

1. THE ‘GADARA REGION PROJECT’/TALL ZIRĀ‘A

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Fig. 1.1 Tall Zirā‘a. View to the east showing Area I and II. Photograph taken in summer 2009 (Source: BAI/GPIA).

There are very few places on either side of the Jordan River where it is possible to explore the history of the Southern Levant in such a small area as in the Wādī al-‘Arab. This deeply incised valley with all its diversity is an archaeological stroke of fortune. Numerous springs, fertile soil and a temperate climate afford excellent living conditions.

Tall Zirā‘a (Israel or Palestine Grid Reference: 2119.2252; 32°37’14.19 N; 35°39’ 22.01 ‘O) is located in the middle of this valley, and the research focuses on exploring this hill. Continuously occupied for at least 5,000 years, it offers unique insights into the way of life of the region’s people. Its outstanding archaeological significance is a result from the artesian spring located in its centre, which created exceptional settlement conditions over thousands of years. For this reason, Tall Zirā‘a offers a unique opportunity to compile an unbroken comparative stratigraphy for northern Jordan from the Early Bronze Age to the Islamic period. It allows to trace cultural developments in urban life, handicrafts and the history of religion over long periods. In addition, it is possible

to study the abundant remains from biblical times in the context of other cultural and historical periods.

The ‘Gadara Region Project’ is also examining the surroundings of Tall Zirā‘a: the Wādī al-‘Arab. A major trade route passed through the valley, connecting the Jordan Valley with the Transjordanian highlands, thus forming a link in the route from Egypt to the Syro-Mesopotamian centres (Figs. 1.21–1.23). Economic success and the hard work of residents across the millennia have left a plethora of traces in the valley. More than 300 sites provide evidence of human habitation from Palaeolithic to the Islamic period, and are an eloquent testimony of the history of this region; settlements, channels, water mills, cisterns, oil presses, wine presses, watchtowers and grave sites.

Located at the junction between Palestine and the Syro-Mesopotamian cultural zone, the area was politically and culturally influenced by both regions. Cultural developments and political changes in Palestine, which were often initiated from the cultural areas in the north or south, can be understood very well here.

1.1. The ‘Gadara Region Project’

The ‘Gadara Region Project’ was launched in 2001 by the Biblical Archaeological Institute (BAI) in Wuppertal, Germany. During the first two years, the project explored the surface of Tall Zirā‘a, a settlement mound located 4.5 km south-east of the Decapolis city of Gadara (today called Umm Qēs). During this investigation the tall was surveyed intensively; 22,383 pottery sherds and many other finds were systematically collected and analysed (*Chap. 2.*)¹.



Fig. 1.2 The Biblical Archaeological Institute (BAI) in Wuppertal (Source: BAI/GPIA).



Fig. 1.3 The German Protestant Institute of Archaeology (GPIA) in Jerusalem (Source: BAI/GPIA).

The findings helped to formulate the objectives of the excavation and to select suitable areas (residential, religious, administrative and craft areas) for further investigation (*Chap. 1.5.*).

The excavation on the tall began in 2003. The first results were so promising that the ‘Gadara Region Project’ was designed and planned for a timeframe of ten to twenty years. In 2004, in order to ensure intensive archaeological work and interdisciplinary collaboration over such a long period, the Biblical Archaeological Institute Wuppertal (BAI; Director D. Vieweger) and the German Protestant Institute of Archaeology in Amman (GPIA; Director J. Häser), which also serves as the research unit of the German Archaeological Institute (DAI), agreed on a close partnership (see *Figs. 1.2–1.4*). The German Protestant Institute of Archaeology in Jerusalem, headed by D. Vieweger since 2005, became associated with the project in 2006.

The ‘Gadara Region Project’, with members from all of the above mentioned institutes, then completed the following tasks: a survey of Tall Zirā‘a (2001), 18 excavation campaigns on the tall (2003 to 2011) and four surveys of the Wādī al-‘Arab environment (2009 to 2012). In order to publish the results, annual study campaigns were undertaken from 2012 to 2016.



Fig. 1.4 The German Protestant Institute of Archaeology (GPIA) in Amman (Source: BAI/GPIA).

1.2. Tall Zirā‘a (*Apps. 1.1–1.3 and 3.1*)

Tall Zirā‘a (translated from Arabic as ‘hill of agriculture’) is circular in cross section; the diameter measures 240 m at the base and 160 m on the plateau (*Fig. 1.1*). The sinter hill covers a total area of more than 5 ha, and its highest point is 17 m below sea level (cf. *Chap. 1.2.2.*).

As the sole prominent natural elevation in the lower Wādī al-‘Arab, Tall Zirā‘a has a dominant position. The wādī connects the Jordan Valley to the Mediterranean

coast via the plain of Jezreel and Tall al-Ḥiṣn (Beth She-an) on the west, and with the Jordanian highlands in the east. This gives the tall a prominent geopolitical role (see *Fig. 0.2*; for a view from the tall see *App. 1.1*).

From the tall it is possible to have visual contact with Gadara and its *extra muros* sanctuary, as well as overlook the narrow opening of the wādī to the Jordan Valley in the west², the potential arable land in the western and

¹ For the 2001 Survey on Tall Zirā‘a see Vieweger 2003 et al., 191–216.

² Today this view is blocked by the wall of the Wādī al-‘Arab Dam.



Fig. 1.5 The stalactites and stalagmites in a cave on the tall's eastern slope (Source: BAI/GPIA).

central areas of the valley, the terraced hillsides, the spur area in the east that is suitable for rainfed agriculture, and the slopes of the wādī in a wide semicircle from north to south that are suitable for small livestock breeding. The tall rises impressively (depending on the direction) 22–45 m above the landscape and was used as a dwelling place from the Early Bronze Age until well into the Middle Ages. In over 5,000 years of continuous settlement, more than 18 m of cultural debris has accumulated through building, destruction and rebuilding of cities and villages on the hill.

The geological, agricultural and geostrategic advantages of this site are obvious, and naturally encouraged the establishment of settlements; the hill is protect-

1.2.1. Morphology of Tall Zirā'a (*Apps. 1.3 and 3.1*)

The appearance of Tall Zirā'a is not constant; it changes depending on the viewpoint. In the north and east steep hillsides dominate. In the south and west 22–25 m high slopes provide natural protection (*Apps. 1.3 and 3.1*).

The first modern text which mentions Tall Zirā'a was written by C. Steuernagel, based on observations by G. Schumacher:

“The tell zara'a is an almost circular hill, 154 m high, insulated on all sides, vertically sloping to the wād el-'arab. The plateau has a diameter of 135 m. In the



Fig. 1.6 Modern ascent to the tall's plateau (Source: BAI/GPIA).



Fig. 1.7 Modern water channel within olive groves and vineyards on the tall's south slope (Source: BAI/GPIA).

ed by steep rocky slopes to the north and east, and the east and south sides tower above their surroundings by 22–25 m. An artesian spring rises on the plateau of the tall that produces ample fresh water, even in the dry season (*Fig. 1.12*).

Finally, the living conditions around Tall Zirā'a were excellent; there were numerous other springs, fertile soil and a temperate climate. The Wādī al-'Arab and the Wādī az-Zaḥar merge below Tall Zirā'a, and provide sufficient water for agriculture and animal breeding. The vast scale of arable and pasture land transforms a rather isolated section of the Wādī al-'Arab (particularly the lower and middle levels), into a formidable self-sufficient settlement area, ideal for mixed agricultural use.

middle of the plateau rises a spring located in a small well overgrown with reeds whose water flows down the slope in the Wād el-'Arab. (...) The hill was once fortified by a strong circular wall³. There are the remains of a large building at the highest point of the plateau, and also in the vicinity of the spring, and a little south of it are the remains of rectangular buildings whose walls were built of massive hewn limestone and basalt blocks. (...) According to the map, the tell is at least partly inhabited again⁴.

3 G. Schumacher is wrong here. The supposed wall, built with massive stone rows, was actually erected by farmers during the last centuries. It is a secondary structure that should protect the plateau from erosion. The plateau itself was used by the family of

Abu Ghassim from Kəfar 'Āsad (Kufr Asad) who ploughed the tall during the 1990's.

4 Steuernagel 1926, 80 f.



Fig. 1.8 The water channel on the tall's north-east side (Source: BAI/GPIA).

The modern ascent to the plateau, constructed by a bulldozer, is located on the southern side, and is deeply incised into the tall (*Fig. 1.6*). This path cuts not only a recent plastered water basin near the base and a structure built of spolia on the slope, but also a number of ancient walls on its midway and at the top, which are mostly from the Byzantine and Islamic period (see the excavation of Area III). Therefore, the modern ascent does not fit into the topography of the hill.

The southern edge of Tall Zirā'a offers the easiest way to climb the 25 m to the plateau via a moderate ascent of approx. 150 m. Modern irrigation lines on the terrace-like ledge, which leads from the south-western foot of the tall up to the wide ledge in the north-east, make skillful use of the old causeway. Unfortunately, the old embankment was severely damaged when a new aqueduct was constructed from the spring to nearby olive groves (*Fig. 1.7*). Nevertheless, the carefully constructed former path is still traceable in some places. Additionally, there are substructures which follow the slope downwards.

The prominent ledge in the south-east, where the old ascent reached the plateau, provides plenty of space to easily allow a turn to the west into the former settlement. A high pile of cultural debris has been collected on the side facing the tall on the upper part of the ascent; a 4.5 m deep hole can be seen here, from an illegal excavation. Fragments of the city gate structure are not extant but should be expected to be found in this area. A large number of cacti on the outer ledge may approximate the



Fig. 1.9 The stretcher-header-wall on the tall's east side (Source: BAI/GPIA).



Fig. 1.10 The Roman/Byzantine bath on the tall's east side (Source: BAI/GPIA).

line of the slope-side fortification of the entrance area, but no physical remains are now present on the surface.

The remarkable descent in the east of the tall overlooks the adjacent deep wādī where several other permanent water springs are still present. The rocks show clear traces of sintering from the outflow of the artesian spring on the tall. In a dripstone cave half way up the slope, rock stalactites and stalagmites can be seen (*Fig. 1.5*). They testify to a considerable flow of water over a long time. A few metres to the north, chalk-sinter sediment has been quarried in a larger cave, possibly to provide more freedom of movement or in order to use the cave as grave. Modern looters have dug a deep pit in the former cave.

The remains of several walls are visible in the upper and middle sections of the eastern slope close to Area II. A north-south oriented, 4.5 m long wall is a prominent feature on the upper part of the slope. It is built of worked stone with *tubuli* on the eastern face. Well burnt ceramic dating to the Classical period was immured into the rough, lower plaster layer (*Fig. 1.10*). Significant traces of sinter on the wall and down the slope as well as deep washed out grooves indicate a strong water flow. Some metres downslope, at the mid-height of the tall, the remains of a stretcher-header-wall were exposed in this way (*Fig. 1.9*). A channel was constructed on the north-east side of the tall; its purpose was to drain surplus water to a nearby wādī in order to control the constant flow of water from the spring and to avoid washouts (*Fig. 1.8*). The time of construction has not been determined⁵.

5 Cf. Steuernagel 1926, 81: "One can see a channel on the eastern slope that drains the water to the southern part of the ruin".

To the north, a small wādī on the north-eastern slope of the tall cuts ever more deeply into the ground and joins the Wādī al-‘Arab on the north-east of Tall Zirā'a. Overgrown with grass, high reeds (some up to 4 m), bushes and trees, it presents an almost idyllic sight and a sense of how fertile and green the entire wādī was in former times.

However, because water pumping stations have now been built to supply the industrial city of Irbid, the ecosystem is being destroyed. Many channels (constructed in different periods) can be seen in the wādī, largely driven into the rock, but partially also concreted over, in order to take advantage of the abundant water resources for agricultural or industrial purposes (particularly mills).

There are also large natural caves at the foot of the steep rock on the northern side of the tall (Fig. 1.13), which are still used by bedouins as winter quarters, storage space or stables (including concrete installations and remains from modern tents). Goat paths cover the northern ascent; currently people climb the rock to the summit.

The northern terrace located below the tall may have once served as a lower city, or another type of settlement, which was connected to Tall Zirā'a (Fig. 1.15). A house built from spolia, a destroyed building in the centre of the terrace and the remains of other houses in the south support this assumption. The terrace, however, was leveled by bulldozers in the 1990's to make way for a new olive grove. The cultural layers have been disturbed and largely destroyed, which can be verified through artificial stone fields and piles of debris where many

Roman and Byzantine sherds were found. In 2011, the 'Wādī al-‘Arab-Dam Authority' ordered the destruction of the olive grove.

Beyond the north-west edge of the tall the towering rock peters out on the western hillside. The hillslope is only 25 m high on this side, making it vulnerable to potential conquerors; the geographical situation led to greater efforts in fortification, as we can see in Area I.

Olive trees were planted on the gently sloping western plateau in the 1980's (Fig. 1.16) and a bedouin family lived in the adjacent area until 2005. It was presumed at first that the plateau would have been suitable for a lower city as well; however, the surveys from 2009 to 2012 found pottery sherds and worked stones only, but no traces of architecture.

However, a channel cut into the rock and the entrance to a carefully hewn (now robbed) grave can be found directly at the foot of the western slope below the present unpaved roadway. Furthermore, several installations, including a large round millstone, were found on the hillside of the north-west plateau towards the dam.

At the west of the plateau, the Wādī al-‘Arab leads into the modern water reservoir.

The plateau of Tall Zirā'a is distinctive by a dip in the centre, caused by the permanent pool of water from the spring, and by the already mentioned gently sloping south-eastern entrance area, which once served as a natural outflow for the water from the spring (Fig. 1.12). The centre is surrounded for 300 degrees by cultural layers approx. 4 m higher than the centre. Naturally, the cultural



Fig. 1.11 Building substructure; in later times reused as a cistern. Area III, Squares W-X 124-126 (Source: BAI/GPIA).



Fig. 1.12 The artesian spring on Tall Zirā'a (Source: BAI/GPIA).



Fig. 1.13 One of the caves at the foot of Tall Zirā'a; north-west side (Source: BAI/GPIA).



Fig. 1.14 Tall Zirā'a. Overview on the plateau. Photograph taken in 2011 (Source: APAMEE, David Kennedy).



Fig. 1.15 The northern terrace below Tall Zirā'a (Source: BAI/GPIA).



Fig. 1.16 The western terrace of Tall Zirā'a (Source: BAI/GPIA).

layer created by human settlement could increase there much faster than in the area of the spring, where the constant water flow removed much of the debris.

The area around the artesian spring was overgrown with reeds, grass and scrub. The drainage channel next to two small trees, running in the direction of the former city entrance, has been dry since 2003. No less than eight flexible rubber pipes were found in the channel that once distributed the water from the spring in different directions. Since 2011, the water flow of the artesian spring has dried up completely. As mentioned previously, the water from the aquifer is now pumped to the modern city of Irbid to the north-east.

About a third of the tall's plateau was used as arable land until the excavation began in 2003. A farmer from the nearby village of Kəfar 'Āsad (Kufr Asad), M. Najib Mehedad, used the plateau for agriculture under the common law until 2001, and piped the water from the spring to the land.

The southern part of the plateau undoubtedly had a special function during the Roman and Byzantine periods. Scattered with worked ashlar as well as Roman and especially Byzantine pottery sherds, it was repeatedly the target of unsuccessful treasure hunters. There is a remarkable *tesserae*-paved courtyard, with an opening which leads into a large vaulted cistern built of ashlar.

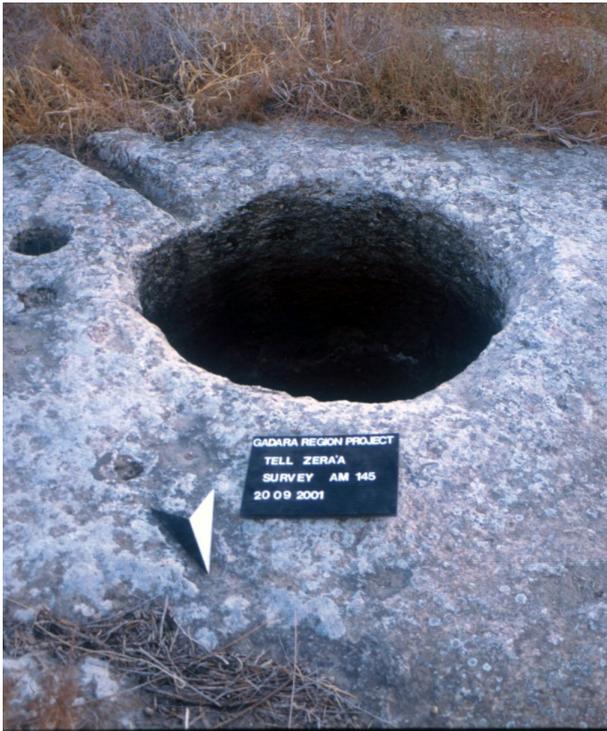


Fig. 1.17 Agricultural installation on the tall's east side. Square AM 145 (Source: BAI/GPIA).

A Byzantine monastery was discovered here, built over the site of an older Roman building, which had been reused in the Umayyad and Mamluk periods. The 6 m x 10.4 m wide and max. 5.75 m deep cistern was lined with a thick layer of plaster, with two distinct overlays evident, which was about 8 cm thick in total (Fig. 1.11). A vaulting technique had been used in the initial construction, to enable further installation elements to be added.

1.2.2. Emergence of the Natural Hill

The bedrock of Tall Zirā'a consists of chalk-sinter, mainly calcium carbonate (Fig. 1.18). It appears that an aquifer formed a more or less circular sinter terrace in the cross section shaped by the hills 300 m above sea level which surround the tall to the north, east and south, due to the crystallization of minerals from the water over centuries. Carbon dioxide (CO_2) was released from the water due to pressure relief, the natural heating of the water after spillage, and the presence of plants, particularly algae. Consequently, once the carbon dioxide has been released, the natural chalk present in the water, in the form of calcium hydrogen carbonate, was deposited as indissoluble chalk (CaCO_3).

It has been adduced that the chemical layers formed on the sinter hill at approx. 0.10 m per year. Due to the fact that the spring water always flows out of the lowest drain, over time a circular hill (in cross section) evolved,



Fig. 1.18 Tall Zirā'a. Chalk-sinter terrace on the tall's north-east side (Source: BAI/GPIA).

The bottom of the cistern was divided by walls, and evidently served as a temporary residential or storage place.

Disused agricultural installations have been found to the south-west of the tall, immediately west of the road leading to it. Depressions for the fixation of vessels and remains of a rock hewn oil or wine press were found here (Fig. 1.17). Additionally, a large rock-cut pear-shaped cistern was found in the immediate vicinity.

with almost equally high sides in every direction. However, the mound did not grow consistently; it is not solid everywhere, and contains numerous caves (Fig. 1.13).

The sinter hill has been used as a settlement since the fourth millennium BC. Thus, further increases in the height of the hill were no longer a consequence of the sinter layer of the spring, but rather due to human cultivation on the tall. By the end of occupation, the hill had grown up to 17 m below sea level. G. Schumacher noticed in his records:

“The Bedouins of the surrounding [area] and the Fellahin claim that the water of the spring was once thermal and that it had a salty, sulfurous taste, which is verified through the large quantity of spring sediment that covers the whole hill; now the water is totally fresh and cool”⁶.

1.3. The Wādī al-‘Arab and its Environment (*Apps. 1.1–1.4*)



Fig. 1.19 The Wādī al-‘Arab and Tall Zirā‘a. View from the Gadara-plateau. Photograph taken in 2007 (Source: BAI/GPIA).

The highly visible ruins of the famous Decapolis city of Gadara impress not only by their exceptional scenic location, but also by their outstanding archaeological value. High over the Sea of Galilee and close to the Jordan Valley, the site towers at the north-western spur of Transjordan. If one looks from there to the south, an extraordinary fertile valley appears: the Wādī al-‘Arab (*Figs. 1.19–1.21*; see *Apps. 1.2* and *1.3*). Neither its relevance to the ancient cities of Gadara or Bēt Rās nor its own history has been noted in current literature of the region⁷.

The Wādī al-‘Arab and its tributary valleys arise in the hill country to the west of Irbid and drains into the River Jordan. There is an abundance of water springs in the wādī, some of which are thermal. Until the 1980’s, approx. 28.8 million m³ of water passed through the valley annually⁸. The remains of former water mills⁹, rock-cut channels and water courses still give the impression of the former abundance of water here. Today, the area is considerably drier because of modern pumping stations. The local peasants are completing the process; they are over pumping the natural water resource in order to irrigate their fields and olive groves.

The modern dam in the lower wādī was erected in 1987 and can hold a maximum of 17.1 million m³ of water. The dam provides water for irrigation in the agricultural area in the lower wādī and is stocked with fish. Since its construction, not only rain water but also water from the King Abdullah Channel is stored there.

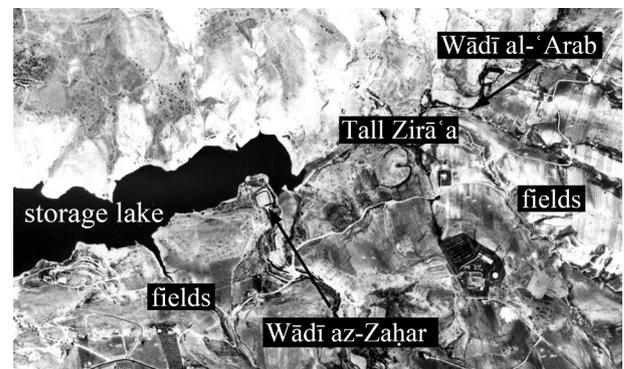


Fig. 1.20 Wādī al-‘Arab with the water reservoir (Source: BAI/GPIA).

7 Cf. Hoffmann 1999, 225–227.

8 Ahmad 1989.

9 Steuernagel 1926, 75. 83. 466 f.; McQuitty – Gardiner 1987.

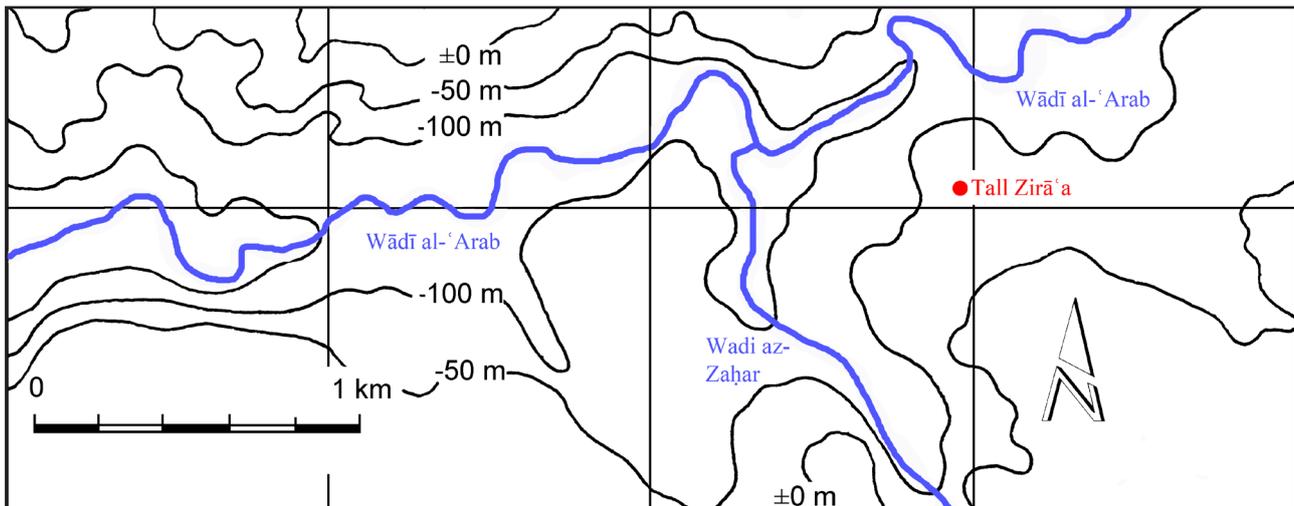


Fig. 1.21 The Wādī al-'Arab-system (Source: BAI/GPIA).

1.3.1. The Natural Conditions in the Wādī al-'Arab

The average temperature in the wādī ranges between 15 °C in winter and 33 °C in summer, with humidity between 45–75 %¹⁰. Annual rainfall averages 380 mm, with particularly heavy rainfall expected between December and mid February.

Typical flora of the Wādī al-'Arab includes the common reed (*Phragmites communis*), oleander (*Nerium oleander*) and tamarisk (*Tamarix aphylla*). Many waterfowl come to this area in autumn and spring; one can find the cattle egret (*Bubulcus ibis*), the little egret (*Egretta garzetta*), the great white egret (*Casmerodius albus*), the grey heron (*Ardea cinerea*), the common teal (*Anas crecca*), and the black coot (*Fulica atra*), the common

redshank (*Tringa totanus*), the marsh sandpiper (*Tringa stagnatilis*), the greenshank (*Tringa nebularia*), the pied kingfisher (*Ceryle rudis*), the Smyrna kingfisher (*Halcyon smyrnensis*) and the common kingfisher (*Alcedo atthis*). Additionally, there are common water frogs (*Rana ridibunda*) and several kinds of Talapia (e.g. *Tilapia zilli*/ St. Peter's fish)¹¹.

Grain is still cultivated today in the wādī, together with vegetables, which grow even in winter due to the climatic conditions. Tropical fruits thrive in the lower valley; however, the higher reaches are often rocky and suited only for grazing livestock.

1.3.2. The Wādī al-'Arab as a Trade Route

The Wādī al-'Arab and its tributary valleys connect the Jordan Valley and the Transjordan high plateau geographically and geopolitically; particularly as the wādī leads into the significant northern ford of the River Jordan.

Likewise, it connects the Mediterranean Sea via the Jezreel Valley and Tall al-Ḥiṣn (Beth Shean) to the Jordan Valley and from there to the Transjordan high plateau. Thus it was a very important trade route (Fig. 1.22). In Pre-Classical periods the 30 km long wādī-system, which provided a more than sufficient amount of water until overpumping and diversion in the twentieth century, was part of an important trade route connecting Egypt with Syria and Mesopotamia. Here (unlike the northern and southern wādīs), the merchants could manage the steep ascent from the Jordan Valley (290 m below sea level) to the East-Jordanian high plateau (550 m above sea level)

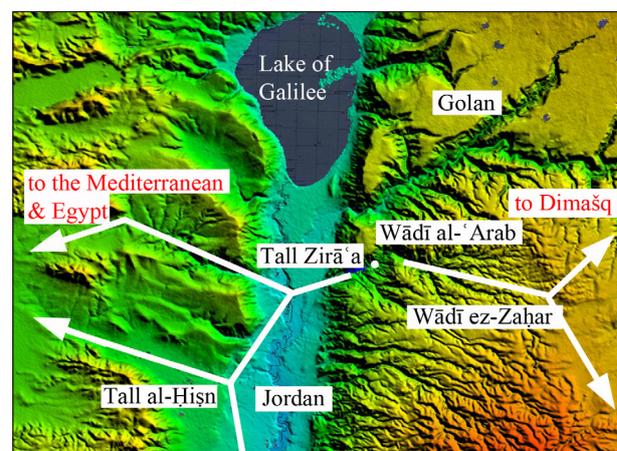


Fig. 1.22 Map showing the trade routes (Source: BAI/GPIA).

10 Hanbury-Tenison et al. 1984, 386.

11 Cf. MMRAE 1991, 226–230; Ahmad 1989, 273–275 and <http://>

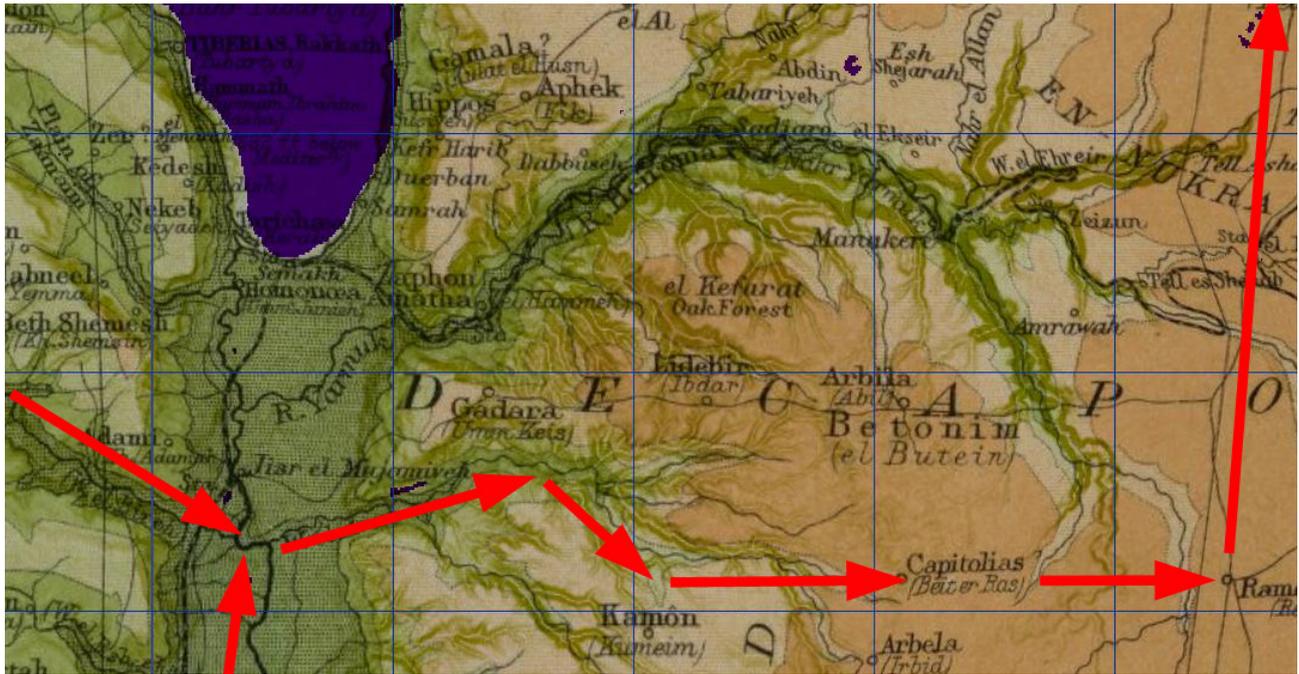


Fig. 1.23 Ascent from the Jordan Valley to the Irbid-Ramtha basin (Source: Section of Bartholomew's quarter inch map of Palestine, 1901, 91.5 cm x 70.5 cm/Edinburgh Geographical Institute).

without the need to overcome steep natural gradients in the terrain or a bottleneck (Figs. 1.21 and 1.23). From the fertile Irbid-Ramtha basin in the East-Jordanian high plateau, trade routes led from Dimašq (Damascus) to Mesopotamia or directly through the Ḥaurān mountains and the Arabian Desert to central Mesopotamia¹². A further trade route led from the Irbid-Ramtha basin to the south (Central Transjordan hill country).

Since the Yarmuk Valley in the north and the Wādī Ziqlāb in the south are too steep and narrow to serve as

major transport routes, the great geopolitical importance of the Wādī al-‘Arab becomes evident.

Countless finds testify to trading between the inhabitants of Tall Zirā‘a with neighboring regions: for example, ceramic vessels from Syria, Greece and Cyprus, bitumen from the Dead Sea, and copper/copper ore from Fēnān (and/or from Timnā) and faience from Egypt; raw glass may come from different regions but potentially a provenance from Egypt can be assumed.



Fig. 1.24 Wādī al-‘Arab. View from west. Photograph taken in 2011 (Source: BAI/GPIA).

12 Bartl 2002, 119.

1.4. Research History for Tall Zirā'a

1.4.1. Records of Gottlieb Schumacher



Fig. 1.25 Gottlieb Schumacher (Source: Eisler 2015/Archive of the Temple Society).

Tall Zirā'a was among the discoveries of the German engineer G. Schumacher when he explored Transjordan in 1885 (Fig. 1.25)¹³.

G. Schumacher mentions seeing the visible remains of rectangular buildings on the tall's plateau:

“the walls were constructed of massive hewn chalk and basalt ashlar”.

Due to the enormous population decline during the Ottoman period the area around Tall Zirā'a was assumed to be uninhabited. Surprisingly, G. Schumacher noted that the tall was partly inhabited until the beginning of the nineteenth century¹⁴; but except for a few sugar mills, operated by water power, there were only a few small hamlets in the vicinity of the tall.

G. Schumacher, who described the water flow through the Wādī al-'Arab as about 0.75 m³ per second in June 1885. The flow remained constant until the confluence with the Wādī az-Zaḥar, which supplied the Jordan River with the same amount of water. After this point, the water again remained constant until the confluence into the Ghōr¹⁵.

“The riverbed consists of soft white chalk, in which the water has scored several parallel channels. The

riverside is densely overgrown with oleander, reeds and other bushes, often covering the path through the undergrowth. Where the valley widens and the water becomes calm, there are plenty of trout that are easy to catch. While bathing Dr Schumacher discovered an almost one meter long water snake, which is supposed to be common and feared here”¹⁶.

G. Schumacher's records are extraordinarily valuable, because they provide an impression of the abundance of water, as well as flora and fauna, from the end of nineteenth century:

“Right below these rocks is Rās Wād Zaḥar, that is, the beginning of the water-bearing Wād Zaḥar, which owes its name to the ruined Zaḥar el-'Aḳabi on a hill located to the south-east. There are approximately a dozen water springs on the slopes, overgrown with reed and oleander; they flow down in a small stream that was 4.2 m wide and 25 cm deep in June 1885. The valley drops 95 m over a length of 4 km from here to the outlet of the Wād el-'Arab. Due to the strong descent, the stream was suitable to power mills. No less than 14 mills are named in northern 'Ajlūn, (...) all of them located at or next to the river of the Wād Zaḥar. According to modern maps, which show only a few of these names, it seems that most of the mills were in the Wād el-'Arab. They are primitive constructions and most of them have only one milling gear, but since they are the only mills in that area they are permanently busy; more sophisticated structures would be highly profitable. The riverside is densely overgrown with oleander, raspberries and reed. Small, natural ponds, full of fish, offer the chance to take a refreshing bath”¹⁷.

G. Schumacher states that the Wādī al-'Arab was rather lively due to the mills, particularly since there are no other industries in the vicinity¹⁸. By the end of the twentieth century, the valley had changed tremendously compared to Schumacher's records. The once abundant waters in the wādī were now used to supply the city of Irbid, and the permanently green resting places for migratory birds had dried up. Only the construction of the Wādī al-'Arab reservoir, which drowned some archaeological sites, restored a fertile ambience to the valley. An agricultural research institute was established on its southern riverside.

Naturally, we cannot draw conclusions about ancient conditions from the present-day situation; however, with the abundant water resources described above and its nu-

13 Steuermagel 1926, 83.

14 Steuermagel 1926, 80 f.

15 Steuermagel 1926, 80.

16 Steuermagel 1926, 80.

17 Steuermagel 1926, 74 f.

18 Steuermagel 1926, 83.

merous settlement remains, the area was beyond doubt used for a wide range of agricultural activities.

G. Schumacher's records about former road links are also of great interest, since they enable conclusions to be drawn regarding the accessibility of this area:

“The main street coming from the southern Haurān (...), that crosses the Wād Zaḥar near the springs, reaches the eastern end of Wustīje 2.5 km north of Wād

Bersīnijā (...) The paving suggests Roman origin. (...) We turn back and follow the street east until it reaches the level of the plateau after crossing the Wād Zaḥar. Here, one kilometer north of the street, on an extended plain, one of the main settlements of Wustīje is located, Kafr Asad. [It is] 340 m high, almost the same height as Mukēs¹⁹ to the northwest, but about 75 m lower than el-Kabū to the north (...)”²⁰.

1.4.2. Observations of Nelson Glueck

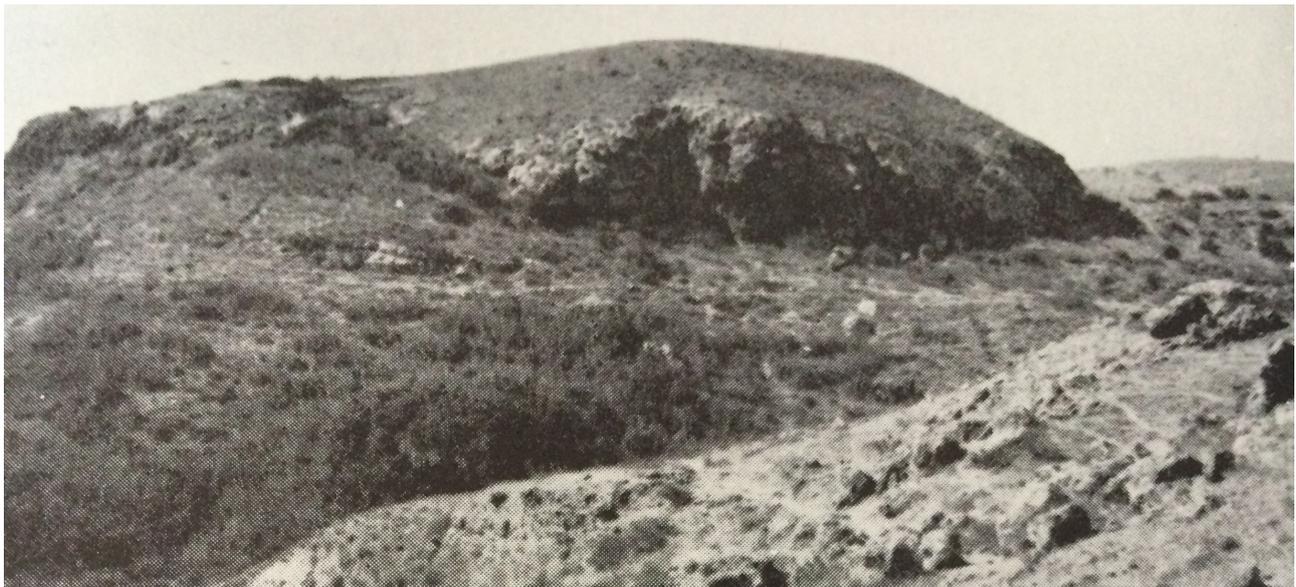


Fig. 1.26 Tall Zirā'a looking south-south-west. Photograph taken by N. Glueck in 1942 (Source: Glueck 1951a, 183 Fig. 71).

The American Archaeologist N. Glueck visited the area in 1942. In his publication ‘Explorations in Eastern Palestine IV’ he mentioned the “singularly imposing and completely isolated” Tall Zirā'a, which is rising starkley and massively out of the Wādī al-‘Arab. He described the tall's topography and reported seeing a spring on the plateau²¹.

A photo published by him shows a view from the south-south-western direction, and documents a perspective that is lost today due to the modern dam (Fig. 1.26)²². N. Glueck also alludes to the archaeological remains:

“The uneven, terraced top of the hill of Tell Zer‘ah was at one time completely enclosed within a strong fortification wall, some parts of which are still visible, particularly on the n. side. This wall probably hails back to the Early Bronze period. Numerous foundation remains are visible on top of the hill, belonging to buildings erected from Roman through medieval Arabic times (...)”²³.

Furthermore he mentions ceramic finds from the Early Bronze Age (I–II and III), Iron Age (I–II) and plenty from the Roman, Byzantine and Islamic periods²⁴.

1.4.3. Modern Surveys Preceding the ‘Gadara Region Project’

Although Tall Zirā'a had already attracted attention due to its location and imposing appearance, there had been no intensive research, due to the hill's location close to the border of Israel in the west and Syria in the north; following the foundation of the State of Israel in 1948 and

again after the Six Day War in 1967, the western part of the Wādī al-‘Arab was declared a military zone.

Two modern archaeological explorations were conducted in the valley before the ‘Gadara Region Project’.

19 Today's Umm Qēs.

20 Steuermagel 1926, 75. 77.

21 Glueck 1951a, 182.

22 Glueck 1951a, 183 Fig. 71.

23 Glueck 1951a, 184.

24 Glueck 1951a, 184.

1.4.3.1. The 1978 Survey

The surface inspection, which took place on March 14 and 15, 1978, was an archaeological rescue investigation considering the then planning phase of the Wādī al-'Arab dam construction. The project was initiated jointly by the 'Jordan Valley Authority' and the 'Department of Antiquities of Jordan' (DoA). The team consisted of T. M. Kerestes, J. M. Lundquist, (University of Michigan), B. G. Wood (University of Toronto) and K. Yassine (University of Jordan). The results were published as a

joint project: 'An Archaeological Analysis of Three Reservoir Areas in Northern Jordan'²⁵. Thereby three locations were discovered (*Tab. 1.1*)²⁶.

Tall Zirā'a was rated as the most important archaeological site²⁷ in the survey area:

"Site 3 (...) The sherds collected were predominantly from the Late Byzantine period (...), with also a good representation from the Early Bronze period"²⁸.

Periods	Areas under study		Settlements		
	A	B	1	2	3 <i>Tall Zirā'a</i>
Paleolithic	2				
Early Bronze Age				2	8?
Early Bronze Age Flint				1?	
Middle Bronze Age II				8	1
Late Bronze Age					
Iron Age	1				1
Persian period					
Hellenistic Age					
Roman period	4	6	20	1	3
Byzantine period	18				14
Early Islamic period					
Late Islamic period	1?				
Ottoman period		1			10
Modern period	1			5	5
Undetermined sherds	1	7	2		
Undetermined flints	3			1	
Total Sherds	61	14	40	17	159
Total Flints	5			1	5

Tab. 1.1. Survey 2001 on Zirā'a and in its immediate vicinity.

Site 1: (Israel or Palestine Grid Reference: 2103.2251) is now under water. It was located 119 m below sea level and measured 75 m x 20 m. T. M. Kerestes found it "on a natural tongue projecting into the wadi from the N side. The foundation of a two-room building is clearly visible. The building follows the natural contour of the ridge, and a well-worn path passes in front of the building, continuing along the N edge of the wadi. The small sample of sherds reflects the Early Roman period"²⁹.

Site 2: (Israel or Palestine Grid Reference: 2113.2253) is located between 100 and 104 m below sea level, and measured 50 m x 20 m. It is situated "on a natural hill on the N side of Wadi Arab. Today there is a small village on the site. Foundations on the S edge of the site ca. 4 m. long appear to be ancient. The artifacts collected were predominantly from the Middle Bronze II period"³⁰.

25 Kerestes et al. 1977/1978, esp. 129.

26 Table according to Kerestes et al. 1977/1978, 129.

27 The measurements differ in the research literature: 40 m (Kerestes et al. 1977/1978, 129), 20 m (Hanbury-Tenison et al. 1984, 389).

28 Kerestes et al. 1977/1978, 129; cf. Hanbury-Tenison et al. 1984, 389 No. 001.

29 Kerestes et al. 1977/1978, 129.

30 Kerestes et al. 1977/1978, 129.

1.4.3.2. The 1983 Survey

In September 1983 the first campaign of the archaeological survey, supervised by J. W. Hanbury-Tenison, was carried out in the Wādī al-‘Arab³¹. His team included A. McQuitty, M. Gardiner and N. Khasauneh. In all 25 km² were examined and 102 archaeologically relevant sites were documented during the 18 days of fieldwork³².

“The areas surveyed were deliberately chosen to represent the total potential of the wadi, whose geophysical and demographic variations are quite considerable. Eleven square kilometers took a section across the whole mouth of the wadi, at the same time covering the area most threatened by the works supplying water to the city of Irbid. Eight square kilometers covered both highland and lowland in the middle wadi, along the Umm Qeis ridge, and six

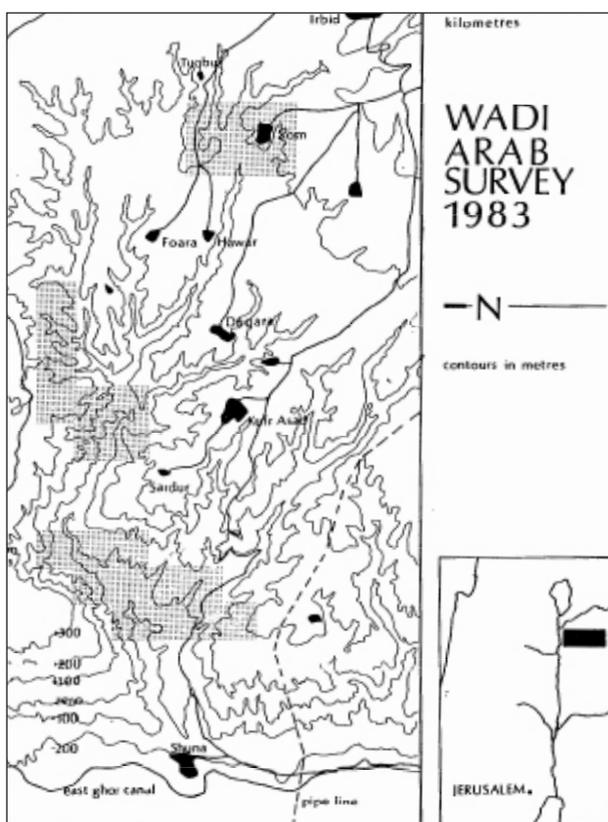


Fig. 1.27 Areas surveyed in 1983 (Source: Hanbury-Tenison et al. 1984, 386).

31 Hanbury-Tenison et al. 1984, 385–424 (text). 494–496 (plates).

32 Hanbury-Tenison et al. 1984, 389, 398, 403.

33 Hanbury-Tenison et al. 1984, 385.

34 Hanbury-Tenison et al. 1984, 392 f.

Ibidem: “Since there are Proto-Urban wares at Shuneh and Arqub edh-Dhar, the absence in the Wadi Arab suggests either a *lacuna* in occupation, or a regional-based typological preference. The preponderance of holemouth jars over V-shaped bowls (...), and the knob handles (...), in conjunction with the thumb-impressed decoration, the triangular section loop handles, and the sparse lithic evidence (...) points to a date at the very end of the Chalcolithic sequence, and is yet only paralleled at the ultimate, and post-Ghas-

covered the upper wadi around the modern village of Som. (...) Retrieval procedure varied according to the site, but tended to be total pick-up at the poor sites, purposive at the middling, and purposive and total pick-up in random metre-diameter circles at the large. This first season was intended as an overview, (...)”³³.

Since the Early Bronze Age, possibly since the end of the Chalcolithic era, there were three *tulūl* in the Wādī al-‘Arab that were inhabited over several cultural periods: Tall Zīrā‘a (Israel or Palestine Grid Reference: 2119.2252), Tall Qāq (Ḥirbet Bond; Israel or Palestine Grid Reference: 2128.2233), and Tall Kinīse (Ra‘ān; Palestine or Israel Grid Reference: 2191.2271). Regarding the Early Bronze Age, J. W. Hanbury-Tenison reported:

“Settlement was concentrated at the four tells (...), and two field scatters (...), with the Early Bronze II being most in evidence, and the pre-urban material mostly where it remained uncovered by later deposition. There was no evidence of (...) 1. Neolithic or Early Chalcolithic; 2. Golan Chalcolithic; 3. Proto-Urban A or B wares, grey-burnished ware, or Proto-Urban D/Umm Hammad ware (including Jawa ware)”³⁴.

The few settlements dating to the Middle and Late Bronze Age were localised at Tall Qāq (Ḥirbet Bond), and Tall Kinīse (Ra‘ān). The ceramic finds of those ages were, according to J. W. Hanbury-Tenison:

“mainly crude and undoubtedly local (...) There was no evidence of the following: 1. EB/MB (EB4) material. 2. Quality vessels—chocolate on white, white-slip, etc. 3. Cypriot or Mycenaean wares, or any other imports”³⁵.

There were only a few artefacts found that date to the Iron Age³⁶. However, material dating to the Hellenistic period and the Middle Ages was detected. J. W. Hanbury-Tenison, for instance, writes:

“Material from these periods was found at a large number of the sites identified on the survey. The Byzantine and Mamlūk presence was particularly strong. (This (...) indicates the broad chronological groupings represented at each site from the Hellenistic period onwards”³⁷.

sulian, level at Pella Area XIV. If the sites do continue uninterrupted from the Late Chalcolithic to the Early Bronze II (grain wash wares), there may be a division between highland and lowland in the ceramic assemblages, and we might be seeing an example of regional rather than chronological factors in typological variability (...) Of particular interest are the stamp seal impression on the neck of an EB jar (...), and the clay nail or fish hook (?) (...). This latter is a gift for those seeking ‘Ubaid parallels for the Palestinian Chalcolithic”.

35 Hanbury-Tenison et al. 1984, 393.

36 Hanbury-Tenison et al. 1984, 398.

37 Hanbury-Tenison et al. 1984, 404.

1.4.4. Archaeological Excavations on Tall Zirā‘a, Surveys and Study Campaigns 2001 to 2016 (*App. 0.1*)



Fig. 1.28 Tall Zirā‘a. View from north to south. Overview with the Areas I, II and III. Photograph taken in 2011 (Source: BAI/GPIA).

The ‘Gadara Region Project’ began in 2001 with a survey and geophysical investigations on Tall Zirā‘a (*Chaps. 2. and 3.5.1.*). Since 2003, excavations of the settlement remains has been the main focus of archaeological research. Furthermore, archaeometric investigations (*Chap. 3.8.*), photogrammetrical and aerial surveys (*Chap. 3.2.*), experimental archaeology projects (*Chap. 3.4.*) and archaeobotanical investigations (*Chap. 3.7.*), as well as extensive surveys in the hinterland (*Chap. 3.6.1.*), have been carried out in order to plan future archaeological work, to solve questions of research, to document results, or to widen the archaeological background.

For the last twelve years, excavations have been undertaken in three distinct areas (Areas I–III; see *Figs. 1.28 and 1.32*) in the west, north, and south of the tall. These areas have been correlated chronologically using finds, radiocarbon samples and survey data as the basis of comparison. A total of twenty five strata have been associated with the settlement layers (*Chap. 4.2.*).

The Wādī al-‘Arab Survey was conducted between 2009 to 2012. In total 25 km² of both the wādī itself and the tributary system have been examined (*Chap. 3.6.1.*).

1.4.4.1. The Three Excavation Areas on Tall Zirā‘a

Area I (2003 to 2011)

Systematic excavation concentrated on the north-western slope of the tall at first (*Figs. 1.28, 1.29 and 1.32*). During the Tall Survey in 2001, extremely promising conditions for the investigation of an extensive stratigraphical sequence and excellent prospects for the discovery of significant residential architecture had been determined for this area. Therefore, geophysical surveys were undertaken in 2001 and 2003, with particular intensity on this terrain.

The microclimatic conditions suggest that this part of the hill was particularly favourable for craft purposes. From midday until well into the evening, thermally induced onshore winds from the Mediterranean create a comfortable living environment, which provide ideal working conditions for craftsmen, especially for the operation of furnaces.



Fig. 1.29 Aerial view of Area I. Photograph taken in 2011 (Source: BAI/GPIA).

This location also provided a favourable topography for excavations. The inhabitants were, in terms of natural conditions, less protected on the western slope than on the other slopes to the north and east. The difference in height from the base to the summit of the hill was only 22–25 m, which suggests that the inhabitants of the set-

Area II (2006 to 2009 and 2011)

Area II, investigated for the first time in spring 2006, is situated in the northern part of the tall (Figs. 1.28, 1.30 and 1.32). The precipitous slopes, with a maximum of 44 m drop, provided effective protection. In addition, the area offers a useful view to the ‘main gate’, the natural access to the hill settlement, which was located in the south-eastern part of the tall. Similar to Area III on the south side of the hill, the accumulation of settlement remains was higher here than on the other parts of the tall. Therefore a longlasting sequence of settlement layers could be expected in this place. The topographical position and the state of preservation of this prominent area suggested representative as well as administrative buildings.

Area III (2007, 2008, and 2014)

A third area for future excavations was chosen in the spring of 2007 (Figs. 1.28, 1.31 and 1.32). The results of the surveys supported the presumption that a large Byzantine period building, measuring 600 m², would be found on the surface of the southern part of the hill. The extent of the building had been indicated by the extensive size of an associated cistern, which was 5.75 m deep, covered an area of approx. 6 m x 10.4 m, and was lined with an 0.08 m thick layer of plaster (Fig. 1.11).

Not only the spacious complex, which was easily discernible in the aerial photograph, but also the construction of such a huge cistern only 80 m away from a fresh water well, suggested a large construction with special significance.

tlement would have had to create a solid fortification system here. Furthermore, the topographical formation indicates that this area would have included a path to the lower towns situated in the well watered wādī west and north of the tall.



Fig. 1.30 Aerial view of Area II. Photograph taken in 2012 (Source: BAI/GPIA).



Fig. 1.31 Overview of Area III. Photograph taken in 2008 (Source: BAI/GPIA).

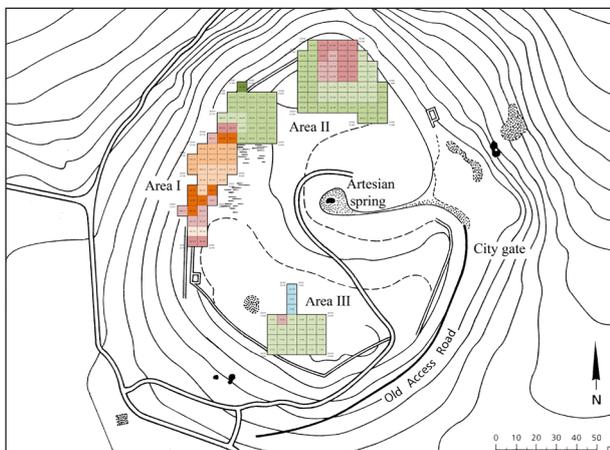


Fig. 1.32 General plan of the excavation areas on Tall Zirā'a (Source: BAI/GPIA).

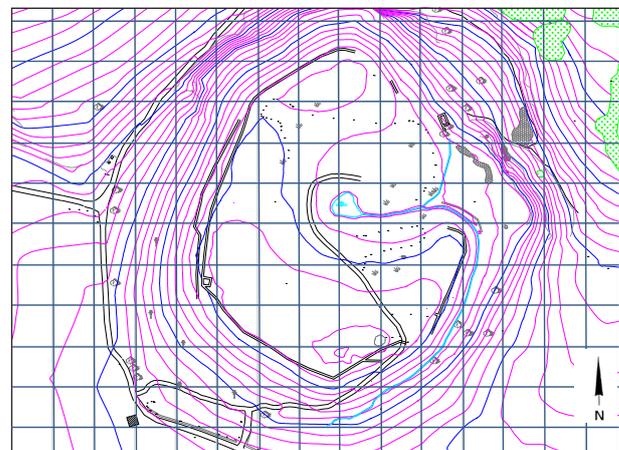


Fig. 1.33 General plan of the excavation grid on Tall Zirā'a. Survey Squares 20 m x 20 m (Source: BAI/GPIA).

1.4.4.2. Archaeological Seasons from 2001 to 2016. An Overview

CAMPAIGNS	EXCAVATIONS						SURVEYS
	Area I		Area II		Area III		
	Surface Area	New Squares	Surface Area	New Squares	Surface Area	New Squares	
2001	<50 m ²	AF 115–116	-	-	-	-	Tall Zirā'a
2003 Summer	250 m ²	AK 116, AL 116–118, AM 116–119	-	-	-	-	-
2004 Spring	500 m ²	AM-AN 115, AN-AO 116–119	-	-	-	-	-
2004 Summer	500 m ²	-	-	-	-	-	-
2005 Spring	675 m ²	AH 115, AI 115–116, AK 115.117, AP 118–119	-	-	-	-	-
2005 Summer	675 m ²	-	-	-	-	-	-
2006 Spring	825 m ²	AG 115–116, AH 114.116, AI 117, AP 117	125 m ²	AV–AW 128–129, AX 129	204 m ²	Test trench in X 124	-
2006 Summer	825 m ²	-	-	-	-	-	-
2007 Spring	925 m ²	AE 115–116, AQ 118–119	400 m ²	AX–AY 128, AV–AY 130–131	-	-	-
2007 Summer	925 m ²	-	-	-	600 m ²	U–X 123–128	-
2008 Spring	1,025 m ²	AQ 120; AR 118–120	825 m ²	AT–AU 128–133; AV–AW 132–133; AX 132	-	-	-
2008 Summer	1,025 m ²	-	-	-	-	-	-
2009 Spring	1,525 m ²	AP 120–123, AQ–AR 121–123, AS–AT 119–123	1,500 m ²	AR 132–134; AS 126–134; AT–AU 126–127. 134; AV–AX 126–127; AY 127	-	-	-
2009 Summer	1,525 m ²	-	-	-	-	-	Wādī al' Arab
2010 Spring	1,525 m ²	-	1,500 m ²	-	-	-	-
2010 Summer	1,525 m ²	-	-	-	-	-	Wādī al' Arab
2011 Spring	1,525 m ²	-	-	-	-	-	-
2011 Summer	1,525 m ²	-	1,500 m ²	-	-	-	Wādī al' Arab
2012 Summer	study campaign						Wādī al' Arab
2013 Summer	study campaign						-
2014 Summer	study campaign			645 m ²	Y 125, half of AA–Z 125		-
2015 Spring	study campaign						-
2016 Spring	study campaign						-

Tab. 1.2 Overview of the archaeological seasons from 2001 to 2016 (Source: BAI/GPIA).

1.4.4.3. The 2001 Survey on Tall Zirā'a and in its Hinterland

The first intensive fieldwork season for the 'Gadara Region Project' undertaken by the Biblical Archaeological Institute Wuppertal (BAI) began on September 11, 2001 and finished on October 2, 2001.

The survey area covered the whole tall, including the slopes. In all, 127 survey squares with an extent of 20 m x 20 m were examined, that is, 5.08 ha. Altogether 24,124 sherds (plus many remains of Roman – Byzantine

roof tiles) were found and catalogued. In total 22,383 of these were detected in the course of the surface inspection of Tall Zirā'a. Another 1,741 were found during the survey based on the Portugali Method³⁸ which entailed an examination of fifteen squares 10 m x 10 m of the tall surface to a depth of about one shovel, that is about 0.30 m deep (*Fig. 1.34*). A total number of 2,847 sherds were determined to be diagnostic. All sherds were evaluated both qualitatively and quantitatively.

38 Portugali 1982, 170–190.

Primarily, the chronological classification of the pottery gathered substantiates a long period of settlement activity on Tall Zirā'a, which extends from the Early Bronze Age well into the Ottoman period.

Within the scope of the geophysical exploration of the tall, geoelectrical mapping was undertaken, in order to facilitate planning the archaeological excavations in advance, developing precise excavation strategies, acquiring knowledge for non-excavated areas, and in order to leave large excavation areas undisturbed for coming generations (*Chap. 3.5.1.*). Two-dimensional as well as three-dimensional tomographic techniques were used. More than 50 profiles in various configurations were measured. The surrounding of the tall was also prospected. A digital contour map of the tall and its vicinity was created with these data.

The 2001 Survey Participants:

- BAI Wuppertal: J. Agrawal, A. Baker, K. Bastert-Lamprichs, J. Eichner, Ch. Hartl-Reiter, U. Koprivic, P. Leiverkus, A. Rauen, G. Reimann, D. Vieweger (director of project), and T. Winzer

1.4.4.4. The 2001 and 2002 Test Trench Excavation

In 2001, K. J. H. Vriezen, together with a small team from the University of Utrecht, opened a 6 m x 6 m test trench at the western edge of the tall (*Fig. 1.35*)³⁹. He continued the work in 2002. Three recent walls were discernible on the surface. Below the surface layer, the team discovered another wall with an adjacent mosaic floor and a tabun. These were dated to the Byzantine period. Beneath this floor, a sequence of four Iron Age houses were uncovered. The lowest stratum showed a settlement layer with collapse debris of a mud brick wall. The excavators initially dated the collapsed wall to the Late Bronze Age, but later corrected the chronological assessment to Iron Age I⁴⁰. Unfortunately, the lower parts of the sounding are severely disturbed by two huge pits dating from the Iron Age II, and are therefore of little use in regard to stratigraphy. As a result of the disturbance, the publication of the test trench was possible only after



Fig. 1.34 Survey work in 2001 (Source: BAI/GPIA).

an objective comparison with the other contexts on Tall Zirā'a until that time⁴¹.



Fig. 1.35 Trench opened by K. Vriezen in 2001. Strata 4 and 3, Area I, Square AF 115–116 (Source: BAI/GPIA).

1.4.4.5. The Summer 2003 Excavation Season with Geophysical Prospection

The 2003 season, conducted by the Biblical Archaeological Institute Wuppertal (BAI), was the first of 18 excavation seasons on Tall Zirā'a. The Tall Zirā'a Survey was also continued.

The excavations on Tall Zirā'a were concentrated on 200 m² of the tall's north-west side (Area I); eight

5 m x 5 m squares were opened, and explored to a depth up to 3 m. The 2001 Survey of the tall had provided a clear concentration of Pre-Classical period sherds (from the Iron Age and Early Bronze Age in particular), within this area, predominantly on the slopes. Four strata have been discerned:

39 Vriezen 2002a, 18 f.; Vriezen 2002b, 9 f.; Vriezen 2003, 13 f.

40 Dijkstra et al. 2005a, 5–26; Dijkstra et al. 2005b, 177–188.

41 Dijkstra et al. 2009.

- In the uppermost stratum (Stratum 4), a large house was found from the Byzantine era. Its rooms were almost exactly aligned to the north.
- The two following strata (Strata 12 and 11) date to the Iron Age. The architectural development of these two layers is quite different. In the upper Iron Age stratum the right-angled corner of a building was excavated; in its western part there was a silo lined with stones. The lower Iron Age layer was almost completely disturbed by later settlement activities.
- The Late Bronze Age settlement layer (Stratum 14) could only be partially excavated, particularly on the western slope (Squares AK/AL 116 and AM 116–118). A casemate wall has been found. In the northernmost excavation Square AM 116, a small stonelined opening of a drainage, built into the casemates, was found (Fig. 1.36). Towards the south, a stonepaved tower followed.

Several stone objects, a large number of pottery sherds, some bronze fragments and an alabaster stand were discovered in this area.

Pottery sherds from Tall Zirā'a have been selected and analysed by the Biblical Archaeological Institute Wuppertal (BAI) together with the 'German Mining Museum Bochum'. Research focused on a determination of the origin of the pottery: whether locally produced, produced in close proximity (e.g. in Gadara), or in more distant regions (e.g. Southern Levant, Syria, Cyprus) (Chap. 3.8.1.). Production technologies were also examined (Chap. 3.4.).

Six water mills of the Ottoman period were explored and surveyed in the Wādī al-'Arab (Figs. 1.37 and 3.55).

An archaeological experiment, involving ethnological and technological-historical aspects, was also instigated. A bread oven (tabun) was built, with the individual steps of construction and utilisation documented and analyzed (Chap. 3.4.1.; Pls. 3.3 and 3.4).

A remote controlled camera fixed to a helium filled balloon was used to photograph the site from a height of 135 m above ground covering an area of approx. 15,000 m² (Fig. 1.38). The aerial photographs and survey points taken with a Global Positioning System (GPS), were used to identify and map archaeological sites, as well as to produce a contour map and a three-dimensional map of Tall Zirā'a and its vicinity (Chap. 3.2.).

Furthermore, these procedures also provided excellent documentation for the overall situation of the excavation. A montage was created, by overlaying the ground survey control points of individual photographs to create an overview of the whole location (Fig. 3.9).



Fig. 1.36. Stone-lined opening of a drainage. Stratum 14, Area I, Square AM 116, Context 4776 (Source: BAI/GPIA).

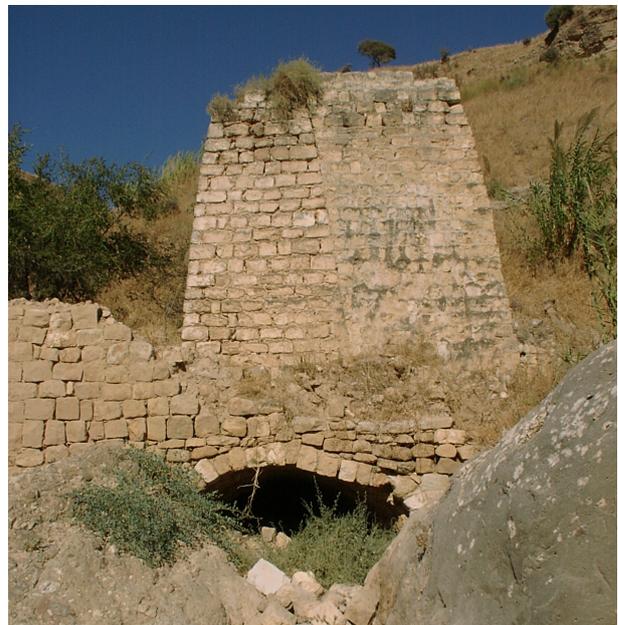


Fig. 1.37 Penstock mill in the Wādī al-'Arab (Source: BAI/GPIA).



Fig. 1.38 Aerial photograph of Area I. Photograph taken in 2003 from a helium filled balloon (Source: BAI/GPIA).

More photographic documentation of the excavation squares on Tall Zirā'a was supplied in the autumn of 2003 by perpendicular photographs, taken at an approx. height of 4 m over the excavation areas (*Chap. 3.2.*).

The Season Participants:

- BAI Wuppertal: W. Auge, A. Baker, D. Biedermann (geophysics), W. Bruns, S. Dörfling, A. Gropp, J. Eichner, M. Heyneck, J. Kleb (surveying, photogrammetry), P. Leiverkus (survey), A. Rauen (geophysics), Ch. Schubert, L. Unterbörsch, and D. Vieweger (director of project)
- DAI Berlin: J. Häser (director of project)
- 20 local workers



Fig. 1.39 Excavation at Area I. Summer 2003 (Source: BAI/GPIA).

1.4.4.6. The Spring 2004 Excavation Season



Fig. 1.40 Excavation at Area I. Spring 2004 (Source: BAI/GPIA).

The second excavation season, directed by D. Vieweger and J. Häser, was undertaken on Tall Zirā'a from April 4 to 17, 2004. It was a joint project of the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Amman (GPIA). The main focus was the excavation of the north-western part of Area I. Ten new excavation squares (AM-AN 115, AN-AO 116-119; that is, 250 m²) were opened with the active collaboration of 40 volunteers from the Protestant Academy Bad Boll.

In addition to the four strata identified in 2003 from the Roman – Byzantine period, the Iron Age and the Late Bronze Age, and an Early Bronze Age stratum was discovered⁴²; a large city wall was excavated in a step trench on the steep slope.

Due to the number of cultural layers present on the tall, it was decided to limit exploration at this stage to the

Late Bronze Age strata. Only after these strata had been excavated could a reliable exploration of older strata, in a sufficiently large area, be carried out at an adequate distance to the profile.

In addition to the typological review of the pottery finds, archaeometric investigation, based on representative samples, was continued by W. Auge (BAI Wuppertal) in close cooperation with the 'German Mining Museum Bochum' (A. Hauptmann) (*Chap. 3.8.*).

The Season Participants:

- BAI Wuppertal: W. Bruns (pottery reading), A. Gropp (square leader), M. Heyneck (square leader), J. Kleb (photogrammetry, survey), D. Jagsch (finds registration), H. Jagsch (photography, survey), L. Unterbörsch (square leader), and D. Vieweger (director of project)
- GPIA Amman: J. Häser (director of project)
- Volunteers from the Protestant Academy Bad Boll, April 4 to 16: K. Ammon, S. Bartschat, J. Bieler, H. Bigelmayr, K. Bocklitz, A. Casse, H. Deininger, S. Deininger, B. Fischer, G. Fitzner, Th. Fitzner (head of volunteers), E. Güntzel, G. Haag, K.-P. Haala, R. Hartmann, H. Herdrich, Ch. Hirth, K. Hungerbühler, D. Komor, H.-J. Kröpsch, K. Kühnel, A. Laderick, K.-U. Leyhausen, S. Lichtenberger, S. Liebegott, W. Luckscheiter, K. Meyer, B. Neusüß, K. Pfeifer, A. Rau, J. Rau, H. Schmidt, R. Schreiber, J. Schulz-Baldes, R. Schweitzer, A. Schwermer, M. Strehl, G. Strobel, A. Wigger-Löffler, H. Wurm, and M. Wurm
- 10 local workers

42 This is Stratum 14 in the final report of the excavation on Tall Zirā'a.

1.4.4.7. The Summer 2004 Excavation Season

The Biblical Archaeological Institute Wuppertal (BAI), in cooperation with the German Protestant Institute of Archaeology Amman (GPIA) conducted a two-week archaeological field school as part of the 'Teaching Course' of the GPIA from July 20 to August 6, 2004.

Several stratigraphic questions, particularly the problem of the transition from the Iron Age to the Byzantine period in Squares AN 118–119 and AO 118 have been investigated.

A team of scientists from South Tyrol has documented three excavation squares with a 3D-pixel camera for presenting them as three-dimensional photographs.

The pottery documentation (including databases) was reviewed and optimised by an up-date of the used program.

The Season Participants:

- BAI Wuppertal: P. Leiverkus, F. Rave, A. Schwermer, and D. Vieweger (director of project)
- GPIA Amman: J. Häser (director of project)
- GPIA 'Teaching Course': M. Lang, K. Rieger, and Ch. Rösel

1.4.4.8. The Spring 2005 Excavation Season

A further excavation season was conducted by the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Amman (GPIA) from March 5 to April 5, 2005. The main focus was to extend the excavation area in the north-west of the tall (Area I), in order to clarify the relationship between the building development of the Iron Age II settlement, including the 'zigzag' protective wall, with the impressive Iron Age I settlement, which had reused the ruins of the Late Bronze Age city for their habitation.

In all 20 volunteers and 15 local workers reopened 175 m² from previous excavations (Squares AH 115, AI 115–116, AK 115, AK 117, AP 118–119), while fieldwork continued over a total area of 675 m² of new ground.

During the 2005 excavation, four of the five strata which had already been explored were carefully exposed. In the uppermost stratum, the remains of three large houses dating to the Byzantine period were uncovered. Two houses, one with six rooms, and the other with four, had already been examined in 2003 and 2004. The orientation for both is almost exactly south-east/west. The walls are mostly constructed from undressed stones, with some dressed stones present. The western foundations of both houses are deeper than in the other directions. The buildings are eroded at the western part of the slope, near the edge of the steep incline.

- 3D-Pixel (digitalisation and visualisation of objects): P. Daldos and G. Miribung
- 10 local workers



Fig. 1.41 Measurement of a pit in summer 2004. Stratum 6, Area I, Square AN 119 (Source: BAI/GPIA).

A pebble-paved path or narrow courtyard could be exposed in the baulk of Square AM/AN 119. In Squares AK/AL 117 a courtyard for one of the houses, and in AK 117 and AI 116, a Roman – Byzantine house was uncovered.



Fig. 1.42 Aerial photograph of Area I. Photograph taken in spring 2005 (Source: BAI/GPIA).



Fig. 1.43 Ceramic figurine, TZ 007430-001. Dimensions: L 9.2, W 7.2, H 4.4. 3D-model: *App. 3.4. a* (Source: BAI/GPIA).

Two subsequent strata, dating to Iron Age II, were exposed in 11 squares (AM–AP 118–119, AL 118, AK 117 and AI 116). The ‘zigzag wall’ of this city had already been discovered in the 2003 and 2004 seasons.

The architectural remains of the Iron Age I stratum have been explored in 14 squares, and a coherent building structure could be established. The remains of the Late Bronze Age city wall had been reused during Iron Age I in almost all of the squares excavated until now.

In the sloped terrain of the excavation area (Squares AI–AO 115–117), it was possible to reach the Late Bronze Age layers; an imposing casemate wall was exposed; features uncovered included a large tower (Figs. 1.44 and 1.52). This city wall protected the western slope and included five internal rooms. Three stone slabs were detected inside a structure which was formerly interpreted as a gate. Two rooms were explored in the northern adjoining tower; one of them contained two column bases and a small plastered bench. There were two floor surfaces: a thick chalkplaster surface and below this, a stone pavement.

In the Squares AM–AN 116–117 and AL 117 three channels were exposed, which were covered by large stone slabs. They collected water from the north, east and south, which drained into the casemate at Square AM 116. It can be assumed that the 3 m deep shaft inside the

1.4.4.9 The Summer 2005 Excavation Season

The sixth excavation season on Tall Zirā‘a was conducted jointly by the the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Amman (GPIA) from August 10 to 24, 2005. The focus was to conduct a review and update of the findings so far; this took place in the newly renovated dig house, located in the Ottoman period village, part of the archaeological site of Gadara/Umm Qēs. All finds from the 2001 Survey were reviewed individually, closely evaluated and added to the database, and all known artefacts and contexts were registered according to a uniform standard.

Since that time, all finds have been deposited systematically in the designated Tall Zirā‘a storeroom at the



Fig. 1.44 Late Bronze Age tower and a sanctuary. Stratum 14, Area I, Squares AI and AK 115–117, AL 115–117 (Source: BAI/GPIA).

city wall in Square AM 115 (first discovered in 2004) was part of this construction. At the foundation level of the Early Bronze Age glacis, the shaft deviates at an angle of approx. 30 degrees from vertical.

The architecture of the Late Bronze Age is very prestigious, and the finds discovered here reflect also the wealth of the city. A number of bronze objects—like knives and needles—were found, as well as the remains of ceramic figurines, and imported Mycenaean and Cypriote pottery.

The 3 m high city wall running along the western hill was further exposed and dated to the Early Bronze Age.

The Season Participants:

- BAI Wuppertal: A. Baker, S. Bartschat (square leader), W. Bruns (find registration), S. Dörfling (photography), A. Gottschalk, A. Gropp, M. Heyneck (square leader), J. Kleb (photogrammetry, survey), J. Kröpsch (architect), H. Pathe, U. Rothe (square leader), N. Schwarz, A. Schwermer (pottery reading), A. Thobe, L. Unterbörsch (square leader), and D. Vieweger (director of project)
- GPIA Amman: J. Häser (director of project)
- 15 local workers

dig house in Umm Qēs, where they are always readily accessible. A typological system for the ceramic finds was also developed at this time.



Fig. 1.45 Team member at work. Summer 2005 (Source: BAI/GPIA).

A geophysical survey was conducted in selected areas on Tall Zirā'a. Furthermore, a regional survey was carried out in the Wādī al-'Arab for monitoring sites which have already been registered during surface investigations by G. Schumacher⁴³, T. M. Kerestes⁴⁴ and J. W. Hanbury-Tenison⁴⁵ since the late nineteenth century.

1.4.4.10. The Spring 2006 Excavation Season

The sixth excavation season on Tall Zirā'a was conducted from March 19 to April 22, 2006 by the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Amman/Jerusalem (GPIA). While fieldwork continued in the already opened Area I, a new section was opened in the north of the tall (Area II).

The excavation site in Area I was extended by six squares (AG 115–116, AH 114, AH 116, AI 117, AP 117) during the spring season.

In Area I, 825 m² of previously opened excavation squares were further explored to a depth of 3.9–4 m. A Late Bronze Age layer (fifteenth to thirteenth century BC) was reached in all squares (Stratum 14). This layer is characterised not only by a massive casemate wall with several rooms, but also by a tower, set inwards with two rooms. One of these has served as a sanctuary, the function of the other room is unclear.

At the end of the spring season, remains of residential buildings, dating to the Late Bronze Age, were found for the first time. A large courtyard probably existed in Squares AL–AM 118–119, which was covered by a compacted pisé floor surface, paved with stones in some places. Three channels joined in this courtyard, draining water into the casemate in Square AM 117 (Fig. 1.46). Several rooms were arranged around the courtyard; namely in Squares AL 117, AL 118, and AN 118.

An older Late Bronze Age stratum was detected underneath the casemate wall, consisting of a channel and a wall along the slope; however, their structure could not be definitively determined⁴⁶. Finally, the previously excavated prestigious Early Iron Age building (Iron Age I; twelfth and eleventh century BC) could be further explored. It is located to the east of the place where, in the later Late Bronze Age layer, a temple was discovered.

The Iron Age I settlement (twelfth and eleventh century BC; Stratum 13) shows a clear change of culture. Further fortification of the settlement could not be proved. The inhabitants of the Iron Age I settlement did not appear to create their own settlement layout; rather, they reused the walls of their Late Bronze Age predecessors.

The Season Participants:

- BAI Wuppertal: A. Cassel, A. Gropp, P. Leiverkus, A. Schwermer, L. Unterbörsch, and D. Vieweger (director of project)
- GPIA Amman: J. Häser (director of project)

The architecture in the older phase of the Iron Age IIA/B stratum (tenth to eighth century BC; Stratum 12) leads to the assumption that the tall's population increased and that the settlement had a more urban character than the one in the Iron Age I (Stratum 13). Even though the fortifications are not as strong as those of the Late Bronze Age, the Iron Age II settlement was protected by a 'zigzag' city wall. Various modifications to the houses were made so that two building phases (older and a younger one) can be distinguished (Strata 12 and 11).

The younger building phase of the Iron Age II stratum (Stratum 11) is marked by an obvious rearrangement of the houses, though not the city wall. In the northern Squares AM–AP 117–119 and the southern Squares AG–AH 115–116, a dense agglomerated architecture could be traced. Three houses were identified in the northern area.

Archaeological finds from the Hellenistic and Early Roman period (fourth century BC to first century AD) were found in 10 of the 31 excavated squares. These indicated that this area was used in that period but not covered with buildings.

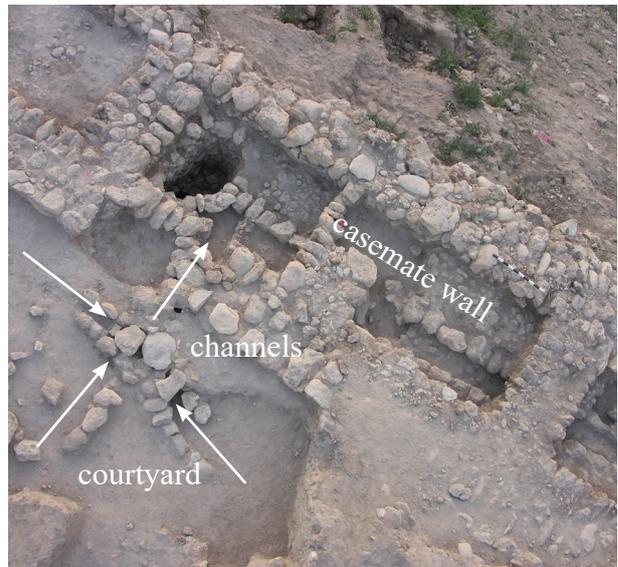


Fig. 1.46 Residential building with casemate wall. Stratum 14, Area I, Square AM 117 (Source: BAI/GPIA).

43 Schumacher 1886; Schumacher 1890.

44 Kerestes et al. 1977/1978, 108–135.

45 Hanbury-Tenison et al. 1984, 385–424 (text). 494–496 (plates); Hanbury-Tenison 1984, 230 f.

46 This is the later Stratum 15, the repair layer of the Middle/Late Bronze Age Stratum 16, which is affected by a landslide at this point.

Archaeological remains from of the Byzantine period were found in 18 of the 31 excavated squares. Five houses, sometimes with elaborated room arrangements, can be distinguished. A stone-paved path or courtyard in the Squares AM–AO 119, following the contour line of the slope, divided the buildings into a western and an eastern section.

A second excavation area was opened in the north of Tall Zirā‘a (Area II). The prominently located Area II is one of the highest terrains on the tall’s plateau and slopes slightly to the north-east. The physical topography provides the area with excellent protection by a 44 m high rocky precipice; government or administrative buildings were expected because of this. Squares AV–AW 128–129 (Fig. 1.47), and AX 129 were opened; all showed signs of recent looting.

A number of building structures were found in this small excavation area, which indicate that a very large building may exist here. Furthermore a paved courtyard, measuring more than 8 m x 4 m with an adjacent room in the south was detected. These could only be partially unearthed during the 14 working days; however, pottery finds indicate a Byzantine period dating.

The Season Participants:

- BAI Wuppertal: W. Auge, S. Bureckhardt, M. Cullibrk, S. Dörfling (photography), Y. Gönster, A. Gropp, M. Heyneck (square leader), T. Hofmann, J. Kleb (photogrammetry, survey), J. Kröpsch (architect), D. Krückmann, K. Kühne (square leader), A. Laderick, P. Leiverkus (photogrammetry, survey), W. Luckscheiter, S. Matzerath, H. Pathe, Ch. Schubert, A. Schwermer (pottery reading), K. Strauch, L. Unterbörsch (square

leader), D. Vieweger (director of project), C. Voigt, and A. Warlies

- GPIA Amman: J. Häser (director of project)
- Volunteers, Thomas Morus Academy, Bensberg: (April 9 to 22): E.-M. Blanke, E. Bremekamp (head of volunteers), M. Bröcker-Garbers, A. Cassel, H. Dinkgraeve, I. Esser, U. Fries, N. Garbers, R. Hartmann, H. Herdrich, H.-M. Jakubik, B. Jantzen, Ch. Jütte, B. Kammann, K.-U. Leyhausen, B. Neusüß, A. Newerla, R. Peters, S. Quinke, K. Schmitz, R. Schreiber, Ch. Schultheis, U. Schwerer, M.-R. Simmon-Kammann, A. Straßburger, M. Strehl, G. Strobel, H.-J. Struck, K. Struck, P. Teichmann, F.-J. Vogel, J. Wendt, and A. Wigger-Loeffler
- 10 local workers



Fig. 1.47 Building structures. Strata 4 and 3, Area II, Squares AV–AW 128–129 (Source: BAI/GPIA).

1.4.4.11. The Summer 2006 Excavation Season

The summer 2006 excavation season on Tall Zirā‘a served as a two week study excavation for the ‘Teaching Course’ held by the German Protestant Institute of Archaeology (GPIA), and at the same time as a short excavation season. Between August 3 and 16, 2006, the archaeological project focused on Area I in the north-west part of the tall, investigating problems with the stratigraphy of this habitation area in particular. The excavation centred around the Late Bronze Age Stratum 14 in Squares AG 115 and AH 115, and on a large Iron Age II (younger phase; Stratum 11) ‘house unit’ in the Squares AO 118 and AO 119.

During this excavation season another residential building, dated to the older phase of the Iron Age II, was completely investigated (Stratum 12; Squares AO 118, and AO 119). This house contained a workshop area

comprised of four longitudinal rooms/courtyards. They yielded interesting discoveries: a metal furnace with a crucible still *in situ* in the south-eastern part, together



Fig. 1.48 Jutta Häser (director of project). Summer 2006 (Source: BAI/GPIA)

with a well-constructed fireplace and a working platform in the north-eastern part. A tabun was discovered in the south-western room, and the north-western room contained four of them. It is possible that they were used simultaneously. Close to another room, three freestanding tall column bases made of field stones, a large storage vessel and a cultic stone (*mazzebe*) were found *in situ*, and another tabun with a smooth chalk working area was uncovered (Fig. 1.49).

Archaeometric work and experimental archaeology were undertaken near the tall in the Wādī al-‘Arab (Chaps. 3.4. and 3.8.). Fifty vessels were manufactured on a hand-moved potter’s wheel from local clay. They were fired in a kiln which was modelled according to Late Bronze Age examples (Chap. 3.4.2.3.). All experiments were supervised by W. Auge (chemist at the BAI Wuppertal) and were documented in detail for archaeometric reasons.

The kiln experiment was continued by extensive follow-up investigations and analyses in Germany. The



Fig. 1.49 *Mazzebe* (TZ 012653-001) on the left and two of three column bases on the right. Stratum 12, Area I, Squares AO 118–119, Contexts 2180 and 2162 (Source: BAI/GPIA).

1.4.4.12. The Spring 2007 Excavation Season

The spring 2007 excavation season of the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Amman/Jerusalem (GPIA) took place from March 3 to April 10, 2007.

Four new squares (AE 115–116 and AQ 118–119) were opened in Area I. The focus was on the impressive Iron Age I house in the southern part of the area, already discovered in 2006. Therefore, the area around K. Vriezen’s test trench in Squares AF 115–116 was excavated (see Chap. 1.4.4.4.). The architectural complex situated there was comprised of two separate sections with separate entrances and a wall dividing the housing complex. This indicates that the building should be interpreted as a ‘double house’.

The Iron Age I layer is characterised by an impressive variety of architectural contexts (Stratum 13). There is hardly a greater contrast to imagine than in the im-

mediate vicinity between the above mentioned double courtyard house in the south, stables and huts, storage pits lined with stones and tent positions in the centre of Area I. In many cases, the remains of the Late Bronze Age structures were reused.

The Season Participants:

- BAI Wuppertal: A. Abbadi, W. Auge (archaeometry), E. Brückelmann (draftsman), H. Brückelmann (pottery production), A. Cassel, M. Culi-brk, A. Gropp, Ch. Heidel, J. Kröpsch (architect), K. Kühne, P. Leiverkus, A. Schwermer (pottery reading), M. Vahrenhorst, and D. Vieweger (director of project)
- GPIA Amman: J. Häser (director of project)
- GPIA ‘Teaching Course’: O. Cremer and St. Ernst



Fig. 1.50 Archaeological experiment: firing the kiln in summer 2006. Film: *App. 3.5* (Source: BAI/GPIA).

mediate vicinity between the above mentioned double courtyard house in the south, stables and huts, storage pits lined with stones and tent positions in the centre of Area I. In many cases, the remains of the Late Bronze Age structures were reused.

A further focus of the excavation in Area I was the continued exploration of the Late Bronze Age stratum (Stratum 14). In addition to the impressive casemate wall, a tower with a sanctuary in one of the internal rooms, and other settlement structures were discovered and excavated inside the casemate wall. The paved inner courtyard of Courtyard House I and its stonecovered sewers were also unearthed. Courtyard House II consisted of four rooms built around a central courtyard with a covered area in the south which was supported by a column.

An additional building, with excellent stonework, was also uncovered in the northern part of Area I. Over an area of 2.5 m x 2.5 m 24 cylinder seals, an intact metal



Fig. 1.51 Architectural sketch of the southern part of Area I. Stratum 13. Spring 2007 (Source: BAI/GPIA).

pendant with a figurative image and other valuable finds were found. They point to a special function of this complex, possibly as a temple (see Fig. 1.52). The building was protected to the north by the slope of the tall, which at this point is a high stone cliff. The topography explains why this is also the point at which the casemate wall ends.

In Area II large-scale building structures dating to the Roman – Byzantine and Umayyad periods were unearthed. Eleven more squares (AX–AY 128, AV–AY 130–131) were opened to the north and east side of the previous excavation area. The total excavation area now comprises 400 m², and reaches the outer limit of the plateau to the north.

A room and a large courtyard, which were constructed in various stages during the Byzantine period, were uncovered in 2006. Further parts of the courtyard were found in the north of the Squares AX–AY 128 and AX–AY 129 as well as in the baulk between Square AX 129 and AX 130.

The extension of the excavation area uncovered another building with the same orientation as the courtyard. The area between the eastern wall of the courtyard and the western wall of the new large building was paved with large stones. It may have been either an alley between two large buildings or another courtyard between two units of one building. The newly excavated area consists of three rooms running almost due south to north in AV–AY 130–131 in its latest stage of construction.

To the south-east, walls and domestic installations were attached to the large building complex in the Umayyad period. There was a small pit in the central room of this building which contained a typical Mamluk pottery vessel which led to the assumption of a—at least partial—reuse of the building.



Fig. 1.52 Architectural sketch of the excavation in Area I. Stratum 14. Spring 2007 (Source: BAI/GPIA).

The lowest level reached to date comprises a large east-west oriented wall, which was first uncovered in Squares AV 128–129 in 2006. During the excavation work, it became clear that it continued to the east in Square AW 130–131. Only the uppermost stones of what is thought to be a foundation wall could be perceived, and it was impossible to date it at this stage of the excavation.

The Season Participants:

- BAI Wuppertal: G. Albers (photography), F. Bachmann (square leader), A. Baker, H. Bremer, M. Bröcker-Garbers, S. Burkhardt, A. Cassel, N. Garbers, Y. Gönster (square leader), A. Gräbner, A. Gropp (square leader), J. Kröpsch (architect), K. Kühne (square leader), A. Laderick, P. Leiverkus (photogrammetry, survey), W. Luckscheiter, C. Mandanici, U. Rothe (square leader), A. Schomberg (square leader), R. Schreiber, A. Schwermer (pottery reading), K. Strauch, M. Strehl, D. Vieweger (director of project), L. Werther (square leader), and A. Wigger-Löffler
- GPIA Amman: J. Häser (director of project)
- Volunteers, Thomas Morus Academy, Bensberg: (March 19 to 30): E.-M. Blanke, Th. Deubel, I. Esser, B. Hellmann, H.-J. Hübner, H.-M. Jakubik, R. Mathias, G. Meuter, S. Meyer-Staufenbiel, K. Moser, E. Mularczyk, A. Newerla, V. Piesche, H. Rasten, G. Schwenkel, J. Soika (head of volunteers), P. Steiner, A. Straßburger, P. Teichmann, H.-U. Uehlecke, R. Weber, J. Wendt, and Th. Wieck
- 10 local workers

1.4.4.13. The Summer 2007 Excavation Season



Fig. 1.53 Aerial photograph of Area I. View from north-west. Photograph taken in summer 2007 (Source: BAI/GPIA).

The excavation team of the Biblical Archaeological Institute Wuppertal (BAI) together with the German Protestant Institute of Archaeology Amman/Jerusalem (GPIA) conducted the summer 2007 excavation season as part of the 'Teaching Course' held by the GPIA from August 1 to 16. The main focus of the season was to explore the Iron Age I (Stratum 13, *Fig. 1.54*) and II strata in Area I (Strata 12 and 11).

Work commenced in the southern squares of Area I (Squares AE 114–116 and AF 115–116), where the former test trench excavated by K. J. H. Vriezen of the University of Utrecht in 2001 and 2002 was located (see *Chap. 1.4.4.4.*). The trench was reopened and extended, in order to further define and consolidate his findings, which were unproved until now⁴⁷. The area around the test trench was excavated; two strata of the Umayyad period and a significant stratum of the Byzantine period were uncovered in the Squares AE 114–115. Under these strata an Iron Age II house with an entrance (door hinge stone and threshold) was uncovered. The Iron Age II habitation had been disturbed by two very large pits, which made interpretation of this layer nearly impossible.

In the Squares AF 115–116, below the Byzantine stratum (Stratum 4), two Iron Age II layers were excavated (Strata 12 and 11), which had not been cut by Vriezen's test trench. Approx. half a metre deeper than the Iron Age II layers, the up to this season unexcavated Iron Age I stratum (Stratum 13) was reached in most

of the four squares from the test trench. The previously mentioned large building with carefully constructed walls of two or more rows of undressed stones in the south of Area I was completely uncovered in Squares AE 115–116 and AK 117; the new excavation exposed a very impressive ground plan.



Fig. 1.54 Silo made of clay. Stratum 13, Area I, Squares AG 115–116, Context 1922 (Source: BAI/GPIA).

⁴⁷ Vriezen 2002a, 18 f.; Vriezen 2003, 13 f.; Dijkstra et al. 2005a, 5–26.

A new excavation area in the south of the tall (Area III) was opened; a Byzantine compound was expected to be found there, associated with a large cistern (10.4 m x 6 m x 5.75 m) which had been uncovered in 2001 (Fig. 1.11; see Chap. 1.2.1.). In the first instance, the current situation of the surface was documented with the help of aerial photographs. A lot of stones with no discernible context were removed from the area.

A test trench was opened (Square X 124; 10 m x 2 m); a paved floor of the building complex with a door way, a door hinge stone (out of context) and a water collecting basin near the door way (*in situ*) were uncovered.

A review of the material found during former seasons was carried out in the dig house in Umm Qēs/Gadara during the season.

1.4.4.14. The Spring 2008 Excavation Season

The spring 2008 season by the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Jerusalem/Amman (GPIA) was undertaken from March 7 to April 14 in Areas I and II.

At the end of the season, Area I comprised 1,025 m² of excavated surface. The youngest stratum of Late Bronze Age habitation (fifteenth to thirteenth century BC; Stratum 14) could be reached in the whole area. Squares AQ 120 and AR 118–120 were newly opened. The impressive Late Bronze Age monumental structures in Area I are distinguished by their excellent state of preservation and the architectural precision.

Also remarkable are the number of finds from the Late Bronze Age temple in the north. Cylinder seals (Fig. 1.55; 3D-model of such as seal App. 3.4 c), scarabs, a miniature silver vessel, several bronze tools (needles, awls, a chisel, daggers) were uncovered, as well as an Egyptian or Egyptianising painted figurine and other figurine fragments. Furthermore, a large number of imported finds from Cyprus, Mycenae and Phoenicia were found.

In one of the courtyard houses in the south, a bottle-shaped and stone-lined pit in the ground was unearthed; the entrance was covered by a meticulously worked,



Fig. 1.55 Cylinder seal from the Late Bronze Age temple in Area I, TZ 010105-001. Dimensions: H 3.3, D (max.) 1.4 (Source: BAI/GPIA).

The Season Participants:

- BAI Wuppertal: J. Berggötz, R. Brock (survey), A. Cassel, A. Gropp, Ch. Höher, N. Karagiannidou, K. Kühne, A. Laderick, P. Leiverkus (survey), W. Luckscheiter, U. Rothe, A. Schwermer (pottery reading), and D. Vieweger (director of project)
- GPIA Amman: J. Häser (director of project)
- GPIA ‘Teaching Course’: W. Auge, A. Basson, M. Heyneck, and M. Rohde
- Scholarship recipients from the Protestant University of Wuppertal: St. Billert, C. Plasche, and B. Stolz

disc-shaped stone with a diameter of approx. 1 m, with a 0.15 m wide hole in its centre; this pit was probably used for storage of grain. It was excavated to a depth of 2.6 m.

Monumental structures were uncovered in the north and south of the excavation area. The northern building had already been excavated in 2007. An impressive staircase, a small part of the courtyard and one more adjacent room to the east were unearthed in the 2008 season.

The house in the south of Area I was excavated further; four well made rooms were totally explored, and parts of two additional ones were exposed. The solid architecture indicates both an important function of the complex and an important owner of the house.

The large number of glass beads that have been found, together with raw glass lenses and the appropriate industrial pottery vessels, suggest that glass objects were manufactured on Tall Zirā‘a in the Late Bronze Age.

As the whole of Area II had been excavated in the 2007 season, the excavation area was extended by Squares AT–AU 128–133, AV–AW 132–133 and AX 132; the



Fig. 1.56 Byzantine/Umayyad building. Stratum 4 and 3, Area II, Square AT 128, Context 10571 (Source: BAI/GPIA).

Area II now covered a total of 825 m². As in previous years, the research of the Byzantine and Umayyad periods continued. The aim of this season for Area II was to continue excavating the large Byzantine building which had formed the basis of work here for the last two years (*Fig. 1.57*).

The southern extension was comprised of three rooms and two courtyards, which were attached to southern walls of the structure. Two occupation levels were identified, both dated to the Byzantine period. Two complete amphorae, with two others which were almost intact, were found in the debris inside the rooms (*Fig. 1.56*). A tabun and two small cooking stoves were uncovered in the upper level in the northernmost room. The well preserved entrances to the rooms also belong to this level; these entrances were blocked at the end of the occupation. A tabun and a storage basin were found in the lower level in the northernmost room. In the room south of it, a floor surface of lime plaster was uncovered. Finally, a large stove was found in the eastern room, and another in one of the courtyards.

The easternmost extension of the large Byzantine building complex could be verified in the Squares AV 132 and AW 132. In these same squares, the eastern extension of a very wide wall of earlier date could be found. However, in Square AV 133 all walls broke off, due to the slope.

The Season Participants:

- BAI Wuppertal: W. Auge (archaeometry), F. Bachmann (square leader), A. Cassel, S. Dillmann (pottery reading), C. Fischer, Y. Gönster (square leader), K. Graffunder, A. Gropp (square leader), F. Kenkel (pottery reading), R. König (square leader), A. Laderick, A. Laube, P. Leiverkus (photogrammetry, survey), C. Mandanici (photography), A. Meyer, B. Neusüß, A. Piller,



Fig. 1.57 Aerial photograph of Area II. Photograph taken in spring 2008 (Source: BAI/GPIA).

A. Quentmeier, A. Schomberg (square leader), R. Schreiber, B. Schröder (smallfind documentation), A. Schürmann, U. Schwerer, H. Steinmetz, A. Straßburger, D. Vieweger (director of project), and A. Wigger-Löffler

- GPIA Amman: J. Häser (director of project)
- Volunteers, Thomas Morus Academy, Bensberg: (March 18 to 30): E. Barkowsky, R. Breitwieser, D. Dahm, H. Franz, B. Grote, R. Grote-Dhom, H. Gerstner, G. Haag, S. Hämke, H. Himmel, H. Hofschulte, G. Hofschulte-Fabian, H.-M. Jakubik, I. Kaul, T. Kuczera-Schwarz, W. Lanquillon, N. Laschinger, J. Luijendijk, G. Lüscher, L. Mathieu, V. Püttbach, Ch. Schultheis, J. Soika (head of volunteers), J. Tinz, H.-U. Uehlecke, E. Unkrig, M. Vogt-Werling, B. Weber, and Th. Weber
- 10–15 local workers

1.4.4.15. The Summer 2008 Excavation Season



Fig. 1.58 Visit of Her Royal Highness Princess Sumaya bint al-Hassan at GPIA Amman in summer 2008 (Source: BAI/GPIA).

The summer 2008 excavation season was conducted from July 19 to August 2 by the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Amman/Jerusalem (GPIA) within a 'Teaching Course' held by the GPIA. Two weeks were reserved for the processing of finds from previous seasons, and two further weeks for the excavation on the tall. On July 16, D. Vieweger and J. Häser presented the 'Department of Antiquities of Jordan' (DoA) 250 restored objects found on Tall Zirā'a. The ceremony was attended by H. R. H. Princess Sumaya bint al-Hassan, H. E. Dr F. al-Khraysheh (Director General of the Department of Antiquities), H. E. Dr F. Nimri (Director of the Jordan National Museum), H. E. Dr J. Heidorn (German ambassador), colleagues from Jordanian and international archaeological institutions along with members of the Jordanian and German press (*Fig. 1.58*).



Fig. 1.59 Excavation in Area III. Summer 2008 (Source: BAI/GPIA).

An Iron Age I silo (Stratum 13) located in Square AE 116 was removed; a ‘window-pot’ used as a small shrine was discovered inside (Fig. 1.60). Another stone silo (Fig. 1.62), probably used to store grain, was uncovered in the Late Bronze Age stratum (Stratum 14) when removing the occupation layer from the courtyard (Squares AF–AG 116); a well made mace head and an Egyptian faience figurine were the most remarkable finds (TZ 012657-001). The figurine, which was broken into two parts is shaped as an Uschebti (Fig. 1.61; 3D-model: *App. 3.4 b*).

The summer 2008 excavation focused on the new Area III, located in the southern part of the tall plateau. This is the highest point of the plateau, and a large number of stones and wall structures are discernable on the surface. In total 24 squares were opened in Area III: Squares U–X 123–128; a total of 600 m² on which a Byzantine complex could be excavated area-wide (except for the Squares U–V 127–128).

A large courtyard (c. 12 m x 12 m) was exposed, with a gateway comprising of finely dressed stones; there was a hole in the threshold stone, for the locking mechanism. Opposite the gate, across an alleyway, a large wall (preserved to c. 1 m height) was revealed, with a long, low bank attached to the southside. A damaged mosaic was



Fig. 1.60 Small shrine, TZ 005552-010. Dimensions: H 23.5, D (max.) 21.5 (Source: BAI/GPIA).

uncovered in the middle of the courtyard; a large roundel of coloured stones (red, black and white) was embedded into a thick, white plaster floor surface (Fig. 1.84). The opening of a large underground barrel-vaulted cistern was uncovered to the east of the courtyard. A basin and a channel leading into the cistern from the north was placed into the mosaic floor.

The Byzantine wall structures were later reused and new, more irregularly-built walls added, thus creating a number of smaller units. These new structures may belong to either the Umayyad and/or Abbasid periods. The new walls are mainly of fieldstones. In Squares U 123–125 and V 123–125 earlier walls had been leveled and used as flagstones for a large, well-paved courtyard. In Squares W 124–125 and X 124–125 (to the north) a wall dated to either the Umayyad or the Abbasid period was built inside the large Byzantine courtyard.

In Squares W 127–128 and X 127–128 an Umayyad complex was revealed; the walls are preserved to a height of over 1 m, and the remains of finely built doorways with threshold stones came to light. In the interior of the complex, one of the rooms was filled with charcoal and ash, and the remains of nails, hinges and handles from a well-built door were found. The courtyard of the complex was used over a long period of time; various floor surfaces were revealed, each with a tabun oven embedded into the floor. In the north-easternmost room of the excavation area, a well-preserved olive press was uncovered, consisting of a segmented stones, bordered by a thin wall on the outside. There was a square opening in the middle of the stone wheel hub for the structure which had supported the arm of the press. The press at this point is c. 0.40 m high above the floor surface; however, the bottom has not yet been reached. Further study is necessary to reveal the chronological connection between this complex and the courtyard complex further to the west, which is situated higher up the slope and still divided by a large, multi-phased wall.

The excavation of the shallow stone structures, which had been visible on the surface, are dating to the Mamluk period or later.



Fig. 1.61 Uschebti figurine made of faience, TZ 012657-001. Dimensions: L 8. 3D-model: *App. 3.4 b* (Source: BAI/GPIA).

The Season Participants:

- BAI Wuppertal: A. Cassel, Y. Gönster, F. Kenkel (pottery reading), A. Laderick, P. Leiverkus (survey), A. Quentmeier, Th. Schierl, A. Schwermer (pottery reading), and D. Vieweger (director of project)
- GPIA Amman: J. Häser (director of project)
- GPIA 'Teaching Course': K. Gies
- Scholarship recipients from the Protestant University of Wuppertal: L. Grimm and N. Oebbecke
- University Lecturer and Students from the University of Edinburgh: C. Branagan Allen, U. Rothe (head of excavation), and B. Sherry
- M. Werling, together with 10 students from the Fachhochschule Köln, Fachbereich Bau-

geschichte und Bauen im historischen Kontext

- 15 local workers



Fig. 1.62 Stonelined pit. Stratum 14, Area I, Square AG 116, Context 3701 (Source: BAI/GPIA).

1.4.4.16. The Spring 2009 Excavation Season

The spring 2009 season was conducted by the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Jerusalem/Amman (GPIA), and took place from March 2 to April 16. Excavations were carried out in Area I and Area II.

The Late Bronze Age city of Stratum 14 had been exposed over approx. 1,000 m² of Area I in 2008. An impressive city groundplan was uncovered 22.9 m below sea level. So far, excavations had revealed several courtyard houses, two particularly large house complexes (not yet excavated in their entirety), a casemate wall and a tower with a sanctuary. In order to clarify the earlier architecture of this area, the focus in 2009 was to remove and excavate the central part, which was protected by the casemate wall, and to uncover the next level.

In doing so, the long process of uncovering the stratigraphy of the tall, which in the coming years will lead to the fourth millennium BC (the Early Bronze Age), was continued. Terraced excavation on the western slope of Area I has enabled the heights of the various levels to

be measured (cf. the measuring point of Umayyad level at 17.04 m below sea level): the oldest Late Bronze Age level is c. 24.5 m below sea level, the three Middle Bronze Age levels are c. 25.4 m below sea level, 26.05 m below sea level and 26.35 m below sea level respectively, and a 3 m thick Early Bronze Age fortification was uncovered 31.2 m below sea level.

A water channel and the inner side of slope fortifications were already visible under the more recent Late Bronze Age casemate wall that was removed this spring. These structures were not, as previously assumed, part of a cohesive Late Bronze Age urban building complex, but rather the final phase of an elaborate renovation of the fortification structure in the western part of the city. Initially, only a cobbled area approx. 8 m wide was visible inside the channel that led from one of the two very large house complexes to the downward drain. The cobblestones overlay six consecutive layers of rubble, with a total thickness of 2.5 m, which had been carefully stabilised and compacted, then each of them covered with horizontal paving. On the slope side, the pavings were

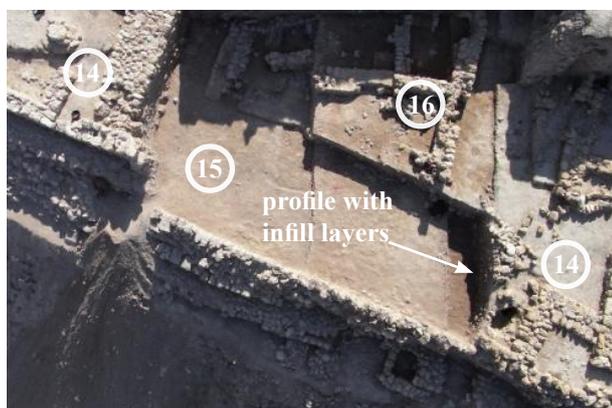


Fig. 1.63 The big Nothing—layers of rubble under the casemate wall. Remains of Strata 16, 15 and 14 (Source: BAI/GPIA).



Fig. 1.64 Rubble and paving layers in the profil; on the top centre: remains of Strata 15 and 14 (Source: BAI/GPIA).



Fig. 1.65 Aerial photograph of Area II. Photograph taken in spring 2009 (Source: BAI/GPIA).

bordered by a wall (Fig. 1.64). However, because more than 75 % of the finds in these rubble layers consisted of Early Bronze Age pottery sherds, it appears that debris was brought up from the foot of the tall and used in the elaborate foundation work for the Late Bronze Age city.

The high wall at the slope was successively reinforced by layers of rubble from behind. Finds such as a tabun, which was found in one of the paving layers in this structure, indicate that there were probably long time intervals (perhaps the changing of the seasons) between the construction of the various layers, which enabled the top layer to compact and as such be strong enough to support the next layer. Some of the paving layers were linked to minor architectural and functional features which we were unable to interpret.

A major landslide that affected a large area at a distance from the northern edge of Area I during the second construction phase of the Late Bronze Age city was probably caused by an earthquake or flood; there was no indication of manmade destruction, such as a siege. Maybe it was a combination with a collapse of underground caves as they are typical for the natural sinter-hill Tall Zirā'a. The remains of the Late Bronze Age strata were, however, recoverable in the eastern part of Area I, and indicate the severity of the catastrophe; destroyed walls, uprooted paving, and rooms that had fallen down the slope. A similar phenomenon occurred on the eastern side of the tall (Fig. 1.68).

The enormous reconstruction effort described further above suggests that ownership of the building-ground did not change; the latest stratum excavated up until 2008 was built on two exterior walls that had survived the

landslide, and consisted of a courtyard house in the same place with a very similar ground plan to its predecessor, including a tabun in the same room.

A section of an elaborately constructed large house complex (Stratum 14) with well built foundations had been uncovered in the northern part of Area I during the spring 2007 season; this was investigated further in 2009, with the intention of excavating it entirely. To this purpose, Squares AP 120–123, AQ–AR 121–123, AS–AT 119–123 were opened.

In the north-eastern part of Area I, comparable to the nearby part of Area II, several strata with residential debris from the Hellenistic, Roman and Byzantine periods were uncovered. It became clear that this housing development was associated with the remains of the same periods in Area II, and conceivably extended from the hills there to the spring. This residential area reached the outermost north-eastern edge of Area I.

To this date a Umayyad house, together with Byzantine and Roman settlements, all of which contained rich finds, have been uncovered. Also remarkable is the fact that, in the north-eastern area, the Hellenistic stratum has not only pits, which are common for this period in Area I outside the settlement, but also domestic structures.

The 2009 spring season also uncovered four well-built, stone-lined silos from the Iron Age to the Hellenistic period outside the habitation area.

During this year's season, the earliest construction phase of Iron Age II was reached in the northern part of Area I; the remains of the city wall and several well-preserved ovens were found. However, the actual floor level was reached only in some areas, not all. Two almost



Fig. 1.66 Iron Age II kiln. Stratum 10, Area I, Square AT 121, Context 4100 left and Context 4133 right (Source: BAI/ GPIA).

complete ovens/kilns, constructed with many layers of insulation, were examined in more detail, and material samples were taken for archaeometric analysis (Fig. 1.66). Eight ovens (tabun) were found. The ash fill from two of the ovens contained multi-handled pots; this style is also unusual. The fill was also collected for archaeometric analysis.

Particularly noteworthy Area I finds from this season are jewellery items: e.g. beads made of glass and other materials. Several faience and metal finds, another cylinder seal, and a coin were also discovered.

Although the northern and eastern limitations of the building complex in Area II had been defined in 2008, the southern and western limitations were still unknown. Therefore, the excavation area was extended by the Squares AR 132–134, AS 126–134, AT–AU 126–127 and 134, AV–AX 126–127 (Fig. 1.67) and AY 127; the excavation area now extended over an area of 1,500 m².

It became apparent that the building had a large, irregularly shaped courtyard in the west; another structure was built inside it during the Umayyad period. Umayyad modifications were also uncovered to the east.

As the walls of the Byzantine period building complex were being removed, wall remains from the Roman period were uncovered. Although these were quite damaged, it was clear they belonged to different construction phases. Furthermore, it became apparent that the broad east-west oriented wall which had been uncovered in the previous seasons lay underneath the Roman structures, and must therefore derive from an earlier period; the ceramic finds point to a Hellenistic date. The wall extended to the western edge of the excavation area, but did not terminate. As it does not reappear in Area I, it is presumed that it is either interrupted, or turns to follow another direction.



Fig. 1.67 Part of Byzantine building. Strata 4 and 3, Area II, Square AX 127 (Source: BAI/ GPIA).

The Season Participants:

- BAI Wuppertal: W. Auge (archaeometry), F. Bartenstein (square leader), A. Cassel, T. Floerkemeier (smallfind registration), D. Fricke, E. Fricke, E. Gitt, Y. Gönster (square leader), A. Gropp (square leader), H.-M. Jakubik, I. Kaul, F. Kenkel (pottery reading), A. Laderick, P. Leiverkus (photogrammetry, survey), M. Lehmann (square leader), B. Neusüß, S. Olschok (square leader), A. Quentmeier, A. Schomberg (square leader), R. Schreiber, B. Schröder (square leader), Ch. Schultheis, A. Schwermer (pottery reading), C. Siebenhaar, K. Soennecken (square leader), H. Steinmetz, A. Straßburger, M. Strehl, D. Vieweger (director of project), M. Voigt-Werling (architect), and A. Wigger-Löffler
- GPIA Amman: J. Häser (director of project)
- Volunteers, Thomas Morus Academy, Bensberg: (March 29 to April 9): Th. Hettlage, L. Kluß, E. Langendörfer, V. Schipanski, R. Surmann, J. Temsch, H.-U. Uehlecke, J. Uehlecke, E. Unkrig, J. Soika (head of volunteers), J. Voss, T. Wieck, and I. Zürrer
- 20 local workers



Fig. 1.68 Tall Zirā'a. Landslide on the east side. Photograph taken in 2009 (Source: BAI/ GPIA).

1.4.4.17. The Summer 2009 Excavation and Survey Season

The first survey season in the Wādī al-‘Arab was conducted from July 28 to August 15, 2009 (Fig. 1.69; Chap. 3.6.1.).

With the knowledge of the previous surveys⁴⁸ and the target of a hinterland survey in mind, the chosen approach was two-fold: firstly, to revisit the known sites in order to enrich current knowledge, and secondly, to fill gaps in knowledge by surveying areas that had not been surveyed before.

In total 78 sites were recorded in this season; 30 of them have not been published, and may not have been known before. Most of them relate to the Roman and Byzantine periods; the others were used in the Bronze Age, Iron Age or at some point in the Islamic period. No lithic sites were discovered.

The large Tall Qāq (Ḥirbet Bond) and Tall Kinīse (Ra‘ān) were revisited. The area around the Wādī al-‘Arab Dam was also covered. Additionally, the upward slopes of the Wādī al-‘Arab from Tall Zirā‘a to the region of Ṣēdūr and Dōqara were surveyed. Higher up in the Wādī al-‘Arab from Tall Zirā‘a, five penstock mills were recorded, together with two dams (Figs. 1.37 and 3.55).

A short excavation season was executed on Tall Zirā‘a from July 28 to August 4, 2009 in Squares AN 116–117 and AO 117–118 of Area I. The soil and stone layers were excavated from the compacted rubble stratum found during the excavation in 2008. This stratum was built up after a catastrophic landslide for constructing the new settlement in the late sixteenth/early fifteenth century BC. After 3 m, the end of these layers has not been reached yet.

The Season Participants:

- BAI Wuppertal: K. Adam, W. Auge, E. Brückelmann (draftsman), A. Cassel, A. Gropp, F.

1.4.4.18. The Spring 2010 Excavation Season

The excavation of the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Jerusalem/Amman (GPIA) from February 22 to April 14, 2010 concentrated on the north-eastern living complexes of Area I.

Significant insights were gained from excavation of the six Classical (Hellenistic, Roman and Byzantine) layers in this section. Large storage silos were uncovered in Area I; these were dated to the Iron Age and the Hellenistic period. The excavation also determined the association with the adjacent buildings of Area II, where

Kenkel (pottery reading), A. Laderick, P. Leiverkus (survey), A. Quentmeier, B. Schröder, A. Schürmann, A. Schwermer (pottery reading), K. Soennecken (survey), and D. Vieweger (director of project)

- GPIA Amman: J. Häser (director of project)
- Bergische University of Wuppertal, Department of Printing and Media Technology: G. Bülow and J. Große-Frericks
- GPIA ‘Teaching Course’: D. Fricke, E. Fricke, and P. Voß
- 5 local workers



Fig. 1.69 Landscape of Wādī al-‘Arab. View to the north. Photograph taken in 2003 (Source: BAI/GPIA).

these layers had already been comprehensively investigated. The northern part of the tall (Area II) was the nucleus of the Hellenistic and Roman period habitation; the north-eastern part of Area I is thus the south-western section of this nucleus. Only in the very prosperous Byzantine period did the settlement spread out beyond this nucleus to cover the whole tall plateau (including Areas I and III).

Area I also provided particularly suitable conditions for craftsmen. Further structures in the residential areas, which were associated with workshop installations, were

48 The Wādī al-‘Arab has been surveyed several times before: cf. Glueck 1951a, 182; Mittmann 1970; Hanbury-Tenison et al. 1984, 385–424 (text), 494–496 (plates).

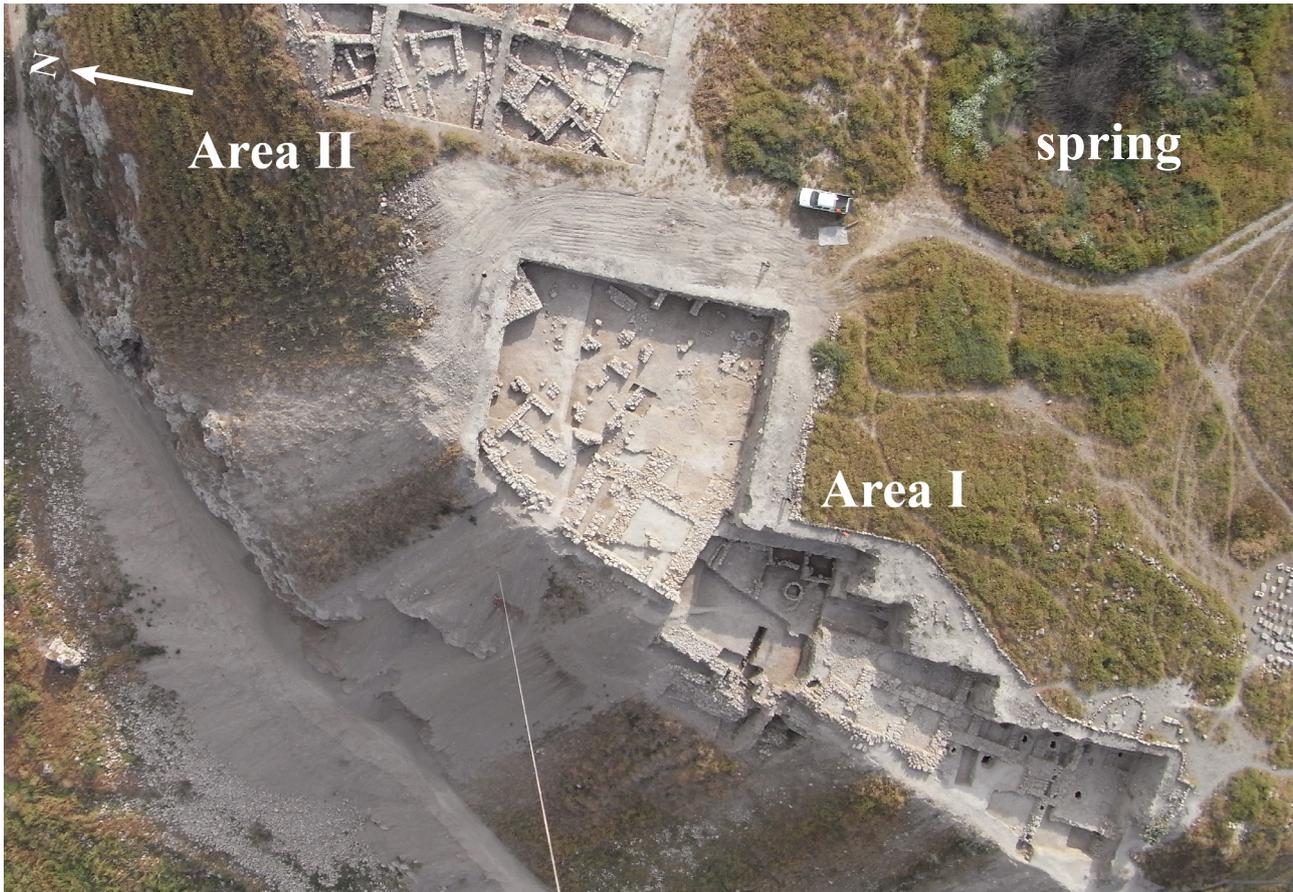


Fig. 1.70 Aerial photograph of Area I and a part of Area II. Photograph taken in spring 2010 (Source: BAI/GPIA).

uncovered. The finds from this area provided spectacular insights into glass, faience, quartz frit, and metal production or processing on the tall.

The Late Iron Age IIA/B strata in the northern part of Area I were partially disturbed by later Hellenistic and Roman activities (wall foundations, grain silos and pits). The underlying Iron Age I structures were far better preserved. Within one of these houses a hearth, associated with a variety of precisely fashioned flint tools, suitable for diverse functions, was uncovered. Altars, cultic stones (*mazzebot*) and a flat divided ceramic basin with a round outlet point to a ritual context (Figs. 1.72; 3.41 and 3.42). Several parts of a faience box, a faience knob and a complete cylinder seal of quartz frit, besides raw glass and slag, indicate that this room was a workshop.

The deep trench that had been started the year before in the middle part of Area I was continued; terraced infill layers to stabilise the terrain following a landslide were uncovered. The slope in this area had been repaired in the Late Bronze Age with many layers of stones and soil; more than ten layers were uncovered in 2010. The more central part of Area I which had not been affected by the landslide provided an opportunity to track the

continuous transition of the settlement sequence until the Middle Bronze Age. Particularly important here was the discovery of a furnace, constructed in the Middle Bronze Age and continued to be used into the Late Bronze Age (Fig. 1.37).



Fig. 1.71 Late Bronze Age water channel and grain silo. Stratum 14, Area I, Squares AG–AH 115–116 (Source: BAI/GPIA).



Fig. 1.72 ‘Ceramic basket’, TZ 006835-016 with a *mazzebe* (a cultic stone, TZ 310339-001). Stratum 13, Area I, Square AP 120, Context 4852 (Source: BAI/ GPIA).

One of the Middle Bronze Age layers also yielded a crucible containing several bronze fragments.

In the southern part of Area I, all habitation phases until the catastrophic landslide around 1500 BC were uncovered. Of particular importance are the various installations built to drain water out of the city. This seems to have been an important consideration on the tall, not only because of the artesian spring in the centre, but also due to heavy rain which typically falls in the winter. Three stonelined vertical channels at the edge of the slope were excavated to a length of 2 m, while a large stormwater shaft with an impressive drainage capacity was excavated to a length of 10 m (Fig. 1.71). The latter was particularly well made; stonelined, it was covered at the top and displayed openings (entrances) that had been dug in order to clean and repair it underground.

In the southern part of Area I, the Late Bronze Age city had seven subterranean grain silos lined with stones

1.4.4.19. The Summer 2010 Excavation and Survey Season

The 2010 season was conducted between July 18 and August 9 in Squares AL–AM 118, AO 118, and AM–AO 119 of Area I. Three strata of the Middle Bronze Age settlement were uncovered. Evidence of copper processing was discovered in some of the squares (Fig. 1.73). At the end of the excavation, a stratum with archaeological remains of the transition from Early to Middle Bronze Age was uncovered.

A survey of the Wādī al-‘Arab and its vicinity was conducted by the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute for Archaeology Amman/Jerusalem (GPIA) from July 17 to August 9, 2010 (Chap. 3.6.1.).

This season in all 57 sites were recorded. The survey covered the area from the village of Dōqara in the west up to the vicinity of Irbid in the east.

that were covered with large, round stone lids. They were 2.6–3.3 m deep, with compacted clay floors (Fig. 1.71). Their dimensions and elaboration are a good indication of the wealth of the tall’s population at this time.

The Season Participants

- BAI Wuppertal: W. Auge (archaeometry), M. Biehl, A. Cassel, H. Diekmann, A. Eigenfeld, S. Fröse, K. Gilles, A. Gropp (square leader), U. Haase (square leader), St. Hoss (smallfind documentation), H.-M. Jakubik, J. Kirschfink, Ch. Köhler, F. Kenkel (pottery reading), E. Kralli, A. Laderick, P. Leiverkus (photogrammetry, survey), J. Molitor (smallfind documentation), B. Neusüß, A. Penninger, St. Raubach (pottery reading), A. Röder (square leader), P. Schaller (photography), R. Schreiber, S. Schütz (square leader), A. Schwermer (pottery reading), K. Soenneken (square leader), H. Steinmetz, A. Straßburger, M. Strehl, D. Vieweger (director of project), M. Voigt-Werling (architect), K. Weber (square leader), and V. Wissner
- GPIA Amman: J. Häser (director of project)
- Volunteers, Thomas Morus Academy, Bensberg: (March 26 to April 5): U. Fahr, H. Koppe, J. Krings, E. Krüger, H.-J. Krüger, J. Listemann, E. Mathias, R. Mathias-Pauer, P. Mundy, J. Nitschke, U. Parnow, H. Raber, B. Ruberg, B. Schneider, A. Schwegler, J. Soika (head of volunteers), St. Steenken, R. Surmann, H. Taffinski, J. Tinz, J. Ucher, H.-U. Uehlecke, Th. Ultsch, F. van Bernem, U. van Bernem, F. Vogel, J. Weisbrich, and H. Wieseler
- 20 local workers



Fig. 1.73 Middle Bronze Age furnace. Stratum 15, Area I, Square AM 119 (Source: BAI/ GPIA).

The Season Participants:

- BAI Wuppertal: W. Auge (archaeometry), T. Bühler, A. Cassel, A. Gropp, I. Holzmann, F. Kenkel (pottery reading), S. Kraushaar, A. Laderick, P. Leiverkus (survey), A. Quentmeier,

B. Schröder, M. Schulze (archaeometry), A. Schürmann, A. Schwermer (pottery reading), K. Soennecken (survey), and D. Vieweger (director of project)

- GPIA Amman: J. Häser (director of project)

1.4.4.20. The Spring 2011 Excavation Season

The seven-week excavation season of the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute Jerusalem/Amman (GPIA) took place from March 6 to April 25, 2011; the work focused on Area I in the north-west and Area II in the north of the tall.

Three different parts of Area I were excavated in 2011. The first part is in the centre of Area I; it is the part in the east of Area I which was not affected by the landslide around 1500 BC and therefore where architectural features of older structures remained. Two strata of the Early Bronze Age IV/Middle Bronze Age I transitional period were uncovered here; two levels with ephemeral remains of habitation from this period were excavated. The remains consisted of many pits, fireplaces, occupational floors, and some faint indications of stone walls. The finds imply that this area was used for residential activities such as cooking, grinding and storage. Underneath the scattered phases, a new occupational layer with real house structures from the Early Bronze Age III was reached.

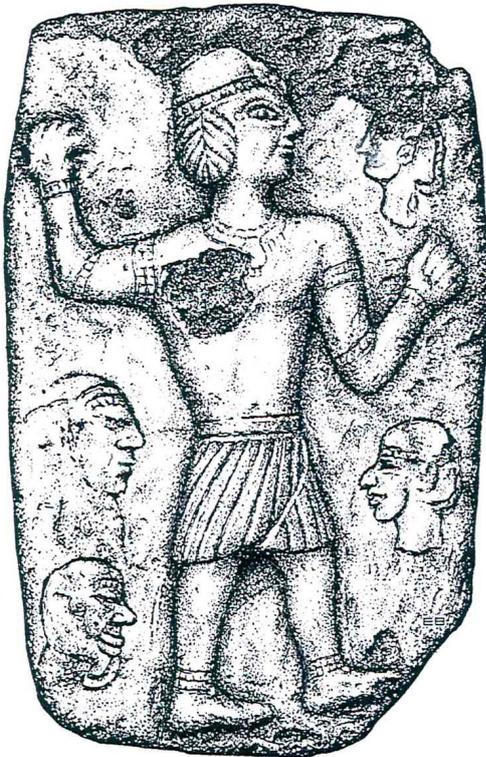


Fig. 1.74 Early Iron Age votive plate with the representation of a king, TZ 018181-001. Dimensions: W 12.5, H 19.1 (Source: BAI/ GPIA).

The second part of the Area I excavation was located on the western slope. During the 2010 season, a straight channel had been found, which ran from the final Late Bronze Age level straight down through the city wall (which cuts the slope here) and a glacis, which were both built in the Early Bronze Age (Fig. 1.76). This season, the relationship between the wall, the glacis and the channel was further examined, and the end of the channel was reached; thus the course of the channel from beginning to end could be ascertained and a Late Bronze Age date of the channel could be proved.

The third part of the excavation in Area I explored the extension of the northern area, which was opened in 2007. In the southern part of this area, a large Late Bronze Age building with a pebble paved courtyard had been excavated in 2010. The 2011 excavation revealed that the courtyard was bordered on the east side by a line of four rooms (Fig. 1.77). The northern limit was made by a thick wall. However, only the foundation trench of this wall could be determined by the edge of the court-

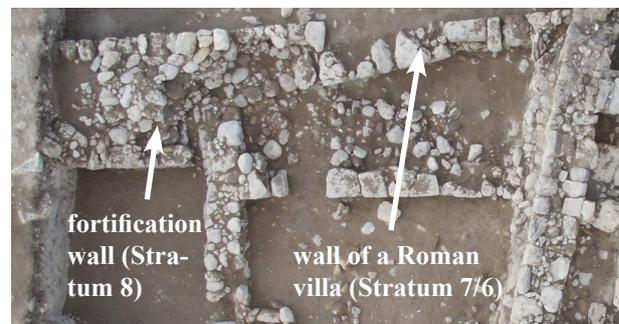


Fig. 1.75 Hellenistic and roman structures. Stratum 8 and 7/6, Area II, Squares AU–AT 126–127 (Source: BAI/ GPIA).

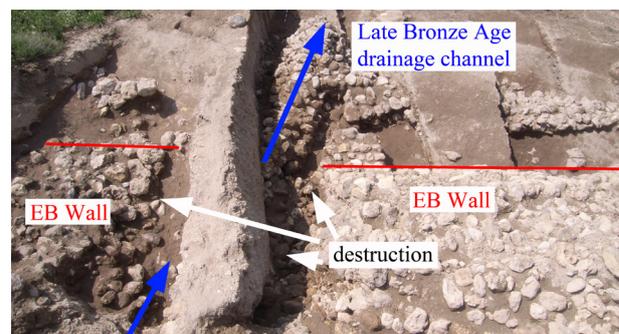


Fig. 1.76 Late Bronze Age channel (Strata 15 and 14) running through the Early Bronze Age city wall (Stratum 25) (Source: BAI/GPIA).

yard pavement on one side, and the edge of the foundation trench on the other; the stones of the original wall had been completely robbed by the inhabitants of the Iron Age I settlement and its associated building activities.

North of the large building with its courtyard and adjoining eastern rooms, walls of different houses of the Iron Age I occupational phase were excavated.

Underneath the Iron Age I stratum, a Late Bronze Age stratum was uncovered; however, for the most part, stone foundations only, from several rooms, were found. The remains of mud brick walls covered with lime plaster were uncovered in only a few places.

An exceptional find from the Iron Age I stratum (Stratum 13) in this area is a ceramic votive plate which depicts a king in a relief (Fig. 1.74). He is surrounded by four heads scratched into the clay (and additionally one head on the back side). Maybe they represent the defeated enemies.

No new squares were opened in Area II during the 2011 season. The focus of the work was to clarify the stratigraphic relationship of the wall structures from the Hellenistic, Roman, Byzantine, Umayyad and Mamluk periods.

During this campaign, the development of the Byzantine building complex could be revealed.

In the following Umayyad period, the Byzantine building structures continued to be used, but modified. Also new houses were built which were placed at those spaces previously unbuilt before, i.e. inside the large western courtyard and at the north-eastern flank of the hill.

While the Byzantine period walls were being dismantled, additional wall remains were uncovered; two strata were identified, both dated to the Roman period (Strata 7 and 6). Since the Roman architecture was almost completely leveled before the construction of the Byzantine

building, the traces of the Roman period were very hard to identify.

South of the wide Hellenistic wall, further faint remains of walls belonging to the same period could be identified. They were severely damaged by the levelling of the area before constructing the Roman building (Fig. 1.75).

The Season Participants:

- BAI Wuppertal: W. Auge (archaeometry), T. Aukes, G. Bongartz (aerial photogrammetry), A. Cassel, L. Erlacher, Th. Graichen, A. Gropp (square leader), S. Hämke, H.-M. Jakubik (square leader), F. Kenkel (pottery reading), Y. Kunisch (square leader), A. Laderick, P. Leiverkus (photogrammetry, survey), M. Lehmann (square leader), J. Molitor, B. Neusüß, S. Olschok (square leader), A. Penninger, K. Riegel, P. Schaller (photography), R. Schreiber, S. Schütz (square leader), A. Schwermer (pottery reading), D. So, K. Soenneken (square leader), H. Steinmetz, A. Straßburger, M. Strehl, C. Thielen, J. Ucher, Th. Ultsch, D. Vieweger (director of project), F.-J. Vogel, M. Voigt-Werling (architect), and Th. Wieck
- GPIA Amman: J. Häser (director of project)
- Volunteers, Thomas Morus Academy, Bensberg: (March 27 to April 13). B. Abitz, E. Bilgram, D. Dreschmeier, U. Fahr, B. Henrich, R. Henrich, M. Kirsch, M. Knaden, M. Krämer, W. Lanquillon, P. Neubert, D. Popp, H. Raber, B. Ruberg, B. Schneider, E. Schneider, G. Schneider, H.-P. Schulz, A. Schwegler, J. Soika (head of volunteers), R. Surmann, J. Tinz, H.-U. Uehlecke, E. Unkrig, J. Weisbrich, J. Wendt, M. Werring, H.-J. Zeuch, and I. Zürrer

1.4.4.21. The Summer 2011 Excavation and Survey Season

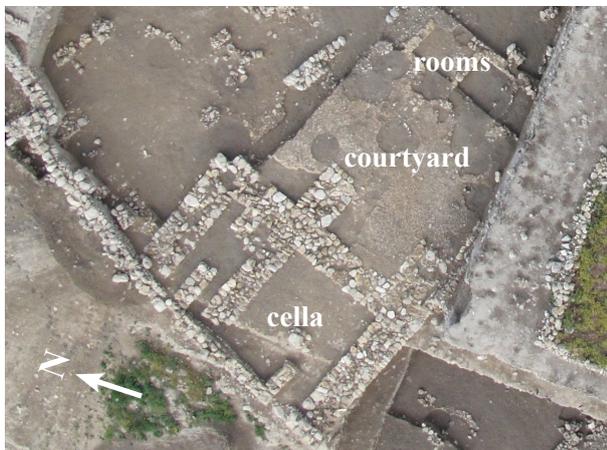


Fig. 1.77 Temple. Stratum 14, Area I, Squares AP 118–122 and AS 119–122. Photograph taken in summer 2011 (Source: BAI/GPIA).

The three-week excavation of the Biblical Archaeological Institute Wuppertal (BAI) and the German Protestant Institute of Archaeology Jerusalem/Amman (GPIA) was carried out from July 7 to 27, 2011, and focused on Areas I and II. The third season of the Wādī al-‘Arab Survey was conducted parallel with the excavation.

Excavation in the centre of Area I explored a well-constructed domestic building in the habitation areas of the Early Bronze Age II/III and III.

In the northern part of Area I, two separate Middle/Late Bronze Age occupation strata (Strata 14 and 13) close to the previously excavated large Late Bronze Age temple with a pebble paved courtyard were exposed (Fig. 1.77); these strata proved the association between the city walls and the Late Bronze Age buildings (Strata 17 and 16).

The previously excavated building structures in Area II were cleared, and some baulks were removed. Additional work attempted to remove as many of the walls from the Byzantine and Roman periods as possible, in order to explore the earlier strata below.

The immediate hinterland of Tall Zirā'a (Zone A) was completely examined during the third season of the survey and extended to include the wide upper Wādī al-'Arab region (Zone B) (Fig. 3.61). 201 sites and installations are now located on the map, including all sites found in previous surveys (Chap. 3.6.1.).

The Season Participants:

- BAI Wuppertal: F. Bartenstein (square leader), A. Cassel, A. Gropp (square leader), F. Kenkel (pottery reading), A. Laderick, M. Lehmann (square leader), P. Leiverkus (survey), C. Pogoda, P. Schaller, M. Schulze (archaeometry), A. Schwermer (pottery reading), K. Soenneken (survey), and D. Vieweger (director of project)
- GPIA Amman: J. Häser (director of project)
- 10 local workers

1.4.4.22. The Summer 2012 Study Season

The finds and contexts of the excavations on Tall Zirā'a were analysed during a study season in the dig house at Umm Qēs from May 3 to 27, 2012 in order to prepare them for publication.

The ceramic and small finds (glass, faience, metal and stone) were documented in more detail. They were drawn, photographed and organised typologically by specialists.

At the same time, experimental archaeology was conducted for pottery and glass production (Chaps. 3.4. and 3.8.); a quadruple-shelled kiln modeled in the same way as that found in 2009 (Stratum 10, Area I) was constructed under the supervision of W. Auge (Pls. 3.8 and 3.9). It



Fig. 1.80 The modelling of a quadruple-shelled kiln in 2012. See Pls. 3.8 and 3.9 (Source: BAI/ GPIA).



Fig. 1.78 Excavation in summer 2011. Area I, Square AO 118–119 (Source: BAI/ GPIA).



Fig. 1.79 Excavation team. Summer 2011 (Source: BAI/ GPIA).

comprised several clay layers rather than only one, in order to achieve improved thermal insulation (Fig. 1.80).

C. Vogt und R. Lehmann (University of Hannover) joined the team in Umm Qēs during the study season. They organised a close archaeometric cooperation between the 'Gadara Region Project' and the university.

Finally, a 3D-model of Tall Zirā'a was created, based on the aerial maps (Fig. 1.81; Chap. 3.2.3.; App. 3.1).

Some previously located sites in the Wādī al-'Arab and Wādī az-Zaḥar were revisited this season, in order to take photographs and complete the documentation; their

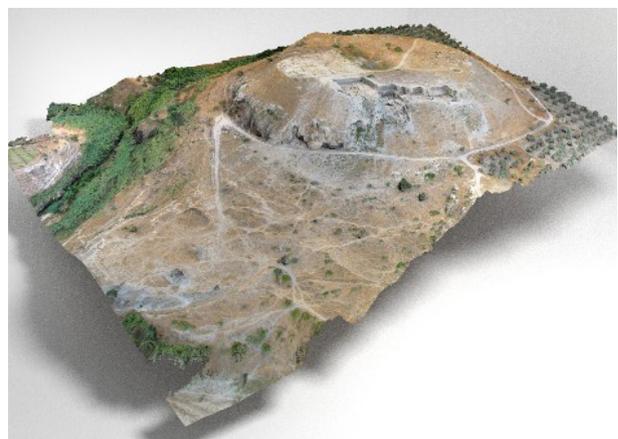


Fig. 1.81 3D-model of Tall Zirā'a. 3D-model: App. 3.1 (Source: BAI/ GPIA).



Fig. 1.82 Team of the 2012 study season (Source: BAI/ GPIA).

1.4.4.23. The Summer 2013 Study Season

A second study season was undertaken in the excavation house of the German Protestant Institute of Archaeology (GPIA) in Umm Qēs from April 29 to May 29, 2013.

The main aim of the season was further documentation of the finds which are stored in the dig house in Umm Qēs.

K. Rassmann and S. Reiter from the ‘Romano-Germanic Commission of the German Archaeological Institute’ in Frankfurt joined the team; they conducted a geomagnetic prospection on Tall Zirā‘a as well as other selected sites located during the Wādī al-‘Arab surveys (*Chap. 3.5.3.*). Furthermore, they took soil samples from different strata for phosphate analyses.

The Season Participants:

- BAI Wuppertal: T. Aukes (experimental archaeology), G. Bongartz (aerial photogrammetry), A. Cassel, J. Jäger, A. Laderick, D. Prüßner, S. Schütz, K. Soennecken, H. Steinmetz, and D. Vieweger (director of project)

1.4.4.24. The Summer 2014 Study and Excavation Season

The third study season took place between April 29 and May 29, 2014 in the dig house of the German Protestant Institute of Archaeology (GPIA) at Umm Qēs.

St. Hoss compiled a catalogue of the glass and metal finds from Tall Zirā‘a as part of the DFG funded publication project.

The ceramic finds from the Middle and Late Bronze Age, as well as those from the Iron Age (Strata 16–11) were studied; additionally the collections of stone vessels and loom weights were examined. Work also focussed on the stratigraphical interpretation of the excavations in Areas I and II.

coordinates were digitally recorded by GPS, and ground measurements determined. Each site was described in detail, and all architectural remains were sketched and photographed.

The Season Participants:

- BAI Wuppertal: W. Auge (archaeometry), G. Bongartz (aerial photography), H. Brückelmann (pottery production), A. Cassel, A. Gropp, St. Hoss (glass and metal documentation), A. Laderick, P. Leiverkus (survey), B. Neusüß, S. Schütz, M. Schulze (archaeometry), A. Schwermer (pottery reading), K. Soennecken (survey), and D. Vieweger (director of project)
- GPIA Jerusalem/Amman: J. Häser (director of project) and J. Oswald

- GPIA Amman/Jerusalem: J. Häser (director of project) and F. Kenkel (pottery reading)
- Romano-Germanic Commission of the German Archaeological Institute Frankfurt: K. Rassmann and S. Reiter (geophysical survey)



Fig. 1.83 Team members of the 2013 study season (Source: BAI/ GPIA).

Chemists from the University of Hannover in Germany continued to study archaeometric questions. Approx. 175 metal artefacts from Tall Zirā‘a were measured using a portable X-ray fluorescence instrument, and the metal quality was determined for the bronze artefacts. Discussion also centred on determining the provenance of the metal sources for these Bronze and Iron Age artefacts. 200 metal and 600 glass samples were collected from Tall Zirā‘a for further investigation in Germany, with the aim to determine the provenance of the raw materials for glass and metal production (*Chap. 3.8.*).

In continuation of the work undertaken in 2013, K. Rassmann and S. Reiter from the 'Romano-Germanic Commission of the German Archaeological Institute Frankfurt' completed the geomagnetic survey on Tall Zirā'a, in order to provide information for the surface layers between Areas I and II, in addition to the area around the artesian spring.

L. Olsvig-Whittaker floated soil samples which were taken from different contexts on Tall Zirā'a for the evaluation of botanical remains (*Chap. 3.7.*).

An excavation focused on the southern part of the tall plateau (Area III), where a significant Byzantine period complex had been explored in 2008, was undertaken from April 29 to May 14. It sought to determine the dimensions of the Byzantine complex, and to investigate any previous structures. Three test trenches were dug in Squares Y 125, Z 125 and AA 125; three occupational strata were determined, dated to the Ottoman, Abbasid/Mamluk and Umayyad periods.

Despite further investigation, the extent of the Byzantine building remains unclear; additionally, any structures which may have existed in earlier strata have been lost, as a result of the huge cistern constructed beneath this building. However, ceramic finds are evidence of the existence of earlier habitation.

A mosaic in the shape of a rondel had been uncovered at the end of the 2008 excavation in Area III. It contains a Greek inscription with some names and a date. The text indicates that the building complex was a monastery (*Fig. 1.84*).

The mosaic could not be recovered in 2008 so the area had been backfilled. Due to the continuous damaging, it was decided to salvage the mosaic and remove it for safety in accordance with the opinion of the 'Department of Antiquities of Jordan' (DoA), who sent A. Bataineh, the Inspector of Antiquities in Irbid, to assess the situation. The mosaic was expertly lifted by the 'Department of Antiquities staff' on May 18, 2014, and taken to Irbid for restoration.

1.4.4.25. The Summer 2015 Study Season

The fourth study season took place from May 16 to June 15, 2015 in the dig house of the German Protestant Institute of Archaeology (GPIA) in Umm Qēs; the work focused on the forthcoming final report of the 'Gadara Region Project'.

Interpretation of the Wādī al-'Arab Survey contexts was continued by K. Soennecken and P. Leiverkus; the pottery from the 2001 Tall Survey were described by F. Kenkel. P. Leiverkus provided geo-referenced maps of all strata excavated on the tall. D. Vieweger worked on catalogues for the stone, metal and glass/faience finds from Strata 25 to 10. J. Häser worked on the stratigraphy of the Byzantine strata in Area I and II. S. zu Löwenstein developed the manuscript layout and the tables to be



Fig. 1.84 Salvage of the mosaic in spring 2014. Stratum 3, Area III, Square X 125, Context 30124 (Source: BAI/ GPIA)

The Season Participants:

- BAI Wuppertal: G. Bongartz (aerial photogrammetry), A. Cassel (excavation), J. Häser (director of project), St. Hoss (glass and metal documentation), A. Laderick (excavation), P. Leiverkus (survey analysis), S. Schütz, K. Soennecken, and D. Vieweger (director of project)
- GPIA Amman/Jerusalem: F. Kenkel (pottery reading), and L. Olsvig-Whittaker (archaeobotany)
- Open University of Manchester and Centre of British Research in the Levant: A. Bongartz, R. Hunsdörfer, and U. Rothe (head of excavation)
- Leibniz University of Hannover: R. Lehmann, and M. Schulze (archaeometry)
- Romano-Germanic Commission of the German Archaeological Institute Frankfurt: K. Rassmann, and S. Reiter (geophysical survey)
- 3 local workers

included. M. Rautenberg digitalised the existing paper drawings for the ceramic finds.

All group members participated in measuring the large cistern in Area III, and contributed to a substantial architectural analysis of this structure.

Season Participants:

- BAI Wuppertal: A. Cassel, J. Häser (director of project), A. Laderick, P. Leiverkus (survey analysis), M. Rautenberg, K. Soennecken, and D. Vieweger (director of project)
- GPIA Amman/Jerusalem: F. Kenkel (pottery reading) and S. zu Löwenstein (editorial work)

1.4.4.26. The Summer 2016 Study Season

The fifth study season took place from May 28 to June 28, 2016 in the dig house of the German Protestant Institute of Archaeology (GPIA) in Umm Qēs; the work focused on the final report of the excavation on Tall Zirā'a in the frame of the 'Gadara Region Project'.

K. Soennecken was working on the stratigraphy and finds of the Late Bronze Age and Iron Age strata. F. Kenkel prepared the texts and plates about the Hellenistic to Umayyad pottery. D. Vieweger worked on catalogues for the stone, metal and glass/faience finds of the Early to Middle Bronze Age and prepared the texts for Volume 2. J. Häser described the finding contexts of the Byzantine and Umayyad strata. B. Schröder typologised the Bronze and Iron Age silex artefacts. S. Schütz scrutinised the finds of the Hellenistic and Roman strata. L. Olsvig-Whittaker continued her work on the habitation mapping of the tall's surrounding. A. Schwermer did the pottery reading of the Early and Middle Bronze Age strata. S. zu Löwenstein was in charge of the editorial work.

At May 29, 2016 members of the team visited the tall and recognised immense destructions on the lower part of the tall's southern slope. A bulldozer created two terracements for an olive grove (Figs. 1.85 and 1.86). This led to serious damages of archaeological layers on this side. Some structures became visible: Fig. 1.87 shows the remains a lime-plastered floor and Fig. 1.88 a wall.



Fig. 1.85 Destruction on the tall's south slope in 2016 (source: BAI/GPIA).



Fig. 1.86 Destruction on the tall's south slope in 2016 (source: BAI/GPIA).



Fig. 1.87 Destruction on the tall's south slope in 2016 with a lime-plastered floor visible (source: BAI/GPIA).



Fig. 1.88 Destruction on the tall's south slope in 2016 with a wall visible (source: BAI/GPIA).

The team made photographs, and collected a lot of archaeological finds for preservation of evidence. They date from the Early Bronze Age to the Islamic periods. After the notification to the 'Department of Antiquities of Jordan' (DoA), a meeting was appointed which took place on June, 20. Dr M. Jamhawi, General Director of the DoA, visited the tall together with employees from Irbid and Umm Qēs. The project's directors, D. Vieweger and J. Häser, showed them the destroyed area and pointed out the specific threat to the Early Bronze Age city wall which runs very close below the surface in this archaeological zone. Noting this danger to the archaeological site, the General Director decided immediately to prevent further bulldozing.

Season Participants:

- BAI Wuppertal: B. Beitz (IT), A. Cassel, J. Häser (director of project), A. Laderick, B. Schröder, S. Schütz, A. Schwermer (pottery reading), K. Soennecken, and D. Vieweger (director of project)
- GPIA Amman/Jerusalem: F. Kenkel (pottery reading), S. zu Löwenstein (editorial work) and L. Olsvig-Whittaker (ground verification for field survey)

1.5. Aims of the 'Gadara Region Project'

In general, the 'Gadara Region Project' explores the way of life, settlement patterns, and cultural changes in the Wādī al-'Arab and its tributary, the Wādī az-Zaḥar, from the beginning of human occupation until today. Additional aims are to answer geological, hydrological, agrarian, and trade policy questions. Therefore, the project as a whole aims at exploring the archaeology of the entire landscape.

Mapping of the archaeological sites, archaeological surveying with the collections of finds, photogrammetry, analysis of satellite imagery as well as geophysics (geomagnetics, georadar and geoelectrics) were employed for the investigation (*Chaps. 3.2., 3.5. and 3.6.1.*). Archaeometric studies on pottery, glass, and metal finds from Tall Zirā'a as well as experiments for the production of pottery and glass were carried out, allowing deeper insight into the technical skills of the inhabitants of Tall Zirā'a over time (*Chap. 3.8.*).

The research therefore focused on the following specific questions:

- (1) *Archaeology of a Landscape:* This includes the exploration of the landscape of the Wādī al-'Arab as well as its tributary, the Wādī az-Zaḥar. The relation between the centre, Tall Zirā'a, and its surroundings are especially interesting. The investigation of agrarian land use, flora and fauna, geology (water, rocks, and soil), trade (roads and infrastructure) and the strategic importance of the valley will result to an better understanding of the historical development of the Tall Zirā'a and its environment.
- (2) *Settlement development:* Tall Zirā'a and the neighboring settlements Tall Qāq (Ḥirbet Bond) and Tall Kinīse (Ra'ān) served as human settlement sites from the Early Bronze Age until the Ottoman period⁴⁹. Therefore, insights into a settlement process of long duration in a relatively isolated, clearly defined geographical area can be expected.
- (3) *Survival strategies:* What survival strategies were developed by the inhabitants over the millennia to adapt to the natural conditions of the valley, and how did they respond to changes in climate and given resources?
- (4) *Trade routes:* The trade route through the Wādī al-'Arab between the Jordan Valley i.e. Tall al-Ḥiṣn (Beth Shean) in the west and the Irbid-Ramtha basin in the east was certainly an important factor for the geopolitical relevance of the valley and the development of the region as a whole (*Fig. 1.22*).
- (5) *Stratigraphy:* Tall Zirā'a is distinguished both by its artesian spring and its privileged location in the fertile and geostrategically important Wādī al-'Arab. Consequently, the continuous stratigraphy from the excavation of Tall Zirā'a will be a useful reference instrument for other sites.
- (6) *Tall Zirā'a/Gadara:* The relationship between the urban centre of Gadara and its environment allows new insights into the development of Gadara in the Classical period. The centre was dependent on its environment. Therefore, it is imperative to explore the regional coexistence between the more rural site Tall Zirā'a and the city Gadara during the Hellenistic, Roman, and Byzantine periods.

The region south of Gadara provides a unique chance to clarify the development of the settlement surroundings in a targeted and extensive way within a naturally confined territory, that is, to explore, especially with regard to Gadara the Pre- and Post-Classical periods in the region of this Decapolis city.

⁴⁹ Isarel or Palestine Grid Reference of Tall Qāq (Ḥirbet Bond): 2128.2233; Isarel or Palestine Grid Reference of Tall Kinīse (Ra'ān): 2191.2271.

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