

PALMYRENA

**PALMYRA AND THE SURROUNDING TERRITORY
JOINT SYRIAN-NORWEGIAN PROJECT**

**SURFACE SURVEY NORTH OF PALMYRA
APRIL AND MAY 2009.**

PRELIMINARY REPORT

HISTORICAL PERIOD

Jørgen Christian Meyer



2009

CONTENTS

Introduction	3
Wadi Abyad	5
Akarem	7
Awtayt	17
Bir al-Dejn	19
Majouf	21
Other sites	25
Wadi al-Takara	28
Wadi al-Takara S	30
Al-Koullah	36
Wall across wadi	44
Wadi al-Takara N	46
Jebel Abyad	58
Al-Mazraah	60
Valley 376	68
Valley 369	69
Wadi Kshebar	72
Shalalah	74
Site 26 (Tombs)	76
Jazal	78
Wadi Shanaeh and area north of Jebel Abyad	87
Bir al-Arfa	89
Station 098	99
Square structure 538	104
Jebel Char	105
Conclusions	123
Bibliography	129
Appendices	
A. List of sites	131
B. Photo list	135
C. List of finds	142
D. Coins	150

SITES SURVEYED HISTORICAL PERIOD.

Introduction:

The main effort of the 2009 survey was in the southern sector of the concession area from Wadi al-Diwa up to the southern edge of Jebel Chaar as a continuation and follow up of the 2008 survey, which had concentrated on a possible caravan route towards the NW, a settlement in the NW corner of Jebel Abyad (Shalalah) and sites at the open plain N of Jebel Abyad. Some sites were only visited shortly in 2008, and one of the aims of the 2009 survey was to complete the registration. Another aim was to get a more comprehensive picture of human activities in the southern part of the area, also by paying attention to areas with a low concentration of finds. The survey of the historical team was made in close contact with the pre-historic team, which visited other sites, and the two teams shared information.

The southern sector was divided into the following areas:

1. The W side of Wadi Abyad up to Shalalah.
2. Wadi al-Takara.
3. Jebel Abyad, both the eastern and northern range.
4. Jazal plain.
5. Plain N of Jebel Abyad and Wadi Shanaeh.
6. SE corner of Jebel Chaar

Members of the historical team:

Prof. Dr. Jørgen Christian Meyer, University of Bergen (JCM).

Azam Daas, Museum of Palmyra (AD).

Adeeb As'ad, Museum of Palmyra (AA).

Dr. Eivind Heldås Seland, University of Bergen (EHS).

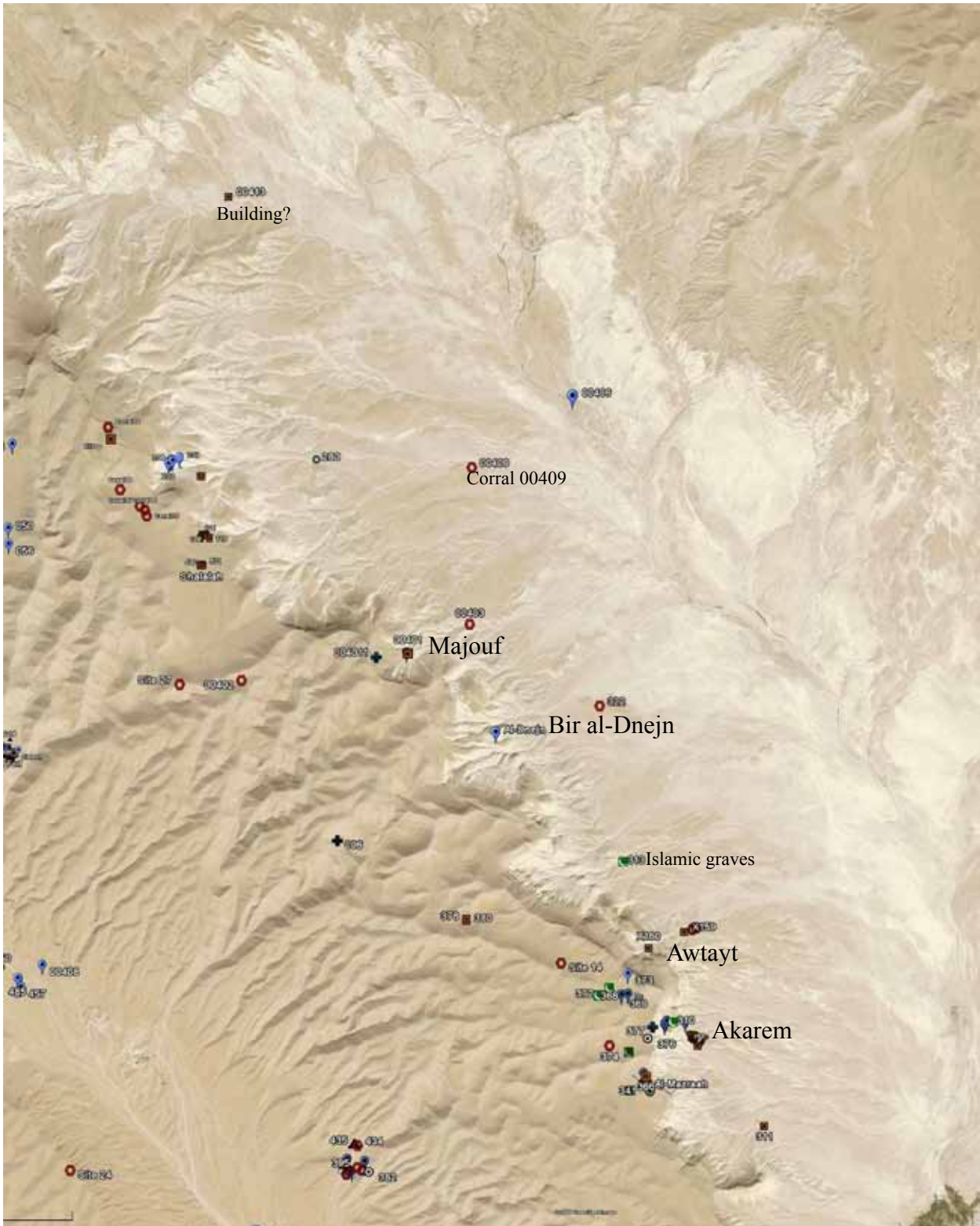
MA Jonatan Krzywinski, Heritage management office, Bergen (JK).

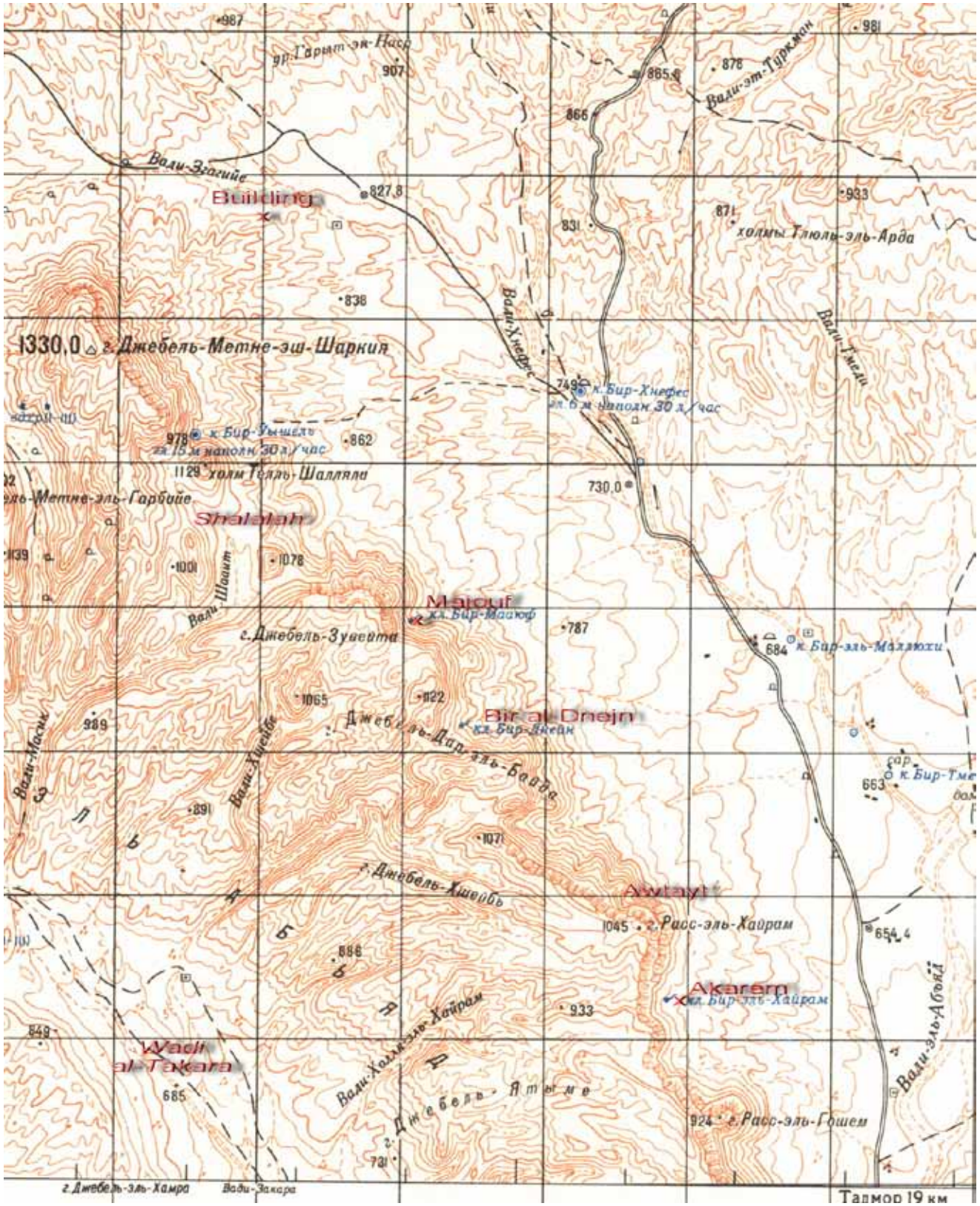
MA Eva M. Sund, University of Oslo (EMS).

BA Kjetil Borthem, University of Oslo (KB).



WADI ABYAD





1:100.000 I-37-41. Every square is 2 x 2 km.

AKAREM

Surveyed by AA, AD, EHS, ES, KB, JCM. April 21, 22, 23, 2009.

GPS: N34 41.519 E38 11.430, altitude (tell) 762.

Map: 1:100.000 I-37-41. 38405, 74259.

The site lies 18 km NNW of Palmyra as the crow flies, at the western side of Wadi Abyad, at the foot of a lower promontory from Jebel Abyad. There are several springs in the gorge between the promontory and the steep face of Jebel Abyad. A deep wadi leads from the springs to the SE, flattening out towards the dam north of Palmyra. There is access to the edge of Jebel Abyad and the valley above, Valley 376 (See p. 68) via a steep narrow path from the promontory and the spring area. Even if the gorge collects some of the rainfall, the area around the site only receives little water from the Jebel Abyad in itself, as most of the precipitation in the mountains flows towards Wadi al-Takara in the west. A few Bedouins have their camp with stone built enclosures SE of the site, fetching water from the springs, but there are no traces of older camps in the area. The site is visible on satellite images as upcasts, and the spring area is marked on the map.

The site consist of the following:

1. Tell area.
 - a. Remains of a more monumental building.
 - b. Structures southeast of the tell.
 - c. Large enclosure E of the tell.
2. Aqueduct between the tell area and the springs.
3. Springs and well in the gorge.
4. Rock cut tombs at the steep face of Jebel Abyad.
5. Rock cut cressets and cistern?
6. Islamic tombs on the promontory.
7. Structures on hilltop SE of tell.



Eastern edge of Jebel Abyad towards Wadi Abyad.



1. Tell area.

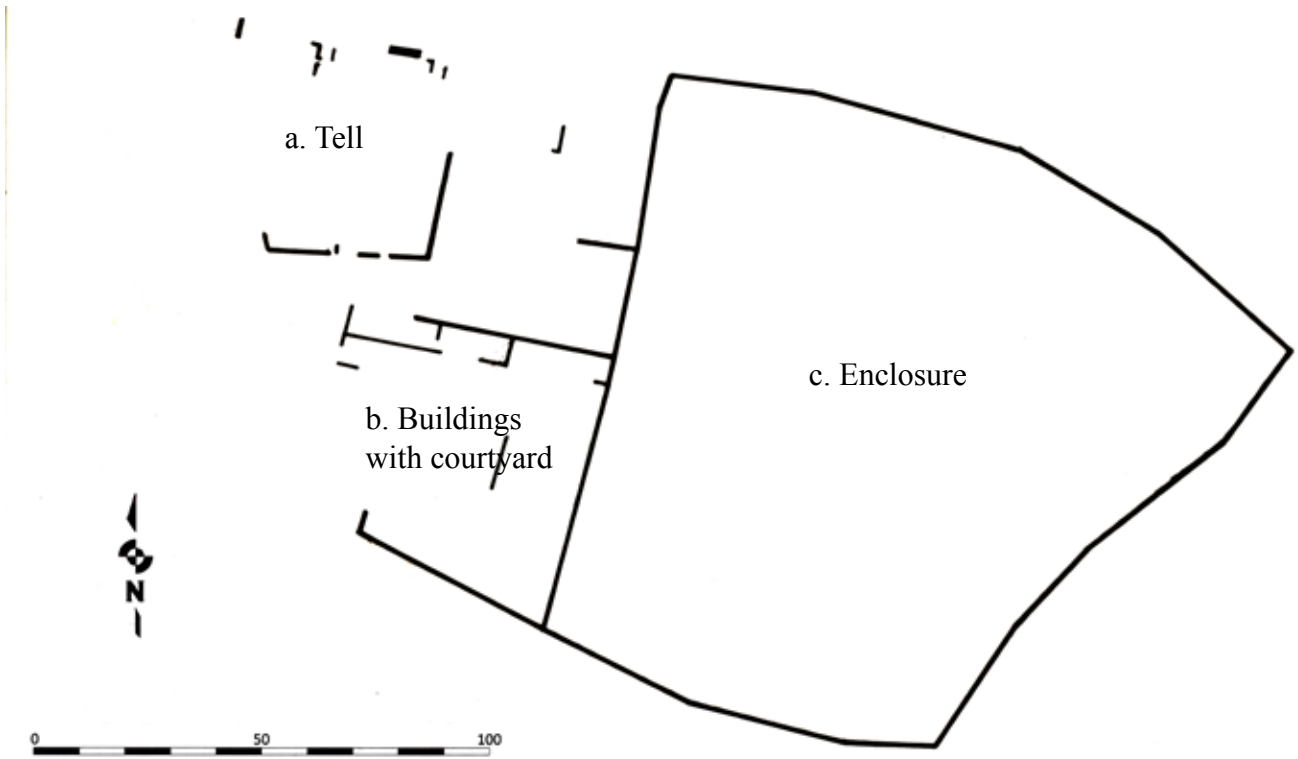
a. Monumental building.

GPS 267: N34 41.519 E38 11.430, altitude 762.

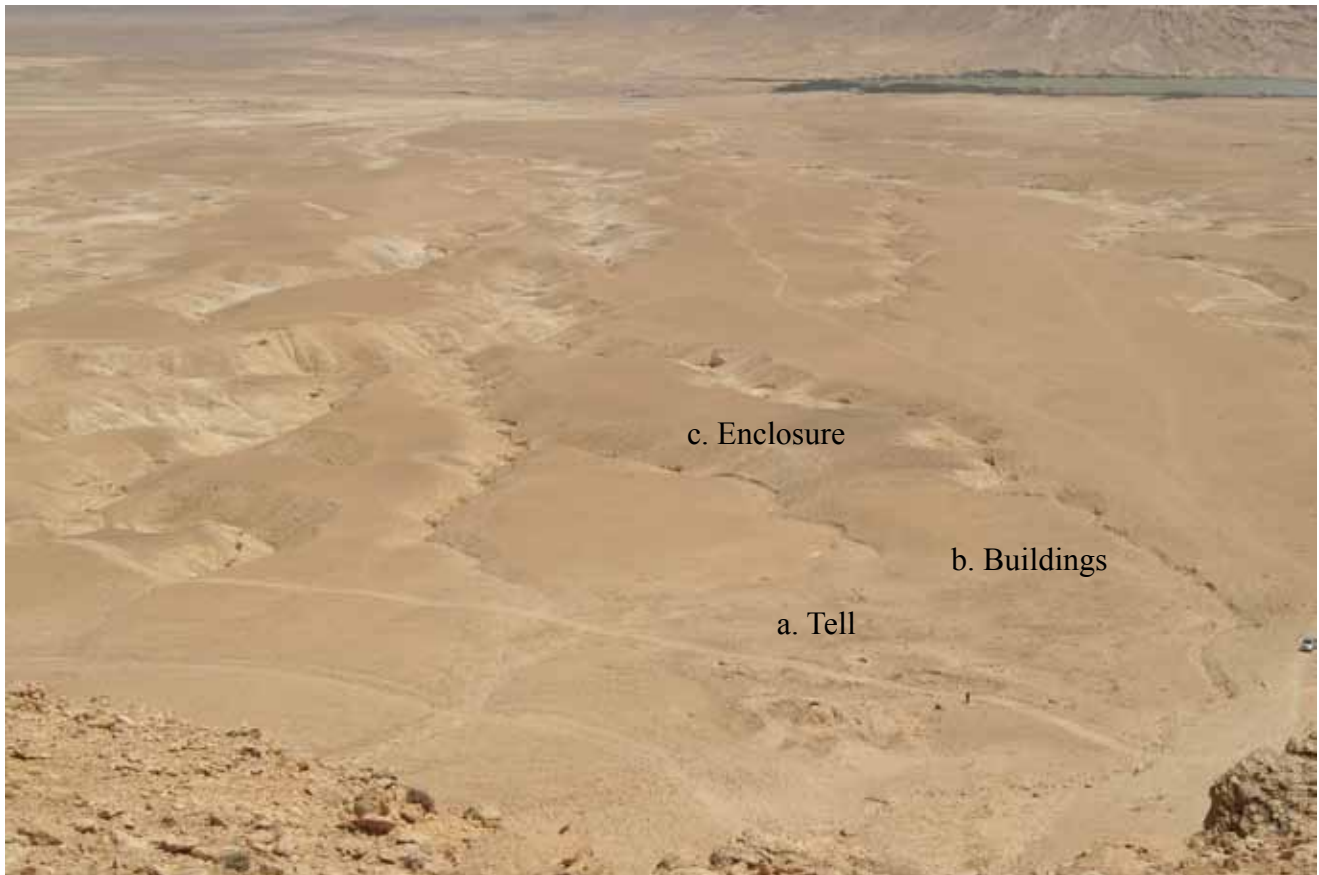
The tell area has been heavily destroyed by recent bulldozer activity, especially to the northwest and east. Also to the south a modern track, also made by bulldozer, cuts through tell. Modern digging in the disturbed area has revealed several walls from the original building. According to local Bedouin information a more monumental building with large rooms was visible only a few years ago, but their more detailed description of the rooms does not fit exactly with the visible remains in the tell, and the general layout of the building can no longer be determined.

However, the preserved walls, the architectural remains and other finds confirm the existence of a more monumental building. At the northern part of the tell a 1.80 m thick wall running E-W, with outer irregular bigger stones, up to 30 cm in diameter, with a filling of smaller stones in the middle, is preserved for about 10 m, forming the northern limit of the building. 14 m further to the west the inner NE corner of a larger room or courtyard is preserved to a height of ca. 1.5 m showing that the construction technique was not that of mud brick, but a stonewall covered with plaster. Only the outer inner layers of the walls are preserved or visible. The 6 m long N-S wall from the corner, has a distinct opening in the middle, 2 m wide, with large elaborated square stones, forming the doorposts. At the eastern part of the E-W wall remains of two rooms. In the western room the northern wall, preserved for about 2 m forms a slight vault into the interior. The eastern wall is preserved for about 2.5 m, and has a stone built up 30 cm wide low bench. The lower levels of all the walls are well plastered with water tight material up to the height of the bench. The western and southern limit of the room cannot be determined. 3 m east of this room another room with remains of what is probably a well-plastered water reservoir, about 75 cm deep. The eastern side of the reservoir is preserved for about 1.80 m. The edge of the reservoir is formed by a distinct 35 cm high, and 5 cm broad bulge, almost flat at the top, tapering inwards at the bottom. At the edge of the digging large fragments of concrete with smaller stones. The surface is prepared with broad furrows to be covered with a finer plaster. The eastern limit of the reservoir is determined by the wall of the room to the west, which is covered by debris. The southern limit cannot be determined. Immediately east of the room at the edge of the tell a 2 m long, and 90 cm broad 65 cm high rectangular limestone sarcophagi-like block, roughly cut, with a rectangular cutting at the top, depth ca. 20 cm forming a trough. The position in the debris clearly indicates that it is secondary to the rooms. Its original position and purpose cannot be determined. Close by, partly covered by debris remains of a large marble door, without decorations, 75 cm broad, 25 cm thick, with well-preserved pivot, diameter 25 cm. The preserved height of the door is 1.60 m. Its position is also clearly secondary.

The exact size of the building is difficult to establish. To the west a few meters from the tell a short stretch of a base of a wall about 1 m thick may indicate the western limit of the complex, as it is close to a small wadi coming from the promontory. In the undisturbed area north of the tell there are no traces of walls. To the east the tell flattens out outside the disturbed sector. In this area there are few traces of bases of walls, thickness about 50-60 cm indicating some structures, but the relationship to the more monumental structures in the tell is doubtful. The area immediately south of the tell, which flattens out, is surrounded by bases of walls; to the east, to the south, and a small stretch to the west, thickness 70-90 cm. They have probably been a mud brick construction, as they are not surrounded by piles of stones. An opening in the south wall, combined with a small stretch of an internal wall, may indicate a gateway. In a modern digging close to the internal wall, a fragment of elaborated L-shaped conglomerate stone, either a threshold or a doorpost, is visible. It is deeply buried into the ground. Few meters from the opening at a lower level three large fragments of elaborated conglomerate stones. The largest one is 2.08 m long, 0.70 m wide and 0.35 m thick with a slightly curved surface at the top.



Akarem. Tell area.



Akarem. Overview.



Akarem Tell. Marble door.



Akarem tell. Water reservoir.



Akarem tell. Internal doorway in NE tell.

Another one is the corner part of a threshold with a distinct hole, 10 cm in diameter for the door pivot. There is no indication that the position of the stones is due to the bulldozer activity, but it is an open question whether they should be related to the walls immediately south of the tell, which may be a later construction. However, the concentration of the stones within a small area strongly indicates that the more monumental structures extended as far as this. The stipulated size of the complex can thus be estimated to ca. 50 x 50 m.



Akerem. South tell. Architectural fragments.

Several fragments of terracotta water pipes, also joints, were collected from the area, most of them from the tell-area, one from the area east of the tell. They all have thick calcareous deposits inside. The diameter of the original pipes can be calculated to be 18 - 20 cm.



Akarem tell. Terracotta water pipes.

b. Structures southeast of the tell.
GPS 277: N34 41.486 E38 11.447, altitude: 743 (SW corner).

The structures southeast of the tell-area lie at a slightly lower level. The plateau falls gently towards the wadi to the south and the southwest. The walls are visible as bases with outer bigger stones and a filling of smaller stones in the middle, and as there are no piles of stones around them, the construction technique has probably been mud brick. The eastern wall is identical with the southern part of the western wall of the large enclosure to the east, thickness between 80 and 90 cm, length 60 m. The southern wall, thickness 75-80 cm turns slightly to the north, following the wadi coming from the northwest, length 45 m. The northern wall, thickness 60 cm length 58 m has series of rooms facing the interior, depth 6 m. The thickness of the preserved walls of the rooms is 50 cm. The exact western limit of the area cannot be determined, but it cannot have extended far to the west because of the wadi coming from the northwest. A small stretch of a wall, orientated E-W in the northwest corner may indicate a series of rooms also to the west. Inside the area a small stretch of a wall, 12 m long, thickness 50 cm. The relation to the other walls is uncertain.

Even if the layout of the structure cannot be determined in detail, and there may also be different phases, the center of the structure is a large open courtyard, with a series of rooms to the north, and perhaps also to the west. It resembles buildings at Jebel Chaar and Shalalah (Ouéchel) in the northeast corner of Jebel Abyad.

c. Large enclosure E of the tell.
GPS SW corner (273): N34 41.457 E38 11.459, altitude 744.
NW corner (270): N34 41.519 E38 11.464, altitude 749.
NE corner (280): N34 41.492 E38 11.555, altitude 740.
SE corner (278): N34 41.448 E38 11.514, altitude 738.

The enclosure lies at the falling landscape towards the east, with larger wadis to the north and the south. A smaller wadi, starting inside the area, running to the east, cuts the area in a northern and a southern sector. The area is well defined by bases of walls, varying in thickness between 70 and 90 cm (with one exception) with no interruption. Most of the construction technique must have been mud brick. The western wall is an almost straight N-S wall, length 125 m. The northern wall, length 145 m, and the southern wall, length 90 m are slightly curved, following the wadis to the north and the south. The eastern wall, length 115 m curves slightly to the interior, and crosses the small wadi coming from the west. The difference in level between the plateau and the crossing point is about 4 m. The wall is clearly vis-



Akarem building b. E-wall.

ible in the wadi bed. It has a thickness about 95 cm and surrounding piles of stones in this sector indicate a much more solid construction. The close relationship between walls and the surrounding wadis to the north and south, and the crossing of wadi to the east, show that not much has changed in the landscape and the drainage in this sector since the construction of the walls. There are no traces of any interior walls, and the structure can clearly be defined as a large enclosure covering an area of ca. 12.000 m².

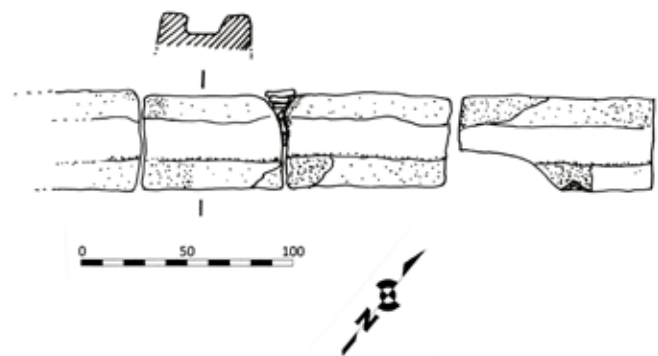


Akerem. Enclosure. E-wall crossing the wadi.

2. Aqueduct between the tell area and the springs.

GPS 309: N34.69203 E38.18951, altitude 772.

At the foot of the promontory, about 50 m from the tell, a 3 m long stretch of an aqueduct is visible where a small path has crossed it course. Its original aqueduct must have followed the contours of the landscape from the spring area around the promontory, first in a southern direction around, then to the



Akarem. Aqueduct

NW. It is constructed by roughly cut square blocks in limestone, with a 20 cm broad and 10 cm deep at the top. The length of the blocks varies from 65 to 90 cm, width ca. 40 cm. The blocks do not fit exactly together, and the space between them is filled with smaller flat stones and a kind of mortar, which now has a grey, porous texture.

There are no traces of any water systems north of the tell or any tanks at the slop of the promontory. Even if the direction of the aqueduct is northwest, due to the contours of the landscape, the target has probably been the tell area, especially as some of the rooms in the monumental structure, mentioned above, clearly has been constructed to contain water, combined with the finds of terracotta water pipes. If the aqueduct should follow the natural contours of the landscape, it would turn to the east very shortly after, leading out into one of the wadis N of the tell. However, the distance between the remains of the aqueduct and the tell is only 70 m and the difference in height about 10 m. A fall of 10 m within such a short distance is unusual, but from an ancient technical point of view not an insoluble problem. In Pompeii water towers are evenly spaced to compensate for the fall from the reservoir at the highest point to the city below. The height is about 10 m with an open tank at the top generating a water pressure of about 1 atmosphere between the towers, which are connected by lead pipes. Well constructed terracotta water pipes with tight joining could serve as well.

3. Springs and well in the gorge.

About 300 m west of the tell, in the gorge between the promontory and the face of Jebel Abyad the strata in the mountain are water-bearing, and the locals still fetch water from a well and the springs. There are no traces of any aqueduct systems in the area.



Akerem. Well and springs.

a. Well.

GPS 306: N34.69221 E38.18686, altitude 803.

The well has a diameter of 2 m and the distance to the water table is 3 m. It is surrounded by a semicircular stone setting, 6 m across. The water is of excellent quality coming from the water-bearing strata, but the well also receives rainwater from the gorge during heavy rain.

b. Spring.

GPS 307: N34.69190 E38.18657, altitude 796.

The spring is situated at a lower level 44 m from the well, at the western side of the gorge. The water from the spring is collected in a circular depression, with a diameter of ca. 2 m and a depth to the silt ca. 70 cm.

c. Spring.

GPS 308: N34.69176 E38.18654, altitude 791.

The spring lies 20 m further down along the path leading along the mountain side. The water is collected in a 6 x 4 m large pond, artificially cut into the mountainside.

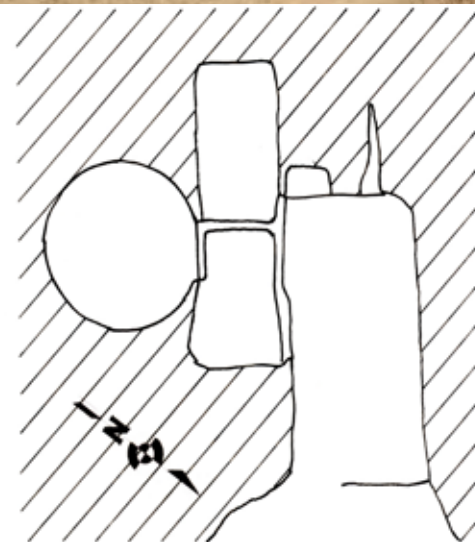
Finds and chronology: No finds. Date uncertain.

4. Rock cut tomb and structures at the steep face of Jebel Abyad.

GPS 377: N34.691800 E38.184865.

Just below the ridge of Jebel Abyad plateau (altitude of the plateau 932) above the springs a rock cut tomb is visible from the plain below. The door opening to the tomb is well elaborated. Access to the tomb needs climbing equipment and the tomb was not investigated.

Nearby another complex of rock cut rooms. It can be accessed from a path leading up along the mountain-side from the gorge and the spring area or from the plateau. The original opening has eroded away. The complex consists of three rooms. The first rectangular northern room, which gave access to the complex, is about 2 m broad; with a height between 1.75 m and 2.4 m. The length cannot be determined, due to the erosion, but probably 3m. In the northwest corner a small niche, width 40 cm depth 25 cm, height 60 cm. In the northeast corner a natural crack in the wall and the ceiling. To the left the room is separated from the other rectangular room (length ca. 2.1 m, width ca. 75 cm, heights 1.5 m) by a low footwall. The room is divided into two smaller rectangular rooms, divided by a footwall, dividing the room into two sections, length 1.3 m and 1.8 m respectively. The southern sector leads to a circular room to the left, diameter 1.3 m, height 1.3 meters, separated by a footwall, width 55 cm. Height of the door is opening 95 cm. There are no decorations or graffiti in the rooms. The rooms are probably part of a tomb-complex. The rooms have not been reused in the Islamic period, as there are no Arabic graffiti on the walls or soot on the walls and in the ceiling, which is common in other places.



Akarem. Rock cut tombs.

5. Rock cut cressets and cistern.

Along the path leading from the promontory up to the plateau there are several cressets, about 15-25 cm wide, cut into the rock and a cylindrical cutting with a short narrow channel leading from the rock above. Probably a small cistern.

Finds and chronology: No finds. Date uncertain.

6. Islamic tombs on the promontory.

GPS 310: N34.69329 E38.18778, altitude 853.

From the tell area a path leads up to the top of the promontory, where there are remains of several old Islamic graves.

Finds and chronology: No finds. Date Islamic period.

7. Structures on hilltop.

GPS 311: N34.68109 E38.20087, altitude 704.

Disturbed stone structures on hilltop, close to the Bedouin camp, 1.9 km SE of tell area. Layout cannot be determined.

Finds and chronology: Brittle ware and coarse grey ware. The grey ware is probably early Roman.

Akarem. Surface finds and chronology:

The surface finds from Akarem can be divided into two groups: 1. The tell area and the structures south-east of the tell. 2. The enclosure.

The largest concentration of finds was, not surprisingly, from the tell-area and the structures southeast of the tell: Brittle ware (142), coarse ware (106), blue glazed ware (1), green glass, iron and bronze fragments and the terracotta water pipes. The datable ceramics show a chronological distribution from the Roman period up to the Byzantine period, perhaps also the 8th century. The finds from the enclosure, brittle ware (40) and coarse ware (23) show almost the same chronological distribution, late Roman to Byzantine period.

Conclusions:

Akerem with its monumental structures must have been an important site in antiquity, and its existence must be related some way or another to the water resources in the spring area. The function of the monumental building is unclear. The large marble door may indicate a temple, but we do not know if it secondary to the original building. It may have been brought to the site at a much later date from another place, as an example Palmyra itself.

The terracotta water pipes from the tell area and the two small rooms in the eastern tell with hydraulic construction may indicate the existence of a bath, which is also known west of Palmyra from the Umayyad period. However, no surface finds can be related to the early Islamic period, where the site seems to have lost its importance.

The function of the buildings south of the tell, and the exact chronological relationship to the monumental building, are uncertain, but as they share the E wall with the enclosure they must be related.

The enclosure must have been intended for more than just animals, and an educated guess of its function is that of a garden, which has also received water from the springs via the aqueduct, as no wadis lead to the area from outside. The dimensions of the aqueduct are not impressive, but a steady flow of water all the year from the spring area would be sufficient for both a bath in the tell and a garden at a lower level, perhaps reusing the water. No water systems are visible at the surface E and SE of the tell in the direction of the large enclosure, apart from the find of one fragment of a terracotta water pipe, but the original context is uncertain. It may have come from the tell area.

The rock cut tombs and the cressets indicate that already in antiquity a path lead up to the plateau above from Akerem.

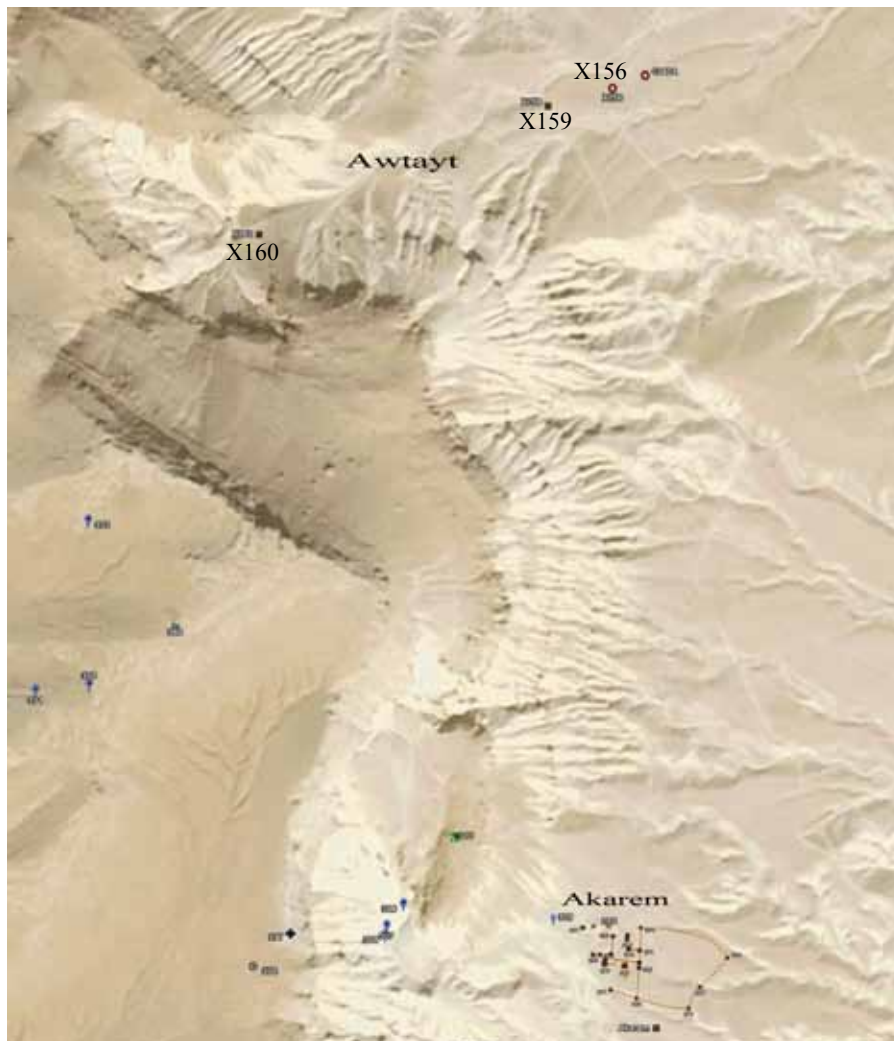
AWTAYT

Surveyed by AA, KB. April 23, 2009, and JCM October 2009.

GPS: N34 70119 E38 18266.

Map: 1:100.000 I-37-41. 38419, 74251.

1.2 km NW of Akerem, where Jebel Abyad turns towards the NW, a ravine from the face of Jebel Abyad leads down into a broader wadi to the east. There are water bearing layers at the top of the ravine, producing small ponds of water and green patches. There are no signs of wells or cisterns.



1. Monumental structure.

GPS X160: N 34.701329 E38.183004.

Close to the spring area at the southern slope of the ravine the locals have done some digging on a small plateau, and have exposed 6 chiseled blocks of stone, now scattered in the area. Two of the blocks are clearly thresholds to a door, with distinct holes for the door pivot. The diggings have not revealed any traces of walls.

Finds and chronology: Fragment of a bowl, red clay, rim and handle, a cooking pot from the 2nd or 3rd century AD, and a rim fragment of late Roman coarse ware.



Awtayt spring area. Architectural fragments.

2. Monumental structure.

GPS X159: N34.70392 E38.18943.

South of the wadi at the open plain, about 650 m ENE of the spring area, several modern diggings, which has exposed three chiseled blocks of stone, ca. 1 m long. Two of them are clearly doorposts or thresholds. The third one may have shell-like elaboration at the top. Perhaps there are traces of a circular structure, but the area has been heavily disturbed.

Finds and chronology: 3 pieces of uncharacteristic well burned red brittle ware. Probably late.



Awtayt wadi area. Architectural fragments.

3. Corral 322.

GPS X156: N34.70417 E38.19057.

Circular stone setting with adjoining smaller stone setting at the N end.

Finds and chronology: 5 pieces of uncharacteristic red well burned brittle ware. Probably late. The relation to the coral is uncertain.

Conclusion:

The function of the monumental structures cannot be established, but the structure in the ravine close to the water bearing levels can undoubtedly be related to the water resources. The structures at the plain probably also got water from the springs, some way or another.

BIR AL-DNEJN

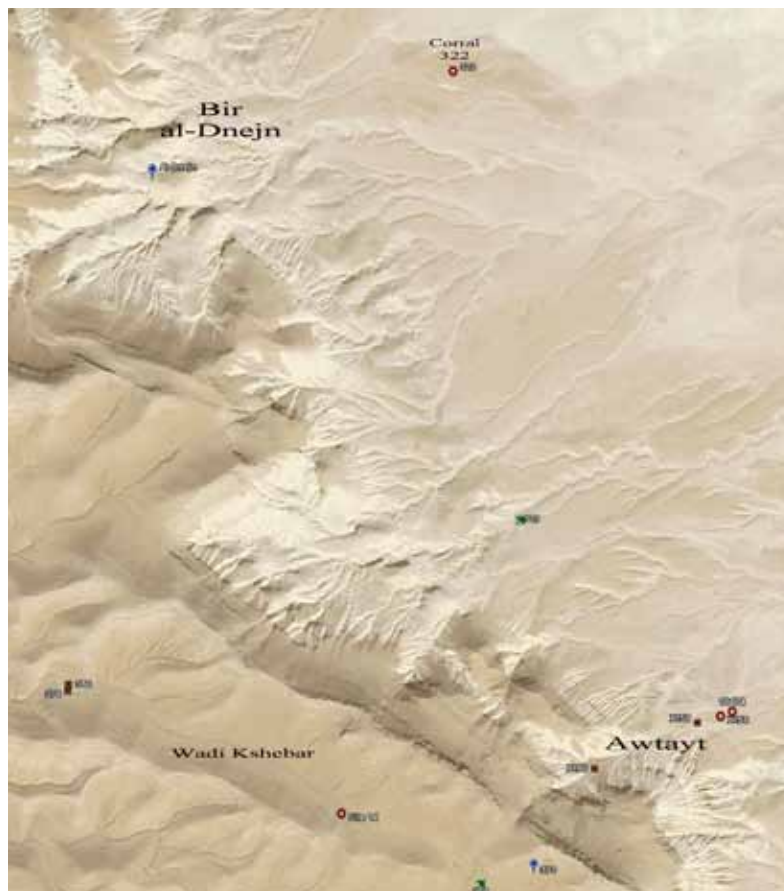
Surveyed by EHS, ES, JCM. April 23, 2009.

GPS 324: N34.72814 E 38.1650.

Map: 1:100.000 I-37-41. 38442 74228.

The site is marked on the map as a spring area in a semicircular valley into the Jebel Abyad range about 21 km NW of Palmyra, about 3.3 km NW of Awtayt and 2 km SE of Majouf. No structures were discovered in the area, which is difficult to access with deep ravines.

Finds and chronology: None.



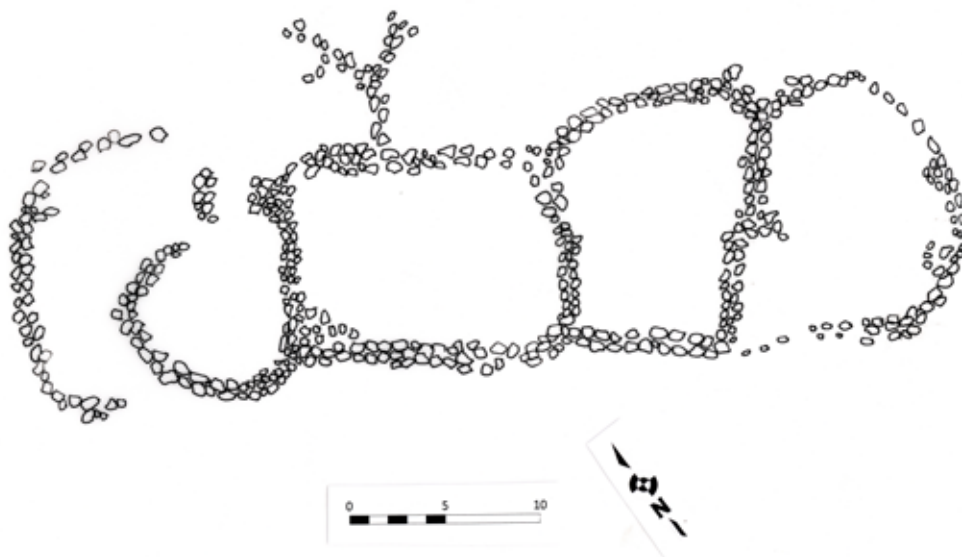
Corral.

Surveyed by EHS, ES, KB, JCM. April 23, 2009.

GPS 322: N34.73046 E38.17734, altitude 759.

The corral lies on a low hill in the open landscape below the al-Dnejn spring area. It is 50 m long, about 15 m broad, divided into 5 sections.

Finds and chronology: Large amounts of brittle ware (100) were collected from the area and coarse ware (13), and a small turquoise pearl. The finds show a large chronological distribution from Roman to Byzantine period. As no finds were registered outside the corral area, the corral must be dated to this period.



MAJOUF

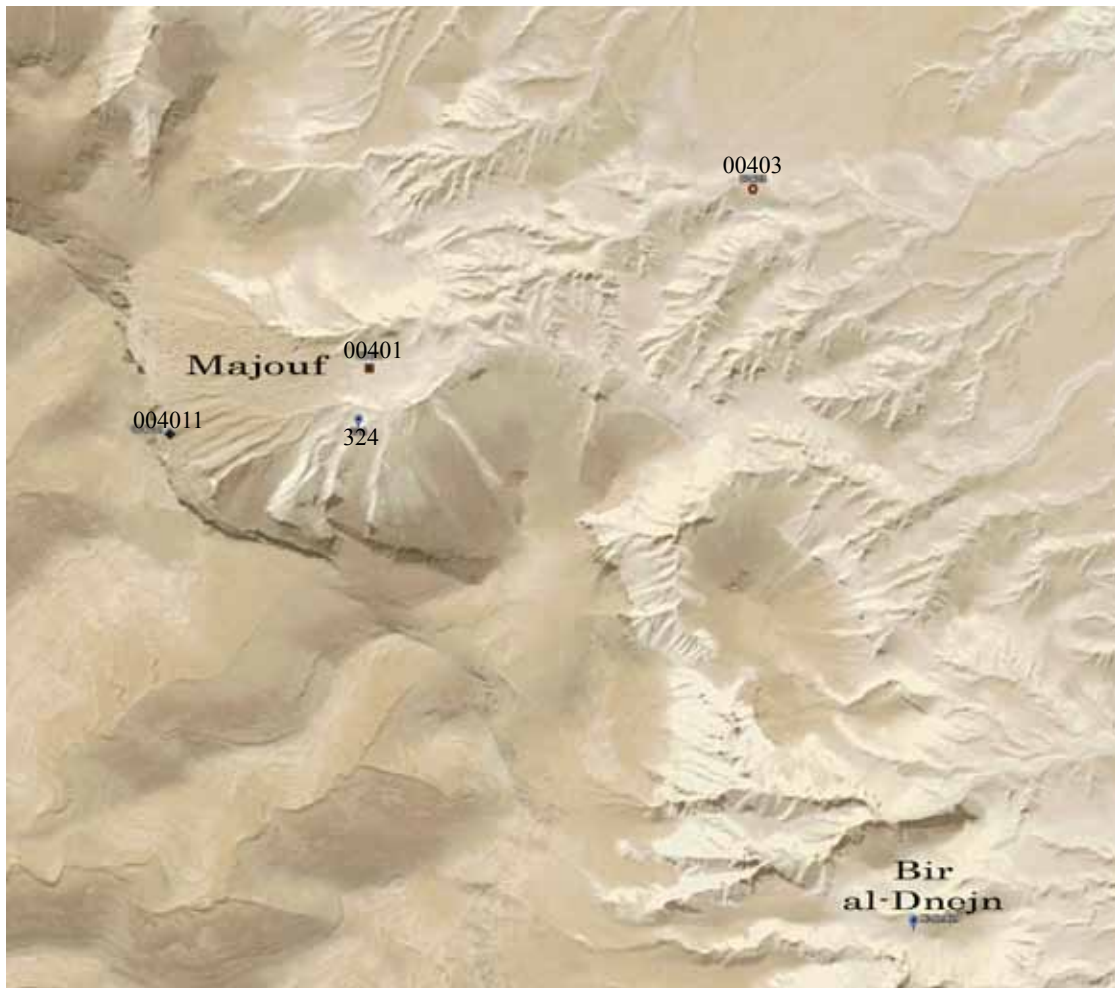
Surveyed by JCM. October 11, 2009.

GPS 324: N34.7407 E38.1577

Map: 1:100.000 I-37-41. 38459 74221.

The site lies in a semi circular valley into the Jebel Abyad range, 22 km NW of Palmyra, 1 km E of the Shalalah plain, from which it is separated by high mountains and a steep face. The area is intersected by deep ravines from the mountainside creating an oblong tongue from the mountainside in the center. There are several springs in the area, which are marked on the map.

The site was visited shortly at distance in April, but survey was not possible due to the breeding season of the Balded Ibis. In October JCM had access to the valley and made a rough registration of the structures at the site.



1. Building

GPS 00401: N34.736694 E38.149911, altitude 905.

On the oblong tongue there are several walls from a small building, about 13 m long and 8 m broad. Modern diggings in the W part reveal deep foundations and accumulation of stones around the bases of the walls indicate a more solid construction in the height. The building is divided into three rooms. In the E part two adjoining rooms NS, width about 3 m, length about 7 m with rectangular corners. The

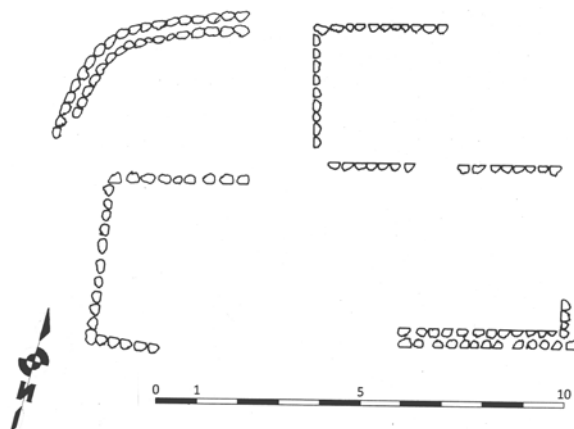
N wall of the W room flushes with the wall between the two eastern rooms, but the NW corner is not rectangular, and the W and S wall have a W inclinations. The relation between the W and E part of the building cannot be established. NW of the building a stretch of a curved wall about 6 m long, with outer bigger stones and a filling of smaller stones in the middle, thickness varying between 45 and 50 cm. It seems to enclose the space between NW corners of the E and W part of the building, but the exact relation to the walls cannot be determined.

The exact layout and purpose of the compound are uncertain, but the finds of a fragment of a terracotta water pipe and pieces of water proof plasters in the digging-up around the building strongly indicate a hydraulic function.

Finds and chronology: Terra sigiliata (2), brittle ware (4), coarse ware (6), reddish coarse ware with white slip (2), terracotta water pipe, inner diameter 12 cm, thickness 3 cm, fragments of watertight plaster. Date: Roman to late Roman.



Majouf. NW corner of building.





Majouf. The valley seen from the E.

2. Well

GPS 324: N34.735549 E 38.149640, altitude 888.

The well lies just N of a wadi coming from the mountainside about 100 m SW of the building. It has a circular opening, about 1 m in diameter, constructed by large slabs of stones, and is well dressed by smaller stones down to the water level 1.5 m below. There are no signs of catch arms and the well is not bottle-shaped, indicating that the water comes from water-bearing strata. It can be compared to the wells in the spring area of Shalalah.

Finds and chronology: None.



Majouf. Well.

3. Rock cut tomb

GPS 004011: N34.735317 E38.145307, altitude?

Just below the ridge of Jebel Abyad a rock cut tomb is visible from the plain below. The door opening to the tomb is well elaborated. Access to the tomb needs climbing equipment and the tomb was not investigated.

Finds and chronology: None.



4. Corral

GPS 00403: N34.740072 E38.158724, altitude 799.

Small circular corral, diameter about 20 m.

Finds and chronology: None.

Conclusions.

The existence of a small building high up in valley and the existence of water pipe must be related some way or another to the water resources in the spring area. The function of the building is an open question.

OTHER SITES

1. Islamic graves.

Surveyed by EHS, ES, JCM. April 23, 2009.

GPS 313: N34.71215 E38.18064, altitude 772.

2.5 km NNW of Akerem.

Finds and chronology: Some finds of uncharacteristic brittle ware and coarse ware in the area, but no ancient structures are visible.

2. Corral.

Surveyed by JCM. October 11, 2009.

GPS 00409: N34.758504 E38.159043, altitude 766.

The corral lies at the foot of a low hill in the open landscape about 4 km E of Shalalah. About 45 m long and 20 m broad, divided into several circular sections.

Finds and chronology: none.



Corral 00409. Seen from NNW

3. Building?

Surveyed by JCM. October 11, 2009.

GPS 00413: N34.790412 E38.124191, altitude 850.

On a small conical hilltop in the NW part of Wadi Abyad, where it turns to the W towards the watershed, about 4.3 km N of Shalalah, there is an accumulation of stones. Some of the stones seem to form a corner. The stones are not natural at the site and there must have been some structure at the hilltop, but the site is heavily disturbed.

Finds and chronology: none.



Building 00413. NW corner.



Building 00413. Hilltop seen from the W.

THE WESTERN SIDE OF WADI ABYAD. CONCLUSIONS

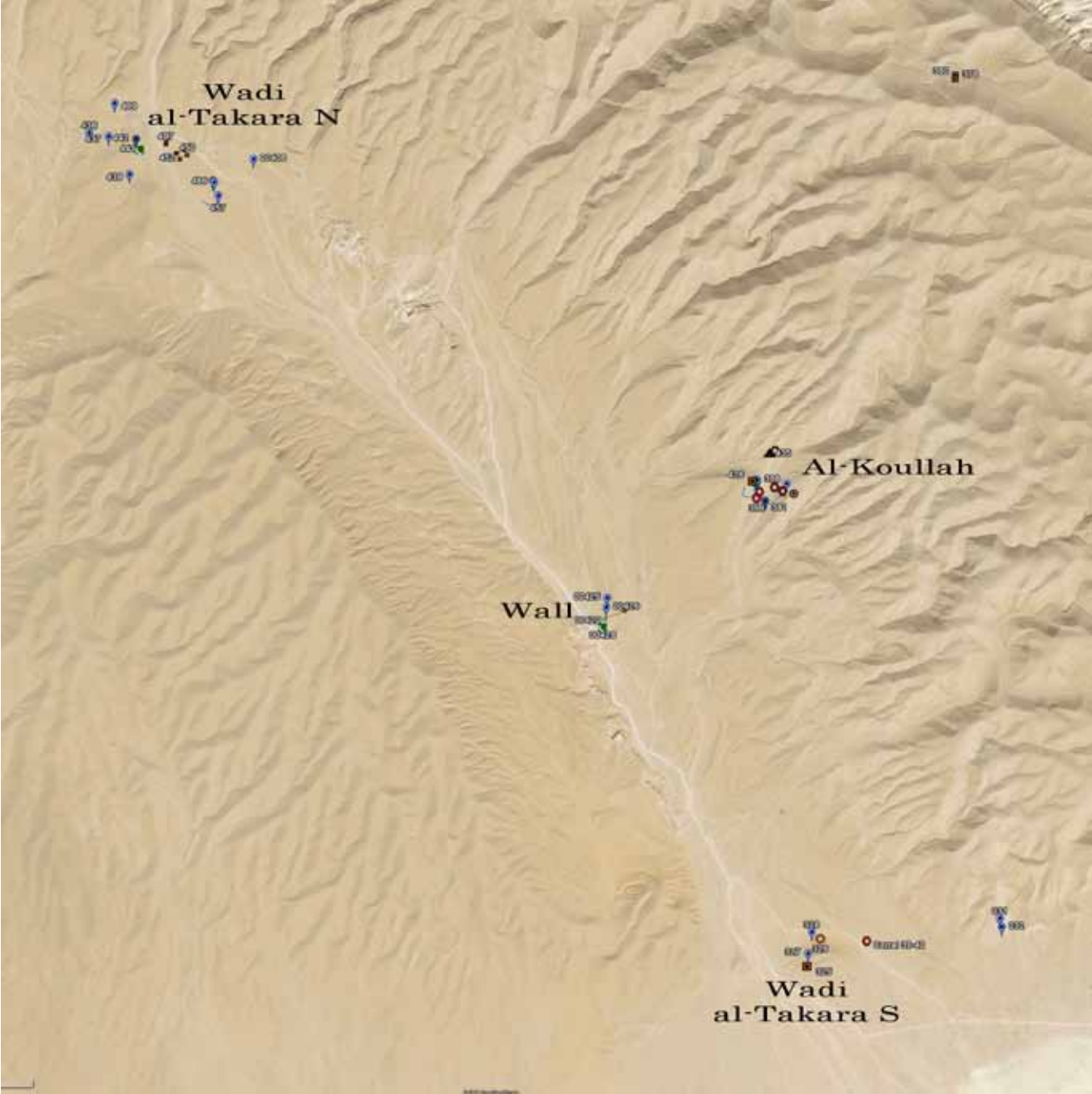
The area covered by the survey in Wadi Abyad is a huge area, E-W from the ridge of Jebel Abyad down to the Wadi Abyad, about 4 to 5 km, N-S from the dam north of Palmyra up to Shalalah or Ouéchel, about 15 km. The landscape is an undulating landscape cut E-W by the wadis coming from Jebel Abyad. The surface of the landscape is relatively uniform: a smooth surface covered with small stones and very sparse vegetation, such as grassroots below the surface and plants in the wadis. The remains of human activities are surprisingly few, also corrals and wells/cisterns, and there are only few traces of former Bedouin camps in the area. Down in the wadi bed itself, however, there are several wells, also marked on the map. The area is not a superb grazing ground according to the Bedouins, even if a few families have settled close to the springs, and according to local information Wadi Abyad was not used for agriculture during the experiments in the 1960'ies. In recent times there is only one garden enclosure in the middle of Wadi Abyad fed but water pumped up from the ground.

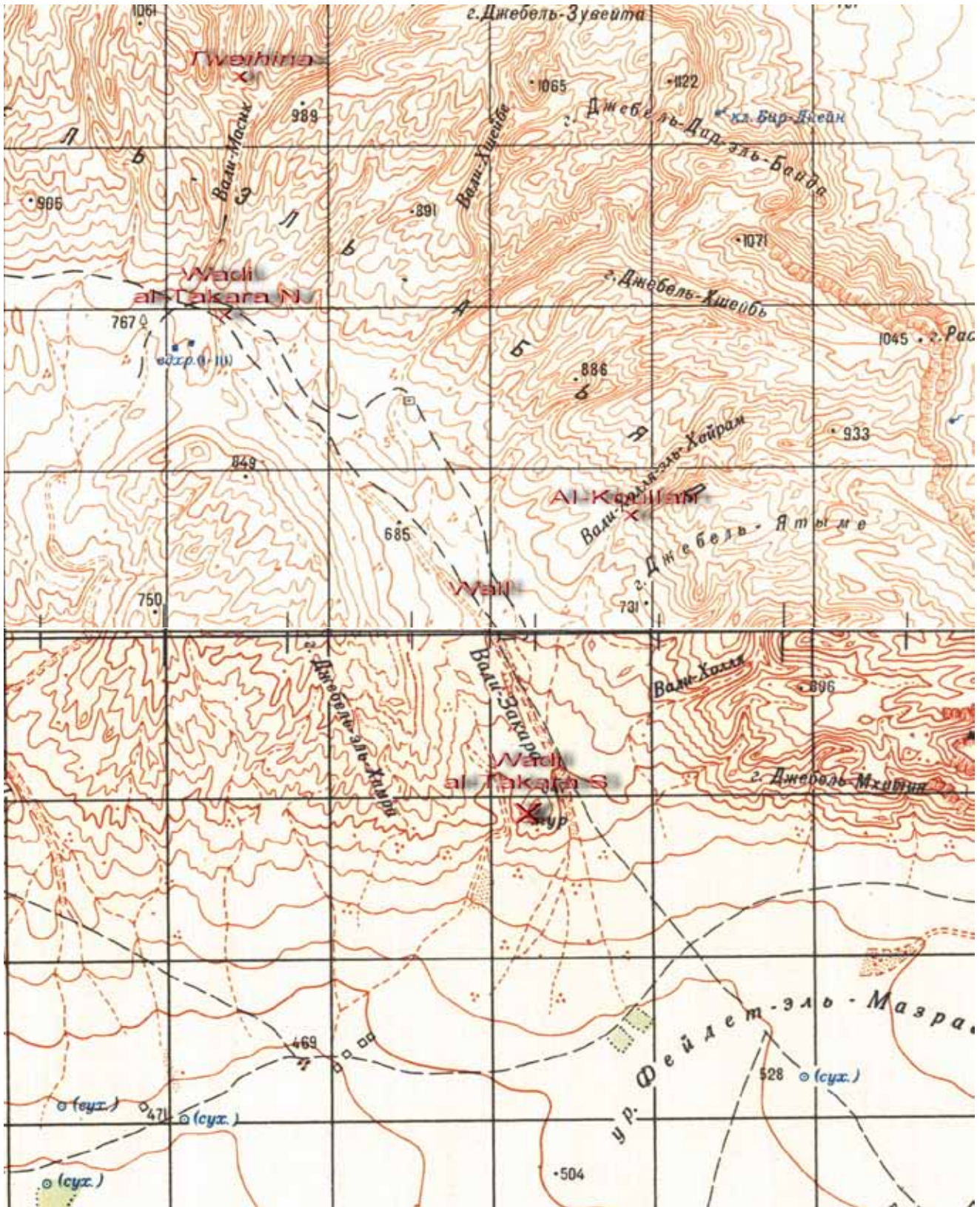
The rather limited scale of human activities in the Wadi Abyad area is due to the fact that most of the precipitation in the Jebel Abyad mountains flows towards Wadi al-Takara in the west, not down into the Wadi Abyad. The Jebel Abyad range forms a steep face to the east. This may also explain why the wadi system around Akerem obviously has not changed much since antiquity.

Human activities seem to be limited to areas related to the springs in Jebel Abyad, at Akerem, Awtayt, Majouf and probably also at Bir al-Dnejn, in antiquity as in modern times. The Shalallah plain, surveyed in 2008, is not dependent on the springs nearby, but receives water from the surrounding mountain sides and in the 1960'ies there were even experiments with agriculture here (barley). The amount of water coming from the springs has clearly declined during the last hundred years. Musil (Musil 1928, 148-149) thus describes how green meadows in the northern part were irrigated by the springs of Shalalah (Ouéchel) leading down into the Wadi Abyad area. The survey found no remains of human activities at the plain below the spring area at Shalalah, even if there are remains of some kind of aqueduct system close to the spring area (Se 2008 report p. 29).

The spring areas were obviously used in antiquity, which are also attested by the terracotta water pipes at Akerem and Majouf, but from a larger economic point of view the area must have been marginal compared to the area to the west and northwest, especially in Jebel Chaar where we have a very high concentration of villages or estates with a very short distance between them.

WADI AL-TAKARA





1:100.000 I-37-41 and I-37-53 Every square is 2 x 2 km.

WADI AL-TAKARA SOUTH

Surveyed by AA, EHS, ES, KB, JCM. April 25, 2009.

GPS: N34.64211 E38.14544.

Map: 1:100.000 I-37-53. 38359 74205.

The site lies 16.2 km from Palmyra, equivalent to half a day's travel, at the western side of the very mouth of Wadi al-Takara, on and around a small hilltop overlooking the great plain west of Palmyra. The wadi system surrounds the hilltop to the west and east before it enters the great plain. There are several Bedouin camps south of the site in the open plain, which is good grazing ground some parts of the year, but only one safely identified cistern was registered in the area, and the Bedouins rely on water brought out by truck.

On the Russian map some ancient remains are marked in the area.

The site consists of the following:

1. Building on hilltop.
2. Cistern N of the building.
3. Possible cisterns or wells NNE of the building.
4. Oval structure NE of the building.
5. Series of corrals ENE of the building.
6. Cisterns E side wadi.



1. Building on hilltop.

GPS 325: N34.64211 E38.14544, altitude 584.

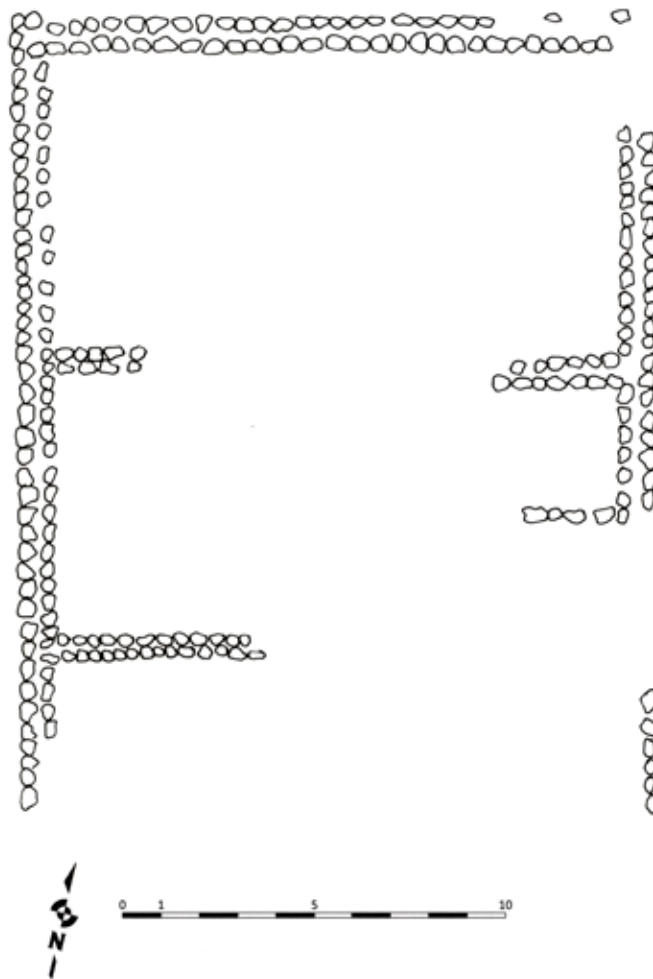
On the western part of the hilltop remains of a rectangular building, orientated N-S, with bases of walls with outer bigger stones and a filling of smaller stones in the middle. The N wall, thickness 90 cm has a length of 17 m with clearly marked corners. The E and W wall, thickness 90 cm, can be followed for about 21 m. The southern part of the building has eroded away, and the exact length of the building cannot be determined. There are several remains of inner walls, dividing the building in 7m long sections. To the W to stretches, thickness about 50 cm, to the E also two stretches, one of them 80 cm thick. The layout of the interior cannot be determined, but there do not seem to have been any interior courtyard. The building does not seem to part of a larger complex, as there are no traces of walls around the building.

The cultural layers at the hilltop are very thin due to the erosion. Especially in the western part of the building the walls are surrounded by stones, which must originally have been part of the construction. This may indicate a more solid construction in the height, or perhaps the existence of a staircase to an upper floor.

Finds and chronology: Brittle ware (28), coarse ware (33), fragments of grinding stones. The datable pottery belongs to the Roman period. However due to the heavy erosion of the hilltop the upper chronological limit is uncertain, as later layers may have been washed away.



Wadi al-Takara S. Building on hilltop seen from NE. The plain W of Palmyra in the background. In the foreground to the right cistern 327, catching the water coming from the E.



Wadi al-Takata S. Plan of building on hilltop.

2. Cistern N of the building.
GPS 327: N34.64233 E38.14548, altitude 577.

24 m N of the building at a lower level at a depression a cistern, circular opening 1.20 m in diameter, cut into the rock, flask shaped. Depth to the silt 2.80 m. The cistern has recently been cleaned, leaving debris of earth to the W, and must still be in use, even if it was dry in April 2009. The cistern catches water from a small 500 m long wadi coming from the hilltop towards the E. There are no traces of constructed catch-arms.

Finds and chronology: Brittle ware (3), coarse ware (58) and plastered pieces from the debris. Datable pottery belongs to the Roman period.



Wadi al-Takara S. Cistern 327.

3. Possible cisterns or wells NNE of the building.

GPS 328: N34.64385 E38.14581, altitude 577.

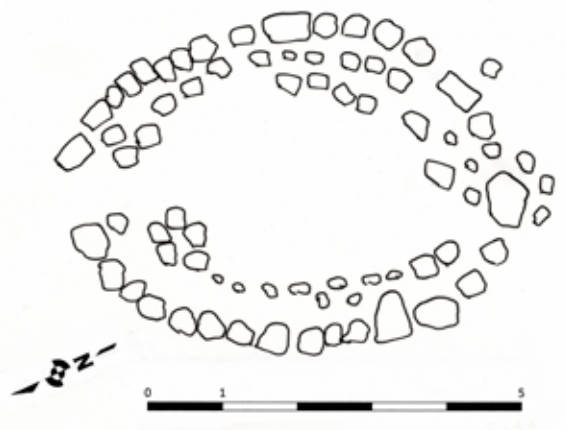
200 m NNE of the building several low broad circular depressions in the landscape, which may have been wells or cisterns.

Finds and chronology: None.

4. Oval structure NE of the building.

GPS 329: N34.64403 E38.14656, altitude 573.

Oval structure, length 6.50 m, width 5.80 m, constructed by up to 50 cm big stones in two rows, the outer stones being slightly bigger than the inner ones. The structure is orientated almost NS with an inclination to the E. The purpose of the structure is uncertain.



Wadi al-Takara S. Oval structure seen from the NE and plan.

Finds and chronology: In the area around the structure great concentration of finds: Brittle ware (82), coarse ware (8), green glazed ware, iron fragments, glass. Datable pottery ranges from Roman to late Roman period. At the surface 50 m NE of the structure a Roman follis, 2.40 g, issued by Maximianus (286-305 AD) and 75 m NE of structure an Islamic bronze coin, probably from the Mameluke period.



Roman follis. Maximianus (286-305)



*Islamic coin.
Mameluke period?*

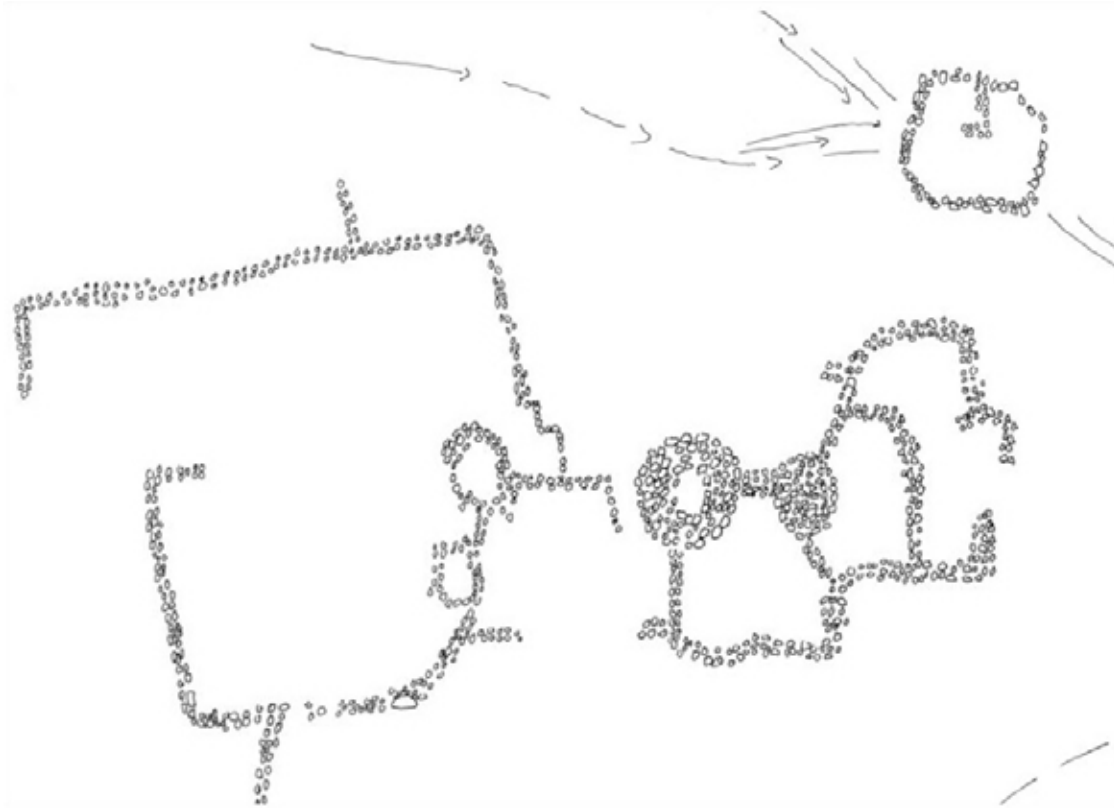
5. Series of corrals NE of building.

Surveyed by: ABK, KJH, HMHR, NA

GPS Corral 39-40: 34.643871 E38.150588, altitude 730.

The corrals is located 500 m NE of the building at the hilltop, around two cairns (See prehistoric report site 13, cairn 39-40). In the west there seems to be some kind of courtyard, with a number of smaller structures to the S. About 30 m to the NE a small corral in the middle of a small wadi is separated from the rest.

Finds and chronology: 4 iron fragments (a spearhead/arrowhead and one nail), brittle ware, coarse ware, painted ware, dark ware, glazed ware. Some of the pottery may belong to EBA IV, and is probably connected to the cairns. The rest of the datable pottery covers a period from Roman to early Islamic period.



Wadi al-Takara S. Corrals 39-40 built around cairns.

6. Cisterns E side wadi.

Surveyed by ABK, KJH, HMHR, NA, April 26, 2009.

Cistern 031: GPS N34.64482 E38.16208, altitude 573.

Cistern 032: GPS N34.66420 E38.16228, altitude 561.

On the E side of the wadi mouth at the SW corner of Jebel Abyad facing Wadi al-Diva there are two cisterns at the mouth of a small steep wadi, with several catch-arms. Just south of cistern 031 there are walls of rocks which have been filled with soil as small terraces, height 0.2 – 1.5 m. Cistern 032 is located about 50 m to the S with 2 roughly cut troughs. The biggest one has a diameter of about 0.8 m and 0.5 m high; the smaller one is 0.4 m high and 0.3 m wide.

Finds and chronology: none



Wadi al-Takara S. Cistern 031 and 032. SW corner of Jebel Abyad.

Conclusions:

The building at the hilltop does not seem to have been a center of any strictly economic activities in the area. It is not part of a larger complex; it does not resemble any of the buildings in the villages of Jebel Chaar or Shalalah and there are no other traces of similar buildings close by. Rather its function should be related to the important communication route from Palmyra to the N and NW, through Wadi al-Takara, entering the Jebel Abyad range through Wadi al-Masek, passing the stronghold Tahoun al-Masek (Twehina) and al-Matna, on its way to Jebel Chaar and the broad valley between Jebel Chaar and Jebel Merah. It has a strategic position on this route half a day's travel from Palmyra, commanding the entrance to Wadi al-Takara, also with an excellent view to the south from the hilltop as far as the low mountain range 6 km away NW of Palmyra, where the route crossed on its way to the NW, and where the modern road leads up to Wadi Abyad. At the Russian map from 1962, revised in 1981, some ancient remains are marked at this point, but they are no longer visible, probably due to the construction of the modern road. Also to the north there is an excellent view to all main routes in Wadi al-Takara.

The cistern demonstrates the ability to collect water, if necessary, even from smaller wadis and lower hilltops in the landscape, but access to water must have been a problem some parts of the year, if this has been the only source. However, Wadi al-Takara is the most important outlet for the seasonal rainfall from the eastern part of Jebel Abyad range to the ridge at Wadi Abyad, as far north as al-Matna and Shalalah, before it enters the huge plain W of Palmyra, and wells and cisterns close to the wadi area, which have not been maintained regularly by the locals, would have disappeared completely during the seasonal flows.

The relatively high concentration of surface finds, and their diversity, around the structures in the area, testifies to the importance of the position of the building at the hilltop, which goes back into the Roman period. The activities in the area at such continued up into the late Roman period, and early Islamic period, as testified by the Islamic coin and the finds in the series of corrals NE of the fort.

AL-KOULLAH

Surveyed by AA, EHS, ES, KB, JCM. April 28-29.

GPS: N34.67581 E38.141304.

Map: 1:100.000 I-37-41. 38395 74213.

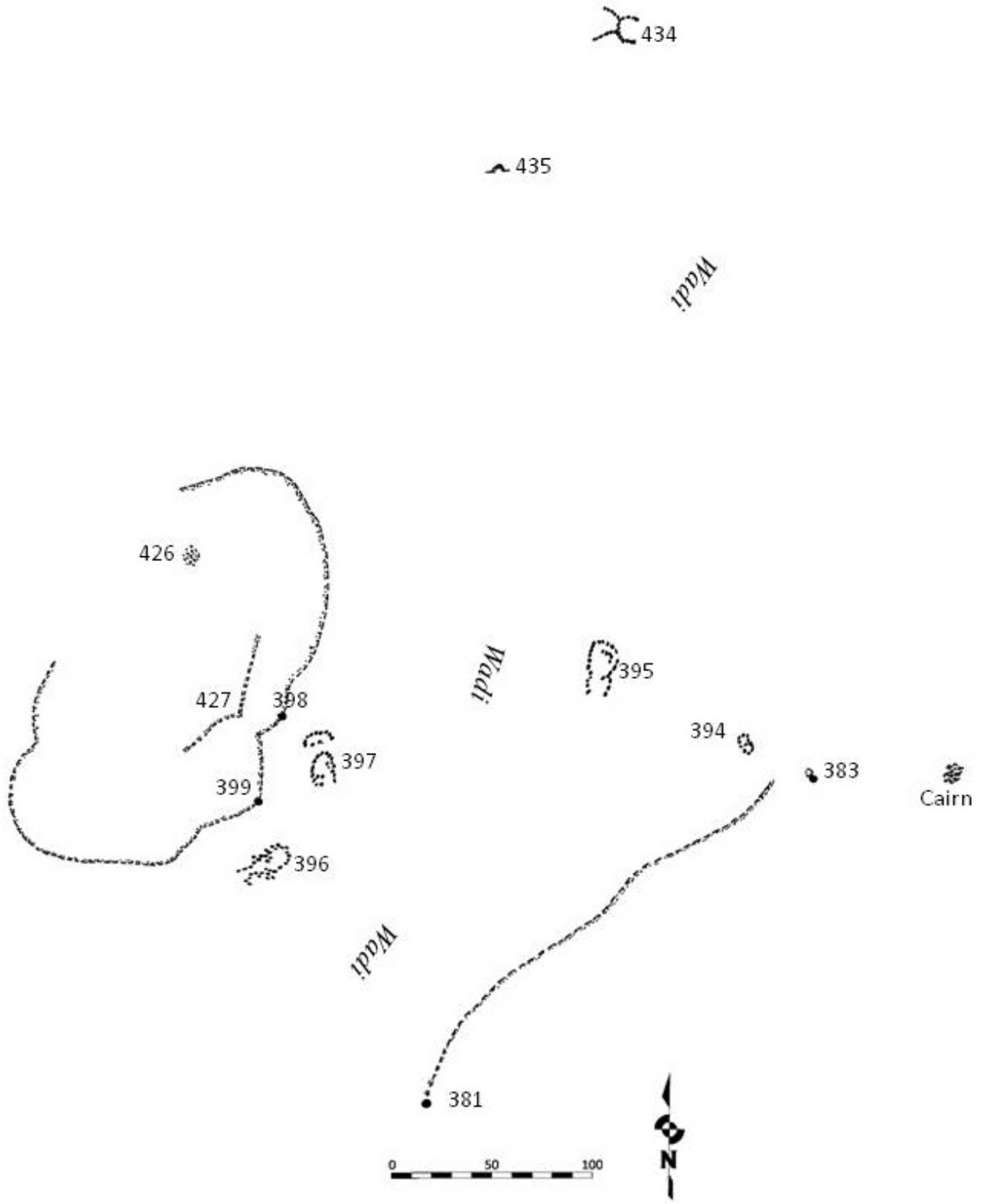
The site lies about 1 km NE of the opening of Wadi al-Koullah. The wadi comes from the plateau of Jebel Abyad to the E and meets Wadi al-Takara 2.7 km north of the building at Wadi al-Takara south. It is surrounded by low hills before the wadi enters the Jebel Abyad range turning up towards the NE. To the W a marked hill has an almost vertical face down to the plain and wadi area below. The structures are on both side of Wadi al-Koullah, which at this section is orientated almost SW-NE with a width of about 60 m.

A modern stone- and mud brick house has been constructed on a plateau on the E side of the wadi 200 m to the S, and the local Bedouins still maintain the old systems in the area.

The site consists of the following:

1. Cisterns and water catching systems.
2. Corrals.
3. Structure on hilltop W of wadi
4. Rock shelter W of wadi.





1. Cisterns and water catching systems.

Cistern 381 (E of wadi).

GPS 381: N34.67451 E38.14176, altitude 697.

The cistern is at the foot of the hillside, 0.60 m from the E bank of the wadi. It is bottle shaped with an oval opening 90 cm x 75 cm, 70 cm deep, covered with plaster inside. Depth to water level about 3 m. The top is covered with modern concrete and an iron lid.

The catch-arm runs NE diagonally up the hillside, length 230 m. The canal is cut into the rock at several places, but otherwise supported by outer larger stones towards the wadi.

Finds and chronology: none.



Al-Koullah. Catch-arm of cistern 381 seen from SW. At the top cistern 383.

Cistern 383 (E of wadi).

GPS 383: N34.67573 E38.14363, altitude 724.

The cistern is situated near the start of catch-arm cistern 381 on the E-side wadi on a slightly sloping plateau towards the wadi. It is cut into the rock with a depth of 2.10 m down to the silt. The cistern widens to north creating a bottle shaped interior. The opening is highly irregular 0.90 x 1.60 m. In the NE corner a 10 cm broad cutting for leading water into the cistern, and from the NW corner a 4 cm wide and 2 cm deep canal extends 3 m to the NW. There are several small canals cut into the rock NW of the cistern, but no distinct catch-arms. The catch area for the cistern is limited to the plateau N of the cistern.

Finds and chronology: none.

Al-Koullah. Cistern 382



Cistern 398 (W of wadi).

GPS 398: N34.67599 E38.14111, altitude 709.

The cistern is at the foot of the vertical face of hill W of the wadi. It has a modern concrete opening and is closed by a metal lid. The inner dimensions are unknown.

A 180 m long catch-arm runs to the N at the foot of the hill, turning NW and W diagonally up the hill, and SW up towards the hilltop embracing the northern part of the hill. It is cut into the rock and supported with an outer lower wall of large stones.

A short catch-arm runs 9 m to the S meeting the short northern catch-arm of cistern 399. The catch-arm receives water from the plateau above and catch-arm system 427.

Finds and chronology: none.



Al-Koullah. Northern catch-arm of cistern 398. Overview from the east.

Cistern 399 (W of the wadi).

GPS 399: N34.67569 E38.14100, altitude 709.

The cistern is at the foot of the vertical face of hill W of the wadi 40 m south of cistern 398. It has a modern concrete opening and is closed by a metal lid. The inner dimensions are unknown. SE of the cisterns a sarcophagi shaped trough, 2.60 m long, 0.90 m broad with a depth of 35 cm, and a oval trough, 0.90 m long and 0.50 m. broad with a depth of 0.30 cm. They do not seem to be modern troughs.



Al-Koullah. Cistern 399 with troughs. Seen from NNW.

A 200 m long catch-arm embraces the southern part of the hill. It runs 24 m S to the vertical face of the hill. 1 m above it continues to the W for 62 m up to the plateau, where it turns N. Here it is cut into the rock with a low outer stone wall support.

A short catch-arm runs 27 m to the N meeting the short southern catch-arm of cistern 398. The catch-arm receives water from the plateau above and catch-arm system 427.

Finds and chronology: none.

Catch-arm system 427 (W of the wadi).

GPS: N-limit: N34.67634 E38.14101, altitude 726.

S-limit: N34.67588 E38.14066, altitude 723.

Outlet: N34.67597 E38.14088, altitude 719.

The catch-arm system is on the W side of the hill, on the plateau above cistern 398 and 399. The outlet of the system is just above, where the southern catch-arm of cistern 398 and northern catch-arm of cistern 399 meet about 10 m below at the foot of the vertical face of the hill.

From the outlet a catch-arm runs 43 m towards the north, and another one 28 m towards the south. The catch-arms are slightly cut into the rock and supported by an outer well maintained wall composed by small stones and earth.

Finds and chronology: none.



Al-Koullah. Outlet of catch-arm system 427 towards the cistern 398 and 399 below. In the distance cistern 381 with catch-arm.

2. Corrals

Corral 394 (E of wadi).

GPS 394: N34.67587 E38.14332, altitude 724.

The corral is on the relatively steep rocky slope down to plain E of the wadi. It consists of 2 irregular circular interlocked enclosures or rooms about 5 x 5 m each.

Finds and chronology: none. Corral 395 (E of wadi).



Al-Koullah. Corral 394, plan and seen from ENE.

GPS 395: N34.67615 E38.14261, altitude 719.

The corral lies at a plain in the wadi area E of the wadi bed. It is about 21 m long and 15 m broad, consisting of a N oval enclosure and a S circular enclosure open to the south.

Finds and chronology: Brittle ware (10), coarse ware (12). A single shard can be dated to late Roman/Byzantine period.



Al-Koullah. Corral 395, plan and seen from E.

Corral 434 (W of wadi).

GPS 434: N34.67874 E38.14266, altitude 721.

The corral lies 300 m north of the hill W of the wadi at the foot of a low vertical face of the W bank of the wadi area. It consists of a circular structure about 10 m in diameter open to the east with a short stretch of wall extending 2.5 m towards the NE from the N side, and stretches of walls, about 15 m long, forming a “V” towards the W and the low vertical face of the bank. There is a marked opening in the S wall.

Finds and chronology: none.



Al-Koullah. Corral 434, plan and seen from E.

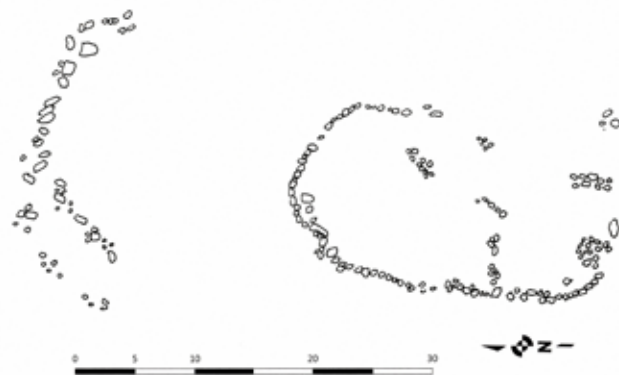
Corral 397 (W of wadi).

GPS 397: N34.67582 E38.14130, altitude 701.

The corral lies just in front of cistern 398 on the sloping plain towards the wadi bed. It is oval in form, about 28 x 12 m, with traces of some inner walls.

About 15 m north of the structure large stones form a 25 m long slightly curved structure open to the S. The relation between the two structures is uncertain.

Finds and chronology: none.



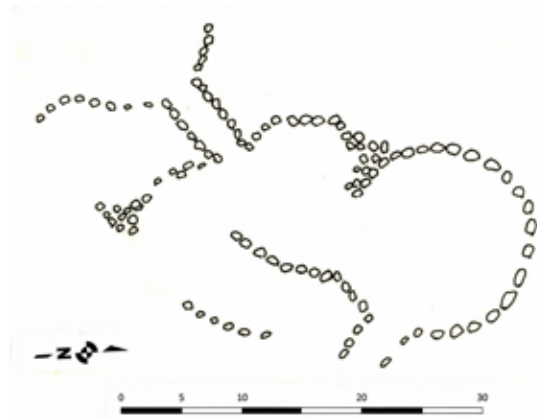
Al-Koullah. Corral 397, plan and seen from NW.

Corral 396 (W of wadi).

GPS 396: N34.67537 E38.14105, altitude 714.

The corral lies just in front of cistern 399 on the sloping plain towards the wadi bed. The stretches of walls show a more sophisticated system. To the N a circular room about 15 m in diameter, with a 4 m broad “corridor” leading to the SE. The room is open to the south and another semicircular room, about 10 m in diameter. To the SW a well marked “corridor”, about 4 m broad and 7.5 m long. Stretches of walls from the end of the corridor show some structure to the SW, but the layout is uncertain.

Finds and chronology: Brittle ware (34), coarse ware (3), red glazed ware, blue glazed ware, fragment of iron hammer head (modern?). The datable shards belong to the late Roman/Byzantine and Islamic period.



Al-Koullah. Corral 396, plan and seen from W.

3. Structure on hilltop W of wadi.

GPS 426: N34.67663 E38.14071, altitude 742.

On the top of the hill W of the wadi a concentration of large stones, the position of which which cannot be natural. It is either a heavily destroyed cairn or remains of some kind of small building.

Finds and chronology: none.

4. Rock shelter W of wadi.

GPS 435: N34.67814 E38.14215, altitude 712.

200 m north of the hill W of the wadi, a smaller hill, with a natural rock shelter in the NE corner. A rough stonewall has been built up to narrow the entrance to the shelter and form protection to the NE.

Finds and chronology: none. The wall is a modern construction.

Conclusions:

Al-Koullah is an impressive site with its sophisticated water catching systems. All the precipitation from the hill W of the wadi is lead to two cisterns. Al-Koullah differ from other sites with concentration of cisterns and water catching arrangement, such as al-Matna, Bir al-Arfa and Twei hina (Tahoun al-Masek), where the water is collected from steep mountain sides. At al-Koullah small differences in height in the landscape are exploited.

What we see today is definitely a recent system still in use, but the troughs in front of cistern 399 and the pottery collected in relation to the corrals, strongly indicate predecessors far back in time, and that at least many of the cisterns have been maintained up through the centuries. At the sites both at Wadi al-Takara South and Wadi al-Takara North (p. 52), pottery from the ancient period is concentrated around cisterns still in use.

As at al-Matna and Bir al-Arfa the amount of pottery from the site is rather limited and there are no fragments of grinding stones. This might suggest that human activities at the site have been more seasonal.

WADI AL-TAKARA WALL

Surveyed by AA, ABK, JCM. October 12, 2009.

GPS: N34.6670 E38.1289

Map: 1:100.000 I-37-41. 38385 74201.



a. Wall.

GPS 00421 NE-end: N34.667406 E38.129637, altitude 654.

GPS 00420 SW-end: N34.666791 E38.127939, altitude 648.

On a low island in Wadi al-Takara 1.5 km SW of al-Koullah a 170 m long rough wall, constructed by large stones, up to 50 cm large, deeply embedded in the ground is visible. It runs WNW across the wadi island in an approximately straight line. It is no double wall with outer shifts and filling in the middle. The ends of the walls are cut off by the wadis.

Finds and chronology: The wall cannot be dated. Some fragments of uncharacteristic brittle ware, coarse ware and grinding stones are scattered in the area.

Wadi al-Takra. Wall. Seen from WSW.



b. Well

GPS 00425: N34.667610 E38.128103, altitude 649.

Completely covered well or cistern, appearing as a crater in the ground.

Finds and chronology: none.

c. Well

GPS 00426: N34.666928 E38.128022, altitude 646.

Completely covered well or cistern, appearing as a crater in the ground.

Finds and chronology: none.

d. Islamic grave field

GPS 00428: N34.666166 E38.127727, altitude 646.

Remains of grave field destroyed by bulldozer.

Finds and chronology: none.

Conclusions:

The wall does seem to be part of a larger enclosure, which are normally constructed by outer shifts of larger stones with a filling in the middle, but it may have had another function. Alois Musil gives the following description of the area W of Palmyra: *At 8.08 (March 20. 1912) we crossed the wide but shallow valley of ar-Raml, in which are ruins of numerous old dams designed to hold back the run-off and prevent the soil from being washed away* (Alois Musil, 1928, 134). The wall cannot have functioned as dam across Wadi al-Takara. That would have demanded a much more solid construction, but it can have prevented the soil from being washed away at high flooding in the rainy season. A system like this is well documented from modern Oman, where several low walls across the larger wadis make agriculture possible (<http://www.hist.uib.no/antikk/oman/Bahla/Ghul/index.htm>). However finds of pottery and fragments of grinding stones in the area, and the existence of wells, also indicate other activities.

WADI AL-TAKARA NORTH

Surveyed by AA, EHS, ES, KB, JCM, JK. April 30, May 01 and 03.

GPS: N34.6998 E38.0908, altitude 778.

Map: 1:100.000 I-37-41, 38415 74168.

The site is located 23 km NW of Palmyra, 3 km S of Tweihina (Tahoun al-Masek) at the beginning of Wadi al-Takara at the mouth of wadi al-Masek, where the wadi system leaves the Jebel Abyad range. The wadi turns to the SE diverging into two branches, which create an oblong 1.5 km long island in the valley tapering to the SE. Big stones in the wadi bed and steep cuttings in the northern side of the island, creating vertical profiles, testify to the huge amount of water passing this point during the rainy season from Shalalah and al-Matna. The course of the smaller wadis and parts of the landscape may thus have changed since antiquity. The western bank forms the watershed to the W towards Jazal.

On the western side of the watershed the Bedouins have erected several small houses for seasonal stay. More resident families have constructed enclosures with small gardens. They rely partly on water from cisterns, but mostly on water brought on trucks. The grazing ground is the mountains to the N and NW, and the slopes of Wadi al-Masek towards Tweihina, where the flocks up through the ages have made paths in the rock.

Some wells are marked on the map. On satellite photos some upcasts and the modern Bedouin constructions are visible W of the watershed and on the island a dark indistinct square in the northern part.

The site can be divided into two areas: The wadi island and the area W of wadi system:

1. Wadi Island.
 - a. Large rectangular structure.
 - b. Wall N of structure.
 - c. Cisterns at the southern part of the island.
 - d. Cistern on wadi island E of the site.

2. Area W of the wadi system.
 - a. Well/cistern SW of wadi system.
 - b. Islamic tombs SW of wadi system.
 - c. Cisterns W of the watershed.



1. Wadi Island.

a. Large rectangular structure.

GPS 445, 448, 450, 452: N34.69989 E38.09087, altitude 778 (NW-corner).

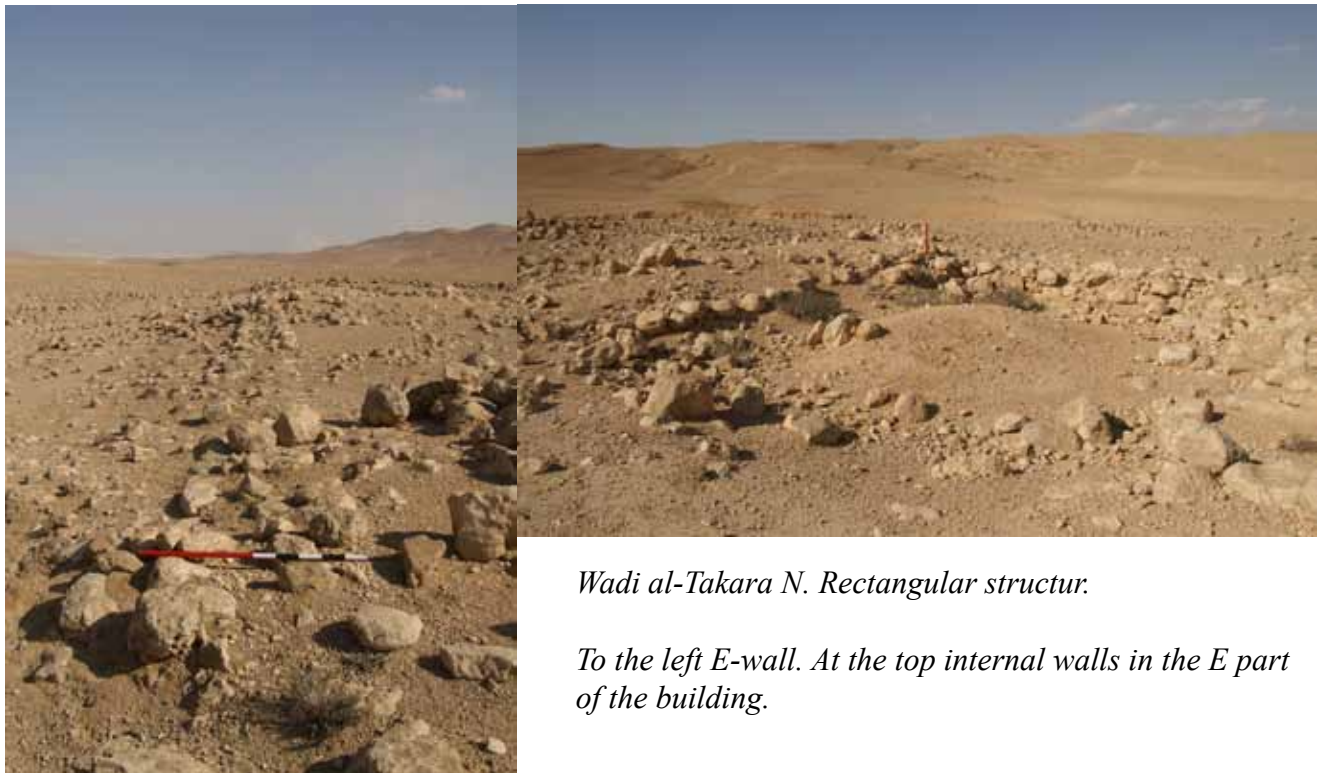
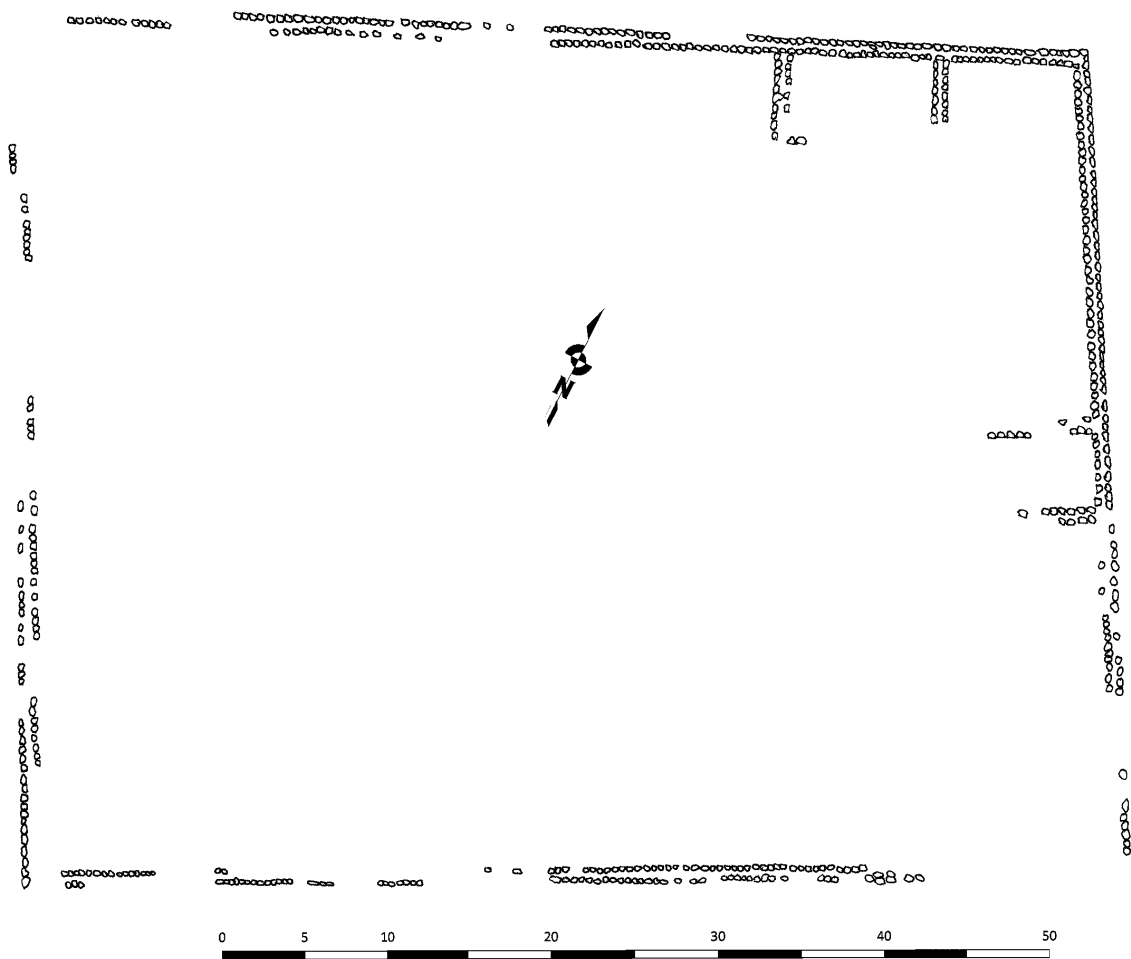
The northern part of the wadi island is covered with larger stones, which are not natural in the landscape. The plain to the south has a smooth, hard surface covered with small stones. Within the stony area well constructed bases of walls, about 100 cm thick, with outer bigger stones and a filling of smaller stones in the middle, forming a slightly trapezoid 66x50x67x53 m rectangular structure, orientated 334° with the long sides orientated E-W. To the north and east, where the cultural layers are thickest, traces of inner walls, rectangular to the outer walls, about 90 to 100 cm thick, showing an internal division into rooms along the outer walls. The distance between the two internal walls at the eastern part is only about 4.80 m, and the position in the middle of the eastern wall indicates the existence of an entrance to the structure.

Inside and outside the structure there are many later corrals constructed by stones from the original buildings. Heaps of stone in the NE corner may indicate a higher wall at the corners, perhaps a tower, and the building definitely has been well constructed also in the height, at least in some parts.

The structure resembles the fort at Shanaeh.



Wadi al-Takara N. Wadi island seen from W.



Wadi al-Takara N. Rectangular structur.

To the left E-wall. At the top internal walls in the E part of the building.

Finds and chronology: Within the structure there was a high concentration of finds: brittle ware (680), coarse ware (144), green and red glazed ware, an iron arrowhead, iron fragments, including nails and tacks, terra sigiliata, a piece of an unidentified bronze coin, diameter 1.3 cm, weight of the preserved piece 0.80 g, probably a late Roman issue. Glass bracelets, glass, grinding stone fragments. Most of the datable finds are from the 1st to the 3rd century with some late Roman-Byzantine ware.



Wadi al-Takara N. Rectangular structur.

Terra sigiliata. Iron fragments.



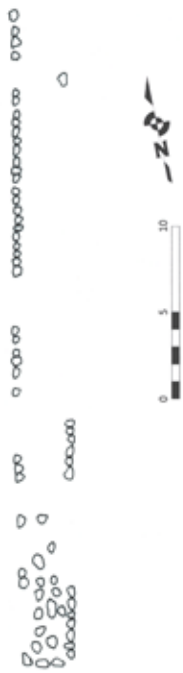
b. Wall N of rectangular structure.

GPS 497, 498: N34.70057 E38.08991, altitude 790 (south end).



Wadi al-Takara N. Entrance to Wadi al-Masek. To the right N end of wadi island with remains of wall.

120 m NW of the rectangular structure a base of a 38 m long wall, almost orientated N-S, about 3 m thick with outer large stones and with traces of smaller stones in the middle. The wall is slightly broader at the middle. The southern end of the wall can be safely identified, whereas the limit to the north towards the wadi is uncertain. There are no traces of any corners or E-W walls. Around the wall there are heaps of large stones, indicating a very solid construction.



Wadi al-Takara N. Wall across northern part of wadi island.

The function of the wall is a puzzle. The thickness of the wall is striking, compared to the structure to the SE and other buildings N of Palmyra, unless it is very monumental buildings like the one at Akerem. However, it has probably not been part of any building, as no corners or other walls can be registered. The thickness of the wall combined with the position at the northern end of the wadi island, at the mouth of Wadi al-Masek, may indicate some kind of protection against heavy flooding in the rainy season. This solution is not satisfactory either. We are at relatively high ground, and the wall is surrounded by a large amount of surface finds, and not only pottery. The function is an open question.

Finds and chronology: Brittle and coarse ware (50), glass, fragments of grindings stones (4). The datable material is from the Roman period.

c. Cisterns at the southern part of the island.

400 m SE of the rectangular structure 3 cisterns are situated at the edge of the open plain, which have a smooth hard surface with small stones. No surface finds between the rectangular structure to the north and the cisterns.

Cistern with long catch-arms.

GPS 457: N34.69622 E38.09443, altitude 759.

The cistern has long catch-arms to the N (104 m) and to the W (129 m) constructed by 30-40 cm large stones. The cistern is bottle shaped, with an opening of 55 cm, made of stones dressed with plaster 1.40 m below the opening. The cistern is still in use, and the depth to the water level is 5.40 m. Close to the cistern an old trough (55 x 45 cm) broken into two fragments.

Finds and chronology: coarse ware (1), brittle ware (5), date uncertain.



Wadi al-Takara N. Cistern 457 with catch-arms at the S end of the wadi island. Seen from the SE. Note the very little difference in height between the cistern and the water catching area.

Cisterns with short catch-arms.

GPS 485: N34.69727 E38.09395, altitude 764.

GPS 486: N34.69716 E38.09408, altitude 764.

Cistern 485 is situated 120 N of cistern 457. It is bottle shaped, with an opening an opening of 70 cm, depth to water level 5.60 m, with two connected stretches of catch-arm walls (length 17 m and 7 m) N of the cistern. A debris of earth close to the cistern to the SE.

Cistern 486 lies 11 m E of cistern 485. It is bottle shaped, with an opening of 55-70 cm, depth to water level 4.60 m. To the N a 11 m long stretch of a catch-arm and 2 troughs, one modern and one ancient, measuring 1.05 m x 0.60 m. A debris of earth close to the cistern to the E.

Finds and chronology: The finds are concentrated in the debris and between them. It comprises brittle ware (10) and coarse ware (32), glass fragments. A few datable shards belong to the Roman and to late Roman/Byzantine period.



Wadi al-Takara N. Cistern 486, with modern and ancient trough.

d. Cistern on wadi island E of the site.

Surveyed by JCM, October 7, 2009.

GPS 00408: N34.698803 E38.097474, altitude 751.

Cistern or well with concrete opening and metal lid on small wadi island, separated from the larger island to the W by a wadi coming from the north. No traces of catch-arms.

Finds and chronology: none.

2. Area W of the wadi system.

a. Cistern SW of wadi system.

GPS 442: N34.70021 E38.08730, altitude 783.

The cistern lies at the eastern side of a small hill at the watershed, facing towards the E, below 2 natural caves in the hill W and SW of the cistern. Remains of a wall, height 1 m, constructed by 20-40 cm large stones, form a half circle to the north around a marked depression in the ground. The original opening must have been at least 4 m. The wall widens up slightly to the bottom, indicating a bottle shaped interior. To the W and S small stretches of stones, but it is not clear if they are part of the opening or if they have surrounded the opening. There are no remains of catch-arms, but the area has been disturbed by recent bulldozer activity.



Wadi al-Takara N. Cistern 442.

Finds and chronology: Brittle (25) and coarse ware (5). The datable shards belong to the Roman period.

b. Islamic graves SW of wadi system.

GPS 441: N34.70012 E38.08763, altitude 780.

The tombs lie 30 m SE of cistern 442, close to the wadi. They are all orientated E-W. Some of them are surrounded by a circular stone row, some of them have a well-constructed rectangular cist. The graveyard has been destroyed by recent bulldozer activity exposing human bones.

Finds and chronology: none.



*Wadi al-Takara N.
Islamic graveyard.*

c. Cisterns W of the watershed.

The cisterns are scattered over a wide area.

Cistern/well 436.

GPS 436: N34.70067 E38.08325, altitude 777.

Cistern or well, completely covered, forming a shallow crater in the surface.

Finds and chronology: none.

Cistern 437.

GPS 437: N34.70041 E38.08491, altitude 782.

The cistern is situated in a small wadi coming from the low hills towards the E is cut into the rock. It is bottle shaped and has an irregular shaped opening. No traces of catch-arms.

Finds and chronology: In the area around the cistern large amount of pottery, Brittle ware (53), coarse ware (23), red glazed ware, a green glass fragment and a fragment of a grinding stone. The datable shards belong to the late Roman/Byzantine period. The red glazed ware to the Islamic period.



*Wadi al-Takara N.
Cistern 437*

Cistern 439.

GPS 439: N34.69772 E38.08674, altitude 772.

The cistern is situated 2 m north of a small wadi running E between 2 hills at the watershed. It is bottle shaped and has a modern opening constructed by concrete. It has no catch-arms, but a shallow canal, dug into the ground connects it to the wadi. A concentration of larger stones in the wadi indicates an older system.

Finds and chronology: In the area around the cistern large amount of pottery, Brittle ware (40), coarse ware (70), red glazed ware and a glass fragment. The datable shards belong to the Roman, late Roman/ Byzantine period, the red glazed ware to the Islamic period.



*Wadi al-Takara N.
Cistern 439*

Cistern/well 499.

GPS 499: N34.70276 E38.08545, altitude 789.

The cistern or well, completely covered, forming a shallow crater in the ground, lies at the southern slopes of Jebal Abyad on the western side of a small wadi coming from the N.

Finds and chronology: none.

Conclusions:

The existence of the large rectangular structure, which can almost certainly be identified as a fort or station, with a great diversity of finds, and the large concentration of cisterns in the area testify to the importance of the area in antiquity. It lies at an important crossroad with control of the entrance to Wadi al-Masek and the corridor from Wadi al-Takara to the valley to the west around Jazal. The route to Jazal is also marked by several Bronze Age cairns, situated on hill tops (see prehistoric report).

The cisterns testify to the ability to catch water even on a plain with very little differences in height. The finds related to many of the cisterns, some of them datable to the Roman period, prove that the water systems in the area, of which many are still in use, go back to Roman times, maintained by the local Bedouins up through the ages.

The cisterns W of the watershed may also have been used by local shepherds with their herds as a watering place, but there are no corrals in the area, like at al-Matna, Bir al-Arfa and al-Koullah (see pp. 33 ff.), where we also find a concentration of cisterns, indicating that the local economic function of the cisterns may have been different.

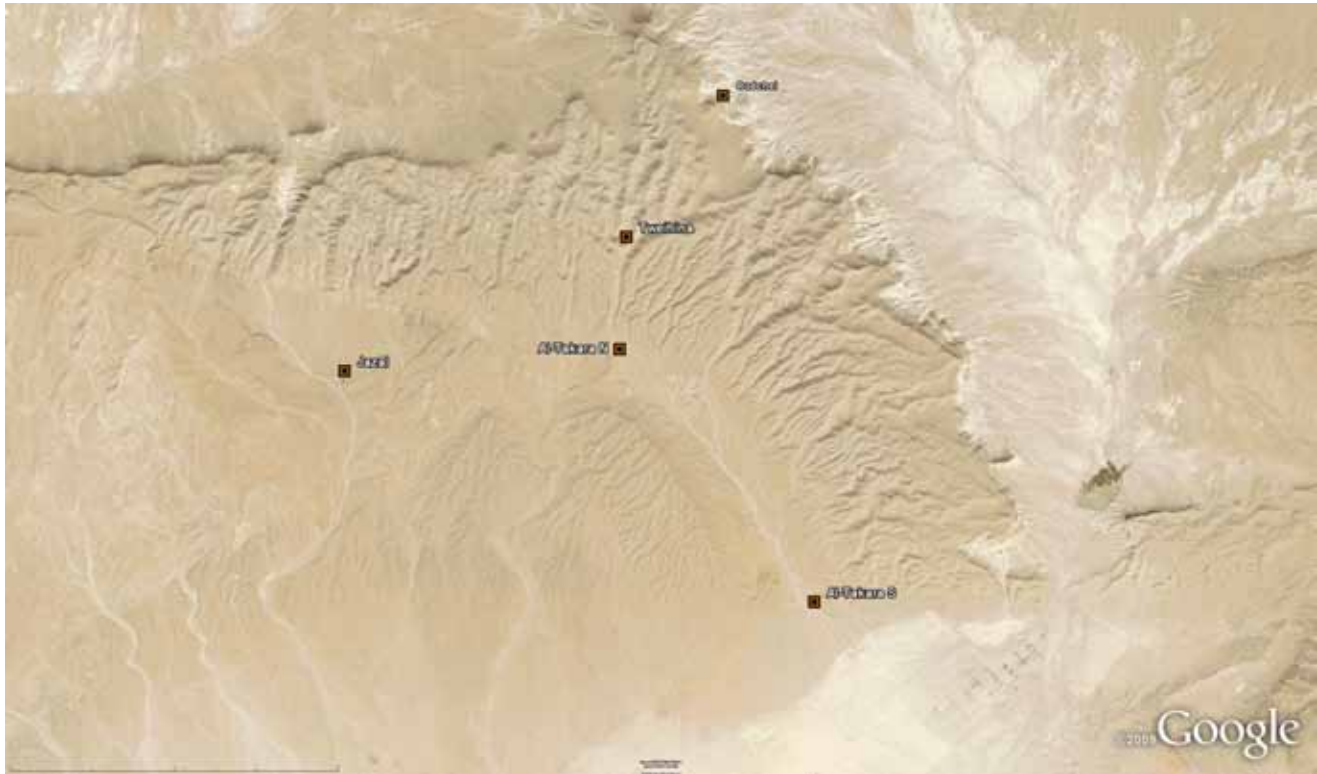
WADI AL-TAKARA CONCLUSIONS

The general ecological conditions in and around Wadi al-Takara have been quite different until recently, from what we see today. Alois Musil (Musil 1928, 147) gives the following description of Wadi al-Takara in March 24, 1912: "The nearer we approached, the more distinctly could be seen the groups of trees in the western part of al-Abjaz mountains. These are especially numerous on both sides of Wadi Dekara, which end in the lowland of al-Ehcej." Only a few isolated Terebinth trees (*Pistacia Atlantica*) have survived in remote parts of the northern Jebel Abyad range, but they must have been a common sight in the antiquity.

The building at the mouth of Wadi al-Takara in the S and the large structure to the N at the mouth of Wadi al-Masek have nothing in common with villages or estates, and they must be classified as military installations, as well attested at Tweihina (Tahoun al-Masek) from inscriptions. Wadi Takara was an important corridor from Palmyra to the N through the Jebel Abyad range. The survey has not found any villages close to Wadi al-Takara at the mountain sides, like the villages in Jebel Chaar, which were also covered by Terebinth trees, or the buildings at the plain of Shalalah. This may be due to the fact that the water has washes away most of the material at W mountain sides of Jebel Abyad down to the rock. However, the existence of a wall across the wadi may indicate that some parts of the wadi area have been used for agriculture.

Wadi al-Takara also gave access to the plateau of the eastern range of Jebel Abyad along Wadi Kshebar and Wadi al-Koullah. There are only a few narrow, steep paths from Wadi Abyad up to the ridge of the mountain, and they are not suitable for larger herds or more heavy traffic.

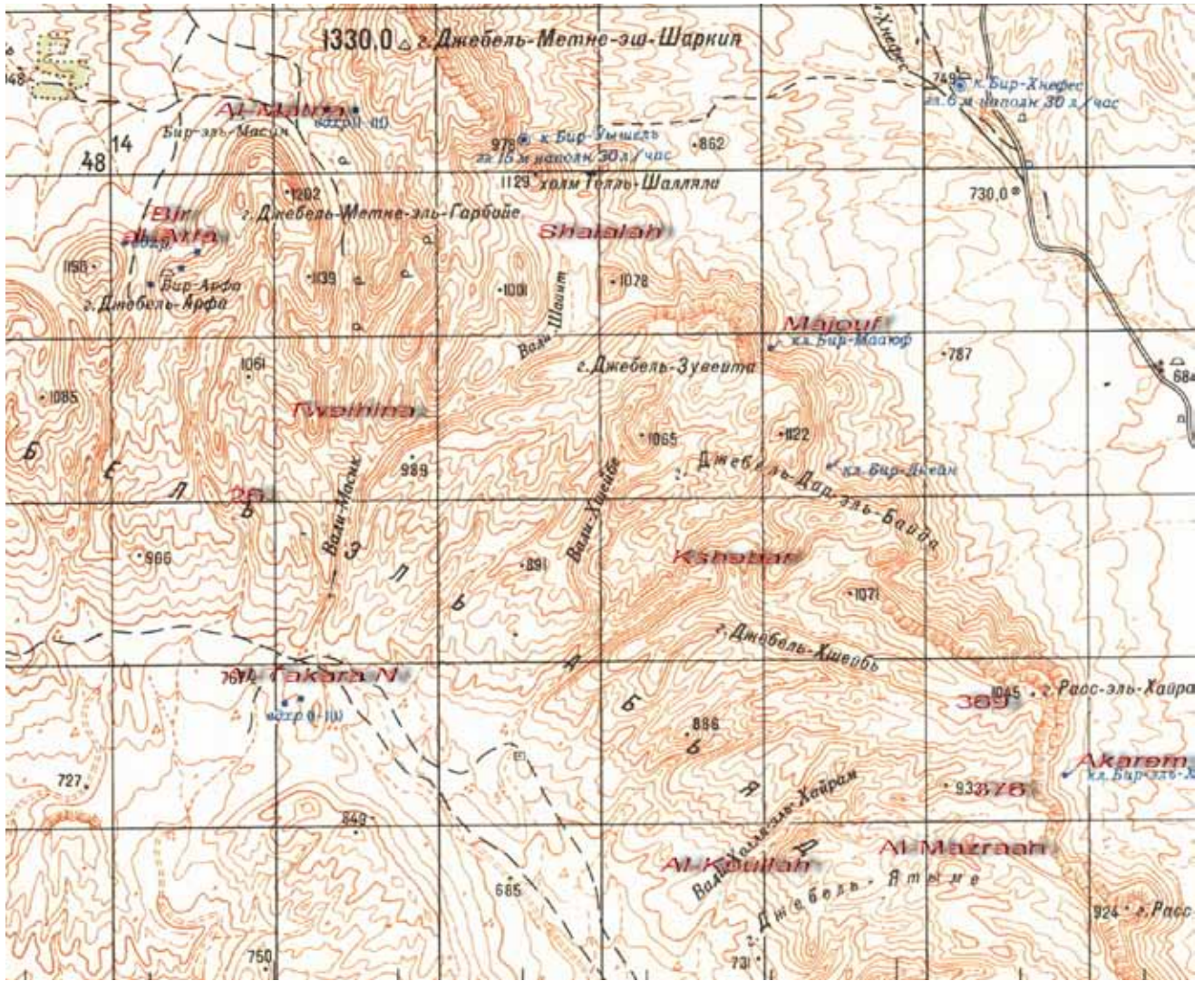
The existence of several military installations within a short distance from each other, including the small fort at Tweihina (Tahoun al-Masek) only 3 km N of Wadi al-Takara North, is striking. The reasons for that will be discussed in the conclusion of this report, as it has to be seen in relation to other installations N of the Jebel Abyad range.



Military installations in the Jebel Abyad and Wadi al-Takara area.

JEBEL ABYAD





1:100.000 I-37-41. Every square is 2 x 2 km.

AL-MAZRAAH

Surveyed by AA, EHS, ES, KB, JCM. April 25-26, 2009.

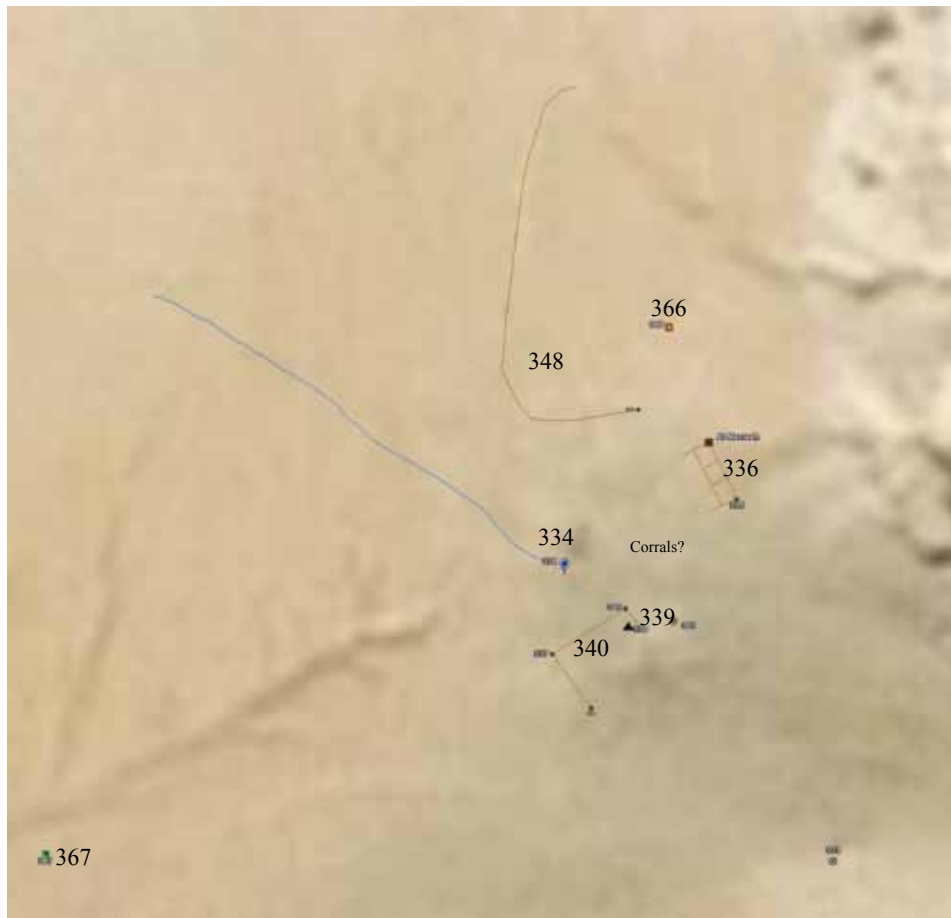
GPS: N34.686093 E38.183524.

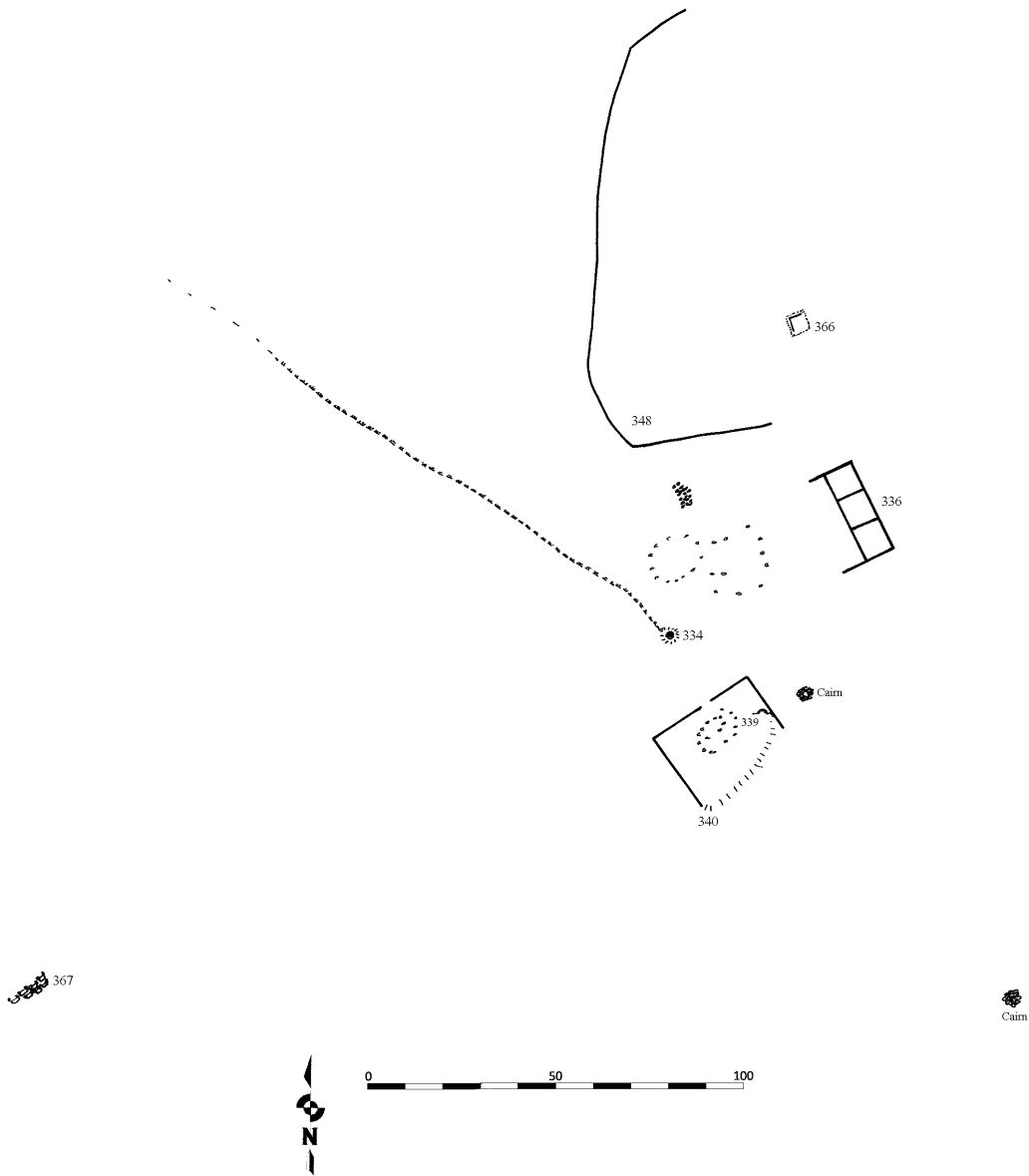
Map: 1:100.000 38398 74255.

The site lies at the eastern edge of the Jebel Abyad range on the northern part of a triangular plain, opening to the E, about 850 m SW of Akerem, 16 km NNW of Palmyra, with a tremendous view over the southern part of Wadi Abyad and the Akerem site below. The plain is divided into 2 smaller plains near the edge, separated by an oblong hill, S of the site, with 2 cairns at the top. No finds were registered S of the hill. The drainage from the plain runs towards W and forms the beginning of Wadi al-Khoullah 700 m to the W. There are no traces of former Bedouin camps in the area.

The site consist of the following:

1. Building A near the edge (336).
2. Structure B on northern slop of the hill (340).
3. Rock cut tombs (?) within structure B (339).
4. Cistern with catch-arm (334).
5. Enclosure on the northern slop of the valley (348).
6. Small square building on the northern slop of the valley (366).
7. Corrals? in the valley.
8. Islamic graves (367).





1. Building A near the edge.

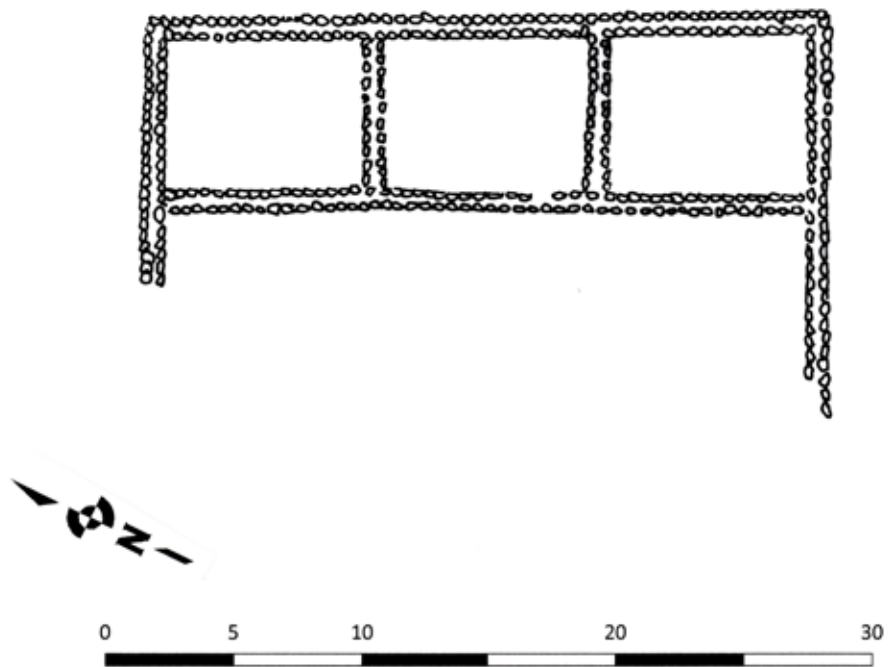
GPS 336: N34.68652 E38.18407 (NE corner), altitude 883.

The building lies close to the edge of Jebel Abyad, where the ground begins to fall slightly towards the steep face. The E side of the building is well preserved with bases of walls with outer bigger stones and a filling of smaller stones in the middle. The outer eastern wall has a length of 27 m, thickness 90 cm. The corners of the building are well defined, and stretches of walls, 90 cm thick, run to the W. The northern wall is preserved for about 10 m, the southern wall for about 16 m. The interior of the building is divided into three rectangular rooms against the E outer wall, about 7 m NS and 6 m EW. The thickness of the partition walls and the walls facing the interior is about 80 cm.

The W delimitation of the complex cannot be established, but the interior of the building must have been an open courtyard.



Al-Mazraah. Building A. In the background small square building (366), seen from S.



2. Structure B on northern slop of the hill.

GPS 340: N34.68598 E38.18376, altitude 886.

About 50 m SW of building A there is a natural plateau into the NW side of the oblong hill, with steep vertical low faces into the hill to the SE and E, formed by vertical layers in the rock. The plateau is surrounded by straight walls to NE, NW and SW, forming a square structure more or less delimited to the SE by the vertical faces of the plateau. The bases of walls with outer bigger stones and a filling of smaller stones in the middle have a thickness of 80-90 cm. The NW wall, facing the valley, has a length of about 30 m. There is a possible opening in the wall 10 m from the NE corner. The NE wall runs up the slop for about 15 m. The SE delimitation is uncertain. The SW wall runs about 20 m to the vertical face of the plateau. There are no traces of interior walls. The center of the plateau is covered with big stones, forming a slightly circular indistinct structure. The structure is clearly secondary to the walls, probably a later corral.

It cannot be determined whether the walls are part of a building or an enclosure.



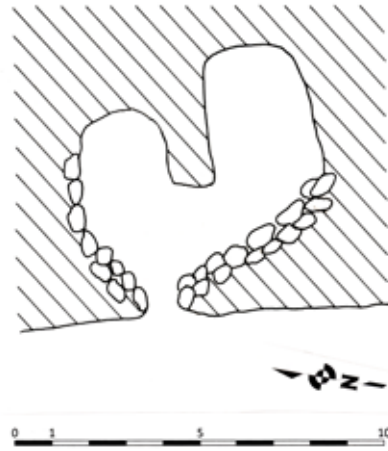
Al-Mazraah. Structure B seen WNW. Entrance to Rock cut tombs? visible in the center.

3. Rock cut tombs (?) within structure B.

GPS 339: N34.685911 E38.183768, altitude 886.

In the NE face of the plateau, below the NE wall of the structure there is a collapsed opening to a grotto. Inside the grotto is divided into 2 irregular interconnected rooms partly cut into the rock and partly built up with big stones. Roof height is about 1 m. The access to the grotto is difficult and the interior partly covered with fallen stones and rubble.

The purpose of structure, its relation to the walls around the plateau and its date are uncertain. It may originally have been a small rock cut tomb, later reused by the Bedouins as a store place or shelter as the top of the roof is blackened by soot.



4. Cistern with catch-arms.

GPS 334: N34.68609 E38.18352 (cistern), altitude 883.

N34.68696 E38.18194 (start of catch-arm), altitude 893.

The cistern is cut into the rock at bottom of the valley about 50 m SW of the building A and 20 m NW of the structure B. The cistern has a circular opening of 1.30 m. The neck is dressed with plastered stone. It is bottle shaped with a depth down to the silt of 4.40 m. From the NW corner a catch-arm runs towards the NW diagonally up the mountainside. It can be followed for 175 m, but has probably continued further up.



Al-Mazraah. Cistern 334, and catch-arm towards the NW.

5. Enclosure on the northern slop of the valley.

GPS: N34.68664 E38.18334 (SW corner), altitude 885.

N34.68754 E38.18344 (N end of wall), altitude 898.

On the southern slop of the mountainside to the north a long stretch of a large enclosure is preserved. The base of the wall with outer bigger stones and a filling of smaller stones in the middle, thickness varying between 80 and 90 cm, starts 20 m NW of the building A, running 40 m to the west, and then turns with slightly rounded corners to the N for about 100 m, and then to the NE for about 18 m, forming an oblong enclosure facing the E. The E delimitation of the enclosure cannot be determined, but it has probably gone as far at the edge of the plateau, where the steep face forms a natural boundary.



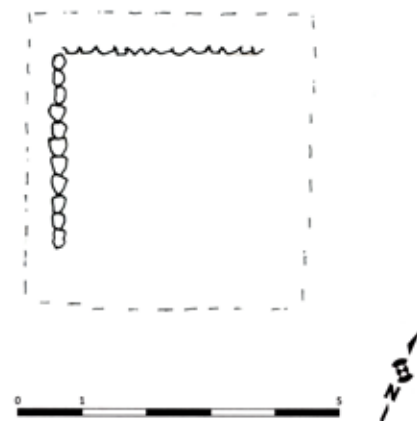
Al-Mazraah. SW corner of enclosure

6. Square building on northern slop of the hill.

GPS 366: N34.68687 E38.18392, altitude 890.

In the SE part of the enclosure 40 m north of the building A modern diggings have revealed a small square building about 4.50 x 4.50 m, roughly calculated on the basis of the outer debris. The building is orientated slightly to the NW. The inner NW corner and stretches of the inner course of the N and W wall are preserved. A possible opening to the building must have been either to E or S.

The purpose of the building is uncertain but it resembles in size and layout corresponding structures



at Tweihina (Tahoun al-Masek) and Shahaeh. At Jebel Chaar they are almost certainly identified as small shrines.



Al-Mazraah. Small square building seen from SW.

7. Corrals in the valley.
Between building A and the cistern stretches of large stones and a smaller concentration of stones form what seems to be corrals or one big corral. They are almost certainly secondary to building A, and should probably, as the corresponding stone circles within structure B, be dated later than the building.



*Al-Mazraah.
Corrals seen from S.*

8. Islamic graves.

GPS 367: N34.68521 E38.18155, altitude 876.

240 m SW of the site a small Islamic graveyard at the edge of a small wadi contains at least 10 graves orientated SW-NE.

Finds and chronology:

Most of the finds have been found in the valley around the cistern and between the cistern and building A, and it has not been possible to separate the finds in distinct groups related to the specific structures. The finds comprise large amount of brittle ware (464) and coarse ware (122), green glazed, red glazed and blue glazed ware, fragments of grinding stones, green and blue glass, an iron arrowhead or small spearhead, several indistinctive bronze fragments, pieces of turquoise, and in building A two heavily corroded coins. One of them is a Roman follis, weight 1.90 g, issued by Theodosius II (408-450), the other one a small bronze piece, weighing 0.30 g, the date of which is uncertain.

The datable shards show a remarkable chronological extension. Most of the pottery belongs to the Roman, late Roman and Byzantine period, but the glazed pottery also covers the 8th and 9th century up to the 12th and 14th century.



Al-Mazraah. Iron spear- or arrowhead. Roman follis of Theodosius II (408-450)

Conclusions:

The amount, diversity of the finds and their chronological extension show that al-Mazraah has been an important site for several hundred years, even if the building and the structures at the site are not that impressive. Even if the chronological relationship between the building and the large enclosure to the N cannot be established on the basis of surface finds, the large enclosure may indicate that the importance of the site was related to some kind of animal husbandry, not sheep and goats, which must have been a common site everywhere. One may speculate if the broad valley has been used for horse breeding either to the military authorities, which would explain the finds of coins, or a wealthy family. This is only speculations, and the question cannot be answered without excavations. Another possibility is that the site some way or another is connected to Akerem below on the plain, though there are no paths leading from al-Mazraah directly down to Wadi Abyad.

VALLEY 376

Surveyed by AA, EHS, ES, KB, JCM. April 27, 2009.
GPS: N 34.691427 E 38.184215 (edge of Jebel Abyad).
Map: 1:100.000 I-37-41, 3841 7425.

North of al-Mazraah there is another triangular narrower valley at a slightly higher level (altitude above 900 m) opening up to the E to the edge of Jebel Abyad, where there are 2 destroyed cairns. The drainage is towards the W, and the wadi system meets Wadi al-Koullah. A small narrow path leads down to Akerem and below the edge there are several rock cut tombs (se Akerem). There are no traces of former Bedouin camps in the area. The valley is almost void of structures apart from the 2 cairns and a corral.



Corral 374.

GPS 374: N34.69049 E38.17871, altitude 934.

The corral lies in the W part of the plain, N of the wadi. It has an oval shape, length of 20 m, open to the S and curved to the N with a small niche.

Finds and chronology: Uncharacteristic brittle ware (4), coarse ware (1), fragment of brown ornamented pipe from Ottoman period.

Islamic graves 375.

GPS 375: N34.68976 E38.18142, altitude 916.

In the middle of the valley just N of the wadi 3 small semicircular Islamic tombs.

Finds and chronology: none.

Conclusions. The valley does not seem to have been center of any permanent settlements.

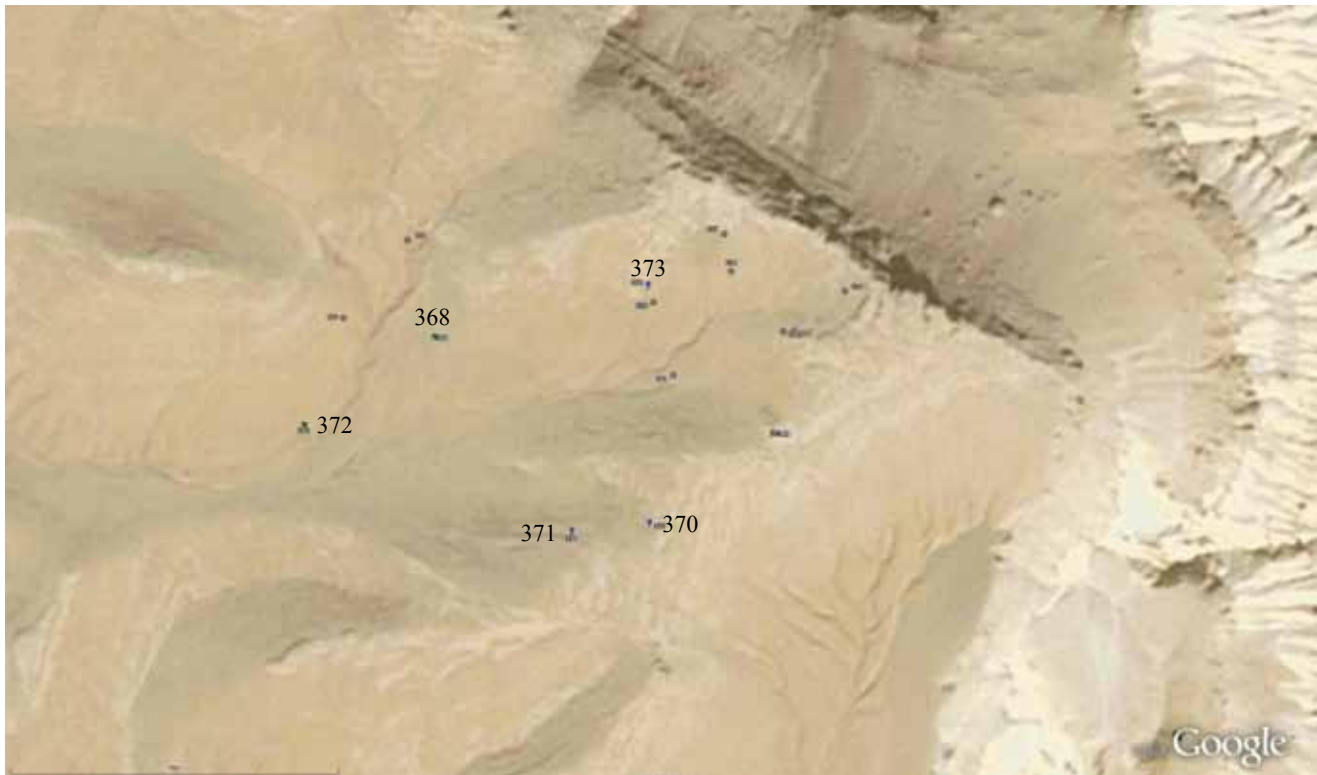
VALLEY 369

Surveyed by AA, EHS, ES, KB, JCM. April 27, 2009.

GPS: N34.69637 E38.18283 (edge of Jebel Abyad), altitude 1021.

Map: 1:100.000 I-37-41, 38415 74250.

Valley 369 lies at a much higher level than valley 376 to the S, above 1000 m, 800 m NW of Akerem. It does not open up towards the E and NE towards Wadi Abyad, but the edge of the mountain forms a large hollow, also to the S with a relatively steep side down to valley 376. The drainage from the valley runs in 2 directions: towards WNW along a wadi following the NE edge of Jebel Abyad, before it turns SW meeting Wadi Kshebar down to Wadi al-Takara, and to the SW towards in a narrow wadi system meeting Wai al-Takara south of Wadi Kshebar. There are no paths down to Jebel Abyad, and the natural access to the valley is from Wadi Kshebar. At the edge of the valley to the E a relatively modern well constructed enclosure, 21 x 21 m (GPS 369: N34.69637 E38.18283, altitude 1021), but otherwise there are no traces of recent activities in the area.



The site has several traces of human activities:

1. Cisterns.
2. Islamic graves.

1. Cisterns.

Cisterns 370.

GPS 370: N34.69540 E38.18131, altitude 1020.

Near the edge of the valley to the S two shallow open cisterns are cut into the rock. The best preserved measures 2.10 x 1.80 m width a depth of only 20 cm. To the W a stone construction to retain the water. There are no traces of catch-arms.

Finds and chronology: Grinding stone 30 m from the cisterns.



Valley 369. Cisterns 370.

Cisterns 371.

GPS 371: N34.69532 E38.18036, altitude 1014.

At the foot of rocky S side of the valley 90 m W of cisterns 370, 3 open cisterns, 20-30 cm deep, cut into the rock with retaining walls towards the N and the valley bottom. There are traces of a catch-arm towards the NE diagonally up the sides of the valley.

Finds and chronology: Grinding stone 120 m W of the cistern.



Valley 369. Cistern 371.

Cisterns 373.

GPS 373: N34.69779 E38.18129, altitude 1025.

On the northern side of the valley faint traces of a cistern, no catch-arms.

Finds and chronology: None.

2. Islamic graves.

Islamic grave field 372.

GPS 372: N34.69644 E38.17709, altitude 1003.

On the northern side of the wadi, leading to the W at least 15 very old Islamic graves, all orientated E-W. Some of them have a well defined chamber marked with upright stones. The shape varies from circular to oval. All the tombs have been looted.



Valley369. Islamic gravefield 372.

Islamic grave field 368.

GPS 368: N34.69732 E38.17867, altitude 1013.

This grave field lies 180 m NE of grave field 372 on the other side of the wadi. The stones are deeply embedded into the ground, and the number, size and shape of the graves is difficult to establish.

Finds and chronology:

At the bottom of the valley brittle ware (13), coarse ware (3), ornamented brown pipe from Ottoman period, several fragments of grinding stones, iron fragments and yellow glass. The brittle ware is uncharacteristic; a single shard may be Roman/late Roman.

Conclusions:

The survey did not find any traces of buildings at the site. The cisterns, though not impressive and the surface finds testify to some activity in the valley. What is surprising, is the relatively high amount of fragments of grinding stones, which do not fit together. This indicates a more permanent use of the site.

WADI KSHEBAR

Site 14, circular corral (WP 035)

Surveyed by: EHS, KJH, NA, April 27, 2009.

GPS: N34.70021 E038.17179, Altitude: 991.

Small circular corral in the major branch of Wadi Kshebar, located on the southern slope, about 25 m from the wadi. Across the wadi to the southsouthwest there are also a rectangular or circular structures, and possibly also more recent Bedouin graves. The corral has a diameter of 10 m both north-south and east-west.

Finds and chronology: one retouched flake, no pottery. Date unknown.



Wadi Kshebar. Site 14. Corral.

Building 378 and structure 380.
Surveyed by AA, ES, KB, JCM. April 27, 2009.
GPS: N34.71372 E38.14035, altitude 962.
Map: 1: 100.000 I-37-41. 38422 74230.

Just N of the wadi leading down to Kshebar, 2.1 km WNW of valley 369 two stone structures on high ground.

Building 378.
GPS 378: N34.70525 E38.15824, altitude 962.

The building, which has been heavily destroyed, is orientated NS-EW. There are traces of a NE corner and a E wall. The thickness of the walls cannot be determined. An estimated size of the building is 3 x 3 m.



Wadi Kshebar. Building 378.

Round structure 380.
GPS 380: N34.70549 E38.15827, altitude 963.

Just north of building 378 a stretch of larger stones forms part of a circle with a diameter of ca 9 m. Perhaps a corral.

Finds and chronology: The finds from the two structures cannot be separated: Brittle ware (17), coarse ware (4), red glazed ware, iron fragment, beads. The brittle ware cannot be dated. The red glazed ware belongs to the Islamic period.

Conclusion: The purpose of the structures cannot be determined.

SHALALAH

Structures on plateau (502)

Surveyed by AA, ES, KB, JCM, JK. May 03, 2009.

GPS: N 34.746958 E 38.120598, altitude 990.

Map: 1: 100 000 I-37-41. 3847 7419.

The buildings on the plateau at Shalalah were registered in the 2008 survey. They are situated at the edge of the plateau near the path leading down to the springs and the small Roman fort registered by Schlumberger. The buildings belong to a village. During a reconnaissance in October 2008, in connection with a study of the pottery in the Museum of Palmyra, some other remains were found on the plateau.

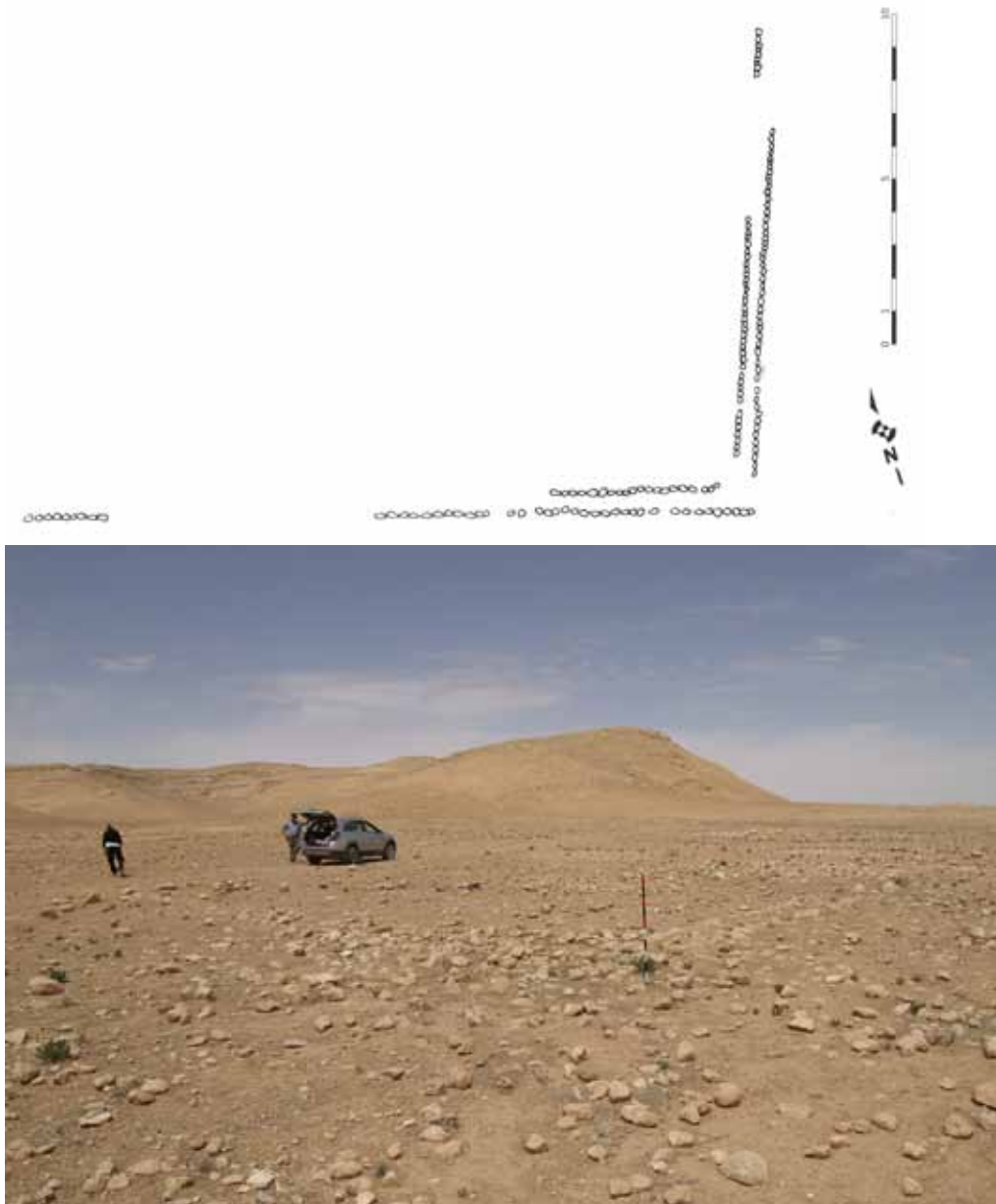


Structure 502.

GPS 502: N34.746958 E38.120598, altitude 990.

360 m S of the village bases of walls with outer bigger stones and a filling of smaller stones in the middle, thickness of the walls varying between 60 – 80 cm. The SE corner is well preserved. The E wall has a length of 15 m, the southern wall, which is cut by a modern track, 22 m. There are no traces of internal walls. 50 m to the north a single square block (30 x 40 x 50 cm) from some more monumental building.

Finds and chronology: Brittle ware (29), coarse ware (34), glass fragments, grinding stones. Most of the pottery is uncharacteristic, but probably belongs to Late Roman and Byzantine period.



Shalalah. Structure 502. SE corner.

Conclusions: It is uncertain whether the walls belong to a building or an enclosure. However it shows that the village at the edge of the plateau probably has extended far to the S of the plateau.

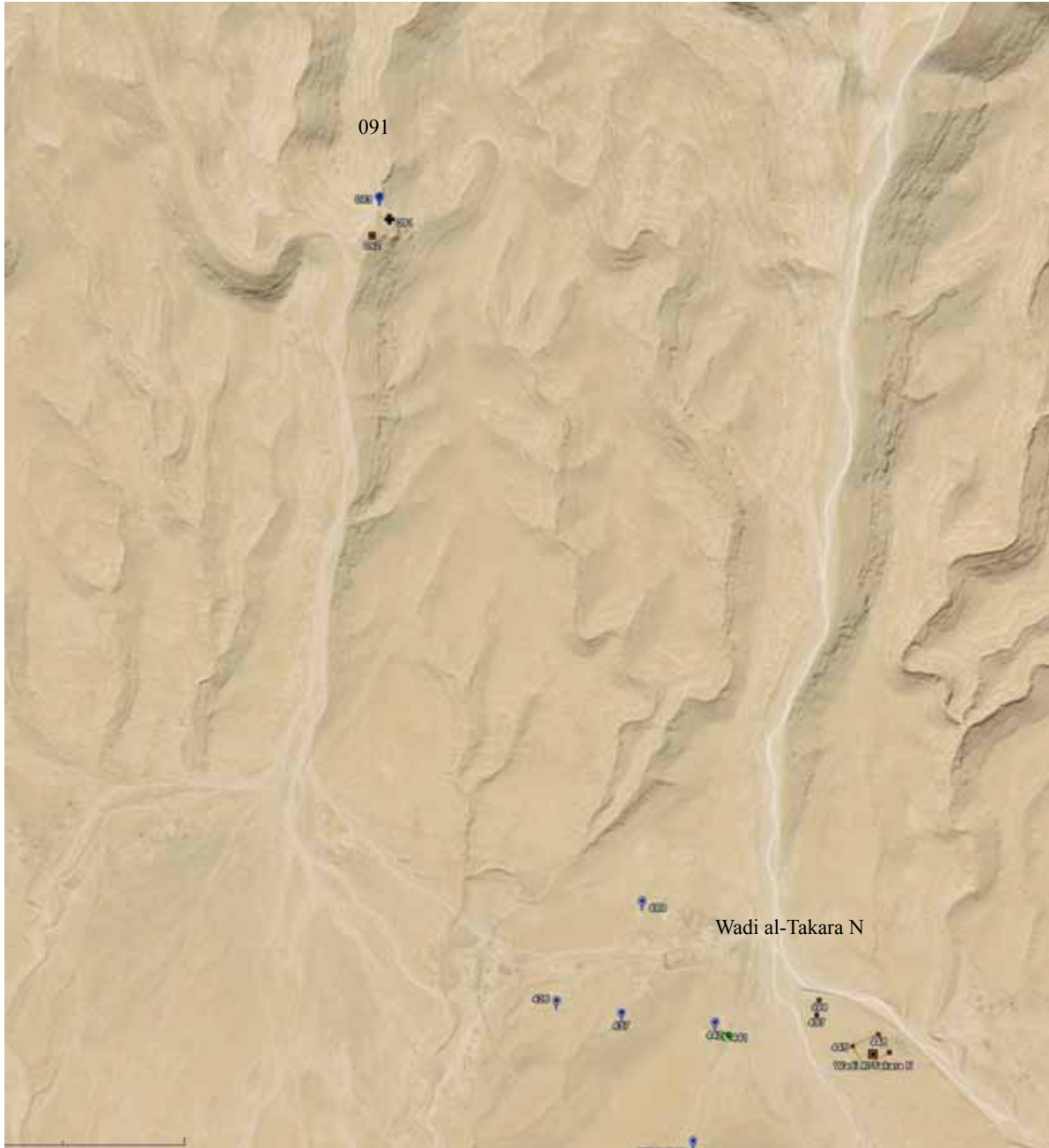
TOMBS N OF WADI AL-TAKARA N (Site 26/091)

Surveyed by: KJH, HMHR, NA, May 02, 2009.

GPS 91: N: 34.71740 E: 038.07904, altitude 860.

Map: 1:100 000 I-37-41. 38441 74157.

The site lies about 2 km north of the plain W of Wadi al-Takara N in a wadi running up in the Jebel Abyad, parallel to Wadi al-Masek.



6 rock cut tombs were found on a steep cliff facing southwest towards the wadi. Tomb 1 (farthest to the west) is the largest about 6x6 m in diameter with a narrow entrance. Inside there is also a small niche to the east. Today the floor is covered by cement, and a fireplace in the middle of the tomb. Tomb

2 is just a small niche and seems to be unfinished. Tomb 3 is about 4x4 m inside with a narrow entrance. Tomb 4 is about the same size 4x4m with several small niches inside which are badly preserved. Tomb 5 is 2x3 m, with several small niches badly preserved inside. Tomb 6 is 3x3 m with small badly preserved niches inside. The tombs have been extensively reused in recent times.

Just to the west of the tombs there is a small wadi with a waterfall with a tree growing on the fall. South of the tombs there is a small wadi terrace, where the wadies meet, here there is a badly preserved squared building and some recent burials. The area is heavily plundered. To the east of this area, and southwest of the tombs a cistern with a small area for water catchment were found.

Finds and chronology: none.

Conclusion: The site resembles the complex at Wadi Kshebar, surveyed in 2008. The original tombs probably belong to the Roman-Byzantine period, but have been reused later for other purposes.

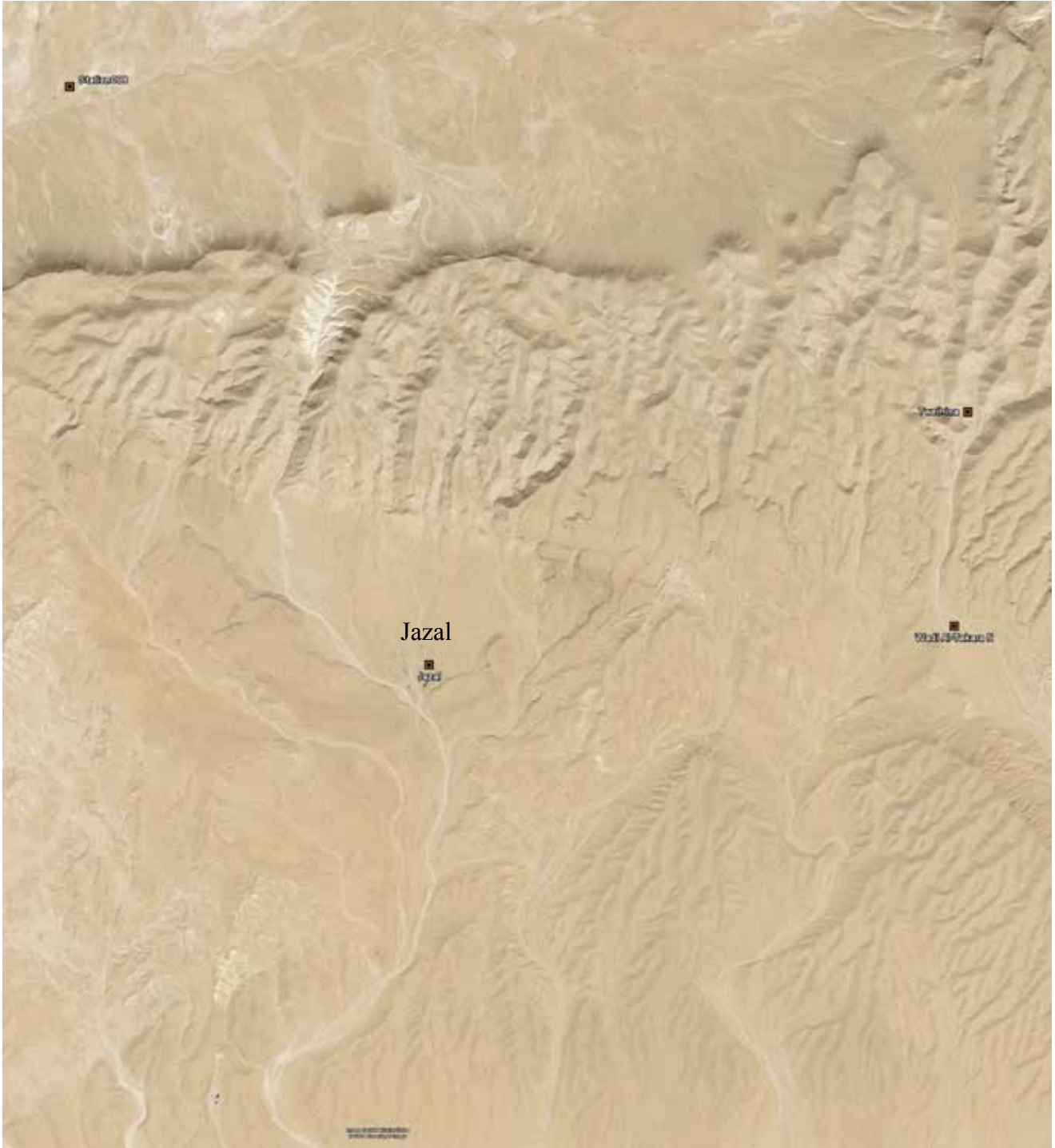


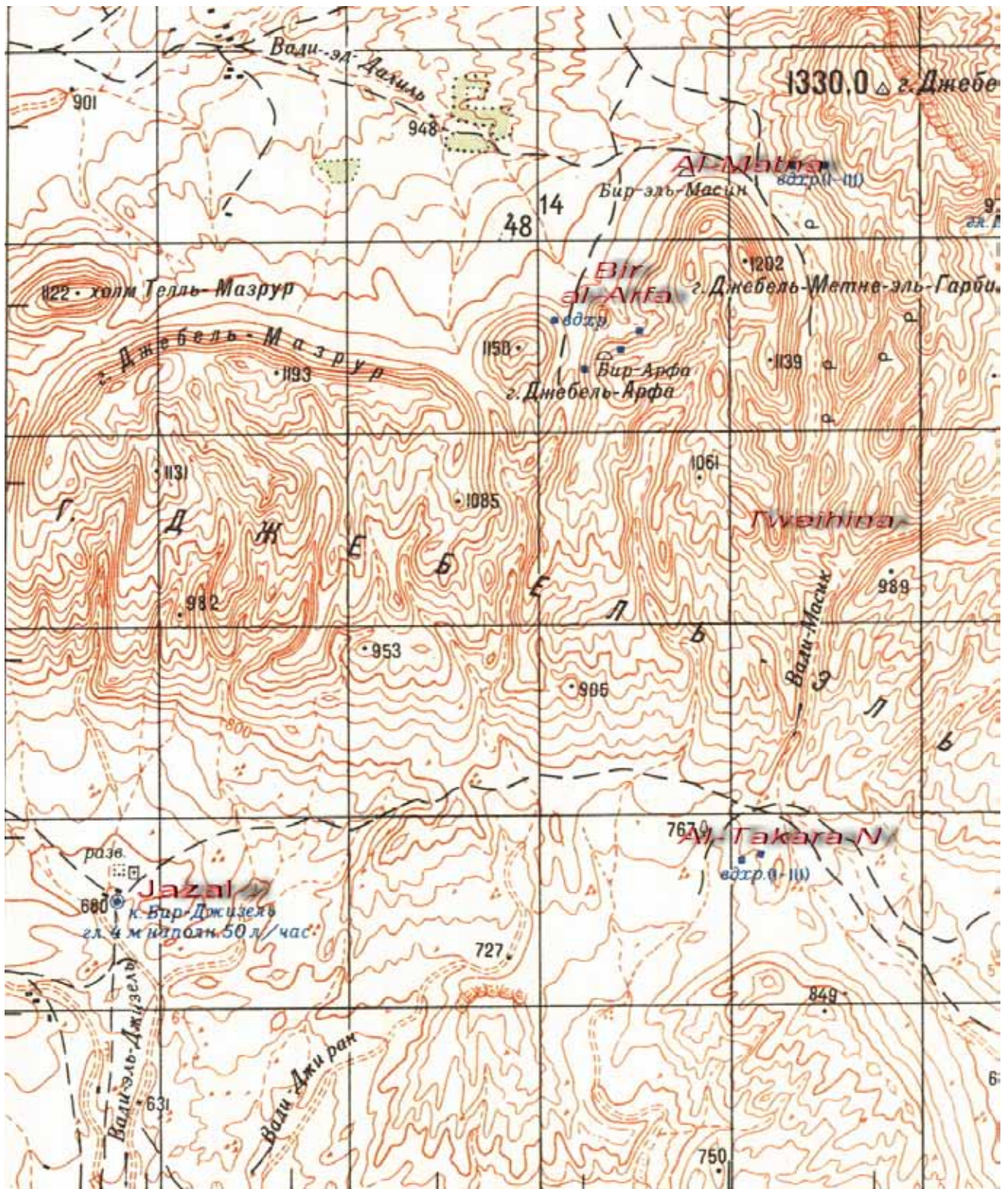
*Site 26/091.
Rock cut tombs*



*Site 26/091.
Buildings SW of tombs.*

JAZAL





1:100.000 I-37-41. Every square is 2 x 2 km.

JAZAL

Surveyed by AA, ES, KB, JCM, JK. May 02 and 04 2009.

GPS: N34.693 E38.008.

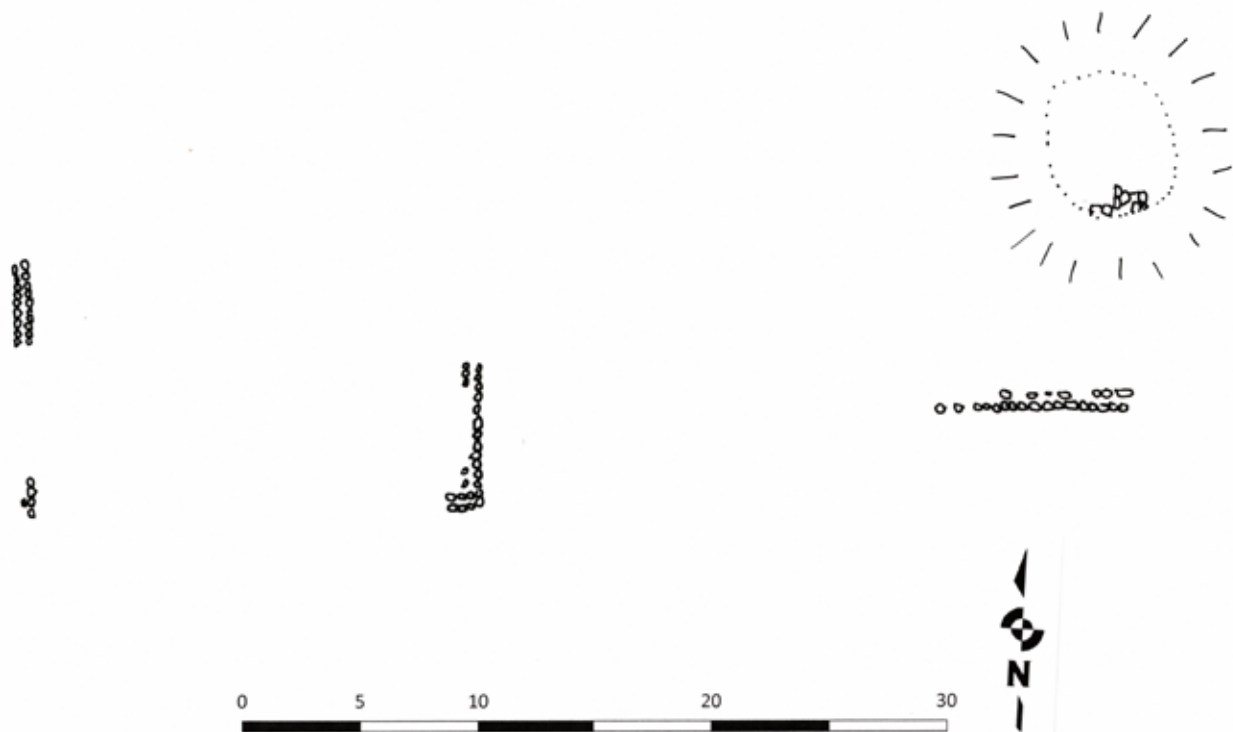
Map: 1:100.000. I-37-41 38414 74095.

The site, Jazal, which was briefly visited in May 2008, lies 30 km NW of Palmyra, and 8 km WSW of Tweihina (Tahoun al-Masek) and 7 km W of Wadi al-Takara N. It lies on the open plain on the south side of Jebel Abyad, with steep slopes to the mountain, with a few passes to the higher plain north of Jebel Abyad, to Zer Dghelar and Bir al-Arfa. To the S a lower range divides the Jazal plain from the plain west of Palmyra. To the E and SE the landscape raises to the mountain range on the western side of Wadi al-Takara. In the area between Jazal and the N end of Wadi al-Takara there are high concentrations of cairns (See prehistoric report).

Jazal receives water from the Jebel Abyad range. A large wadi comes from WNW, with a lot of small side wadies from the N, and 2 larger wadies N and NW of the site. The wadi system then turns S through a passage in the low mountain range to the plain W of Palmyra. Jazal appears as an oasis with a few modern houses, scattered on the elevated plain between the 2 wadies coming from the N. Apart from the houses many Bedouins have pitched their tents, and there are many traces of former Bedouin camps. At the S part of the site there are several very deep wells, with a wide opening, well constructed with a stone lining into the depth. They have a very high water level. The water is pumped up, watering a large enclosure with olive trees, fruit trees and a few date palms. There are also traces of former, now covered wells, scattered on the edge of the site.

The site is marked on the Russian map with wells and also some ruins, but not much is visible of the ruins. On the E side of the site, on a slightly higher level the ground is covered with larger stones and a few old Islamic tombs. The raised ground forms an indistinct flat low tell, bounded to the E by the wadi, but otherwise the exact extent cannot be determined. The ground is covered with pottery. In 2008 only a few stretches of bases of walls were visible, giving no indications of the layout, but since then a modern digging in the tell close to the wadi has revealed remains of more solid walls.





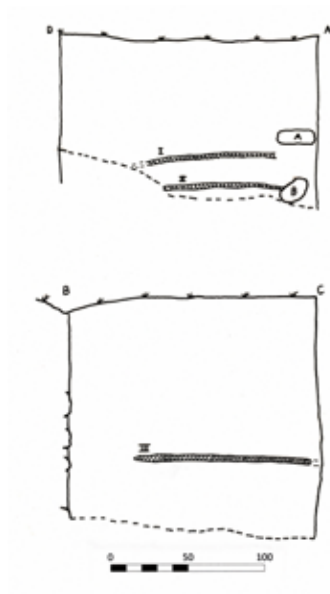
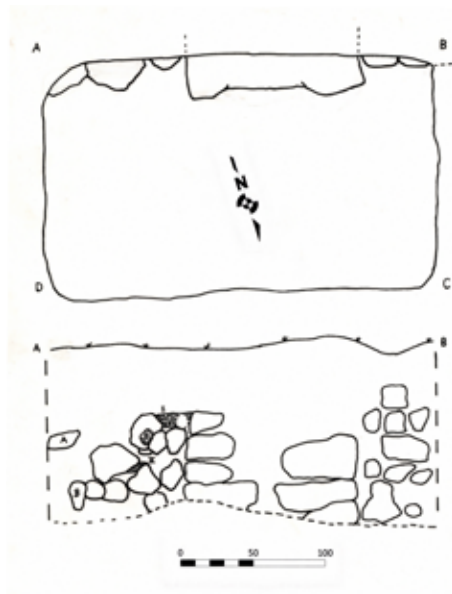
Tell with remains of larger structure.

GPS 488: N34.69475 E38.01479, altitude 713.

In the S profile of digging there are remains of a 1.20 m thick well constructed wall, protruding about 30 cm from the profile, with very large outer flat stones, up to 50 cm long, with smaller stones in the middle. The visible height in the digging is about 0.75 m. The wall is orientated N-S and has followed the E limit of the tell parallel to the wadi. S of the digging several large stones are visible at the edge of the tell almost in row, but as they do not flush exactly with the wall in the digging, they must be in secondary position, and probably fallen stones from the same wall. In the W part of the S-profile the outer course of an E-W wall, forming a corner with the N-S wall. It is constructed with smaller stones. The preserved height in the profile is about 1 m, but the thickness cannot be determined. In the N profile there are not traces of any walls. This strongly indicates the existence of an opening in the N-S wall, perhaps a gateway.

Outside the N-S wall towards the wadi there are several larger stones in the S profile. They are not part of any outer course of a wall and they are obviously in secondary position. Between the stones there are several ash layers and some of the stones are blackened by fire. Oblong ash layers are also visible in the E and W profile. All together they form a distinct destruction layer from the demolition of the structure. Samples of the charcoal were collected for possible future chronological analysis.

8 m south of the digging a 8 m long stretch of basis of wall with outer bigger stones and a filling of smaller stones in the middle, thickness 90 cm, running from the edge of the tell towards W. The relation to the walls in the digging cannot be determined. Further to the W two stretches of bases of walls of the same construction running N-S. The first one, 27 m from the edge of the tell is 6 m long, thickness about 60 cm, with traces of a corner to the south. The second one, 48 m from the edge of the tell, thickness 60 cm, can be traced for 12 m. It cannot be determined if the walls are part of the same building.



Jazal. Wall in the digging of the tell, seen from N. To the left destruction layer with charcoal.



Jazal. Oblong ash layer in E profile and stone blackened by fire.



Jazal. Remains of buildings on the top of the tell. From SE.



Jazal. Well from southern part of the settlement.



Jazal. Settlement seen from the SW.

Finds and chronology:

Brittle ware (389), coarse ware (232), blue and green glazed ware, glass, fragments of grinding stones, fragment of a pipe from ottoman times and two coins. One of them is a follis, issued by Constantine II (337-340), the other an early Islamic bronze coin, probably from the Umayyad period. The datable pottery ranges from Roman to early Islamic times (8th century).



Jazal. Follis issued by Constantine II (337-340)



Jazal. Islamic bronze coin. Umayyad period?

JAZAL CONCLUSIONS

The hydraulic conditions at Jazal are very favorable with water bearing layers close to the surface, and the settlement is one of the few permanent villages in the area north of Palmyra with a headman. There can be no doubt that also in antiquity the site must have had some importance even if there are few visible traces of a larger settlement. The walls in the digging of the tell are impressive, and they must have been part of some more monumental structure, perhaps a military stronghold, but the exact function cannot be determined without excavations in the tell.

The site has been occupied up into early Islamic period as shown by the surface finds on the tell, but it is possible that the destruction of the monumental structure happened at an earlier date, and that the remains of buildings at the top of the tell belong to a later period.

THE PLAIN NORTH OF JEBEL ABYAD WADI SHANA'EH





1:100.000I-37-40 and I-37-41. Every square is 2 x 2 km.

BIR AL-ARFA

Surveyed by AA, ES, KB, JCM, JK. May 04-05, 2009.

GPS: N34.748 E38.067.

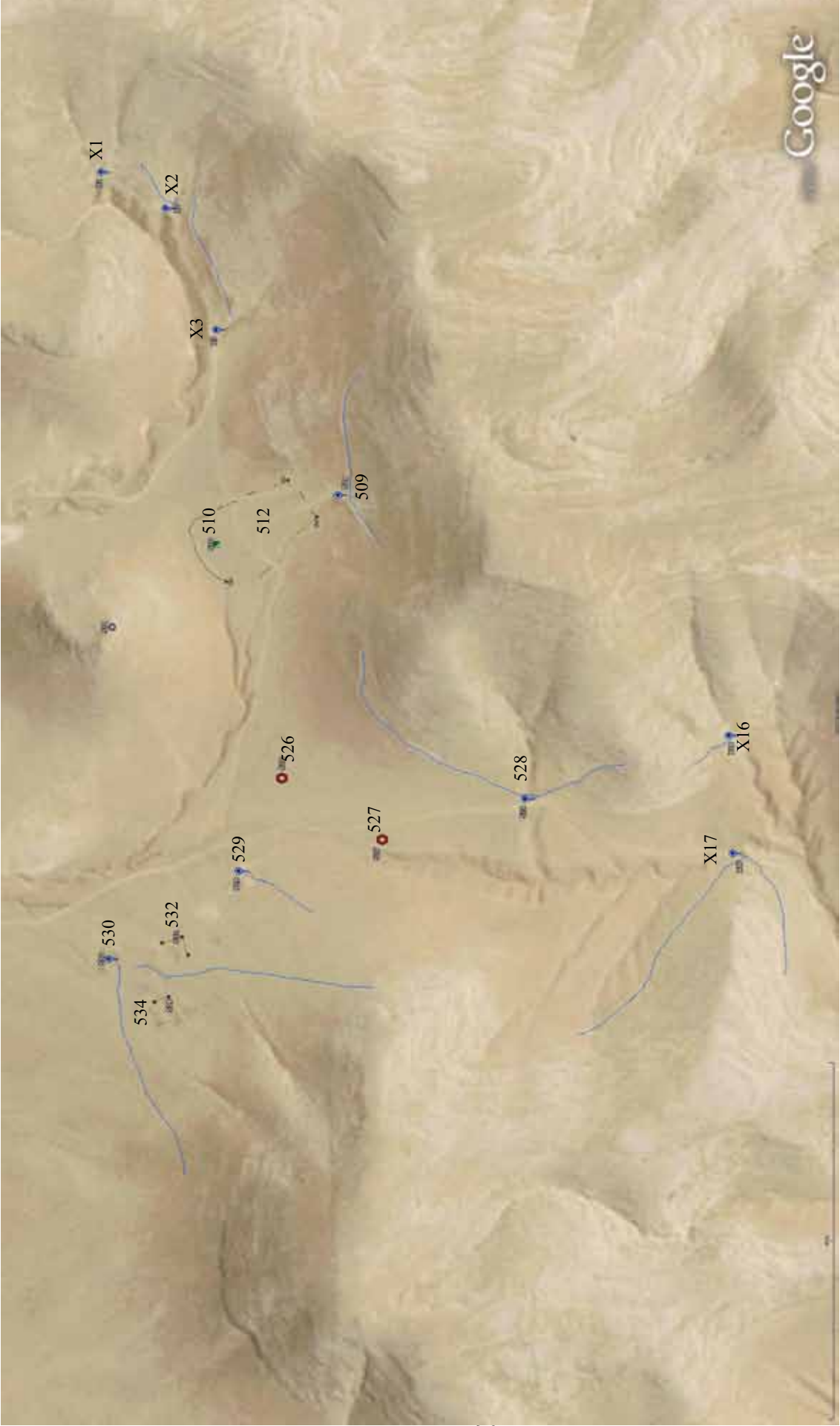
Map: 1:100.000. I-37-41. 38473 74148.

The site, which was visited briefly in 2008, but not measured, lies 3 km W of al-Matna, the northern part of the pass through Jebel Abyad from Twei-hina. The centre of the site is dominated by an oblong cone-shaped mountain with several cairns at the top, surrounded to the E by a northern spur of Jebel Abyad, to the S of the N face of Jebel Abyad and to the W by Jebel al-Arfa, which has given name to the site. There are several cairns at the top of the mountains. To the north the landscape opens up towards the broad valleys between Jebel Abyad, Jebel Merah and Jebel Chaar. On both sides of Jebel al-Arfa paths lead through the mountain descending sharply to the plain at Jazal. The paths are only suitable for sheep and goats. There are usually Bedouin camps in the area and many traces of former camps.

The site is marked on the map with several wells and it is visible on satellite images as circular upcasts on the E side of Jebel al-Arfa.



Bir al-Arfa. The cone-shaped mountain seen from SE. To the left the upcasts. In the background Wadi Shanaeh and Jebel Chaar.



The site consists of the following:

1. Cisterns.
2. Enclosure between the cone-shaped mountain and Jebel Abyad.
3. Islamic graves.
4. Corrals.
5. Buildings.
6. Cup-shaped marks.

1. Cisterns.

The cisterns, of which many are still in use, can be divided into 4 groups according to their location:

- a. Cistern X1, X2 and X3. SE of the cone-shaped mountain in the corner between the N spur and the N face of Jebel Abyad. The mountainsides are heavily washed by the water and contain several small caves.
- b. Cistern 509. N face of Jebel Abyad at the ridge separating Jebel Abyad and the cone-shaped mountain.
- c. Cistern X16, X17 and 528. On the mountainsides on both sides of the defile leading down to the plain NE of Jazal.
- d. Cistern 529 and 530. The E slope of Jebel al-Arfa.

Cistern X1 (SE-corner).

GPS X1: N34.74744 E38.07399.

The cistern is connected to a cave. No traces of catch-arms.

Finds and chronology: none.



Bir al-Arfa. Cistern X1.

Cistern X2 (SE-corner).

GPS X1: N34.74666 E38.07346.

The cistern has 2 catch-arms, one longer to the east and a shorter one to the west containing the water from a small ravine. Length E catch-arm 79 m, length S catch-arm 10 m.

Finds and chronology: none.



Bir al-Arfa. Cistern X2. Catch-arms leading down to the cistern.

Cistern X3 (SE-corner).

GPS X3: N34.74605 E38.07168.

The cistern has one large E catch-arm diagonally up the mountainside, 192 m long. High walls have been built up a on each side of the cistern.

Finds and chronology: none.

Bir al-Arfa. Cistern X3. Walls around cistern.



Cistern 509 (N face of Jebel Abyad).

GPS 509: N34.74460 E38.06944, altitude 1075.

The cistern has 2 catch-arms to the E and the W running diagonally up the mountainside. The cistern is bottle-shaped, depth cannot be determined. The opening is 90 cm wide, and the neck is lined with stones to a depth of c. 1 m. The E catch-arm has a length of 180 m and in some short stretches cut into the rock. Length of W catch-arm is 73 m.

Finds and chronology: none.



Bir al-Arfa. Cistern 509. Catch-arms leading down to the cistern.

Cistern 528 (Defile towards Jazal).

GPS 528: N34.74239 E38.06479, altitude 1044.

The cistern has 2 long catch-arms embracing the E corner of Jebel Abyad at the defile down to Jazal. The length of the NE catch-arms is 343 m, the length of SE catch-arm 135 m. Ancient troughs close to the cistern.

Finds and chronology: none.

Bir al-Arfa. Cistern 528.



Cistern X 16 (Defile towards Jazal).

GPS X16: N34.73986 E38.06574.

The cistern is located on the E mountain side of the defile at a small EW wadi. It has one short catch-arm, 70 m long, running diagonally up the mountainside N of wadi.

Finds and chronology: none.

Bir al-Arfa. Cistern 16. In the foreground catch-arm leading down to the cistern.



Cistern X 17 (Defile towards Jazal).

GPS X17: N34.73981 E38.06401.

The cistern is located on the W mountain-side of the defile. It has 2 catch-arms, one to the SW, 181 m long, and one to the NW 332 m long.

Finds and chronology: none

Bir al-Arfa. Cistern 17. NW catch-arm.



Cistern 529 (E-slope Jebel al-Arfa).

GPS 529: N34.74575 E38.06369, altitude 1036.

The cistern has a concrete opening, and lies at the S end of the sloop. Low 1 m high walls lead the water into the cistern on both sides. It is bottle shaped with a depth of about 5 m. It has 2 catch-arms, one to the NW, 45 m long, and one to the SW, 86 m long. When cistern 530 was in use the catch-arms of this cistern blocked the flow of water from the mountainside, and cistern 529 is later than cistern 530. In front of the cistern light colored debris, this can be seen on the satellite images.



Bir al-Arfa. Cistern 529. The debris in front of cistern is visible on satellite images.

Finds and chronology: Brittle ware (60), coarse ware (24) in the surroundings, but it is uncertain if they can be related to the cistern, as the mountainside has probably been occupied by structures, which can be seen further to the N (Building A and B).

Cistern 530 (E-slope Jebel al-Arfa).

GPS 530: N34.74726 E38.06245, altitude 1031.

Remains of large cistern with upcast of debris towards the valley to the E, which is visible on satellite images. The cistern is bottle shaped and dressed with large stones to a depth of 1.90 m, but it is filled with gravel and sand, and the original depth cannot be determined. The opening of the cistern is irregular, measuring 2 x 2.70 m, with a well constructed inlet to the W. It is possible that it originally has been stone vaulted. The original catch-arms are barely visible, but they can be traced c. 325 m to the S, and 309 m to the W, embracing the NE part of Jebel al-Arfa.

Finds and chronology: Some coarse ware around the cistern.



Bir al-Arfa. Cistern 530. Cistern and traces of western catch-arm.

2. Enclosure between the cone-shaped mountain and Jebel Abyad.

GPS 512: NW corner: N34.74607 E38.06799, altitude 1058.

GPS 521: SE corner: N34.74527 E38.06944, altitude 1075.

Between the cone-shaped mountain and the N face of Jebel Abyad a broad flat ridge divides the water flow on each side of the cone shaped mountain. The area has been enclosed with a long wall, of which the bases are visible in several places. The width of the wall is about 1 m, with outer bigger stones and a filling of smaller stones in the middle. There are some large stones on both sides of the bases, which may indicate a more solid construction in the height. The wall is straight at many places, but the corners are rounded. The enclosure embraced an area about 140 x 80 x 150 x 100 m, i.e. 1500 m².

Finds and chronology: Several fragments of grinding stones. Some shards (2008 reconnaissance) of coarse and brittle ware, perhaps late Roman and Byzantine.



Bir al-Arfa. View of enclosure from cone-shaped mountain. In the center Islamic graves. In the background cistern 509.

3. Islamic graves.

GPS 510: N34.74615 E38.06854, altitude 1052.

Inside the enclosure to the N an oblong concentration of larger stones. They probably belong to an old Islamic grave field, heavily disturbed, as there are faint traces of individual burials.

Finds and chronology: none.

4. Corrals.

Corrals 526

GPS 526: N34.74536 E38.06511, altitude 1048.

Larger system of interlocked small enclosures and rooms. Between two of the rooms a corridor with upright stones.

Finds and chronology: none.

Bir al-Arfa. Corral 526 seen from SW.



Corrals 527

GPS 527: N34.74414 E38.06421, altitude 1040.

Larger system of interlocked small enclosures and rooms.

Finds and chronology: none.

Bir al-Arfa. Corral 527 seen from SW.



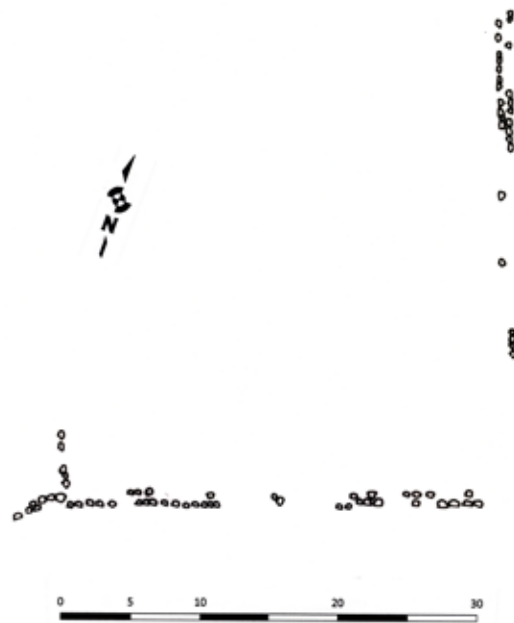
5. Buildings.

Building 532.

GPS 531: N34.74645 E38.06243, altitude 1047.

Between cistern 529 and 530 on the E slope of Jebel al-Arfa remains of two long stretches of bases of walls, 80 cm thick with outer bigger stones and a filling of smaller stones in the middle, which must have been part of the same structure, orientated almost NS. An E wall, preserved for 29 m, disappears to the N into a small tell. To the S it is badly preserved, but it must have been connected with the S wall, 26 m long, which runs to the W. In the W end there are traces of a wall, running to the north, forming a corner. The wall continues to the W with a small bend towards the SW. Immediately S of the building 2 worked rectangular blocks. The biggest one is 43 cm long, 20 cm broad and 18 cm high, the smaller one is a fragment of a corner.

Finds: Brittle ware (148), coarse ware (34), terra sigiliata, green glazed ware, glass, iron fragments, grindings stone fragments.



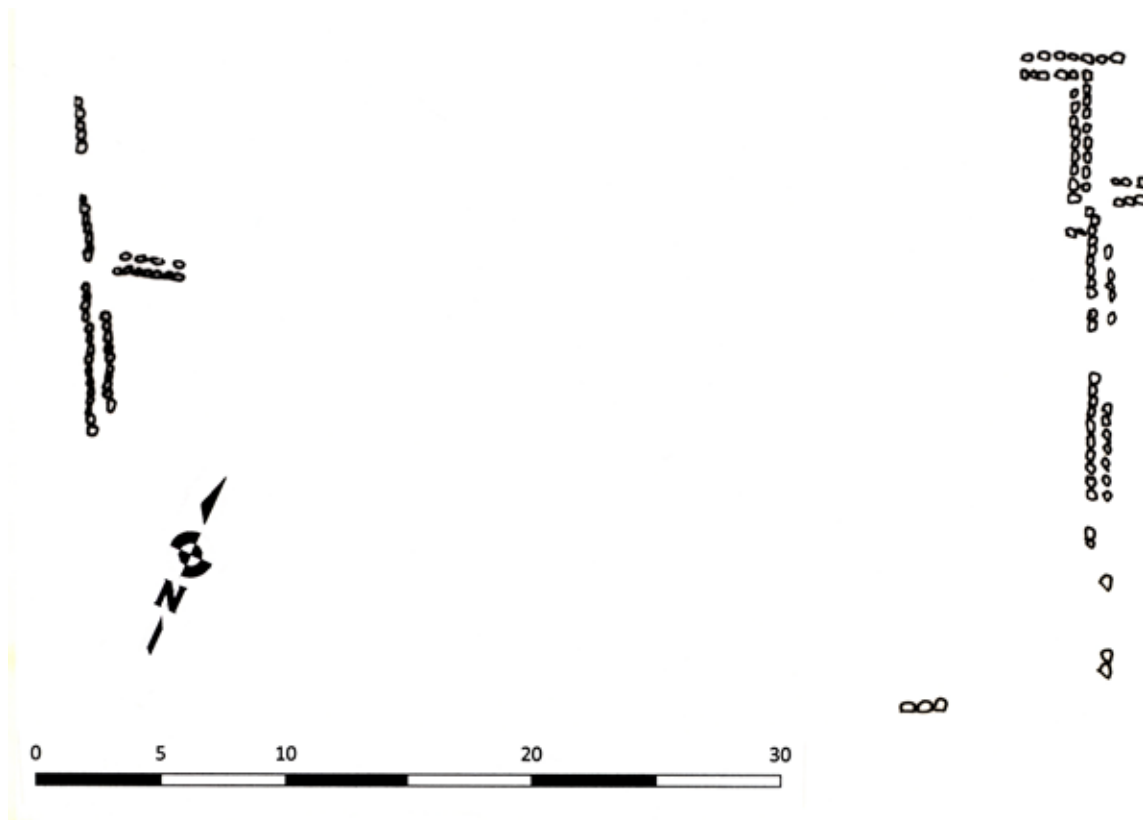
Bir al-Arfa. Building 532. E wall and tell. Worked rectangular block.

Building 534.

GPS 534: N34.74670 E38.06194, altitude 1066.

80 m WNW from building 532 up the slope two parallel stretches of bases of walls, 80-90 cm thick, orientated almost N-S. The E wall, 21 m long, makes a parallel displacement at the N end, where it meets another wall, forming a "T". There is also a small stretch of a wall running to the E at the displacement point. This shows that the E wall must have been an inner wall of a larger complex. To the S there are faint traces of a wall running to the W. The W wall is at a slightly higher level 31.5 m from the E wall. It has a length of 11 m. No corners can be traced, but a 2 m long internal wall, 60 cm thick, runs to the E from the wall, with an inclination to the S. The two parallel stretches of walls probably belong to the same building complex. NE of the area a smaller tell.

Finds: Brittle ware (16), coarse ware (4).



Bir al-Arfa. NE corner of building 534.

6. Cup-shaped marks.

GPS X1: N34.74744 E38.07399

Close to cistern X1, above a natural cave on a small plateau two 55 cm long parallel slightly curved rows, each with 7 circular cups, cut into the rock. The arrangement and number of the cups resembles the favorite Arab game al-Hawailah (Dickson 1949, 522-523).

Finds and chronology: none



Conclusions:

The site is not situated along major communication lines, though there is an opening i Jebel Abyad down to the plain east of Jazal. The importance of the site must be due to the possibility to concentrate several water systems, as cisterns with catching arms at the foot of the mountainsides. The site Bir Al-Arfa, the well at al-Arfa, both on the map and in local Bedouin usage, testifies to its importance of the water resource.

The pottery from the building area and the conneted cisterns range from the Roman period to late antiquity. There are no Islamic shards. However, it is not possible to establish any reliable chronological relationship between the cisterns, the enclosure, the corrals and the buildings. The buildings and the surface finds related to them show that it was an important site, a village or estate, in antiquity, but the function of the buildings is an open question. The fragments of grinding stones and some pottery within the large enclosure may belong to another structure, no longer visible.

STATION 098

Surveyed by AA, ES, KB, JCM, JK. May 03, 06, 2009.

GPS: N34.76340 E37.96234.

Map: 1:100.000. I-37-40 38490 74050.

The site, which is not clearly visible on satellite images, was visited briefly in 2008, but not measured. It lies in the open landscape between Jebel Char and Jebel Abyad with a good view of the surrounding territory, 8.4 km ESE of Shanaeh, 4,8 km. W of station 242, 17 km NE of Bir Djahar. It is visible in the landscape as a tell north of Wadi Shanaeh, where the wadi makes a sharp S-turn. However, N of the station there is an older wadi-reach, and it is possible that Wadi Shanaeh has changed its course in a more southern direction since antiquity. Some traces of former Bedouin camps in the area and on the tell.



Station 098. View of the tell from SE.

The site consists of the following:

1. Building on the tell.
2. Stretch of wall east of tell.
3. Islamic graves.

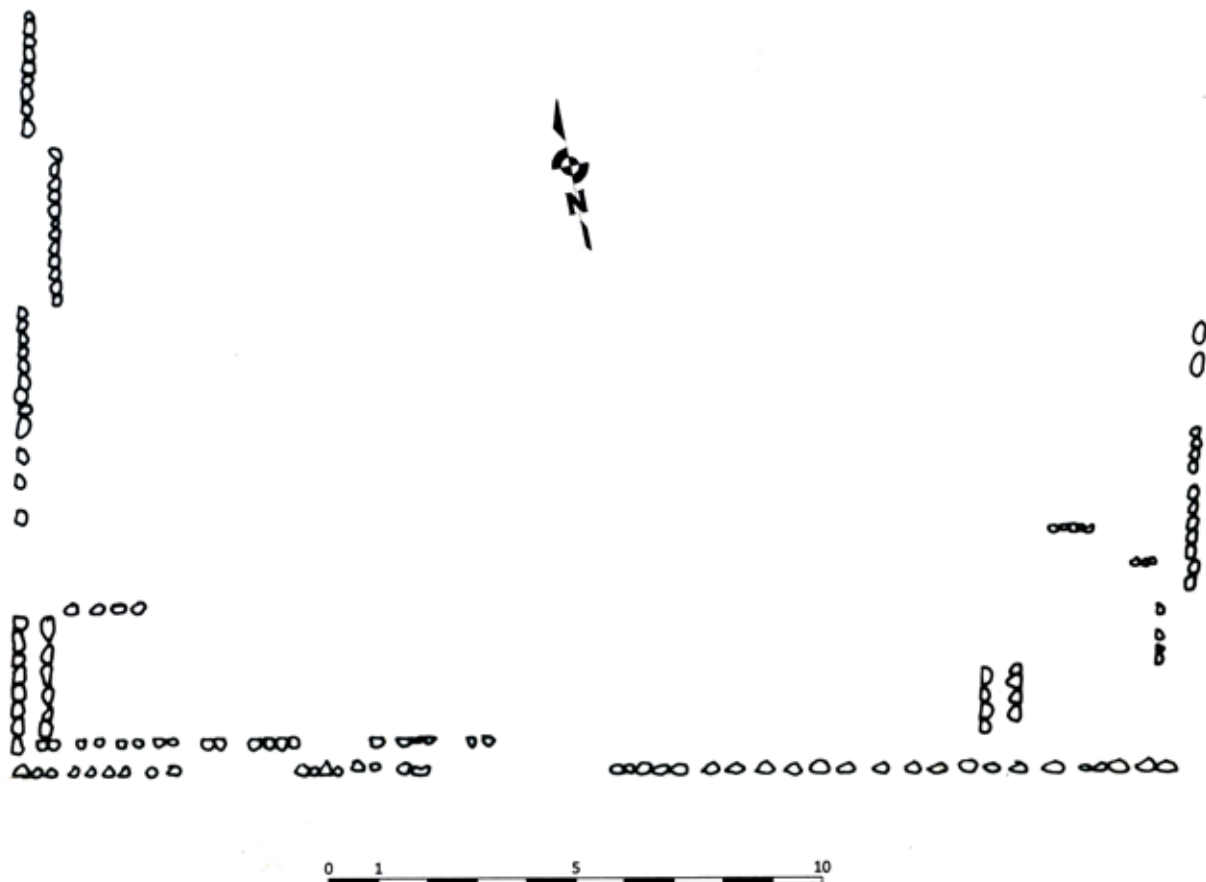
1. Building and tell.

GPS 505: N34.76330 E37.96219, altitude 872.

On the sloping S side of the tell there are several bases of walls with outer bigger stones and a filling of smaller stones in the middle, probably bases for mud brick walls as there are no heaps of stone around the walls. A 24 m long EW wall, thickness 80 cm, with distinct corners delimits the structure to the S. A W wall 15.50 m long and an E wall 9 m long run to the N from the corners, before they disappear into the tell delimiting the structure to the E and W.

At both corners there are traces of inner walls thickness about 60-70 cm. 2.50 m N of the SW corner a 2 m long stretch of an E-W wall. At the SE corner, a 1.5 m long stretch runs to the N 2.5 m from and parallel to the eastern wall. 3.5 m north of the corner there is a 2 m long stretch of an E-W wall, parallel to the south wall, thus indicating an oblong corner room measuring 2.5 x 3.5 m. As the E-W wall does not flush with the corresponding E-W wall in the SW corner, the building probably had two oblong rooms in the corners, not a series of rooms facing a courtyard to the N. There seems to be a shift in orientation of the longitudinal direction of the rooms.

As the tell to the north has a distinct delimitation down to the northern wadi-reach, the size of the building can be calculated to be approximately 25 m EW and up to 35 m NS.





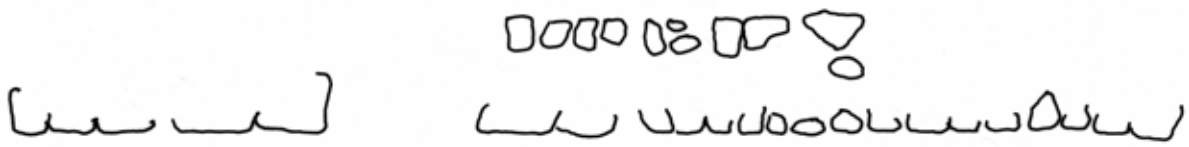
Station 098. South wall of building.

2. Stretch of wall.

GPS 537: N34.76340 E37.96316, altitude 870.

On the eastern edge of the hill, where the Wadi Shanaeh cuts into the hill, there is a 7.80 m long stretch of a solid wall, thickness about 80 cm with outer bigger stones. To the W it continues into the tell, to the E it is cut of the face of the wadi, which indicates a change in the wadi course, as mentioned above. Purpose of the wall cannot be determined.





Station 098. West wall.

3. Islamic graves.

GPS 536: N34.76344 E37.96254, altitude 871.

On the E part of the tell, outside the E wall there are remains of several disturbed Islamic graves.



Station 098. Islamic graveyard.

Finds and chronology:

Most of the finds have been found south of the tell, obviously been washed down by the rainfalls. Brittle ware (123), coarse ware (35), terra sigiliata, green glazed ware, fragments of tiles and grinding stones. The datable finds range from Roman to early Byzantine period.



Station 098. Fragment of roofing tile and terra sigiliata.

Conclusion:

The layout of the building with 2 corner rooms differs from the buildings at Shalalah and the villages at Jebel Chaar, which have a series of rooms facing a courtyard. The shift in orientation of the longitudinal axis of the rooms resembles the arrangement at the large fort at Shanaeh (See 2008 report) and it is possible that the walls have been the bases for small towers. The building lies at the natural communication line from E to W towards Bir Djahar, and the function of the building should probably be seen in relation to that, as a station. The distance to the bigger stations 242 (4 km) and Shanaeh (8.4 km) is very short, but also in Wadi al-Takara and Wadi al-Masek the distances between bigger and smaller strongholds are short.

SQUARE STRUCTURE 538

Surveyed by AA, ES, KB, JCM, JK. May 06, 2009.

GPS 538: N34.78489 E37.95216, altitude 930.

Map: 1: 100 000 I-37-40 38513 74041.

The structure is located on a small ridge 2.5 km NNW of station 098. It is orientated NS and has an almost square layout. The length of N-wall is 4.70 m, E-wall 4.60 m, S-wall 5.20 m and W-wall 4.70 m. The walls consist of larger outer stones. It cannot be determined whether there were an outer and inner row of stones with filling in the middle, though the eastern wall show signs of this construction. The purpose of the building cannot be determined, perhaps a small shrine.

Finds and Chronology: none



Square structure 538. From west.

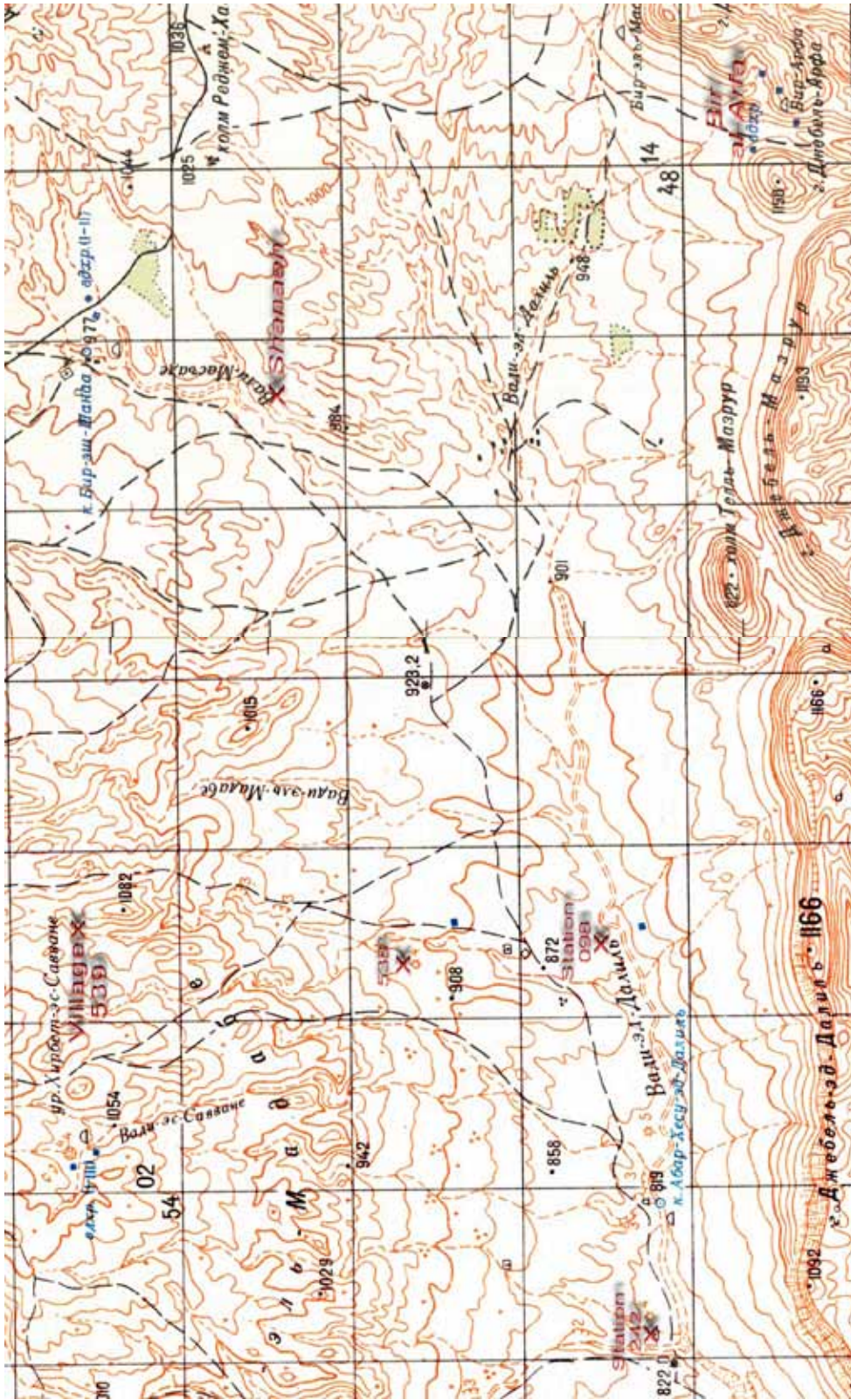
THE PLAIN NORTH OF JEBEL ABYAD WADI SHANAHEH CONCLUSIONS

The plain N of Jebel Abyad is relatively void of structures and finds, apart from Bir al-Arfa, where we have a high concentration of cisterns, and station 098 and station 242 (See report from 2008), which lie at the communication line towards the W and Bir Djahar. Shanaeh lies on the route to Jebel Chaar from al-Matna, and it is also a possible station on the route N to Khabar. There are only a few cairns and corals between Jebel Abyad and Wadi Shanaeh, and almost no wells and cisterns. The cairns on the top of Jebel Abyad are not visible from Wadi Shanaeh. To the N some cairns are visible at the southern slopes of Jebel Chaar.

The area in many ways resembles the western part of Wadi Abyad, and the two areas have one thing in common. The mountain side of Jebel Chaar is relatively steep and the mountains incline towards the plain around Jazal, which receives most of the precipitation in the mountains, just as the precipitation in the eastern part of Jebel Abyad flows towards Wadi al-Takara in the west, not down into the Wadi Abyad.

JEBEL CHAAR





1:100.000 I-37-40 and I-37-41. Every square is 2 x 2 km.

Introduction:

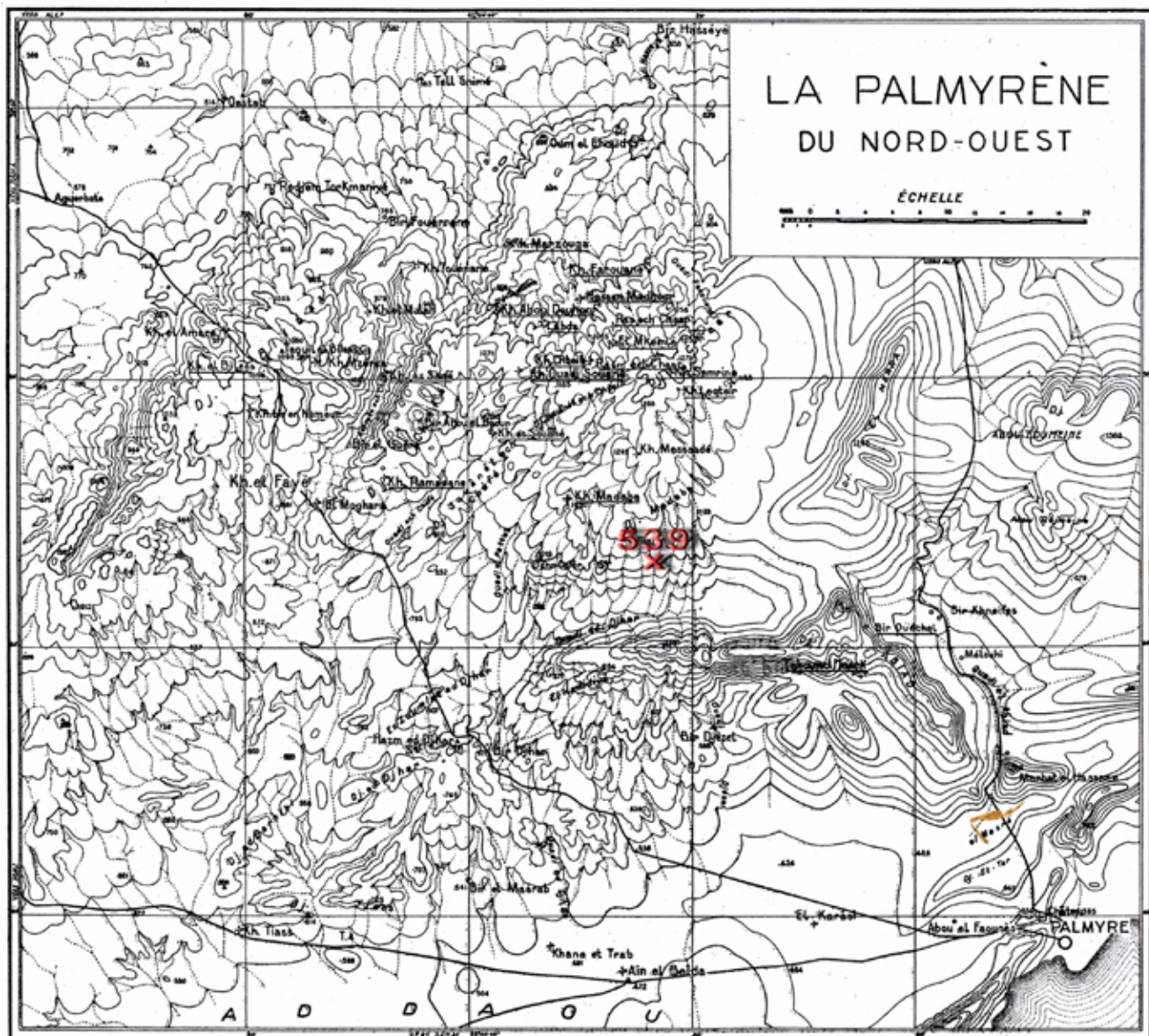
Jebel Chaar is called a mountain, Jebel. However, the area differs markedly from the other mountain areas N of Palmyra, Jebel Abu Righmen, Jebel Abyad and Jebel Merah. They have marked sides and often steep faces. Jebel Abu Righmen and Jebel Abyad are intersected by deep valleys with wadis, which also are the main communication lines. Other smaller tracks are only suitable for shepherds with their herds. Jebel Chaar, which reaches almost the same height as the other mountains (over 1000 m), can be characterized as a huge mountain plateau, covering more than 400 square km. Access to the plateau is easy from all sides. The landscape is undulating and communication within the area is not limited to a few valleys. Most of the sloping sides of Jebel Chaar are covered by deep layers of sediments with a thin layer of grass roots just below the surface.

The area of Jebel Chaar was investigated by Daniel Schlumberger between 1933 and 1935 (Schlumberger 1951) and he registered 15 villages with sanctuaries and a fort at the N part of the plateau, Rasm ech Chaar (N34.93349 E37.95556). Later in 2007 Khaled As'ad visited 11 sites in the area (K. As'ad 2007), and added some new to the list. Schlumberger's survey forms the basis of any study of Jebel Chaar, but unfortunately he did not give any detailed coordinates of the sites, and it can be difficult to identify the position of some of villages today. The area needs to be restudied and resurveyed as satellite photos show many new sites with only a short distance between. The Canadian-Syrian oil-company has also during their recent geological survey added sites to the list. Another aspect that needs attention is the dating of the sides. Schlumberger only registered, apart from the buildings, art artifacts, lamps and inscriptions, not the pottery, and it can be difficult to compare with other sites, where we have only got the pottery from the surface.

The E slopes of Jebel Chaar are part of our concession area, and the mission surveyed one village, which has not been registered by Schlumberger.



Jebel Chaar mountain plateau. In the center village 539 seen from SSE.



Jebel Chaar. Schlumberger's map of the area NW of Palmyra. The position of village 539 is roughly indicated.



VILLAGE 539

Surveyed by AA, ES, KB, JCM, JK. May 06, 07, 11, 13, 2009.

GPS: N34.82308 E37.96467.

Map: 1: 100 000 I-37-40 38548 74051.

The village lies in the SE part of Jebel Chaar 6 km WNW of Shanaeh, at the beginning of a wadi leading out into Wadi Shanaeh to the S, 42 km from Palmyra as the crow flies. Several smaller tells were identified on satellite images and the site has also been plotted by the Canadian-Syrian oil-company working in the area. Close to the village there are other sites; 3 km to the W a large village (GPS 559: N34.823281 E37.929751) outside our concession area and two smaller ones 3.4 km (GPS 52: N 34.854450 E 37.973917) and 4.8 km (GPS 265: N34.856000 E37.997899) N and NE of village 539, none of them surveyed yet. To the S, E of the wadi, a hilltop 1082 dominates the landscape with a marvelous view over Wadi Shanaeh and towards Jebel Abyad. A small recent Islamic graveyard occupies the summit.

The site can be divided into 5 areas, divided by smaller wadies: area 545, 542, 546, 550 and on the E ridge 554. Most of the structures have been roughly measured and positioned in relation to each other on an overview map. One structure on the ridge, area 554, where the general outline is well preserved, has been registered more in detail. All walls are visible as bases with outer bigger stones and a filling of smaller stones in the middle. The walls are embedded in deep cultural layers.

a. Area 545.

This area lies W of the main wadi, coming from the N. It only contains remains of one structure, 545, immediately east of the wadi.

545.

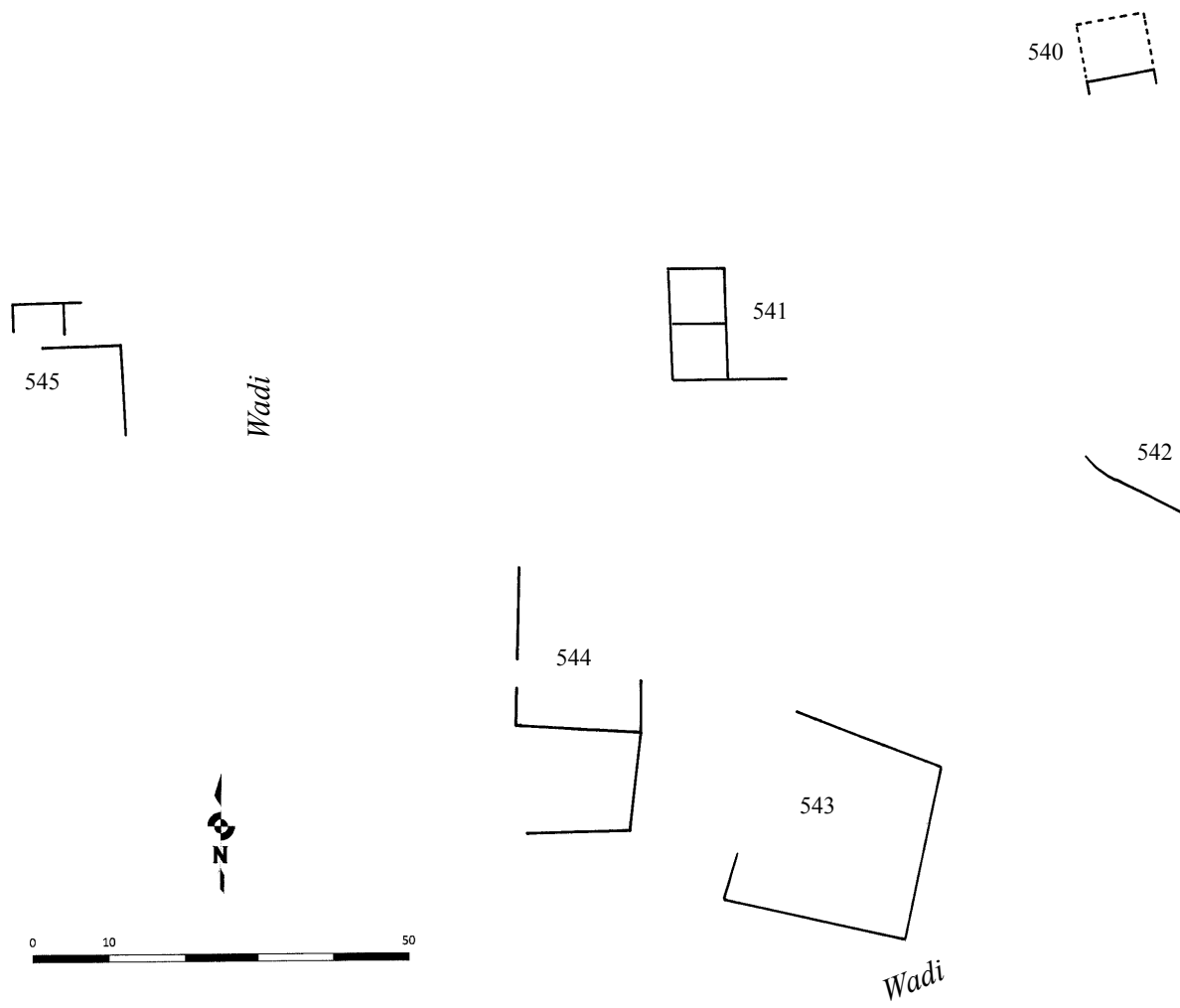
GPS 545: N34.82331 E37.96229, altitude 1048.

On the slope down to and close to the wadi there are traces of a rectangular building, orientated E-W, at 13 m long and 6 m broad, with an internal wall, separating it into two rooms. There are faint traces of an E-wall running to the S from the SE corner, perhaps part of a small courtyard. Thickness of the walls cannot be determined.

Finds: Brittle ware (23) and coarse ware (3).



Jebel Chaar. Village 539. Area 545 seen from the east.



Jebel Chaar village 539. Area 545 and 542.

b. Area 542

The area lies E and N of the main wadi, where it makes a sharp S-turn. Two of the structures, 543 and 544 are close to the wadi, 540, 541 and 542 on a higher level to the N.

Finds: Brittle ware (217), coarse ware (24), terracotta foot, basaltic mortar, green glass, fragments of grinding stones.

544.

GPS 544: N34.82273 E37.96304, altitude 1047.

Oblong structure, 13.5 m broad, orientated NS, divided by an internal wall. The S section of the structure forms almost a square 13.5 x 12.5 m. The W wall of the N section continues 21 m to the north. The N limit cannot be determined. The E wall makes a slight bend at the NE corner of S section. Thickness of walls 80-90 cm. The structures are either part of a building or two enclosures.



Jebel Chaar. Village 539. E wall of 544 seen from N.

543.

GPS 543: N34.82278 E37.96347, altitude 1042.

Large trapezoid structure 10 m ESE of 544 with clearly defined SW, SE and NE corners. The length of S wall is 25 m, E wall 25 m. The W wall is preserved for a length of 6.5 m, the N wall for about 20 m. Thickness of walls 75-80 cm. No traces of internal walls. The structure is probably an enclosure.



*Jebel Chaar. Village 539.
Structure 543 seen from the SE corner.*

541.

GPS 541: N34.82319 E37.96321, altitude 1050.

About 30 m NNW of 544 remains of a rectangular building (15 x 7 m), orientated N-S, divided into two square rooms (6.5 x 6.5 m). The building disappears into a small tell to the north. The S wall continues to the east for a length of 15.5 m, showing that the structure extended to the E. Thickness of the walls 80 cm.



Jebel Chaar. Village 539. Structure 541 seen from the NW corner.

542.

GPS 542: N34.82308 E37.96372, altitude 1049.

About 50 m ESE of 541 a 15 m long stretch of a wall is visible, orientated NW-SE. In the NW end it makes a slight inclination to the N. Thickness of the walls 60-65 cm. Purpose of the wall cannot be determined.

540.

GPS 540: N34.82351 E37.96381, altitude 1054.

50 m NE of 541 remains of building, orientated almost N-S. A 9 m long E-W wall, thickness 80 cm, has distinct corners, with small stretches of walls running to the S. To the north there are indistinct traces of an adjacent room about 8 m deep. The walls belong to a building.

Area 546

This area lies E of area 542, separated by a small wadi coming from the N. The structures lie up the hill to the NE.

Finds: Finds: Brittle ware (30), Coarse ware (10), fragments of plaster (building 549).

546.

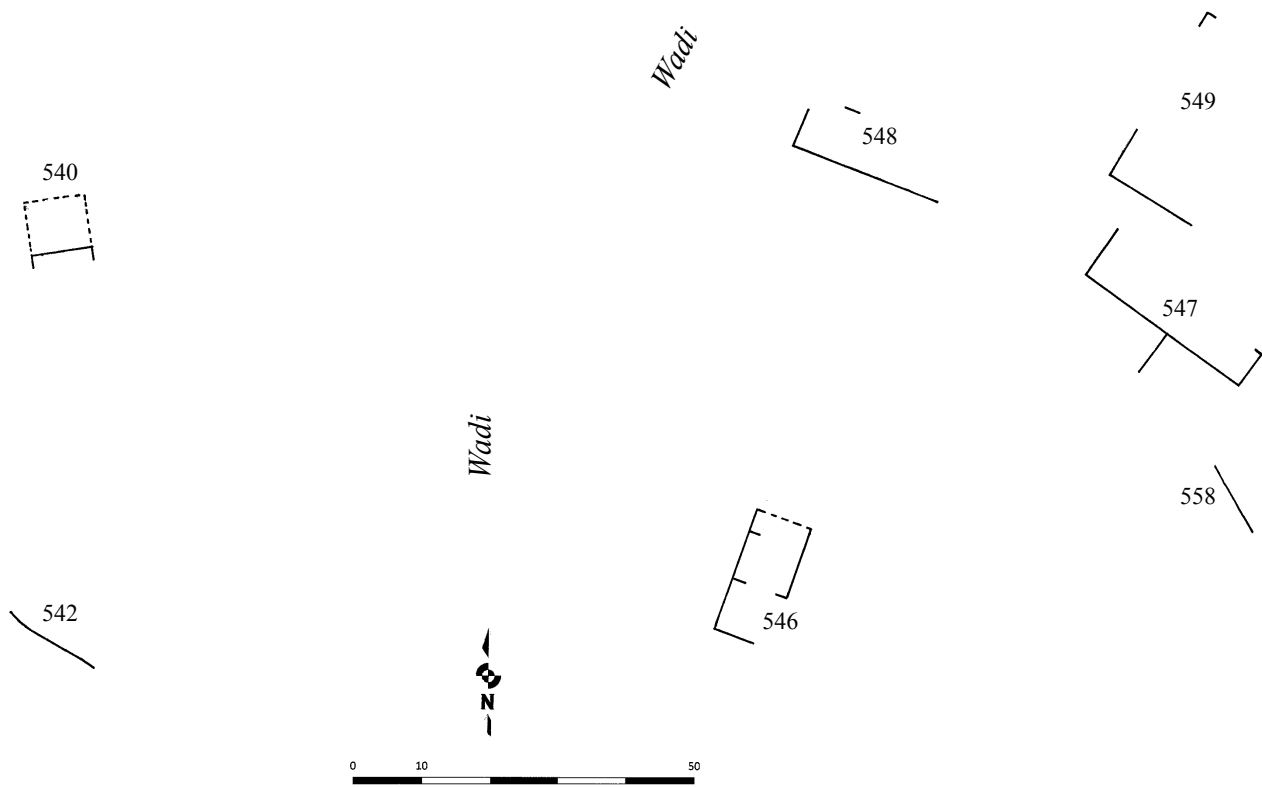
GPS 546: N34.82310 E37.96474, altitude 1049.

Remains of a rectangular building at least 18.5 m long and 8.5 m broad, orientated NNE-WSS. There are small stretches of internal walls dividing the building in two almost square rooms 7.5 x 7.5 m. The northern limit cannot be determined. Thickness of the walls 1 m.

547.

GPS 547: N34.82339 E37.96527, altitude 1055.

55 m NW of 546 there are several stretches of connected walls. A 27 m long wall, orientated NW-SE has distinct corners with walls running to the NE. The W wall is preserved for 8.5 m and disappears in the tell to the N. At the N end of E wall, which is preserved for 5.5 m, there is a small stretch of what is probably an internal wall. 14.5 m from the SE corner a 7 m long wall runs to the SW, showing that the



Jebel Chaar village 539. Area 546. To the left area 542.

structure extended in that direction, too. Thickness of the walls 80-90 cm. The walls have probably been part of a larger building. The relation to structure 549 in the tell to the N cannot be determined.



Jebel Chaar. Village 539. W part of structure 547 from SE. In the background the tell of 549.

549.

GPS 549: N34.82361 E37.96522, altitude 1060.

Above 547 there is a small tell with visible stretches of walls. A NW-SE wall, preserved for a length of 14 m, and a SW-NE wall, preserved for 8 m form a distinct corner at the SW part of the tell. In the northern part of the tell modern diggings have reveal another corner of the structure, with small stretches of walls (2 x 1.5 m), 28 m from the SW corner. In the tell 2 fragments of water tight plaster, forming a curve, which must have belonged to the same construction. Thickness of the walls 90 cm. The walls have most probably been part of a building. The relation to structure 547 at a lower level to the S cannot be determined.



Jebel Chaar. Village 539. NW corner in the tell.

558.

GPS 558: N34.82321 E37.96536, altitude 1047.

15 m SSE of 547 a 11 m long NW-SE wall with no corners are preserved, thickness 80 cm. Purpose unknown.

548.

GPS 548: N34.82356 E37.96497, altitude 1056.

25 m W of 549 remains of a rectangular building, with a distinct SW corner, orientated WNW-ESE. The S wall is preserved for 21 m, the W wall for 5 m. A small stretch of a wall 8 m N of and parallel to the S gives the width of the building. Thickness of the walls 80 cm.

Area 550

This area lies 30 m NNW of area 546, separated by a wadi, and 110 m N of 545, separated by a smaller wadi. Remains of several structures from the wadi up the hill to the N.

Finds: Brittle ware (150), coarse ware (18), glass, red glazed ware.

550.

GPS 550: N34.82415 E37.96490, altitude 1030.

Remains of a large enclosure in the lower southern part of the area close the small wadies coming from the NE and N. The well preserved corners to the S are rounded and the enclosure opens up towards the N. The length of the S wall is about 20 m. The E wall, which ronds towards the NNE is preserved for 20 m. Thickness of the walls 60 cm. The N limit of the enclosure cannot be determined but it is possible that the enclosure has extended as far as structure 557.



Jebel Chaar. Village 539. Enclosure 550 seen from SE. At the top of the hill to the right diggings around 551 and 553.

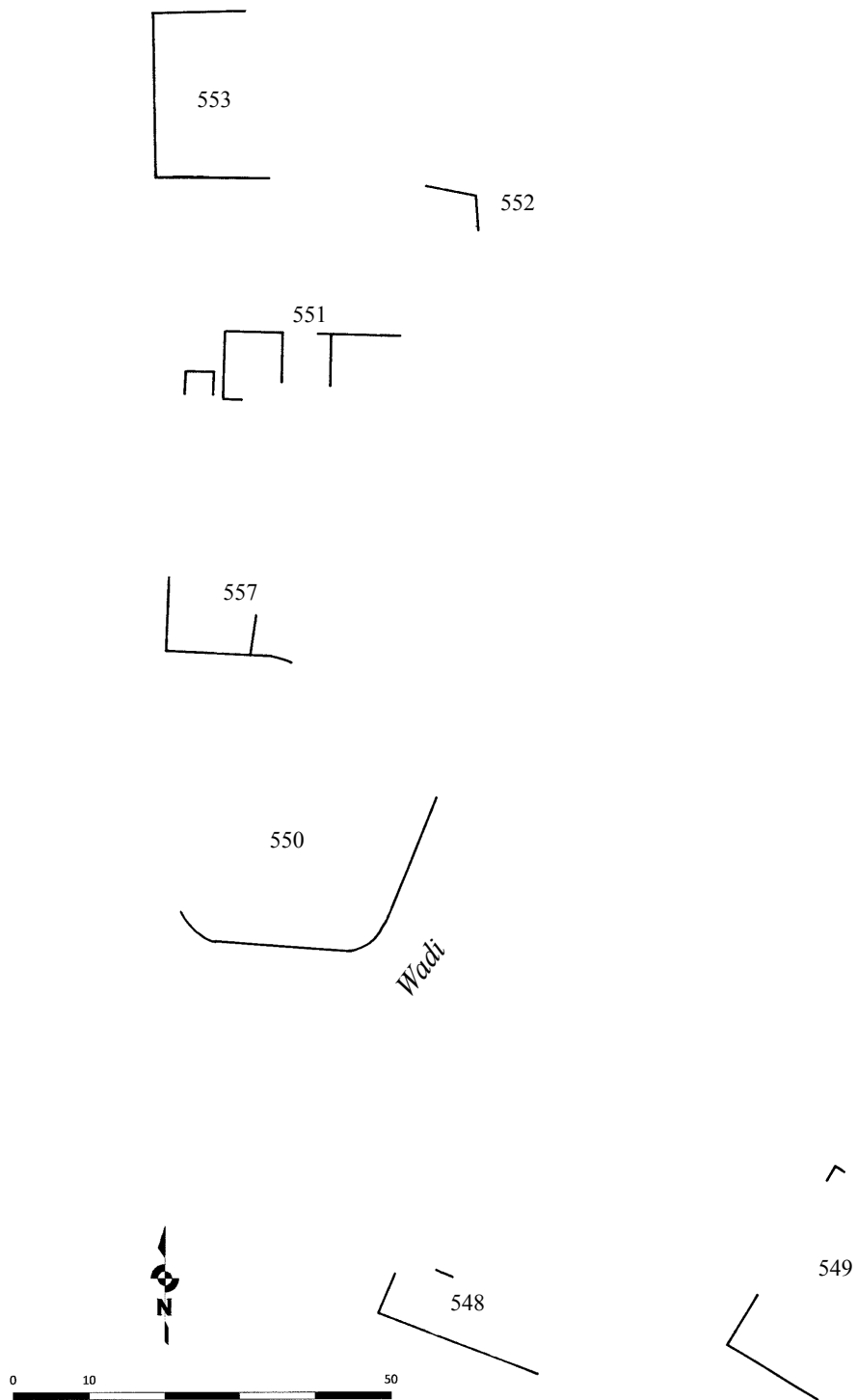
557.

GPS 557: N34.82442 E37.96457, altitude 1057.

Remains of a structure orientated NS-EW with a distinct SW corner. The preserved length of S wall is 16 m, and it makes a slight bend to the S. The W wall is preserved for 10 m. 11 m E of the SW corner an internal wall, preserved for 5.5 m. Thickness of the walls 80-90 cm. The walls are probably part of a building or small enclosure.

Jebel Chaar, Village 539. S wall of 557. In the background area 546





Jebel Chaar village 539. Area 550. At the bottom area 546.

551.

GPS 551: N34.82462 E37.96467, altitude 1060.

25 m N of 557 remains of a larger building, orientated NS-EW. Two stretches of an EW wall, thickness 1 m, in line with each other, form the N limit of the complex. The E stretch is preserved for 11.5 m, the W stretch for 7.5 m, separated by an opening 4 m width. The W stretch forms the N wall of a rectangular room, 9 m long, orientated NS. The SE corner is not preserved. Thickness of the S walls of the room is 80 cm. Parallel to the E wall, 6.5 m apart to the E, a 7 m long wall runs to the south from the N-wall of the complex, thickness 1 m. It is uncertain if the internal walls are part of a series of internal rooms facing S, or if they are part of an opening to the complex. Immediately W of the southern part of the NW room, but with no walls between, there are disturbed remains of a smaller rectangular structure, ca. 4 m E-W and 3.5 N-S, and its relation to the rest of the building cannot be determined.



Jebel Chaar. Village 539. Building 551 seen from SW, E-W wall and internal walls

It is uncertain if the internal walls are part of a series of internal rooms facing S, or if they are part of an opening to the complex. Immediately W of the southern part of the NW room, but with no walls between, there are disturbed remains of a smaller rectangular structure, ca. 4 m E-W and 3.5 N-S, and its relation to the rest of the building cannot be determined.

552.

GPS 552: N34.82477 E37.96490, altitude 1060.

About 15 m NE of 551, 2 stretches of walls form a corner, length of the N wall 7 m, the E wall 5 m. The corner is not right-angled. The N wall has a slight inclination to the NW, the E wall to the SE. Purpose of the walls cannot be determined.

553.

GPS 553: N34.82499 E37.96454, altitude 1063.

20 m N of 552 at a higher level a large regular structure with well-preserved NW and SW corners orientated NS-E-W. Length of W wall is 21.5 m. The preserved length of S wall is 15 m, the N wall 12.5 m. Thickness of the walls 90 cm. The eastern limit of the structure cannot be determined.

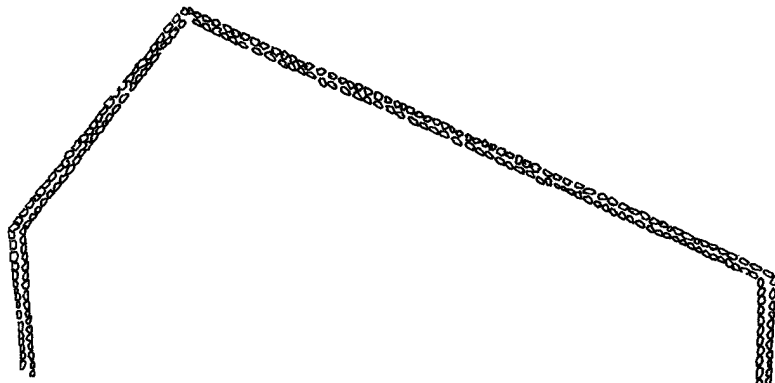
Area 554

260 m E of valley up on the ridge to there are remains of a larger complex with a building 556, an connected enclosure 554 and to the N some other structures 555.

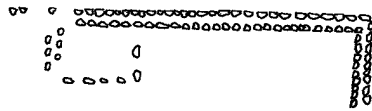
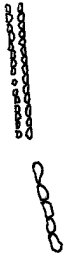
556.

GPS 556: N34.82423 E37.96785, altitude 1075.

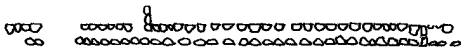
At the ridge, close to the modern track towards the south there are, there are remains of a relatively well preserved complex, with a large central courtyard, ca. 33 m E-W and 30 m NS. The E wall is covered by the tell and other debris, and the position of the NW and SW corners can only be estimated roughly.



554



556



Along the W side of the complex several internal walls, 80 – 90 cm thick, show a series of rooms facing the interior along the outer wall. The width of the rooms is about 6 m, the depth cannot be determined, but from the preserved end of the S wall it must have been at least 7 m. The N wall is 80 cm thick. 10 m W of the NE corner, and 10 m E of the walls facing the interior, traces of interior walls forming a rectangular room, 5 m E-W, and 1.5 m N-S, probably a gateway into the courtyard. As there are no other traces of internal walls along the N wall, this is probably an entrance to the complex from the N. The E wall, thickness 90 cm, shows no traces of any internal rooms. The S wall, thickness 1 m, is preserved for 22 m. It shows no traces of internal rooms, but some distinct upright slaps at the E end indicate the existence of a door opening.

Finds: metal fragment, brittle ware (134), coarse ware (7), green glazed.



Jebel Chaar. Village 539. Building complex 556 seen from N. To the right the tell in the W part. In the foreground the W wall of enclosure 554.

554.

GPS 554: N34.82460 E37.96765, altitude 1075.

Immediately N of 556 there are distinct remains of a large 5-sided enclosure with corners to the NW, N and NE. To the S the E and W wall points slightly inwards towards the E and W limit of the larger complex, which has formed the S limit. The enclosure is about 50 m long N-S, about 33 m wide to the south and 39 m wide to the N. The thickness of the walls is about 60-70 cm. At the S end of the W wall 5 large upright stones in a single row make an inward bend. They are probably secondary to the original enclosure, due to different construction technique and orientation. The layout of the enclosure

is probably determined by older roads around the structure. Even if there are no walls preserved that connect the enclosure and the complex directly with each other, the orientation of the E and W wall of the enclosure shows a clear connection between 554 and 556.

Finds: none.



Jebel Chaar. Village 539. Interior of building complex 556 seen from S. In the center traces of small rectangular room, probably forming a gateway into the courtyard. In the background E and N walls of enclosure 554.



*Jebel Chaar. Village 539.
View from the hilltop 1082 SE
of village over Wadi Shanaeh
towards Jebel Abyad.*

555.

GPS 555: N34.82534 E37.96814, 1080.

30 m N of 554 there are remains of two corners, facing each other 26 m apart. They have been partly disturbed by the track along the ridge. The two corners have a slightly different orientation. The SW corner (11 m NS, 5 m EW) is orientated NS-EW. The NE corner (17 m EW, 7 m NS) is not quite right angled and has an inclination towards the E. The relation between the two corners cannot be determined.

Finds: none.

JEBAL CHAAR. VILLAGE 539. CONCLUSIONS

No traces of wells or cisterns have been found in the area, which probably means that the locals have not maintained them up through the ages.

It is not possible without excavations to get a more detailed picture of the layout of the single structures and the settlement as such. However the visible structures closely resemble the villages that Schlumberger registered, as an example in Kheurbet Quadi Souâné (Schlumberger 1951, 30-33). The building complex 556 with enclosure at the hilltop can be classified as an estate.

The amount of pottery gathered at the site is surprisingly small, probably due to the fact that the erosion has not touched deeper layers. There is no larger difference in the composition of the pottery found in the different areas. A few shards can be dated to the Roman and late Roman period, but most of the datable material belongs to the Byzantine and early Islamic period. A single shard may even be dated to 12th - 14th century.

The chronological distribution of the datable pottery is surprising. It shows that human activities at the site continued up into early Islamic period, perhaps even later. Of course the surface finds tell us nothing about the earliest phases of the settlement. The cultural layers are thick and the erosion has probably only touched the later periods.

CONCLUSIONS

These conclusions are based both on the 2008 and 2009 survey and also on the studies of the pottery from the 2008 survey.

Chronology of the sites

In the 2008 preliminary report, delivered in June 2008, we concluded that only few fragments of pottery gathered at the sites could be dated to the Umayyad and Islamic periods, and that this indicated that the human activities and the exploitation of the resources of the area changed dramatically in late antiquity (Report 2008, 124), though more detailed conclusions had to await an analysis of the pottery.

In October 2008 the pottery was studied more closely at the Museum of Palmyra. Dr. Grzegorz Majcherek, deputy director of PCMA, and member of the Syrian-Polish mission in Palmyra, had a short look at the finds, and Ela Katzy, University of Tübingen, Institut für klassische Archäologie, member of the German-Syrian mission at Tell Halaf, made a more detailed study of the pottery and presented her results at a Workshop in Nordheimsund, Norway in March 2009. The results of these studies were unambiguous. The chronological composition of the surface finds showed a much later distribution than supposed in the preliminary report of 2008. At most of the sites material could be dated from the Roman to the Byzantine period and at several sites also to the early Islamic period and even Islamic period. At some sites there was only material from the Byzantine and early Islamic period. The same tendency can be observed at the sites investigated in 2009. I am deeply grateful to Denis Genequand (CBRL) for his assistance during the 2009 survey. The coins from the 2008 survey have now been cleaned and identified by Khaled Kiwan, The National Museum in Damascus. The bronze coin from Tweihina station was issued at the mint at Antioch during Antoninus Pius (138-161 AD). The coin found at Shanaeh is a Roman tetradrachm issued in 251 at Antioch during Volusianus (251-253).

To sum up the chronology of the 2008 and 2009 surface finds, including coins, at the major sites:

Akerem:	Roman/late Roman/Byzantine/early Islamic?
Al-Mazraah:	Roman/late Roman/Byzantine/early Islamic/Islamic.
Wadi al-Takare S:	Roman (late Roman, early Islamic and Islamic in surroundings)
Wadi al-Takara N:	Roman/late Roman/Byzantine
Tweihina station:	Roman/late Roman/Byzantine
Tweihina hillfort:	Roman/late Roman/Byzantine
Shalalah:	Roman/late Roman/Byzantine
Jazal:	Roman/late Roman/Byzantine/early Islamic
Bir al-Arfa:	Roman/late Roman/Byzantine?
Shanaeh:	Roman/late Roman/Byzantine/early Islamic (Islamic)
Station 098:	Roman/late Roman/Byzantine
Jebel Chaar (539):	Roman/late Roman/Byzantine/early Islamic (Islamic)
Khabar station:	Byzantine/early Islamic
Khabar East:	Roman
Khaleed al-Ali:	Early Islamic
Fasida:	Byzantine/early Islamic

It is very complicated to use surface finds to date human activity at a site. Firstly; it is characteristic that sites with heavy erosion display a relatively early chronology of the pottery, as an example the small station at Wadi Takara S. On the contrary sites with deep cultural layers have a much later distribution. From the station at Khabar only Byzantine and early Islamic shards were gathered, but the original walls are covered by broad ramparts of windblown material. A few hundred metres from the station, where the wadi has cut through some structures the finds can be dated to the Roman period.

Secondly; during the rainy season the water removes and displaces the shards, and at sites with several structures on the same plateau, not divided by wadies, the finds cannot be related to the individual buildings with certainty. At station 098 most of the pottery was thus gathered over hundred metres away from the tell.

Thirdly; the quantitative, chronological distribution of the finds cannot reveal fluctuations in the intensity of human activities in the area. A predominance of early pottery is very often related to the extent of erosion at the site, as a predominance of late pottery is related to the existence of deep cultural layers, as mentioned above. The issue can only be resolved through excavations at sites with deep cultural layers.

However, with all these limitations in mind some conclusions can be drawn. No material can be dated to the Iron Age or Hellenistic period. Most sites seem to go back to the Roman period at the earliest. There is not enough characteristic pottery or coins to date them more precisely within the three first centuries AD. Human activities continue up into the late Roman and Byzantine period and at some sites well into the early Islamic period, perhaps even later as attested by shards, which probably belong to the 13th and 14th centuries. The Ottoman period is almost void of finds. Only two possible late Ottoman shards have been registered during the entire survey, and only one of them at a site (al-Mazraah).

Strongholds and stations:

One of the objectives of the 2008 survey was to trace a possible caravan route from Palmyra towards the NW. The survey documented the existence of a chain of strongholds, TweiHina, Shanaeh and Khabar. Fasida was also classified as a stronghold or station, but the shape of the structures suggests another function. The 2009 survey has confirmed the existence of a route, not N of Palmyra via Wadi Abyad, but more to the NW, via Wadi al-Takara and Wadi al-Masek towards the plain between Jebel Chaar and Jebel Merah. The smaller stronghold at the mouth of Wadi Takara and the larger one at the northern end of Wadi Takara stress the importance of this communication line. There are no structures in the Wadi Abyad area, which can be classified as a station or a stronghold. The larger stronghold at Wadi al-Takara N, 24 km from Palmyra, may have functioned as a station on the route, instead of TweiHina only 3 km to the N, which is cramped between steep mountainsides in the narrow wadi.

As noted in the 2008 report the location of the strongholds N of Wadi Abyad, Shanaeh, station 098 and 248, can only partly be explained by the logic of one day's travel, and the existence of two strongholds in Wadi al-Takara confirms that also other considerations must have played a rôle than just to provide safety for caravans and traders along the route to the NW as *hans*, caravan serailles. The distances between Palmyra – Wadi al-Takara S – Wadi al-Takara N – TweiHina are thus only 16 – 8 – 3 km respectively. The small fort near the springs at Shalalah (Ouéchel) is not located along any route to the N, but controls the spring area (Schlumberger 1951, 46-47). The structures at Jazal seem to be surrounded by a strong wall. All this strongly indicates an intention to control the area and important resources with some sort of military presence in the locality.

From the tax law of Palmyra we know that nomads brought their flocks of animals into Palmyrene territory (Matthews p. 180) for grazing. It is very doubtful, however, if the surrounding nomads posed any larger military threat as such during their seasonal migrations. The stations and strongholds N of



Stations and military installations N and NW of Palmyra.

Palmyra are relatively lightly constructed with mud-brick walls, some of them probably with more solidly built towers in the corners. They differ markedly from the Roman forts along Strata Diocletiana from Damascus to Palmyra and the forts along Via nova Traiana from Bostra to Aqaba at the Red Sea (Kennedy & Riley 1990). The villages in Jebel Chaar must have been an obvious target for raids, but they are not surrounded by any walls. In Jebel Chaar only one fort has been registered in the N part of the mountain plateau at Rasm ech Chaar by Schlumberger (Schlumberger 1951, 44-45). The Palmyrenes undoubtedly needed to control this nomadic population, not to protect their own villages in the highland, but this control was probably mostly related to tax farming. As mentioned above, grazing rights for animals brought into Palmyrene territory are specified in the tax law, and also that the tax collector may have the animals branded (Matthews 1984, 180). Further, conflicts between the different nomadic groups have probably been a common phenomenon, and the military presence guaranteed some degree of law and order and conflict solution. Access to the water in the area was another possible source of income. The tax laws do specify access to water, but only sources in Palmyra itself (Matthews 1984, 177). In the old law, which unfortunately is very fragmentary, water sources and salt which is in the city and within its borders are mentioned (Matthews 1984, 177), but no details have survived. It would indeed be natural also to impose some tax on the water sources in the territory, as also strongly indicated by the presence of a small fort close to the springs at Shalalah.

Another purpose of the military presence in the territory might have been to prevent smuggling of goods liable to duty. The tax law specifies a lot of commodities related to Palmyra and the surrounding territory, and even if the fee has been relatively modest, more or less equivalent to the Roman *portorium* (normally 2 ½ % of the value), the tax law shows a concern for this income. The Caravan trade through Palmyra from the Arabian Gulf also brought highly valuable goods from the East, which were levied a fee of 25%, the *tetartê*, probably in Antioch (Seland 2008, 93). The ancients were probably just as creative and eager, as we are, to escape duties and taxes, if it could be avoided.

This military presence in the territory was not confined to the centuries of the flowering of the Eastern trade. Everything points to the important conclusion that the strongholds were still functioning, though we do not know the details, through the late Roman and Byzantine period, and at some places also up into the early Islamic era and probably even later.

Villages and estates:

The 2008 survey proved that villages were not confined to Jebel Chaar. The buildings at Shalalah (Ouéchel) in the NE corner of Jebel Abyad resemble the structures registered by Schlumberger. The 2009 surveyed has showed that the size of the village is also comparable to the villages in Jebel Chaar, and that there have been other villages at Bir al-Arfa at the northern edge of Jebel Abyad and at the summit above Wadi Abyad, at al-Mazraah, though the exact size cannot be determined. During a reconnaissance in October 2009 for future survey several sites with remains of buildings and cisterns were discovered on the E and W side of Jebel Merah, one of them with a small dam across a wadi, which have been added to the map of the distribution of villages. The exact nature of these sites can only be determined after proper registration and investigation.

However, the mission had expected many more sites in Jebel Abyad and also at the western side of Wadi Abyad. Musil thus mentions green meadows beneath the springs of Shalalah, and at the western face of Jebel Abyad there are several other springs. The survey has shown that the springs were utilized, as an example at Akerem, Awtayt and Majouf, but there are no traces of any villages, comparable to the villages in Jebel Chaar, in the lowland beneath the Jebel Abyad range, even if the exact function of the buildings at Akerem is an open question. As mentioned above, this may be due to the fact that most of the precipitation in the mountain range flows towards Wadi al-Takara in the west. The same



Villages or estates N and NW of Palmyra.
00420-00421 is the wall across Wadi al-Takara.

phenomenon can be observed north of the Jebel Abyad range, where the buildings at Bir al-Arfa are an exception, surrounded by water-catching systems with a very high potential.

A careful study of the satellite photos of Jebel Abyad and the survey have not revealed any clusters of buildings that can be compared with the villages in Jebel Chaar, where many of them are visible on satellite photos due to modern diggings in the tells. The function of the buildings at al-Mazraah is an open question, but also this site seems to be more or less an exception. The resources of Jebel Abyad, which was covered by trees in the beginning of the 19th century, have certainly been exploited in antiquity. The need for fuel must have been enormous in Palmyra and the highland must also have been a good grazing ground.

Of course the mission cannot claim to have found all potential buildings or villages in Jebel Abyad, but notwithstanding the difference to Jebel Chaar is striking. The distances between the villages in Jebel Chaar are very short, down to 3 km. Perhaps the difference in settlement pattern between Jebel Abyad and Jebel Chaar is related to geographic differences, some way or another. Jebel Abyad can be classified as a proper mountain range, with steep faces and deep valleys, and much of the surface has been washed down to the rock, apart from in the valleys. Jebel Chaar is an undulating mountain plateau, with deep deposits, also originally covered by trees. Jebel Chaar is also closer to the modern limit of 200 mm annual deposition (Wirth 1971, 88 – 93). Just northwest of Jebel Chaar and Jebel Bilas the conditions for agriculture are markedly different. Even a small lurch of the limit of the precipitation would have changed the economic potential of the Jebel Chaar area dramatically, but we have no information of the micro climatic conditions in antiquity. The economic basis of the villages is still an open question. Normally they are classified as pastoral holdings of the elite in Palmyra (Will 1957, 271-273. Young 2001, 150-151). The larger building complexes in the villages can indeed be classified as estates, not small holdings, but the short distance between the villages in Jebel Chaar is striking. It can be compared to the distances between villages in central Europe, indicating a much more intensive exploitation of the mountain plateau than pastoralism.

Just as was the case with the strongholds and stations everything seems to indicate that the settlements also in Jebel Chaar continued up into late Roman, Byzantine and early Islamic period. This conclusion is based on the investigation of only one village in Jebel Chaar, and the sites in Jebel Abyad. Future survey is needed to confirm the chronology of the villages in Jebel Chaar, which until now has been based on art artefacts, lamps and inscription, not pottery from the surface.

Water supply:

In the 2008 report three different sources of water in the area were listed; wells, cisterns with catch-arms and springs. We stressed that it was human activities and human demand that created the water supply, not vice versa. However, the 2008 survey did not give any clue to a more firm dating of the wells and cisterns. It was supposed that many of them were probably old systems, maintained by the Bedouins up through the ages, and that the more well-constructed wells and cisterns presupposed a much more complex organisation than that of a traditional Bedouin society. The concentration of pottery close to some of the cisterns, but not in the area around, in Wadi al-Takara S and N leaves no doubt about an early dating of the original system, even if the opening has been repaired with concrete in recent times. This of course does not mean that all specific wells and cisterns necessarily have an ancient origin, but that the locations with a high concentration of wells and cisterns probably also have been exploited in antiquity.

Most of the water catching systems registered in 2008 was in areas with relatively steep mountain sides, such as Bir al-Arfa, al-Matna and Twei hina. However, some of the water systems in Wadi al-Takara show that even small differences in height can be exploited, such as at the cisterns S of the stronghold at Wadi al-Takara N, or small hilltops, such as the sophisticated system at al-Koullah.

Corrals:

Corrals are found almost everywhere in the territory, from small valleys high up in the mountainsides, such as at Shalalah (2008 report, 30) to more open plains in the lowland, very often close to smaller wadies. There seems to be a concentration of corrals in locations with cisterns and water catching systems, such as al-Matna, Bir al-Arfa and al-Khoullah. The date of the corrals is a very complicated issue. The stones of the corrals are well embedded in the ground, and the structures have obviously not been used in modern times, as many of them have not been preserved in their original layout. Many corrals have been constructed around cairns and with stones from the cairns, and they must post-date the cairns. A good example is cairns 39 & 40 in the southern part of Wadi al-Takara, which are surrounded by a series of corrals (See prehistoric report: Site 13, cairn 39 & 40, WP 83-84, and this report p. 31). The pottery associated with the corrals covers a long span of time, from the Roman period to early Islamic times, and the corrals probably belong to the same period as the original cisterns. It is also normal in Syria and Jordan that the local population up to modern times has reused the material from forts and stations to construct smaller settlements and enclosures (Poidebard 1934, Kennedy & Riley 1990). This can be observed at Shanaeh and the larger northern fort in Wadi al-Takara.

The function of the corrals is another complicated issue. Some of the corrals are definitely too small to function as animal pens. They may have been bases of temporary shelters for people and equipment. Other corrals, close to the wadis, may have been small garden enclosures. William Beawes, who traveled from Basra to Aleppo in 1745, mentions (Carruthers, 31): "These wanderers of the desert remain sometimes on or near one spot for a whole season, and these cultivate gourds, cucumbers and such like vegetables; and the remains of these miserable plantations we met with three or four times in our journey." Also modern Bedouins construct enclosures to protect small gardens from the herds, though they have a rectangular layout. Other larger corrals, like corral 396 at al-Koullah, have a more complicated layout and some of them have "corridors" between different sections. They make much more sense as animal pens. The layout permits the shepherds to separate the herd in smaller groups, which is important during milking and especially during shearing, and perhaps also branding, which is mentioned in the Palmyra tax law (Matthews 1984, 180).

(Jørgen Christian Meyer and Nils Anfinset)

Agriculture:

Apart from the wall crossing Wadi al-Taka, which may be related to agriculture, the survey has not yet identified any structures or registered any finds that can be safely related to agricultural activities in the survey area.

References:

- Al-As'ad, K. (2007): *Archaeological Journey to Sha'aer's mountain*. Palmyra. (Unpublished report).
- Carruthers D. (1929): *The Desert Route to India. Being the Journals of Four Travelers by the Great Desert Caravan Route between Aleppo and Basra 1745 – 1751*. London, Hakluyt Society.
- Cherry, J F & Shennan, S (1978): Sampling cultural systems: some perspectives on the application of probabilistic regional survey in Britain. In Cherry, J F, Gamble, C & Shennan, S: *Sampling in contemporary British archaeology*, Oxford, Brit. Archaeol. Rep. 50, 17-48.
- Dickson, H.R.P. (1949): *The Arab of the Desert. A Glimpse into Badawin Life in Kuwait and Sau'di Arabia*. London.
- Kennedy, D. and Derrick Riley (1990): *Rome's Desert Frontier from the Air*. Austin, Texas.
- Matthews, J.F. (1984): The Tax Law of Palmyra: Evidence for Economic History in a City of the Roman East. *JRS* 74, 157-180.
- Meyer, J.C. (2008): *Surface Survey between Palmyra and Isriye. April 2008. Joint Syrian-Norwegian Project. Preliminary Report*. <http://www.org.uib.no/palmyrena/documents/Survey2008.pdf>.
- Musil, Alois (1928): *Northern Arabia. Maps*. New York.
- Musil, Alois (1928): *Palmyrena. A topographical Itinerary*. New York .
- Poidebard, A. (1934): *La trace de Rome dans le désert de Syrie*. Paris.
- Schlumberger, Daniel (1951): *La Palmyrène du nord-ouest. Villages et lieux de culte de l'époque impériale. Recherches archéologiques sur la mise en valeur d'une région du désert par les Palmyréniens*.
- Seland, E. H. (2008): Trade Routes of Palmyra. With Special Notes on Western Routes in the Palmyrene Trade. In Minna Lönnqvist (ed.): *Jebel Bishri in Context. Introduction to the Archaeological Studies and the Neighbourhood of Jebel Bishri in Central Syria*. BAR International Series 1817, 89 – 97.
- Will, E. (1957): Marchands et chefs de caravanes à Palmyre. *Syria* 34, 262-277.
- Wirth, E. (1971): *Syrien. Eine geographische Landeskunde*. Darmstadt.
- Young, Gary K. (2001): *Rome's Eastern Trade. International Commerce and Imperial Policy 31 BC-AD 305*. London & New York.

APPENDIX A

SITELIST

WADI ABYAD

Akerem

267-269-283-285	N34.69197 E38.19021	NW-tell
272-273-274-276	N34.69152 E38.19042	S-building
270-280-278-273	N34.69198 E38.19106	Enclosure
309	N34.69203 E38.18951	Aqueduct
306	N34.69221 E38.18686	Well
307	N34.69190 E38.18657	Spring
308	N34.69176 E38.18654	Spring
310	N34.69329 E38.18778	Islamic tombs
377	N34.69180 E38.18486	Rock cut tombs
311	N34.68109 E38.20087	Small building?

Awtayt

x160	N34.70119 E38.18266	Architectural fragments
x159	N34.70392 E38.18943	Architectural fragments
00404	N34.70435 E38.19114	Corral
x156	N34.70417 E38.19057	Corral

Majouf

00401	N34.73669 E38.14991	Building
004011	N34.73531 E38.14530	Rock cut tomb
324	N34.73554 E38.14964	Cistern
00403	N34.74007 E38.15872	Corral

Other sites

313	N34.71214 E38.18064	Islamic graveyard
322	N34.73046 E38.17734	Corral
323	N34.72815 E38.16506	Covered well
00409	N34.75850 E38.15904	Corral
00406	N34.76542 E38.17342	Concentration of wells
00413	N34.79041 E38.12419	Building on hilltop?

WADI AL-TAKARA

Wadi al-Takara South

325	N34.64211 E38.14544	Fort on hilltop.
327	N34.64233 E38.14548	Cistern with catch-arm
328	N34.64385 E38.14581	Covered cisterns
329	N34.64403 E38.14656	Oval structure
39-40	N34.64387 E38.15058	Corrals
031	N34.64481 E38.16208	Cistern with catch-arms
032	N34.64419 E38.16225	Cistern with catch-arms

Wadi Al Koullah

381	N34.67451 E38.14176	Cistern with catch-arm
383	N34.67573 E38.14363	Cistern
394	N34.67587 E38.14332	Corral
395	N34.67615 E38.14261	Corral
396	N34.67537 E38.14105	Corral
397	N34.67582 E38.14130	Corral
434	N34.67874 E38.14266	Corral
398	N34.67599 E38.14111	Cistern with catch-arms
399	N34.67569 E38.14100	Cistern with catch-arms
427	N34.67634 E38.14101	Catch-arm system
426	N34.67663 E38.14071	Cairn or building?
435	N34.67814 E38.14215	Rockshelter

Wall across wadi

00420-00421	N34.66679 E38.12793	Wall
00425	N34.66761 E38.12810	Covered cistern/well
00426	N34.66692 E38.12802	Covered cistern/well
00428	N34.66616 E38.12772	Islamic graveyard

Wadi Takara North

445 (448-450-452)	N34.69989 E38.09087	Fort
496 (497-498)	N34.70057 E38.08991	Wall
457	N34.69622 E38.09443	Cistern with catch-arms
485	N34.69727 E38.09395	Cistern with catch-arm
486	N34.69716 E38.09408	Cistern with catch-arm
00408	N34.69880 E38.09747	Cistern
436	N34.70067 E38.08325	Covered well/cistern?
437	N34.70041 E38.08491	Cistern
439	N34.69772 E38.08674	Cistern with catch-arm
442	N34.70021 E38.08730	Cistern
499	N34.70276 E38.08545	Covered cistern
441	N34.70012 E38.08763	Islamic tombs

JEBEL ABYAD**Al Mazraah**

336-335	N34.68652 E38.18407	Building A
337-340	N34.68584 E38.18348	Structure B
339	N34.68591 E38.18376	Rock cut tombs
334	N34.68609 E38.18352	Cistern with catch-arm
354	N34.68673 E38.18329	Enclosure
366	N34.68687 E38.18392	Square building
367	N34.68521 E38.18155	Islamic graveyard

Valley 376

374	N34.69049 E38.17871	Corral
375	N34.68976 E38.18142	Islamic graveyard

Valley 369

369	N34.69637 E38.18283	Modern stone enclosure
370	N34.69540 E38.18131	Rock-cut cisterns
371	N34.69532 E38.18036	Cisterns with catch-arm
372	N34.69644 E38.17709	Islamic graveyard
368	N34.69732 E38.17867	Islamic graveyard
373	N34.69779 E38.18129	Covered cisterns?

Wadi Kshebar

378	N34.69656 E38.09439	Building
380	N34.70549 E38.15827	Corral
14	N34.70021 E38.17178	Corral

Shalalah

501-502-503	N34.74696 E38.12059	Building or enclosure
-------------	---------------------	-----------------------

Rock cut tombs

091	N34.71716 E38.07902	Rock cut tombs
093	N34.71757 E38.07876	Cistern
092	N34.71696 E38.07859	Building?

Jebel Abyad South

09	N34.64788 E38.18331	Corral
10	N34.64226 E38.17925	Corral

JAZAL**Village**

491	N34.69470 E38.01474	Walls in tell
490	N34.69465 E38.01449	Walls on tell
489	N34.69474 E38.01421	Walls on tell
487	N34.69305 E38.01465	Well
494	N34.69240 E38.01393	Well
495	N34.69241 E38.01400	Well
493	N34.69511 E38.01273	Covered well
x497	N34.69496 E38.01438	Islamic graveyard

**WADI SHANAEH
AREA NORTH OF JEBEL CHAAR**

Bir Al-Arfa

X1	N34.74744 E38.07399	Cistern
X2	N34.74666 E38.07346	Cistern with catch-arms
X3	N34.74605 E38.07168	Cistern with catch-arms
509	N34.74460 E38.06944	Cistern with catch-arms
510	N34.74615 E38.06854	Islamic tombs
512	N34.74607 E38.06799	Large enclosure
526	N34.74536 E38.06511	Corrals
527	N34.74414 E38.06421	Corrals
528	N34.74239 E38.06479	Cistern with catch-arms
X16	N34.73986 E38.06574	Cistern with catch-arms
X17	N34.73981 E38.06401	Cistern with catch-arms
529	N34.74575 E38.06369	Cistern with catch-arms
530	N34.74726 E38.06245	Cistern
531	N34.74645 E38.06243	Building A
534	N34.74670 E38.06194	Building B

Station 098

504-505-506-507	N34.76317 E37.96217	Tell and building
537	N34.76340 E37.96316	Stretch of wall
536	N34.76344 E37.96254	Islamic tombs

Other sites

538	N34.78489 E37.95216	Square structure
-----	---------------------	------------------

JEBEL CHAAR

Village 539

544	N34.82273 E37.96304	Building
545	N34.82331 E37.96229	Building
543	N34.82278 E37.96347	Building/enclosure
541	N34.82319 E37.96321	Building
542	N34.82308 E37.96372	Wall
540	N34.82351 E37.96381	Building
550	N34.82415 E37.96490	Enclosure
557	N34.82442 E37.96457	Building
551	N34.82462 E37.96467	Building
552	N34.82477 E37.96490	Building
553	N34.82499 E37.96454	Walls
546	N34.82310 E37.96474	Building
547	N34.82339 E37.96527	Building
548	N34.82356 E37.96497	Building
549	N34.82361 E37.96522	Tell
555	N34.82534 E37.96814	Wall
554	N34.82460 E37.96765	Enclosure
556	N34.82423 E37.96785	Building

APPENDIX B

PHOTO LIST

	<i>GPS number</i>	<i>Description</i>	<i>From</i>
Akerem			
	0149-151, 0153	Overviews from mountain N of site	
	0126-129	Overviews	
	0149-151, 0153	Overviews from mountain N of site	
	0058-0069	Overviews	
	0095	Tel	SE
	0040-0043	267 N Tell	MarmordoorSE tel
	0044-0048	267 N Tell	Corner and dooropening
	0049	267 N Tell	Wall inn tel
	0050-0052	269 N Tell	NE corner
	0053-0056	269 N Tell	Water-basin
	0057	269 N Tell	Sarcophag-water-basin
	0145-147	269 N tell	Corner. Vaulted wall.
	0148	269 N tell	Worked stones. Basis for plaster?
	0071-0075	284 S Tell	Stoneblocks
	0076	284 S Tell	S-N internal wall digging
	0077	284 S Tell	Stoneblock in digging
	0078	282-283 S Tell	Wall
	0079	272-276 S building	Wall
	0080	277 S building	Wall corner
	0081	272-276 S building	Wall
	0082	305 S building	Wall corner
	0083	272-273 S building	Wall
	0038	279 Enclosure	S wall
	0039	279 Enclosure	S wall
	0084	273-278 Enclosure	Corner 273
	0085	273-278 Enclosure	Corner 278
	0086	278-279 Enclosure	Wall
	0087	278-280 Enclosure	Wall across wadi
	0088	279 Enclosure	Wadi toward W and tell
	0089	279-278 Enclosure	Wall in wadi
	0090	278-280 Enclosure	Wall in wadi
	0091	280 Enclosure	Corner 280
	0092	280 Enclosure	Overview from corner 280
	0093-0094	280-281 Enclosure	Wall
	0130-140	309 Aqueduct	
	0096-0117	Spring area	Overviews from NW and well area
	0125	Spring area	Spring area Overview
	0118	306 Spring area	Well 306
	0119	306 Spring area	Well 306
	0120	307-308 Spring area	Spring 307 and 308
	0121	307 Spring area	Spring 307
	0122	307 Spring area	Spring 307
	0123	308 Spring area	Spring 308
	0124	308 Spring area	Spring 308
	3319-3322, 0106-0114	377 Jebel Abyad	Rock cut tomb and face of mountain
	33442-3363	377 Jebel Abyad	Rock cut tombs
	3338-39, 3389-91	Jebel Abyad	Rock cut cressets and cistern.
	00152	310 Islamic graves	At summit N of Akeram

	<i>GPS number</i>	<i>Description</i>	<i>From</i>
Awtayt			
3406, 3409-13, 0026-32		Awtayt valley	Overviews
3408, 0023, 0028	x160	Spring area	Overview
3425-29, 341, 0024-25	x160	Spring area	Architectural fragments
0032, 0037	x159	Plain	Overview
3395, 3397-405, 0033-36	x159	Plain	Architectural fragments
Bir al-Dnejn			
0154	322	Corral	S
0155	322	Corral	N
Majouf			
0088		Majouf valley	Overview
0065-66, 0070-72		Majouf valley	Overviews
0074-80	41	Building 00401	
0081	324	Cistern	Overview
0082-83	324	Cistern	
0084-85	324	Cistern	Opening
0086-87	403	Corrals	
Wadi Abyad N			
0092	409	Corral	N
0097	413	Building on hill	Overview
0095	413	Building on hill	SW corner
Wadi al-Takara S			
0189-190	325	Fort on hilltop	Overview
0170-171	325	Fort on hilltop	E wall. Well 327 in background
0172	325	Fort on hilltop	N wall
0173	325	Fort on hilltop	NW corner
0174	325	Fort on hilltop	N wall, detail
0175	325	Fort on hilltop	W wall
0176	327	Cistern 327	
0177-179	327	Cistern 327	
0180	325	Fort/cist. 327	
0184	325	Fort/cist. 327	
0181	325	Wadi al-Taka	Overview towards N.
0182	325	Fort/wadi	Overview from hilltop
0183	325	Fort/wadi	Overview from hilltop
0185	328	Cisterns?	
0186-187	329	Oval structure	NW of site 325
Wall across Wadi al-Takara			
0103, 0105, 0107	00420-00421	Wall	
0106	00420-00421	Wall	Crossed by modern track
0109-0110	00420-00421	S om wall	Grinding stones
0104	00426	Cistern or well	Covered
Wadi al-Koullah			
0341	399		Overview into mountains
0310, 0316	399		Overview W side
0336	381		Overview E-side
0311	381		Overviews mouth of wadi, E side
0298-301	381	Cistern 381	N-catch-arm

	<i>GPS number</i>	<i>Description</i>	<i>From</i>
0304-305	381	Cistern 381	N-catch-arm
0304-305	383	Cisern 383	
0306	382	Cairn	NE
0307	382	Cairn	SE
0312-313	394	Corral 394	Corral on slope
0314-315	395	Corral 395	E of wadi
0309	434	Corral 434	Overview
0347	434	Corral 434	
0348	435	Rock shelter 435	
0345	397	Corral 397	Overview
0334	397	Corral 397	
0318, 0332, 0339	396	Corral 396	
0320, 0326	398	Cistern 398	
0321	398	Cistern 398	N catch-arm, near cistern
0322	408	Cistern 398	Start N catch-arm
0323-325	398	Cistern 398	N catcharm, towards cistern
0308	398	Cistern 398	N catcharm.
0327	399	Cistern 399	In background 398
0335	399	Cistern 399	N catcharm, overview
0329-330	399	Cistern 399	Troughs
0319, 0331	399	Cistern 399	S catch-arm, low plateau
0328	399	Cistern 399	S catch-arm, low plateau
3037,0338, 0340	399	Cistern 399	S catch-arm, higher plateau
0342-344	427	Catch syst. 427	E hill
0346	427	Catch syst. 427	E hill, overview wadi
Wadi al-Takara N			
0352	437	W of watershed	Cistern
0356-0358	439	W of watershed	Cistern
0361-0362	441	W of watershed	Islamic graves
OCT0815-16, 0818	441	W of watershed	Islamic graves
OCT0811, 0813.	442	W of watershed	Cistern/well
0363-0365	442	W of watershed	Cistern/well
0355	439	W of watershed	Overview towards 439 and 440
0360	440	W of watershed	Overview towards 439 and 438
0366	442	W of watershed	Overview towards 442 and 445
OCT0802, 004-008,	445	Fort	Overviews
0017-19	445	Fort	Overviews
0368	445	Fort	Overview, Northern wall
0372	445	Fort	Corrals in interior
0373	445	Fort	Northern wall (W)
0374	445	Fort	Northern wall, internal wall
0375	445	Fort	Northern wall (E)
0376	445	Fort	NE corner
0377	445	Fort	Eastern wall (N)
0378	445	Fort	Eastern wall (N)
0379	445	Fort	Eastern wall, internal structures
0380	445	Fort	SE-corner, circular corral
0381	445	Fort	Western wall, SW corner
0018-0019	496	Wall	Overview
0492	496	Wall	
0493	496	Wall	
0494	496	Wall	
0495	496	Wall	Northern section
0496	496	Wall	Southern section
0497	497	Wall	Northern section

	<i>GPS number</i>	<i>Description</i>	<i>From</i>
6654-6660	457	Cistern With catch-arms	
6662-6670	485-486	Cisterns	
Al-Mazraah			
0200-201	334	Overview eastern part	S
0202	334	Overview western part	S
0203	335-336	Building A	N
0204	335-336	Building A North room	N
0205	335-336	Building A Building A	NW
0206	335-336	Building A Building A	NW
0207	335-336	Building A W-wall N	
0209	337-340	Structure B	E
0210	337-340	Structure B Corrals	E
0241	337-340	Structure B Corrals, intrance to rock cut tombs.	W
0211	337-340	Structure B Corrals, NE corner	NE
0232	337, 334	Overview cistern and structure B	NW
0212	334	Cistern Overview	S
0213-214	334	Cistern	S
0215	334	Cistern Catch-arm	SE
0229	334	Cistern Catch-arm	SE
0230	334	Cistern Catch-arm	NW
0231	334	Cistern Catch-arm	NW
0233	354	Enclosure C Overview	S
0234	354	Enclosure C N wall	W
0235	354	Enclosure C W-wall	N
0236-237	354	Enclosure C SW-corner	NW
0238	354	Enclosure C SW-corner	SE
0239	354	Enclosure C S-wall	E
0240	334	Valley Corrals/cairns	S
0242	334	Valley Cairns?	NE
0243	366	Building D	NW
0244	366	Building D	SW
0245	366	Building D	NE
0246	366	Building D Building D, details inner N-wall	S
0247-248	367	Islamic graveyard	W
Valley 376			
0253-0254-0259	369	Overview from Valley 369	N
0284-285, 0288-290	376	Valley376 Overview	S
0282	375	Islamic graveyard	SE
0283	377	Cairns Heavily destroyed	N
0287	374	Corral	NE
Valley 369			
0281	369	Overview plain, towards SW	NW
0250-255	369	Overview Wadi Abyad	N and NW
0256	369	Modern enclosure	N
0257	369	Modern enclosure	N
0258	369	Modern enclosure	N
0260	369	Modern enclosure	S
0261-262	370	Cistern 370	
0263-264	370	Cistern 370 Grindingsstones, 30 m W of 370	
0265	371	Cistern 371 Catcharm	E
0266	371	Cistern 371 Catcharm	SE
0267-268	371	Cistern 371 Cistern A	
0269	371	Cistern 371 Cistern B	

	<i>GPS number</i>	<i>Description</i>	<i>From</i>
0270	371	Cistern 371	
0271	371	Cistern 371	Grindingstone, 120 m w of 371
0272-277	372	Islamic graveyard 372	
0278	371-368	Valley369	Grindingstone
0279	368	Islamic graveyard 368	Islamic graves
0280	373	Cisterns 373?	SW
Wadi Kshebar			
0291	378	Square structure Square structure	SE
0292	378	Square structure Square structure	NE
0293	380	Circular structure Corral?	SW
0294	380	Circular structure Corral?	NNE
0295	380	Circular structure Corral?	E
Shalalah			
0499	259	S building E-wall	N
0500	259	S building S-wall	E
0501	259	S building NE corner	SE
0502	259	S building S-wall	W
Rock cut tombs. Jebel Abyad N			
0401	091		Overview
0002	091		Overview towards Wadi al-Takara
0412-13, 0418, 0421-23	091	Rock cut tombs	
0427-30	091	Rock cut tombs	
0431-0433	093	Cistern	
0001, 0429	092	Building?	
Jazal			
0483-0484	488	Overview from valley	W
0485-0487	488	Overview from hill	WSW
0488	488	Valley west of Jazal	E
0489	488	Area east of Jazal	W
00133	488	Overview	S
00148	488	Overview	ESE
0478	488	Tell area	SW
0472-0474	488	Tell area	NE
0467-0468	492	Tell area	N-S wall, and W side wall
0463-0464, 0471	492	Tell area	Destruction layers above collapsed wall
0465-0466	492	Tell area	Destruction layers in western profile
0469-0470	492	Tell area	Burned stone from destruction layer
0475	491	E part tell	E-W wall
0476	490	Center om tell	E-W wall, corner.
0477	489	W part tell	E-W wall.
00134-00135, 0480-0482	488	Wells	
Bir al-Arfa			
0612	508	Valley towards the plain of Jazal	N
0591	508	View towards eastern area	W
0592, 0597	508	View towards western area	E
0596, 0598	508	View towards the west	E
0594	508	Valley towards the plain of Jazal, Corral 526	N
0599-600	508	View towards Jebel Chaar	SE
0601-602	508	View towards Jebel Merah	SW
0615	511	Overview hill, with large cairn	W
0623-624	508	Overview plain Jebel Chaar and Jebel Merrah	S

	<i>GPS number</i>	<i>Description</i>	<i>From</i>
4869	X1	Cistern X1	W
0603	X1	Cup-shaped marks	SW
4870	X2	Cistern X2	N
4871-73	X2	Cistern X2 Catch-arm	E
4875	X3	Cistern X3 E catch-arm, start	W
4876	X3	Cistern X3 E catch-arm towards cistern	E
4877	X3	CisternX3 E catch-arm	W
4878	X3	Cistern X3 E catch-arm towards cistern	E
4879	X3	CisternX3 Cistern and end catch-arm	N
4880	X3	Cistern X3	
4883	X3	Cistern X3 Retaining catch-arm	W
0604	509	Cistern 509 W catch-arm	E
0605	509	Cistern 509 Cistern	NE
0606	509	Cistern 509 E catcharm	SE
0588	510	Islamic tombs	S
0589-590	512	Enclosure 512 With graveyard and cistern	509
0607	512	Enclosure 512 E-wall	SW
0608	527	Corrals 527	S
0614	526	Corrals 526	W
0609	528	Cistern 528	S
0610	528	Cistern 528	W
0611	528	Cistern 528	SE
0613	528	Cistern 528	NE
4909	X16	Cistern X16	N
4911	X17	Cistern X17 Overview	E
4914	X17	Cistern X17 Cistern and troughs	N
4916	X17	Cistern X17 S catch-arm	W
4918	X17	Cistern X17 S catch-arm	W
4919	X17	Cistern X17 Cistern and catch-arms	W
4920	X17	Cistern X17 N catch-arm near cistern	NW
4924	X17	Cistern X17 Opening in catch-arms to cistern	W
4925	X17	Cistern X17 N catch-arm	SE
4926	X17	Cistern X17 N catch-arm	NW
4927	X17	Cistern X17 N catcha-rm	NW
0616-619	530	Cistern 530	
0620	529	Cistern 529	SW
0621	529	Cistern 529	NW
0622	529	Cistern 529	E
0623-624	531-534	Tells Overview	SSW
0625-627	531	Building 531 Carved blocks	
0628	531	Building 531 S wall	W
0629	531	Building 531 S wall	E
0630	531	Building 531 E wall	N
0631	531	Building 531 E wall	S
0632	534	Building 534 Tell and NE, corner	S
0633	534	Building 534 N wall	E
0634	534	Building 534 N wall, W corner	W
0635	534	Building 534 E wall	N
0636	534	Building 534 S wall	W
0637-638	534	Building 534 S wall	E
Station 098			
0641	98	Tell Overview	E
0642	98	Tell Overview	S
0649	98	Tell Overview tell and islamic tombs	
0503	504-507	Building S-wall	W

	<i>GPS number</i>	<i>Description</i>	<i>From</i>
0504	504-507	Building NW-corner tell	SW
0505	504-507	Building S-wall, SW corner	W
0507	504-507	Building S-wall, SE corner	E
0644	504-507	Building E-W inner wall, from Ewall, SE corner	E
0645	504-507	Building NS inner wall, from S wall, SE corner	S
0654	098	Building sh layer from digging in W tell	S
0657, 0658, 0661	537	E wall	W
0646	536	Islamic tombs	W
Zer Dghelar			
0639-640	106	Valley towards Jazal plain	N
Square structure Jebel Chaar S			
0662	538	Square structure	N
0663	538	Square structure	W
Jebel Chaar			
Village 539			
0896, 0890	539	Area 545 Overview 545/542	N
0897	539	Area 542 Overview	S
0898	539	Area 542 Overview	N
0899	539	Area 550 Overview 550/449	N
0879	539	Area 550 Overview	N
0901-904	539	Area 539 Overview 539	S
0666	544	Building 544	E
0667	544	Building 544	N
0668	543	Building 543	W
0669	543	Building 543	E
0670-671	543	Building 543	SE
0672	543	Building 543	S
0673	545	Building 545 Across wadi	E
0674-675	541	Building 541	SW
0676	542	Wall 542	W
0871	550	Enclosure 550	S
0872	550	Enclosure 550 E wall	S
0881	550	Enclosure 550 Overview	E
0873	557	Building 557	NW
0874-876	551	Building 551	SW
0877-878	551	Building 551 With small square structure	NE
0882	549	Building 549 Corner in digging	SE
0883	549	Building 549 W wall	N
0884	548	Building 548 S wall and corner	E
0885	558	Wall 558	W
0886	547	Building 547 S wall	SE
0887	554	Enclosure 554 Overview	S
0892	554	Enclosure 554 Overview	S
0893	554	Enclosure 554 E-wall	S
0894	554	Enclosure 554 NE-corner	SE
0888	556	Building 556 S wall	E
0889	556	Building 556 S wall, door?	S
0890	556	Building 556 N wall with entrance	S
0891	556	Building 556 E part building, inner walls	SSE
0895	554 556	Building 556/554	N
0956-04962	539	Islamic graveyard On hill 1182. Views om Wadi Shanaeh	

APPENDIX C

LIST OF FINDS

AKAREM

Tell area

0516	Brittle ware
0517	Brittle ware, handles
0520-521	Blue glazed, glass
0522-523	Coarse ware, body sherds
0524	Coarse ware, rims
0525-26	Coarse ware, rims
0527	Coarse ware, rims
0528	Coarse ware, rim
0529-530	Coarse ware, rim
0531	Coarse ware, rim
0532-533	Coarse ware, bottom sherds
0534	Coarse ware, bottom sherds
0535-536	Coarse ware, bottom sherds
0537-538	Coarse ware, bottom sherds
0539	Coarse ware, handle attachm.
0540	Coarse ware, handles
0541-542	Coarse ware, handles
0543-544	Coarse ware, handles
0545	Coarse ware, handles
0546-547	Coarse ware, handles
0548	Coarse ware, handles
0549	Coarse ware, handles
0550-551	Coarse ware, handles
0552-553	Coarse ware, handles
0554-555	Coarse ware, handles
0556-557	Coarse ware, rim
0558-559	Terracotta water pipe
0560	Terracotta water pipe
0561-563	Terracotta water pipe
0564	Terracotta water pipes
0770-071	Terracotta water pipes
0565-566	Mortar
0518-519	Fragment om Ottoman pipe

Garden enclosure

0567	Brittle ware
0568-569	Brittle ware, rims
0571-572	Brittle ware, handles
0573-574	Brittle ware, bottoms
0575-576	Brittle ware
0577-578	Brittle ware, rims
0579-580	Coarse ware
0581-582	Coarse ware, handles
0583	Coarse ware, rims
0584	Coarse ware, body sherds
0585	Coarse ware, body sherds

AWTAYT

0740-43 Coarse red ware. Rim and handle fragment
0744-45 White coarse ware, rim.

MAJOUF

0132-134 Terracotta water pipe
0137 Terra sigiliata
0144 Terra sigiliata
0135-136 Brittle ware handles
0153-154 Brittle ware coarse red.
0138-139 Coarse ware with white slip. Rim.
0140-141 White coarse ware. Body shard
0142-143 Reddish coarse ware with white slip. Body shard.
0149-150 White coarse ware. Body shards.
0151-152 White coarse ware. Body shard
0145-148 Watertight plaster.

WADI ABYAD

322 Corral

0507 Brittle ware
0508 Handles brittle ware
0509 Brittle ware
0510 Coarse ware
0511 Turkis pearl

311 Building?

0512 Brittle ware

323, Covered well

0513 Brittle ware

X156 Corral

0514 Brittle ware

X159 Islamic tombs

0515 Brittle ware

WADI AL-TAKARA S

Fort325

0436 Grinding stone
0437 Brittle
0438 Brittle
0439 Brittle
0440 Coarse ware
0441-0442 Coarse ware
0443 Brittle
0444 Brittle

327 Cistern fort

0445 Brittle
0446 Brittle

0447 Coarse ware
0448-449 Coarse ware

329 Oval structure

450 Green glazed
451 Metal fragments
452 Glass fragments
0453 Brittle
0454 Brittle
0455 Brittle
0456-0457 Brittle

0164-0165 Roman coin
0161-0162 Islamic coin

WADI AL-KOULLAH

Cairn 382

424 Fine coarse ware (EBA?)

Corral 396

0425 Brittle
0426 Iron hammer head
0427 Glazed ware
0429 White coarse
0431 Brittle

WADI AL-TAKARA N

Fort 445

0172-0173 Coin
0179-0180 Glass bracerates
0181, 0183 Beads
0184-0184 Iron arrow head
0677 Terra sigiliata
0678 Iron metal fragments
0679 Iron metal fragments
0680 Glass fragments
0681-682 Glass fragments, rims
0683-684 Glass fragments, rims
0685 Green glazed ware
0686 Glazed ware
0687 Painted and red glazed ware
0688-689 Fine white ware
0690 Brittle ware, handles
0691-692 Brittle ware, fine red ware, bottom sherds
0693-694 Brittle ware, coarse ware, handles
0695-0698 Brittle ware, rims
0699-700 Brittle ware, rims
0701-702 Black brittle ware, red core
0703 Red brittle ware
0704 Black and red brittle ware
0705 Brittle ware misc.
0706-707 Black brittle ware, black core
0708-709 Brittle ware, handles
0710-711 Brittle ware, handles

0712-713	Brittle ware, handles
0714-715	Brittle ware, rims
0716-717	Brittle ware, rims
0718-719	Brittle ware, rims
0720-721	Brittle ware, rims
0722-723	Brittle ware, rims
0724-725	Brittle ware, rims
0726-727	Coarse ware, body sherds
0728	Coarse ware, body sherds
0729	Coarse ware, rims
0730	Coarse ware, rims
0731-732	Brittle ware, fine coarse ware rims
0733-734	Coarse ware, handles

Wall 496

0735-736	Glass
0737-738	Hard burned coarse ware
0739-740	Hard burned red ware, bottom sherds
0741-742	Hard burned red ware, handle
0743-744	Brittle ware, rims
0745	Brittle ware

Cistern 442

0746-747	Coarse ware handle
----------	--------------------

Cistern 437

0748	Red glazed ware
0749-750	Brittle ware, hard burned red ware, handles
0751-752	Brittle ware, rims
0753	Brittle ware

Cistern 439

0754	Red glazed ware
0755-756	Brittle ware, handles
0757-758	Coarse ware, rims

Cistern 457

0759-760	Coarse brittle ware
----------	---------------------

Cistern 485-486

0761-762	Coarse ware
0763	Coarse ware
0764-765	Brittle ware, handles
0766-767	Brittle ware, handles

AL-MAZRAAH

0157-0158	Coin (building A)
0159-0160	Coin (building A)
0174-0175	Arrow head
0386	Glass
0387	ed glazed
0388	Blue stone (Turkis?)
0391	Green glazed
0392	Blue glazed
0393	Brown red glazed
0394-95	Brown red brittle

0396	Brittle
0397	Brittle
0398	Brittle
0399	Handle, badly burned
0400	Handles, brittle
0401	Handles, brittle
0402	Handles, brittle
0403	Handles, brittle
0405	Rims, brittle
0406	Rims, brittle
0407	Rims, brittle
0408	Rims, brittle
0409	Rims, brittle
0410-11	Rim, white fine ware (Red slip interior)
0412	White coarse ware
0413	White coarse ware
0414	White coarse ware
0415-16	Fine white ware (horizontal handle?)
0404	Grinding stones
0389-90	Fragment om Ottoman pipe.

VALLEY 376

0419	Brittle
0420-21	Ottoman pipe
0422	Badly burned, near cairn

VALLEY 369

0389-0390	Ottoman pipe
0418	Flint glass handle (coarse ware.
0460, 0462	Grinding stones

KSHEBAR 380

0423	Glass red glazed ware.
------	------------------------

SHALALAH

0768-769	Brittle ware, coarse ware, rims
0770	Coarse ware, handle
0771	Grinding stone

JAZAL

0168-0169	Coin
0170-0171	Coin
0176-0177	Colored glass fragment
0772-773	Grinding stones
0774	Blue and green glazed ware
0775	Green glass
0776	Brittle ware, black, black core
0777-778	Brittle ware, rims

0779-780	Hard red burned ware
0781-782	Brittle ware, rims
0783-784	Brittle ware, rims
0785-786	Brittle ware, rims
0787-788	Brittle ware, rims
0789	Brittle ware
0790-791	Brittle ware, handles
0792-793	Brittle ware, handles
0794	Coarse ware, rims
0796	Coarse ware
0797	Coarse ware
0798	Coarse ware
0799	Brittle ware, misc.
0800	Coarse ware, handles
0801	Coarse ware, handles
0802-803	Coarse ware, handles
0804-805	Coarse ware, handles
0806-807	Coarse ware, handles

STATION 098

0099-0102	Terra sigiliata
0808	Green glazed ware
0809	Brittle ware, foot
0810-811	Brittle ware
0812-813	Brittle ware, rims
0814-815	Brittle ware, rims
0816-817	Brittle ware, handles
0818	Coarse ware
0821-824	Coarse ware, sherd with horizontal handle
0825-826	Coarse ware, handles
0819, 0098	Fragment om tile

BIR AL-ARFA

531 bulding

0827	Green glazed ware
0828, 829, 830	Terra sigiliata
0831-832	Green glazed ware
0833	Glass fragments
0836-837	Brittle ware
0838-839	Brittle ware
0840-841	Brittle ware, handles
0842	Grey brittle ware
0843-844	Brittle ware, rims
0845	Brittle ware, rims
0846-848	Brittle ware, rims
0849-851	Brittle ware, rim
0852-853	Coarse ware, rims
0854-855	Coarse ware, handles
0856	Coarse ware

530 cistern

0857	Coarse ware
------	-------------

529, cistern

0858-859	Brittle ware
0860-861	Brittle ware
0862-863	Brittle ware
0864-865	Brittle ware, rim and foot
0866-867	Brittle ware, handles

512 enclosure

0868-870	Grinding stones
----------	-----------------

JEBEL CHAAR, VILLAGE 539**549**

0913-914	Watertight plaster
----------	--------------------

554

0915	Green glazed ware
0916-917	Brittle ware, body sherds
0918-919	Brittle ware, handles
0920-921	Red brittle ware, handle and body
0922-923	Brittle ware, rims
0924	Coarse ware, handle and body.

545

0925-926	Brittle ware rim
0927-928	Brittle ware, handles
0929-930	Brittle ware, handle
0931	Coarse ware, body

546

0932	Large coarse dolie. Diam. 24 cm.
0933-934	Brittle ware.

550

0937-938	Coarse ware
0939	Glass
0940	Red glazed ware
0941-942	Brittle ware, handles
0943-944	Brittle ware, handles
0945	Brittle ware
0946-947	Brittle ware neck
0948-949	Brittle ware, rims
0950-952	Brittle ware, rim
0953-954	Brittle ware, rims
0955-956	Brittle ware, rims
0957	Coarse ware, body

542

0958-960	Terracotta foot?
0961-962	Brittle ware
0963-964	Brittle ware
0965-966	Brittle ware, rims
0967-968	Brittle ware, rims
0969-970	Brittle ware, neck
0971-972	Brittle ware, handles
0973-974	Brittle ware, handles
0975-976	Brittle ware, handles

0977-978	Rim of plate, white slip
0979	Coarse ware, body
0980-981	Coarse ware, handles
0982-983	Coarse ware, handles
0984-987	Basalt mortar

539 - area unknown

0935-936	Brittle ware, handle
----------	----------------------

APPENDIX D

COINS

The coins from the 2008 and 2009 survey have been cleaned and identified in Damascus by Dr. Khaled Kiwan, Musée National de Damas.

1. Tweihina (Tahoun al-Masek)



2008 survey.

Antoninus Pius (138-61)

As 7.95 gr.

Obv: Head of Antoninus Pius

Rev: SC (Senatus consulto)

Mint of Antioch

2. Shanaeh, building in wadi area



2008 survey.

Volusianus (251-253)

Tetradrachm 10.65 gr. Mint of Antioch, First emission AD 251 (A)

Obv: Head of Volusianus, radiate

AVTOK[ρατορ] Κ[αισαρ] G AFIN GAL OVEND
OVOLOCCIANOC CEB[αστος]

(Imperator Caesar Gaius Afinius Gallus Ven(l)
dumnianus Volusianus Augustus)

Rev: Eagle with "A" between the legs. SC below.
DEMAPC[ικης]EXOVCIAE (Tribunicia potestas)

3. Wadi al-Takara S.



2009 survey.

Maximianus (285-306)

Follis.

Obv: Head Maximianus, radiate (285-306)

IMP C MA MAXIMIANUS P F (Pius Felix)
AUG

Rev: Maximianus and Jove with a statue of Victoria in the middle. Jove holds a sceptre and a globe in his hands.

CONCORDIA MILITUM

4. **Wadi al-Takara S.**

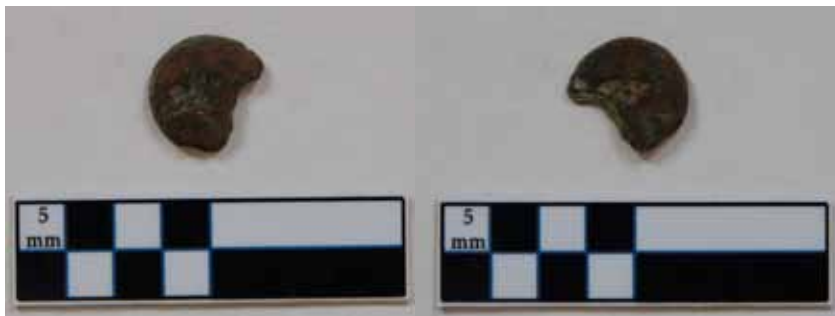


2009 survey

0.30 g folis with Arabic inscription.

Mameluke (13th century)?

5. **Wadi al-Takara N, fort.**



2009 survey

0.80 g. bronze coin.

Unidentifiable.

6. **Al-Mazraah. Building A.**



2009 survey.

Follis

Theodosius II (408-450)

Rev: Head of Theodosius II.

Obv. Statue of Victoria.

SALUS REIPUBLICAE

7. **Al-Mazraah. Building A.**



2009 survey

0.30 g bronze coin.

Unidentifiable.

8. Jazal, Tell.



2009 survey.

Constantinus II (335-340)
Follis.

Obv: Head of Constanti-
nus II, laurelled.

CONSTANTINUS IUN
NOB (Iunior Nobilissi-
mus)

Rev: Two standing veter-
ans with two standards in
the middle.

CONCORDIA EXER-
CITUS

9. Jazal, Tell.



2009 survey

1.35 g follis.

Umayyad?