The "Pisidian" culture? The Classical-Hellenistic site at Düzen Tepesi near Sagalassus (SW Turkey).

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In 2005, during the annual 'intensive' archaeological surveys in the peri-urban zone of Sagalassus (Pisidia, southwest Anatolia), the remains of an extensive Classical-Hellenistic settlement were identified at Düzen Tepesi, 1.8km southwest of Sagalassus. The results of three seasons of site investigation (2005-2007), comprising archaeological and geophysical surveys, architectural mapping, test soundings, and archaeometric and environmental research, are presented here, together with a discussion of the settlement's most likely socio-economic background. The (proto-)urban settlement at Düzen Tepesi, inhabited during the fifth to second centuries BC, is the first of its kind to shed light on the material culture of the ancient inhabitants of the region, the 'Pisidians'.

Introduction

Sagalassus is located on the southern slopes of Mount Ağlasun (2045m) at 1450 to 1600m a.s.l., ca. 7km north of the ilçe of Ağlasun, in the Turkish province of Burdur (southwest Turkey) (fig. 1a). Since the first excavation in 1989, research at Sagalassus is carried out in close cooperation with scientists from diverse fields in order to reconstruct the city's paleo-economy and paleo-ecology (Waelkens 1993; Waelkens, Poblome 1993, 1995, 1997; Waelkens, Loots 2000; Degryse, Waelkens 2008; Waelkens, Poblome in press). While this research initially focused on the urban site, between 1993 and 1998 reconnaissance surveys explored the city's ca. 1200km² large hinterland and constituted the basis for a tentative broad outline of settlement history in the area (Vanhaverbeke, Waelkens 2003). Since 1999, annual 'intensive' archaeological surveys are carried out in the city and its vicinity. The latter, the city's peri-urban zone, has been defined as the area within a radius of 5km from Sagalassus, equivalent to ca. 1 hour walking in flat terrain (ca. 42.5km²). The aim of these surveys is to gain insight in how Sagalassus developed as a regional centre during the Hellenistic period at the latest and how, from this period onward, this development affected and was affected by the city's immediate vicinity until the role of the city drastically changed in the course of the early seventh century AD (most recently Waelkens et al. 2006).

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During the preparative stage of the application of the 2005 survey season, attention was drawn to the remarkable traces noticeable on Quickbird-2 satellite images (© 2003, Digital Globe) at a location called Düzen Tepesi (fig. 1c). In 1994, during one of the reconnaissance surveys, this area had already been explored, leading to the collection of undiagnostic pottery and the identification of pre-Roman structures in dry rubble (Waelkens et al. 1997: 43-4, 50, 52). The pottery consisted of very weathered and coarse wheelmade sherds without any parallels at Sagalassus or elsewhere in its territory. This implied that it had to be older or younger than the stratigraphic sequences in the city, which at that time covered the Late Hellenistic to Early Byzantine period, or ca. 100 BC to AD 700. In both scenarios, further research would greatly add to our knowledge on periods which are badly known in the region. The natural setting of Düzen Tepesi (fig. 1b) was promising as well. The site has a prime strategic location on two wide and flat promontories, backed in the north by the slopes of the Zencirli Tepe (1782m) and on the other side protected by steep slopes. It is, moreover, located within easy reach of arable land in the valley. The site thus had all the potential to sustain a large settlement. In 2005 and 2006 therefore, the archaeological surveys focussed on Düzen Tepesi.

Natural setting

Düzen Tepesi is located 1.8km southwest of Sagalassus, on the other side of a dry riverbed (the Çuleyik Deresi). The site can be reached by car through the village of Başköy to its west, following a narrow winding track, or on foot from Ağlasun's Bâlâ Mahallesi to its east. Essentially the site consists of two promontories (ca. 1400-1450m asl) with steep slopes descending to the valley of the Ağlasun river to the south, bordered in the north by the Zencirli Tepe (1782m). The geological substrate of the area is made up of Lycian nappe limestone and ophiolitic sequences, overlain by limestone breccia and sandstone-shale flysh deposits (Degryse et al. 2008). The bedrock is covered by highly weathered limestone, the result of karstic processes that have produced small rock fragments and clayey soils. The concave slope between the Zencirli Tepe and Düzen Tepesi is a colluvial fan or a footslope deposit where much of the fine soil material that once covered the slopes of the Zencirli has been deposited. Electrical resistivity imaging has attested that the limestone bedrock is not continuous in the upper 40-50m between the Zencirli Tepe and Düzen Tepesi. The same technique suggests a strongly fractured limestone, which may be caused by a fault, or which may represent the sliding surface of a mass movement. Since the top of the unweathered limestone bedrock of Düzen Tepesi is dipping towards the north, it is most likely that Düzen Tepesi in fact slumped down the Zencirli Tepe. Many other limestone hills south of the major escarpment of the Lycian nappe are also interpreted as the result of giant mass movements (De Laet 2007: 53; Verstraeten et al. 2000).

Today the site is sparsely vegetated (fig. 1b); low grasses cover the surface interspersed with isolated stands of prickly oak. The thick colluvial deposits accumulated on the lower slopes of the Zencirli Tepe are cultivated (wheat) and it is here that the only trees, an isolated oak, and some stands of *Crataegus*, occur. The area is primarily used for grazing flocks of sheep and goat, and a number of pens and shepherd shelters bear

testimony to this activity. There is no fresh water on the site. The nearest spring is located between the two promontories, ca. 0.8km north of the track leading from the village of Başköy to the site. On the site itself, the remains of a cistern of at least 10m deep are preserved. The lower part of this cistern is rock-cut, while its upper half is built in limestone rocks, the top rows of which are now embedded in concrete, illustrating its continued use to provide water for the animals herded here. Either springs were more abundant at the time of the site's occupation, or it was provided with several cisterns.

Site investigation methods

The study of Quickbird-2 satellite images (©2003, DigitalGlobe) was one of the stimuli for a thorough investigation of the site, and assisted in the delineation of major architectural features. Quickbird-2 imagery is composed of one panchromatic (black and white) and four multispectral bands, covering the blue, green, red and near infrared part of the electromagnetic spectrum. The images contain spectral information (i.e. energy reflected from a surface) on surface and subsurface features (e.g. crop marks). The spatial resolution of these images varies between 0.61m and 0.72m for the panchromatic band and between 2.44m and 2.88m for the multispectral bands. For this study, image enhancement and filtering techniques improving the distinction between features were applied, in order to facilitate the visual interpretation of the imagery. Image enhancement techniques alter the contrast in the image, while filtering techniques selectively emphasise or suppress information present in the image (Mather 2004). By applying these techniques on both individual and combined bands, it was possible to delineate archaeological surface remains, recent artificial structures and geological features.

However, a more detailed on-site investigation was required. In 2005 and 2006, an intensive archaeological survey was undertaken which covered both promontories and the Zencirli Tepe. Artefacts were counted and collected in grids of 50m by 50m, surveyed at 6-7m intervals. All artefacts are collected, including modern-looking pottery and undiagnostic sherds. This strategy aims to avoid a priori qualitative judgments of what could be 'useful' data, and to minimize the risk of unskilled surveyors missing less obtrusive information. In general, conditions for surveying were excellent. The vegetation cover on the promontories and the Zencirli Tepe hill slopes is minimal. Post-occupational erosion and human intervention are restricted, ensuring that the surface assemblage is exposed and remains relatively stable. A major difficulty encountered during survey were the many concentrations of limestone rubble. Since the local bedrock consists of limestone and breccia, often forming natural linear outcrops or debris of fragmented rocks, the distinction between mere heaps of stones (e.g. to clear areas for grazing) and actual structures was not an easy task. In 2006 and 2007 the entire site was accurately mapped with a theodolite (fig. 2). The resulting map, on figure 2, however, should be considered a minimal representation of surface remains, in the sense that only those traces that were clearly identifiable as walls were recorded, and only when at least two wall sections could be connected. In fact, numerous fragmentary and often vague remains of structures extend over the two promontories, in an area of ca. 1.2km from west to east, and ca. 0.7km from north to south, covering nearly 75ha.

In order to gauge whether more building remains were buried and how these relate to the surface remains, geophysical survey, using both GPR (georadar) and magnetometry to different extents, was carried out on the site in 2006 and 2007 (fig. 3). Since the local geological and geomorphological situation at Düzen Tepesi is characterised by karstic processes, where the efficiency of geophysical methods is normally limited, the geophysical methods and field procedures were adapted on the basis of experiences from karstic regions elsewhere (see Mušič 1999). Fortunately, the strong contrast between the low magnetic susceptibility of the limestone building material (see below) and the very high average magnetic susceptibility of the topsoil clearly highlighted the shallowly buried remains of numerous structures. Magnetometry even allowed to trace internal spatial subdivisions. The choice of magnetometer in such conditions is strictly limited to high resolution instruments recording in gradient mode (*Geometrics G-858* in this case).
Complementary to the magnetic method, GPR (GSSI SIR3000) was used to provide a 3D-view of subsurface features. GPR electromagnetic wave propagation enables to deduce the depth at which features are buried, as well as an estimate of their size and shape. GPR is based on the fact that all materials conduct electricity to different degrees. Interfaces between different materials, e.g. between limestone walls and the surrounding soil matrix, will clearly be recorded by GPR because of the abrupt change in electric conductivity between the limestone and the soil. Since a GPR is furnished with an antenna which has to be dragged over the soil, the many rubble heaps at the surface of Düzen Tepesi made it not an obvious place for GPR surveys. It was therefore only used in smaller, flat parts with a deep soil cover, such as occur at the terraces at the foot of the Zencirli Tepe (fig. 3). The best way in which to present GPR results is through so-called time slices, which are essentially a series of parallel and usually equidistant GPR profiles (see Goodman et al. 1995: 85–9), showing a series of plan views at different depths.

Once the extent, depth and density of architectural remains had become clear, test soundings were undertaken under the supervision of the Museum of Burdur in 2006, while in 2007 the extension of the excavation permit for Sagalassus to Düzen Tepesi enabled further small-scale research. Faced with a site the size of Düzen Tepesi, a selection of areas for test sounding was unavoidable. Since the aim was to gain an insight in the material culture and living conditions of the people inhabiting the site, trenches were opened in the area with the densest occurrence of buildings, or in or near structures that seemed in some way different (in size or complexity) from the average (see below).
Five trenches were opened (fig. 4). Trench I consists of a southern area (Ia) and a northern extension (Ib). Trench Ia (10m by 10m) was the initial trench. Trench Ib was opened 2m north of it to enlarge the area of the test sounding, and consists of three 5m x 5m sectors (two in the east, one in the west), an extension (2m by 5m) to the west and one to the southwest (ca 2m by 3m). Trench II is an oblong trench (2.5m by 10m) to its west, while trench III is a small trench (5m by 5m) northwest of trench I. Trench IV is another small sondage (5m by 5m) undertaken in the southwestern corner of what was thought to be one of the larger buildings on the site (28m by 34m).

Site layout

Access

In the course of mapping all topographic and archaeological surface features, two partly rock-cut pathways were discovered (fig. 2). The western of these ascends in a zig-zag way up the flanks of the western promontory from the present-day village of Başköy. It is still used by shepherds today and is visible on the Quickbird-2 image (fig. 1c). The eastern path runs along the flanks of the Zencirli Tepe, where some stretches are supported by 'terrace walls' constructed in dry rubble (figure 5). This path leads straight to the ancient road to Sagalassus. Its physical connection to this road has been wiped out by the construction and subsequent activities of the modern stone and lime quarry situated here, in the dry riverbed of the Çuleyik Deresi. The width of these pathways (max. 1m), and their rough surface, precludes them from being used for carts or wagons. They were intended for pedestrians and pack animals. Possibly more tracks led from the valley to the site, but these have not (yet) been discovered. Most of the slopes leading to the site are inaccessible since they are covered with dense stands of prickly oak.

Defences

The site was equipped with a formidable three-tiered line of defences. The first of these is only preserved in some places. It consists of a trapezoidal watchtower (cf. fig. 2), on the edges of the barren flat area east of Düzen Tepesi, of which only the dry rubble stone socle is preserved (9m x 10m x 12m). The tower overlooks the eastern stretches of the Ağlasun valley and the road leading up from the valley to Sagalassus. Some 200m to the southwest, a ca. 35m long barrier wall (?), constructed in large breccia boulders blocking off one of the valleys leading down from Düzen Tepesi (figure 6). Both features are located near the 1260m contour line. Probably this line of defence was originally more substantial. Further remains may lie hidden under the very dense cover of prickly oak spreading over much of the lower slopes of Düzen Tepesi.

The second line of defence constitutes the best preserved and most impressive architectural feature of the site. Skirting the edge of the promontories, following approximately the 1600-1800m contour lines, two fortification walls were erected in two faces of large unworked breccia boulders quarried from the flanks of the Zencirli Tepe (fig. 7), some 700m to the north, with an infill of rubble. The first wall, ca 200m long, encircles the western promontory of the site, blocking access in those parts where the slopes are relatively easy to scale. However, no traces of fortification were found on the western flank of this promontory. This is remarkable since one of the accesses to the site ascends here. It is not clear how this can be explained. The second wall, around the eastern promontory, extends over ca. 1.2km, and is more elaborate. At its starting point, in the west, a tower (?), built inside the fortified area, guards the approach from the west. The fortification wall runs to the southwest and then to the southeast, where it reaches the edge of the promontory. At this point four walls jut out from the fortification wall, over distances of 100m, 80m, 50m and 30m respectively. Three transverse walls connect these, thus creating three 'bastions'. These are clearly visible on the Quickbird-2 image (fig. 1c). The same arrangement (with walls of 25m, 30m and twice 100m length) was made near the eastern extremity of the wall. Here it ends, as it began, with a small tower-like structure, located on the inside of the fortification wall. These transverse walls (or

bastions ?) probably served a strategic purpose in allowing the people at Düzen Tepesi to repel attackers at some distance before they reached the site.
The final defensive arrangement is located on the Zencirli Tepe. A circuit wall erected in large limestone rocks encircles the top of the mountain (fig. 8). It is also visible as a faint white line on the Quickbird-2 image (fig. 1c). Inside the walled area, no remains of structures are preserved. Only at the highest point on the mountain, where the wall seems to peter out, a square structure was built (5m x 5m), with a separate courtyard (?) using both limestone boulders and roughly cut polygonal stones. In earlier reports on the fortification system of Sagalassus this structure was interpreted as a Hellenistic watch tower (Loots et al. 2000: 606). In view of the main date of occupation at Düzen Tepesi, however (see below), this date needs to be revised. From the Zencirli Tepe one has an excellent view on the wider region, only blocked in the north by a range of even higher mountains (the Akkır Tepe (1994m), the Koyaklının Tepe (1912m) and the Ağlasun Dağları culminating into the Akdağ (2250m)). On clear days, the Beşparmak Dağı is visible in the west (a distance of 18.5km as the crow flies). To the south the view stretches as far as the Peçenek valley and the northern edge of the Çeltikçi valley (15km), controlling the main entrance to the Ağlasun valley from the south. To the east the valley of the Ağlasun Çayı can be followed until the point where it narrows to a width of ca. 100m, near the village of Dereköy (11km), thus offering a view on the approach from the east. From the Zencirli Tepe one also has an excellent view on Sagalassus to its northeast. Probably mountain functioned as a refuge place for the people inhabiting the promontories.

Settlement layout

No traces of occupation between the first and second line of defence are visible at the surface. Future geophysical research will need to assess whether indeed this area was never used for habitation, or whether it served another function (cemetery?).
The actual settlement was laid out in the area between the second and third line of defence, on the promontories and the lower slopes of the Zencirli Tepe, where architectural remains cover an area of ca. 75ha (fig. 2). Most structures are located in the centre of the promontories. In the vicinity of the fortification walls their density decreases. The density of surface pottery, calculated according to number of pieces and to weight, and taking into account post-depositional factors confirms that most activity took place at some distance from the walls, in the centre of the promonotories. However, the contemporaneity of all surface remains in this area of 75ha cannot be assumed. When plotting the degree of sherd fragmentation (the ratio of density to weight), the largest or least fragmented pieces occur on the western promontory and at the edges of the eastern one; the smallest sherds were collected in the central area of the eastern promontory. This pattern is inversely correlated to sherd density. In other words, in areas where archaeological surface traces are limited, sherds are less fragmented, while in areas with dense occupation traces, more fragmented sherds are found. This negative correlation can be understood to reflect the difference in occupation intensity. The central area of the eastern promontory may have been used more intensively, and for a longer period of time, hence the high degree of pottery fragmentation.

Most buildings preserved at the surface consist of two to three rooms, but both smaller and more complex layouts occur (fig. 2). Single-room structures seem to be more common on the western promontory, and the lower slopes of the Zencirli Tepe, while multi-roomed clusters of buildings occur centrally on the eastern promontory. On the outskirts of this promontory rooms arranged in a linear gradation (one behind the other) occur. At the centre of the promontory radially arranged structures, with one room placed beside the other, possibly laid out around a courtyard, are prominent. All structures are arranged in irregular groups along a northwest-southeast axis, parallel to the flanks of the Zencirli Tepe. Clusters of rooms seem to be separated by empty spaces (courtyards ?). Although most structures display straight walls and corners, some apsidal constructions are noted. No cisterns were recognized. The magnetograms convey the same picture of a densely built up area, with groups of rooms seemingly arranged around courtyards (fig. 9). Some alleys can be tentatively traced (fig. 9, B), while distinct magnetic anomalies characteristic of ancient artisanal activities, such as kilns, can also be distinguished (fig. 9, C). Geochemical analysis of the ca. 100 soil samples spread over the site shows a strong anomaly in Cu, Pb and As contents in the vicinity of these kilns. Such elevated values, especially in these elements, are typical for ancient pollution and could specifically indicate metallurgy, e.g. ore melting in the nearby kilns. The strong sub-linear magnetic anomalies (fig. 9, D) may possibly be interpreted as vein-type iron mineralization. Still, caution is required when interpreting the anthropogenic anomalies. The often apparently very large and complex structures with bizarre angles, visible on the magnetometry images (e.g. fig. 9, A), may be the result of the plane view in which features that are buried at different depths are displayed (the palimpsest effect). The time slices produced by GPR (fig. 10) and the sondages (see below) clearly show a superposition of different constructions and building phases. The complexity of the buried features may also be the reason why in many instances, the correlation between structures visible at the surface and buried constructions is weak. Another element hindering a straightforward interpretation of the magnetograms, in particular at Düzen Tepesi, is the occurrence of heaps of stones at the surface. These are mixed with and covering the strongly magnetic topsoil and cause severe background noise. A more reliable interpretation of the magnetometry results can be gained through the application of theoretical 2D archaeophysical models. These are based on on-site measured values of magnetic field densities, which are then compared with the expected magnetic anomalies as generated by the archaeophysical model used (Eppelbaum *et al*. 2001; Mušič 1999; Mušič, Horvat 2007). Such a model heavily relies on the magnetic susceptibility values of the local building material and on variables furnished by archaeological excavations, such as the shape of the archaeological remains, their dimensions, and the depth at which they are buried.

Construction technique and building layout

All that remains at the surface of the buildings are their socles. Only in some instances more massive remains still stand. The socles are built in small- to medium-sized rough local fieldstones (limestone), without the use of mortar, and are between ca. 0.70m and 1.00m thick. The occasional find of burnt clay fragments with clear imprints of twigs and of holes where larger branches were inserted, suggests that these socles carried wattle and daub walls, possibly reinforced by wooden beams. Virtually no tiles were found, so

roofing material was most probably organic. Numerous architectural fragments in andesitic lava and volcanic tuff with pumice inclusions, brought to the site from the Gölçük area on the other side of the Ağlasun Dağları some 5km north of Düzen Tepesi, are spread over the promontories. It is not clear yet what purpose they served, but some seem to have been used to anchor timber beams (of the roof ?).
On the lower slopes of the Zencirli Tepe, however, the extant structures display a different building technique, making use of large to very large breccia blocks, quarried nearby, and minimally shaped to ensure a stable placement on the surface and a good junction with adjoining stones (fig. 11). The size of these stones (more than 1.50m tall and at least 1.00m thick), and the fact that they rest on levelled bedrock, so that a socle was not needed, could indicate that they were part of buildings largely made in stone. Small-scale quarry faces were also used as walls for partly rock-cut structures. Defining floor plans, however, is difficult, because of the use of natural breccia outcrops as a construction basis. Most of the walls built in this style seem either to belong to simple one- or two-roomed structures, or form linear arrangements. The latter may be terrace walls, although some of them run perpendicular to the slope angle.

The 2006 and 2007 sondages furnished more detailed information on the layout of rooms and courtyards, their building techniques and the use of space. A complex archaeological sequence of at least four architectural building phases with associated floor levels and refuse pits was brought to light (figs. 12, 13).
The socles belonging to the oldest phase, phase 4, were built on the red, clayey virgin soil, which constituted the floor level. It was a sterile layer, except in its upper few cm where small artefacts were trampled into the earth floor during its use. In other places, the natural limestone outcrops were used as a first course of stones. Alternatively, these outcrops were covered with earth to create a level floor surface. Phase 4 socles are ca. 0.60m wide and erected in medium-sized fieldstones, carefully placed in two faces. They are oriented northwest-southeast and in most cases run underneath the socles of later building phases, which followed the same orientation, particularly phases 3 and 1. Remains of phase 4 are few and scattered (fig. 13). They consist of several wall fragments with an associated succession of fireplaces.
In phase 3 socles were partly built in, or on top of the previous floor level, embedded in a thin (avg. 0.10m), more sandy layer. Inside the structures of this phase, the surface of this layer is very compact, identifying it as a trodden earth floor. The socles of this phase were carefully constructed in medium-sized limestone rubble, forming two faces filled with smaller stones, and were on average 0.70m wide. They were oriented northwest-southeast, as in phase 4, and often reused the socles of this phase, merely elevating them by a new rubble course. This building phase was better preserved than phase 4 and the outlines of several buildings could be traced (fig. 13). In the southern part of the test sounding area, the remains of an apparently apsidal building of at least 8.00 by 10.00m were preserved. North of this, two adjoining smaller rooms were located. They could have been part of a two-roomed building, separated from the first by a narrow alley of ca. 0.75m. Further north still, a 11.5m long southwest-northeast oriented socle was found, which actually consisted of three abutting socles, the easternmost of which had a length of ca. 3.25m, while the westernmost extended over ca. 5.25m. The middle stretch of this socle, ca. 2.50m long, was erected in a different architectural style. It consisted of

much larger and less carefully erected limestone boulders and was on average 0.90m wide. Most probably the middle part was a later addition, closing off an opening (entrance) between two existing socle stretches. Perpendicular to this long socle, but not attached to it, two more socles were excavated. In this way, a structure which originally had at least three entrances, of which the southern one was subsequently closed off. The large size of this structure, at least 11.5 by 7.5m, together with the lack of postholes inside this space, could identify it as an open space (courtyard, corral ?). Further west, the corner of another phase-3 structure was excavated (min. 1.5m x 0.70m).
Phase 2 (fig. 17) socles were dug in the floor level of phase 3, and abutted by a thin-layer of sandy soil. Inside the one building belonging to this phase, this layer was very compact at its surface, constituting the trodden earth floor of phase 2. Construction seemed to be less careful; the use of a facing of larger stones was abandoned and stones were not neatly set. On average the socle width was 0.70m. The one excavated structure was not orientated southwest-northeast, but west-east. It was extremely difficult to differentiate fallen debris from actual construction. The building seems to have been apsidal in plan and may have consisted of two rooms: the apse and a room leading into it. It was ca. 5.00m wide and at least 9.00m long (the outer wall was not excavated).
Phase 1 (fig. 13) is represented by the remains that are still visible at the surface. The socles belonging to this phase were oriented along a northwest-southeast axis. They were partly embedded in the topsoil and sometimes dug into the phase 2 floor level, or they were built on top of older socles. The socles were on average 0.80m wide and carefully erected with two faces of medium-sized fieldstones, packed with smaller stones. The remains of a large apsidal building, ca. 12.00m long and ca. 7.00m wide, were excavated.
While finds in the archaeological layers were very scarce, rich deposits in the many refuse pits scattered over the excavated area and related to the 4 architectural phases outlined above were retrieved. From these pits numerous sherds, animal remains, charred faunal remains, some metal artefacts, ashes and clumps of broken out slightly burned beaten earth floors were retrieved. Originally some of these these pits were dug to extract the fine clays formed by the weathering of the limestone bedrock, which explains their irregular shape. Possibly the clay was extracted not (only) for the production of pottery, but for also for the construction of wattle and daub walls. They were subsequently filled with refuse to create a level (living or building) surface. In the further investigation of the artefacts and ecofacts retrieved from these pits, one should take into account that these can come from elsewhere on the promontory, and can be older than their final stratigraphic position.

The test soundings in the central area of Düzen Tepesi have attested to the dense occupation of at least this area, confirming the impression gained through surface surveying, satellite remote sensing and magnetometry. Not only do four building phases occur within the small area of the test soundings, ca. 10m by 20m, the reuse of socles from older phases in younger structures, not separated by any deposits, the thinness of the floor levels (at most 0.10m), and the fact that quite important architectural changes happened even in the time span of one and the same phase (e.g. the closing of the southern entrance to the open space in phase 3), point to a limited span of time during which all these structures were used. When new walls needed to be erected, the floor level was slightly raised as well as the existing socles, which then received a new wattle

and daub superstructure. Apparently floors were cleaned regularly, as the scarcity of finds retrieved in these layers attest. Since no rooftiles were found and no postholes were detected during the excavation, the spaces were probably spanned without extra support. Roofs were either flat, or pitched resting on gables on the front and back short walls. In both cases a lattice of wooden beams may have been covered by reed matting or twigs covered with clay to make the roofs watertight. In view of the climate, with winter rains and even snow, pitched roofs would seem the natural choice. The roofs possibly extended over the wattle and daub walls in order to protect them from rain. Clay for the walls, as well as to seal the roof, must have been dug in the vicinity of the buildings, and the clay pits, later used for the dumping of refuse, near some of the preserved socles may well have served this function. Evidence for streets or alleys is limited. The very narrow space between the two buildings of phase 3, can be considered an alley, but is unlikely that it ever functioned as an important passage. The larger alley, delineated on the magnetometry results (fig. 9, B) could not be traced in the test soundings. Interspersed with the buildings, open areas were provided, as is attested by the large structure in phase 3.

Site chronology

Relative and absolute chronological indications for the period of occupation at Düzen Tepesi are furnished by the ceramic assemblage and by radiocarbon dates on faunal material retrieved during the test soundings.

In general, the pottery collected during the survey seasons at Düzen Tepesi is very weathered, disallowing the preservation of slip, painted decoration or other diagnostic morphological features. The addition of excavated material improved these poor ceramological conditions only to a limited degree. The main advantage of the stratified material is the possibility it offers to study the interplay of fabrics and forms, albeit that the quality of the deposits did not allow the application of seriation techniques to obtain an independent relative chronology. Strikingly, the survey and excavation pottery proved to be very similar and consistent from a fabric/form/function point of view. The preliminary results of the ongoing archaeometrical programme (Braekmans et al., in press) indicate that the majority of the pottery was produced locally/regionally, represented by a few main fabrics, with detailed variation in composition. No correlation between fabrics and functional pottery shapes could be established, indicating that each vessel function could be made from more than one fabric and each fabric represented a range of functions. This condition is generally characteristic for the more simple modes of artisanal production, such as household industry (as discussed by Peacock 1982 and Arnold 1985).
From a chronological point of view, the material from Düzen Tepesi is considered to be consistent and datable to mainly the fifth to second centuries BC. The presence of some somewhat older pottery can in theory not be excluded. Considering the fact, however, that Düzen Tepesi is far removed from trendsetting regions in socio-cultural terms, such as the northern Levant and the eastern Aegean, such pottery could rather represent

fossilized shapes. Additionally, a limited quality of late Hellenistic and Imperial pottery was retrieved.
Diagnostic Classical/Hellenistic features include:
- for table wares: bowls with simple straight rim, so-called echinus bowls with incurving rim, a small quantity of imported black glazed wares in different qualities, indicating multiple provenances, so-called Achaemenid and mould-made bowls, both in different qualities and mostly local/regional fabrics.
- for utilitarian wares: cooking pots with simple rounded rim, thickened on the lower exterior, constricted and occasionally slightly flaring and so-called disc-bases, i.e. flat bases constrained at the bottom of the wall of the vessel, mostly used for cook wares and jugs; vessels with folded thickened rim, roughly triangular in section, mostly used for storage vessels; strap handles, flat or faintly ribbed, with occasional thumb impressions at the lower part of the handle, mostly used for cook wares, jugs and storage vessels and rounded handles, attached to cook ware, small jugs and possibly drinking vessels.

Apart from the ceramic evidence, a number of radiocarbon dates are available for Düzen Tepesi (Table 1). These are based on samples of pig bones retrieved from the small-scale excavations. Their range (at 2σ) lies between the fifth and the early second century BC, supporting the ceramic dates.

Sample nr	Locus	Context	BP date	Cal (68%)	Cal (95%)
F1	TD 2006.46	Pit fill, dug in phase 4 deposits		340-320 BC, 210-160 BC	360-280 BC, 260-60 BC
F4	TD 2006.143	Pit fill, dug in phase 4 and 3 deposits		410-390 BC	510-380 BC
F7	TD 2007.66	Floor level phase 4, 20cm thickness, lots of artefacts		340-320 BC, 210-160 BC	360-280 BC, 260-60 BC
F11	TD 2007.22	Floor level phase 4, 20-40cm thickness, lots of artefacts		370-200 BC	390-170 BC
F15	TD 2007.12	Floor level phase 3, 30-50cm thickness lots of artefacts; levelling operation		370-340 BC, 330-200 BC	390-180 BC

Table 1. Radiocarbon dates on pig bones retrieved from the test soundings at Düzen Tepesi (Beta Analytic Inc., Miami)

However, also in the case of the ceramic evidence, one needs to be aware of what one is dating exactly. None of the five contexts from which bone samples were taken can, for instance, be assumed to be primary deposits. Even in the case of the floorlevels, scepticism is warranted since the archaeological layers, of which only the surface was used as a floor, consist in all three cases of soil mixed with artefacts. This soil was dumped on the bedrock, virgin soil or an earlier floorlevel to create a level surface, or to raise the floor level along with a new architectural phase. The material included in these layers, be it bones or pottery, is definitely not in a primary context. For the scope of this paper, however, which does not go into detail into the dating of specific structures or contexts, the broad chronological framework provided by ceramic and radiocarbon dating is sufficient. One can assume that at least the central area of the eastern promontory was

occupied between ca. 500 and 170 BC. This part of the settlement of Düzen Tepesi is thus Classical and Early Hellenistic in age. In view of the less complex structures elsewhere on the site, an earlier date for some of its quarters cannot be excluded.

Düzen Tepesi in a wider context

In order to understand the importance of the discovery of Düzen Tepesi, the site must be placed into a wider regional context. A comparison of the layout and the architectural features of Düzen Tepesi with similar sites, or with sites having similar features, may prove useful in assessing the nature of the site. This comparative evidence should first be looked for in the region of SW Anatolia itself.

As described above, Classical-Hellenistic Düzen Tepesi consists of a walled refuge on the Zencirli Tepe, and a fortified lower settlement. This settlement was clearly not planned, although most constructions were laid out along a SW-NE axis, dictated by the local topography.
The arrangement of an acropolis and a lower town, both fortified is a recurrent feature in the Archaic and Classical settlements on the Aegean coast. It occurs at Archaic Pergamum where the 2-3m thick wall around the lower town consisted of big roundish boulders with no trace of stoneworking. The wall did not follow a straight line but used outcrops of bedrock upon which the stones were piled. The acropolis, on the other hand, was provided with a wall in worked blocks. During the fifth century BC, the wall around the lower town was remodelled and now provided with a gate and tower of the overlapping type. The approach to the gate was by a ramp constructed of polygonal masonry (Radt 1999: 53-54; 2001: 43-45). At Xanthus the so-called Lycian acropolis was surrounded by a rampart in polygonal masonry, dating to the Classical period, below which spread the actual town (des Courtils & Cavalier 2001: 151). At Miletus the Kalabaktepe was possibly provided with a defensive wall already in the eighth century BC, but certainly by the second half of the seventh century BC when a wall in cut blocks of gneiss was erected. A further inner defensive wall of 1.2m thick was constructed in the mid-sixth century BC, consisting of a stone socle in polygonal blocks and probably with a mud-brick superstructure (Greaves 2002: 58-60, 76, 86-87). At Old Smyrna, the oldest fortifications walls, dating to the middle of the ninth century BC, consisted of a foundation in carefully assembled hammer-dressed blocks, with a backing of medium-sized stones, packed against mud-brick and were nearly 5m thick. These walls were repaired and extended in the mid-eighth century BC, and were now provided with inner foundations faced with huge hammer-dressed blocks of approximately polygonal shape. During the late seventh century BC the fortification wall was rebuilt, reusing material from the previous phase, and consisted again of an outer face in dressed stones, and a mud-brick backing. The last phase of the walls dates to the 4th century BC, at which time they were built with an outer face in polygonal stones, with a stone fill behind it. This wall was only 1.3m thick and seems to be a circuit wall rather than a fortification. The upper stretches of the walls in all phases were built in mud-brick, possibly reinforced with timber to prevent collapse (Nicholls 1957-1958: 40-50, 107-111, 122-136; Coldstream 1977: 303-304). At Gordion a massive fortification wall built with two faces

and an inner rubble fill, preserved up to 10m high, and provided with an impressive gate was constructed during the Early Phrygian period (new dates: ca. 950-800 BC, cf. DeVries et al. 2003). During the Middle Phrygian period (ca. 800-540 BC) the lower town received a 3.5m thick and at least 14m high mud-brick fortification wall (Voigt, Henrickson 2000; Voigt, Young 1999). The Lydian fortification at Sardis, dated to the late seventh century BC at the earliest, was a massive construction of ca. 20m wide, in parts built of mud-brick on a stone socle in coursed polygonal style (in an earlier phase), and in other parts entirely built of stone in the same style (later phase) (Greenewalt & Rautman 2000: 656, 668; Hanfmann 1983: 71).
The very simple building technique of the fortification walls at Düzen Tepesi, using unworked breccia boulders is only replicated at the wall of the lower town at Archaic Pergamum. All other settlements had much more elaborate defences. In view of the location and the history of some of these communities, Greek influence or a dominant role in Anatolian politics must be taken into account. However, at Classical Xanthos, the arrangement of the rampart and the acropolis is considered an indigenous Lycian element (des Courtils & Cavalier 2001: 155). More adequate possible parallels for the fortifications at Düzen Tepesi should probably be sought in settlements where Greek influence may be assumed to have been neglectable or in places which never played a front-stage role in politics. The walls surrounding the acropolis of the Classical Lycian settlement at Avşar Tepe, for instance, whose main occupation dates to ca. 500-350 BC, were constructed in coarse polygonal stones, often making use of the bedrock, and probably surmounted by a wooden structure. They were furnished with a bastion and a tower (Thomsen 1996: 31-35). Other, smaller Lycian fortified settlements, all dating to the Classical period, displayed an equally sophisticated fortification systems with wall predominantly built in polygonal or trapezoidal stones, often provided with gates and towers (e.g. at Tüse (Marksteiner 1995a) and Hoyran (Marksteiner 1995b)). The walls around Archaic-Classical Panemoteichus were equally built in a rough polygonal style, with two faces packed with smaller stones and rubble, and furnished with several towers and gates (Aydal et al. 1995: 147). In and near the later territory of Sagalassus, several Classical to Hellenistic sites are preserved which were also walled. Again, these were either polygonal in style or built in ashlar masonry (e.g. Hisar, Kepez Kalesi, and Belören just to the SE of the Roman territory of Sagalassus; cf. Waelkens 2004). In comparison, to all these sites, including settlements that were much smaller, and as far removed from direct Greek influence, the walls at Düzen Tepesi were extremely simple in their construction, except for the 'bastions' at the outer end of the eastern promontory's fortification wall.

The unplanned layout of the settlement within the fortification walls at Düzen Tepesi is to be expected if, indeed the site grew organically. Orthogonal grid plans in Anatolia were introduced during the fifth century BC (e.g. after 494 BC at Miletus), when cities were refounded or newly founded (Greaves 2002: 81). In all other instances, the original, more "chaotic" layout was conserved, often for very long periods. In inland Lycia, for instance, the city of Kyaneai continued to maintain its unplanned appearance throughout the Hellenistic and Roman periods (Kupke 1993, Abb. 4-5).

The few apsidal buildings attested at Düzen Tepesi represent a very old tradition in domestic architecture, which in general disappeared by the end of the seventh century BC, but for some time continued to be used in sacral architecture (Whitley 2001: 171; Coldstream 1977: 304; Lang 2007: 189). The houses at Geometric Old Smyrna, for instance, were mostly apsidal in plan (Coldstream 1977: 304; Cook 1957-1958: 14). The majority of the structures at Düzen Tepesi are rectilinear, however. Based on the findings of the surface survey and the test soundings, three building types can be distinguished, the presence of which seems to be correlated to their location on the site: single-roomed rectilinear structures on the western promontory, multi-roomed buildings with rooms in a linear gradation nearest to the fortification walls on the eastern promontory, and radially arranged structures, with one room placed beside the other, possibly laid out around a courtyard at the centre of the eastern promontory. In general, single-room multifunctional rectilinear structures gave way to house complexes with many rooms often grouped around a courtyard during the seventh and sixth centuries BC (e.g. on the Kalabaktepe in the sixth century BC). At Zagora on Andros megaron houses, the typical house types at Phrygian Gordion, were extended and converted into courtyard-centred houses with functionally differentiated rooms already in the eighth century BC (Whitley 2001: 171; Greaves 2002: 79; Coucouzeli 2007: 101-171; Lang 2007: 188). Later evolutions included, from the fifth century BC onwards (see above), regularly laid out rectangular houses implanted in the urban grid, such as attested in late fourth century BC Pergamum (Radt 2001: 45) and assumed for Lysimachan Ephesus (Scherrer 2001: 84). At Hellenistic Kyaneai in Lycia, the loose configuration of rectilinear compounds, often with courtyards, continued to be in use in later times (Kupke 1993: Abb. 4-5).

The use of a drystone socle carrying a wattle-and-daub superstructure, supporting a flat or pitched roof in organical materials attested at Düzen Tepesi is firmly set within a very long tradition of domestic architecture, going back to the Neolithic period, e.g. at Neolithic Hacılar located 25km W of Düzen Tepesi (Mellaart 1970: 10-11). Remarkable for the site is, however, the apparent absence of clay rooftiles. Rooftiles were first used in Corinth in the first half of the seventh century BC, to cover the roof of two temples. Their use spread rapidly throughout the Eastern Mediterranean over the next 50 years (Wikander 1990). The settlement at Düzen Tepesi seems not to have adopted this new building feature.

Given the date of occupation at (part of) Düzen Tepesi, many features strike as being quite “old-fashioned”. Apart from the absence of rooftiles, the fortification walls in unworked stone, the occurrence of apsidal features and of very simple single-roomed structures, are remarkable at a time when even in contemporaneous settlements nearby, sophisticated city walls were built (e.g. Hellenistic Kepez Kale, Sagalassus itself), and ashlar masonry was used, at least for public buildings (e.g. Sagalassus, Hisar, Kepez Kalesi, cf. Waelkens 2004). Either some, as yet unexcavated parts of the site, are pre-Classical in date, or the inhabitants of Tepe Düzen held onto traditions for a much longer period than is usual elsewhere in Anatolia. Could this be related to the specific ethnic, Pisidian background of the people living at Düzen Tepesi?

The Pisidian background

The Pisidians are the descendents of Luwian Indo-European immigrants settling in southern and western Anatolia at the end of the third, or the beginning of the second millennium BC. By 1800 BC, these peoples had split into two distinct linguistic groups, the Hittite and the *Ur*-westanatolian group. It is within the latter group that *Ur*luwian was developed, which subsequently evolved into a multitude of regional languages, including Pisidian, as yet undeciphered (Öttinger 2002: 51-52).

The Pisidians were not an ethnically homogenous people, however. Several Pisidian groups are mentioned in the ancient sources. Apart from the Pisidians *stricto sensu*, the Solymoi are mentioned, possibly situated in the borderlands between Lycia, Pamphylia, Pisidia and the Milyas, and maybe the occupants of the latter region (Homerus *Ilias* 6.155-210; Strabo *Geographica* 13.4.16-17; Herodotus *Historiae* 1.173). Included amongst the Pisidian groups were also the Milyai, generally accepted to have occupied the area between the city of Apamea in the north, the cities of Kremna and Ariassus in the east (thus running through or passing along the territory of Sagalassus) and the plain of Elmalı in the south (Strabo *Geographica* 13.4.17 c. 631; Herodotus *Historiae* 1.173, 3.9; Polybius *Historiae* 5.72.5, 21.46.10). Parts of the mountains southwest of Termessus, the Lysis valley and the Burdur Lake basin are equally assigned to the Milyas (Hall 1986: 147; Magie 1950: 671-672; Bracke 1993: 16). In the first half of the first century BC, the Milyas still constituted a separate enclave, the *commune Milyadum* (Cicero *In Verrem* 1.95). By the time of August, however, the lands of the Milyai had to a large extent been annexed by the Lycians and the Pisidians (Hall 1986). From their homebases near Sagalassus, Kremna and Ariassus, the Pisidians had migrated westwards during the preceding centuries, and had by the end of the first century BC confined the Milyas to a small enclave near the upper course of the Lysis river, Lake Kestel and the shores of Lake Burdur. The Lycians in their turn drove the Milyai back to the plain of Elmalı. (Hall 1986: 143, 148; Kearsley 1994: 51; Waelkens et al. 1997: 188-192).

Reference to the Pisidians is first made in the context of a rebellion against the Persian king Artaxerxes II (405/404-358/357 BC) at the beginning of the fourth century BC (Xenophon *Anabasis* I.1.11; *Hellenika* III.1.13). Kyros, who rebelled against the king, prepared a campaign in Greece and pretended at first that the expedition was directed against the Pisidians, 'always a menace to peace and security' (Xenophon *Anabasis* I, 1.11). Under the same Persian king Pisidian mercenaries stationed in Egypt revolted again around 390 BC. When a third Pisidian revolt occurred under Artaxerxes II, a detachment was sent to subdue them led by Datames, the satrap of Caria. However, Datames turned against the king who subsequently sent another military detachment, this time to deal with Datames. This detachment incorporated 3000 Pisidian and Pamphylian mercenaries (Cornelius Nepos, *De viris illustribus XIV. Datames* 4.1; Diodorus Siculus, *Biblioth.* XV 90.3). When Euagoras (ca. 433-373/4 BC), the ruling knight of Cyprus, fought against the Egyptian pharaoh Akoris in 393/2-390 BC, he was also assisted by Pisidians (Brandt 1992: 33; Olmstead 1948: 373, 397, 412-3; Briant 1996: 614, 636, 669, 679-80). The Pisidians thus had a strong reputation as mercenaries and soldiers, a fame

which they still carried in Hellenistic times (Arrianus *Anabasis Alexandri* 1.27.-28 stating that the Sagalassians were the most warlike of the warlike Pisidians).

In past decades, several authors (Jones 1971: 214; von Aulock 1977: 1; Levick 1967: 16) have taken these episodes, together with the many instances of inter-city strife in Pisidia and attested activities of Pisidian mercenaries during the Hellenistic period (see Mitchell 1991; Bracke 1993: 19-20; Kosmetatou, Waelkens 2000), to understand that the Pisidians were a rather primitive, particularly warlike and unruly people. Recent field studies in Pisidia, however, have questioned this perception by documenting the high degree of Hellenisation in the Pisidian cities from the third century BC onward. The Pisidia Survey, directed from 1982 through 1997 by S. Mitchell (Exeter, UK), and since 1998 by L. Vandeput (director of the BIAA), together with the excavations and surveys of the Sagalassus Project directed by M. Waelkens, have played a central role in urging the scientific community to radically alter its view on Pisidia during the Hellenistic period (especially Mitchell 1991; Waelkens 2004; Vanhaverbeke 2006).

However, evidence predating the Hellenistic period in Pisidia is still extremely scarce. In the wake of the Pisidian Survey Project, a small Archaic-Classical settlement, dated to the eight to fourth centuries BC was discovered at Boğazköy (Panemoteichos I) (Aydal *et al*. 1997), while the tumuli at Elmalı/Bayındır (eight-seventh centuries BC) are the only excavated remains in the region dating to the same period (see Mellink 1976). Within the territory of Sagalassus a number of Archaic-Classical settlements have been located, all of which occupy remarkable landscape features, but are small-scale (Vanhaverbeke, Waelkens 2003: 195-216). The discovery of the settlement at Düzen Tepesi now offers unique evidence to discuss the way in which (some of) the Pisidians were organised at the time when they were first mentioned in the written sources, and before.

In the ancient Greek sources the different groups amongst the Pisidians are described as ethnè (single: ethnos), commonly translated as ‘tribes’. Most often referred to is the statement by Strabo that the Pisidians who live in the mountains are divided into separate tribes (ethnè) governed by tyrants, like the Cilicians, and are trained in piracy (Strabo *Geographica* 12.7.3., based on the late second century BC writer Artemidorus). The word ‘tribe’, however, is a very inadequate translation of ‘ethnos’, the latter being a people inhabiting a specific region, dwelling in a number of separate communities, in areas where there was only a need for a rather limited range of functions to be performed collectively (Osborne 1996: 286). However, even this description seems to be too specific and, in one of the latest discussions on the meaning of ‘ethnos’, it is simply referred to as a (consolidated or dispersed) population (Hall 2007: 51).
In anthropological-ethnographic literature (pioneer works by Service 1962; Johnson, Earle 1987), ‘tribe’ has a specific socio-economic connotation, which cannot idly be applied to ancient societies. In Service’s original model (1962), tribes are held together by kin-based systems. The society is basically egalitarian, and leadership is personal, charismatic, and limited to special situations. There is no well-developed craft specialisation, and each settlement is relatively autonomous and self-sufficient, and mostly occurs in villages of 100-200 people subdivided into clan or lineage segments of hamlet size (ca 25-35 persons). In spite of the fact that Service’s evolutionary model is

largely out-dated, his basic description of tribal societies is still accepted (see Parkinson 2002, Fowles 2002, Carneiro 2002).

It is clear that the settlement at Düzen Tepesi is far too complex to comply with a tribal society. The mere size of the three-tiered fortification system of the site are clear indications for the workings of a well-organised community in which a leader, or a group of prominent persons, could muster and organize the labour force required for this undertaking. This is not compatible with the rather basic social organisation common in tribes. Another indication for the more complex status of the community living at Düzen Tepesi may be the size of the site. The total area of the two promontories and the lower slopes of the Zencirli Tepe amounts to 75ha. When compared to Hellenistic Sagalassus, which extends over ca. 12.8ha, or even Roman Sagalassus extending over 33.5ha, it is clear that Tepe Düzen covers a very extensive area. However, open spaces within the settlement need to be taken into account, as well as the fact that, at this moment, the contemporaneity of all structures attested on the site is not proven. As observed above, both the characteristics of the surface pottery and the diversity in building types seem to suggest that shifts of occupation within this area of 75ha cannot be excluded. For this reason, it is too tentative to estimate the population that at any given time lived on the site. However, since the fortification wall on the eastern promontory is clearly a construction that has been devised and built in one stage, one can assume that at some point at least the eastern promontory housed a settlement that was conceived as a community. In that case, the extent of the settlement would still amount to ca. 30ha.

Evidence for economic activities on the site and for craft specialisation is fragmentary. There is not enough evidence yet to ascertain whether the site was producing food and goods above subsistence level. Preliminary fabric analysis of the pottery collected through surveys and excavations indicate a nearly exclusive use of local clays and almost no imports. Based on the magnetometry images, and the results from geochemical analysis of soil samples, indications exist for artisanal activities in the shape of kilns either for the production of pottery, which was produced locally, or, as indicated by geochemical analysis of soil samples (see above) for metallurgical purposes.
The faunal and botanical remains give no indications of the scale of agricultural production and the size of the flocks. Among the small sample of identified animals bones retrieved during the test soundings[7], most belong to traditional domestic species used as food animals (sheep (*Ovis ammon* f. aries), goat (*Capra aegagrus* f. hircus), cattle (*Bos primigenius* f. Taurus), and pig (*Sus scrofa* f. domestica). It is striking that a large proportion of the ovicaprines from Tepe Düzen are from older individuals. This indicates that they were not only kept for their meat, but that they also must have provided secondary products such as milk. In the case of sheep, wool may have been important as is also suggested by several loom weights that were found on the site. Among the cattle remains, older animals occur, but relatively young individuals are also present. A pelvic bone shows traces of coxarthrosis, a pathological deformation that can be related to traction or other heavy-duty work. Cattle were probably used for working the fields in the valley, and for transporting goods to the site. Bird bones are rare, but the presence of domestic fowl (*Gallus gallus* f. domestica) is attested. Dog (*Canis lupus* f. familiaris) and

[7] Of the 1929 bones obtained by sieving only 3% (or 65 remains) could be identified

donkey (*Equus africanus* f. asinus) have also been attested. The donkeys were of very small size, and were probably the preferred pack-animals. The contribution of wild mammals to the diet was rather low, but in any case more important than during the first to seventh centuries AD at Sagalassus. Fallow deer (*Dama dama*), red deer (*Cervus elaphus*), hare (*Lepus europaeus*) and possibly wild goat (*Capra aegagrus*) are attested. Fish remains could be attributed to the carp family (Cyprinidae), and to tuna (*Thunnus* sp.). While the cyprinids may come from the local Ağlasun river, the tuna find indicates (trade) relationships with the coast.
Macrobotanical research of selected samples (mainly from refuse pits) have indicated that the principal crops were barley and wheat. Lentil and grape pips have also been retrieved. More than half (56%) of the charcoal samples come from deciduous oak, 19% from fir or cedar and 9% from pine. The high amount of oak wood fragments can be related to a dense forest cover near the site and/or the preferential use of oak as a building material (e.g. for wooden roof beams), of for fuel. Palynological investigation has studied a number of cores sampled along a transect in the valley of the Ağlasun river, just south of Tepe Düzen. Since the resolution of the pollendiagrams is rather coarse, only general observations are warranted. A clear cultivation phase has been attested in the valley going back to the beginning of the first millennium BC, and lasting for some 2000 years. The earlier stages of this occupation phase show an increase in *Plantago lanceolata*, *Artemisia*, *Juglans regia* and Cerealia type pollen. *Olea europaea* occurs, but its percentages are too low to indicate cultivation of the tree. *Vitis vinifera* is in general badly represented (Vermoere 2004: 84-88, 104-105, 108-111).

At this moment there is no clear evidence for social stratification. Some buildings are larger than others, but, although this difference in size can in some cases be related to social status of the occupants or users, it may also be related to the structure's function. There is no evidence for an exceptionally large building, distinct from the surrounding constructions, or at a prominent location. However, this kind of structure can maybe not be recognised on the basis of surface remains alone. Above, the difficulties in interpreting the seemingly larger and more complex structures visible on the magnetograms have been referred to.

The extent of the area that was exploited by the settlement at Düzen Tepesi can tentatively be reconstructed by using topographic boundaries as a guideline (concept of Siedlungskammer - Kirsten 1956, Bintliff 1994, 1999). It seems likely that its direct catchment area was delimited by the mountain range to its north -as was the case with Sagalassus later-, by the valley of the Ağlasun river, at least until Dereköy where the valley suddenly narrows (dotted line on fig. 14), but maybe further east, to where it joins the Isparta river, to from the Aksu (ancient Kestros), by the northern part of the valley of Çanaklı to the south, and by the ridge closing off the Ağlasun valley near Başköy to the west (fig. 14). This tentative territory covers ca. 170km², or 125km² if one does not count the long stretch downstream from the Ağlasun river.

Summarizing, the settlement at Düzen Tepesi displays characteristics for a society which could muster the manpower and the leadership to build a relatively impressive fortification system, and which may have controlled an area of at least 125km², but which

does not show any sophistication in its domestic architecture and may have been much smaller than its current 75ha suggests. Although evidence for craft specialisation is available, social ranking cannot as yet be attested. These are rather contradictory observations. When compared to contemporary nearby settlements, such as Hisar and Kepez Kalesi, the contrast between the architectural record at Düzen Tepesi, even considering its fortication system, is striking. As stated above, the Pisidian inhabitants were either extremely conservative in their building technology, or the remains which one can see at present on the site are a palimpsest of a settlement that goes further back in time than the pottery and the radiocarbon dates seem to suggest at present. The fortification walls and some of the more simple building plans may be indicative for an earlier date, perhaps in the first half of the first millennium BC, at which time they seem to be more at home.

Conclusions

Three seasons of inter-disciplinary research at Düzen Tepesi have resulted in a considerable amount of information on the material culture of the Pisidians. Although important issues remain to be resolved regarding the chronology of occupation of the site, the region near later Sagalassus sustained a large settlement, which was heavily fortified and consisted of an 'acropolis' and a 'lower town' where habitation units were arranged in irregular clusters along a northwest-southeast axis. Evidence for craft specialisation is available, but social ranking cannot as yet be attested.

Although for the first time a substantial "Pisidian" settlement has been discovered, many questions remain to be resolved, amongst which the nature of the relationship between Düzen Tepesi and Sagalassus, the occupation of which overlaps with that at Düzen Tepesi, and the issue of the relation of Düzen Tepesi with other Classical sites in its neighbourhood features large.

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Fig. 1a-b-c Location of Sagalassos and its territory in southwestern Anatolia, Quickbird-2 (© 2003, Digital Globe) image of the site, and a view from Sagalassos on the promontory of Düzen (© The Sagalassos Project)
Fig. 2. Map of the settlement at Tepe Düzen (© S. Aydal, H. Vanhaverbeke)
Fig. 3. Circuit wall on the Zencirli Tepe, view from the west (© The Sagalassos Project)
Fig. 4. Fortification wall on the Tepe Düzen promontory (© The Sagalassos Project)
Fig. 5. One of the multi-roomed structures built in medium-sized rough fieldstones on the promontory of Tepe Düzen (© The Sagalassos Project)
Fig. 6. Structure built in large limestone boulders on the lower slopes of the Zencirli Tepe (© The Sagalassos Project)
Fig. 7. Some examples of the coarse pottery sampled at Tepe Düzen (© The Sagalassos Project)
Fig. 8. Density of surface pottery per 50 by 50 m grid (© The Sagalassos Project)
Fig. 9. Degree of surface pottery fragmentation (© The Sagalassos Project)
Fig. 10. Topographic map of Tepe Duzen with the walls visible on the surface. Areas surveyed in 2006 and 2007 using the magnetic method and GPR are indicated (© The Sagalassos Project, B. Mušič)
Fig. 11. The main features deduced from the magnetic survey method at Tepe Duzen: A and B = linear magnetic anomalies caused by induced magnetization (walls (A) and streets (B); C = areas associated with strong thermoremanent magnetization (kilns); D = possible vein-type iron mineralisation (© The Sagalassos Project, B. Mušič).
Fig. 12. GPR time slices of area GPR 1 (see Fig. 10) show a succession of building phases, with more or less rectangular, multi-roomed structures densely arranged along ‘streets’ or open places, following a northwest-southeast orientation, confirming the general impression gained from surface mapping and magnetometry (© The Sagalassos Project, B. Mušič).
Fig. 13. Location of the 2006 and 2007 trenches on the Tepe Düzen promontory (© S. Aydal, The Sagalassos Project)
Fig. 14. View from the north on Trench Ia-b (© The Sagalassos Project)
Fig. 15. Phase 4 architectural remains in Trenches I and II (©The Sagalassos Project, K. Vyncke, E. Arnauts)
Fig. 16. Phase 3 architectural remains in Trenches I and II (©The Sagalassos Project, K. Vyncke, E. Arnauts)
Fig. 17. Phase 2 architectural remains in Trenches I and II (©The Sagalassos Project, K. Vyncke, E. Arnauts)
Fig. 18. Phase 1 architectural remains in Trenches I and II (©The Sagalassos Project, K. Vyncke, E. Arnauts)
Fig. 19. One of the garbage pits in the eastern part of Trench Ia (©The Sagalassos Project)
Fig. 20. Tentative delineation of the site catchment area of Tepe Düzen (© The Sagalassos Project)

Illustrations Düzen

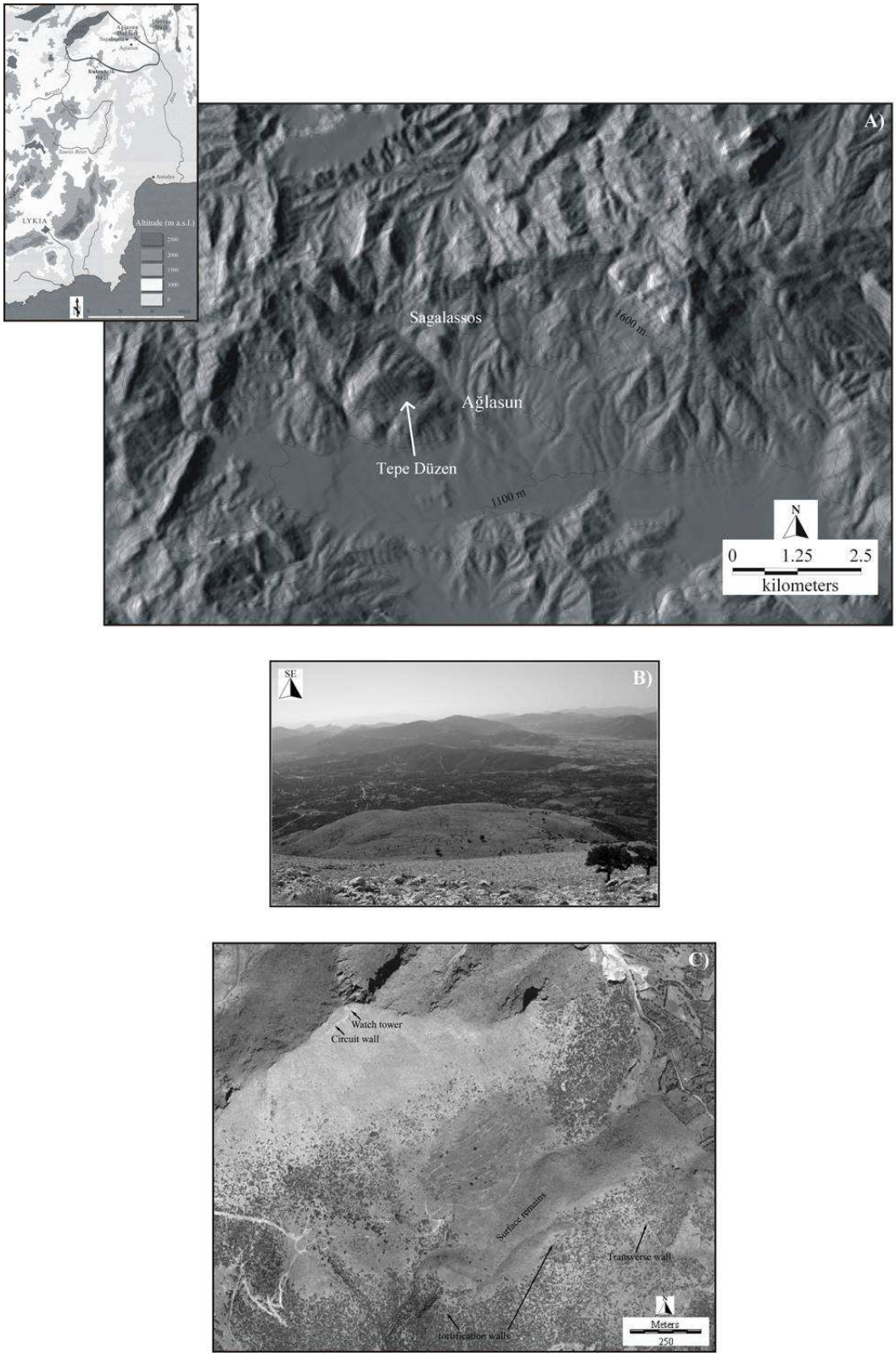
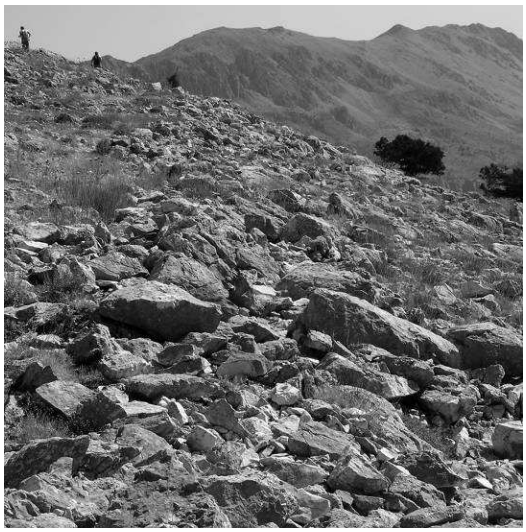


Figure 1.



Figure 2.



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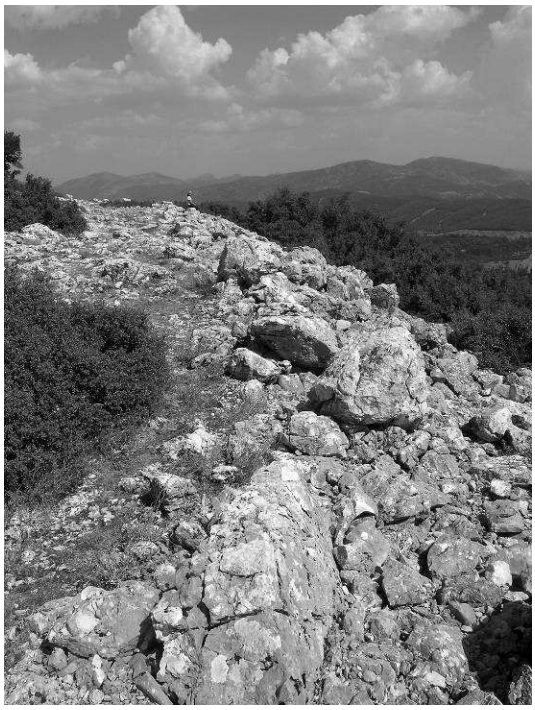


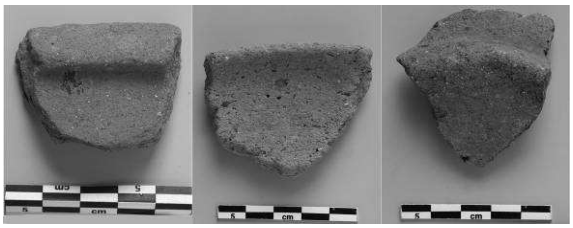
Figure 4



Figure 5



Figure 6.



Figure

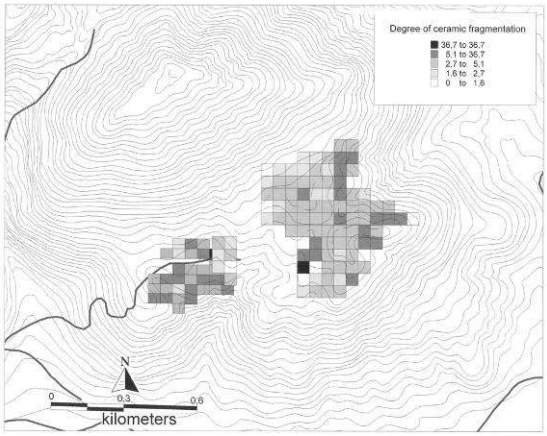


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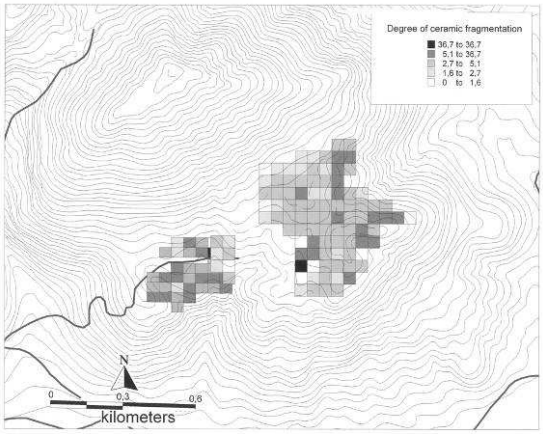
Figure 8



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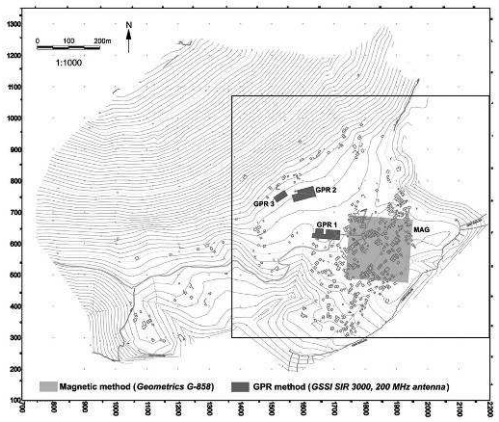

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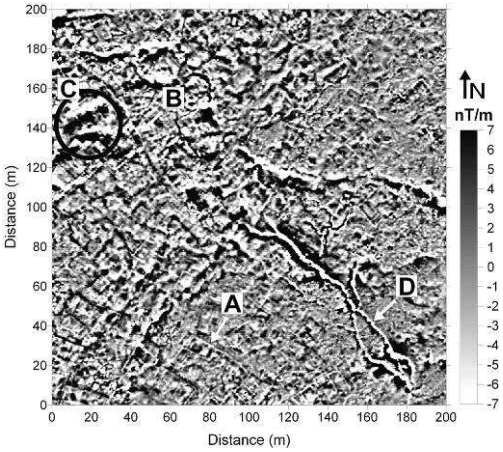

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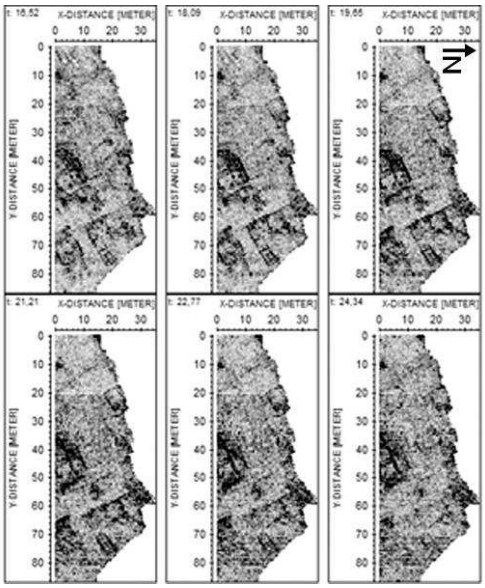

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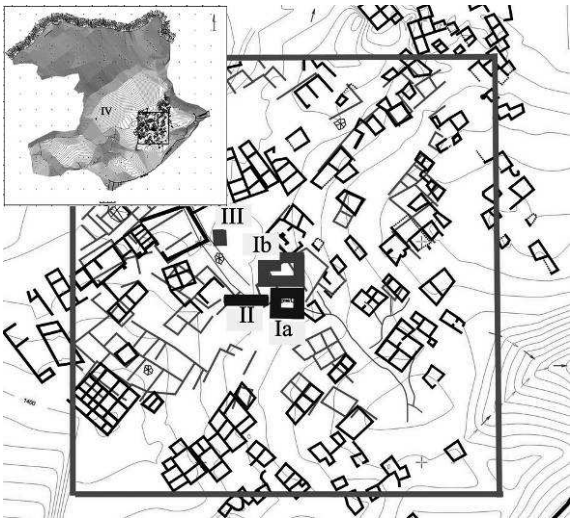
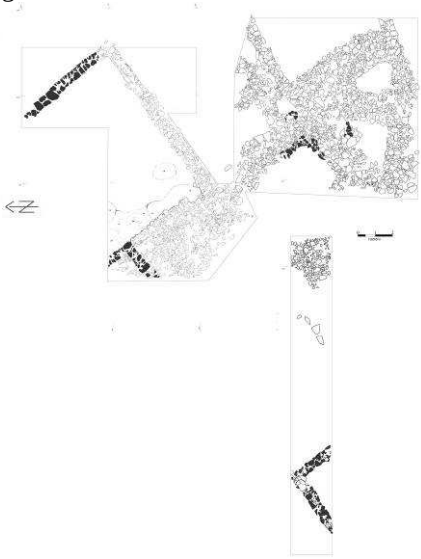


Figure 13



Figure 14



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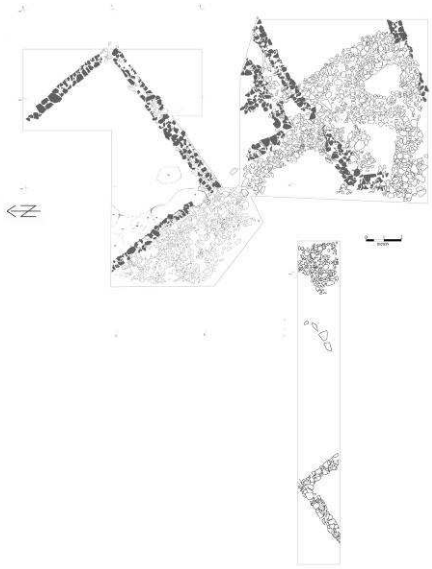

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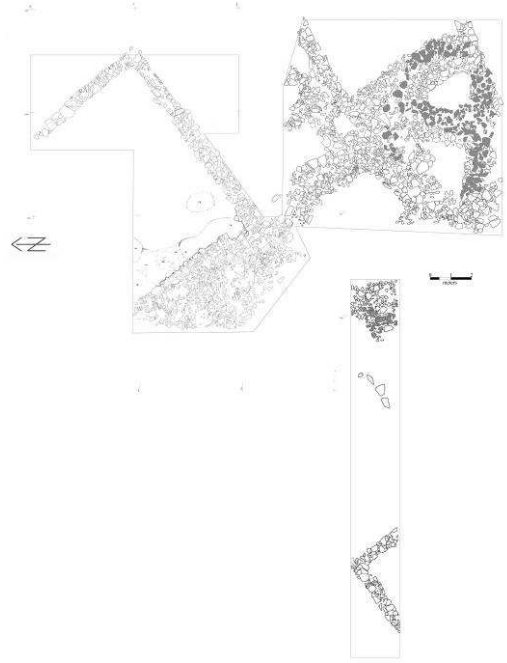

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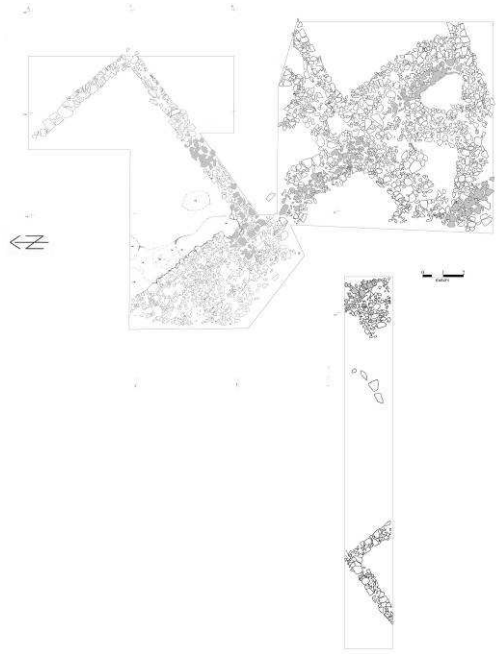

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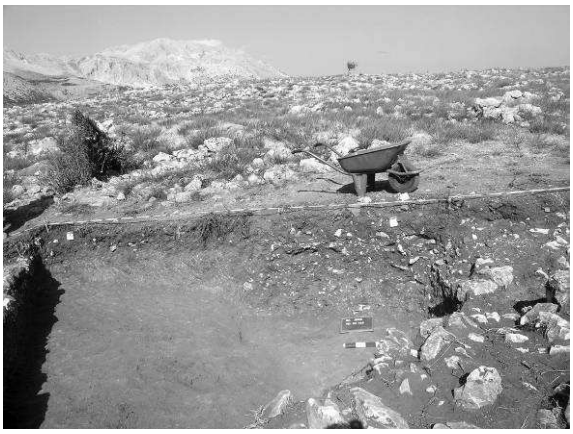

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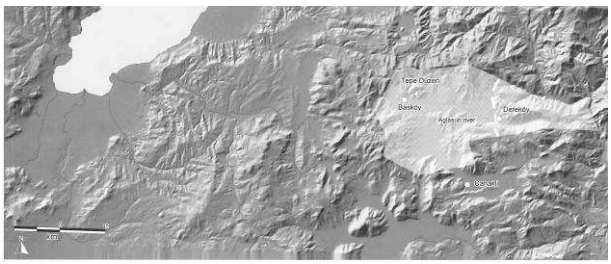

Figure 20