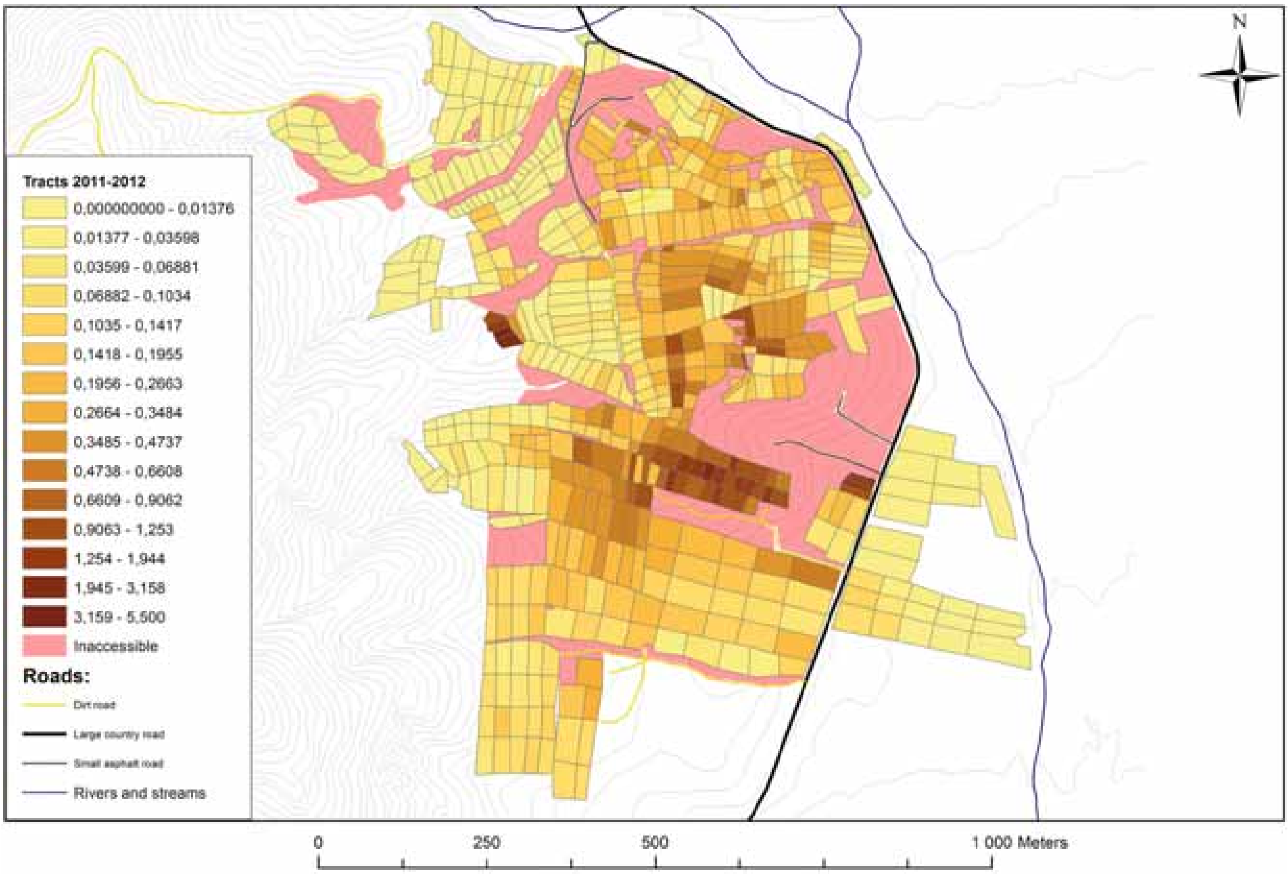

Fig. 40. Calibrated densities per square metre in the full survey area. Contours at 4 m intervals. By A. Bonnier.

ware sherds with visible inclusions) and lithics, as well as a material category termed “other” which would be used for tracts where less common items such as ancient glass, loom weights and metal artefacts were recorded.

The approximations of find categories were important as they provide us with the possibility of comparing total tract assemblages in different parts of the research area, in addition the recorded overall densities. Although these approximations are subjective and partly dependent on the individual walker’s ability to recognize different material types on the ground, they provided us at least with a rough idea of the material variability on the surface.

The recorded information for each tract was continuously inserted into our database which was further joined with the GIS. Within the GIS tract information was combined with maps and satellite imagery as well as the results of from the architectural survey. This meant that through the updated GIS we could analyse and evaluate the results and the strategies used by the different survey teams throughout the campaign.

MATERIAL DENSITIES AND SPATIAL PATTERNS OF SURFACE SCATTERS

Densities of recorded surface material varied considerably between different parts of the site. The initial density counts are based on the clicks provided by the fieldwalking team for each tract, regardless of material categories. The distribution of the these uncalibrated densities of the tracts walked in 2011 and 2012 shows that a significant amount of archaeological material lies scattered in the central part of Asteria, as well as on the sloping ground which is today used for intensive cultivation of olives and pistachios, towards the modern country road which runs between Makrakomi and Platystomo (*Fig. 39*).

As tracts were laid out according to local topography and field boundaries, producing an irregular grid of survey units, a corrected density figure had to be produced in order to ensure that larger tracts would not automatically provide higher densities. Density counts were therefore calibrated against the square metre value of each tract, with raw densities calculated on the basis of the 40% coverage, which was taken to be roughly representative of the full tract surface. The corrected density figures thus provide proportional densities according

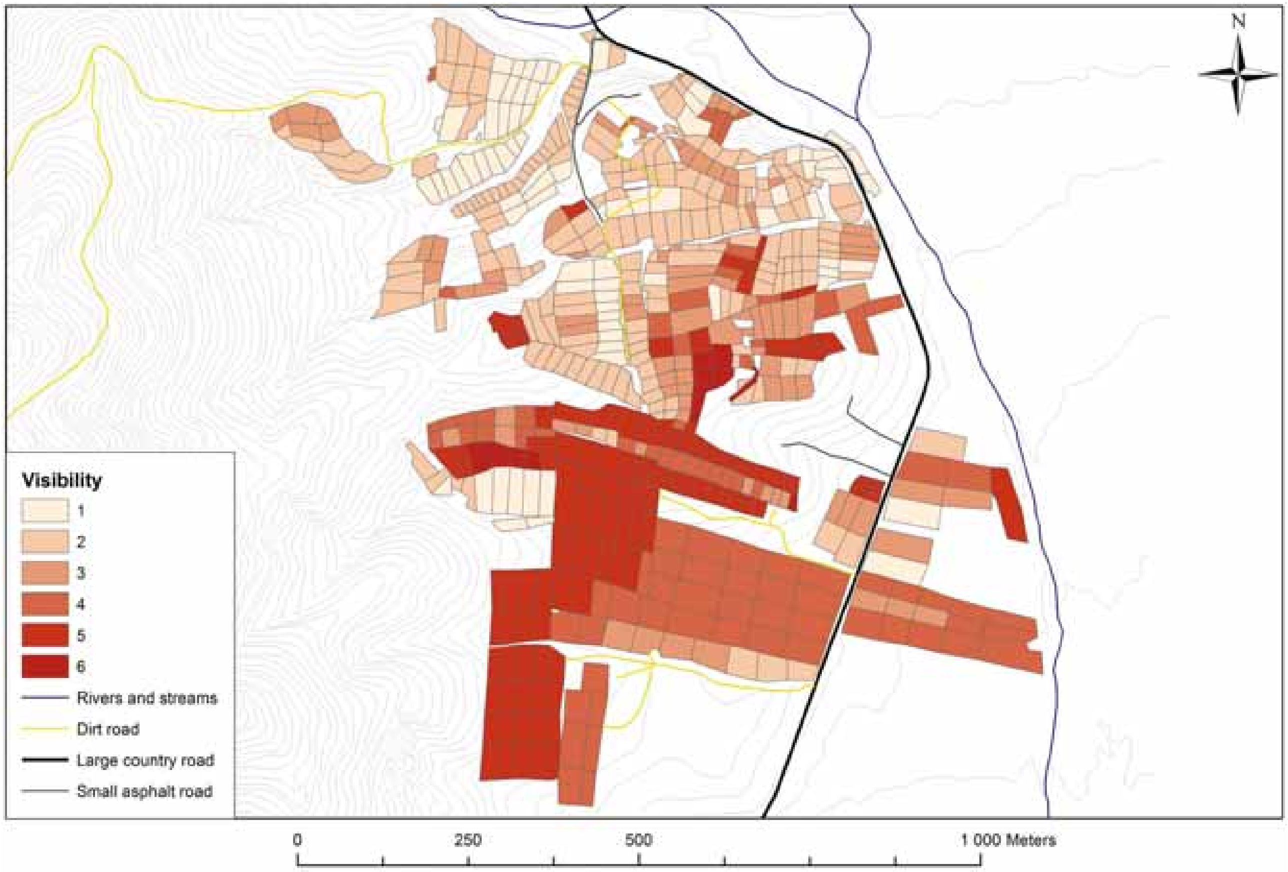

Fig. 41. Visibility values for Tracts 2011–2012. Contours at 4 m intervals. By A. Bonnier.

to the calculated artefact density per square metre for the full tract surface, increasing the comparability of the density value for each tract (*Fig. 40*).

A significantly dense concentration of material (between 1.2 and 5.5 finds per square metre) was recorded on the top of a plateau positioned between the Profitis Elias hill and the lower slopes, and which is currently used as a small olive grove, (and will therefore be referred to within this report as the "plateau with olive grove"), and where each tract produced several hundreds of clicks in a comparatively small space.

A medium dense to dense scatter of archaeological material, comprising between 0.3 and 5.4 finds per square metre is more or less maintained throughout the central part of Asteria/Area C and the lower slopes towards the modern country road, but we were also able to observe a thinning out of the archaeological surface scatters at some of the edges of the survey area. In 2012 we covered much of the open land on the north-eastern slopes of Profits Elias and material densities were much lower here compared to those of the central area and lower eastern slopes, ranging between 0 and 0.2 finds per square metre. Further to the south, on the upper eastern slopes of the Profitis Elias hill a similar drop-off of surface material was documented, with values ranging from 0 to 0.3 per square metre. Fields to the east of the modern country road also provided us with interesting indications of a drop-off in the number of surface artefacts. While the tracts closest to the road produced a comparatively high number of finds (between 0.1 and 0.3 finds per square metre), the tracts further to the east of the road generally produced very little material.

The picture provided by these density counts suggests definite site concentrations of material focused towards the centre and lower slopes of Asteria, but a number of factors must be taken into account when interpreting these density figures. Ground visibility was initially a concern, and all of the fieldwork was carried out during the summer months so that we would be operating in a dry period during which we would get a good view of the ground in the area. Visibility values ranging from one to six were also assigned to each tract, where six represents full visibility of the ground and one represents no visibility (*Fig. 41*), in order to examine the potential effect of poor visibility on the density figures which was recorded by the survey team.

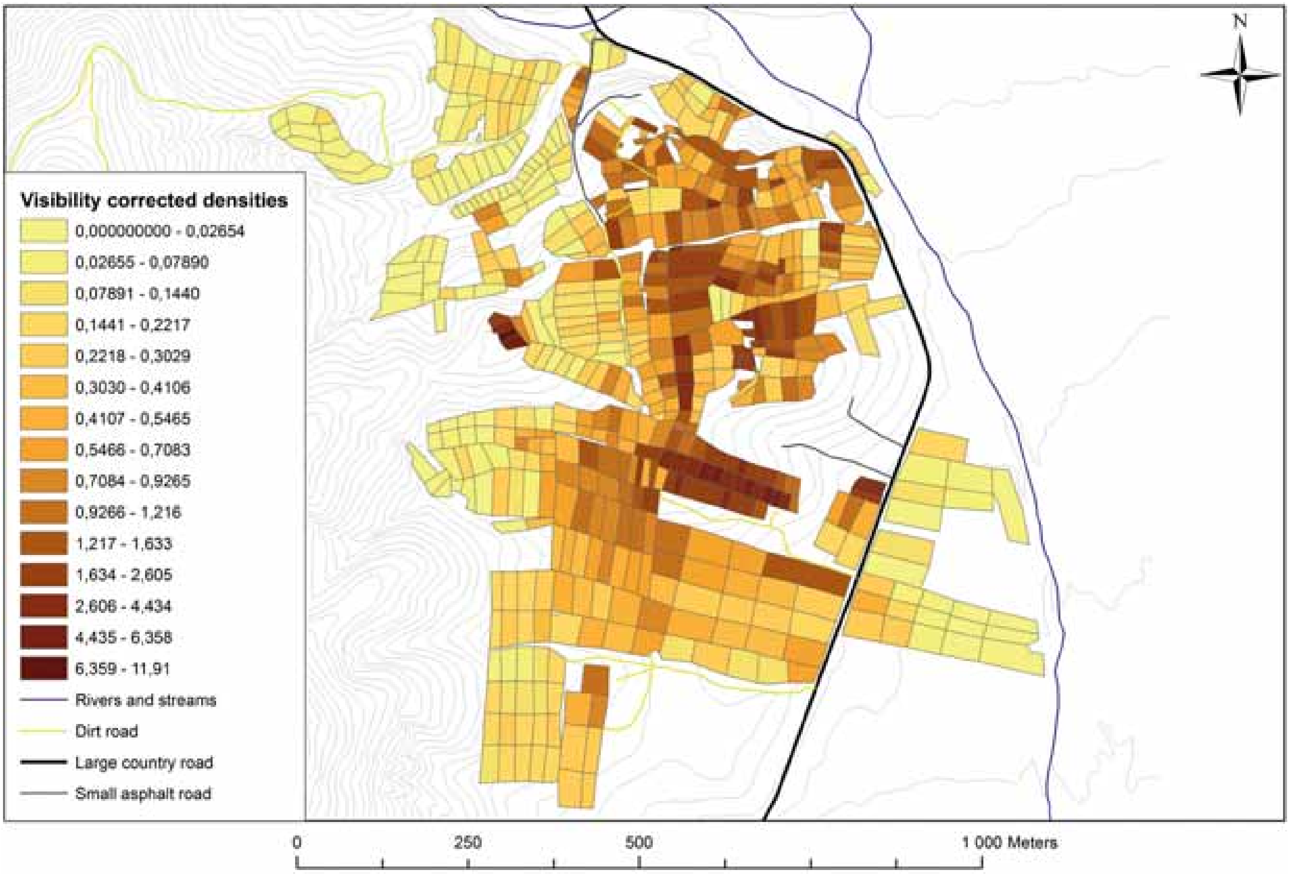

Fig. 42. Calibrated densities per square metre corrected through the visibility filter.

The best visibility was provided by the fields in the central part of Asteria, as well as in the southern part of the survey area, generally composed of groves and open fields. Although some of these fields provided high-density counts, ground visibility does not seem to have been a determinant factor behind patterns of artefact densities. A fairly stable medium to high density of all artefact types (ranging between 0.2 and 1.2 finds per square metre) was recorded in the northern part of the area, consisting of fields that offered comparatively poor visibility. Some of the highest densities were further recorded in fields on the lower slopes that offered only medium visibility, while some groves on the upper slopes provided good visibility but only limited artefact scatters.

The visibility index can further be used as a filter to calibrate potential density values of the covered surface, as has been done in some other survey projects in Greece.[67] Although the index was primarily used qualitatively, the values can be used to create a quantitative filter in the GIS by using the visibility value of six as full visibility where the density per square metre would remain unchanged while the density count for a tract which had been assigned a visibility value of five would be multiplied by two, and so on, with the density of tracts that had been assigned visibility values of one being multiplied by six at the other end of the spectrum (*Fig. 42*).[68]

The purpose of the visibility filter is to even out some of the sharp drops in densities that could potentially be determined by low ground visibility rather than actual surface densities. The visibility corrected density, nevertheless, repeats the picture provided by the initial density counts. It became clear

[67] Visibility filters were, for example, used during the Boeotia Survey in order to provide calibrated density values, see Bintliff, Howard & Snodgrass 2007, 20–22. Not all survey projects in Greece have, however, used visibility values in such quantitative and corrective fashion. Visibility indexes can be used as qualitative indicators of factors that may or may not influence density values (cf. Lolos Gourley & Stewart 2007, 279; van Wijngaarden *et al*. 2007, 47–49).

[68] This quantitative correction is carried out on the basis of a visibility value of six representing more or less 100% ground visibility, while five would correspond to 80–100%, four would correspond to 60–80%, three corresponding to 40–60%, two corresponding to 20–40%, and one corresponding to between 0 and 20% ground visibility.

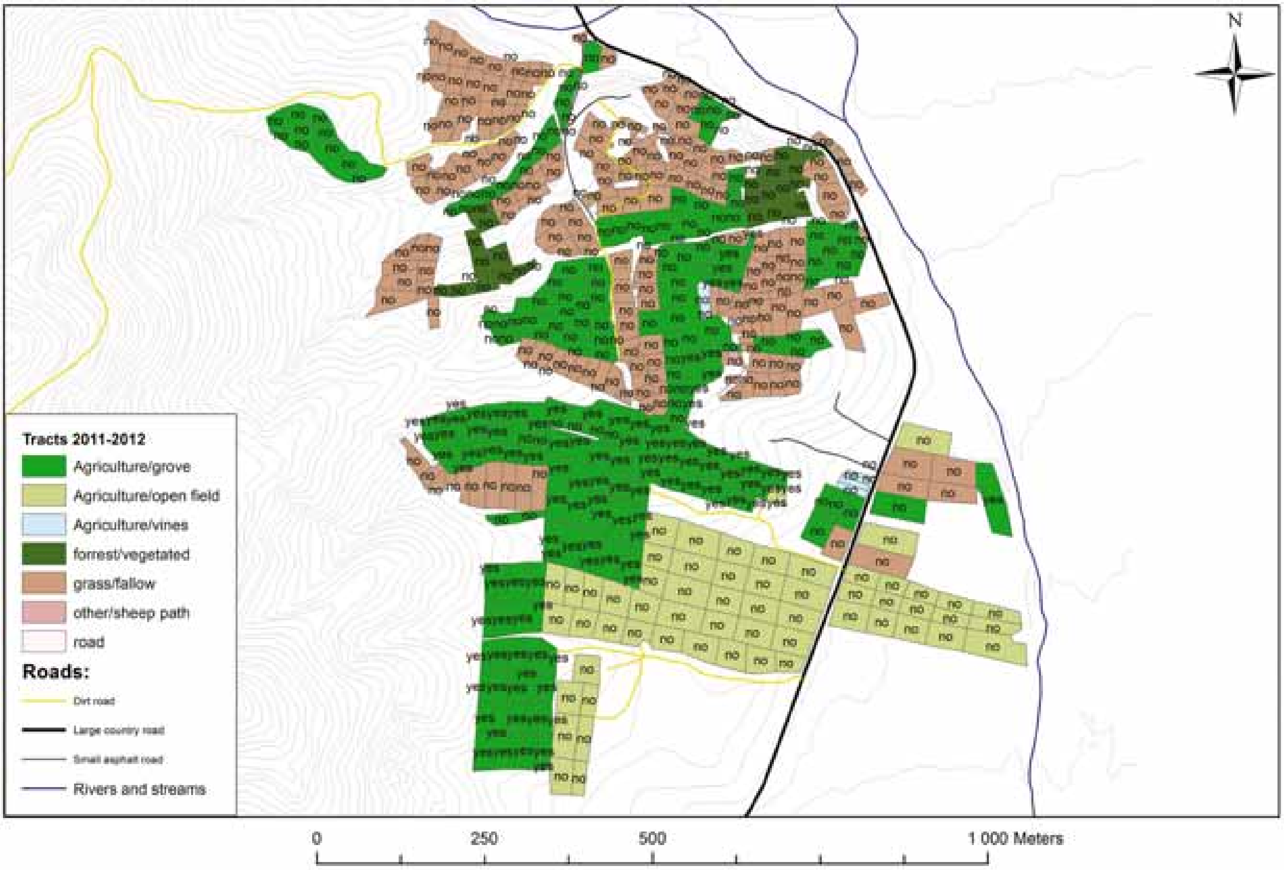

Fig. 43. Current land use in the survey area. The text displayed in each tract indicates whether the tract had been recently ploughed. Contours at 4 m intervals. By A. Bonnier.

that even if ground visibility were to have a slight effect on the total number of clicks recorded for each tract, it would not in any way prevent us from sufficiently examining the pattern of artefact distribution.

Modern land use seems instead to have had a much greater effect on both the varying distribution of surface scatters and our ability to record them. In general the highest material densities were recorded on land which is currently being used for agriculture or which has been used for such activities in the very recent past (*Fig. 43*). It is clear that much of the archaeology in these fields have surfaced because of ploughing and bulldozing, and it is indicative that the fields where the highest densities were recorded were also fields that had very recently been ploughed. But even if the effect of modern land use is considerable, medium dense scatters were recorded in fields that were currently fallow, highlighting that current agricultural use would not fully determine the presence of surface archaeology.

Areas with much vegetation, but where some visibility of the ground was possible, and which had not been subject to any visible recent agricultural activities presented some of the greatest problems, though again this environment type did not completely determine the presence of surface artefacts. Medium densities were recorded in such environments, in the northern part of the research area close to the modern country road. Fieldwalking was thus a viable strategy on all types of land and sufficient comparison can be made between density values derived from agricultural zones and fallow land as well as areas with much vegetation.

The artefact distributions and the spatial variations in artefact densities suggest that ancient on-site activity in this area was focused towards the central Asteria area and the lower eastern slopes towards the modern road. A change in the nature of surface scatters can be noted at the northern, southern and eastern edges of the research area, possibly reflecting the transition from site areas to off-site scatters.

Such off-site scatters may reflect a possible halo of rubbish disposal surrounding the Late Classical and Hellenistic settlement, given the dates of the recorded feature sherds in these areas, or possible traces of field manuring close to the

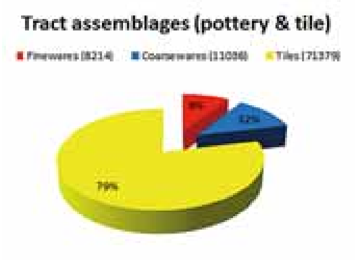

Fig. 44. Percentages of artefact types for surveyed tracts.

settlement (including possible garden areas utilized by nearby households).[69] The transitions from on-site settlement scatters to off-site artefact dispersals seem to reasonably clear, though in the southern sector the off-site scatters can be fairly dense (up to 0.3–0.4 finds per square metre). In comparison with the suggested on-site sectors of the survey area, there are no tracts in the southern sector that reach beyond these densities, and tracts with such a medium density were usually located in proximity to tracts with much lower densities.

It thus seem reasonable to suggest that the surface scatters in the southern part of the survey area represent edge or off-site material, such as rubbish halos or manuring, though further GIS analysis and survey in this sector are required, using first phase methodology in 2013, with continued investigations in 2013 and 2014 with the second phase re-survey approach, before any definite conclusions can be reached.

TRACT ASSEMBLAGES

While the pattern of artefact scatters allowed us to interpret potential spatial variations of ancient activity at the site, it was thought that a closer investigation of material assemblages would allow us to examine activity types represented through the surface archaeology. The approximation of artefact categories meant that we could assess the tract assemblages, which in turn could be used to assess the function, nature and spatial extent of ancient activity in the survey area. Overall, tile fragments made up the dominant find category, with a lesser amount of coarse and fine wares being represented across the area (*Figs. 44–45*). Only a small amount of lithics or other

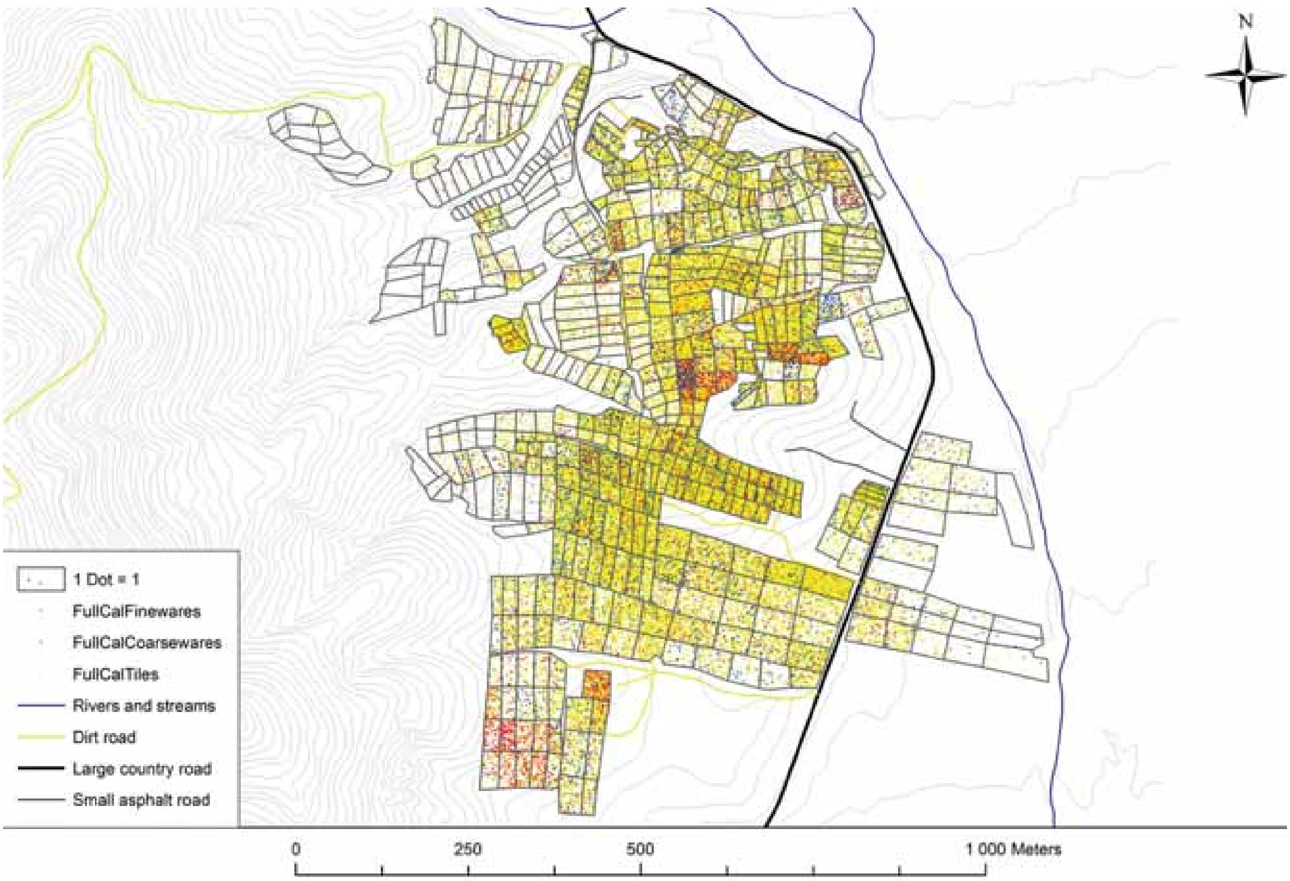

Fig. 45. Dot density representing the approximated number of fine wares, coarse wares, and tiles in each tract, based on the calibrated densities. By A. Bonnier.

[69] Cf. Bintliff & Snodgrass 1988; Alcock, Cherry & Davis 1994; Bintliff *et al*. 2002; Bintliff, Howard & Snodgrass 2007, 20–26.

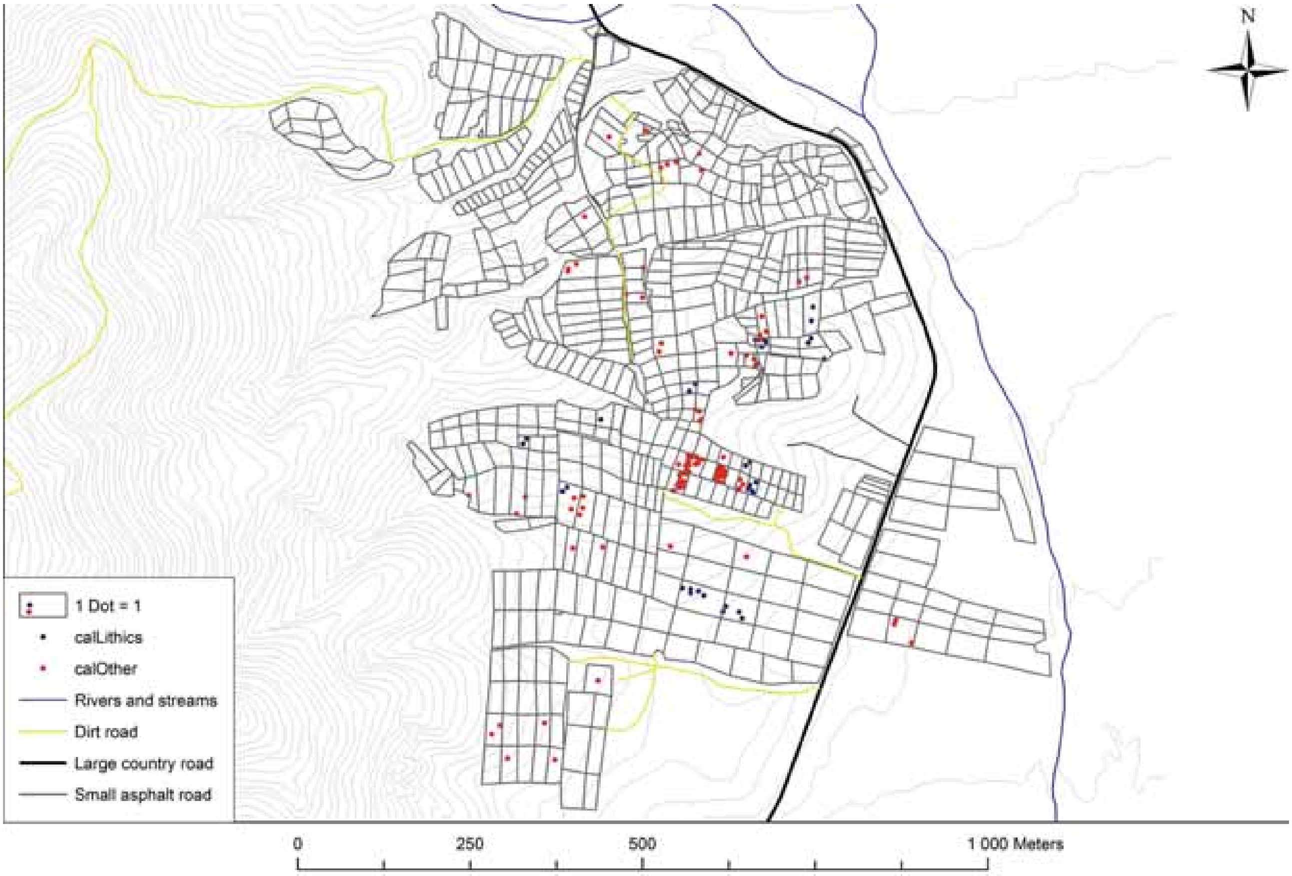

Fig. 46. Lithics and "other" artefact types in the research area, based on the approximations of the uncalibrated, "raw", density values. By A. Bonnier.

find types (metal objects, loom weights, etc.) were recorded in the survey area (*Fig. 46*).

The consistent mixture of predominant tiles, with much smaller amounts of fine wares and coarse wares across the site suggests that we are to a large extent dealing with assemblages typical of Classical to Hellenistic domestic houses.[70] It is interesting that this pattern is consistent with all the areas which produced medium to high densities of surface artefacts as a whole. It is only at the edges of the survey area where the tract assemblages tend to change, though at the edges the surface scatters were predominantly made up of tile fragments with coarse and fine sherds even if ratios tend to change, possibly indicating the off-site nature of the assemblage.

In the northern part, in the fields on the north-eastern slopes of Profitis Elias, we see an almost equal amount of fine wares and tiles and a smaller amount of coarse wares. In the easternmost area, on the eastern side of the modern country road, the proportion of tile, coarse wares and fine wares becomes much more equal in the tracts with very low overall densities. Other variations in tract assemblages occur on the southernmost edge of the survey area where the ratio of fine wares increased substantially in some tracts.

The variations and changes in tract assemblages on the northern and southern edges of the research area can easily be correlated with the drop-off of total surface densities and help to indicate probable limits on-site and off-site sectors of the survey area. In the northern part of the site the hypothesis of a possible limit to ancient habitation is further suggested by the presence of burials on the north-eastern slopes of Profitis Elias, which were noted during the course of the 2012 campaign (*Fig. 47–48*).[71] These burials consist of tile graves and at least one cist burials. The burials are in general in a highly fragmentary condition and we were not able to identify any artefacts on the ground that could potentially be taken as pos-

70 Cf. Ault & Nevett 1999.

71 Burials have previously been excavated in this area of the Profitis Elias hill, see Roux 1954, 92.

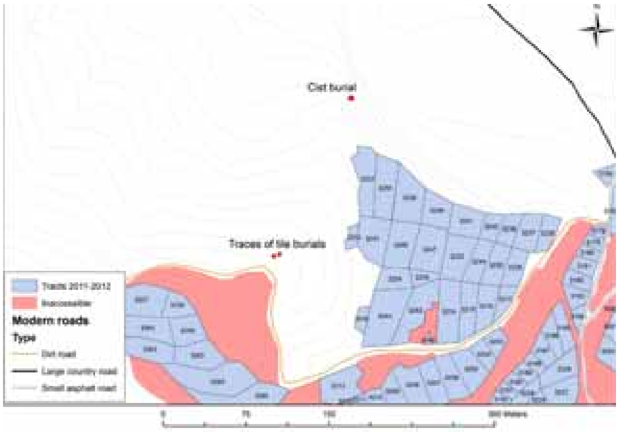

Fig. 47. Position of recorded tile and cist burials in relation to tracts. By A. Bonnier.

Fig. 48. Cist burial. Photo: H. Boman.

sible grave goods and we could consequently not assign any preliminary dates to these burials.

A further section of the research area where it is possible to observe changes in tract assemblages consists of the small plateau located in between Profitis Elias and the lower eastern slopes, the "plateau with olive grove", where significant densities of material were recorded. Here the proportion of tile fragments was much higher compared to tracts in other parts of Asteria, and only a small amount of fine ware and coarse wares was recorded. As was stated above, the plateau is currently used as a small olive grove and it is possible that soil may have been brought from the neighbouring fields immediately to the east, in order to assist cultivation. We did nevertheless record ancient architectural traces (which will be described further below), the foundations of which must lie close to the soil surface.

The recorded surface material should therefore probably be associated with the architectural traces, and the large amount of tile fragments may possibly indicate the presence of a comparatively extensive building with a probable public or at least non-domestic function, given the associated tract assemblages.

DIAGNOSTIC FINDS: FUNCTION AND CHRONOLOGICAL HORIZONS

The examination of tract assemblages provides a rough idea of the total makeup of surface artefacts in each tract. Further discussion on the recorded diagnostic finds is, however, necessary in order to approach questions concerning chronological horizons represented in the research area, as well as a closer investigation of activity types associated with specific diagnostic types. Overall the methodology employed for the first phase survey utilizes the feature sherds and other diagnostic artefacts in order to provide a chronology for the recorded surface scatters and varying densities produced through the fieldwalking. Material was deemed as a diagnostic if any indicator of function, shape or chronology could be derived from the artefact. Primarily the diagnostics consist of handles, bases and rims. Body sherds with some form of decoration or visible treatment, such as a slip, ribbing or stamped decorations, were also treated as diagnostics.

The diagnostic material is to a large extent composed of base fragments and handles from coarse and plain vessels, used as household wares and for cooking, storage or transport. Handles from jugs and other household or storage vessels were recorded in most tracts with a medium to high overall density. Strap handles and thick rounded handles occurred in all sectors of the survey area, both of which are typical of jugs and other vessel types which span most of the Hellenistic period.[72] Rope handles, primarily from cooking wares (possibly chytrai), were also frequently recorded and the Athenian Agora provides good parallels for the use of these vessels, which were common during the first half of the 2nd century BC (*Fig. 49*).[73] One possible "piecrust" handle from a Hellenistic mortar, in a hard coarse reddish fabric, was further recorded in Tract 2061 (*Fig. 50*).[74] Again these span the whole of the Hellenistic period and are common in the 3rd and 2nd centuries BC.[75]

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72 For the use of such handles type on jugs and other vessel types in the Hellenistic Agora, see Rotroff 2006, 69–89.

73 Rotroff 2006, 170–172.

74 Hellenistic mortars are generally less coarse than the example from Tract 2061, but the shape of the handle compares well to less coarse mortars found elsewhere.

75 Rotroff 2006, 100–102.

Fig. 49. Rope handle from coarse cooking ware (Tract 2101). Photo: MALP team 2011.

Fig. 50. "Pie crust" handle from a Hellenistic mortar (Tract 2061). Photo: MALP team 2011.

Among the plain and coarse diagnostics was a large number of handles and toes from transport amphorae. It is striking that most of the recorded amphora toes belong to similar types, rounded with bevelled profiles, usually concave with a circular depression underneath. These toes resemble those of Classical and Hellenistic transport amphorae from various production centres in the southern Aegean area (*Fig. 51–52*).[76] The amphora fragments are interesting in that they provide indications of external links and the access which the settlement may have had to interregional trade networks and the consumption of non-local goods, even if further study is needed.

Fig. 51. Amphora toe (Tract 2172). Photo: MALP team 2011.

Fig. 52. Profile drawing of amphora toe (Tract 2172).

[76] Vaag, Nørskov & Lund 2002, nos. G109–G111, no. I41; Göransson 2007, 146–166, see especially nos. 291, 295, 322 & 346. We also wish to thank Kristian Göransson for giving his opinion on the amphora finds from Area C.

Numerous fine ware fragments were also recorded during the surface survey, consisting primarily of black glazed body sherds as well as a smaller number of bases and handles. Overall many of the black glazed body sherds are difficult to accurately date beyond a very broad Classical–Hellenistic time frame, but there are some quantities of base fragments of table vessels which provide evidence of activity at the site more specifically in the late 4th and 3rd century BC (*Figs. 53–54*).[77] Rouletting and stamped decoration occurs on a few vessels, and again seems to emphasize activity in the late 4th and 3rd century BC (for

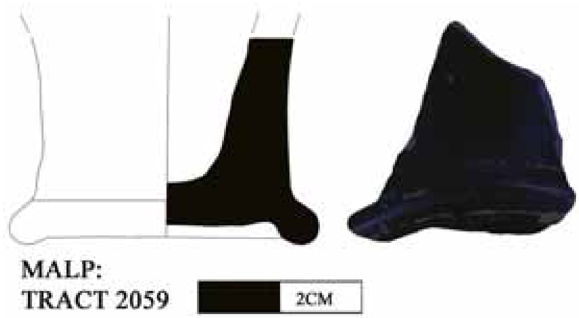

Fig. 53. Base fragment and profile drawing of a skyphos (Tract 2059). Photo: MALP team 2011.

Fig. 54. Echinus bowl (Tract 2060). Photo: MALP team 2011.

[77] The base fragment of a skyphos recorded in Tract 2059 (*Fig. 62*) has a close parallel from the Athenian Agora (Rotroff 1997, no. 153) which dates to the first quarter of the 3rd century BC, and it is possible that the fragment from Tract 2059 belongs to an Athenian import. The rim and base fragment in Tract 2060 (*Fig. 63*) comes from an echinus bowl, similar to the shallow Hellenistic types known from the Agora which generally belong to the late 4th century and first half of the 3rd century BC (Rotroff 1997, 162).

example *Fig. 55*).[78] The fact that there are so far no fine wares which provide indications of dates earlier than the later 4th century BC suggests that many of the black glazed body sherds can be broadly placed within a rough Late Classical and Hellenistic sequence (from the later 4th century to the 1st century BC).

Fig. 55. Plate with stamped palmettes and rouletting (Tract 3015). Photo: MALP team 2012.

Beyond these various categories of pottery, other artefact types were able to provide further information on the chronology of activity at the site as well as types of activities. Loom weights were for example recorded throughout the survey area, and give further support to the interpretation that much of the surface archaeology belongs to household assemblages derived from Late Classical and Hellenistic domestic units, or at least discards from such units (*Fig. 56*).[79]

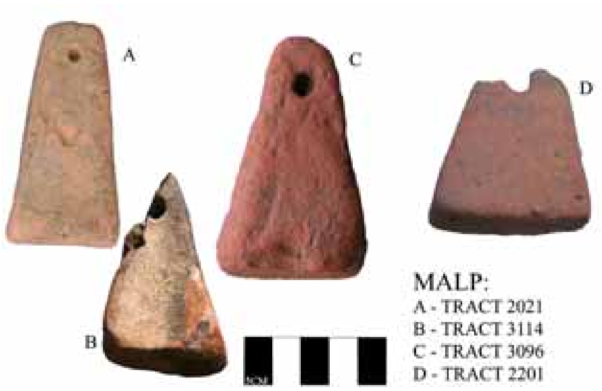

Fig. 56. Loom weights from various tracts walked between 2011 and 2012. Photo: MALP team 2011 & 2012.

Lamp fragments were also found in some tracts, as well as a whole lamp which was recorded in the vicinity of a modern house in the northern part of the survey area. The lamp is plain but with traces of brown glaze close to an inward curving rim, rounded sides, with a low base and a fairly long wide nozzle (*Fig. 57*). A similar type has been found at Nea Halos, which is suggested to be of local production dating somewhere in the late 4th or early 3rd century BC.[80] The low base, flaky glaze and the shape of the shoulder and nozzle are, however, similar to earlier types found in the Agora and Isthmia, and may potentially be dated as far back as the late 5th or early 4th century BC.[81]

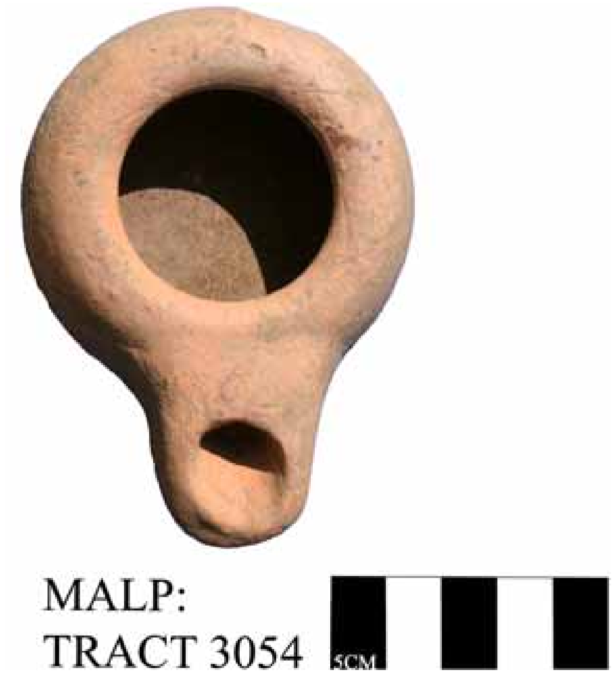

Fig. 57. Lamp (Tract 3054). Photo: MALP team 2012.

Two coins also form part of the recorded diagnostic material from the lower slopes. The first of these was recorded during the 2011 campaign and consists of a tetradrachm depicting Herakles/Alexander the Great in a lion skin on the obverse,

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78 The base fragment of a plate from Tract 3015 displays four closely spaced palmettes within rouletting, suggesting a late 4th century date based on Athenian parallels (see Rotroff 1997, 37–38). A good parallel of the stamping type within rouletting also comes from a late 4th century BC cup from Halikarnassos (Vaag, Nørskov & Lund 2002, no. K26, pl. 74; cf. Rotroff 1997, pl. 146, no. 973 for a further parallel to this palmette type.

79 All of the recorded loom weights are pyramidal in shape, with square bases, flat sides with a single hole just below the top of the loom weight. The loom weights recorded during the survey do, nevertheless, vary in terms of size and dimensions. The dominance of pyramidal shapes is similar to the situation at the nearby site of Nea Halos, in southern Thessaly, where pyramidal loom weights made up 68% of the total number, and were the most frequently occurring types in the various houses (Burnier & Hijmans 2003, 119).

80 This is similar to P475 from Nea Halos which is a variant of Howland 30B from the Agora (see Beestman-Kruyshaar 2003, 98; Reinders & Prummel 2003, appendix I, 278–279). The lamp was deposited at the archaeological museum in Lamia.

81 The lamp shape is reminiscent of Howland Types 21C from the Athenian Agora, see Howland 1958,48–49, nos. 171–178. For possible parallels from Isthmia see Broneer 1977, 10–11, nos. 48 & 58 (the first of these is dated to the late 5th century BC while no. 58 comes from a context with mainly late 4th and early 3rd century BC pottery. We also wish to thank Arja Karivieri for giving her opinion on this lamp.

and with a seated Zeus holding an eagle and a sceptre with an inscription reading ΑΛΕΞΑΝΔΡΟ[Υ] on the reverse (*Fig. 58*). Alexander introduced this type of coinage sometime after 335 BC, but similar types were frequently minted in the eastern Mediterranean and the Near East after the death of Alexander from the late 4th and into the early 3rd century BC.[82]

Fig. 58. Tetradrachm depicting Herakles/Alexander (Tract 2163). Photo: M. Nilsson.

The second coin is a Boeotian federal chalkous, depicting a Boeotian shield on the obverse and a decorated trident head and dolphin on the reverse (*Fig. 59*). The inscription on the reverse is too worn to identify but should probably read ΒΟΙΩΤΩΝ based on existing parallels.[83] This type of federal coin has previously been dated to the later part of the 4th century and early 3rd century BC, thus providing similar chronological information as the Alexander coin recorded in 2012.[84]

Fig. 59. Boeotian federal chalkous (Tract 3055). Photo: MALP team 2012.

Further study of the diagnostics recorded during the 2011 and 2012 seasons is needed, particularly in relation to the finds produced by the excavations and the second gridded survey phase which will be carried out in 2013 and 2014, but some preliminary conclusions can be made: the material corresponds to typical household assemblages from other Classical and Hellenistic contexts in mainland Greece, and certainly reflects the presence of several houses and households in the survey area during antiquity. This is also consistent with broader tract assemblages which were recorded for each tract during the surface survey.

The chronological horizons which can be inferred from the various categories seem to be broadly Classical/Late Classical to Hellenistic, primarily spanning the second half of the 4th century to the 1st century BC. Evidence for earlier activity at the site is at the moment meagre and later post-Hellenistic material was not identified in the survey area, even if some artefacts can potentially be placed within a Late Hellenistic/Early Roman phase.

There is in general very little modern refuse in these fields and nothing which could be characterized as early modern or even modern pottery. The only form of "disturbance" in regards to the overall artefact densities consists of modern tiles, but these are easily recognized and have usually not been recorded as part of surface scatters.

Lithics from the 2010–2012 seasons

(BY MONICA NILSSON)

During the three survey seasons, 18 lithic artefacts were recorded and, with two exceptions, all finds are from the Asteria area. The exceptions are a chert arrowhead, which was found on the summit of Area B (Tract 1061), and the lower stone of a hopper mill which was recovered from Area A (Tract 1075) next to the chapel of Profitis Elias.

The main body of lithic finds consists of twelve chipped stone objects of either red chert or obsidian. Prismatic blades are the most common of the types found at Makrakomi and they are of both triangular (Tracts 1097, 2060, 2064) and trapezoidal cross-section (Tracts 2101, 3314). All but one (Tract 2060) are made of obsidian. A few chipped stone fragments are of unknown type and function, but two were identified as projectile points fashioned in red chert. One is a rather rough and big implement with a short tang (Tract 2144) whereas the other (Tract 1061) is a delicately worked arrowhead with a concave base (*Fig. 35*).

Six lithic artefacts are not included in the chipped stone category. One is a disc-shaped hand tool of andesite with rounded edge (Tract 3166). Only a quarter of the artefact is preserved and there are no wear marks to suggest its func-

[82] Mørkholm 1991, 27–28, 42–52, see also pls. 1–5, 9–12, 15–17, 28–33.
[83] See Alexopoulou & Sidiropoulos 2011, no. 54.
[84] Picard 1984, 288, nos. 43–46; Alexopoulou & Sidiropoulos 2011, no. 54.

Fig. 60. Worked limestone fragment, possibly from a Doric column or pilaster (Tract 2201). Photo: MALP team 2011.

tion. The neighbouring tract (Tract 3167) produced a bar-shaped, fine-grained andesite implement with square cross-section. Both ends are broken off, but the smoothness of the stone and the wear marks suggest that it was used as a whetstone. One enigmatic fragment of fine-grained, yellowish white limestone (Tract 2201) appeared at first glance to belong to the chipped stone category since it is a flat, tapering fragment with a trapezoidal cross-section. The most likely explanation, however, is that it is a chip from a Doric column or pilaster which displays parts of two flutings (*Fig. 60*).[85] No other indications of the presence of fluted columns or pilasters have been encountered during the survey.

Three stone artefacts are associated with hopper mills of the Olynthus type dated to the Late Classical to Hellenistic period.[86] The apparatus has a rectangular, flat stone slab, with striations on its upper surface, and placed on top of it is another rectangular, flat stone slab with striations on its lower surface. The latter has cuttings for a slot to feed the mill with grain and for a wooden bar to move the slab sideways. The striations function as channels for the flour to be pushed out of the contraption. The lower stones are also known to have been used in combination with handheld millstones. Two such lower stone slabs (Tracts 1075, 3066) and one upper stone with partly preserved cuts for slot and handle (Tract 2164, *Figs. 61–62*) were found during the survey. The material used in all three cases is andesite.

The millstones and, probably, the three other non-chipped stone artefacts fit into the short time frame of the extensive use of the site, as indicated by the pottery recorded as part of the surface scatters, i.e. the Late Classical to Hellenistic period. Of the thousands of survey finds, only the handful of chipped stones suggests a prehistoric presence in the survey area.

Fig. 61. Part of a top stone of hopper mill; upper side with cuttings for slot and handle. Photo: MALP team 2011.

Fig. 62. Part of a top stone of hopper mill; lower surface with striations. Photo: MALP team 2011.

Methods and results of the architectural survey 2011 & 2012

(BY HENRIK BOMAN)

In 2011 the architectural survey was focused both on Profitis Elias and in Asteria, while in 2012 Asteria was investigated exclusively. As has been described earlier some structural remains on Profitis Elias, other than the fortification walls, were identified and described by Yves Béquignon in the early 20th century.[87] Today these areas are overgrown by vegetation and it has not been possible to identify all of the previously recorded remains. We did, however, examine a number of additional walls in 2010 and 2011 that could be identified as a courtyard house. Other walls seem primarily to outline the remains of a terrace system on the slopes towards the still-standing south tower.

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[85] We wish to express our sincere gratitude to Curtis Runnels for his dedication to all things lithic and for suggesting the most plausible interpretation of this find.
[86] Cf. Frankel 2003.
[87] Béquignon 1937.

The investigations in Asteria in 2011 yielded large quantities of information on what we have identified as a nucleated and structured settlement, and the extension of this settlement is far larger than expected. The work in 2012 was therefore focused exclusively on the Asteria area and the remains of walls and structures still visible above ground level. In 2012 lighter clearings of vegetation and loose soil were also made around identified wall traces, though only to a very limited extent.

The architectural remains identified in Asteria have consistently been interpreted as domestic and these are found throughout the area. The architectural recording during 2011–2012 suggested that the most significant feature of these domestic units is a grid pattern, consistently executed all over the central, northern and eastern parts of the area (*Fig. 63*). On a low hill, which we here refer to as the "plateau with olive grove", is the only part of the survey area where we could identify the remains of a structure which departs from the settlement grid (*Fig. 64*). Based on the material from the surface survey as well as the architectural survey, it seems possible that these remains point to a structure which is suggested to be of similar date but distinctly different from the domestic architecture found elsewhere in the area. It should further be stressed that we have not yet detected any remains of a lower fortification wall in Asteria; neither foundations nor large cut stones that may have belonged to a fortification wall have been recorded.

To measure the remains and pinpoint their location in the landscape, we have consistently used a combination of new technology and traditional methods. Ground visibility is often very limited and both vegetation and the terrain obstruct sightlines. To overcome these obstacles, the project used Leica NRTK GNSS (Network Real Time Kinematic Global Navigation Satellite System) receivers in order to measure and record wall traces. This type of equipment uses satellites such as GPS satellites to pinpoint and correct its position using reference stations connected via the 3G net, giving it an accuracy of between 1 and 3 centimetres. This removes the need for fixed points and base stations needed when using RTK GNSS receivers or DGPS receivers. Finally, as opposed to using total stations that have higher accuracy, a NRTK GNSS receiver does not need a line of sight between the station and target,

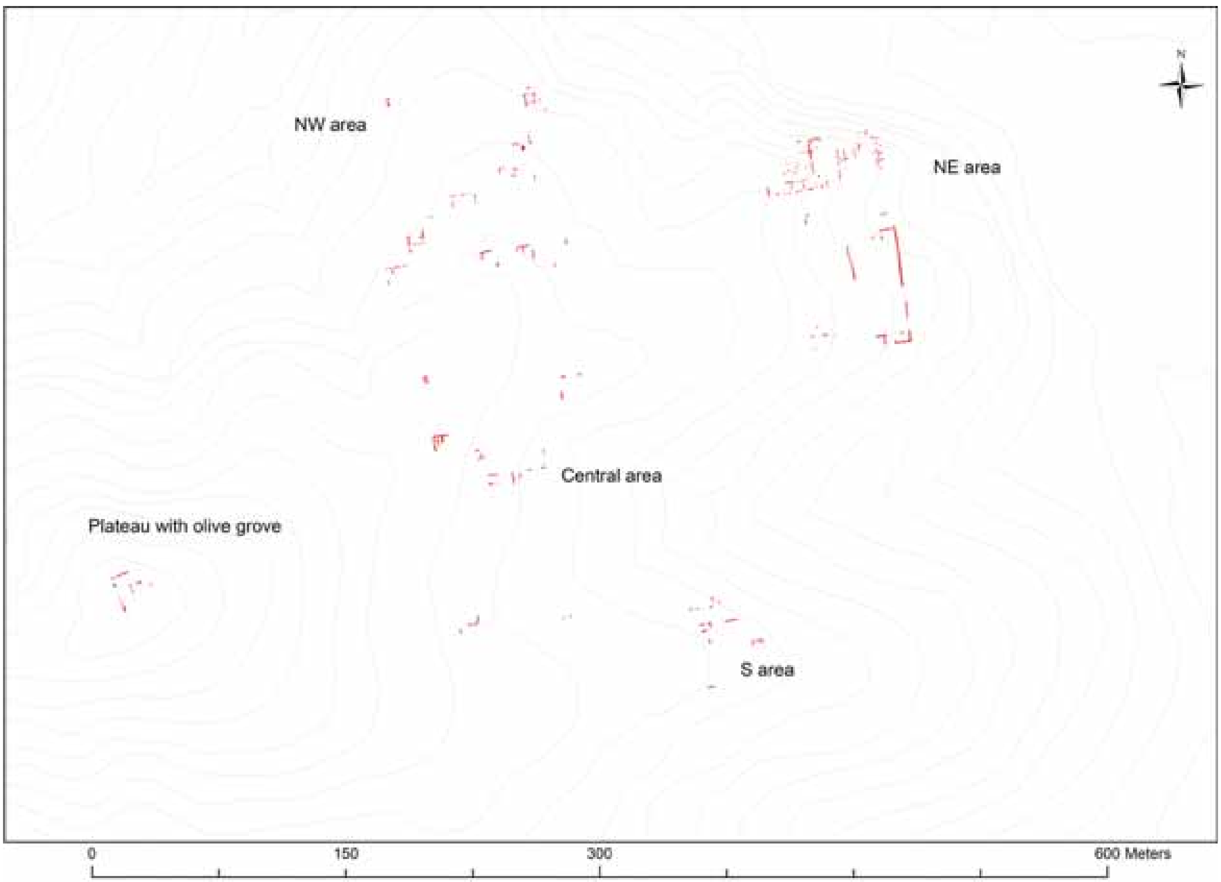

Fig. 63. Overview of architectural remains in Area C (Asteria). All structures measured and drawn 2011–2012. By H. Boman & J. Klange.

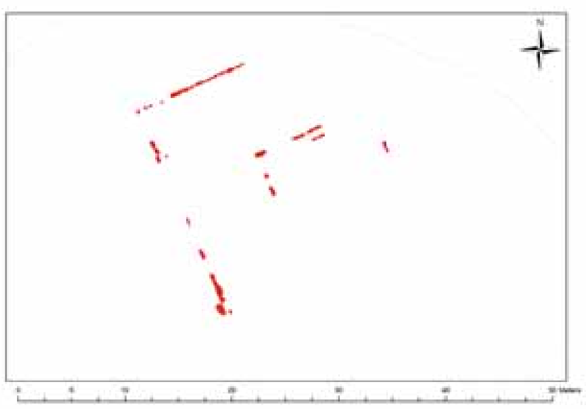

Fig. 64. Area C (Asteria), "Plateau with olive grove". By H. Boman & J. Klange.

thereby making it more mobile and especially so in fragmented and difficult terrain.

The type of equipment used by the project thus combines high accuracy with high mobility, making it ideal for the type of architectural survey conducted by the project, where surveying has been carried out over a large area and often in densely vegetated terrain. To process the raw data we used computer software called SiteWorks which is designed to handle the spatial data and to combine it with archaeological documentation that then can be exported in the form of shape files or as spreadsheet data.[88]

The identification of architectural remains in the field was carried out in two stages: a first investigation was made by the fieldwalking team which was engaged in the surface survey, when larger concentrations of stones and remains were noted. Thereafter, the architectural team scanned the field once more.

Visibility was a major issue in terms of the identification of architectural traces in Asteria. Few of the stones protrude more than a few centimetres above ground level. In 2012 the clearing of bushes and some of the accumulated earth was undertaken in some cases after potential wall traces had been identified.[89] However, it is important to note that large areas were not cleared at all and the majority of the remains were recorded on the basis of visible surface features only.

These features were measured using the NRTK GNSS GPS in order to provide an exact location in the landscape, after which all of the visible stones were drawn and measured using traditional methods in order to record the nature and appearance of the stones in their specific locus. Each feature has been given a specific number with the prefix CS (construction context), and documented as single contexts. We have chosen this method to avoid associating single structures with larger complexes in an early stage of the documentation. The CS numbers are not connected to the tracts walked during the first phase surface survey—the connection between the survey and structures are based on topographical association that can easily be established through the GIS.

The building material identified in both Asteria and on Profitis Elias was principally natural stones of different dimensions. The stones must have been quarried locally from the bedrock, or found as loose stones. Usually one side of the stone is cut roughly flat to enable the stone to be placed upright. The blocks are rarely cut into rectangular shapes, and in general we have found surprisingly few blocks which display clear signs of cutting. Only one single block cut to a rectangular shape and with lifting bosses still *in situ* has been identified, though found out of context.

Most of the walls at the site are constructed with two faces; one side of the wall is usually built of upstanding stones, these large stones are the ones that are visible above ground level today, while the other side is made out of smaller stones. The space inbetween is filled with rubble stones, pebbles and soil. The superstructure was most likely built in mud brick. The upstanding stones, as found in the excavation in 2012, are used in parallel with the technique of using flat stones, which clearly aimed at supporting an upper structure (*Fig. 65*).

Fig. 65. Area C (Asteria), NE area. Stone foundations with flat upper surface. Photo: H. Boman.

Since the use of cut stone is infrequent, the basic principles for identifying the remains as part of built structures were based on quantitative qualities: two stones, or more, in a line or right angle, within close proximity of each other, were measured and drawn. Since the sightlines in the fields usually were limited, the larger pattern of the recorded stones was often recognized only when the data were analysed in SiteWorks, highlighting the importance of recording the remains as single contexts rather than full structures.

Single stones or loose stones in the field were not measured or mapped. Changes in the landscape, due to modern agriculture, have moved many of the stones out of position, often

88 In 2011 a Leica GS09 GNSS was used, in 2012 a Leica VIVA GS15 GNSS. The network of reference stations used is called Metrica NET. Information and text provided by Johan Klange, Arkeologikonsult.

89 We want to give our thanks to all involved in the cleaning, the fire brigade of Makrakomi included.

by fairly large distances. We considered the amount of loose stones found as indicators of both extensive building activities during antiquity and active landscape manipulation through more recent agricultural exploitation. We have so far not measured or estimated the size of these field clearance mounds of stones, which are sometimes incorporated into modern field boundaries, since it could require extensive cleaning.

A STRUCTURED SETTLEMENT—THE GRID

We have found concentrations of preserved architectural remains primarily in the eastern and northern parts of Asteria. In the southern part, remains are much less frequent compared to the northern areas. However, as seen on the established plan, all remains seem to have the same orientation (*Fig. 63*), which is essential for the identification of an ancient structured settlement.

The grid system seems to have been executed uniformly throughout the survey area. As has been shown for other Late Classical and Hellenistic town sites, there can be differing orientation of diverse areas within the grid system of a structured settlement;[90] however, in Asteria we seem to have one grid executed over the entire settlement area.

Rapid changes in the level of the terrain occur frequently throughout Asteria, often in connection with archaeological remains. There are few flat areas, so a system of retaining walls and terraces was presumably needed to support the buildings.[91]

A potentially significant feature was documented in the eastern edge of the survey area that could be identified as a possible retaining wall; built with large blocks and with a significant difference in height from the ground in front of the wall, which would have been able to support buildings of the size that has frequently been identified (*Fig. 66*). It should, however, also be stressed that the foundations of the houses themselves could have functioned as terrace walls, resulting in a less monumental terracing system elsewhere in Asteria.

In the north-western area, a number of identified structures could be associated with each other, according to the

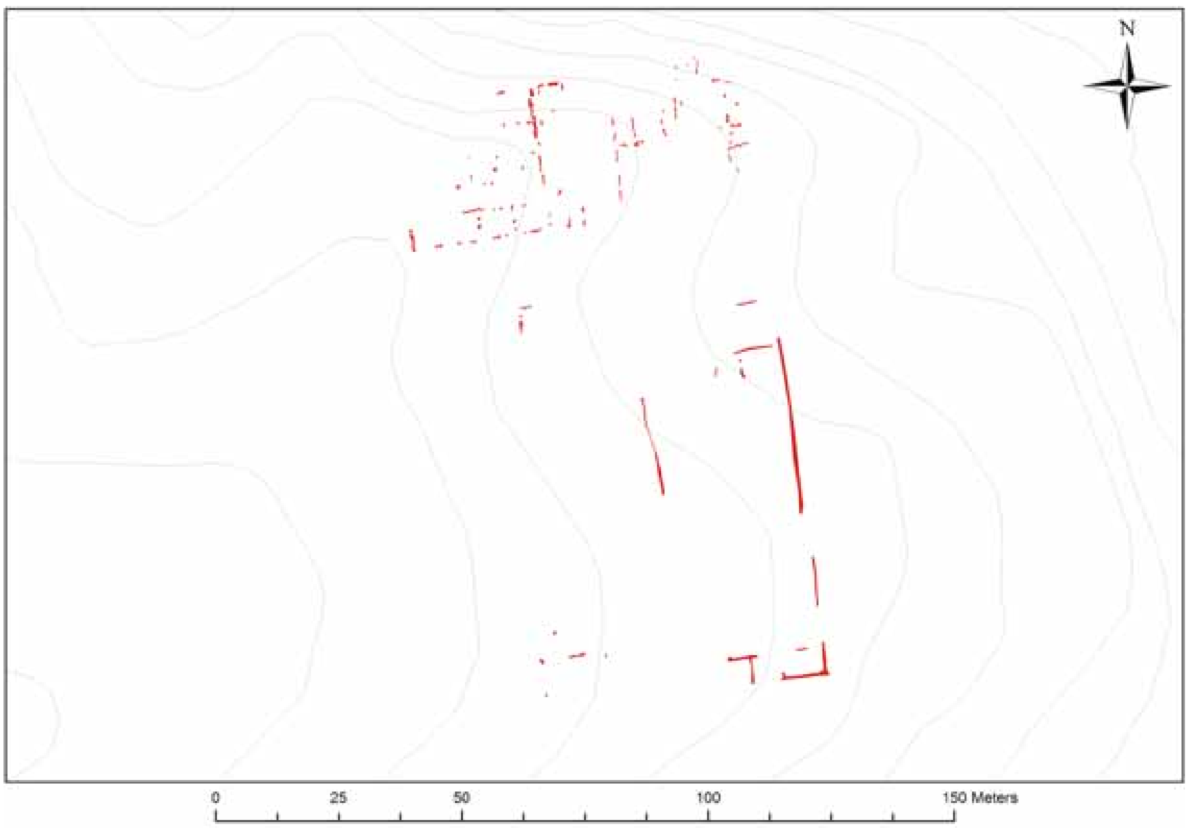

Fig. 66. Area C (Asteria), the NE area. By H. Boman & J. Klange.

90 As for example in Olynthos and Goritsa.

91 Best example for the street view in a city with extensive built terraces for houses and official buildings is Priene; Wiegand 1904.

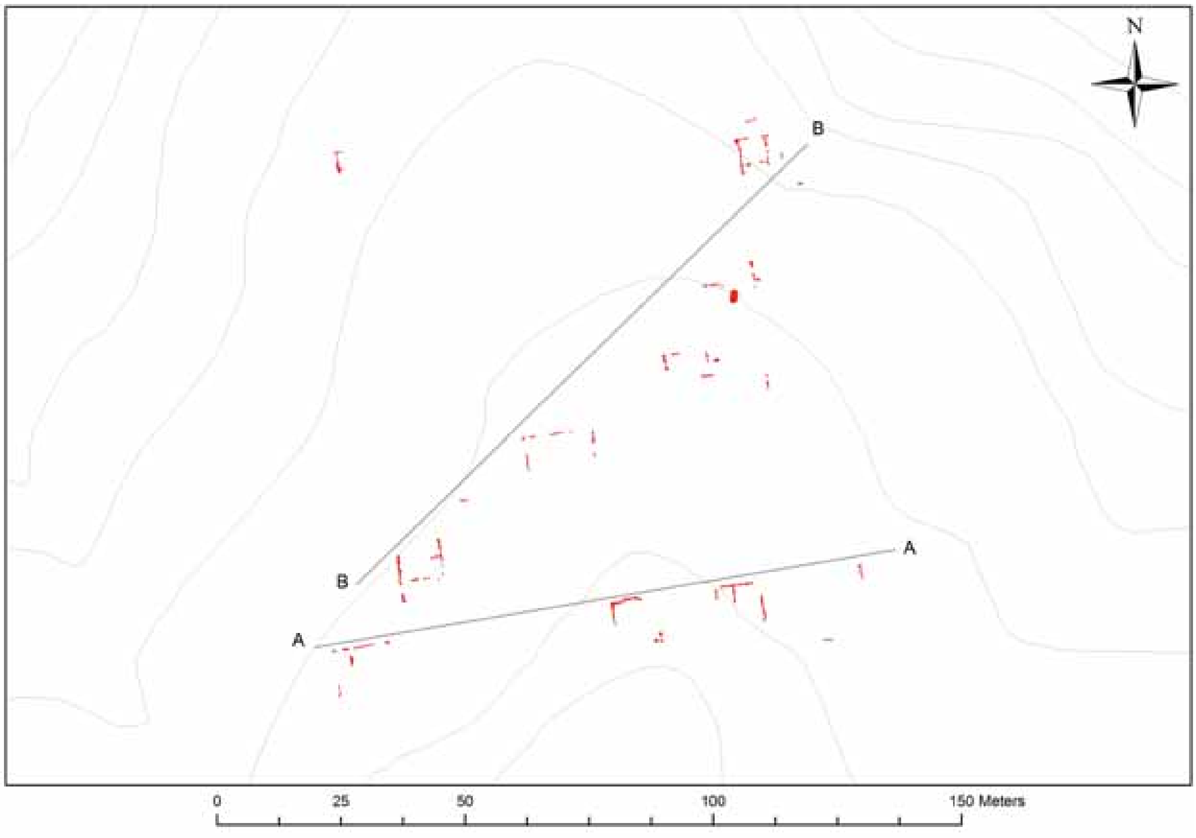

Fig. 67. Area C (Asteria), the NW area. By H. Boman & J. Klange.

plan which was produced during the survey. Several wall traces have been identified in a straight line oriented E–W (*Fig. 67*, A–A). Since there are also substantial remains found north of this line, this should be understood as some kind of internal boundary inside the structured settlement. We can with the information at hand only suggest that this might have been a façade along a street or some other kind of boundary for a unit of houses.

Along the edge of the north-western area, a number of structures were found in the sloping terrain, presumably parts of dwellings and terrace walls oriented according to the general grid system. The structures are cut diagonally along the sloping hill and large amounts of loose stones are found in the lower slopes (*Fig. 67*, B–B). A few stones *in situ* are found downhill, suggesting that the nucleated settlement continued further north of the remains. We assume that this disturbance reflects recent changes made in the landscape and that the northern area of the structured settlement is mostly destroyed.

There are no indications of a fortification wall around the lower town and we have not found any specific features that could indicate an outer perimeter of the settlement.[92] We can associate these features with a structured settlement with an E–W, N–S oriented street system, a pattern that can be associated with the orthogonal grid pattern of Hellenistic town planning after the late 4th century BC.[93]

DOMESTIC STRUCTURES

All of the investigated areas produced remains of ancient structures, primarily of a domestic character. Both the extensive planned grid system and the building technique of the two-surfaced walls of natural stones, acting as foundations for mud brick superstructures, suggest domestic functions. The remains on the western "plateau with olive grove" constitute the only outstanding feature that departs from the grid pattern.

The architectural survey has so far not been able to produce a complete plan of the structured settlement. Neither have we

92 We cannot exclude the possibility of a fortification, due to the terrain and dense vegetation which might obscure such remains.

93 Höpfner & Schwandner 1986; Dietz & Stavropoulou-Gatsi 2011.

been able to identify enough remains in order to create a plan for a single house or specific building; though several of the measured structures enclose an area on four sides, indicating some kind of room structure. The architectural remains documented in Asteria can best be paralleled with the layout of domestic buildings found in Nea Halos,[94] Olynthos,[95] Piraeus,[96] or the more distant Priene.[97]

There are also some specific building details that further identify the recorded remains as ancient domestic structures. Found in an area of thick shrubby vegetation, the remains of one building constructed of large stones are well preserved above ground level (*Fig. 68*). The stones, when partially cleared, revealed a corner with three flat stones in front of the line of the wall. Parallels of similar building techniques can be found in Nea Halos, and these stones would probably have been placed in front of a door with a threshold.[98] We have so far not identified a threshold, though an excavation of the area might possibly reveal one. So far, this is one of the best preserved features from a domestic structure that we have found.

Fig. 68. Area C (Asteria), the NW area. The corner of the large structure. Photo: H. Boman.

Further to the east, in the north-eastern area, there is a structure with four stones which now diverge somewhat from their original position due to the sloping terrain. A shallow rough conduit-like cutting runs through all four stones, which were found in connection with a number of wall traces that could, hypothetically, belong to one single edifice (*Figs. 66, 69*). Since the stones have been moved from their original positions, it is difficult to identify the original arrangement of the stones. If the stones are joined according to their well-cut sides, the conduit is not straight. Positioned to create a straight conduit, the joints of the stones, although cut straight, do not match each other. There seems to be no stones missing in between the preserved ones. These cut stones might indicate some kind of support for a partition, or fence, with thin slabs of stone or a wooden structure. Alternatively, though very shallow, the cuttings could be some kind of water conduit.

Based on the remains uncovered during the excavations in Asteria in 2012, we can conclude that the many of the recorded stones, belonging to ancient structures in Asteria, are the top parts of larger stones from foundations of buildings or retaining walls.[99] The structures found in the excavations also show that the larger stones are not necessarily the external walls facing a street or court, though there is a tendency to use large standing natural stones in both the dividing walls, between houses, and as façades facing the street.[100] We can assume that the condition of the walls in other areas of Asteria might be in the same state of preservation as those unearthed in the excavation. Despite the changes made to the landscape in modern times, substantial remains seem to be preserved below ground level.

Fig. 69. Area C (Asteria), the NE area. Details of dwelling structure, the stones with the shallow cutting. Photo: H. Boman.

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94 Reinders & Prummel 2003; Nevett comments on Nea Halos as an example of a uniform grid system though the houses "suggest a remarkable degree of dissimilarity from each other and serve as a warning against taking one or two excavated houses at a site as representative of all its housing"; Nevett 1999, 117.
95 Robinson 1930; 1932.
96 Höfner & Schwandner 1986, 12–20.
97 Wiegand 1904.
98 Reinders & Prummel 2003, fig. 2.12, House of the Coroplast; Haagsma 2010, fig. 2.16.
99 See entry by Papakonstantinou, Stavrogiannis & Psarogianni in this report.
100 Examples from Nea Halos (see Reinders & Prummel 2003; Haagsma 2010).

OUTSIDE THE GRID

On a low plateau we refer to as the "plateau with olive grove", between the Profitis Elias hill and Asteria, we found the remains of walls in a rectangular formation (*Fig. 64*). The walls are preserved along the northern, western and eastern sides, and the preliminary interpretation is that it is an inner structure with an outer boundary wall. These remains are the only features that deviate from the grid pattern found in the lower hills east of Profitis Elias.

Only the top surfaces of the stones are visible, though along the outer western edge, more stones are visible and it is clear that the wall was originally higher than what is preserved today, built with stones in more than one course (*Figs. 70–71*). Only two stones have been found in the eastern part of the area. They presumably define the eastern extension of the inner structure, giving it a length of *c*. 11.30 m. Nothing has been found of the southern boundary, though the vegetation on this side is dense. We cannot at present estimate the width of the structure. The inner walls have two wall surfaces preserved and are *c*. 1 m wide, wider than other walls found in Asteria (*Fig. 70*).

As described earlier, significant densities of surface material were recorded on the plateau during the surface survey and the amount of tiles was significantly higher than in other areas. This, in combination with the walls found, suggests that the area has a different function than other parts of Asteria.

We cannot, as earlier emphasized, identify the exact nature of the structure, though we stress that the location at a very prominent point in the landscape is an important key to the understanding of these remains, offering excellent views of both Profitis Elias and the slopes and fields further east as well as being visible from large parts of Asteria. It is tempting to identify these structural traces as an edifice (the wide, inner walls) placed on a platform with a possible boundary wall around (the outer walls), though further investigations are required in order to provide a more precise interpretation of the identity and function of these remains.

Discussion: Prehistoric presence in the area of Profitis Elias and Asteria

(BY MONICA NILSSON)

Twelve fragments and implements of obsidian and chert constitute the entire assemblage of prehistoric survey material of the MALP project during 2010–2012. Modern Makrakomi traditions insist on an extensive Mycenaean settlement at Asteria and Profitis Elias, fuelling the local enthusiasm for any archaeological undertaking in the area.[101] The prehistoric finds from the survey were therefore less substantial than expected

Fig. 70. Area C (Asteria), "Plateau with olive grove". The wide, inner walls, seen towards west. Photo: H. Boman.

Fig. 71. Area C (Asteria), "Plateau with olive grove". The northern wall of the outer boundary wall. Photo: H. Boman.

[101] The traditions can be traced back to the 1970s and the presumed Mycenaean settlement is associated with a palace and the mythological Achilles as its governor (Makrygiannis-Matapas 1979, who includes plans of the "palace" at Asteria in figs. 10–11).

and in terms of finds of Late Bronze Age date we have none that can be clearly identified as such.

One arrowhead was found on the summit of the northernmost of the two hill tops, Area B, whereas the other lithic finds were distributed across the Asteria foothill and the fields to the south of it. The find spots were not nucleated, but their distribution coincides with the nucleation of the Hellenistic settlement, emphasizing the geographical and strategic suitability of the site for either a permanent settlement or temporary encampment.[102]

Looking at the negative evidence, not one single piece of pottery has been identified as prehistoric—or even possibly prehistoric—from the thousands that have been examined during the survey. Furthermore, millstones such as saddle querns and other ground stone implements of prehistoric date are also absent in the material. Accordingly, not only the quantity retrieved, but also the spectrum of artefact types at the site is very limited, and the question is whether we can we tentatively draw any conclusions from negative evidence. One could perhaps argue that there is actually no prehistoric material whatsoever from the survey. If there is no prehistoric pottery to date the chipped stone assemblage, can we really exclude the reuse or manufacture and usage of chipped stone in a rural historical environment? Probably not. There are, however, a few other prehistoric finds associated with the site, although not part of the survey and therefore not included in our study.

In 2010, a visitor to the site presented us with a find allegedly retrieved right there and then in Area A, just to the east of the Profitis Elias chapel. The artefact was a black sealstone, possibly of Early Helladic III date, with a loop for suspension and a simple and crudely executed hatch pattern for the seal stamp.

In the excavations carried out at the site of Asteria by the 14th Ephorate in 2012, two presumably prehistoric stone tools were part of the fill in a Hellenistic street.[103] One was a heavy, spherical hand tool and the other a complete axe (*Fig. 21*). Lacking context, the exact dating is difficult to assess, but such tools are generally dated to the Neolithic or possibly the Early Helladic period. The digging of foundation trenches during the construction of the historical settlement, and the subsequent exposure of prehistoric material, easily explains the Hellenistic context of these tools. However, no layers with prehistoric finds were encountered below street and floor levels although excavations continued to bedrock. If the two lithic artefacts are still in the area of their original deposition it would mean that they were simply "stray finds", tools that were lost at the time, or shortly after, they were in use.

The situation is paralleled in many Boeotian sites where prehistoric survey material is scant, consisting only of a few lithics and/or worn sherds. Nevertheless, John Bintliff and others have demonstrated that a small amount of prehistoric material at these sites may in fact signify "hidden" prehistoric landscapes, which are drowned by larger volumes of Greco-Roman material.[104] Accordingly, the possibility should not be ignored, but the trial trenches of 2012 were excavated down to bedrock and they did not yield any hidden prehistoric landscapes at Asteria.

No prehistoric settlement can, as yet, be demonstrated at the site and, therefore, the prehistoric presence is difficult to define. Chronologically, all finds could possibly originate from the Early Bronze Age period, but some may be earlier or later. They may comprise the background scatter of repeated use of the area for the gathering of plants or as hunting grounds, for instance. The artefacts found in the survey would be serviceable for such exploitation of the natural resources since they were manufactured for cutting and hunting. If one includes the negative evidence, for now, this argument is further strengthened. Without a permanent settlement there is no use for pottery. Also, without a permanent settlement there would be no cultivation of grain in the neighbouring area and no need for millstones. At present, we can assume that the site was used in prehistory, but probably not intensively. More importantly, the material recorded in the survey can in no way be used to substantiate the claim that a large Mycenaean settlement, acting as an important regional centre, existed at Asteria since such a site would have left more extensive material traces even in an area covered by a later settlement. Future investigations may prove us wrong, but it would appear that the first permanent settlement was not established until the Late Classical to Early Hellenistic period.

102 The finds in the fields to the south of the foothill are likely to have shifted from their original place of deposit due to the erosive inclination of the area.

103 See entry by Papakonstantinou, Stavrogiannis & Psarogianni in this report.

104 Bintliff *et al*. 1999; Bintliff *et al*. 2002, 261; Bintliff, Howard & Snodgrass 2007, 129–131; Bintliff 2011.

Discussion: A structured Late Classical and Hellenistic settlement on the lower eastern slopes of the Profitis Elias hill

(BY ANTON BONNIER & HENRIK BOMAN)

Through the integrated methods of geophysics, the archaeological surface survey and the architectural investigation we have been able to demonstrate the presence of a nucleated settlement, possibly un-walled, on the lower eastern slopes of the Profitis Elias hill, above the modern country road running between Makrakomi and Platystomo. The recorded surface scatters of archaeological material suggest the presence of domestic housing units, evident through a large quantity of tiles as well as household assemblages consisting of storage vessels, transport amphorae, plain table and cooking wares as well as drinking cups and other fine ware shapes, which also extend into potential off-site scatters particularly in the southern and eastern sector of the survey area.

The surface archaeology recorded in the survey area can further be fitted together with the picture provided by the architectural survey. It is clear that most of the examined architectural traces belong to multiple domestic houses, laid out on a regular grid, even if some of the structural remains may be associated with a system of building terraces that would have existed simultaneously at the site, supporting the grid of houses.

The edges of the settlement can be at least tentatively identified on the northern and eastern edges of the survey area where there was a sharp drop in material densities, with thin scatters of off-site material represented on the ground. In the north, finds of burials together with information of previously recorded burials in this area help to indicate that we are moving beyond the site of the settlement, even if we have little evidence for the chronology of these graves and consequently the temporal relationship with the nucleated settlement recorded through the survey in Asteria.

Possible settlement edges in the southern part of the survey also seem to suggest a limit to the nucleated settlement. Tract densities are higher here compared to those noted in the northern and eastern edges, but are still slightly lower compared to the central Asteria. It thus seems probable that the surface scatters should be understood as off-site material, potentially reflecting halos of settlement rubbish and manuring.[105] A potential reason for the slightly higher off-site densities may be due primarily to recent ploughing and good ground visibility, particularly compared to the northern sector.

Much further research is needed, and which will be carried out within the framework of MALP, but overall the first phase of the surface survey has suggested the presence of a notable concentration of Late Classical to Hellenistic material in the central part of Asteria, which is framed by surrounding off-site scatters of pottery and tile of similar date (*Fig. 72*).

The architectural traces are similarly focused to the Asteria area and the lower slopes, particularly in the northern part of the survey area. The structural traces support the indications of the spatial extent of settlement in the area, as provided by the surface survey, even if the picture is complicated in the southern part of the site. Dense scatters of archaeological material were documented in this section of the survey area, but very few architectural traces have been recognized. The reason for this may be connected to modern agricultural activities.

Agricultural groves cover much of this area, which has been subject to extensive ploughing as well as bulldozing. While the surface finds suggest a dense pattern of ancient habitation here, the associated structural traces must to a large extent have been destroyed; a picture which is confirmed by the presence of large blocks scattered along field boundaries and in bushes at the edges of the groves. The geophysical investigations that were carried out in the autumn of 2011, similarly suggest that structural traces in this part of the survey area are likely to have been removed in order to accommodate cultivation.[106] Further surface survey and architectural investigation is thus needed in the southern area, but through the 2011 and 2012 campaigns we have been able to acquire a fairly good picture of the layout of the ancient settlement in the area.

The examined area acts as a natural plateau which is suitable for the construction of multiple terraces and housing blocks and provides good visibility of the surrounding landscape and the eastern Spercheios Valley, as well as routes running northwards towards Thessaly through the Giannitsou Pass.

The physical relationship between the lower town on the eastern foothills and the fortified area on the summits of Profitis Elias is so far difficult to fully assess. We have no indications of fortifications surrounding the lower settlement or any fortifications connecting the upper area on Profitis Elias with the eastern foothills, and it is possible that the Asteria settlement remained unfortified.

Connections between the upper and lower area can potentially be examined in terms of the chronology of development at the site. The pilot survey, and in particular the examination of recently surfaced material along the modern dirt road leading to the chapel of Profitis Elias, provided good indications of activity in the area of the two hill summits, spanning the

[105] Cf. Bintliff & Snodgrass 1988; Alcock, Cherry & Davis 1994; Bintliff *et al*. 2002; Bintliff, Howard & Snodgrass 2007, 20–26.

[106] See entry by Tsokas *et al*. in this volume.

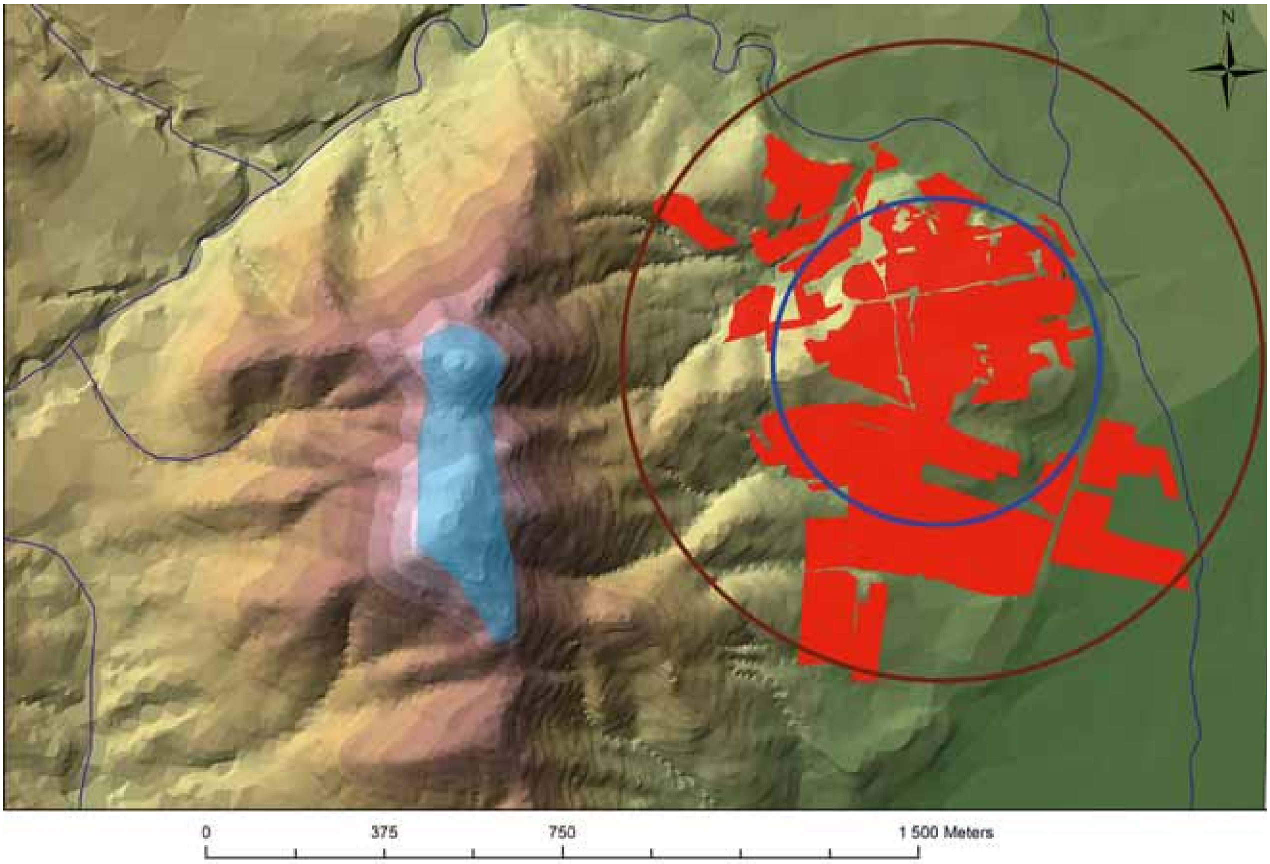

Fig. 72. Hypothesized relation between site and halo/off-site areas based on the survey data. By Anton Bonnier.

Late Classical and Hellenistic to Early Roman periods (even if this represents only a tiny portion of the total area). Similarly the preliminary evidence for the chronological range of habitation in the lower area, provided by the survey in 2011 and 2012, suggests extensive settlement development, probably in the later part of the 4th century BC, and with continuation of habitation into the 2nd century BC.

The development of the lower settlement thus fits neatly into the period of development on the summits of Profitis Elias suggested by the surface finds. Whether this development constitutes Late Classical to Hellenistic urbanization is problematic in regards to archaeological taxonomy. Both the recorded surface scatters and the investigated architectural traces in the area suggest the presence of a relatively large structured settlement, but we only have a few indications of the presence of public buildings, beyond the actual Profitis Elias fortifications, typical of urban environments in the Greek world.[107] This may be a result of continuous destruction of archaeological remains in the area over several centuries, and without excavation it can be difficult to fully identify specific building types.

The site seems, nevertheless, to have functioned as a population locus in the western Spercheios Valley which also had access to goods produced beyond its immediate neighbourhood, thus displaying possible urban characteristics. Based on the preliminary chronology of the surface scatters, these settlement structures do not seem to be maintained, however, into the first centuries AD and the period of Roman rule.

Questions must consequently be asked as to what stimulated nucleation at the site as well as why this settlement system was not resilient enough to survive in its previous form into later periods. Looking at a broader political geography, regional history and geopolitical developments in the western Spercheios Valley we get some indications as to why settlement development and nucleation seem to be focused to these periods, even if the information provided by the written sources is fragmentary. The valley has the potential to act as a significant border zone and facilitates a number of important physical routes that connect Central Greece (including Aitolia, Phokis, Boeotia and Lokris) with Thessaly and Mace-

[107] Cf. Morgan & Coulton 1997.

donia. During the 4th century BC these routes must have become increasingly important, and by the later part of the 4th century the valley would have been intrinsically linked with Macedonian networks, and would have been physically significant in connecting several parts of the Greek mainland.

These physical routes must be seen as an important factor in regards to investment at the site and the construction of the fortifications on the Profitis Elias hill, which seem to form part of a broader system of Late Classical and Hellenistic fortifications in the western Spercheios Valley. Issues of security and defence as well as ideological manifestations of power in connection with sensitive and important routes may thus help to explain the extensive investment at the site in the Late Classical and Early Hellenistic period.

The role of the *ethnos* of Ainis itself in stimulating nucleation and investment of resources at the site is difficult to fully assess due to a general lack of written sources. It is possible that the material may reflect a local mobilization of resources, but we also know that the Spercheios Valley was under political influence from Thessaly and later Macedonia throughout the 4th century BC. Investment may therefore potentially be related to outside interests in securing important routes and strengthening local Ainian settlement and fortification systems.

Ainis was further incorporated into the Aitolian League during the early part of the 3rd century BC, and the *ethnos* remained a member of the koinon probably until the middle of the 2nd century BC, when the federal structures of the league seems to have disintegrated, probably due to interfering Roman interests.[108] The incorporation of Ainis into the Aitolian League can again be seen as a possible further stimulus to investment and nucleation at the Profitis Elias site. Connections with broader federal networks in Central Greece and southern Thessaly may also be significant in how local settlement structures were maintained throughout the Hellenistic period in the western Spercheios Valley.

Previous research has shown that Roman rule transformed several parts of mainland Greece, particularly in regards to land ownership and settlement patterns.[109] On the basis of the preliminary chronology of habitation at Profitis Elias and the Asteria site, it seems that the nucleated settlement could not be maintained in these new political structures and that the disintegration of federal networks was catastrophic to the local settlement systems.

The discussion presented above must be seen as preliminary, as further study of diagnostics recorded during 2011 and 2012 as well as finds from continued survey and gridded re-survey on the lower slopes, and the finds from the excavations, is required in order to produce a better understanding of the chronological horizons at the site. The results from the fieldwork carried out between 2010 and 2012 nevertheless provide a first picture of the pattern of nucleation and limits to the structured settlement in the Profitis Elias area. This is important in regards to the settlement archaeology of the western Spercheios Valley as the focus of previous research was mainly directed at the system of fortification and little was known of the extramural habitation site on the lower eastern slopes of Profitis Elias.

MALP fieldwork has also prompted us to ask further questions regarding the Classical to Roman settlement systems in the western Spercheios Valley. Do we find other fortified sites where it is possible to identify a similar pattern of extramural nucleation in the Classical–Hellenistic phase? How resilient are the Classical and Hellenistic settlement structures and what changes can we observe in the periods of Roman rule? Further fieldwork in the western Spercheios Valley and the municipality of Makrakomi, as part of the MALP programme, will allow us to discuss and explore these issues further.

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108 Grainger 1999, 108–113, 534; Scholten 2000, 51–52.

109 Alcock 1993.

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