

TAESP

Troodos Archaeological and Environmental Survey Project

Report on the Fourth Season, July-August 2003

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1. Introduction

The Troodos Archaeological and Environmental Survey Project (TAESP) is studying the relationship between people and their environment from the Neolithic to the Modern period. Its 159 square kilometre survey area, on the northern slopes of the Troodos Mountains in central Cyprus, stretches from Skouriotissa and Kalia in the west to Potami and Xyliatos in the east. TAESP is directed by Dr Michael Given (University of Glasgow), Dr Vasiliki Kassianidou (University of Cyprus), Prof. A. Bernard Knapp (University of Glasgow), and Prof. Jay Noller (Oregon State University). Our season ran from 5 July to 8 August, with 41 team members from eleven countries and eleven universities.

TAESP is very grateful to the Department of Antiquities, and in particular to its Director Dr Sophocles Hadjisavvas, for permission to carry out this survey. We also thank Mr Antonis Nikolaidis, the Mayor of Phlasou, Mr Pantelis Andreou Iakovou, the Mayor of Katydata, and Mr Georgios Papacharalambous, the Mayor of Tembria, for their generosity in allowing us to use the Phlasou, Katydata and Tembria schools and the Phlasou church hall. We have benefited greatly from the help and hospitality of the village councils and communities of Phlasou, Katydata, Tembria, Evrykhou, and the other villages in the survey area. Our principle funder is the UK Arts and Humanities Research Board. We have received additional support from the Carnegie Trust for the Universities of Scotland, Oregon State University, the University of Cyprus, and Glasgow University. Our fieldwalkers and specialists worked hard and cheerfully during a long and busy season, and we are very grateful to them all.



Figure 1. Part of the 2003 team during a geomorphological tour of the survey area

During the 2003 season we worked in four Intensive Survey Zones (ISZ) and more widely across the entire survey area (Figure 2). Team West carried out an additional three transects to extend the Karkotis ISZ to the south, as well as surveying the new Atsas ISZ east of Skouriotissa. Team Central worked in the Asinou ISZ, extending the surveyed area both up and down the valley. Team East extended the Xyliatos ISZ to include the area of Alestos mine. The fourth team, Team X (for 'extensive'), carried out 20 transects across the entire survey area, in order to sample those areas which do not lie within Intensive Survey Zones. While the survey teams were fieldwalking, the various project specialists worked on their different disciplinary areas, particularly archaeometallurgy, architecture, artefact studies, geomorphology, and oral history.

All these varied data are recorded systematically on a series of paper forms, and then transferred, stored and manipulated in the project database (*Microsoft Access*). Spatial data such as the outlines of survey units are digitised in the GIS (*ArcGIS*), which are then joined to carry out spatial analysis (e.g., distribution mapping, artefact densities, etc).

During the season we began discussing the organisation and schedule of our final publication. The structure of what follows in this report is based on our proposed scheme for its 'Survey Results' section.

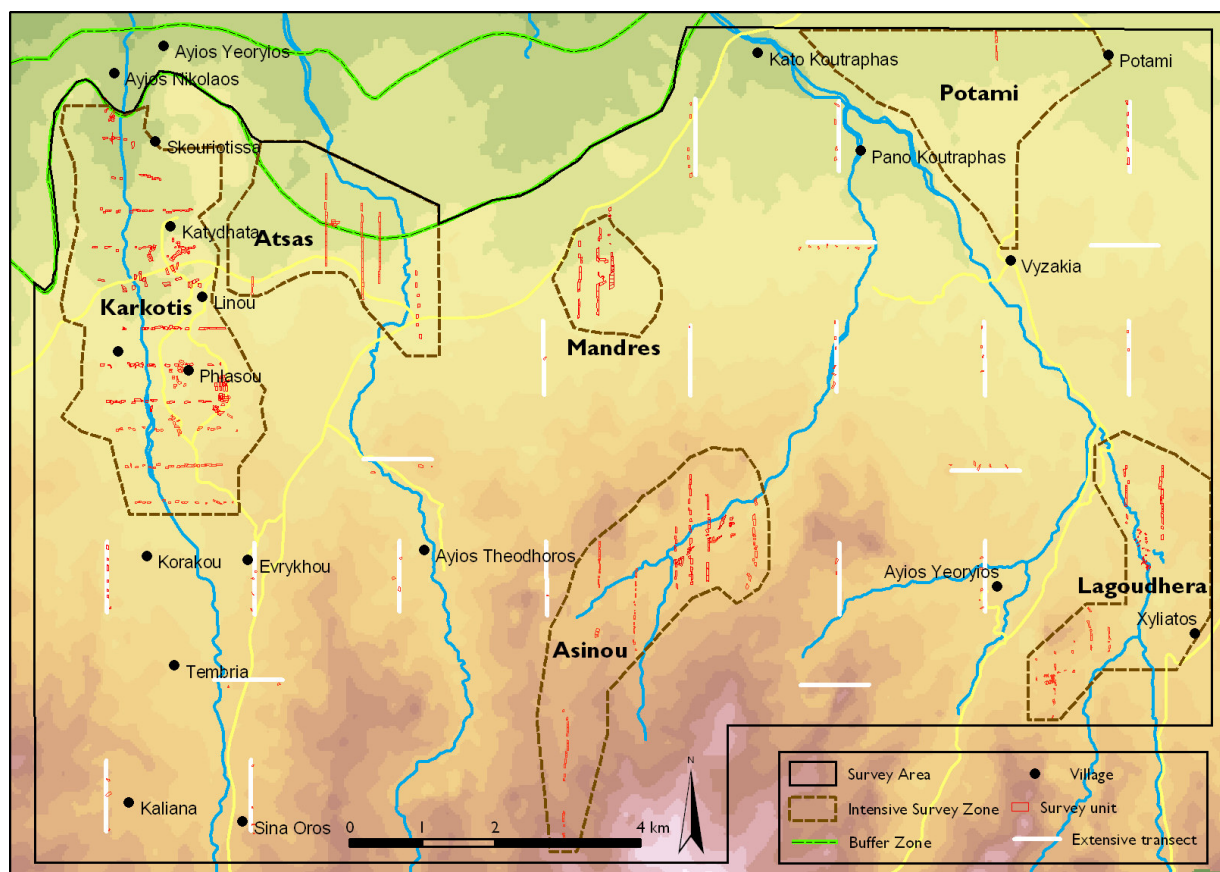


Figure 2. Map of the TAESP survey area. Contour interval: 50 m

2. The Plain

The north and northeastern part of the TAESP survey area consists of a large area of open ancient alluvial fans that spill out of the Troodos massif. These have been incised by north-running river channels, some of them very deeply, and as a result take the form of long narrow plains (bajada). The pillow lava bedrock is overlain by Pleistocene alluvial pediment from the Troodos, later alluvial deposits of mixed sands and gravels up to 10 m thick, and gravelly colluvium associated with bedrock outcrops, hilltops and adjacent foot-slopes. Land use is predominantly agriculture in this broad plain,

and the plots usually follow the contours of the spurs. Most of the area is intensively cultivated with cereals, although where there are good water sources vegetables are also grown. In general, slopes are gentle and soil surfaces are stable.

In 2001 and 2002 we carried out survey transects and block survey round Mandres, but were severely limited because of poor visibility in the straw and stubble. We did no work there in summer 2003, but intend to do more transects during the November 2003 season, after ploughing. The Potami ISZ was similarly obscured, apart from one short transect of seven survey units in an area that had been recently ploughed. These units were dominated by lithic material, especially ground stone on the north side of the river and chipped jasper. The striking lack of pottery suggests that we are dealing with an aceramic culture. As with Mandres, we intend to do more survey in this area in November 2003.

Team X surveyed nine transects in the plains, consisting of 34 survey units. There is no conclusive evidence that aspect influences pottery counts in the sampled survey units, although there did seem to be more evidence of agriculture on western slopes. In general, recent cut grain restricted the visibility over the landscape and it made it difficult to find survey units.

Atsas ISZ (Team West)

The Atsas Intensive Survey Zone lies in the central part of the Atsas drainage, east of Skouriotissa mine. The Atsas and its numerous tributaries cross Upper Pillow Lava bedrock, usually flanked by narrow terraces underlain by alluvial sediments and overlying topsoil. Because of the *havara* soils that have formed on these terraces, the river banks are resistant to erosion. There has also been very little agricultural and industrial modification of this landscape, and so the archaeological material is exceptionally well-preserved.

The four transects that Team West surveyed showed a major contrast with the Karkotis ISZ. Instead of the broad, continuous pottery scatters of the Karkotis valley, there were broad areas with nothing or almost nothing, punctuated by distinct and discrete concentrations of pottery. Although we did not find *in situ* remains from the Chalcolithic, Bronze Age and Iron Age, significant quantities of pottery from these periods provide intriguing evidence of occupation in the area. By far the best-represented period in terms of the pottery is the Historical Antiquity category, specifically the Hellenistic and Roman periods. The most intact archaeological evidence comes from the Roman period, in the form of two farmsteads. Further exploration on the north side of the Atsas revealed a third farmstead and a much larger Roman settlement.

Linou *Vrysi tou Haji Christophi* (TP202) consists of two small structures lying on a small rocky spur above a spring in the Argaki tou Haji Christophi. We mapped the structures and sampled the pottery and tile associated with it, and carried out block survey in the fields surrounding them (TS18). The pottery included transport amphorae of the same types as those identified at Skouriotissa, Xyliatos *Mavrovouni* and Xyliatos *Litharkies*; a variety of Late Roman table wares, mostly Cypriot Red Slip but also some Phocian and African fragments; a Late Roman spouted *mortarium*; and a Dhiorios pot rim of similar date. There are large numbers of Late Roman tiles, some of them very well preserved. Only three sherds (one sgraffito) may belong to the Post-Roman period, and there is no conclusive evidence for occupation before the Late Roman period.

Between the two structures is a large gabbro millstone 95 cm in diameter with a square socket 11 cm wide and 5 cm deep. We also observed volcanic and basalt quern fragments, a stone *mortarium* and one other possible ground stone, several building stones of which at least one had a square corner cut into it, and a small piece of slag.

The abandoned village of Lemonas (TP209; Evrykhou *Tanayies*) consists of a series of structures with foundations of river boulders, stone and potsherd chinking, and mudbrick superstructures. A few ground stone tools had been incorporated in the structural foundations. If these tools prove to be prehistoric, it would be an intriguing example of interaction between successive populations inhabiting

the same region. In the 1963 aerial photographs, several threshing floors encircle the village. Although they no longer exist, their paving stones seem to have been pushed into rubble piles or strewn throughout adjacent fields as a result of cultivation practices.

The southern portions of the Transect TT492750E produced very few artefacts, but there was a distinct peak between Lemonas village and the river. These survey units contained high proportions of ancient pottery from the Chalcolithic Period, Bronze and Iron Ages, and Roman period. Also found here were fragments of figurines from the Cypro-Archaic to Cypro-Classical periods. More diagnostic Medieval and Ottoman pottery was found close to Lemonas village.

Further westwards, below the eastern spoil heaps of Skouriotissa mine, Team West discovered another Roman farmstead, Petra *Phoukasa* (TP221). A circular cistern *ca.* 2.5 m in diameter was dug into the western part of a small ridge, and was surrounded by large amounts of Late Roman tile and pottery, as well as two clear rubble heaps. The same area has several outcrops of high quality red and brown jasper (TP236; TP237), and there are extensive scatters of cores, flakes and debitage. Only a few *ad hoc* utilized flake tools and two side scrapers hint at the types of tool produced. These could be anything from Aceramic Neolithic to Bronze Age, but hopefully further analysis will help to refine the chronology.

Because of the well-preserved landscape that has so far escaped bulldozing and development, our ten days of work in the Atsas ISZ was enormously productive. We have begun to elucidate a network of Late Roman farmsteads that is almost certainly linked to the contemporary intensive exploitation of the copper resources at the neighbouring Skouriotissa mine.

3. The Valleys: Karkotis

The two major valleys of the survey area, the Karkotis in the west and the Lagoudhera in the east, are characterised by a great variety of terrain, which results in a variety of land management schemes. As the rivers incise into the valleys, they leave behind many terraces. Terraces at different levels represent different stages of the height of the river. Almost all of this terracing has been modified by human activity.

In both valleys our transects extended into the garrigue or pine-forested ridgelines. At these higher elevations, the landscape is not modified by the river, and so the soil consists of alluvium and colluvium from hill slopes, with a sandier texture than lower down in the valley. These ridges retain more of their original contours, which are more sloping and variable. Essentially, the river valley can be considered as one giant geomorphological unit. Our transects provide a cross-section of an area in which all artefacts are subject to the same general geomorphological processes of the river valley system.

In the upper part of the Karkotis Valley, south of the Intensive Survey Zone, Team X carried out four transects, three of them north-south and one east-west. The systematic rather than purposive placing of these transects meant that they were all in the higher parts of the steep valley sides, rather than down in the valley bottom. These areas were of great interest for their networks of paths, evidence of intensive fruit and vine-growing, much of it abandoned, and more recent hunting and forestry activity.

One of Team X's transects (TT491000C) passed through the centre of the village of Evrykhon. Its four survey units were not enough to demonstrate a clear pattern of pottery concentration, though there were substantial numbers of sherds within the village. The sherds showed a striking time range, with all periods represented as far back as the Late Chalcolithic or Early Bronze Age, indicating long-term human activity in the area.

Karkotis ISZ (Team West)

In the 2003 field season, Team West conducted three east-west transects in the southern part of the Karkotis ISZ. By adding to the data collected for the middle (2001 season) and northern (2002 season)

parts of the ISZ, we have achieved comprehensive coverage of this rich river valley. The two previous field seasons documented material culture concentrations from the Early-Middle Bronze Age, Iron Age, Hellenistic and Roman periods, and Medieval-Ottoman periods. Our fieldwork this season pushed back the occupation of the Karkotis valley even further, but also elaborates our understanding of historic period human activity in the valley.

The three transects across the valley revealed a wide variety of material. The team found both oral and material evidence of tombs on the slopes along the eastern side of the valley. This same area had some very subtle traces of hillslope terraces which zig-zagged up the slope, taking advantages of the bedrock dykes. These may have been for subsistence agriculture during the Medieval and Ottoman periods when the best land in the valley bottom was taken up by large estates producing cash crops. Also east of the river was an intriguing scatter of Hellenistic and Roman pottery (SU2069-SU2070), including a wide range of utility and cooking wares, tiles and a transport amphora.

There was very little pottery on the slopes and ridges along the western side of the valley. The team discovered the site of the abandoned, now obliterated, Medieval and Ottoman village of Agroladou, with a series of very old olive trees. The pottery included glazed and monochrome painted wares from the Medieval and Ottoman periods.

The richness and variety of ground stone from the Karkotis valley this season was very striking, even without the large assemblage from Phlasou *Koutroullis* (see below). Of particular interest were four ground stone axes in and around the village of Phlasou, suggesting that there was very significant Late Chalcolithic and Prehistoric Bronze Age activity in this whole area. Ground stone vessels are still very rare, suggesting either regional variation or else functional differences in the types of site. The dominance of pounding and hammering tools suggest heavy processing that could include the early stages of mineral preparation for copper production.

TS01 Skouriotissa

During the season Vasiliki Kassianidou and Thomas Tselios cleaned up three sections at Skouriotissa *Vouppos* (TP007), the main slag heap at Skouriotissa. One section (AU07) consisted of a stone wall and an area of sediment rich in slag and pottery fragments. This may be a later support wall, but it could also be part of an earlier structure that was subsequently engulfed by slag. The talus in front of it contained large chunks of plaster, fallen rocks and tile, as well as animal bones, an iron nail, and what is probably a hammer stone. Section AU09 is a retaining wall neatly constructed out of slag cakes. The section and the area in front of it is full of Roman pottery and tile. The third section (AU14) to be cleaned was a high section through the main slag heap at its northern end.

The archaeometallurgical team also cleaned up a section at Skouriotissa *Kitromilia* (TP172), a small slag heap about 100 m north of the main slag heap. The layers consist mostly of finely crushed slag mixed with furnace material and large amounts of charcoal, some of which will be suitable for species identification. During cleaning, a Roman tile and a piece of Late Roman table ware were found. The bluish tinge suggesting a high manganese content and the slag heap's similarity to TP007 support this Roman date.

Thanks to Constantinos Xydias, the director of the Hellenic Mining Company, we were able to examine and sample a dump of Roman pottery within Skouriotissa mine (TP171). This had a maximum diameter of 6.9 m, a maximum height of 1.9 m, and an approximate volume of 21 cubic metres. The dump is no longer *in situ*, and the pottery is poorly preserved because of the action of the copper salts on the surface. It is made of two types of amphora, of which one is predominant. Both types are remarkably thin-walled, and seem unsuitable for sea transport. Several rim fragments of the first type have been found elsewhere in the survey area, but only one of the second.

TS06 Kato Phlasou Koutroullis

One of the most striking discoveries in the Karkotis ISZ was the Late Chalcolithic and Early Bronze Age site at Koutroullis. A 35-m long bulldozed cut along the base of a small spur in the bottom of the

valley produced large quantities of pottery and ground stone, as well as a little chipped stone. Several layers could be distinguished, and a possible wall was visible at the eastern end. Large amounts of similar material was visible in another bulldozed cut below the site, where old flood deposits fill an ancient river meander.



Figure 3. View from the west along Transect TT3879500N. The Late Chalcolithic and Early Bronze Age settlement of Koutroullis (TS06) is on and behind the low hill on the left.

The pottery consists of Chalcolithic, transitional and early Red Polished wares. Chalcolithic Red Monochrome ware was common, particularly thick coarse fragments with finished interiors from large storage jars with wide mouths. The Early Bronze Age ware included some classic Philia (RPI) material. The diagnostic Red Polished ware seems to be distinctly early in the Red Polished sequence, and suggests continued inhabitation during the transitional period (*ca.* 2400 BC).

In terms of its chipped and ground stone tools, Koutroullis is far more representative of an Early/Middle Bronze Age settlement with antecedents in the Late Chalcolithic than Laonarka. The chipped stone sample is small, but provides clear diagnostic markers of the simple core technology that defines Chalcolithic/Bronze Age assemblages elsewhere in Cyprus. The small size of the sample and the heavily exploited nature of the Lefkara cherts show an initial connection with sites to the east. This connection was apparently not continued, as these material resources were not replenished. Potential food processing tools are well represented in the ground stone samples, but a significant number of tools are associated with pounding and hammering. Notably missing is the variety of vessels documented at settlement sites elsewhere in Cyprus, apart from two small globular bowls. The site may have had a very specific function, perhaps the processing of metal ores.

TS09 Katydata *Laonarka*

Most of the work at this Early and Middle Bronze Age site was carried out in 2002. This season, Team West carried out another four survey units in the lemon orchard to the south, to define more precisely the boundaries of the pottery scatter. One surprising find was a survey unit (SU2188) with a scatter of Late Bronze Age material, almost certainly deriving from tombs. To add to the geophysical survey we did last year, Iain Banks (Glasgow University Archaeological Research Division) carried out resistivity survey on each side of last year's work, and discovered that the apparent structures continue across an area some 100 m across.

TS15 Katydata *Pano Limna*

At the end of the 2002 season, we mapped, gridded and sampled this large site which includes an Archaic sanctuary and a substantial Late Roman settlement. In the 2003 season we did block survey in the area to the east, geophysical survey over the sanctuary and the main area of the settlement, and

worked on the material collected last year. The most interesting results from the geophysical survey were an oval feature round the sanctuary, presumably the temenos wall, a larger feature in one corner, perhaps the shrine, and a diagonal line across the middle. Results from elsewhere were disappointing because of the shallow soils, but there was apparently some sort of structure just northwest of the Late Roman wall revealed last year by the bulldozing.

Block survey revealed a rather wider chronology of occupation than expected, with a wide range of Iron Age material, but also material from the Hellenistic and Early Roman periods, as well as the expected Late Roman. Most of the identifiable figurines from the sanctuary were from ring-dancer groups, with ring bases ranging from 9 to 13 cm in diameter. There were also small free-standing tubular figurines, two rectangular plaques with mould-impressed figures in profile, probably Classical, and one tiny horse's head. Fragments from larger, hollow statues suggest that these terracotta sculptures probably stood between 0.6 and 1.2 m tall. The large numbers of figurines and comparatively few numbers of contemporary sherds suggest that their source might be a *bothros*, a deliberately buried deposit of sculpture from the sanctuary.

4. The Valleys: Lagoudhera (Team East)

Our aim in the 2003 season was to extend the investigation of the Lagoudhera ISZ into the area of Alestos. The ore body of Memi, the closest to the slag heap of *Mavrovouni*, consisted mainly of pyrites, the iron sulphide mineral which is not an ore for copper. Alestos, by contrast, is a chalcopyrite mine, and is more likely to have been mined in antiquity for copper. The mountain of Alestos sits alone in the foothills of the Troodos with its summit at 683 m. It is a great mass of pillow lava uplifted from the ocean floor and greatly modified since then by water erosion, the twentieth-century copper mine, and, in the last few years, massive bulldozing. Our work in the area consisted of a series of five transects 250 m apart across its southern and southeastern flank, and block survey round the Roman mining settlement of Xyliatos *Litharkies* (TS05).

The transects very helpfully put the settlement at Litharkies into context, and showed that even with the steep slopes and substantial erosion, Roman material could still be found on the higher parts of Alestos. A series of eight mining adits were of particular interest. One of them had steps running down into it, and joined up with two other openings further up the hill. Their size and appearance suggests that they are probably ancient, although in at least one case they were reinvestigated during the twentieth century. Less easy to explain were a series of small, carefully built platforms, often circular or semi-circular and in some cases associated with the adits.

TS05 Xyliatos *Litharkies*

The Roman settlement of Litharkies lies on a broad spur on the southern side of Alestos, between the Kannavia and Lagoudhera river valleys. The pottery is largely dated to the Roman period, with a little Iron Age, and no survey unit has more than a handful of post-Roman material. The highest density of pottery and tile is found on a single terrace. This terrace is under the influence of colluvial processes that could be implicated in the movement of materials from further up the slope. Considering the density of large rock piles forming the field boundaries on this terrace and the one above, this seems the most likely area of settlement. The preliminary results of the geophysical survey we carried out here were a little disappointing, but there were suggestive features in the upper terrace. Further up on the slopes and summit of the spur we mapped 42 rock piles, and collected material from over 30 of them. Most of this consisted of large fragments of Roman pithos and tile. The rocks themselves had clearly been imported into the area as building material, and cleared for agriculture after the end of the settlement's life.

The variety of forms of tableware, cooking wares and utility wares reveal a place of food storage, preparation and consumption, and the high proportions of tile fragments are evidence of the structures around which these activities were centred. When we consider the fact that the Late Roman material contains many of the better preserved materials, e.g. tiles, whereas the Hellenistic and Early Roman

corpus is made up of tablewares, most of these units have a relatively higher proportion of Hellenistic to Early Roman material compared to the Late Roman material. SU2605 in particular has both the Early and Late Roman material, and is notable for the wide variety of cooking wares. All the common tableware types known throughout the TAESP area are represented in this unit.



Figure 4. Team East fieldwalking at Xyliatos Litharkies, with Alestos in the background

The character of the assemblage is very similar to that at Xyliatos *Mavrovouni*, lying 2 km to the northeast and surveyed last year. Unlike *Mavrovouni*, the amount of Late Hellenistic and Early Roman pottery appears to be equal to the pottery of the Late Roman period. The variety of material is very high: six types of amphorae, two of which are types hitherto mainly identified at *Mavrovouni*; four types of *pithos*; eleven types of cooking pots; nine different tableware forms; and at least three types of tiles with matching cover tiles. On top of this is a large amount of light utility wares, but interestingly the heavy utility ware mainly consists of *pithoi*. The food may not have been produced here, but there was a lot of eating, cooking and storing food, a situation similar to *Mavrovouni*.

There are many pieces of ground stone across the settlement site, particularly in the rock piles. Two of these are limestone basins and must have been brought into the area. The other ground stone is the more locally available diabase. The repertoire of functions tends towards the activities of heavy crushing and grinding rather than the lighter and more varied work of food preparation. This may reflect activities of ore preparation prior to transportation to *Mavrovouni*. This picture of some preparation before transport to the smelting site can be seen at the Iron Age ore preparation site of *Agrokippia Kriadhis* in the SCSP survey area.

A number of wells are known from the cadastral map, two of which have been recorded as TP195 and TP196. Both these are within a few metres of the present stream-bed and the water level is only 2.5 m below ground level. A third well was revealed in a cut by bulldozing in 2002 (TP191). It is a plaster lining of a circular hole with a series of cuts and fills visible outside the plaster. There are several pieces of concrete on the surface above suggesting that it is either Roman or modern. It seems more likely that this is a cistern rather than a well, as it would have to be very deep to reach ground water level.

Conclusions

Xyliatos *Litharkies* is firmly placed in the Roman period and is almost certainly connected to the activity of exploiting the copper ores of Alestos. Analysis of the pottery presently suggests greater activity in the Early Roman period which is in contrast to the interpretation of the assemblage at Xyliatos *Mavrovouni*, which has more Late Roman material. This may represent a change in the organisation of the mining and smelting in the area. It is possible that the majority of the workforce was

located at Xyliatos *Litharkies* in the Early Roman period, and that this arrangement of labour settlement was reversed in the Late Roman period.

Xyliatos *Litharkies* appears at least to have carried out some of the initial processing, as the ground stone suggests. However, there is no evidence of the waste material from the crushing of ore and bedrock material. Paths marked on the cadastral map and those recorded during transect survey reveal that moving between the processing and mining sites would not have been particularly difficult. A number of areas on the side of Alestos provide commanding views of the area of mining as well as the communication route between *Litharkies* and the Lagoudhera valley, and could have been employed to observe and control the workforce.

5. The Mountains

Team X completed seven transects in and around the Troodos Mountains proper, skirting around Team Central in the Asinou Valley. Three of the transects were near the village of Ayios Theodoros on the slopes above the River Kourdhalı, located from 324 m to 712 m asl. Forestry is the dominant human activity that has affected the landscape. In the foothills, bulldozed terraces have been constructed to create a rigidly ordered landscape for orchards of almonds and olives, and for pine plantations.

Of particular interest in several of these transects were the check dams collecting sediment within gullies, sometimes associated with olive trees. Other finds included paths, a possible small settlement just north of Ayios Theodoros (TP194), resin tapping scars and pines, and plentiful evidence of forestry practices and hunting. These are all very much in keeping with the findings of Team Central's more intensive survey, and show that these activities are prevalent throughout the mountainous part of our survey area.

Asinou ISZ (Team Central)

The V-shaped valleys of the Asinou Valley ISZ cut into intrusive and volcanic rocks of the Troodos ophiolite. Long, graded, Pleistocene alluvial terrace surfaces composed of red channel gravels and silts demarcate ancient streams that once shaped the valley. Where road-cuts have sliced through substratum, the red and grey silts and rounded cobbles of channel-form Pleistocene sediments contrast strongly with the dominantly reddish yellow-brown, fractured blocks of weathered volcanic bedrock. The most common hillslope morphologies consist of either long, linear bedrock spurs with narrow ridges and steep, contiguous sideslopes, or conical bedrock landforms with triangular facets. Gully erosion marks all hillslopes to varying degrees, and gullies may consist of vegetated or bare, shallow colluvial hollows, or deep, rocky ephemeral channel incisions.

A thin layer of gravelly colluvial silts drapes the landscape from shoulder positions down to the sparse alluvium of footslopes and toeslopes. The gravelly nature of the silt loam and silty clay loam soils indicates that mass creep has brought coarse fragments down from the upper layers of the fractured and weathered bedrock. Summit landscapes are typically very rocky, lacking soil and colluvium, and have probably been stripped of fine sediments by rainfall runoff, wind and mass creep. They constitute stable surfaces for large human constructions such as churches, while finer materials such as pottery sherds might achieve stability only on foot- or toeslope surfaces. The exception to these trends is found on the Pleistocene terrace remnants, which have more gentle slopes, a more planar morphology, and a parent material more conducive to soil formation. Consequently, these surfaces are much more stable than the surrounding colluvial slopes and may have better preservation potential for archaeological artefacts.

Team Central carried out four transects in the Asinou Valley, one of them just downriver from the Church of Panayia Phorvıotissa, and the other three upriver. The transect below the church (TT497900E) was very instructive for understanding the workings of soil cover and erosion, with a thin layer of gravelly alluvium covering the surface except where it had been stripped by localized sheet and gully erosion. As well as the ruined church on the summit of Stavros Mountain, the team located three amorphous but suspicious rubble piles, and evidence of resin tapping.

The most interesting discovery in the area of the transect was a series of 71 check dams in 13 different gullies, which we systematically mapped and recorded (Nikitari *Stavros*; TS19). The slopes were characteristically about 15°, and the dams typically between 1.5 and 2.5 m long and up to 0.5 m high. They were carefully built out of small boulders, and because of their low height rarely trapped any more than 2 cubic metres of sediment. Their spacing varied from 2 to 10 m depending on the steepness of the slope: they were closer together on steeper slopes that generated more sediment.

Initial analysis suggests that there are two phases of construction of these check dams. The most recent ones probably date to the earlier part of the twentieth century, and are associated with forestry department erosion control. The earlier ones, dated mainly by the extensive cover of the slow-growing lichen *Rizocarpin tinei*, probably go back to the eighteenth century, and so must have been used for agriculture. Two such dams still have olive trees growing on them (TP143). Another (TP161) has *pithos* rims and body sherds built into it, and a path running alongside it. These were probably associated with the settlement at Asinou and the monastery at Panayia Phorvotissa, to which they were joined by a well-constructed path.

Historical sources record a monastery associated with the church of Panayia Phorvotissa. Our work in the 2003 season has tentatively identified this with a series of ruined structures and a substantial scatter of pottery, tile and rubble at Nikitari *Kapsalia* (TP117), 150 m south of the church. We mapped three structures, of which two are substantial and rectangular (10.0 x 6.5 m and 11 x 8 m), and the third so ruined that its plan is unclear (c. 7 m across). The rubble in one of these rooms had extensive colonies of the slow-growing *Rizocarpin tinei*, and so according to preliminary analysis has been undisturbed for some 200-300 years. Resistivity survey 20 m down the spur from these three structures, in an area of dense surface pottery and rubble, detected another structure some 15 m long. The pottery from this same area and two 300-year olive trees suggest that we have a substantial complex of structures, very likely constituting or associated with the monastery, dating to the 17th and 18th centuries.

Team Central's other three transects extended a further 5 km up the Asinou Valley. As expected, there was little cultural material on the steep mountain slopes and ridgelines other than evidence of forest activities and hunting. The valley bottoms, by contrast, turned out to be very rich, with two out of three transects finding pottery and a range of check dams, agricultural terraces and structures. The most surprising find was a large building complex dated by its pottery to the Roman and Ottoman periods (Nikitari *Trimitheri*; TP220). This consisted of at least three substantial rooms, one of them probably subdivided. The Roman pottery consisted of a cooking pot fragment, a Cypriot Red Slip rim (Form 9: second half of the sixth century AD), and a large number of tile fragments. In a later phase, probably contemporary with the Medieval-Modern *pithari* fragments, the northernmost room was rebuilt with two very rubbly walls. We know from oral sources of goat folds in this area, which would be in keeping with this second phase of the structure.



Figure 5. Looking south down Team Central's transect TT495260E. Trimitheri lies in the valley bottom just beyond the bend in the road

Other features recorded in these three transects included two more structures, one of them (TP200) with fragments of storage jars, four terraces or retaining walls, a check dam 7 m across with 1 m of sediment accumulated behind it (TP204), and two paths.

The ruined settlement of Ayios Yeoryios *Aspri* (TP066) lies along a high spur in the Adelphi Forest at 960 m asl, some 4 km south of Asinou. It is recorded in Venetian village lists as having six families in 1565, and was clearly abandoned in the 17th or 18th century. During the 2003 season we mapped the church, three structures and various other features along the line of the spur. The church was very substantial, with a nave, narthex, southern aisle and tiled roof. Several of the tiles were warped and vitrified, and two had the paw prints of an animal imprinted on them. The other remains of the village consist of a three-roomed house, a structure with one or two rooms, a two-roomed structure, and various other stretches of wall. There was little pottery found in the village, other than heavy utility fragments round the church.

6. Specialist Work

As well as the four principal field teams, we had a further six teams working intermittently throughout the season (archaeometallurgy, geomorphological mapping, settlement mapping, seeding experiments, architectural recording, geophysics). Most of this fieldwork has already been summarised. In addition, a team of artefact specialists worked in our laboratory in the Katydhata School, while it took two experts working half-time to maintain our database, GIS and a network of twelve computers. Other specialists visited for a week or more at various points during the season.

The season's **architectural work** focused on filling gaps in our recording of a representative range of structures from the survey area (Ian Evans, Tracy Ireland, Sevina Zesimou). Our database now consists of 43 seasonal village houses (mostly at Kato Koutraphas *Mandres*), 24 churches, 24 water mills, 17 water-related features such as irrigation dams, 9 village houses, 7 shrines, a *hamam*, a khan, and five others. A high point of the season was the very detailed recording of the Ottoman period water mill at Evrykhou *Lachistos* (BU0070) by Tracy Ireland and Sevina Zesimou. Other structures recorded this season include the church of Ayios Yeoryios west of Phlasou (BU0088), two lime kilns on Koronia hill (BU0141-BU0142), a multi-phased Ottoman and Colonial bridge below Linou (BU0128), and several abandoned village houses at Karterouni (TS14). Ian Evans continued his work on building materials and construction techniques, and Tracy Ireland worked on her analysis of colonialism and modernisation in the context of the TAESP landscape.

As part of its commitment to improve the reliability of data generated by regional survey projects, we have embarked upon a program of **seeding experiments**, run by Rob Schon. The main goals of these experiments are: 1) to help us understand the biases in artefact recovery created by variable visibility and background disturbance; 2) to gauge the variable recovery rates of pottery of different sizes; and 3) to measure the consistency between survey teams in the recovery of artefacts.

We placed fixed quantities of yogurt bowl and roof tile fragments into fields that were to be surveyed by our field teams. These were broken into a range of sizes from 20 to 100 mm, numbered, coated in mud (to mimic actual field conditions) and systematically placed into a number of survey units with different surface visibility conditions. Our field teams then walked the seeded fields as they would any other survey unit, and collected all the numbered yogurt bowl and tile sherds they discovered.

Preliminary results indicate that ground visibility is indeed an influence in artefact recovery, and in fact the relationship is a linear one, but it is not as severe an influence as previously thought. Similarly, archaeologists have long understood that fieldwalkers find a higher proportion of larger artefacts than smaller ones, but our experiments take a step towards quantifying this relationship. Finally, the experiments have shown that different field teams can produce consistent results within a single project's methodological program. As we continue to analyse the data from these experiments, we hope

to incorporate our experimental results into our analysis of actual survey data, thus producing a more reliable and accurate archaeological document.

Project historian Marios Hadjianastassi continued our programme of **oral history** with a series of interviews in the villages of Katydhata, Nikitari and Xyliatos. Mr Pantelis Andreou Iakovou, the mayor of Katydhata, explained the economic importance of the twentieth-century copper mine of Skouriotissa, with villagers selling their surplus agricultural produce to the miners at an informal market every Saturday when they were paid. Mr Panayiotis Alexandrou Loppas, who works at the forest fire lookout above Asinou Valley and who has been so hospitable to our team through the entire project, talked about his own and his father's experience as forest goatherds under colonial rule. The links between the higher parts of the valley and the bigger villages on the plains were very strong, with Panayiotis' father regularly taking donkey loads of halloumi and firewood to sell in Morphou, Zodhia and Petra. It is entirely clear that forest communities were far from being remote and isolated, as is usually assumed today. Other informants in Nikitari gave valuable information about topics such as local fairs, grain mills, and the agricultural economy.

The **pottery analysis** carried out by Kristina Winther Jacobsen, Smadar Gabrieli, Mara Horowitz and Trine Wismann went very smoothly, and we ended the season with all 9,696 sherds collected by the teams studied and recorded. In addition, over 400 sherds were described in full in the pottery inventory. Mara Horowitz completed the study of the figurines from the Iron Age sanctuary at Pano Limna discovered at the end of last season (TS15). Smadar Gabrieli visited for two weeks to examine the Medieval to Modern cooking and utility wares, and establish a preliminary chronological sequence.

The **lithics analysis** by Carole McCartney consisted of the recording and processing of the 681 ground and chipped stone artefacts collected by the teams, as well as the detailed inventory recording of 56 of those, and continuing work on auditing the lithics database from previous seasons. Although the chipped stone count was down on last year, the pieces represented all major categories of cores, blanks, debris and tools, demonstrating the complete spectrum of lithic types expected for local manufacture and use. The 100 ground stone artefacts represents by far the largest number of such tools collected by the project, dominated as usual by grinding equipment.

The project's relational **database**, built and maintained by Luke Sollars, continued to serve the project well, storing and manipulating increasing amounts of wide-ranging data with no more than minor teething problems as field workers familiarised themselves with the system. It was ready for all types of data entry at the beginning of the 2003 season, and data-extraction was developed over the season in consultation with specialists and field workers. It had been hoped to produce routines to automate the querying and data-extraction process between the 2002 and 2003 seasons, but time constraints were such that this did not progress far enough and project members were, again, never able to do more than the most basic filtering and sorting of records for themselves. We did, however, begin working on designing and implementing a series of queries for more far-reaching analysis of the data.

The **GIS**, run by Hugh Corley and Jay Noller, worked relatively smoothly. Individual aerial photographs still needed to be rectified before they could be used as base maps, but this operation took little over an hour for each one. Producing image prints and digitising were fairly straightforward, and we were able to produce preliminary analytical maps towards the end of the season for use in report writing.

The project's digital data consist not just of the database and GIS but also several thousand photographs, as well as numerous text files and reports. Managing all of this was only possible thanks to our local **network**, which linked together up to twelve computers in one of the classrooms in Katydhata School.

7. Conclusions

Summer 2003 was our last full field season, and a very successful one. The detailed recording of Xyliatos *Litharkies* and a series of transects enables us to discuss a Roman mining landscape on a broad scale, including the two previous year's work at Xyliatos *Mavrovouni*. We have covered enough of the challenging Asinou Valley to have a good picture of changing land use, communications and settlement since the Medieval period. We now have an impressive twelve transects every 500 m in the rich Karkotis Valley, combined with more intensive block survey in six areas within that. The new Atsas Intensive Survey Zone has been very exciting for its well-preserved landscape, particularly its network of Roman farmsteads, but also with material from the Bronze Age to the Ottoman period. Finally, the 'extensive transects' carried out by Team X have given us a general picture of our 159 square kilometre survey area, and have helped to put the other teams' work into their broader context. All of this provides an excellent basis on which to write up our final publication.

	2000	2001	2002	2003	Undated	Total
SIA	2	5	4	6	3	20
POSI	7	54	64	103	6	234
Survey Unit	10	249	320	433	6	1,019
Geomorph Unit	0	221	246	413	6	886
Building Unit	43	47	36	9	5	140
Geobotanical Unit	7	28	10	0	2	47
POSI unit	1	69	231	93	6	400
Archaeometallurgical Unit	0	32	144	72	3	251
Pottery counted	1,387	17,056	38,648	25,573	791	83,455
Tile counted	925	4,154	6,970	5,491	238	17,778
Pottery & tile analysed	732	8,728	13,343	9,665	139	32,607
Lithics counted	5	233	662	788	53	1,741
Lithics analysed	0	289	907	681	4	1,881
Slag counted	97	8,899	4,996	406	500	14,898
Pottery inventoried	31	112	139	355	0	637
Lithics inventoried	0	69	309	56	26	460
Archmet inventoried	0	4	7	7	0	18
Special finds inventoried	0	0	3	35	0	38
Photographs	49	1,754	3,518	4,169	251	9,741
Drawings	0	147	192	19	4	362

Table 1. Numbers of recording units and artefacts by type and year (as of September 2003; substantial auditing is still to be done). 'Undated' refers to records with no date for when they were recorded.

Table 1 shows the numbers of units and artefacts that we recorded this season, compared to previous seasons. The much higher numbers of Survey Units and Geomorphological Units are mainly due to our having four main field teams instead of three. The rather lower numbers of pottery are probably due to Team West only spending three weeks instead of five in the enormously rich Karkotis Valley. The higher number of POSIs is due to the teams' care in recording features such as structures, check dams, terraces and platforms, which were particularly abundant in Team East and Team Central's areas. The very high numbers of slag fragments counted in 2001 and 2002 are largely due to Team East's work at Mavrovouni. This year they were working in an ancient mining area, rather than a smelting area. In spite of our hopes for Team West and Team X, we found no other new smelting areas, other than the new slag heap at Skouriotissa recorded by the archaeometallurgists.

We will hold a small survey season for three weeks in November 2003, with the specific aim of surveying the Mandres and Potami survey areas, which have always been covered in stubble and straw during our summer seasons. This will consist of some six or seven people. In summer 2004 we will hold a study season, to fill in any gaps in our recording, finish the analysis of our areas and artefacts, and work on the final publication. The submission of the final manuscript is scheduled for 2006.

TAESP Publications

- Boutin, Alexis, A. Bernard Knapp, Iain Banks, Michael Given, and Mara Horowitz
2003 Settlement and Cemetery in and around Katydhata Village: from Prehistory to the Roman Era. *Report of the Department of Antiquities, Cyprus* (forthcoming).
- Given, M., A.B. Knapp, I. Evans, E. Gibson, T. Ireland, V. Kassianidou, J. Noller, H. Saunders, L. Sollars, N. Urwin, K. Winther Jacobsen, and S. Zesimou
2001 Troodos Archaeological and Environmental Survey Project: First Preliminary Report (June-July 2000). *Report of the Department of Antiquities, Cyprus*: 425-440.
- Given, Michael, Vasiliki Kassianidou, A. Bernard Knapp, and Jay Noller
2002 Troodos Archaeological and Environmental Survey Project, Cyprus: Report on the 2001 Season. *Levant* 34: 25-38.
- Graham, Angus, Kristina Winther Jacobsen, and Vasiliki Kassianidou
n.d. Xyliatos *Mavrovouni*: a Roman settlement and smelting workshop in the central northern foothills of the Troodos Mountains, Cyprus. To be submitted to *Journal of Roman Archaeology*.

<http://www.taesp.arts.gla.ac.uk/>

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