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

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**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.
5. Plain N of Jebel Abyad and Wadi Shanaeh.
6. SE corner of Jebel Chaar

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WADI ABYAD
1:100,000 I-37-41. Every square is 2 x 2 km.
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.
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 cm 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 cm. 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.

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.
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. They 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 (Ouêchel) in the northeast corner of Jebel Abyad.

c. Large enclosure E of the tell.
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-
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.

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. It 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

_Akerem. Enclosure. E-wall crossing the wadi._

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_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 mountainside 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 southeast 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:

Akarem 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 know 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 the 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

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 E 38.183004.
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.

2. Monumental structure.
GPS X159: N 34.70392 E 38.18943.
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.
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.
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 slaps 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.
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 abot 20 m. Finds and chronology: None.

Conclusions.
The existence of a small building high up in valley and the existens 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.

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.
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.
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 extensions, 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.
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.
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.

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.

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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
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-Koulah, 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.

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

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 an 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 slop 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).
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 394, plan and seen from ENE.*

*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.

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 Tweihina (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.
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 structure.

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 structure:**

*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.

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.
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.

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 the 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.

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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 cater 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.
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.
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 then 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

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).
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).
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.

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.

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.

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 Shahae. At Jebel Chaar they are almost certainly identified as small shrines.

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. Small square building seen from SW.*

*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.

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.
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 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.


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)
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.

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.

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.

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.
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.
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 Jebl 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 pibe 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?
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 SHANAEH
1:100,000 I-37-40 and I-37-41. Every square is 2 x 2 km.
BIR AL-ARFA

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 Tweihina. 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.
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.

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 traces 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.

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.*

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.

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 in 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 connected 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 Chaar 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 chanced it 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.
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.
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 sigilliata, green glazed ware, fragments of tiles and grinding stones. The datable finds range from Roman to early Byzantine period.

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.

Station 098. Fragment of roofing tile and terra sigilliata.
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

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THE PLAIN NORTH OF JEBEL ABYAD WADI SHANAEH

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 corrals 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 Rigmen, Jebel Abyad and Jebel Merah. They have marked sides and often steep faces. Jebel Abu Rigmen 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 was 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: N34.854450 E37.973917) 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 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.*
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.

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.

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

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.

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.
Area 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.

Area 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. Enclosure 550 seen from SE. At the top of the hill to the right diggings around 551 and 553.

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.

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.
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.*
GPS 555: N34.82534 E37.96814, 1080.
30 m N of 554 there are remains of to corners, facing each other 26 m apart. They have been partly disturbed by the track along the ridge. The 2 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 2 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 2½ % 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-Mazraa 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-Arfâ, al-Matna and Tweihina. 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 wadis. 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:


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

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### Wall across wadi

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### JEBEL ABYAD

#### Al Mazraah

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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
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## APPENDIX B

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**Wadi al-Takara N**

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| OCT0815-16, 0818 | 441  W of watershed Islamic graves | |
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**Al-Mazraah**

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| 0202       | 334 Overview western part | S |
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| 0205       | 335-336 Building A Building A | NW |
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| 0209       | 337-340 Structure B | E |
| 0210       | 337-340 Structure B Corrals | E |
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| 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 Valley Overview | S |
| 0282         | 375 Islamic graveyard | SE |
| 0283         | 377 Cairns Heavily destroyed | N |
| 0287         | 374 Corral | NE |

**Valley 369**

<p>| 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 Catch-arm | E |
| 0266         | 371 Cistern 371 Catch-arm | SE |
| 0267-268     | 371 Cistern 371 Cistern A | |
| 0269         | 371 Cistern 371 Cistern B | |</p>
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**Wadi Kshebar**

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**Shalalah**

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**Rock cut tombs, Jebel Abyad N**

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**Jazal**

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<td>0485-0487</td>
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<td>Tell area Destruction layers in western profile</td>
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<td>Tell area Burned stone from destruction layer</td>
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**Bir al-Arfa**

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<td>View towards Jebel Merah</td>
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**Square structure Jebel Chaar S**

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**Jebel Chaar**

**Village 539**

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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 on 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

142
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 Coarsde ware with white slip. Rim.
0140-141 White coarse ware. Body shard
0142-143 Redish coarse ware with white slip. Body shard.
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
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 bracelates
- 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
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>0396</td>
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<tr>
<td>0397</td>
<td>Brittle</td>
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<td>0398</td>
<td>Brittle</td>
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<td>0399</td>
<td>Handle, badly burned</td>
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<tr>
<td>0400</td>
<td>Handles, brittle</td>
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<td>0401</td>
<td>Handles, brittle</td>
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<td>Handles, brittle</td>
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<td>0403</td>
<td>Handles, brittle</td>
</tr>
<tr>
<td>0405</td>
<td>Rims, brittle</td>
</tr>
<tr>
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<td>Rims, brittle</td>
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<tr>
<td>0407</td>
<td>Rims, brittle</td>
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<td>0408</td>
<td>Rims, brittle</td>
</tr>
<tr>
<td>0409</td>
<td>Rims, brittle</td>
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<tr>
<td>0410-11</td>
<td>Rim, white fine ware (Red slip interior)</td>
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<tr>
<td>0412</td>
<td>White coarse ware</td>
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<tr>
<td>0413</td>
<td>White coarse ware</td>
</tr>
<tr>
<td>0414</td>
<td>White coarse ware</td>
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<tr>
<td>0415-16</td>
<td>Fine white ware (horizontal handle?)</td>
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<tr>
<td>0404</td>
<td>Grinding stones</td>
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<td>0389-90</td>
<td>Fragment on Ottoman pibe.</td>
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**VALLEY 376**

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<td>0419</td>
<td>Brittle</td>
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<td>0420-21</td>
<td>Ottoman pibe</td>
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<tr>
<td>0422</td>
<td>Badly burned, near cairn</td>
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**VALLEY 369**

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<tbody>
<tr>
<td>0389-0390</td>
<td>Ottoman pibe</td>
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<tr>
<td>0418</td>
<td>Flint glass handle (coarse ware.</td>
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<tr>
<td>0460, 0462</td>
<td>Grinding stones</td>
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**KSHEBAR 380**

<table>
<thead>
<tr>
<th>No.</th>
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<tbody>
<tr>
<td>0423</td>
<td>Glass red glazed ware.</td>
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**SHALALAH**

<table>
<thead>
<tr>
<th>No.</th>
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<tbody>
<tr>
<td>0768-769</td>
<td>Brittle ware, coarse ware, rims</td>
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<tr>
<td>0770</td>
<td>Coarse ware, handle</td>
</tr>
<tr>
<td>0771</td>
<td>Grinding stone</td>
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</table>

**JAZAL**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>0168-0169</td>
<td>Coin</td>
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<tr>
<td>0170-0171</td>
<td>Coin</td>
</tr>
<tr>
<td>0176-0177</td>
<td>Colored glass fragment</td>
</tr>
<tr>
<td>0772-773</td>
<td>Grinding stones</td>
</tr>
<tr>
<td>0774</td>
<td>Blue and green glazed ware</td>
</tr>
<tr>
<td>0775</td>
<td>Green glass</td>
</tr>
<tr>
<td>0776</td>
<td>Brittle ware, black, black core</td>
</tr>
<tr>
<td>0777-778</td>
<td>Brittle ware, rims</td>
</tr>
</tbody>
</table>
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
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>0977-978</td>
<td>Rim of plate, white slipe</td>
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<tr>
<td>0979</td>
<td>Coarse ware, body</td>
</tr>
<tr>
<td>0980-981</td>
<td>Coarse ware, handles</td>
</tr>
<tr>
<td>0982-983</td>
<td>Coarse ware, handles</td>
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<tr>
<td>0984-987</td>
<td>Basalt mortar</td>
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**539 - area unknown**

<table>
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<tbody>
<tr>
<td>0935-936</td>
<td>Brittle ware, handle</td>
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</tbody>
</table>
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
(Imperator Caesar Gaius Afinius Gallus Ven(l) dumianus Volusianus Augustus)
Rev: Eagle with “A” between the legs. SC below. DEMAPC[ικης]EXOVCIAC (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 Constantinus II, laurelled.
CONSTANTINUS IUN NOB (Iunior Nobilissimus)
Rev: Two standing veterans with two standards in the middle.
CONCORDIA EXERCITUS

9. **Jazal, Tell.**

2009 survey

1.35 g follis.

Umayyad?