DAYR ʻALLĀ REGIONAL PROJECT: SETTLING THE STEPPE THIRD CAMPAIGN 2006

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Introduction

The Dayr ʻAllā Regional Project *Settling the Steppe* is an interdisciplinary research program targeted on the study of patterns of settlement and land use in the southern part of the Middle Jordan Valley during the Bronze and Iron Ages. The project is directed by Gerrit van der Kooij (Leiden University, the Netherlands) and Omar al-Ghul (Yarmouk University, Jordan). Its main objective is to place the detailed results from 45 years of excavations at Tall Dayr ʻAllā (Franken 1969, 1992; Van der Kooij 1989, 2001) within a broader regional perspective. These excavations have shown relatively short periods of occupation alternating with equally short periods of abandonment during the Iron Age II period. This apparent instability in settlement is the central focus of our research. Emphasis is placed on four main questions: How does this mode of occupation compare to other sites from the same period in the region and how do these compare to sites from the periods before and after the Iron Age II period? Why did people choose to live in this part of the valley with such an apparent dry climate? What were the landscapes and climatic conditions existing during the different periods? How did the inhabitants of the region around Dayr ʻAllā use and manage to maintain soil and water resources?

The third and last campaign of the *Settling the Steppe* project took place from September 11th until November 2nd, 2006. Fieldwork proceeded in three separate but cooperating components. The geoarchaeological part of the project was carried out by Fuad Hourani and included among other things the investigation of wadi cuts and small soundings. An archaeological surface survey conducted by Eva Kaptijn examined the archaeological remains in the landscape. Small-scale excavations were undertaken by Lucas Petit at two talls, *i.e*. Tall al-ʻAdliyya and Tall ʻAmmata. Scopes, directions and methods of each one of these subprojects have been described in the project's first and second preliminary reports (Kaptijn *et al*. 2005; Petit *et al*. 2006). This paper focuses on the work progress achieved during the 2006 field campaign and associated results.

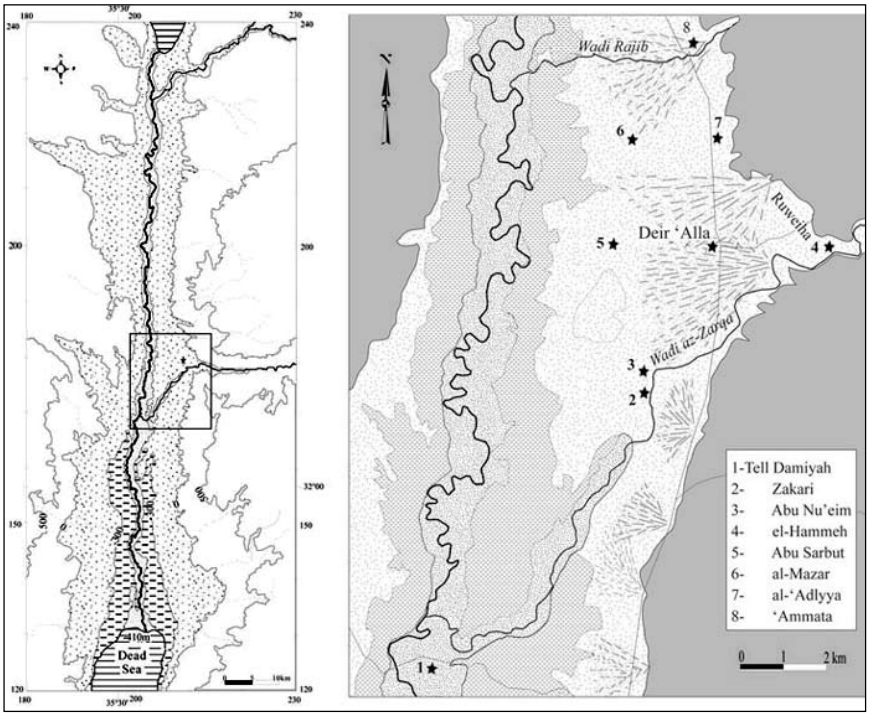
Geoarchaeological Investigations (Fuad Hourani)

In addition to the geoarchaeological investigations and their related paleogeographical results here described, a summary description on five newly discovered sites during these investigations will be given at the end of this section.

As reported in our previous preliminary reports (Kaptijn *et al*. 2005; Petit *et al*. 2006), geoarchaeological investigations aimed primarily at analysing the paleogeographical development of the study region since the Late Chalcolithic Period. Two geomorphologic features are prominent in the region and were of big influence on human settling activity and on settlements' remains: the Zarqā' River system and the widely spread Ruwayḥa alluvial fan to its north (**Fig. 1**). Therefore investigations have focussed primarily on these two systems since the first season of the project. Two additional areas were also investigated during this third campaign: the flat land around Tall al-Mazār and the strip of Qaṭar hills located between the Zarqā' channel and the Zur, to the south of Tall Umm Ḥammād.

Area of Tall al-Mazār

In order to assess the sequence of events involved in the development of the landscape around Tall al-Mazār and the type of deposits



1. General location of the study region and some of its geomorphic features.

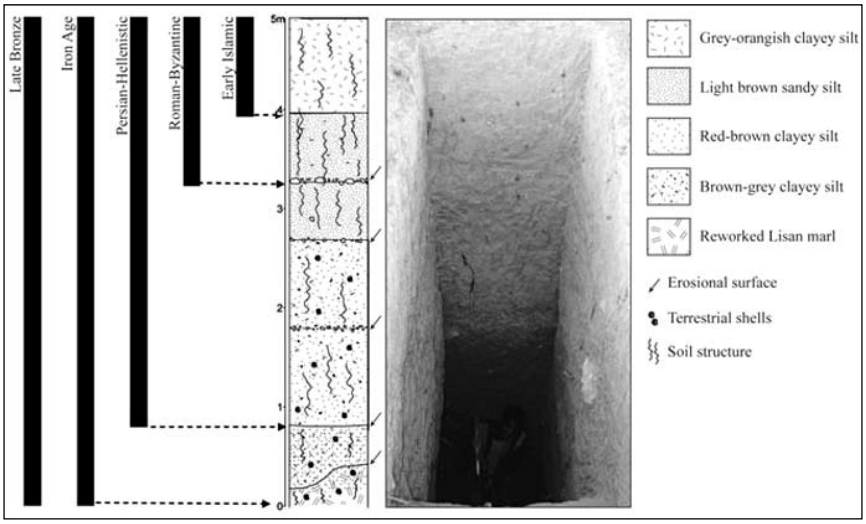
on which the site was built, a five meters deep sounding was dug in the cultivated fields north of the site. The sounding revealed a succession of multiple episodes of cut-and-fill (**Fig. 2**). The first of these episodes, five meters below the modern walking surface, corresponds to a channel cut. The channel appears to have truncated a soil horizon that had developed on the Lisan deposits during an older phase and to have mixed it with a kind of red silty deposits. Although it was not fully exposed within the 1m wide trench base, this channel was very likely cut-down through another brown soil developed on top of the first. Interestingly this layer and the underlain reworked one contain fragments of fired mud bricks and pottery sherds. Most of them are dated to the Iron Age I/II; but some are from the Late Bronze period. The ceramics indicate that the episode of down-cutting occurred during or, more probably, after the Iron Age occupation on Tall al-Mazār.

At least four other similar episodes were identified in the sequence (**Fig. 2**). The second, third and fourth episodes, located respectively at about 4.2m, 3.2m and 2.3m below the present surface, occurred during or after the Persian/ Hellenistic period. The last episode, at 1.8m below the surface, seems to have taken place during or after the Roman/Byzantine Era. The Early Islamic remains appear only within the uppermost meter of the deposits. After each erosional/ depositional phase some soil structure could develop, indicating more or less prolonged lulls.

The sedimentary sequence studied near Tall al-Mazār thus suggests multiple modifications in the landscape near the site after the Iron Age occupation and before the Early Islamic Period. Although the full implications of these results are not yet known, the acknowledged development suggests stream discharges stronger and especially more abundant than today.

Wādī al-Ghawr

The east-west running Wādī al-Ghawr located north of Dayr ʻAllā has been deviated in the 1960s by the Jordan Valley Authority. A straight line canal was then cut down into the deposits of the alluvial fan of Ruwayḥa, while retaining in its middle part the original channel of the wadi. The sides of this canal as well as those of the preserved original wadi channel were extensively studied in 2006 in order to check the stratigraphic sequence of the alluvial fan of Ruwayḥa and the extension of its geomorphologic influence over the region. The uncovered geomorphologic sequence appeared to be very complicated, showing different phases of cutting/ re-cutting and refilling. However, some differences in type



2. Soil and sedimentary sequence observed in the sounding near Tall al-Mazār and sequence of the associated pottery sherds.

and date of the geomorphologic events could be observed between the eastern, the middle and the western parts of the canal and channel.

In the east, from the crossroad near the modern village of Ruwayḥa down to the point where the artificial canal joins the original wadi channel, the sequence was composed of two main groups of deposits: laminated Lisan marls, associated with some fairly consolidated sandbanks, followed by a brown orangish sand and a clayey-silty sand layer. The latter appeared in many places associated with imposing channel gravels. Pottery sherds show that most, if not all, deposits overlying the Late Pleistocene marls and sands are post-Roman in age.

In the middle part of the canal, corresponding to the original wadi channel, the sequence showed a massive dark green to dark grey and moderately hard clay deposit at the base. In the section this deposit extends deeply under the channel bed: we observed it down to a depth of 80cm. Only one Iron Age sherd was collected from the lower levels and some Roman/Byzantine ones were found in the upper 30cm. Around one hundred meters to the east of the main valley road a concentration of big pieces of sugar pots of the Islamic period can be seen above the clayey deposits (cf. *infra*). Deposits on top of these dark clays are mostly washed and reworked sediments deriving from the slightly sloping wadi banks.

In the flat land area located at about 200m to the north of this middle part of Wādī al-Ghawr and at the point where in 2005 the survey team found on the surface a concentration of pottery sherds from the Late Chalcolithic period (Petit *et al*. 2006), a probe trench was opened in order to understand the geomorphologic context of this concentration and to study the sequence of the Ruwayḥa alluvial fan in this area. Here, a stone wall and two pits (cf. *infra*) associated with pottery sherds from the Late Chalcolithic was found buried under ca. 1,10m of natural deposits. These archaeological features appear to be set upon freshly deposited sand and layers of small gravels. Deposits covering these features are composed of light brown orangish silty clay, with massive to columnar soil structure and plenty of calcitic nodules.

The western area of Wādī al-Ghawr, from the main road down past Tall Abū Sarbūṭ and further down into the Qaṭar, was studied in its middle part around another concentration of pottery sherds from the Chalcolithic period observed in the section. On the surface next to this section some other concentration of Early Bronze Age sherds was found in 2005 (Petit *et al*. 2006). The lowest part of the wadi cut shows here well-developed dark-brown to yellowish clayey soil, with columnar to grumular structure and plenty of carbonate nodules. This layer is 110cm thick and is expected to continue down the modern wadi bed. It was overlaid by a 20cm thick wash layer with some small but unsorted angular stones and many fragments of pottery and burnt bones. The pottery is entirely Chalcolithic; some sherds are probably from the early phases of this period. The pieces are relatively large; some of them were not worn off by long transportation. On top of this layer another clayey soil, of 50cm

thick, with dark red-brown colour, carbonate nodules and Chalcolithic sherds was seen. The red brown component observed in theses deposits more likely derives from far the upstream, where subsist the red Mediterranean soils, than from the Ruwayḥa alluvial fan, principally supplied by the escarpments with their sandstones and yalowish/orangish Mediterranean soils. It may suggest thus a coalition in this area of flows from both Wādī az-Zarqā' and the Ruwayḥa fan (See also below, the section concerning Wādī az-Zarqā'). The youngest component observed in this sequence was an 80cm thick package of brown to light-brown fine sandy silt, with a poor soil structure.

Three preliminary conclusions and points of attention can be drawn from these observations. Firstly, the geomorphologic events associated with the Chalcolithic structures and pottery concentrations discovered a little north and north-east of Tall Dayr ʻAllā indicate the onset of at least two main phases of extensive surface flows and alluvial fan activities during the Late Chalcolithic. Soil development and the extensive formation of carbonate nodules after each depositional phase suggest alternation of periods of landscape stability under humid conditions and regular streaming.

Secondly, together with the evidence collected near Tall al-Mazār, deposits in the study region, especially in the flat land areas, are highly variable not only from a mineralogical point of view, but also chronologically. On the surface sediments may appear homogeneous in colour and texture, but in their chronology, they may vary within a same small field. This is not only the effect of modern agriculture nor only caused by winds, it is mainly the influence of the escarpments with their torrential flooding, sometimes channelled, sometimes overflowed. This brings us to the issue of to what extend the number and size of the visible sites correspond to their reality in the past. Some sites may have been naturally swept away and some others reduced in size. Furthermore, pottery sherds scattered on the surface could have been subjected to transportation by channel/sheet flows or by soil reworking processes.

The third point of attention concerns the massive clay deposits distinctly present in the middle part of the Wādī al-Ghawr channel. Their mass, their consistence and their colour strongly suggest attributing them to a massive water body that could have occupied this part of the wadi for a relatively long period. It may be a natural or partly artificial reservoir.

Wādī az-Zarqā'

A first preliminary assessment of the paleogeographical development of the Wādī az-Zarqā' was presented in the second preliminary report (Petit *et al*. 2006). It reveals two main alluvial terraces, which are called middle and younger terrace for the time being. A third older terrace, identified during a previous study in some small wadi systems elsewhere in the Jordan Valley (Hourani 2002), was not recognized in this area. The middle and younger terraces were investigated in detail during the current field season at four distinct parts along the western cut of the Zarqā': near Tall al-Ḥammah, near the village Abū Nuʻaym and Tall Zakārī, near Tall Umm Ḥammād and a little north of Tall Dāmiyah. Among the areas investigated during this season, it is only in the two last areas that the younger terrace appears clearly.

In the sections of an 80cm deep pipeline trench dug by the Jordan Valley Authority in the eastern slope between the site of Tall al-Ḥammah and the Zarqā' channel, the middle terrace appears to be inset in the surrounding Late Pleistocene deposits. It overlies unconformably the laminated green Lisan deposits, which in turn overlap densely packed Pleistocene gravel conglomerates. Near the top of the slope deposits of the middle terrace appear located above the Lisan deposits and are characterized by a 60cm thick layer of medium size gravel and lenses of gravel. Both the gravel and the laminated Lisan deposits are obliquely cut by a massive layer of red-brown clayey silt, that may overflow the banks of the wadi in this area. This layer was later eroded and covered again by material washed down from the site and from the non-cemented conglomerates. Numerous reworked Late Chalcolithic pottery sherds were collected from the red deposits, thus giving a minimum age limit for the last over-bank flooding in this area. Further down on the slope, yellowish-brown sandy silt and grey-brown clay, each some 50 to 60cm thick, were observed below the red alluviums. Close to the Zarqā' channel, a more recent clay-

ey and sandy silt material cuts the red deposits and the underlain layers. This sequence reflects a similar development that was observed in a previous study of the area west of the village of Dibab. It shows the existence of a major erosion phase immediately before the onset of the middle terrace and another event on the top associated to the red brown deposits. This latter can be dated to the Late Chalcolithic/Early Bronze Age period.

More information about these events was collected near the village Abū Nuʻaym and under the Iron Age site of Tall Zakārī. The sequence of the middle terrace stands here between 20 and 25 metres above the Zarqā' channel bed. The base of the sequence is characterized by a 1m thick layer of small to medium sized, angular poorly sorted gravel in a coherent dark sandy clay matrix. These deposits, containing numerous Late Neolithic pottery sherds, partly covered the laminated Lisan marls, and partly a 0.2-0.6m thick package of massive yellow sand, with a sharp cut. This same cut was reported by Mabry (1992) at Qaṭar Zakārī, a little north of the section described here. He did also discover some Late Neolithic (Yarmukian) flint tools. A massive yellowish-brown clayey soil with columnar structure and abundant carbonate nodules covered the angular stone layer. The surface of this soil horizon appears in the section near Abū Nuʻaym and at Tall Zakārī cut by pits and a stone silo (**Fig. 3**), all containing Chalcolithic pottery sherds. This soil and the associated Chalcolithic structures were covered again, on both sections, by a *ca*. 2m thick, clayey soil of reddish brown colour, also with a columnar structure and secondary carbonate nodules. The quantity of these nodules decreases, however, gradually as the sequence is built up. The base of the deposits is naturally cut by a series of large, but relatively shallow, depressions filled with a dark clayey matrix, angular gravels and Chalcolithic pottery sherds. The upper part of this soil contains large pieces of Early Bronze Age pottery, besides Late Chalcolithic sherds and some others of an uncommon ware.

The section near Tall Umm Ḥammād shows a similar development, especially the event of the red clayey soil in the upper part. This soil, upon which the site of Umm Ḥammād was built, revealed, similar to the situation seen at Tall

3. Section studied near Abū Nuʻaym showing a stone silo dug into yellow clayey soil.

Zakārī and Abū Nuʻaym, pottery sherds from the Chalcolithic Period and Early Bronze Age. The yellowish clayey soil that appears at Tall Zakārī and Abū Nuʻaym and was associated with Chalcolithic structures is not as clear in the section at Umm Ḥammād. Here successive layers of clays and sandy-silty clays of dark red, dark green or yellow colours characterize the deposits underneath the red clayey soil. Some of them are composed of thin laminated beds. It reflects slow deposition under very humid conditions and even water stagnation. It shows similar environmental conditions as were detected at Tall Zakārī and Abū Nuʻaym in association with the yellowish soil, but the former were more subject to direct influence of streaming.

Further south of Tall Umm Ḥammād, on the top of the Qaṭar hills that overlook the Iron Age site of Tall Dāmiyah from the north, and where a new Late Chalcolithic/ Early Bronze-I site was discovered (see below), a section in the buried soil under this site was cut and studied. The mas-

sive yellowish and red brown clays observed in the sections studied further north are lacking here. The buried soil appears to be mainly developed on top of the Late Pleistocene Lisan marls. Its dark colour, fine columnar structure and, most of all, the presence of calcitic nodules reflect, nevertheless, a paleoenvironmental ambiance similar to the humid one associated with the yellowish and red brown soils observed a little to the north, in the regions of Umm Ḥammād and Abū Nu'aym/Zakārī. This would indicate that the Zarqā' channel at this point, indeed very close to the Jordan river, was more entrenched than further north and that floods are confined here to the major bed without being able to reach its banks.

Thus the sequence of the middle terrace shows firstly the occurrence of torrential inundations during or sometime after the Late Neolithic that incised the banks of the wadi and generated a deep reworking of the surrounding soils and sediments. The succeeding accumulation of the yellowish brown clayey silt and the development of a soil with abundant calcitic nodules demonstrate subsequent regularization of the stream discharges and the development of a high water table. The most prominent event to be noticed here is the widespread deposition of the red clayey silt at the end of the Chalcolithic and the beginning of the Early Bronze Age, indicating the formation of wide floodplains with over-bank flows during this period. This situation can be compared with the results obtained at the flat land a little north and north-east of Tall Dayr 'Allā, among the middle and western parts of Wādī al-Ghawr (see above). Here, a contemporaneous alluvial fan activity had demolished one or probably two Chalcolithic settlements and covered them with new deposits, upon which the survey team found concentrations of Early Bronze Age material.

On top of the red soil at Tall Zakārī and just under the Iron Age remains, a 40cm naturally deposited stone layer was seen containing both rounded gravels and angular stones. The same layer can also be observed on top of the red deposits at the Zarqā' cut more to the south. It indicates the onset of an erosive episode, with incisions of the Zarqā' banks, somewhere after the Early Bronze Age and before the Iron Age. The absence of any over-bank deposits after this erosion phase indicates that the Zarqā' channel was deeply incised during the Iron Age and afterwards. This is also demonstrated by the location of the Iron Age Tall Dāmiyah in the actual floodplain of both the Jordan and Zarqā' rivers. However, successive erosions since that period continued to entrench the channel bed to a greater depth. The main conclusion to be drawn from this (these) post-Early Bronze Age incision(s) is that naturally supplied soils' moister was highly deficient in the over-bank areas during at least the Iron Age and onward.

The geomorphologic events associated with the younger terrace were mainly studied during the second field season in the region around Tall Dāmiyah (Petit *et al*. 2006). Similar deposits were observed in 2006 in the region of Umm Ḥammād, at around 15m down below the site. The results indicate a major depositional phase within the main bed of the Zarqā'. During the 2005 field season it was suggested that this depositional phase post-date the Iron Age site of Tall Dāmiyah (Petit *et al*. 2006). To this depositional phase might also be associated, at least partially, the episodes of channels' cut-and-fill studied near Tall al-Mazār (cf. *supra*), where the pottery sequence collected from the probe trench allowed to date them roughly between the Persian/ Hellenistic era and the end of the Roman-Byzantine period. However, several organic samples were collected from the terrace deposits present to the north of Tall Damieh and those located near Tall Umm Ḥammād in order to date this depositional phase, hopefully, more accurately.

Sites Newly Discovered

In addition to the above-mentioned results about landscape development in the study region, geoarchaeological investigations during mainly this field season have allowed identifying five new archaeological sites, referred to in the preceding paragraphs. Cultural remains associated with these sites suggest a preliminary assignment of one of them to the Natufian period, three to the (Late) Chalcolithic and one to the Late Chalcolithic/ Early Bronze Age transition. Data collected from all five sites are currently being processed and will be published subsequently.

The Natufian settlement (32°07'50 N,

35°34'05 E) was discovered in a bulldozer cut in the Qaṭar hills, near the small village of Zaqøm, at about 3km south of Tall Umm Ḥammād. Stratigraphically the site presents an interesting and original position, since it is embedded within the laminated Lake Lisan deposits. According to the archaeological material, mainly flints, collected on the slopes of the surroundings Qaṭar hills, the site may cover an area of 1500 to 2000 square meters. Cultural deposits observed in the cut are 0.60-0.80m thick, varying in colour and texture between brown-reddish fine sand and soft light grey to dark brown material. The whole package is ashy and mixed with plenty of charcoal lenses. No built structure was found in the 8m wide bulldozer cut. Portions of at least two occupational (ashy) surfaces were however clearly discernable. The site appears to be heavily affected, on the one hand by slow water movement, and on the other hand by seismic activities. The latter manifest themselves in the section by a number of cracks with vertical and oblique shifting in both the cultural and the Lisan marl deposits. Cultural remains collected from this site comprises a number of lunates and bladelet microlithis as well as tubular marine shell beads. A used stone and two antler branches were also found in the section. Two charcoal samples for radiocarbon dating as well as three undisturbed soil samples were collected in order to better understand the environmental context of the site as well as its position in relation to the Lake Lisan terminal history, on the one hand, and the chronology and regional distribution of the Natufian culture, on the other hand.

One of the newly discovered Late Chalcolithic sites was found buried under 1.10m thickness of natural deposits in the flat land area a little north of Dayr ʻAllā, at 32°12'11 north and 35°37'23 east. The survey team had found a dense surface scatter of Chalcolithic sherds during a previous season (Field 27; see the previous reports), but occupation layers of the site were discovered in a probe trench opened in order to study the depositional sequence of the Ruwayḥa alluvial fan in this area (see above, the Wādī al-Ghawr paragraph). Cultural deposits visible in the sounding are 1.6 to 1.8m thickness. At the base they comprise one ashy pit with charcoal lenses and another one containing a concentration of pottery sherds and a two courses stone wall on its top. Pottery sherds and flints collected from the sounding are typical of the Late Chalcolithic (Ghassulian) culture found elsewhere in the Jordan Valley such as at Abū Ḥāmid and Ghassūl. Post occupational geomorphologic events in this area do not allow a clear knowledge of the size of the site.

The second Chalcolithic site discovered is at the north western cut of Wādī az-Zarqā' near the village of Abū Nuʻaym, at 32°10'04 north and 35°36'11 east (see the Wādī az-Zarqā' paragraph, above). Cultural remains appearing in the section include a stone silo (**Fig. 3**) and at least two partially preserved pits cut into a 0.80m thick layer of massive yellowish alluvial clays. The pottery collected from these features is rather general Chalcolithic. Likewise, the settlement here also clearly appears to be truncated by — and buried under — another bed of alluvial deposits (more information on the nature, chronology and environmental significance of these deposits is presented above). On top of this alluvium the Roman-Byzantine and Islamic remains of Tall Abū Nuʻaym ADDIN ENRfu (Glueck 1951; Ibrahim *et al*. 1988) are accumulated .

The third (Late) Chalcolithic site was found under the Iron Age occupation of Tall Zakārī (32°09'43 N, 35°36'08 E) at about 700 meters south of Abū Nuʻaym, on the same Zarqā' cut. This site could be the extension of the one seen at Abū Nuʻaym since it is relatively close to it and both are found exactly in the same stratigraphic context. The site is represented here by a series of three oval pits cut into an earlier alluvial clays. One of these pits was studied in detail. In its largest and deepest points it measures respectively 1.10m x 1.05m. Deposits inside it consist of a mixture of ashy material mixed with some small stones, few pottery sherds and with some yellowish clayey silt, identical to the one of the alluvial substratum. The mouth of the pit is covered by some small to medium size stones, upon which large pieces of pottery were found that apparently belong to a single pot. This pottery as well as that collected from inside the pit is similar to the pottery found at Abū Nuʻaym.

The transitional Late Chalcolithic/ Early Bronze Age site was discovered on the Qaṭar hills near the point where the Zarqā' channel joins the Jordan River, at 32°06'54 north and

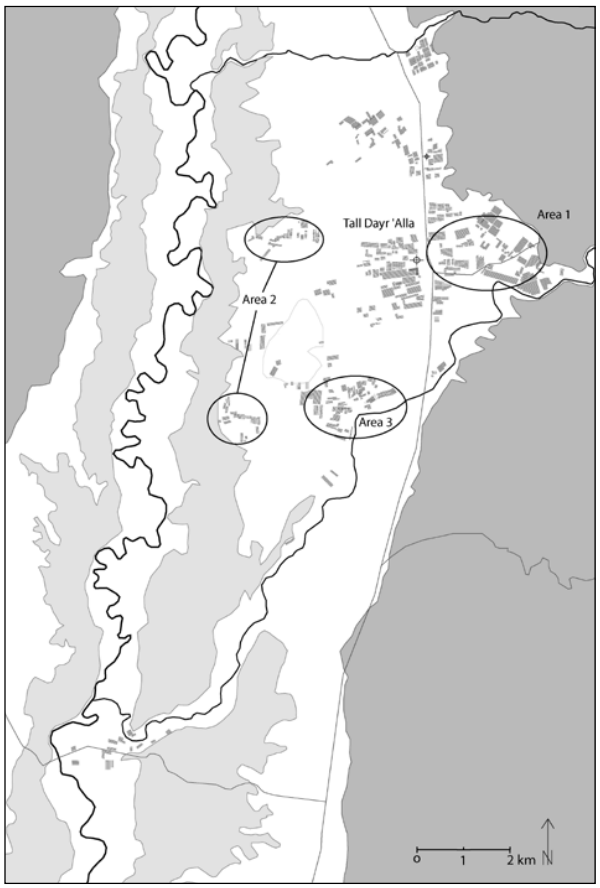
35°33'30 east. The site is extremely eroded and divided by multiple gullies. No structures or architectural features were observed on the surface or in the gullies' cuts. The cultural remains found are large pieces of ceramic and flint tools scattered on the surface along with stones of small to medium size, which cannot have been deposited here naturally according to the geological context of the area. These remains are scattered over an area of 1.7 to 2 hectares in size. Nevertheless the size of the site may have been of greater extent during the period of its occupation, taking into account the deep erosion of this area. The pottery collected on the surface of the site includes material dating to a very early phase of the Early Bronze Age, according to our colleague in the Settling the Steppe Project, Eva Kaptijn.

This site is of special interest not only because its remains offer additional information to understand the transition of the Late Chalcolithic to Early Bronze Age period in the Jordan Valley, but also by providing some key elements for a better understanding of the development of landscapes and climate of this region during the mid-Holocene (see above).

The Regional Surface Survey (Eva Kaptijn)

During this third and last survey season of the Settling the Steppe-project, apart from a few smaller investigations, three distinct regions have been examined and will be discussed here separately (**Fig. 4**). The survey team was formed by Ms. Jitske Blom, Ms. Ingrid Heijen, Ms. Eva Kaptijn, Mr. Jeroen Rensen, Ms. Jacqueline Ruland, Ms. Marjolein Verschuur, Mr. Thomas Wolter and assisted by DoA representatives Mr. Ali Alowaisi and Mr. Ziyad Ghnaimat. Survey methodology and design have been described in the preliminary report of the 2004 season ADDIN ENRfu (Kaptijn *et al*. 2005). Survey work started this season east of Tall Dayr 'Allā. Parts of this area had already been surveyed during the 2004 season and had revealed among others a large Late Chalcolithic concentration north of Tall Qa'dān North (field 27) and a concentration of Mamluk sugar pot sherds just east of Dayr 'Allā (field 31) ADDIN ENRfu (Kaptijn *et al*. 2005: 93).

One of the reasons to return to this area was to check for possible remains of Tall Ḥammah West. Tall Ḥammah West has been first identified by the East Jordan Valley Survey (EJVS) in 1976, which dated the material to Early Byzantine and Mamluk/Ayyubid periods, besides one Early Bronze Age sherd and some possible Early Bronze IV remains ADDIN ENRfu (Ibrahim *et al*. 1988: 190). Both Glueck, surveying the region in the 1940's, and Kirkbride, who conducted a small survey within the scope of the Dayr 'Allā excavations in 1960 and 1961, did not mention this tall. However, both investigated the Byzantine cemetery located immediately south-west of the tall, but apparently did not recognize the tall as such ADDIN ENRfu (Franken 1960: 392; Glueck 1951: 312). The tall is nevertheless indicated as a small rise of 3 to 4m on a 1:10.000 map from 1965 ADDIN ENRfu (anonymous 1965). In 2004 the tall was not visible anymore. The survey passed just west of the supposed location, but only a limited amount of sherds was discovered. Moreover, these were not typically Byzantine sherds, but as the collection was small it was decided to return in 2006



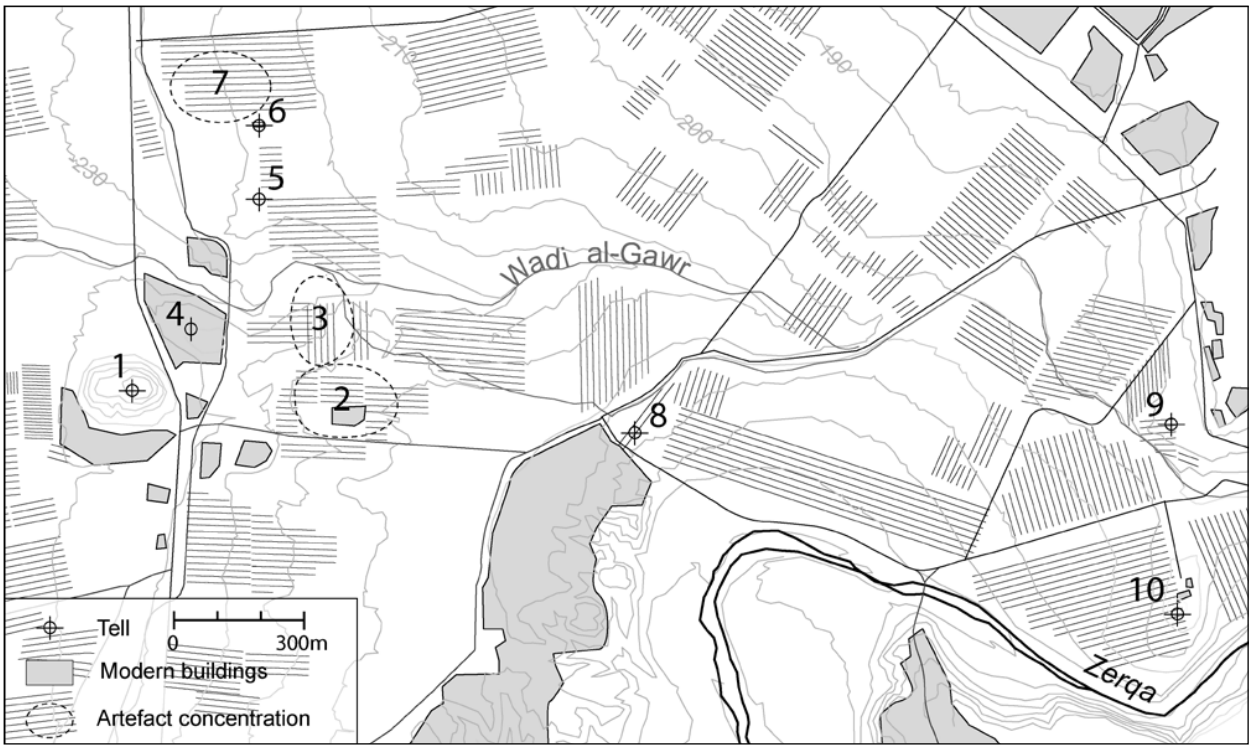
4. General overview of the fields surveyed during the 2004/2005/2006 seasons.

and collect more datable pottery. Unfortunately, the 2006 survey was not very successful in collecting pottery either. Plots were laid out over the exact location of the former tall and the area was randomly surveyed for feature sherds. Only a small number of sherds was discovered. Again typical Byzantine sherds are largely missing. Most sherds are of a light grey, yellow or buff ware and mainly take the form of handles, body sherds with wavy comb decoration, while only a few ribbed body sherds and rims are present. Dating is problematic as the assemblage is a mix of different periods including the Roman, Islamic and possibly the Hellenistic and Byzantine periods. Four fragments of Mamluk sugar bowls and a few (sub-) modern sherds were found.

The small number of sherds and the absence of the once discovered Byzantine pottery shows that Tall Ḥammah West was removed in its entirety and has not been levelled and spread out over the surrounding soil. Reasoning from the lack of typical Byzantine pottery it is possible to think that only the earliest layer of the tall left some ceramic traces. One would however expect the tall to have left a halo of sherds outside its limits. These sherds would represent the pottery as it was distributed on the surface of the tall. As the halo area was surveyed in 2004 and showed the same pottery as the 2006 collection it might be that the entire tall should be dated to the Late Roman and the start of the Early Byzantine period. The small size of the collection, however, makes that a large question mark must be added to this conclusion.

The hypothesis that the tall was completely removed has been corroborated by an eyewitness. Amin Kan'an, an inhabitant of the neighbouring village of Dibab and the oldest living technician of the Dayr ʻAllā excavations, informed us that the tall was removed by bulldozers about 10 to 15 years ago and had indeed been called Tall Ḥammah West.

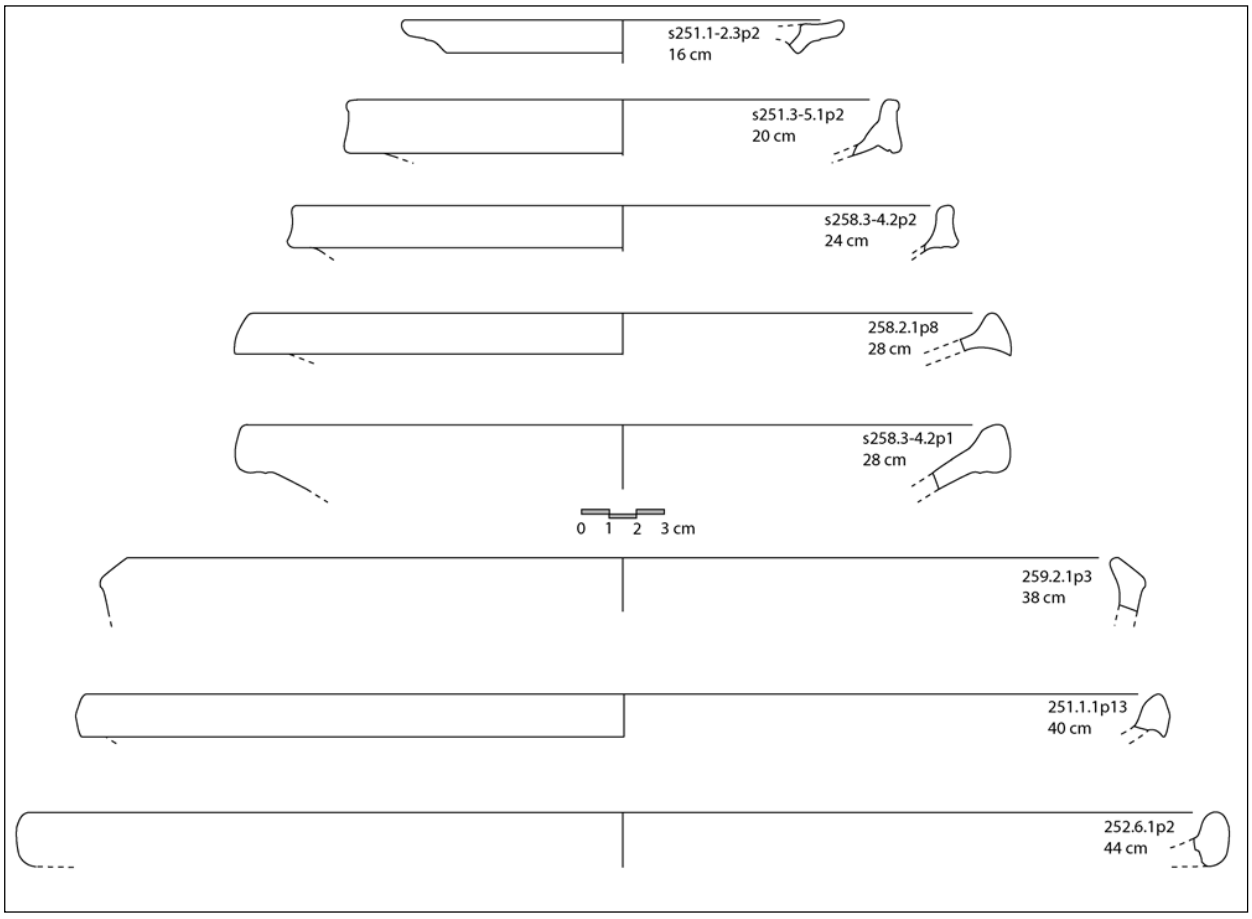
A site that is undoubtedly of Byzantine age has been discovered only one kilometre west of Tall Ḥammah West. This site has not been reported by Glueck or the EJVS and does not appear in JADIS. Franken, however, mentioned that a large Byzantine settlement is located east of Tall Abū Ghurdān, but no further information was given ADDIN ENRfu (Franken 1960: 392). It seems certain that Franken was referring to the same concentration of remains (**Fig. 5**). Large



5. Area east of Dayr ʻAllā: 1) Tall Dayr ʻAllā; 2) Byzantine concentration; 3) Mamluk concentration; 4) Tall Abū Ghurdān; 5) Tall Qaʻdān South; 6) Tall Qaʻdān North; 7) Chalcolithic concentration; 8) Tall Ḥammah West; 9) Ruwayḥa; 10) Tall Ḥammah.

quantities of pottery have been discovered, with a mean of *ca*. 350 sherds per plot at the densest part of the concentration.[1] Pottery included casseroles and lids, cooking jars, storage jars, etc. A few pieces of imported Red Slip Wares have been found, mainly Phocean Red Slip Ware (n=13), but also six pieces of African Red Slip Ware and one Cypriot Red Slip Ware sherd (**Fig. 6**). Taken together these date between 325 and 625 AD, while most centre between 500 and 625AD.[2] Other finds included a few slabs of polished marble, fragments of glass bottles and cups, and small mosaic stones. Although the finds have not been completely processed a date in the Byzantine period seems certain, though there might be a continuation into the early Umayyad period. The pottery shows many parallels to the concentration south of Tall 'Ammata surveyed in 2005 ADDIN ENRfu (Petit *et al*. 2006).

A modern farm villa is located on top of a little rise just next to the concentration.[3] The men that worked the land surrounding it had discovered several column bases, drums, and capitals together with grinding stones and other hewn stones and had used them as terrace decoration. These columns together with the marble slabs, the relatively large amount of glass fragments and the imported tableware show this concentration should be not interpreted as a simple workman's house but probably as belonging to wealthier occupants. Its exact function, for example as a rural villa, can, however, only be ascertained through more detailed analysis of the finds.



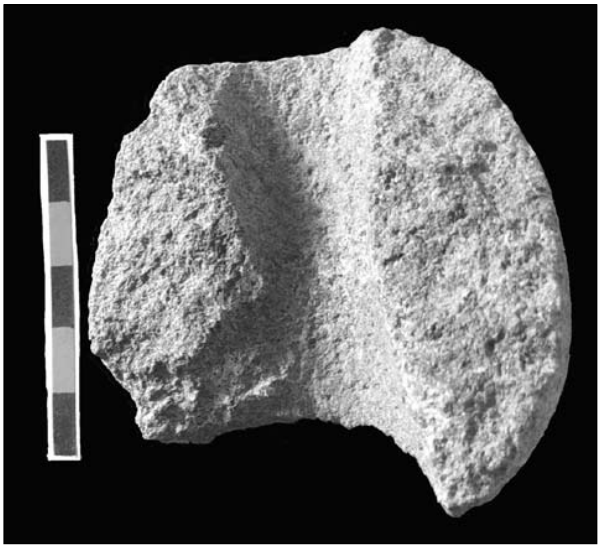
6. Red slip wares, rim sherds.

1. A plot is an area of 50m long and 1m wide in which surveyors collected all artefacts they came across.
2. *E.g*. 5x PRSW form 3F (500-550 AD), and 3x PRSW form 10A (575-625 AD). Thanks must be expressed to Philip Bes (Icrates project, Catholic University of Leuven) for preliminarily dating these imported table wares.
3. Most likely it is built on the centre of the concentration, but as it was impossible to survey this area and the road immediately to its south we were not able to ascertain this.

Immediately north of this Byzantine concentration large numbers of Mamluk sugar pots were found (**Fig. 5**). The western edge of this concentration was already touched upon in the 2004 survey. As very little domestic pottery was present within this assemblage it was decided to return to this concentration, survey the remaining area and ascertain whether this site was a sugar mill or a production site for sugar bowls and whether there was a domestic component present as well. Again very little domestic pottery was discovered. This time apart from sugar pots several vitrified lumps of clay were found. This points to a pottery production site. Furthermore, a slightly elevated area was visible consisting of ashy material on the edge of the site where it slopes down to the Wādī al-Ghawr. This ashy soil can be interpreted as an indication for pottery production, but it can also be taken as a by-product of sugar production as the sugar pulp is heated by fires to extract the sugar. An additional feature pointing to the use as a sugar mill is the location of the site. It is placed alongside the Wādī al-Ghawr on a small natural ridge. On the 1:10.000 map of 1965 a canal is visible running more or less along the top of this little rise. At the location of the sugar pot concentration the canal makes a 90º turn and runs into the Wādī al-Ghawr. This canal might have powered the watermill that was used to grind the sugar cane. The fact that the canal runs over the top of this small ridge shows that it is manmade; a natural wadi would choose the lowest areas. The sharp turn at the sugar pot concentration suggests a connection between the two features, because had it been an agricultural irrigation channel it would have continued to water the eastern fields of this ridge as well. This canal is of course of recent age, but as was argued elsewhere there are several indications that the ethnohistorical irrigation system is of great age and can be dated back to at least the Mamluk Era ADDIN ENRfu (Kaptijn in press; Petit *et al*. 2006). The location of the site with a channel bringing water, a difference in altitude to power a waterwheel and the Wādī al-Ghawr as natural drainage seem ideal for a sugar mill. Until a millstone has been found it is impossible to be certain, but it is known from early Ottoman tax records dating between 1525 and 1597 AD that the village of Dayr ʻAllā had indeed a mill in the period following the Mamluk Age ADDIN ENRfu (Hütteroth and Abdulfattah 1977: 168). It therefore seems reasonable to conclude that the concentration probably represents a Mamluk sugar mill possibly in combination with some production of sugar pottery.

Further investigations in the area east of Dayr ʻAllā included the resurveying of Tall Ruwayḥa. During the 1960 excavations of Tall Dayr ʻAllā a villager came to show the archaeologists several large flint blades he had found near the village of Ruwayḥa ADDIN ENRfu (Franken 1960: 293). When Kirkbride investigated this area she discovered sherds that were interpreted as representing a large Chalcolithic/ Early Bronze Age village situated at the foot of the mountains three kilometres east of Dayr ʻAllā ADDIN ENRfu (Homes-Fredericq and Franken 1984: 71). In 1976 the EJVS visited the tall and also dated it to the Late Chalcolithic/ Early Bronze Age ADDIN ENRfu (Ibrahim *et al*. 1988: 190). The last archaeologist to survey the tall was Helms during the excavations of Tall Umm Ḥammād. Helms describes Ruwayḥa as a ʻsmall, now virtually destroyed, settlement' ADDIN ENRfu (Helms 1992: 95). Only a small part of the tall remained, the rest seemed to have been ploughed away leaving only sparse remains on the surface. On its western side the tall was cut through by a modern track showing an occupation depth of about one meter ADDIN ENRfu (Helms 1992: 96). Helms dated the pottery to the Early Bronze Ia and a smaller part to the Early Bronze Ib period, concluding that it was a small open village ADDIN ENRfu (Helms 1992: 97). It was decided to revisit the tall to ascertain whether it still existed and if so, whether it was threatened by agricultural or building activities. The situation we encountered was almost exactly as described by Helms. A small part of the tall was still present although some shallow holes had been dug and a few child's graves were visible. The road cutting through the tall was still a dirt track showing occupational layers in its section. Although finds on the tall itself were indeed sparse the survey examined all accessible areas surrounding the tall attesting much pottery, some flint tools and a stone mace head (**Fig. 7**). In line with Helms' conclusion the pottery was preliminarily dated to the Early Bronze Ia and Ib periods.

In the area west of Ruwayḥa two small Early



7. Mace-head from Ruwayḥa.

Bronze Age pottery concentrations have been found. Both do not extend over more than 30m and contained only a few feature sherds. Although the number of finds was very limited, both concentrations had pottery dating to the Early Bronze I and Early Bronze II/III periods. The small size of the concentrations points the interpretation into the direction of an isolated activity like a single house or some sort of small storage area. What is remarkable, however, is the continuity that both show as being used during episodes in at least two sub-periods of the Early Bronze Age.

After most of the accessible areas east of Dayr ʻAllā were surveyed it was decided to investigate an area along the lower course of the Wādī al-Ghawr. This year's and last year's surveys have revealed several concentrations of pottery from different periods along the Wādī al-Ghawr, *e.g.* the Mamluk and Byzantine occupations described above and the Early Bronze Age concentration discovered in the 2005 season ADDIN ENRfu (Petit *et al.* 2006). The question therefore was whether the same amount of occupation was present in the area where the Wādī al-Ghawr crosses from the Ghawr into the Qaṭar hills. Further downstream the amount and quality of water carried by the Wādī al-Ghawr might have been less and no use can have been made from small seasonal wadis coming from the foothills. Nevertheless good drainage was of great importance to counteract salinization and a deep gorge has been worn away in the Qaṭar pointing to prolonged water transport and erosion. An additional reason to survey this area was to attempt locating Tall Abū Nijrah reported by Glueck as being a low hill on the western edge of the Ghawr overlooking the Qaṭar and containing some Late Bronze and much Iron Age I and II pottery ADDIN ENRfu (Glueck 1951: 312). The EJVS also visited the site and reported to have found some sherds from the Early Bronze Age and early modern period, while most sherds dated to the Late Bronze Age ADDIN ENRfu (Ibrahim *et al.* 1988: 190). However, in 2004 Lucas Petit was unable to locate the tall during an explorative tall survey within the scope of the Settling the Steppe-project.

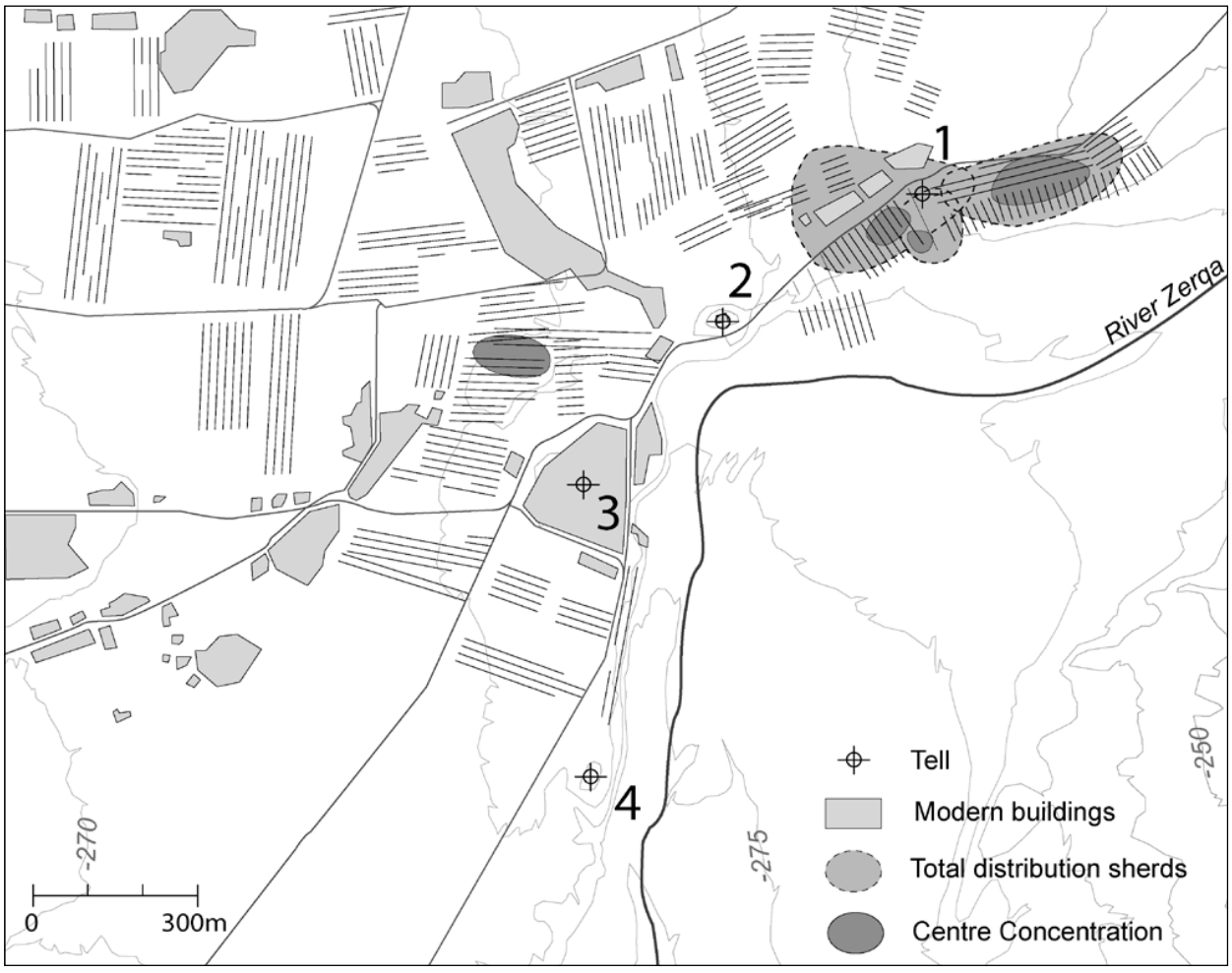
The valley plain on the edge of the Qaṭar, along the southern bank of the Wādī al-Ghawr, was investigated until west of the village of Khirbat Abū Nijrah (see the northern part of area 2 on **Fig. 4**). The amount of artefacts discovered in these fields was very low. Ribbed body sherds from the Roman, Byzantine and Islamic periods, that are discovered in low numbers in all parts of the research area, were found together with the occasional Early Bronze Age sherd but no concentrations of any period were discovered. Furthermore, even after randomly searching the Qaṭar hills and the courtyards of the village, no sign was found of Tall Abū Nijrah, although Glueck's description, his mark on the aerial photograph and the name of the village show that its location must have been close by or even crossed.

To further investigate artefact density on the western edge of the valley plain another area bordering on the Qaṭar hills was surveyed, namely further to the south in the area east of the village of Ṭiwāl (**Fig. 4**). This southern area also shows quite heavy occupation towards the east (see below). The same low amount of sherds was discovered in this area allowing a conclusion that at least in these two areas the eastern part was more heavily occupied than the western edge of the plain bordering on the Qaṭar. This might be explained by the closer proximity of the river Zarqā' and better quality agricultural soils created by overflowing of the Zarqā' during the Late Chalcolithic and Early Bronze Age times (see the geomorphologic section, above).

A part of the eastern area near the village of Ṭiwāl was already surveyed in 2004. West of the

location where Glueck and the EJVS placed Tall Rikābī a concentration of seemingly Chalcolithic or Early Bronze pottery was discovered in 2004. The number of diagnostic feature sherds was however insufficient to come to a clear date for the concentration. In 2006 the survey therefore returned to this site and focussed on collecting datable pottery. The date of the site is now firmly established as Early Bronze I. The densest part of the concentration is found on a very shallow rise next to the road leading to the village of Ṭiwāl (**Fig. 8**). Immediately west of this Early Bronze site a dense concentration of Mamluk sugar pottery was discovered. The concentrations overlap, but their centres seem to have been located next to each other. Further to the north-west, but still south of the road an elongated concentration of pottery provisionally dated to the Roman and Byzantine periods was discovered together with a few Iron Age sherds. The pottery, however, still has to undergo detailed analysis to date it more precisely and conclusively. On the south-western edge of this concentration an area with some Late Bronze Age and Iron Age sherds was discovered, but only in low quantities and without constituting a clear concentration. These three concentrations, all partially overlapping but with different centres, cluster around the supposed location of Tall Rikābī.

Glueck was the first to survey Tall Rikābī. He described it as a small insignificant mound with several modern houses on top. The collected pottery has been dated to the Roman, Byzantine, and Medieval periods and he notes that some Early Bronze and some Iron Age I-II sherds have been found ADDIN ENRfu (Glueck 1951: 314). The location has been marked on an aerial



8. Fields around the village of Ṭiwāl: 1) Tall Rikābī; 2) Tall Bashīr; 3) Tall Abū Nuʻaym; 4) Tall Zakārī.

photograph. The EJVS also visited Tall Rikābī and gathered a few Early Bronze Age sherds, one possible Middle Bronze Age sherd, possibly some Iron Age sherds and one Byzantine sherd. The dominant period in their collection is, however, the Ayyubid/Mamluk Era ADDIN ENRfu (Ibrahim *et al*. 1988: 191). On the spot where Glueck has marked Rikābī on the aerial photograph a low rise is indeed visible in the landscape. This rise is, however, very small and is one of a series of small hills flanking the river Zarqā'. Recent bulldozer activity has left a small section in the hill's flanks. This section shows that at least this part of the hill is natural and without occupation layers. The lack of a tall at this location or its immediate vicinity can either be explained by it having been bulldozed away or the mistaken identification of a natural hill as a tall. The former explanation seems highly improbably as the different periods would have been bulldozed into separate directions without any mixing of layers. This leaves the latter explanation as the most likely. It would also account for the difference in dominant periods between Glueck and the EJVS. They probably surveyed slightly different areas.

The last week of the survey season was used to investigate the area surrounding the village of Ṭiwāl near the turn in the Zarqā' where many talls have been reported. The survey moved from the area of Rikābī, described above, towards the north-west turning around Tall Bashīr/Tall 'Asiyah and Tall Abū Nu'aym towards Tall Zakārī.[4] Tall Abū Nu'aym, or Tall Shahwān as it is also called, was dated by both Glueck and the EJVS to the Roman period and virtually all periods after that ADDIN ENRfu (Glueck 1951: 316; Ibrahim *et al*. 1988: 191). Unsurprisingly, its vicinity revealed many sherds dating to these periods. What was surprising, however, was the presence on the surface of several bones and a few teeth, some of them of definite human origin. These bones were found together with many fragments of pottery and glass and most likely form part of the cemetery of Tall Abū Nu'aym. In the section eroded away by the Zarqā' three graves consisting of large flat stones with bones underneath them and in one instance part of a skull were visible beneath the present-day village. As they could not be reached it is unknown from which period these graves stem. Further analysis on the finds should take place to date the tall and its probable cemetery more precisely.

Iron Age Settlement Site Study in the Middle Jordan Valley (Lucas Petit)

It was made clear in earlier preliminary reports of the project *Settling the Steppe*, that the occupation history of the Middle Jordan Valley is very complex, with many settling, resettling and abandonment processes (e.g. Kaptijn *et al*. 2005; Petit *et al*. 2006). These processes should be understood in order to be able to tell something about social, political and economical activities and entities in the region. To what degree are hamlets, villages and cities depending on each other? Can the inhabitants be considered as dependent on others or were they autonomous? The excavations in 2004 and 2005 at three sites, e.g. Tall al-'Adliyya, Tall 'Ammata and Tall Dāmiyah have generated important information about different factors that influence occupation processes in the region. The results show the quickly oscillating variety and intensity of use of settlements and the importance of the landscape for the occupants. However in order to base conclusions on solid grounds, more information was needed, especially from the sites of Tall al-'Adliyya and Tall 'Ammata, where previous small scale work was limited to four weeks only.

A small team of archaeologists carried out fieldwork at *Tall al-'Adliyya*: Ms. Jitske Blom and Dr. Lucas Petit from Leiden University, and Mr. Nabil Qadi and Mr. Mohammed Jamil Ruwashda from Yarmouk University. The team was accompanied by the representative of the Department of Antiquities, Mr. Hussein al-Jarrah, and the surveyor Mr. Muaffaq Batayneh (Yarmouk University). Excavations took place from the 11th until the 28th of September 2006.

The earliest phase excavated was reached in the most western square IV and consists of a walking surface and a mudbrick wall, deposited

4. Tall Bashīr and Tall 'Asiyah are reported as two separate talls on more or less the same location. It was reported by Glueck as Tall 'Asiyah but later the name seems to have changed into Tall Bashīr causing confusion (Glueck 1951). To all likelihood Tall Bashīr and Tall 'Asiyah should be considered as one and the same tall.

directly on sterile soil. Some burnt mudbrick debris and fragmentary pottery confirm that a destruction had ended the oldest occupation at Tall al-ʻAdliyya, preliminarily dated to the Iron Age IIa/b period. After a gap in occupation people settled again. Taking the thick occupation deposit in account, it seems that this phase had lasted longer than most other occupation periods at the site. Mudbrick walls were still standing about 1.4m high above the walking surface and demonstrate some rebuilding and restoration activities. Broken, but restorable, pottery was uncovered on one of the surfaces in square IV. A new destruction ended this occupation and the inhabitants moved away. Tall al-ʻAdliyya was left unoccupied for a while.

The succeeding package of courtyard and wash layers is almost 1.5m thick, and still puzzling, while no contemporaneous architectural features were excavated. A study of the main north-south profile (a bulldozer's cut) might give the crucial information about this phase in the nearby future. During the excavation of 2004 this phase was not encountered and also the succeeding occupation period did not have any contemporaneous parallel in the excavation trenches on the northern slope (Kaptijn *et al*. 2005: 94-95). In the most eastern square a wall and a pavement were found, on top of these courtyard layers. The pottery assemblage on top of the pavements is typical for the Iron Age IIc period. A small wall, visible in the eastern section of square V, and a pit are the scarce remains of later occupation. This situation is in contrast to the extensive Roman/Byzantine and Islamic occupation found during the 2004 season.

Small excavation work was carried out at *Tall ʻAmmata* from the 5th until the 22nd of October 2006. The team included Mr. Jeroen Rensen and Dr. Lucas Petit from the University of Leiden, and from the Yarmouk University: Mr. Nabil Qadi, Mr. Muaffaq Batayneh and Mohammed Jamil Ruwashda. The representative of the Department of Antiquities was Mr. Ashraf al-Khraysheh.

The oldest remains, dated preliminarily to the Late Bronze Age, were discovered on top of a natural gravel layer in the small sounding V on the eastern slope. A thick layer of red burnt mudbrick and roof fragments on top of smashed pottery shows the sudden conflagration that had ended this last phase of the Late Bronze Age. The oldest layers discovered in soundings IV and III can be dated to the Iron Age II period. The occupation remains and pottery assemblage point to a domestic character. This changed with the construction of a large wall. At the western side of this structure some installations were built with the same orientation. The floors related to these installations show burnt mudbrick rubble, but different from the thick Late Bronze Age destruction layer found in square V. Sounding III and the section made by the bulldozer in the north-eastern corner of the site, revealed the remains of several stone-lined storage pits, that can preliminarily be dated to the end of the Iron Age and beginning of the Hellenistic Period.

Acknowledgements

We would like to thank the following institutions and people for their strong support and help: The Department of Antiquities of Jordan, especially the Director General, Dr. Fawwaz al-Khraysheh and involved staff-members, as well as Mr. Hussein al-Jarrah, of the Dayr ʻAllā office. He also was a DoA representative, as were Mr. Ali Alowaisi, Mr. Ziyad Ghnaimat and Mr. Ashraf al-Khraysheh. We thank Yarmouk University for its support, especially Prof. Dr. Ziad al-Saad, Dean of the Faculty of Archaeology and Anthropology. We are grateful for the support of The Faculty of Archaeology of Leiden University, especially its Dean Prof. Dr. Willem Willems, and The Netherlands Organisation for Scientific Research (NWO), that largely funded the project (project number 360-62-020). Many thanks go to Mr. Ahmed Jude, keeper of the Dayr ʻAllā Station for Archaeological Studies, for his essential efforts with other personnel at the Station, as well as to the Yarmouk University driver, and to all the inhabitants of the Dayr ʻAllā region, who were so kind to let our team members survey the fields.

IN MEMORIAM MR. NABIL AL-QADI

When Nabil al-Qadi passed away on December 7th, 2007, a strong sense of loss was felt by us, because of the role he had in our fieldwork, study of pottery and personal life.

Nabil, Abu Sallim, worked as field supervisor and instructor on most of the field seasons of the renewed excavations at Dayr ʻAllā, which were done jointly with the Department of Antiquities of Jordan and — since 1980 —with Yarmouk University. He started working with us 30 years ago, in 1978, for the DoA, and continued joining — now for YU — in 1982, ’84, ’87, ’98, 2000 (missing only the seasons of 1994, ’96 and 2004). Subsequently he joined for Yarmouk University all three seasons of the Settling the Steppe project in the Dayr ʻAllā region (**Fig. 9**), in 2004, ’05 and ’06. Right from the beginning he had a remarkably sharp view on soil layers and understanding of stratigraphy, which he combined with careful recording, and with a clear, strict and effective organisation of work in his squares. This rare combination of qualities continued to develop, and it made his field documentation very reliable. It also made him into a good teacher, not only for Yarmouk University students, but also for Dutch students from Leiden University, because his communication in English was excellent.

He liked to work at Dayr ʻAllā, especially if he had Jamil Kan’an as his local foreman; they formed an unbeatable team, but Jamil passed away four years before. Nabil was a stable team member, also socially in camp, with his keen eye for those that needed his attention, and great joy when playing chess, especially with Hugo.

Nabil came to Leiden within the exchange programme between Yarmouk University and Leiden University, during 8 months from June 1994 till mid February 1995. There he was trained in the technological approach of pottery with Bram van As and Lou Jacobs, and dealt with the MB II and LB I pottery collection from Tall Dayr ʻAllā accordingly. He worked precise, consistent and hard on this and managed to get much of the classifying and descriptive part done. He also very much enjoyed living in Leiden, having rooms with the kind landlady, Mrs Schultheiss in Oegstgeest. Although Nabil had hoped to develop this training into an MA degree — which unfortunately was not possible at that time — he benefited a lot from it, because he now was able to bring in a new approach of pottery study at Yarmouk University. What he did with the MB-LB pottery collection will be combined with additional material and become part of the final report on the MB and LB strata of Tall Dayr ʻAllā.

9. Nabil al-Qadi in the Dayr Allā Station November 10th 2004.

Nabil became for many team members a personal friend, with his quiet and steady character and well pondered authoritative speech. He was proud to tell my children about the many aspects of Jordanian hospitality when my family was invited at his house many years ago. His illness and hospitalisation a few years ago changed him by making him less optimistic, a bit worried, but not complaining. His religious experience clearly was for him a source of strength. In March 2007 he took the effort of showing my wife and myself around in the beautiful Mughāyir and Zayraqūn region — enjoying the region and its archaeology.

This is how he will stay with us, from Leiden, when travelling in Jordan, when working with the MB-LB pottery and when excavating.

Gerrit van der Kooij
Universiteit Leiden
Faculteit der Archeologie

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