

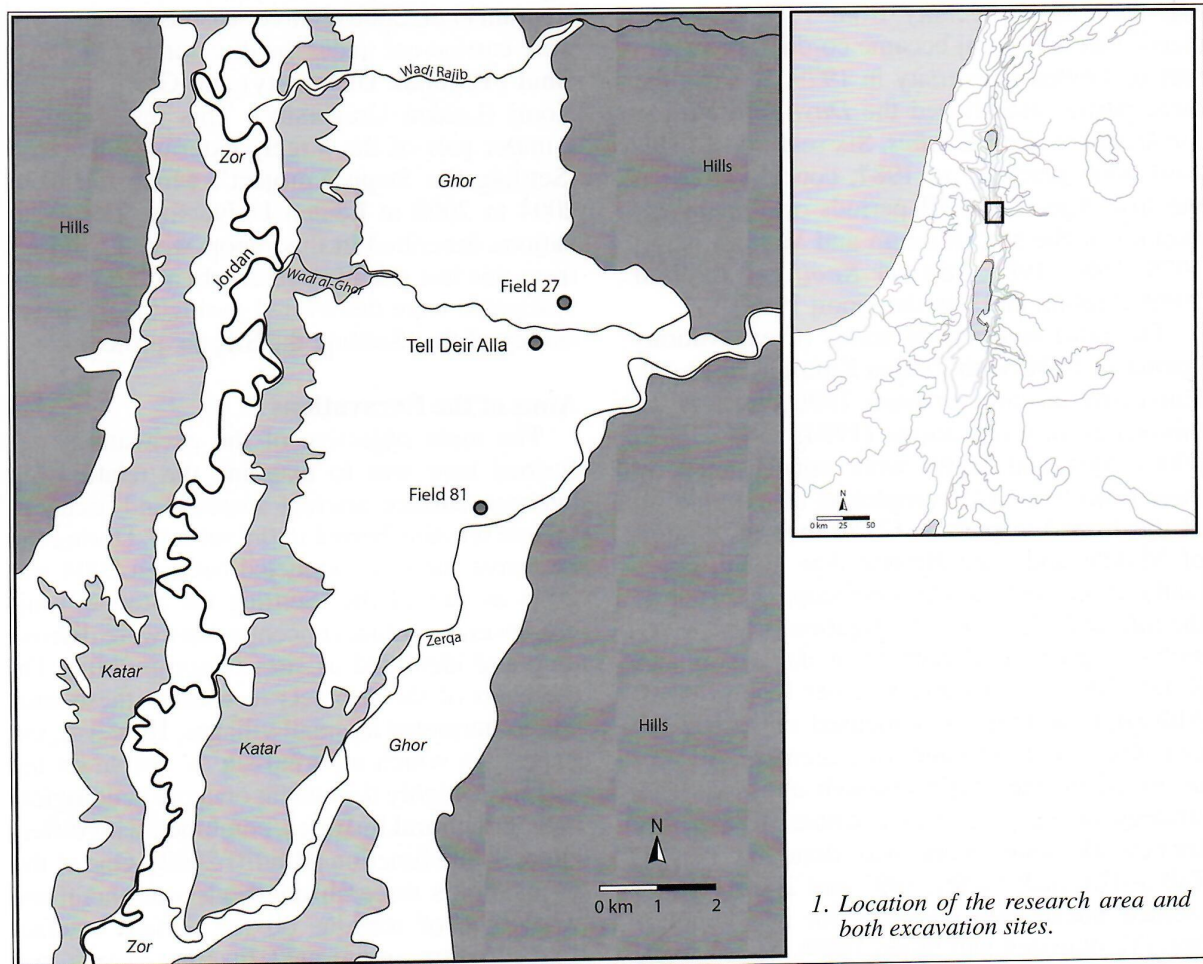
PRELIMINARY RESULTS OF THE DAYR 'ALLĀ REGIONAL PROJECT EXCAVATIONS OF A LATE CHALCOLITHIC SETTLEMENT, IRON AGE BURIALS AND SOME EARLY BRONZE AGE I REMAINS

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Introduction

Between 20th April and 20th May 2010 excavations were carried out in the Jordan Valley near the hamlet of ad-Dayyāt, in the Dayr 'Allā municipality, and at a second location situated

in the fields north-east of Tall Dayr 'Allā (**Fig. 1**). This fieldwork was part of the Dayr 'Allā Regional Project involving Leiden University, Yarmouk University and the Department of Antiquities of Jordan, under the directorship of



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Zeidan Kafafi (Yarmouk University) and Gerrit van der Kooij (Leiden University). Day-to-day field supervision was in the hands of Eva Kaptijn, with the assistance of Ali Omari (surveyor) and Yousef Zu'bi (photography). Mr Ziad Gh-naimat was the DoA representative.

History of the Tall Dayr 'Allā project

The Tall Dayr 'Allā excavations have a long history, being started in 1960 by Leiden University under the direction of Henk Franken. In the first five excavation seasons, 1960-1964 and 1967, the project concentrated on the Late Bronze Age and Iron Age I periods (Franken 1969, 1992).

Work resumed in 1976 as a joint expedition with the Department of Antiquities of Jordan. Moawiyah Ibrahim was co-director, representing Yarmouk University from 1980 onwards. Gerrit van der Kooij became co-director on behalf of Leiden University in 1979. In 1982 the three parties established the *Dayr Alla Station for Archaeological Studies*. Six seasons of fieldwork took place up to 1987, concentrating on the Iron Age II and III periods on the eastern summit of the site (Ibrahim and Van der Kooij 1979, 1983, 1986; *Van der Kooij* and Ibrahim 1989; Ibrahim and Van der Kooij 1997).

The third and current series of excavations started in 1994, with Zeidan Kafafi as Yarmouk University co-director from 1996 onwards. In this series of excavations (1994, 1996, 1998, 2000, 2004 and 2009) work concentrated on three objectives: (1) completion of exploration of the Iron Age phases, (2) further excavation of Middle and Late Bronze Age strata, especially at the south-south-west slope and foot of the *tall*, and (3) some investigation of the wider archaeological landscape (Van der Kooij and Kafafi 2008; Kafafi and Van der Kooij 2009). Although the latter was focused on rescue archaeology and heritage management, it was informed by the wider research questions and strategy of the project as a whole. Within this framework some work was done on nearby Tall al-Ḥimmah (1996, 1997 and 2000), which yielded unexpected evidence for iron production (Veldhuijzen and Steen 1999). Minor work was done elsewhere, including damage assessments of some sites.

The results of this research demanded more

intensive regional investigations. One example was the study of iron production at Tall al-Ḥimmah undertaken by Alexander Veldhuijzen, with the initial involvement of Yoshua al-Amri. This included renewed excavations at Tall al-Ḥimmah in 2009 by 'The Iron Track of Jordan' project' (2007 - 2009) (Veldhuijzen 2009).

Wider regional investigations started in 2004 in the form of intensive surveys by Eva Kaptijn (Kaptijn 2009) of the so-called 'Zarqa triangle', located between Wādī Rājib and the az-Zarqā' and Jordan rivers, and small-scale excavations at the neighbouring sites of Tall Dāmiyah, Tall 'Adliyah and Tall 'Ammata by Lucas Petit (Petit 2009). Within this project geomorphological and archaeobotanical investigations were carried out by Fuad Hourani and Ellis Grootveld respectively (Kaptijn *et al.* 2005; Petit *et al.* 2006; Hourani *et al.* 2008). Three seasons of fieldwork were carried out under the directorship of Omar Ghul (Yarmouk University) and Gerrit van der Kooij (Leiden University). This research was a major part of the largely externally financed 'Settling the Steppe' project', which ran from 2004 to 2008 at Leiden University. The excavations described in this report were a spin-off from this last strand of research, as the sites investigated were discovered during the intensive survey of the 'Settling the Steppe' project.

Aims of the Excavations

The main objective of the excavations described here was to examine the relationship between surface artefact scatters and archaeological remains buried in the subsoil. During the intensive surveys conducted between 2004 and 2008 as part of the 'Settling the Steppe' project, several artefact concentrations were discovered and identified as sites (Kaptijn 2009). On the basis of the artefacts recovered, these sites were interpreted as small villages. However, the manner in which a buried site is visible on the surface is highly dependent on local pedological and agricultural histories, combined with differences in site function (Bintliff 2000). One of the excavation's research questions was therefore: what type of remains do the surface artefact concentrations represent? In other words, are the hypothesised origins of these artefact concentrations correct? The results of these excavations will have a bearing on the interpretation of

other sites identified by the 'Settling the Steppe' survey.

It was envisioned that excavation would provide new insights into the poorly understood Late Chalcolithic - Early Bronze Age transition and, to a lesser extent, the shift from EB I villages (3600-3100 BC) to EB II urban communities. Furthermore, a better understanding of EB I village society would facilitate subsequent study of the transition to early urbanisation visible in the EB II period. The survey results suggested that the site discovered in Field 81 has parallels with pottery dated to the earliest part of the EB Ia period, or possibly the Late Chalcolithic - EB I transition (Gustavson-Gaube 1985, 1986; Wright *et al.* 1998; Brückner *et al.* 2002). Only a few sites dating to this early part of the EB I period are known and none of these are located in the central Jordan Valley. More information on settlement and subsistence during this little-known period would be extremely valuable for our understanding of this transition.

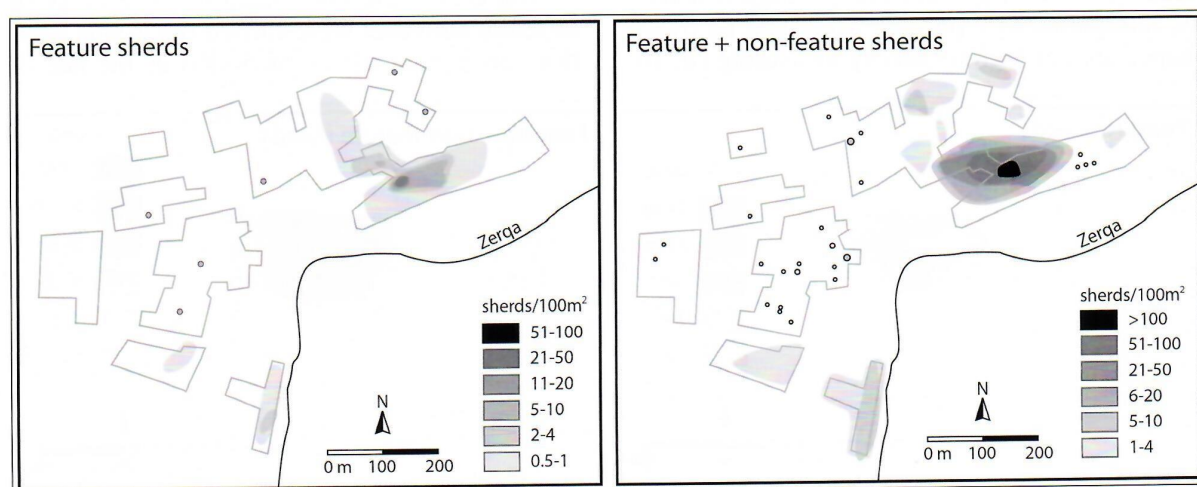
The location of the Late Chalcolithic and EB I sites discovered during the 'Settling the Steppe' survey, together with the results of related geomorphological research carried out by Fouad Hourani, suggested that EB I communities in this area relied on agriculture made possible by floodwater irrigation of the seasonally inundated floodplains of the Zarqā' and other wadis (Kaptijn 2009: 411f; Hourani 2010). One of the aims of this excavation was to acquire more information on the mode of subsistence of these communities. For example, were these commu-

nities indeed farming societies, was floodwater irrigation practiced, and to what extent did these communities rely on animal herding?

Expectations

The artefact concentrations in Field 81 and Field 27 were both discovered during the 'Settling the Steppe' survey. Field 81 was initially discovered in 2004 and was re-surveyed in 2006 to recover a larger sample of diagnostic pottery sherds. As can be seen in **Fig. 2**, the concentration consisted of a central cluster surrounded by concentric rings of decreasing artefact densities. The pottery sherds recovered represent a range of different vessel types, including cups, V-shaped and hemispherical bowls, holemouth jars and necked jars. These vessels are similar to ones found at the transitional Late Chalcolithic / EBA site of Ḥujayrat al-Ghuzlān near 'Aqaba (Brückner *et al.* 2002; Khalil *et al.* 2003; Khalil and Eichmann 2006). Furthermore, the presence of abundant parallels at Shunah N, even for apparently rare vessels, is another indication of a possible early EB I date for the concentration (Gustavson-Gaube 1985, 1986). Shunah N is one of the few sites in the Jordan Valley that was occupied during Late Chalcolithic - EBA transition and earliest part of the EB I period (Blackham 2002: 99). These and other parallels with excavated pottery assemblages suggest that the majority of the Field 81 assemblage dates to the EB Ia period, with some continuation into EB Ib (Kaptijn 2009: 118-139).

The distribution of chipped stone at this loca-



2. Artefact concentration in Field 81, discovered by the 'Settling the Steppe' survey.

tion suggested a slightly different picture (Kaptijn 2009: 137-139). First, typical EBA tools such as Canaanian blades were discovered in Field 81. The distribution of these tools is a perfect match with that of the pottery concentration. Second, flint tools from earlier periods were also discovered. These include a so-called Harpassa point from the Pottery Neolithic, a Late Neolithic chisel and Late Neolithic / Chalcolithic backed sickle blades. However, these earlier tools have a slightly wider distribution and cluster slightly to the south-west of Field 81, suggesting the co-location of two sites of different periods.

Basalt grinding stones, a fine grained basalt bowl and two stone discs, probably spindle whorls, were also recovered (Kaptijn 2009: 119-120). Together, these finds suggested that the concentration represented a site at which a range of domestic activities were carried out. The site was therefore interpreted as a small village of the EBA I period.

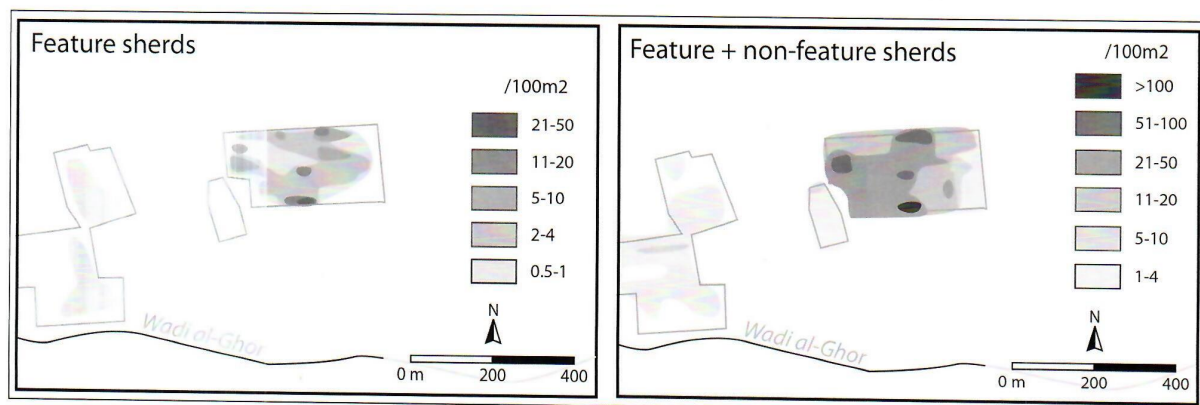
In 2009, geophysical investigations were carried out at Tall al-Himmah as part of the 'Iron Track of Jordan' project. During these investigations, which were conducted by TNO (Toegepast Natuurwetenschappelijk Onderzoek / Applied Scientific Research), the artefact concentration in Field 81 was examined as well. Both electroresistivity (ground penetrating radar) and magnetometry were used. As it turned out, the character of the soil was not conducive to ground penetrating radar. Magnetometry yielded more promising results, with the identification of a long linear area of high resistivity, interpreted as a possible wall, and an oval-shaped area of high resistivity measuring ca. 10

x 15m. The latter was interpreted as a possible floor, or perhaps a concentration of sherds (internal report by M.A.J. Bakker, TNO Built Environment and Geosciences).

The artefact concentration in Field 27 was also discovered in 2004 and consisted of a large spread of mainly Late Chalcolithic artefacts (**Fig. 3**). The concentration measured approximately 200 x 300m and included several clusters of extremely high artefact densities. The variation in artefact density can be attributed to the fact that this area, which is farmed by the Muasher family, was until recently a citrus plantation. In some areas the removal of trees has disturbed the soil to a considerable depth, whereas in others it is undisturbed.

The pottery recovered at this location consists of V-shaped bowls, holemouth jars, necked jars and the typical Jordan Valley jar (Kaptijn 2009: 84-89). Good parallels were found in the excavated Late Chalcolithic assemblages from Tulaylāt al-Ghassūl, Abū Hāmid, Gilāt, Wādī ar-Rayyān and Pella (Dollfus and Kafafi 1986; Bourke *et al.* 1994; Lovell 2001; Commenge *et al.* 2006; Lovell 2007). A few Late Roman/ Byzantine and Islamic period sherds were also recovered. Other finds included several fragments of basalt grinding stones, a basalt pestle and a possible basalt macehead fragment (Kaptijn 2009: 84). The flint artefacts also suggested a Late Chalcolithic date and included several backed sickle blades, some small chisels and a few tabular scraper fragments (Kaptijn 2009: 92-94).

Together, these finds suggest that a range of different activities were carried out at this location, prompting its interpretation as the site of



3. Artefact concentration in Field 27, discovered by the 'Settling the Steppe' survey.

a Late Chalcolithic village. The presence of *in situ* remains was suggested by the presence of large yet fragile pottery sherds. This was corroborated by geomorphological soundings made by Fuad Hourani as part of the 'Settling the Steppe' project, in which he exposed fragments of a stone wall associated with occupation layers containing Late Chalcolithic pottery (Hourani *et al.* 2008: 429).

Results of the Excavations

Field 81

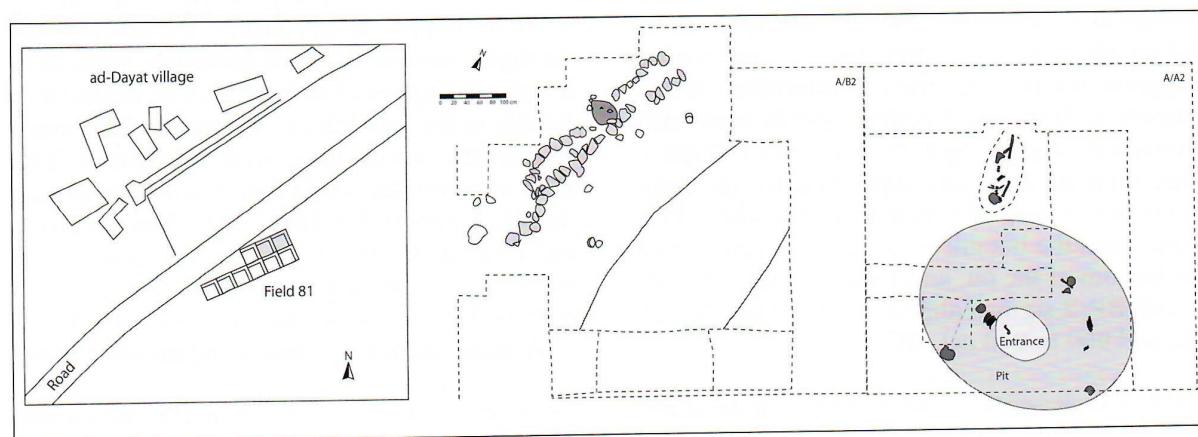
Excavation in Field 81 started on 20th April 2010. The site is located between the villages of Sawālḥa and Abū Nu'aym, immediately south of the road and opposite the village of ad-Dayyāt. The land is registered as Estate 307 (Basin 23 of the Dayr Alla - Atwal municipality; central coordinates: 745890 / 3562575 UTM). An agreement was signed with the owners of the land, represented by Mr Saleh Abd el-Fatah Shehab of the village of Mu'addi.

A total of eight 5 x 5m squares were laid out in the field. The squares were laid out in a row following the contour lines as well as the south-west — northeast plough furrows in the field. A/F1 and A/A1 were the south-west square and north-east squares respectively (co-ordinates of south-east corner of square A/A1: 0745861 / 3562412 UTM) (see **Fig. 4**). To the east, a second line of three squares was added north of squares A/C1, A/B1 and A/A1, being A/C2, A/B2 and A/A2.

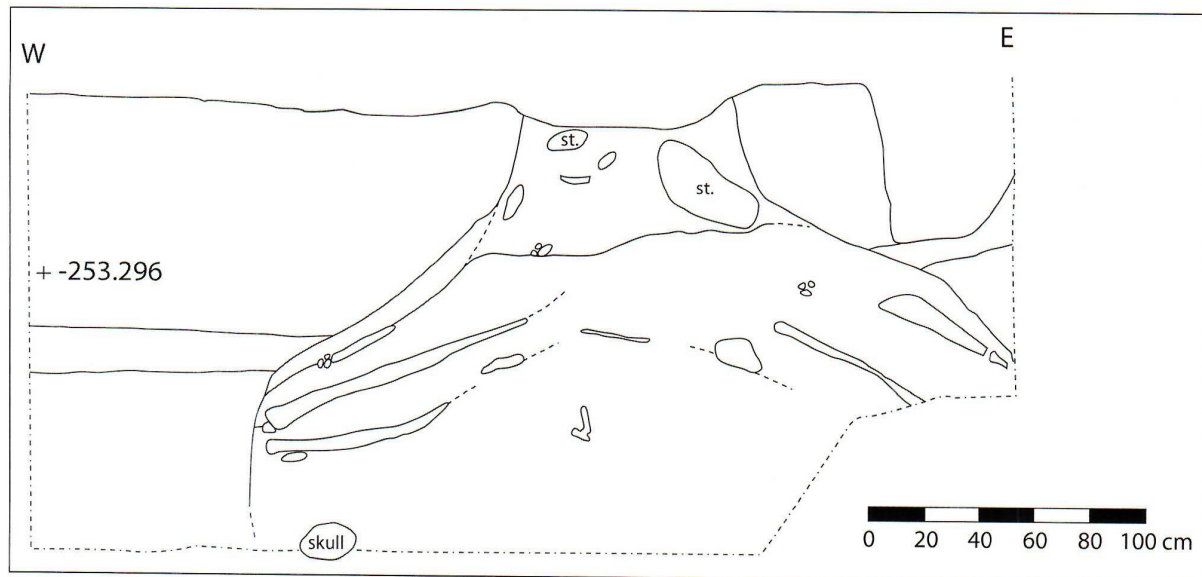
The field is currently used for agriculture and has been for many years. At the time of excavation, courgettes were being cultivated. The agri-

cultural use of the field means that the upper layer of soil has been heavily disturbed by ploughing and plant roots. This layer of disturbed topsoil was *ca.* 40 cm thick and contained many Early Bronze Age sherds and flint artefacts. Below the topsoil, however, clay and gravel layers were exposed that contained neither man-made structures nor pottery. These layers were interpreted as natural riverine deposits laid down by the Zarqā' River. They were excavated to a depth of at least 1-1.3m below ground surface in all squares, and down to 1.9m in square A/B1. The lack of archaeological remains in six of the nine squares prompted a shift of the excavation area. As it was not possible to open more squares in Field 81 owing to cultivation and the presence of buildings and a road to its north, after the first week of excavation part of the team moved on to another artefact concentration, i.e. Field 27 (see below).

In the northernmost squares, A/A2 and A/B2, *in situ* archaeological remains were exposed. In the north-eastern square A/A2, a bell-shaped pit was discovered underneath the topsoil that widened out to a diameter of more than 3m and reached a depth of almost 2m (**Fig. 5**). Its fill was dark brown in colour, suggesting a high organic content. A small sample of charred plant remains was recovered from the bottom of the pit but, although it evidently contained cereal grains, the high level of fragmentation meant that these could not be more precisely identified. The pit may at some point have been used for storage, but the fact that it had been thoroughly cleaned out means that this cannot be established with certainty.



4. Plan of Field 81 (based on measurements by Ali Omari).



5. Section drawing of Iron Age burial pit in Square A/A2, Field 81.

Other finds in the pit suggest a rather different, secondary function. Fragmentary human skeletal remains of at least four individuals were recovered. Although the skeletal remains were mostly very incomplete, their position suggests that these were articulated primary burials. Three of the skeletons consisted only of the skulls and a few associated long bones. They were found near the edge and close to the bottom of the pit. As the pit has not yet been completely excavated, it is likely that parts of these skeletons remain unexcavated. The fourth skeleton was found higher up in the pit and more or less in its centre, directly below the entrance. In contrast to the others, this skeleton was relatively complete. Parts of the pelvis, vertebrae, some ribs, clavicle, mandible and skull were recovered, though in a fragmented state. Its position within the pit and generally better state of preservation suggests that this was the last interment. A few diagnostic Iron Age I pottery sherds were also recovered, suggesting a date of 1200-1000BC). This relative date was supported by the only radiocarbon date obtained from the site⁴. This came from the botanical sample recovered from the bottom of the pit, and yielded a date of 2890 +/- 40 BP, 2 sigma calibration: 1210 to 970 cal. BC and 960 to 940 cal. BC⁵.

4. Only a single sample of charred botanical material proved large enough to be radiocarbon dated. Additionally, uncarbonized bone samples from Field 81 and Field 27

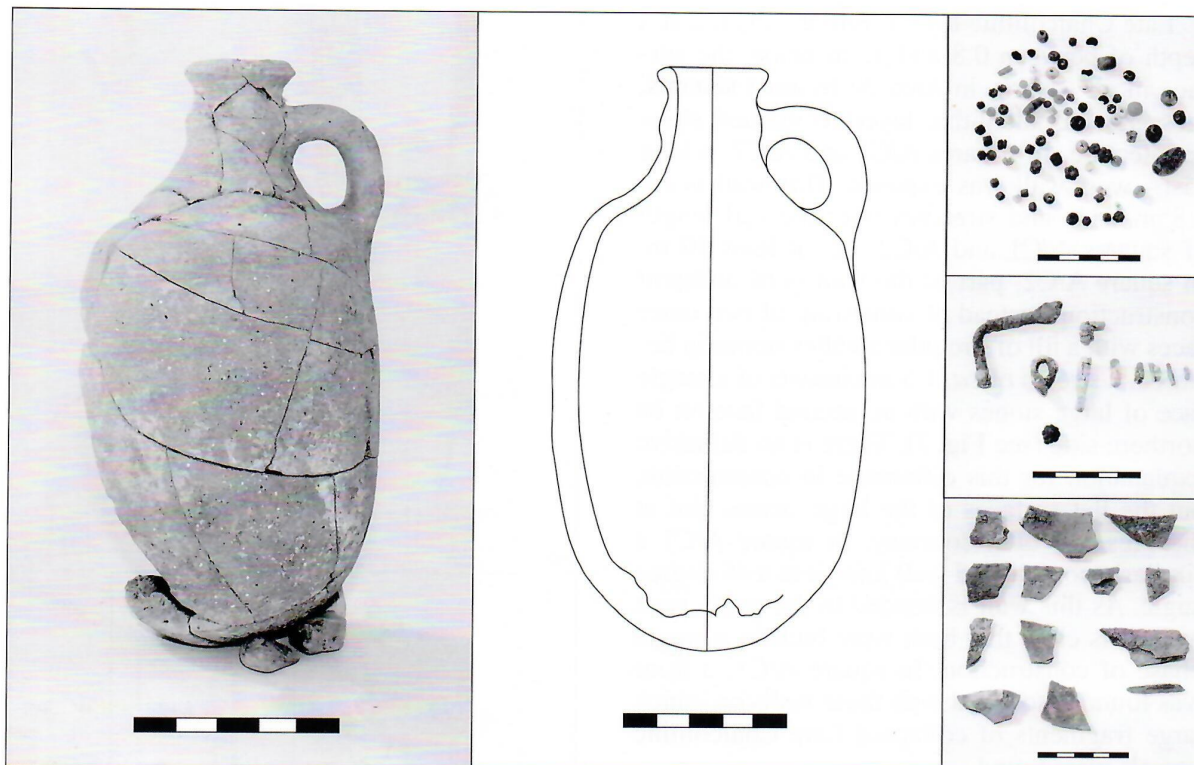
Beyond the pit, a fifth burial was discovered just under the topsoil. Again, its state of preservation was poor. The body was lying on its side facing east to north-north-east. No artefacts were discovered in association with the skeleton. Both the entrance to the pit and this fifth skeleton were dug into natural soil immediately below the topsoil, making stratigraphic correlation impossible. This skeleton therefore remains undated.

In the neighbouring square immediately to the west, i.e. A/B2, a stretch of probable EBA walling was exposed. Two small EBA vessels were discovered on a floor associated with this wall. In a later phase, a small pit was dug through the wall, which yielded a small juglet of the late 8th or 7th century BC (Iron Age IIc period). In this pit, and probably originally inside the juglet, several beads of carnelian, bone, metal and other types of stone, a bronze fibula (also datable to the late 8th or 7th century BC) and a fragmented bronze bowl were also found (Fig. 6). A very similar fibula was discovered in Iron Age IIc layers at Tall Dayr 'Allā (Van der Kooij and Ibrahim 1989: 37, 55-56, 108) and several have been excavated at the Iron Age IIc cemetery of Tall al-Mazār (Yassine 1984: fig. 55).

A deep trench, probably relatively recent,

were sent in for analysis, but these contained too little collagen to provide a date.

5. The INTCAL04 curve was used to calibrate the dates.



6. Finds from small pit in Square A/B2, Field 81 (photographs by Yousef Zu'bi).

was also discovered. The function of this trench, which was excavated to a depth of 2.8m without reaching the bottom, is unknown. The homogeneous fill suggests that it was backfilled relatively quickly with material derived from the trench itself.

In sum, archaeological features have only been discovered in the northernmost squares of this area. To the south, further into the agricultural field, archaeological remains were only found in the disturbed topsoil. The remains that were present on the northern edge of the field were located very close to the surface (20-30cm) and only survived because this area had not been ploughed. The survey data suggest that the EBA site continues under the road and the hamlet of ad-Dayyāt to the north. Unfortunately, the presence of buildings prevented further investigation. The presence of Iron Age I burials was completely unexpected and remains unique in the Jordan Valley.

Field 27

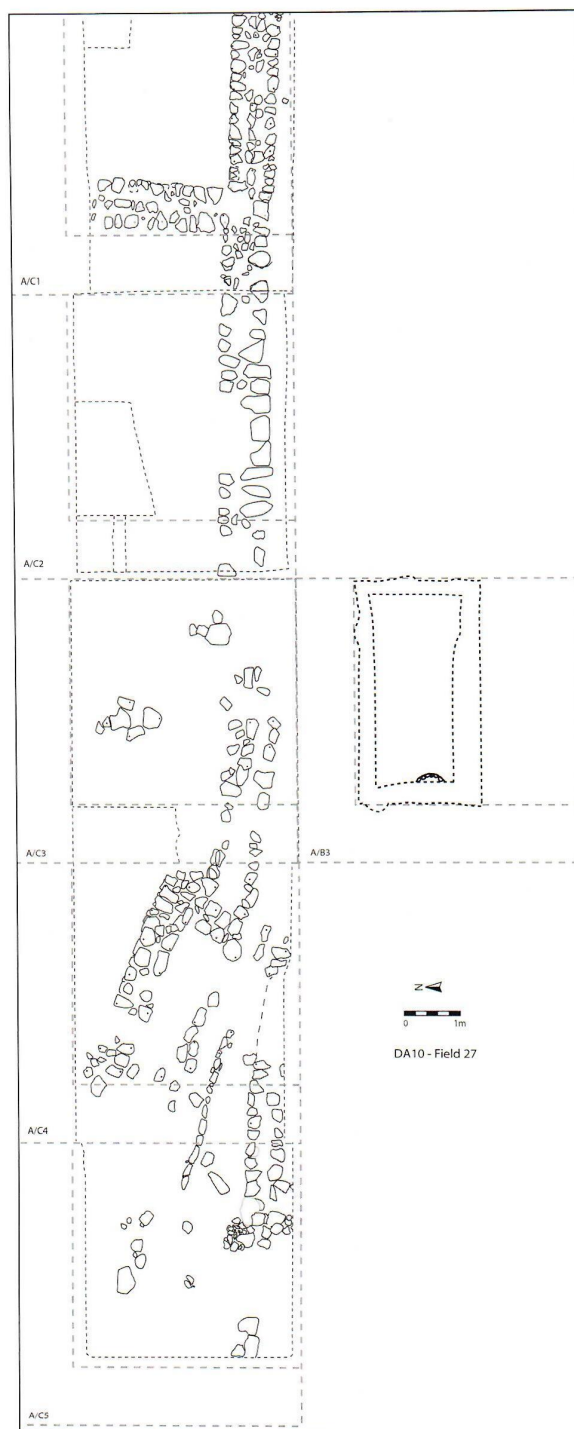
As the six southern squares of Field 81 turned out to be devoid of archaeological remains, with

the exception of artefacts in the disturbed topsoil, a second series of squares was opened 2nd May 2010 in Field 27. Field 27 is located *ca.* 1km north-east of Tall Dayr 'Allā and is owned by the Muasher family, who kindly allowed us to excavate on their land. The 'Settling the Steppe' survey had previously discovered a concentrated scatter of Late Chalcolithic artefacts in this location (see above). Excavations in this area were aimed at establishing the character of the site, previously interpreted as a village on the basis of surface finds, and to ascertain whether or not floodwater irrigation was practised.

Two areas, consisting of three squares each, were opened 50 m apart, i.e. D/D3, D/D4 and D/D5 and A/C2, A/C3 and A/C4. The squares were oriented on an east-west axis in both areas. None of the three squares in Area D yielded any archaeological remains. When excavation had reached a depth of 1.5 - 1.7m beneath the surface it was decided to stop work at this location and focus further attention on Area A, where archaeological remains were starting to appear. This resulted in the addition of squares A/C1, A/C5 and A/B3.

Late Chalcolithic layers were uncovered at a depth of between 0.8 and 1.1m below the surface in all squares in Area A. In most squares, these Late Chalcolithic layers contained stone architecture. In squares A/C1 and A/C2, a long east - west wall was exposed. This wall is *ca.* 0.85m wide and stretches over the full length of squares A/C1 and A/C2, i.e. at least 10 m. In square A/C2, part of the wall is of different construction. Instead of consisting of two outer faces with a fill of irregular smaller stones in between, a stretch of *ca.* 1.5 m consists of a single face of large stones with no second face on its northern side (see **Fig. 7**). There is no definitive explanation for this difference in construction, but the flat surfaces of the large stones hint at the presence of a doorway. In square A/C1 a similarly constructed wall joins it at a 45 degree angle. As this wall is bonded to the east - west wall, it is clear that both were built in a single phase of construction. In square A/C1, a floor was found associated with these walls on which large fragments of collapsed Late Chalcolithic vessels were found.

In the three western squares, i.e. A/C3 to A/C5, several unrelated wall fragments were exposed. Judging by the finds in the debris and on a floor associated with one of the walls, all date to the Late Chalcolithic period. In addition to Late Chalcolithic pottery, several spindle whorls were discovered in these layers (**Fig. 8**). In square A/C4, a considerable length of a north-west - south-east wall was exposed. This is smaller (*ca.* 0.6m wide) than the robust wall in squares A/C1 and A/C2, but is well constructed and preserved to a height of two courses. Traces of what might have been a mudbrick superstructure were visible in the section. A floor was associated with this wall, but as it was only exposed in a small area its relationship with the other walls remains unclear. A small wall abuts this wall at a 45 degree angle. In view of the fact that it abuts the first wall and is not bonded to it, this small wall is probably associated with a secondary phase of construction. Along the southern edge of squares A/C4 and A/C5 another wall was found. Only the top of this wall was exposed, and is slightly lower than that of the other wall in A/C4. Like the other walls, it consists of two faces of stones with a central fill of compact soil and smaller stones. This wall seems



7. Plan of Field 27 (based on measurements by Ali Omari).

to have a side wall running off to the south, which almost immediately disappears into the south section of square A/C5. As only the top of this wall was exposed, its relationship with the other walls and floor remains unclear. A single



8. Selection of finds from Field 27 (photographs by Yousef Zu'bi).

line of long stones, seemingly too thin to have been a wall but which may represent some sort of partition, runs from square A/C4 into A/C5. Again, its stratigraphic relationships can only be established by further excavation. Other stones in squares A/C5 to A/C3 appear to be disturbed, or represent tumble from badly preserved walls.

In square A/B3 no architectural features were found, but a sequence of debris and occupation layers were excavated that extended below the levels reached in the other squares. Late Chalcolithic pottery was also discovered in these lower layers, suggesting several phases of occupation at the site.

In the upper levels of squares A/C2, A/C3 and A/C4, highly disturbed remains of the Iron Age III (two bronze arrowheads from topsoil and a wash layer in square A/C2), Roman / Byzantine (small fragment of floor with a scattered late Roman cooking jar and remnants of a small jug) and Islamic (large fragment of the bodies of two probable Mamluk jars, one found next to a lower grinding stone) periods were uncovered. The stratigraphic context of these finds was badly disturbed owing to the uprooting of modern citrus trees, which resulted in 'floating islands' of archaeological deposits of different periods surrounded by areas of recent disturbance. It is therefore difficult to associate these deposits with each other or with the underlying Late Chalcolithic occupation.

Conclusions

These excavations have generated a good deal of new information about subsistence in the

Late Chalcolithic and Early Bronze Age I periods. However, the scarcity of botanical samples means that it will be difficult to shed further light on agricultural practices or floodwater irrigation on the basis of the samples recovered to date. Further excavation in Field 27 will hopefully lead to the recovery of better preserved material. The faunal assemblage should provide information about the pastoral side of the subsistence economy.

The relationship between the surface artefact scatters identified in the survey and the remains buried beneath the surface is much better understood as a result of these excavations. Broadly speaking, the excavations in Field 27 confirmed the expectations of the survey, i.e. significant remains of a Late Chalcolithic village. In Field 81 the results were slightly different. The EBA I village that had been expected proved to have been largely destroyed by later erosion and agriculture. Instead, quite unexpected remains of the Iron Age I and IIc periods were discovered. No indication of Iron Age remains had been identified in the survey. This is unsurprising, as the Iron Age IIc remains were extremely ephemeral, leaving little trace when ploughed out on to the ground surface. Similarly, the chance of identifiable pottery from the burial pit ending up on the surface was very small. It is therefore unlikely that this type of Iron Age burial would ever have been identified on the basis of surface indications. This may explain Franken and Kirkbride's lack of success in locating the Iron Age cemetery of Tall Dayr 'Allā during the first two seasons of excavation at that site in 1960 and 1961

(Kaptijn in prep.). Discovery of such features will probably remain a matter of chance, as geophysical methods proved similarly unsuccessful in identifying them. More positively, surface survey was able to identify the presence of the now largely destroyed EBA I village. Although excavation has demonstrated that most of the village is destroyed or buried under the road, the survey generated a good deal of information about its character and date. This demonstrates that survey not only complements excavation, but also that it is a relatively cheap method of recovering information from sites which have lost their stratigraphic integrity.

Because both fields are used for agriculture, the excavations were backfilled. The Late Chalcolithic remains in Field 27 are sufficiently deep to be in little danger of agricultural destruction. In contrast, the remains in Field 81 that are located immediately under the topsoil are threatened by ploughing, as demonstrated by the relative absence of sub-surface finds in comparison to the dense artefact concentrations visible on the surface. Further excavation in this location would be worthwhile. The Iron Age burials in Field 81 are so unique that it would be valuable to check whether any more are preserved in the area. Further excavation in Field 27 would provide a much better understanding of the Late Chalcolithic village which, to judge by surface indications, extends over a large area. The remains uncovered to date are extremely promising and a better level of preservation can be expected for those that are buried at a greater depth.

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Franken first arrived in 1960. Thanks are also due to all team members, without whom this excavation would not have been possible: Ali Omari (survey), Yousef Zu'bi (photography), Mariette Grimbergen-Driessen (housekeeping and administration), and Hana' Bani Ata, Cla-sine van Doorn, Sterre van Heemst, Lise den Hertog, Jeroen Rensen, Judith Schoester, Jade Schoon and Salam al-Waked (field supervisors and trainees). Many thanks also to Mr Ahmed Jude, custodian of the Dayr 'Alla Station for Archaeological Studies, the Yarmouk drivers and all of the inhabitants of the Dayr 'Alla region who were kind enough to let our team members excavate on their lands.

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