
Tall Zera'a in the Wadi al-'Arab, the 2003 and 2004 campaigns

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Introduction

In 2001 an interdisciplinary research program – called 'Gadara Region Project' – was initiated by the Biblical-Archaeological Institute at the University of Wuppertal (Germany) directed by Prof. Dr. Dr. Dieter Vieweger. This project is focused on the investigation of the Wadi al-'Arab southwest of Gadara/Umm Qeis. The exploration started with a ceramic survey on Tall Zera'a, the most prominent *tall* in the wadi. This study has shown that the *tall* was inhabited from the Early Bronze Age until Ottoman times.

Furthermore, various geophysical methods were used for explo-

ration. The results demonstrate that there is a thick cultural layer up to 6 m in height in many areas of the *tall*.

Detailed information on the aims of the project, the geographical situation of the Wadi al-'Arab and Tall Zera'a as well as the results of the first investigations have previously been published by Vieweger (2002a: 157-177; 2002b: 12-14; 2003a: 191-216; 2003b: 459-461) and Vriezen (2002, 18-19; 2003, 13-14).

A topographical survey was carried out in the Wadi al-'Arab with the help of a digital global positioning system (GPS). It provides the basis of a digital terrain model

in order to map the different archaeological features in the *wadi*.

The campaigns 2003 and 2004

A first larger excavation campaign started in September 2003. It was carried out by the Biblical Archaeological Institute of the University Wuppertal directed by Prof. Vieweger. The excavation concentrated on the northwestern slope of the *tall*. This area (I) was chosen because a significantly high concentration of finds had been found there in the course of the previous *tall* survey. In addition, this area is exposed by its special topographical situation. At this point, a

defense system could be assumed, since there is no natural protection here by topography unlike on the southeast, east, north, and northwest sides of the *tall*.

Eight squares (measuring 5 m x 5 m each) were opened and explored to a maximal depth of 3.3 m.

A second campaign was conducted in April 2004 as a co-operation project between the Biblical Archaeological Institute and the German Protestant Institute of Archaeology Amman directed by Prof. Vieweger and Dr. Häser. The excavations were continued in the previously opened squares and ten more squares were uncovered.

A further, ten-day campaign was carried out as study course for theologians in July 2004. The work was continued in three of the eastern most squares.

During the excavations in 2003 and 2004 five strata were exposed. They were labeled 1 to 5 from top to bottom. In the upper most stratum (1) the remains of three large houses were uncovered. They are orientated almost exactly northward. The entrance situation is unresolved in this stage of excavation. Two of the houses are joined, a third one is situated east of them separated by a 4 m wide stone-paved road. The walls are built with undressed and some dressed stones. The last ones are *spolia* from a building elsewhere. The walls rest on the butt of walls of the Iron Age II, i.e. stratum 2.

The eastern most house, no. 1, consists of at least six rooms. The rooms have an average dimension of 4 m. In one of the rooms a threshold (AL 118), a column base (Fig. 1) and, adjoining it, a narrow bench (AM 118) were found. The column base points to the fact, that this area was roofed. The area east of the threshold might not be a room but a courtyard.



Fig. 1: Roman-Byzantine column base in square AM 118.

House no. 2, to the north of house no. 1, consists at least of two rooms (AO 117-119). The northern limits have not been reached. A stone-lined pit was excavated in the western room (AO 118).

Toward the western part of the slope, the buildings are eroded near the edge of the slope's steep incline.

House no. 3 is represented only by a single wall running from north to south (AM 119).

The pottery found in the houses can be dated to the Roman-Byzantine Period. In addition, fragments of glass vessels and some coins were uncovered. The coins have not been dated yet, since they have to be cleaned before.

A deep pit with a diameter of about 4 m was discovered under the paved road (AN 119). It contained a mass of Roman-Byzantine pottery. This pit was presumably built when this area was not covered with houses.

The two subsequent strata (2 and 3) can be dated to the Iron Age. These strata are disturbed in many parts by large pits of the Ro-

man-Byzantine period. Nevertheless, remains of a settlement wall and some houses could be traced.

The western limit of the built-up area of stratum 2 is marked by a sawtooth-like wall following the curve of the *tall* (AL-AO 117). Due to the balk it is unclear if the wall in the squares AK-AL 116 is the continuation of the aforementioned wall. Both walls are built with field stones and are 1-1.20 m wide. They are constructed on the casemate wall of the Late Bronze Age period.

An area with house remains was discovered east of the defence wall. A room structure can be observed in the center of the area (AM-AO 118). The outer limits of this structure have not been excavated yet. Therefore, the building type cannot be determined as yet. Two building phases can be distinguished. In the first phase, two ovens are cut into the floor level. These were destroyed in the second phase. One of these ovens was partly covered by a wall constructed between two east-west running walls (AN 118) (Fig.

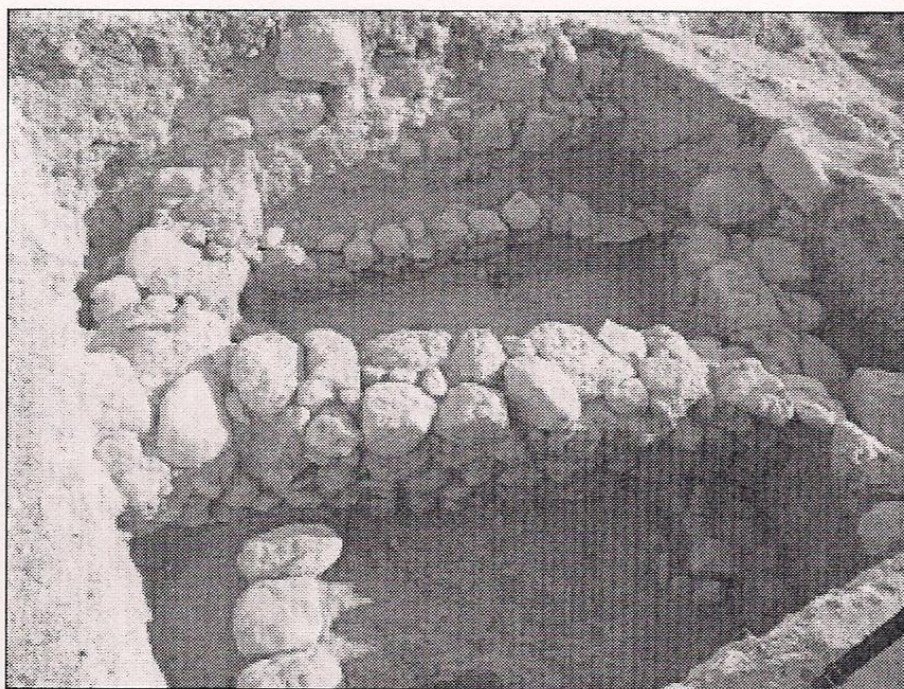


Fig. 2: Iron Age II building in square AN 118.

2). Another wall was built parallel to the west, forming a new room.

A well-prepared working area with a large flat grinding stone was built in the south (AL 117) (Fig. 3). This stone is surrounded by two rows of standing stones like a stone-lined silo. The connection of this working area with the room structure is still undetermined.

The pottery shows that stratum 2 can be dated to the Iron Age II.

The architectural remains of stratum 3 were also disturbed by later construction work. Therefore, a coherent building structure cannot be observed. However, the remains of the walls of this stratum follow a consistent orientation from northwest by west to southeast by east or join them forming a right angle. Most of the walls were excavated in the squares AL-AO 117.

Two tabuns were discovered in AM 117 and AO 117, and a considerably large oven was uncovered in square AM 118.

The walls of stratum 3 are based on the remains of the preceding Late Bronze Age city wall in many places. These walls were built with

field stones and are very thin. The remains of the Late Bronze Age tower were used as foundation for a hearth. In addition, stone-lined pits were dug in the remains of the Late Bronze Age city wall in the squares AM 117 and AO 117.

The pottery of this stratum can be dated to the Iron Age I.

The layers of the Late Bronze Age (stratum 4) could be exca-

vated in the slope terrain of the excavation area. A casemate city wall protected the western slope in this period. It was built above the Early Bronze Age city wall and glacis, separated from it by a one meter thick deposit. A small stone-lined pit was found in one of the rooms of the wall (AM 116) (Fig. 4). To the south, a room paved with stones was uncovered. From this room a passage leads into another stone-paved room, which is surrounded by 2 m thick walls. Presumably, this was the interior of a tower. This might have belonged to a gate or a poterne, which can be expected south of the present excavation area.

A street runs parallel to the casemate wall on its east side. The width of the street cannot be measured in this stage of excavation. The street has a canal which is covered by large stones. This canal collected the water from two sides, draining it in another room or basin (AM 116/117). It can be assumed that the 3 m deep shaft beyond the city wall in square AM 115 was part of the construction. At the foundation of the Early Bronze Age glacis the shaft deviates from the vertical at an angle of about 30°.



Fig. 3: Iron Age working area in square AL 117.

Just as the architecture of the Late Bronze Age is very prestigious, so are the finds. Various bronze objects have been found like remains of a dagger, a needle and a mirror (Fig. 5) as well as imported Mycenaean and Cypriote pottery. Several stone vessels, including an alabaster stand, imported pottery and bronze fragments were discovered in an architectural structure which can probably be reconstructed as a room of a building with several installations.

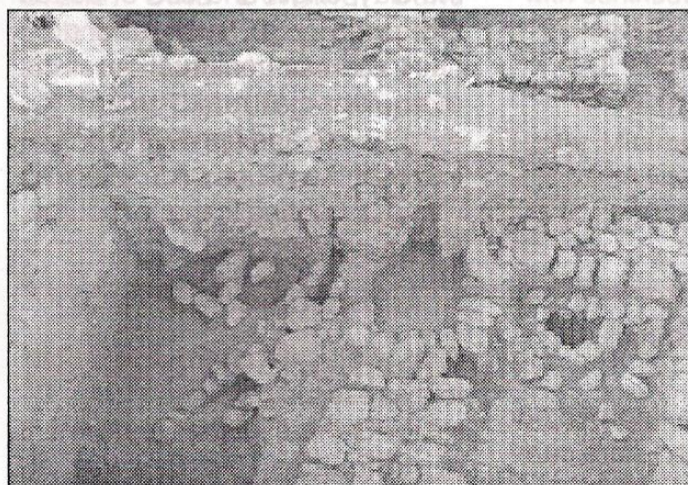


Fig. 4: Late Bronze Age stone-lined pit and canal in square AM 116.

Stratum 5 is represented by a 3 m high glacis running along the western hill. This glacis and the basis of the city wall can be dated to the Early Bronze Age. It is cut vertically by the shaft mentioned before (AM 115). At the moment only the outer skin of this glacis is visible. The results of the survey suggest, that the levels between the Late Bronze Age and this Early Bronze Age stratum are several meters thick.

The pottery analysis

About 24,000 sherds were found during the survey on Tall Zera'a. Geochemical and mineralogical analyses of 23 unstratified sherds from the survey on Tall Zera'a and two sherds from Gadara provide the following results.

There is a main group of 12 sherds which can be dated to the Late Bronze Age, the Iron Ages and to the Islamic period. This includes a group of three very similar Iron Age sherds. All these pottery sherds stem probably from the surroundings of Tall Zera'a.

Five sherds from Tall Zera'a belong to a subgroup which can also be included in the main group. Three sherds from Tall Zera'a are similar to Gadara-sample 1. One other sherd from Tall Zera'a resembles Gadara-sample 2. Four sherds are so different in composition that they belong neither to the main group nor to the Gadara samples.

Generally, it can be said, that the pottery sherds of the Bronze and Iron Age as well as from the Islamic period come from the surroundings of Tall Zera'a. In Hellenistic and Roman-Byzantine times the pottery sherds show clear similarity with samples from Gadara.

These results have to be scrutinized with stratified samples from the excavation on Tall Zera'a.

About 25,000 sherds were excavated during the excavation campaigns in 2003 and 2004. All of them were determined in respect to ware. The pottery can be divided in c. 100 ware groups, dated from the Early Bronze Age to the Islamic period. The diagnostic sherds (rims, bases, decorated sherds) were also defined in respect to typology.

The aerial survey

Surveying and photogrammetric mapping have made possible new

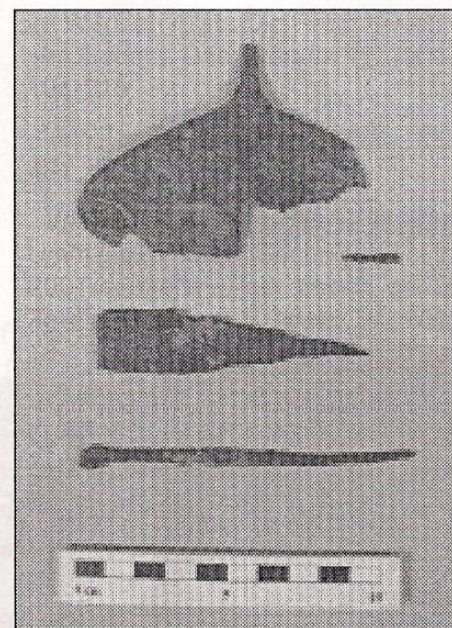


Fig. 5: Late Bronze Age finds.

research methods for archaeology by a combination of modern equipment with digital technologies.

The mapping of features in large-scale surveys has long since been carried out by GPS in an effective and time-saving way. This mapping method was combined with the recording of objects, as has been common in restoration (measuring of façades) for some time: a camera platform, equipped with three-dimensional mobility via remote control, was fastened to a helium-filled balloon (Fig. 6). The balloon was tied up on the ground or directed to the areas to be surveyed with the help of a rope. In order to take photos, the camera had to be positioned almost perpendicularly above the areas to be mapped. This was done with the help of radio telecontrol. The section in the viewfinder was relayed digitally to a ground station (TFT monitor or head-display during strong sun radiation). Photos taken from heights of up to 135 m supplied ground segments of maximally 15,000 m² per picture. On one hand, these photos served as photograms for specific site data supplemented by GPS data. On the other hand, the overall view of

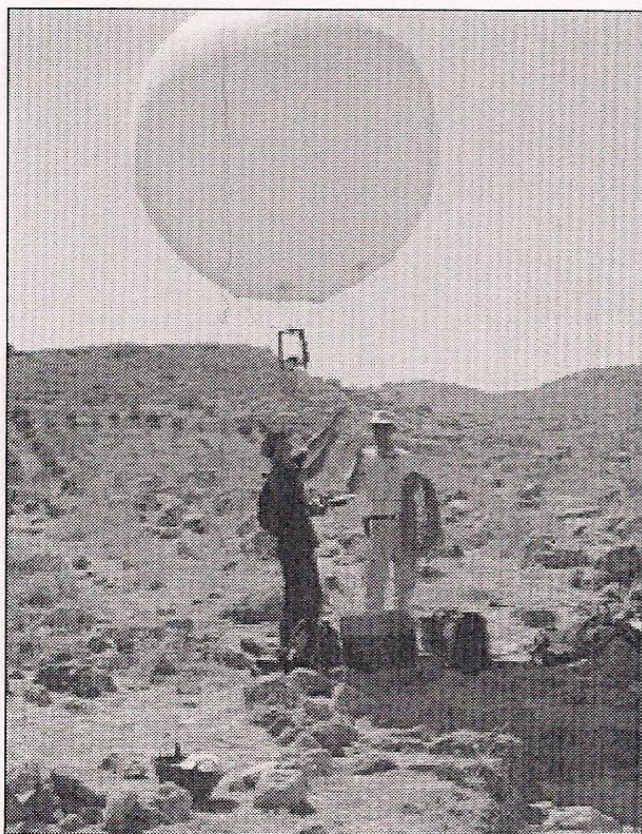


Fig. 6: Helium filled balloon with camera for aerial photographs.

the excavation area and its surroundings could be impressively documented. The pictures were rectified and assembled into a mosaic with the help of control points.

Photogrammetry

Similarly, the excavation squares on Tall Zera'a were documented with the help of modern technological equipment. On a daily basis, nearly perpendicular photos were taken from c. 4 m above the squares. First, the distortion of the lens was corrected. Then the digital photographs were rectified via control points (here the corner points of the squares). In this way, both the progress of the excavation could be documented and site sketches produced with great accuracy.

The evaluation of these photographs should be undertaken jointly by the surveyor and the archaeologist in charge to ensure that the represented data are cor-

rectly interpreted. To improve our techniques, we will in future campaigns analyze potential error sources inherent in deeply excavated squares and consider the former's elimination while looking at aspects of practicality and accuracy.

Experimental archaeology

Following the excavation in 2003, a project with a technological-historical background was carried out. Within three weeks, Mustafa Saleh, the son of the last Tabunye still living in Umm Qeis, built a bread-baking oven commissioned by the Biblical-Archaeological Institute (Fig. 7). In particular, we analyzed and documented the following stages of construction: origin, grinding, cleaning, mixing of the clay, origin and use of added materials (e.g., rush and goat hair), manual construction of the oven, special make-up of the oven's base and upper rim, preparation of the pit in which the oven was set, heating it and, of course, the baking of bread.

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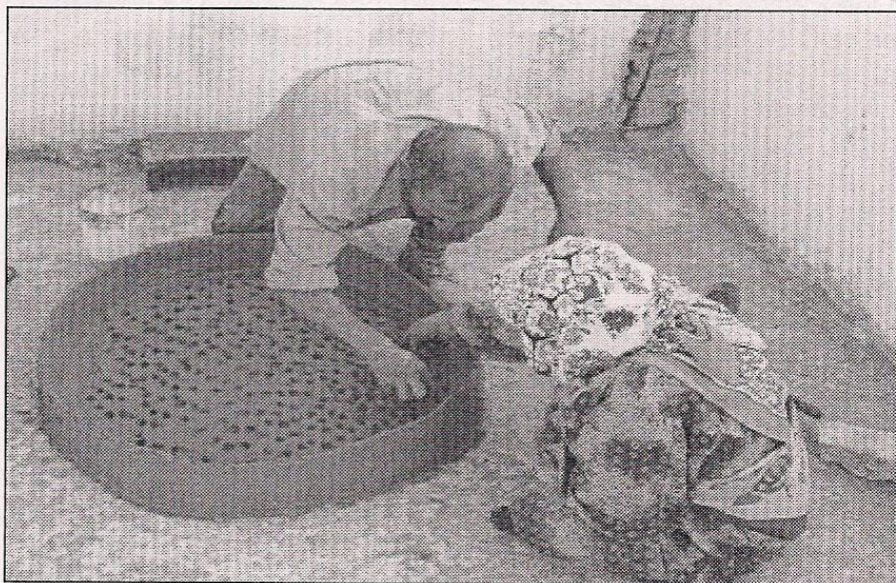


Fig. 7: Building up a traditional tabun.

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