KOUPHOVOUNO 2000

Artefact Study

Pottery

A total of 54,443 sherds was collected from the surface of the site. Once the pottery from each square had been washed, it was strewn and sorted. 7555 feature sherds (13.8% of the total) were marked and registered. The rest of the pottery was divided into fine (thickness less than 8 mm) and coarse (8 mm and over), counted and weighed. Details of each registered sherd entered on the database included: type, open/closed, shape, fabric, decoration, treatment, width/diameter, ware and period.

The earliest pottery from Kouphovouno is apparently Middle Neolithic and includes Urfirnis sherds, as well as examples of scribble-burnished ware which can be paralleled in ceramic phase 2.5 at Franchthi. A red-on-white decorated sherd hints at links with central Greece. Late Neolithic bowls with a distinctive rounded lip find parallels in ceramic phase 3 at Franchthi. Characteristic of the later Neolithic period is pattern-burnished pottery and also the heavy fabrics which turn up on the Final Neolithic sites recorded by the Laconia Survey. Also Late-Final Neolithic are pedestal bases in a rather gritty fabric and a type of burnished pottery which has been dubbed slinky ware. From the distribution of the Neolithic sherds, it would appear that the site extended at least 230 m north-south and 240 m east-west in this period (Figure 1). Because we could not survey in the market garden and the orange grove, it is difficult to calculate the size of the site accurately, but if we assume that it was elliptical and multiply the north-south and east-west radii (that is 115 and 120 m) by pi, we have a figure of over 43,000 m^2 or four hectares, which can be regarded as a minimum.

The distribution of the Early Helladic sherds is remarkably similar (Figure 2) and the site was evidently much the same size, at least by EH II which is well represented by typical fine ware bowls and sauceboats on conical bases and by the coarse fabrics used *inter alia* for pithoi. Some red-slipped and burnished EH I sherds were identified but no EH III pottery. The presence of a tile inevitably makes us wonder about the type of architecture at Kouphovouno in the Early Helladic period.

For the later phases of the Middle Helladic period we have Minoanising sherds and goblets on low conical bases which continue into the Early Mycenaean period. LH III is represented in particular by kylikes. The Middle and Late Helladic pottery is concentrated on the southern and eastern sides of the site.

It is not clear whether occupation continued into the LH IIIC period and there is only one sherd which could be Early Iron Age. We found a scatter of Classical-Hellenistic pottery across the site and a number of Roman sherds were identified. Much of the 527.6 kg of tile which was collected also dates from the historical period and, more than the pottery, gives an indication of the level of activity at this time.

Small Finds

Thirty-three small finds were registered, although not all of these could be dated. Of particular interest were four animal figurines, almost certainly bulls, of Early Helladic date, which could be distinguished from the four Mycenaean examples on the basis of

their fabric. Also of Late Helladic date was a psi figurine. A fragment of a spondylus shell bracelet, almost certainly Neolithic in date, was found, as well as a triton shell which could be Late Helladic. Finds of historic date include a loom-weight and a fragment of a clay votive figurine.

Geomorphological and Soils Research at Kouphovouno

The hill of Kouphovouno stands about 5 m above the plain of the Sparta basin, at *c.* 200 m above sea level, 3.7 km east of the Taygetos and outside the distal margin of a large alluvial fan that issues from a mountain-front gorge at Parori (the apex of the fan being at *c.* 305 masl). This is one of a number of fans developed along the eastern margin of the Taygetos range. The channel of the ephemeral stream running from the Parori gorge is entrenched through the entire length of the fan and beyond, to near its confluence with the Evrotas, 2.45 km to the east of the site (*c.* 165 masl). The trench forms the northern limit of the site.

Aims of geomorphological and soils research

There were two broad aims of the geomorphological and soils research:

1. It was hoped to produce a detailed three-dimensional 'map' of soil chemical, mineral magnetic and other properties for an excavated part of the site. The aims were to assist in identifying likely former activities on the site, to improve our understanding of controls on archaeological soil properties and to examine post-abandonment effects on soil below and above the cultural layer, thus extending earlier research undertaken in Laconia. This project could not proceed, but ground surface soil samples will be analysed.
2. To use all available archaeological and geoarchaeological data to reconstruct palaeoenvironmental change in the area of the site, with reference to geomorphology, hydrology, vegetation and soils. Drilling of cores through the site and adjacent land by IGME was arranged in 1999, with the aim of determining the depth of cultural horizons within the hill and the nature of underlying sediments. Further coring, using a manoeuvrable percussion corer, was planned for 2000. The aims were to obtain good quality cores of banded clays found beneath the hill in 1999 and to determine the spatial extent of these and other sediments that have lacustrine characteristics. This programme, however, was curtailed because of a two-week delay in air-freighting of the equipment from England, and because further coring on the site was not permitted.

Fieldwork in 1999 and 2000

In 1999 landform morphology, sediment exposures in stream channels and surface soil characteristics were described in the vicinity of the site. Surface soils were sampled for chemical and mineral magnetic analysis along two transects (north-south and east-west) across the hill and surrounding surfaces. Nine cores were drilled by IGME (eight of 5 m and one of 10 m depth). Five were spaced at 25 m intervals southward from the hill summit (the last of these being off the hill), two were taken on the hill flank and adjacent lower surface on the east side, and two were similarly placed to the west of the hill summit (Figure 3). The cores were described and sampled in the field, then transported for storage at the British School at Athens. Core and soil samples have been kept in cold

storage in Liverpool.

Three further cores were taken in 2000. These were at 200 m to the SW of the hill summit, 180 m to the east and 575 m to the SSW. They were described and sampled in the field. The samples are in cold storage in Liverpool.

Before the arrival of the corer in the field, a reconnaissance study was made of the geomorphology of the Sparta basin and adjacent uplands. Areas of all major rock and sediment types were visited in order to record the range of weathered materials and soils of the Evrotas catchment. This provided the broad geomorphological context of Kouphovouno and defined the range of potential sources for fluvial and lacustrine sediments within the basin.

Laboratory analyses

Mineral magnetic, particle-size and chemical (to include total organic C, $CaCO_3$, Fe, Ca, Mg, Na, K) analyses of sediment and soil samples are to be undertaken in Liverpool during the coming winter. Preparation of several samples from the 1999 cores revealed only one species of diatom and one of pollen (*Abies* sp), but further analyses will be attempted. Micromorphological analysis of thin-sectioned core samples will be undertaken by Maria Kousoulakou at the Fitch Laboratory. This approach will be used to examine varve-like and other structures. Charcoal samples were taken for ^{14}C dating. Species identification will be attempted on other charcoal fragments.

Brief summary of field observations

Cultural horizons exposed in the cores through the hill comprised chiefly building materials of mud and cobbles. Sherds and fragments of tile and charcoal were common and there were signs of burning. In all but one of the cores, the cultural horizon was significantly more stony than the sediment below it. In places, the cores had disintegrated or were otherwise distorted as a result of the drilling and, except where distinct and defined by the presence of sherds or tile, the transition from cultural horizon to underlying sediment was not everywhere easy to identify. Beneath the hill, the depth of the cultural horizon, as identified, varied between 155 cm and 401 cm. At the base of the west flank of the hill (100 m from the summit), the transition was judged to be at a depth of 388 cm. Off the hill, 100 m to the south of the summit, it was placed at 235 cm. In the three cores taken to the east of the summit, beyond an artificial or naturally eroded bank that cuts into the SE side of the hill (see below), the cultural layer was significantly shallower (varying between 55 and 80 cm). In the core furthest from the hill summit (at 575 m to the SW), artefacts were few and restricted to the modern topsoil. In at least three of the cores, a stone layer occurred at the junction of the cultural horizon and lower sediment. These were similar to stone layers placed on ill-drained ground at Neolithic sites in Albania.

Detailed sediment stratigraphy varied spatially, with no close correlation between cores. The surface identified tentatively in the cores as forming the base of the cultural layer varied in elevation. The sediments beneath cultural horizons were clay-rich and, particularly beneath the hill and its flanks, tended to have significant depths (*c.* 7.5 m in the 10 m core on the east flank) with few, if any, clasts. The core to the east of the hill (only 30 m from the 10 m core) was an exception, having a coarse matrix (sandy clay above sand) and containing many clasts throughout its depth. In four of the cores

beneath the hill, there occurred units of clay with fine (<1 to 2 mm) banding, reminiscent of lacustrine varves. The composition has yet to be determined, but the banding appears rhythmic and may reflect seasonal changes in deposition. The greater part of the 10 m core had fine banding. Such banded clay was not found in the off-site cores taken in 2000.

Diagenesis of sediments is most marked in the clays, and includes the formation of abundant carbonate nodules and mottles of iron oxide and manganese. Bioturbation was much in evidence in the core at 180 m to the east of the hill summit. This core comprised 342 cm of moist clay with rare clasts. Mixing by gastropods appears to have occurred to a depth of 230 cm. This could destroy any small-scale sedimentary structures.

Exposures in the trench wall of the Parori stream channel are not good, but reveal two sediments of appreciably different age. Downstream of Kouphovouno are exposed brown muds that we interpret as late Holocene fill, largely removed by renewed erosion of the trench. In the top of the trench wall, close to the margin of Kouphovouno, is exposed an older, coarser fluvial sediment into which the trench is incised. The age of this sediment is not known, and its chronostratigraphic relationship with sediments beneath Kouphovouno remains a problem, but its degree of redness and other diagenetic features are typical of those found in late Pleistocene sediments of the Mediterranean region.

Preliminary interpretation and discussion of field results

Over a period of millions of years, hundreds of metres of fluvial and lacustrine sediments have accumulated in the tectonically active graben of the Sparta basin (Piper *et al*. 1982). The Kouphovouno cores reflect the final stages of an alternation between styles of deposition. The gravel beds were deposited by a major river (the precursor of the Evrotas) or by floods from the Taygetos. The clays, however, are not alluvial: they were deposited in a sizeable body of relatively still water, a large pond or lake. The presence of occasional clasts, though not easy to explain, is common in lake sediments (J.F. Boyle, pers. comm.). Deposition of the clays in a marsh seems unlikely, as plant remains, apart from charcoal, were not in evidence. Why the clays do not correlate closely between cores is not clear: the chronostratigraphic relationships between cores may be impossible to define without further, more closely spaced coring. The gravels, however, may reflect channel fills or local deposition in a standing body of water. Pliocene or Pleistocene lake sediments, now preserved in low isolated hills on the basin floor (IGME), were largely removed by river erosion before the Kouphovouno clays were deposited. The banded clays beneath Kouphovouno represent a later sediment fill with charcoal washed into its upper horizons. In at least three cores, the surface underlying the cultural horizon was covered by the apparently artificial stone layer referred to above. It appears that the ground was still ill drained when Kouphovouno was first settled. Leaves of *Nymphaea* sp., found in the excavation by Von Vacano, indicate that water still stood near the Middle Neolithic site. In no core was a soil profile preserved at the base of the cultural horizon.

According to legend, the plain of Sparta was drained by King Eurotas (Pausanias 3.1), though it is not clear when this impressive feat is supposed to have been undertaken. There is no indication of a local barrier that would have dammed a lake in

the Kouphovouno area. The barrier to drainage of the Sparta basin is the southern rim of hills that the present River Evrotas has negotiated with some difficulty, via a narrow limestone gorge, to reach the Helos plain. This gorge may not have been cut when lakes existed in the basin, or drainage from the basin may easily have been blocked by massive deposition during the Neogene and Quaternary. Lake levels, as well as the force of erosion off the uplands, will have fluctuated with climate, the full glacial maximum (18,000 BP) having been cool and dry.

The early Holocene, including the Neolithic, was a period of ecological and geomorphological stability in Greece. Conditions would surely have favoured a woodland cover on well-drained land in lowland Laconia (cf Wijmstra *et al*. 1990; Jahns 1993; Willis 1994). Whatever the situation on the basin floor during the early Holocene, stability in the Taygetos cannot be assumed. The mountain catchments, sensitive to rain storms, have always been a potential sediment source for episodic deposition in the basin. In a recent paper, however, Pope and Millington (2000) date the greater part (medial and distal portions) of the mountain-foot fans as Middle and Late Holocene (i.e. post-Neolithic), though the dating is not well constrained and must be regarded as extremely tentative. Kouphovouno lies beyond the limit of the fans, but the area surrounding the site has experienced deposition and site margins may have suffered erosion. Pope and Millington consider it possible that the stream channels were completely entrenched by the start of the Middle Byzantine period, and that the trenches may have continued across the basin floor to the Evrotas floodplain. Before their entrenchment, stream courses would have been free to migrate across part of the basin floor, with significant implications for the landscape surrounding Kouphovouno.

There is evidence of possible fluvial erosion of the southern and eastern margins of the Kouphovouno tell. A distinct bank running for 191 m around the southern and eastern flank of the hill may be artificial, or it may have been eroded by floodwaters. In addition to the stream from Parori, a second stream may have affected the Kouphovouno area: the Parori stream flows into this, to the NE of the site. If the brown muds exposed in the Parori stream trench (referred to above) were indeed a channel fill, then this major deposition post-dates the Middle Byzantine, according to Pope and Millington's tentative dating of channel entrenchment. Flood events may have overtopped the channel and deposited material on the surface surrounding Kouphovouno. Erosion by floodwaters may have fashioned the bank skirting the south and east side of the hill and may account for the shallower depths at which artefacts were found in two cores to the east of this. Has episodic deposition since the Neolithic to the west of the hill resulted in a deeper cultural layer in that area?

Post-Roman deposition in the fan trench of the River Xirias, to the south of Kouphovouno, is attested by 0.8 m of gravel above Roman structures and artefacts that lie *in situ* at the base of the 2 m-deep trench. Since Hellenistic times, 2.8 m of gravels have been deposited beneath the medial part of the large Kalivia Sokas fan, also to the south of Kouphovouno: the gravels bury the remains of the Eleusinion (Cook 1950). During the twentieth century, extreme flood events have resulted in extensive deposition of gravels and muds at locations along the western margin of the Sparta basin.

Conclusion

The situation at Kouphovouno is complex and precise relationships between the cores,

and therefore full interpretation of the core data, may not be possible without further coring and geomorphological survey. Prospects for palaeoenvironmental reconstruction based on dating and laboratory analyses of the sediments, however, are good.

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