

ARCHAEOLOGICAL SURVEY OF THE EAST COAST OF THE DEAD SEA PHASE 1: SUWAYMA, AZ-ZĀRA AND UMM SIDRA

by

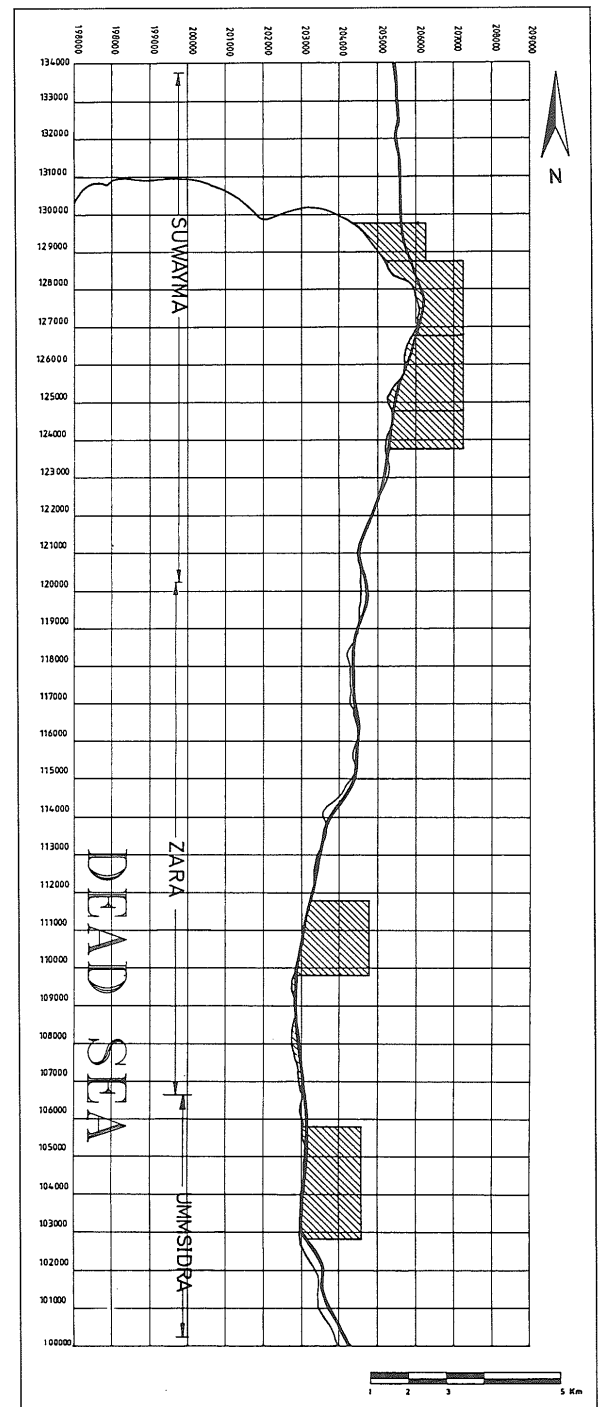
Khairieh 'Amr, Khalil Hamdan, Svend Helms and Luay Mohamadieh

Introduction

A master plan for the touristic development of the east coast of the Dead Sea is currently being prepared by Sigma Consulting Engineers, under contract from the Jordan Valley Authority (Sigma Consulting 1996). Two priority areas at Suwayma and az-Zāra were chosen as sites for development.

Due to the military nature of the area up till almost a year ago, as well as the scarcity of occupation and development activities, much of the northern east coast of the Dead Sea has never been properly surveyed for archaeological remains, with previous surveys concentrating on the areas close to the northern tip of the sea or south of and including Ghawr Ḥaditha (see for example Mallon 1924; Glueck 1945; Rast and Schaub 1974; Ibrahim *et al.* 1976; Raikes 1979; Worschch 1985a, b; King *et al.* 1987; Yassine 1988; MacDonald 1992; Kaliff and Holmgren 1995; Prag *et al.* 1995); the major excavated sites being Tulaylāt al-Ghassūl, az-Zāra, Bāb adh-Dhrā', Numayra, Dayr 'Ayn 'Abāta and an-Naq'. Of these sites, only az-Zāra is in the area covered by this present survey (Strobel and Clamer 1986; Strobel 1989a; b; Clamer 1989).

As part of the Environmental Impact Study of the region, an archaeological survey was conducted at the Suwayma development area on 2-5 and 25 September 1995, by Khairieh 'Amr and Khalil Hamdan, and on 15 and 19 October by Khalil Hamdan and Luay Mohamadieh. The az-Zāra area was surveyed from 6 to 20 September 1995, by Khairieh 'Amr and Khalil Hamdan. The Umm Sidra (South Zara) area was surveyed from 19 to 21 November 1995 by Svend Helms, Khalil Hamdan and Luay Mohamadieh (Fig. 1).



1. Map of the survey areas.

The archaeological survey benefited greatly from the support and cooperation of

the Sigma Consulting Engineers planning team, especially Dr Akram al-Attar and Dr Khaled Momany. The contour survey was carried out by the Modern Surveying Offices (Mohammad Khalil Ahmad) under sub-contract from Sigma.

THE SUWAYMA DEVELOPMENT AREA

The area proposed for development at Suwayma is divided into three sections: the first (northern) section is situated directly to the south of the modern town of Suwayma. It covers 100 dunums to the east of the present highway. The area is comparatively flat with lush vegetation and limited agricultural activity. No archaeological remains were found in this section.

The two other sections are situated approximately 1.5km to the south of the modern town of Suwayma. The second (middle) section covers an area of 1.6km², mostly on the hill slopes to the east of the modern highway. The terrain of this section is very rough, being cut by several wadis. Most notable are outcrops of columnar basalt on the upper slopes to the east and tufa in the centre and west. It was noted during the survey that the tufa outcrops are a refuge area for birds, mostly quail. Animal dens were also noted in the area, and the remains of many carnivorous animal meals were encountered. The plant cover of this section is very scarce, and only one fresh water stream to the north of this section was noted during the survey. Limited farming using piped water is carried out on the upper slopes to the east of this section. Only one shepherd with a small flock of sheep and goats used a small modern pool on the fresh water stream during the four days of the initial survey. The only real disturbance to this section occurs next to the modern highway.

The third (southern) section is on the beach to the west of the modern highway. This section is a somewhat flat terrace above

the shore, cut by the large Wādī Mukhayriṣ and by several tributary wadis. Other than the highway disturbance, the area directly to the north and south of the existing "Dead Sea Spa Hotel" is greatly disturbed by bulldozing and dumping.

Methodology of the Archaeological Survey

The survey was conducted on foot, with the two archaeologists walking north-south transects approximately 50-100m apart, depending on the topography of each transect, starting at the upper slopes to the east of the development area. Due to the scarce plant cover in the area, this distance between the transects allowed for good detection of remains. Still the distance between the surveyors had to be reduced to only a few metres when walking among the tufa outcrops. Special attention was also paid to the sections formed by the wadi cuts. Pottery was read at the sites and only diagnostic sherds were collected (no flint tools were found in the area).

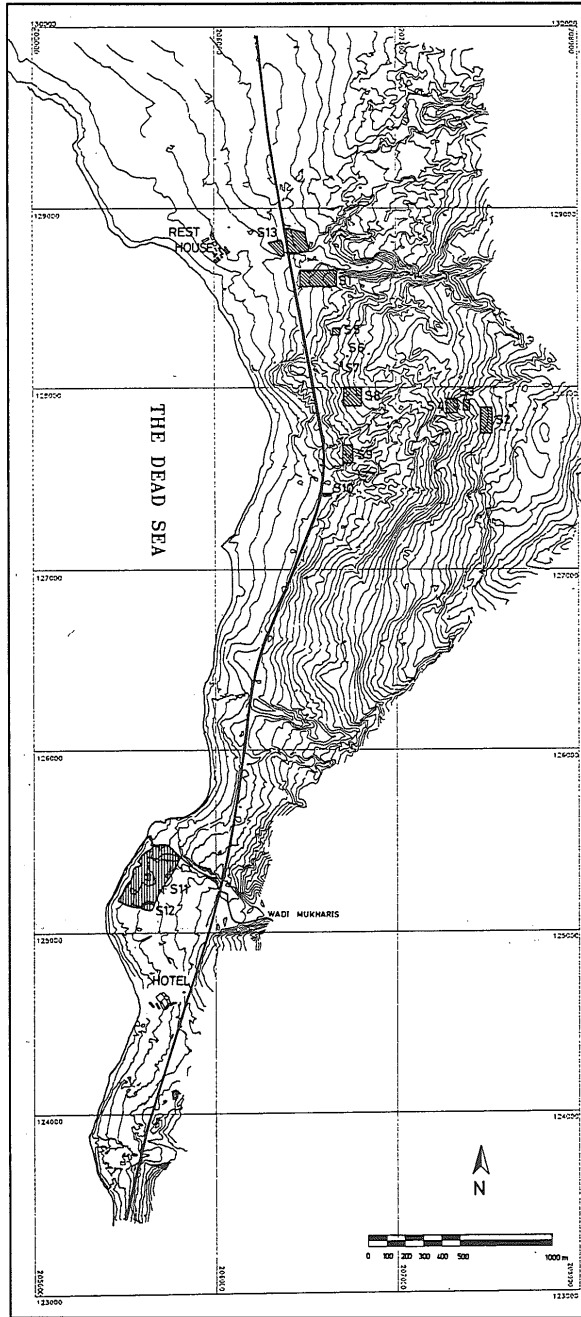
The sites were plotted on a 1:5000 topographic map provided by Sigma Consulting. The Palestine Grid coordinates and altitudes denote the estimated centre of the site. Thirteen sites were recorded in the Suwayma area (Fig. 2).

List of Sites

Suwayma 1

P.G. coordinates: 128.615N; 206.583E. Altitude: -369m. Dimensions: 90m N/S x 200m E/W.

Cemetery. Tombs defined by oval outlines of medium sized tufa and basalt stones. One tomb was found disturbed (Fig. 3). Also probable wall outlines at the western edge. Located on a flat ridge at the hillside. A fresh water stream runs just to the north of the site. The site is cut by a modern track and disturbed by bulldozing at the western edge (near the modern highway). A few Late Byzantine body sherds were noted at the site. It



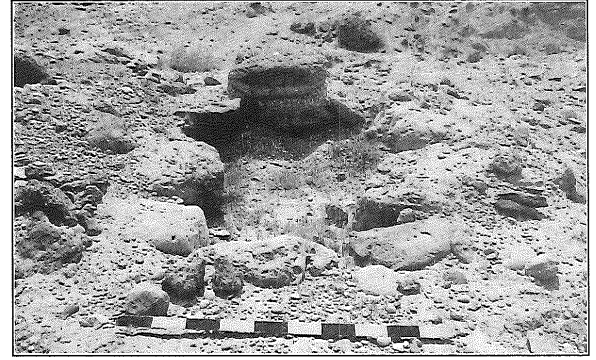
2. Archaeological sites in the Suwayma area.

is thought that these are not connected with the date of the establishment of the site.

Dating: Uncertain, probably Chalcolithic/ Early Bronze Age.

Suwayma 2

P.G. coordinates: 127.828N; 207.497E. Altitude: -264m. Dimensions: 150m N/S x 65m E/W.



3. Disturbed burial at Site Suwayma 1.

Cemetery. Tombs defined by oval outlines of medium sized basalt stones. Located on a flat ridge below outcropping columnar basalt formation. A few pottery sherds were noted at the site. One wheel-made base of probable Late Roman date was collected. Like the Late Byzantine sherds of Suwayma 1, this is not thought to be an indicator of the date of the site.

Dating: Uncertain, probably Chalcolithic/ Early Bronze Age.

Suwayma 3

P.G. coordinates: 127.914N; 207.387E. Altitude: -279m. Dimensions: 58.5m N/S x 37.5m E/W.

A complex series of corrals among a tufa rock outcrop. Low walls formed by rough basalt and tufa stones spanning the gaps in the tufa outcrop, as well as stone semi-circles on the flat ledge to the south of the outcrop. A few non-diagnostic and very worn pottery sherds were noted at the site, probably of Early Bronze Age and Roman/ Byzantine date.

Dating: Modern, although the semi-circles to the south may of older date.

Suwayma 4

P.G. coordinates: 127.908N; 207.308E. Altitude: -296m. Dimensions: 80m N/S x 60m E/W.

Cemetery. Tombs defined by oval outlines of medium sized basalt and tufa stones. Lo-

cated on a flat ridge below outcropping tufa formation. Cut by a wadi on the south and west. No pottery sherds or flint tools were noted at the site.

Dating: Uncertain, probably Chalcolithic/Early Bronze Age.

Suwayma 5

P.G. coordinates: 128.323N; 206.680E. Altitude: -352m. Dimensions: 40m N/S x 40m E/W.

Cemetery. Tombs defined by oval outlines of medium sized tufa stones, one tomb was found disturbed, only one small bone fragment was noted on the surface of the disturbed soil. Located on a somewhat flat ridge below outcropping tufa formation, with a small wadi to the north. No pottery sherds or flint tools were noted at the site. One small carnelian bead was found on the surface.

Dating: Uncertain, probably Chalcolithic/Early Bronze Age.

Suwayma 6

P.G. coordinates: 128.188N; 206.735E. Altitude: -342m. Dimensions: 0.67m N/S x 1.70m E/W.

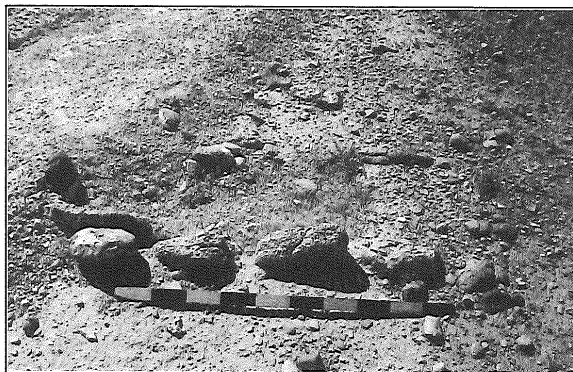
One isolated burial defined by a rectangular outline of relatively small stones (tufa, sandstone and one basalt), oriented at 80/260° (Fig. 4). Construction markedly different from the tombs in Suwayma 1, 2, 4 and 5. Located on a flat ridge below outcropping tufa formation. No pottery sherds or flint tools were noted at the site.

Dating: Early Bronze Age (?).

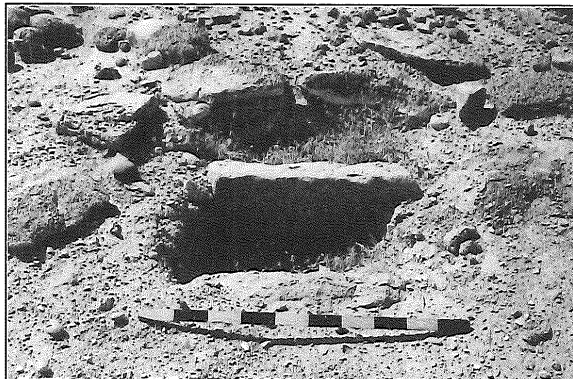
Suwayma 7

P.G. coordinates: 128.142N; 206.707E. Altitude: -344m. Dimensions: 35m N/S x 10m E/W.

Small cemetery. Tombs defined by oval outlines of medium sized tufa stones. One tomb was found disturbed (Fig. 5). Located on a



4. Burial Site Suwayma 6.



5. Disturbed burial at Site Suwayma 7.

narrow ridge below outcropping tufa formation. No pottery sherds or flint tools were noted at the site.

Dating: Uncertain, probably Chalcolithic/Early Bronze Age.

Suwayma 8

P.G. coordinates: 127.961N; 206.762E. Altitude: -340m. Dimensions: 100m N/S x 100m E/W.

Cemetery with three stone circles. Tombs defined by oval outlines of comparatively large basalt stones, the tombs being larger than in any of the other cemeteries in the area. Three well-defined stone circles were noted: SC1 in the middle of the field, measuring 12m in diameter with a probable entrance facing north (Fig. 6); SC2 in the eastern part of the field, measuring 10.50m E/W x 12.80m N/S; and SC3 in the southern part measuring 20m in diameter. The site is located on a slope with tufa outcrops to the north and south. Four pottery sherds belonging to one vessel



6. Stone circle SC1 at Site Suwayma 8.

dating to the Late Byzantine-Early Islamic period were collected at the surface.

Dating: Uncertain, probably Chalcolithic/Early Bronze Age.

Suwayma 9

P.G. coordinates: 127.642N; 206.737E. Altitude: -358m. Dimensions: 100m N/S x 57m E/W.

Cemetery. Tombs defined by oval outlines of medium sized basalt and tufa stones. The field includes one stone circle of 7.50m diameter. The site is located on a flat ridge above outcropping tufa formation to the west, with wadi cuts to the north, south and east. No pottery sherds or flint tools were noted at the site.

Dating: Uncertain, probably Chalcolithic/Early Bronze Age.

Suwayma 10

P.G. coordinates: 127.420N; 206.621E. Altitude: -383m. Dimensions: 16m N/S x 40m E/W.

Cemetery. Tombs defined by oval outlines of relatively small basalt, tufa, sandstone and flint stones. Located on a flat ridge with a tufa outcrop to the south. The field is much disturbed by bulldozing to the north, bulldozing and dumps to the west near the modern highway, and is cut by four rows of recently planted shrubs. It is also cut by a water course to the south. No pottery sherds or flint tools were noted at the site.

Dating: Early Bronze Age (?).

Suwayma 11

P.G. coordinates: 125.150-.450N; 205.550-.700E. Altitude: -395 - -385m. Dimensions: 300m N/S x 150m E/W.

An extensive site on a terrace above the Dead Sea shore, on the south bank of Wādi Mukhayriş. The site exhibits many low "field" walls of rough stones, less than 1m high, forming complexes of corrals and rectangular structures. There are also many stone piles dotted throughout the site. A single one-room house with walls preserved ca. 1.50m high is evident in the northern part of the site. The house measures 6.90m N/S x 3.60m E/W, built of rough stones with mud/ash/reed mortar, doorway to the west facing the sea, has four small niches in the interior west, south and east walls. The site is cut by three tributaries of Wādi Mukhayriş, one of which cuts directly next to the southern wall of the house. No cultural remains or habitation stratigraphy were noted in the cuts. The surface has the remains of numerous recent fires and is obviously a favoured picnic area.

A few modern pottery sherds, one single Late Byzantine storage jar body sherd, and numerous modern glass bottle fragments were noted at the site. The site is associated with a cemetery (site Suwayma 12).

Dating: Modern.

Suwayma 12

P.G. coordinates: 125.160N; 205.570E. Altitude: -390m. Dimensions: 49m N/S x 60m E/W.

An Islamic cemetery at the southern end of site Suwayma 11. Tombs defined by oval piles of rough stones oriented east-west (estimated around 30 burials). The cemetery is bound by a low winding wall of rough stones to the east and south, while the west and north boundaries are not clear. The site is cut by a modern track to the north and a water

course to the southwest. No pottery sherds or flint tools were noted at the site.

Dating: Modern.

Suwayma 13

P.G. coordinates: 128.820N; 206.450E. Altitude: -380m. Dimensions: 108m N/S x 170m E/W.

Cemetery and stone-built structures. Tombs defined by oval outlines of relatively small stones. Wall lines are also apparent in the western part of the site. Located on a flat ridge. The field is cut by the modern highway, and much disturbed by bulldozing to the south and west. No pottery sherds or flint tools were noted at the site.

Dating: Early Bronze Age (?).

Comments

All but one of the sites in the northern section of the development area are cemeteries. A feature they share in common is their situation on flat areas below steep slopes or rock outcrops, still there are variations in their structures, probably indicating varying dates. The scarcity of pottery sherds and flint tools, even in the dumps from the disturbed burials, makes it very difficult to date the structures without excavation. Dates in the Chalcolithic or Early Bronze Age are postulated based on surface similarities with excavated cemeteries further south, such as at Bāb adh-Dhrā' (Schaub and Rast 1989), Khirbat Khanāzir (MacDonald 1995) and an-Naq' (Waheeb 1995), as well as the proximity of the Suwayma cemeteries to Tulaylāt al-Ghassūl and Tall Iktanū. It cannot be confirmed that the few Roman, Byzantine and Early Islamic sherds noted in the area are associated with the use of the cemeteries. Due to the undisturbed nature of the Suwayma section, and the low visibility of the tombs, the existence of more cemeteries in the area cannot be ruled out.

THE AZ-ZĀRA DEVELOPMENT AREA

The area proposed for development in the az-Zāra sector starts at approximately 20km to the south of the northern tip of the Dead Sea, covering an area of over 3km².

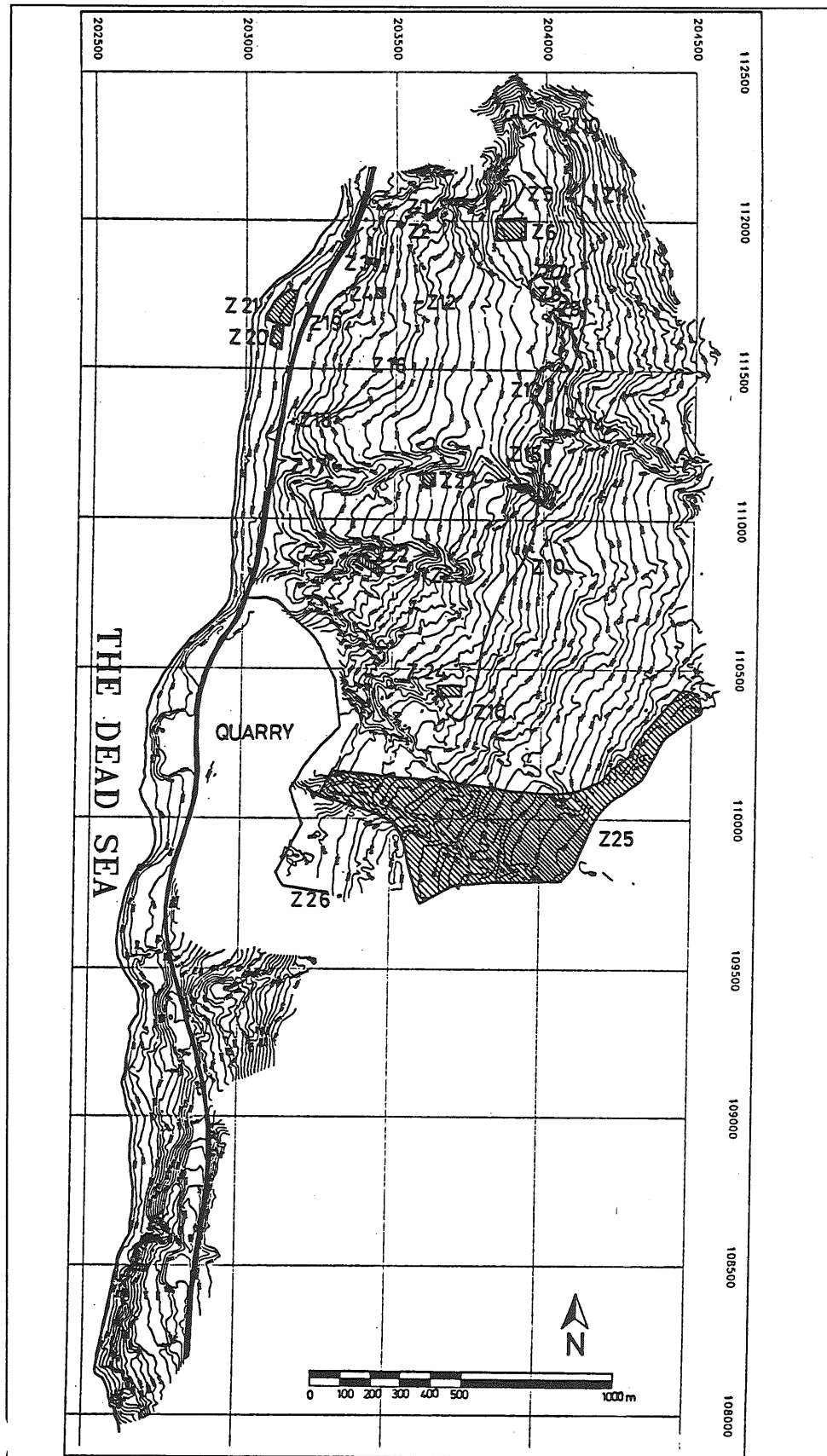
The region is surrounded by high, rough terrain in the north, east and south, with the sea to the west. The northern 2km² are dominated by concentrations of hot water springs and streams, the courses of which are covered with lush vegetation of tall grasses and palm trees. Some of the stream courses are deep-cut wadis with sheer banks. The relatively flat areas in the north and centre are divided into private farms, mostly fenced with small farm houses. The southern section is cut by a modern quarry next to the highway and is quite arid. The eastern section is the source of most of the springs, it is also home to many wild birds such as doves, rock pigeons, quail and partridge.

Methodology of the Archaeological Survey

Due to the many streams and fences around farms, the area was divided up into sections. The survey was conducted on foot, with the two archaeologists walking north-south transects within the sections. Because of the richness of the area, the thick plant cover and disturbance by agricultural activities, the distance between transects rarely exceeded 20m. Pottery sherds were read at the sites and only diagnostics were kept.

The survey was greatly aided by an unpublished map of an archaeological survey conducted by the Deutschen Evangelischen Instituts für Altertumswissenschaft des Heiligen Landes (Palästina Institut) and kindly provided by Prof. Dr A. Strobel, the director of the survey (Strobel 1989a).

The sites were plotted on a 1:5000 topographic map provided by Sigma Consulting. The Palestine Grid coordinates and elevations given in this report denote the approximate centres of the sites. Twenty seven sites were recorded in the az-Zāra area (Fig.7).



7. Archaeological sites in the az-Zāra area.

List of Sites

Zara 1

P.G. coordinates: 112.014N; 203.611E. Altitude: -350m. Dimensions: 38m N/S x 20m E/W (actual orientation 50/230°).

Strobel 1989a site VI (Gebäudefundament). A complex of rooms which seem to belong to more than one phase. Wall lines barely showing above the surface, built of various sized stone blocks (limestone, sandstone and tufa). Located on a ledge defined by a travertine outcrop, above stream course. The higher (eastern) part of the structure is disturbed by an okra field, while the lower (northern and western) parts may not be preserved to a considerable height, as bedrock is showing at the surface there. Wild bushes also cover some of the northern part. A few Roman sherds were found at the site (Fig. 8:1).

Dating: Roman.

Zara 2

P.G. coordinates: 111.980N; 203.514E. Altitude: -355m. Dimensions: 16m N/S x 16m E/W (actual orientation 20/200°).

Structure with wall lines barely showing at the surface, built of various sized stone blocks (sandstone and limestone). One apparent corner in the southwest. Located on a relatively steep slope. The structure is much disturbed by a modern agricultural field. The slope, however, indicates good preservation of at least the eastern part, which is covered by deep soil deposits. Wild trees are growing in the western part. A few Early Roman sherds were noted on the lower (western) part of the site.

Dating: Early Roman.

Zara 3

P.G. coordinates: 111.852N; 203.434E. Altitude: -375m. Dimensions: 20m N/S x 12.5m E/W (actual orientation 40/220°).

Strobel 1989a site III (Wohnzeile). A rec-

tangular structure with several cross-walls. Built of medium sized stone blocks (sandstone and tufa/travertine). One excavation trench was noted in the northeast corner. Located above a travertine outcrop, overlooking the sea to the north of the main excavation site (Zara 4). Early Roman sherds were noted at the site (see also Strobel 1989b: 638; Clamer 1989: 223-224).

Dating: Early Roman.

Zara 4

P.G. coordinates: 111.750N; 203.450E. Altitude: -375m.

This is the main excavated area, Strobel 1989a site II (Herodianische Villa). Accounts of the excavations are given in Strobel and Clamer 1986; Strobel 1989b; Clamer 1989: 217-223. The site is currently fenced within private land.

Dating: Early Roman and Byzantine.

Zara 5

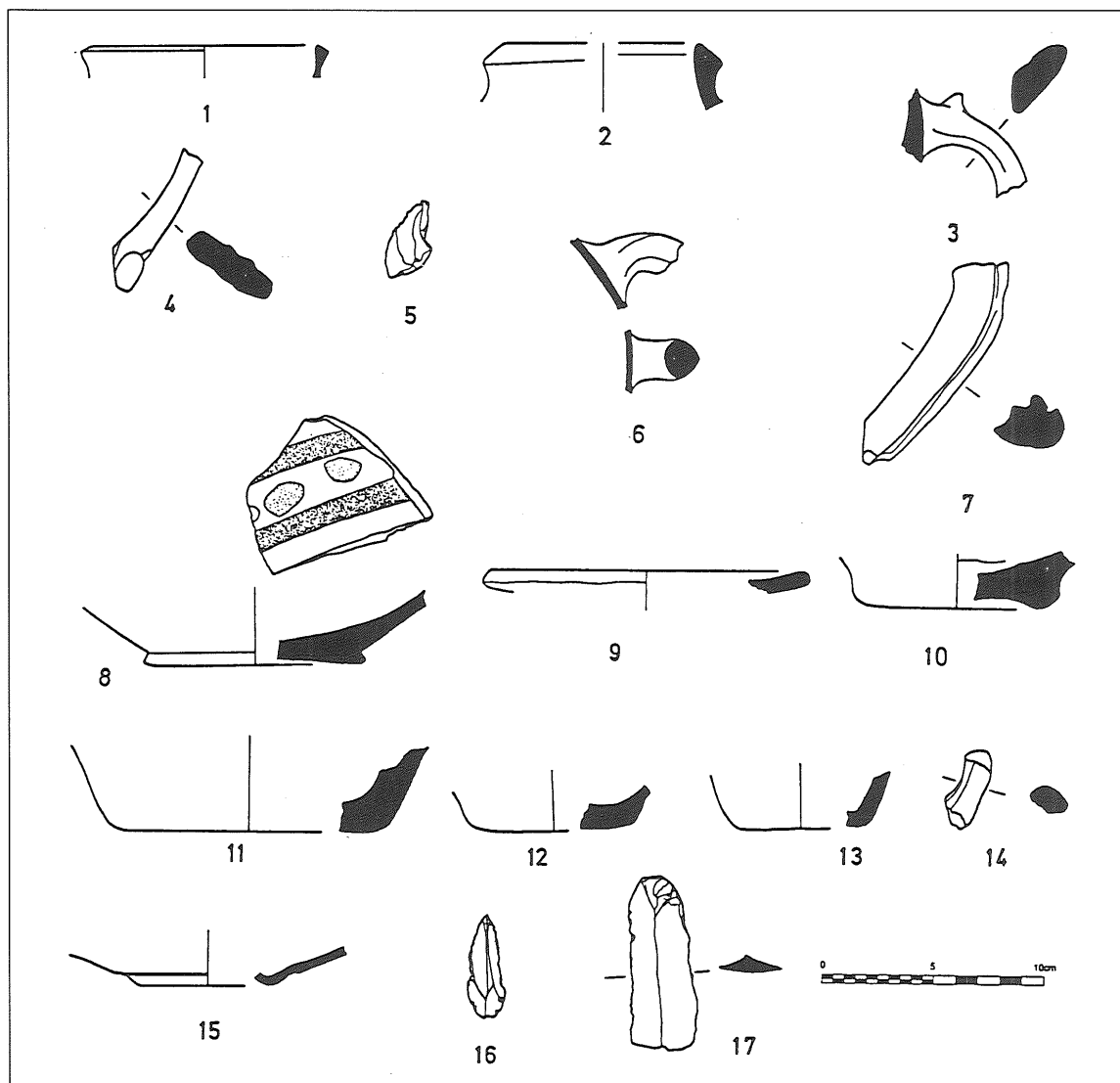
P.G. coordinates: 112.075-112.115N; 203.842-203.915E. Altitude: -290m. Dimensions: wall with total preserved length of 139.50m, western 85m oriented at 44/224° then curves to 0/180° orientation; width 1m. Strobel 1989a site XI (Kanal). A wall of comparatively large limestone boulders, two stones wide, only one course showing at the surface. Located at the edge of a slope, above stream course. The site is disturbed by a threshing floor, modern agricultural field and water channel. It also has several wild trees growing and covering parts of it. No pottery sherds were found at the site.

Dating: Roman (?).

Zara 6

P.G. coordinates: 111.968N; 203.878E. Altitude: -290m. Dimensions: 72m N/S x 95.60m E/W (actual orientation 84/264°).

A large structure, only parts of the south



8. Pottery and flint tools from az-Zāra: **1. Zara 1**; wheelmade cooking pot rim; 2.5YR 4/6 red, few small calcite inclusions; Early Roman. **2. Zara 7**; wheelmade jar rim; ware 10YR 4.5/3 brown, ext. 2.5Y 7/4 pale yellow, int. 2.5Y 5/2 greyish brown, numerous mineral white and grey inclusions; Iron Age II. **3. Zara 7**; handle, 7.5YR 6/6 reddish yellow, numerous mineral white, grey and grog inclusions; Late Islamic. **4. Zara 10**; jar handle; ware 2.5YR 6/8 light red, surface 2.5Y 8/4 pale yellow, numerous sand inclusions; Late Byzantine-Early Islamic. **5. Zara 15**; denticulated tool, light brown chert. **6. Zara 18**; wheelmade casserole handle, 2.5YR 5/6 red, some mineral white, grey and grog inclusions; Late Byzantine-Early Islamic. **7. Zara 18**; amphora handle; 10YR 7/4 very pale brown, numerous mineral grey inclusions; Late Byzantine-Early Islamic. **8. Zara 18**; glazed bowl base; ware 2.5Y 8/2 white, stripes deep green and dots 5Y 7/3 pale yellow painted under clear glaze; Fatimid. **9. Zara 25W**; handmade bowl rim; 5YR 6/6 reddish yellow surface with wide dark grey core, numerous calcite, chert and grog inclusions, very rough; Late Chalcolithic. **10. Zara 25W**; handmade base; 2.5YR 7/4 pink with slight light grey core, numerous calcite, chert and grog inclusions, very rough; Late Chalcolithic. **11. Zara 25W**; handmade base; 10YR 6/4 light yellowish brown with slight light grey core, numerous calcite, chert and grog inclusions, very rough; Late Chalcolithic. **12. Zara 25W**; handmade base; ext. 10R 5/8 red, int. 10YR 5/4 yellowish brown, with wide medium grey core, numerous calcite, chert and grog inclusions, very rough; Late Chalcolithic. **13. Zara 25W**; handmade base; ext. 2.5YR 5/6 red, int. 5YR 5/3 reddish brown, with very wide dark grey core, numerous calcite, chert and grog inclusions, very rough; Late Chalcolithic. **14. Zara 25NE**; handle; 5YR 6/6 reddish yellow with very wide medium grey core, numerous calcite and grog inclusions, rough; Neolithic(?). **15. Zara 25NE**; wheelmade base; ware 5YR 5/4 reddish brown, ext. slip N3/0 very dark grey, int. as ware with horizontal bands of 5YR 4/1 dark grey, wide grey core toward int., some small calcite and sand inclusions; Late Byzantine. **16. Zara 25NE**; arrowhead, of pinkish grey chert, Chalcolithic-Early Bronze Age. **17. Zara 25SE**; Canaanite blade, of very light brown chert; EBIV.

and west walls showing at the surface, the southern wall could be traced almost all the way north to site Zara 5 (Fig. 9). A section of the southern wall can be seen standing over 1m high next to a tree. Walls built with mainly sandstone blocks, 70cm wide. The site forms a flat terrace, currently an agricultural field. The structure is disturbed by the modern agricultural field and track. It is filled up with deep soil deposits and covered with manure for fertilizing the agricultural field. No pottery sherds were found at the site.

Dating: Roman (?).

Zara 7

P.G. coordinates: 111.805N; 204.060E. Altitude: -270m. Dimensions: 34.70m N/S x 13.70m E/W (actual orientation 160/340°).

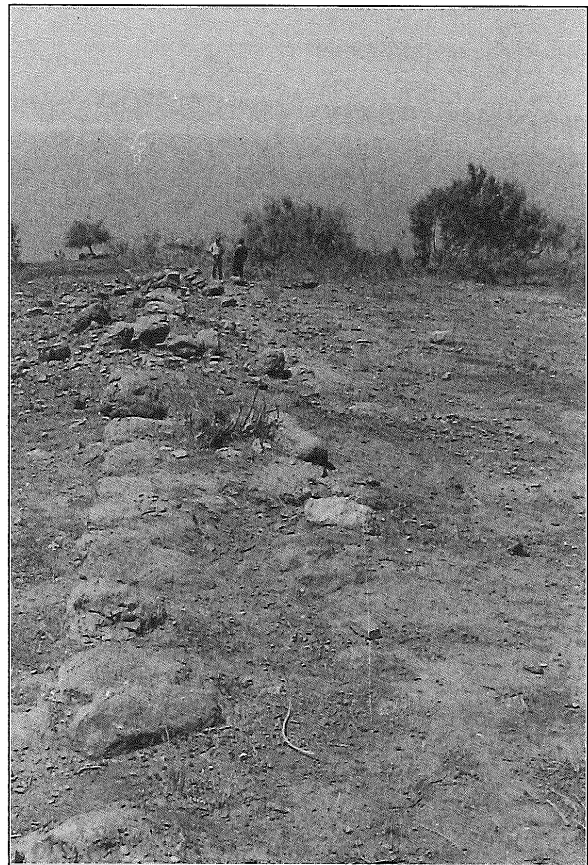
A rectangular structure with internal cross walls. Walls built with medium sized stone blocks, the external walls being 1m wide. Also probable wall lines to the south. Two stone piles at the surface may be recent burials, there is also some limited clearing of stone blocks into piles to the west. The site is located on a flat ridge above a sandstone outcrop to the west, below a spring to the north. Pottery sherds dated to the Iron Age II, Late Byzantine and Late Islamic periods were found at the site (Fig. 8:2, 3).

Dating: uncertain, most probably multi-period.

Zara 8

P.G. coordinates: 111.771N; 204.058E. Altitude: -275m. Dimensions: wall length 40m, width 75cm (orientation 0/180°).

Wall built with dry laid sandstone boulders, most probably a terrace wall. Located at the edge of a flat area, on sandstone outcrop to the west. The wall is cut by shallow dry water courses to the south. One small marble fragment was found a few centimetres to the east of the wall. No pottery sherds or flint



9. Western wall of Site Zara 6.

tools were found at the site.

Dating: uncertain.

Zara 9

P.G. coordinates: 111.742N; 204.201E. Altitude: -275m. Dimensions: 6m N/S x 4.80m E/W (actual orientation 140/320°).

A cairn, of medium and large rough sandstone blocks. Located within a sandstone outcrop at the edge of a flat ridge. No pottery sherds or flint tools were found at the site.

Dating: uncertain.

Zara 10

P.G. coordinates: 110.600-112.450N; 203.750-204.450E. Altitude: -340 - -230m. Dimensions: approximately 2.5km long, width >1m (varying orientations).

Strobel 1989a site XII (Grenz -und Schutzmauer). This was identified by Strobel as the

boundary and protection wall of Kallirrhoe (Strobel 1989b: 639). The wall is built of dry-laid rough stone boulders, extending on the slopes overlooking the area from the north and east (Fig. 10). The structure, as preserved, is not continuous. It is disturbed by modern agricultural fields and tracks, and cut by wadis. The southernmost section mapped in Strobel 1989a was not found, most probably collapsed at the northern edge of Sayl 'Ayn Umm Hudayb. Few pottery sherds were found along the long stretch of this wall (Fig. 8:4), but it is difficult to determine its date.

Dating: Roman (?), but would have been in use during other periods as well.

Zara 11

P.G. coordinates: 112.066N; 204.161E. Altitude: -220m. Dimensions: length 85m, width uncertain (orientation 0/180°).

Strobel 1989a site XIII (Sgaße). Remains of a road, the western curb of which is defined by a line of mainly small stones, and larger stones where it spans slight depressions in its course. Located on a flat ridge above a segment of boundary wall Zara 10. Most of this road had been eroded away, only 85m could be traced at the surface. No pottery sherds were found at the site.

Dating: Roman.

Zara 12

P.G. coordinates: 111.666N; 203.629E. Al-



10. Southern section of boundary wall Zara 10.

titude: -330m. Dimensions: length 5.80m, width 1m, max. preserved height 2.20m (orientation 130/310°).

Strobel 1989a site VII (Mühl mit Kanalzuführung). Remains of a water mill built with small stones and mortar (Fig. 11). Channel paved with small pebbles and plaster leading to a vertical shaft at the western edge. Located on a travertine outcrop at the edge of a flat ridge. No pottery sherds were found at the site.

Dating: Islamic (?).

Zara 13

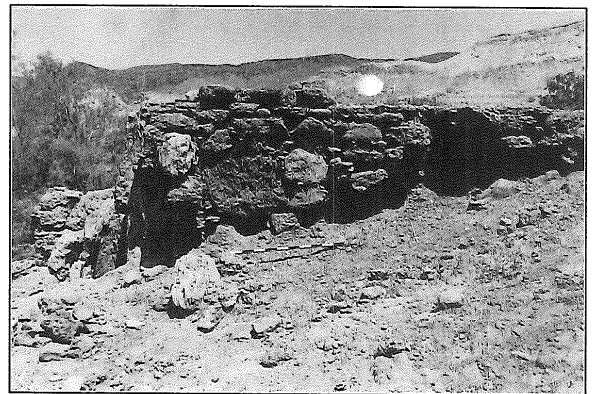
P.G. coordinates: 111.433N; 204.014E. Altitude: -260m. Dimensions: 71m N/S x 15m E/W.

Cemetery. Tombs defined by oval outline of medium-sized stones (mainly sandstone) oriented almost due north-south (Fig. 12). Around ten tombs could be discerned, some in the southern part may be communal. Located on a flat ridge above a sandstone outcrop, with sandstone outcrops also above to the east. Some Chalcolithic/Early Bronze Age I pottery sherds were found at the site.

Dating: Chalcolithic/Early Bronze Age I.

Zara 14

P.G. coordinates: 111.292N; 204.058E. Altitude: -255m. Dimensions: 17.5m N/S x 40m E/W.



11. Southern face of the channel leading to water mill Zara 12.



12. Tombs at Site Zara 13.

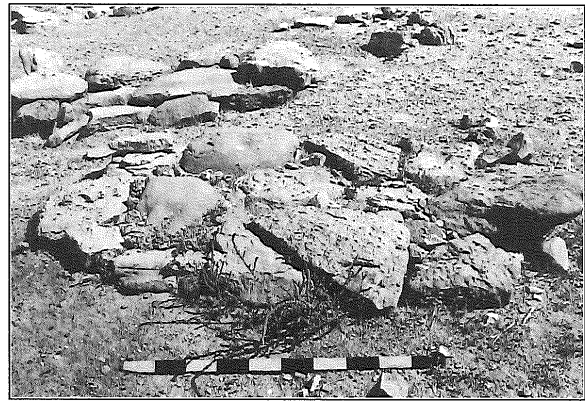
Cemetery. Tombs defined by oval outline of small stones (mainly sandstone), of a different structure to those of Zara 13. Around ten tombs could be discerned. Located on a narrow ledge above wadi to the south (above a segment of boundary wall Zara 10). No pottery sherds or flint tools were found at the site.

Dating: Early Bronze Age (?).

Zara 15

P.G. coordinates: 111.218N; 204.008E. Altitude: -265m. Dimensions: 29.80m N/S x 16.50m E/W.

Probable cemetery. Tombs (?) of different orientations defined by oval flat-piled stones, similar to modern bedouin "milk platforms", however the proximity and distribution of the oval forms preclude this identification (Fig. 13). Around twelve such structures could be discerned. Located on a flat ridge above a sandstone outcrop, directly



13. Stone platforms at Site Zara 15.

below a segment of boundary wall Zara 10. One worked flint tool was found at the site (Fig. 8:5).

Dating: uncertain.

Zara 16

P.G. coordinates: 111.508N; 203.560E. Altitude: -335m. Dimensions: 14.50m N/S x 9m E/W.

Strobel 1989a site VIII (Kanal- und Fundamentreste). Only some wall lines seen, of differing construction and orientations, barely showing at ground level. One wall is built of two rows of large, well-cut ashlar. Located on a flat ridge above a stream to the south. The site is much disturbed by modern agricultural activity. Not much may be preserved as travertine outcrops on all sides. No pottery sherds were found at the site.

Dating: Roman (?), may be multi-period.

Zara 17

P.G. coordinates: 111.167N; 203.311E. Altitude: -370m. Dimensions: 11.10m N/S x 20m E/W.

Possible remains of a camp. Sandstone and limestone pebbles in circular or oval formations. Located on a long knoll of light grey soil (stream deposit), with wadi to the south. No pottery sherds or flint tools were found at the site.

Dating: uncertain, probably recent.

Zara 18

P.G. coordinates: 111.326N; 203.310E. Altitude: -335m. Dimensions: 10m N/S x 5.40m E/W (actual orientation 10/190°).

Rectangular structure. Wall lines showing at surface, built with large sandstone and tufa/travertine blocks. Located at the edge of a travertine outcrop. There is a late corral built above the structure, thus obscuring any internal divisions. The north and west boundaries are eroding down the slope, while the east and south are disturbed by modern agricultural activity. The height of the slope, however, indicates that the walls of the ancient structure may still be preserved to a considerable degree. Some Late Byzantine/Early Islamic and Middle Islamic pottery sherds were found at the site (Fig. 8:6-8).

Dating: Late Byzantine/Umayyad-Late Abbasid/Fatimid.

Zara 19

P.G. coordinates: 111.650N; 203.330E. Altitude: -365m. Dimensions: 29.90m N/S, E/W not certain (orientation 20/200°).

Strobel 1989a site IV (Fundamente). Wall outline of comparatively large stone blocks. Located on a travertine outcrop. The eastern part of the structure is covered with thick soil deposits and disturbed by modern agricultural activity. Many scattered pottery sherds (none diagnostic) were found at the northern edge of the site. These are most probably dumps from the nearby excavations and not related to this structure.

Dating: Roman (?).

Zara 20

P.G. coordinates: 111.650N; 203.110E. Altitude: -395m. Dimensions: not taken.

Large piles of dump on the beach, obviously from a Classical archaeological site. Ashy soil containing many worked stones and some pottery. Fragments of Roman/Byzantine amphorae were collected.

This is not an *in-situ* archaeological site. The dumps may have originated from the opening of the track leading up to Zara 4 and/or the levelling of the area below Zara 3 and 4, next to highway. They may include remains of the site of *Qaşral-Bahr*, described in Donner 1963: 78-79 and reported as having been destroyed in Strobel and Clamer 1986: 381-382.

Zara 21

P.G. coordinates: 111.750N; 203.150E. Altitude: -395m. Dimensions: >150m N/S x 80m E/W (orientation 25/205°).

Strobel 1989a site I (Kaianlage). Harbour with five or six long walls built with large limestone ashlar, of around 1.20m width, and several cross-walls (Figs. 14 and 15). There is also a square anchorage installation



14. Foundations of the walls of the harbour at Zara 21.



15. Construction of a wall of harbour Zara 21.

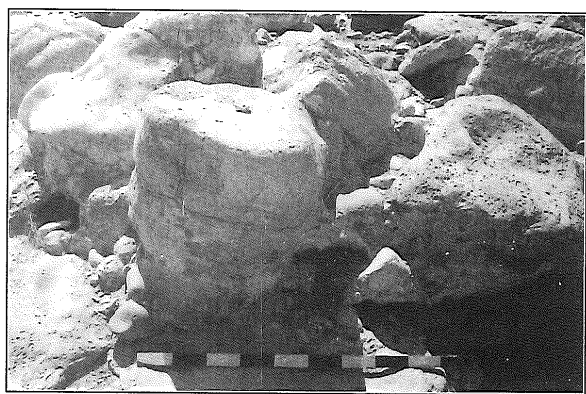
(?) cut in the bedrock (may also be a “rock-cut house” as described by Clamer 1989: Pl. XXXIX:2). There are scattered worked stones, including column drums and bases, on the beach directly to the west of the structure. Many of these architectural elements are cemented together with salt formations, indicating that they were submerged for a lengthy period of time (Fig. 16). Two column drums were also found on the beach approximately 500m to the north, and several column drums said to come from the beach were recorded in private farms in the area. A small archaeological sounding was seen in the centre of the structure. It revealed ashlar on top of a vertical cut in the bedrock, and much fallen plaster. For descriptions of this harbour see Strobel 1989b: 639; Clamer 1989: 224-225. Schult 1966 and Hadas 1993 also describe the harbour and give further information on sailing in the Dead Sea.

The eastern part of the structure is covered with soil and pebbles and seems to have been partly destroyed by the road work (Strobel 1989b: 639). The northern part is disturbed by bulldozing, while a section of the southern part may be covered by the Zara 20 dumps. No pottery sherds were found at the site.

Dating: Roman.

Zara 22

P.G. coordinates: 110.841N; 203.426E. Al-



16. Column drums cemented together with salt formations to the west of harbour Zara 21.

titude: -350m. Dimensions: 23.50m N/S x 68m E/W.

An Islamic cemetery. Tombs defined by oval piles of stones oriented east/west. Located on slopes of two adjoining hills to the south of wadi.

Dating: Modern.

Zara 23

P.G. coordinates: 110.810N; 203.604E. Altitude: -305m. Dimensions: wall length 3.50m, width 40cm (orientation 35/215°).

Strobel 1989a site X (Gebaufundamente). Only one wall line, of eight unhewn sandstone blocks, is apparent (as opposed to three walls plotted by Strobel). Located on a flat ridge with wadis to the north, south and west. There is also a probable (badly disturbed) stone circle approximately 18m to the east of the wall line. No pottery sherds or flint tools were found at the site.

Dating: uncertain.

Zara 24

P.G. coordinates: 110.427N; 203.697E. Altitude: -280m. Dimensions: 80m N/S x 40m E/W (actual area very difficult to define).

Remains of ancient agricultural fields. Scattered winding wall lines, most probably defining agricultural boundaries, and stone piles from ancient field clearance can be seen, as well as some probable tombs (badly disturbed?). Located on a flat area below sandstone outcrops. Few Early Bronze Age I pottery sherds were found at the site.

Dating: uncertain.

Zara 25

P.G. coordinates: 109.700-110.500N; 203.300-204.600E. Altitude: -220 - -340m. Dimensions: ~ 1km E/W x 100-800m N/S.

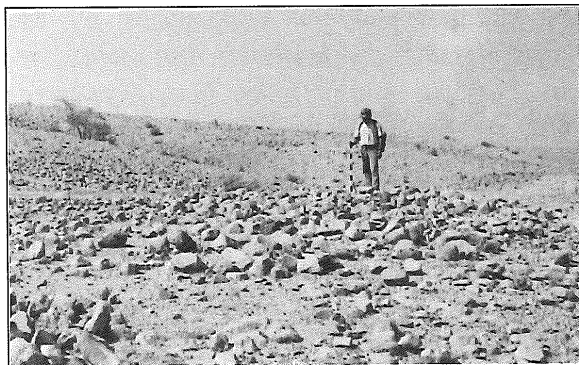
This is an enormous site, by far the largest in the area. Located on the long flat east-west ridge above the modern quarry, extending all

the way to the basalt outcrops in the east, bound by Wādī Abū Khushayba to the south and going slightly beyond the spring feeding Sayl 'Ayn Umm Hudayb in the northeast. Luckily, the modern quarry was stopped directly west of the (steep) slope on which the site starts.

The site contains many complexes and structures, starting with a 100m wide cemetery in the west, tombs defined by oval outlines of small-medium stones, the area widens towards a ridge above a slope in the centre. Below the ridge there are wall lines of varying orientations. Some on the edge overlooking Wādī 'Ayn Umm Hudayb may be aqueducts. A complex structure of fine though small masonry in the southeast of this western area has a tomb on it obscuring its outline (Fig. 17). This western part of the site is slightly disturbed by a few shallow bulldozer pits. The most frequent pottery is Late Chalcolithic (Fig. 8: 9-13. Thanks to Dr Geneviève Dollfus for confirming our initial reading of the Late Chalcolithic material).

The central section, starting with a north-south ridge in the middle of the site going towards a shallow wadi further east, also has complex wall lines and cemeteries, including several stone circles (Fig. 18). The structures in this section are generally more crude and built of larger stone blocks than the structures to the east and west.

The eastern section goes all the way to the basalt outcrops in the east, widening to the maximum of ~800m in the far east, thus



17. Structure disturbed by a later burial in the western section of Site Zara 25.

spanning the area above the springs. Again this part has several structures, circular and square, built with double rows of relatively small stone blocks similar to the structures in the western section of the site (Fig. 19). There are basalt stone circles and a cemetery in the southern part of the section. In none of the sections was there a clear defining area separating cemeteries from other structures. The eastern section of the site is disturbed by a few illicitly excavated pits.

Probable Neolithic, Chalcolithic, Roman and Byzantine pottery sherds were collected in the eastern section (Fig. 8:14, 15), in addition to one finely worked flint arrow head (Fig. 8:16) and a fragment of a Canaanian blade (Fig. 8:17).

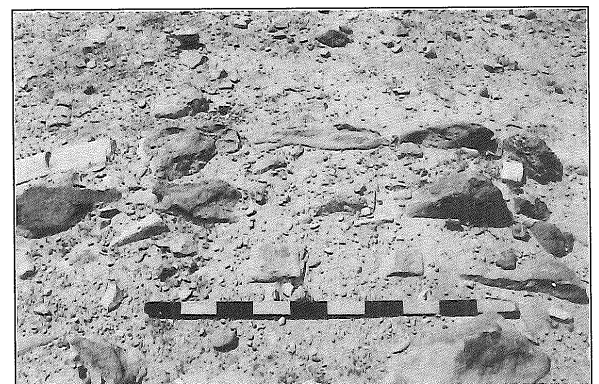
Dating: multi-period, Late Chalcolithic and Early Bronze Age being the most abundant.

Zara 26

P.G. coordinates: 109.750N; 203.342E. Al-



18. Stone enclosure in the central section of Site Zara 25.



19. Detail of the wall of a circular structure in the eastern section of Site Zara 25.

titude: -270m. Dimensions: 1.40m N/S x 2.40m E/W; standing 55cm above ground (actual orientation 110/290°).

One isolated tomb, oval outline defined by standing large stone (tufa and sandstone) slabs. Located on a flat ridge at the bottom of slight hillock. The tomb was robbed out in antiquity (Fig. 20).

Late Byzantine pottery sherds, all belonging to the same vessel, were found at the site. These were obviously left after the burial, probably by the robbers?

Dating: Bronze Age (?).

Zara 27

P.G. coordinates: 111.120N; 203.610E. Altitude: -317m. Dimensions: 40m N/S x 40m E/W.

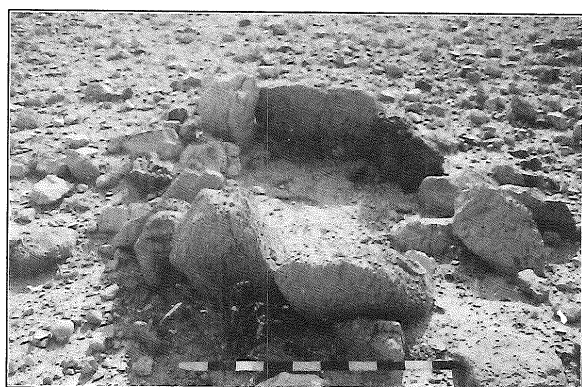
Square structure defined by walls of two rows of dressed stones, approximately 1m wide (Fig. 21). Located on a flat area overlooking deep wadi to the north. Much disturbed by field clearing and cut by dirt tracks, one of which reveals a substantial ash layer at the northern edge of the structure; the wall there is preserved to a height of 90cm.

No sherds were detected at the site. We are grateful to Mrs Christa Clamer for pointing out this structure to us.

Dating: Roman (?).

Comments

The az-Zāra sector is obviously rich in ar-



20. Tomb Site Zara 26.



21. Northern wall of structure Site Zara 27, cut by modern track.

chaeological remains. It should be noted that the previous archaeological survey (Strobel 1989a) recorded 13 sites, 11 of which were re-recorded by the present survey. One site (cemeteries no. IX) could not be seen any more due to recent agricultural disturbance of the area. Sites Zara 25 and 26 are to the south of the area surveyed by Strobel.

Due to the extensive disturbance by modern agriculture, the thick vegetation around the streams and the depositions by the springs, *it is highly probable that several archaeological remains at az-Zāra are currently totally buried or too disturbed to be recognised at the surface.* A visit to the area after the first winter storm in November 1995 surprised us with dramatic changes in the landscape, especially changes in water courses and landslides. Site Zara 19 got totally covered up with deposits and was no longer visible at the surface.

The sites recorded at az-Zāra give the im-

pression that the situation in the past (especially during the Roman to Medieval Islamic periods) was similar to the present situation. The fertile northern and central sections were divided up into farms with farmhouses and villas. Wall Zara 10 defines this fertile part of the area, and would have served as a boundary wall for the "village" as well as for protection against rock-fall and slides from the very steep slopes to the east. Road Zara 11 may have connected az-Zāra with Makāwir (as suggested by Strobel, we are grateful to Mrs Juliette Jabajy for translations of unpublished reports on this route). Unlike the modern cemetery Zara 22, burial grounds seem to have been restricted to the steep rock outcrops in the east, which are useless for agriculture.

The special importance of az-Zāra, however, is illustrated by the presence of the villa Zara 4, and especially the harbour Zara 21. This harbour is too large and elaborate for small rowing boats, and may have received small sailing ships carrying cargo such as the one depicted (with folded sails) on the mid-sixth century AD mosaic map of Mādabā next to what looks like a harbour at ΘEPMAKAAAIPHC (see for example Piccirillo 1993: folded illustration opp. p. 80). More research needs to be done to determine whether such cargo included the famous precious products of the area, e.g. bitumen (Hammond 1959) and balsam (see for example Patrich and Arubas 1989: esp. 50-55; Zayadine 1995: 72). The large structure Zara 6, dominating the area in the north is strategically located and may be the remains of a fort guarding the harbour, the routes along the coast as well as the routes going up to the plateau (including Zara 11).

The southern arid section is mostly occupied by the extensive and complex Site Zara 25. This large site may have started as two distinct (Chalcolithic?) sites in the extreme east and west, the area between which got later "filled up" with structures over several centuries. This hypothesis is based on the

similarities between some of the structures in the southeast and west edges of the site, and the distinctly different architecture in the centre and northeast. Of course this hypothesis can only be verified after excavation.

Due to the high concentration of archaeological remains, as well as the rich natural flora and fauna of the az-Zāra sector, it was decided that the area be kept as a natural and archaeological park, and development be moved south to the Umm Sidra sector.

The zone between az-Zāra and Umm Sidra, to the west of the modern highway, was also surveyed. This zone consists of a narrow strip of land next to the sea. The northern end is disturbed by modern road works and levelling. Part of the area is presently fenced off and could not be surveyed. No ancient remains were found. All along this zone, the area immediately beneath the modern road consists of stone scree from road construction and erosion as well as steep natural cliffs.

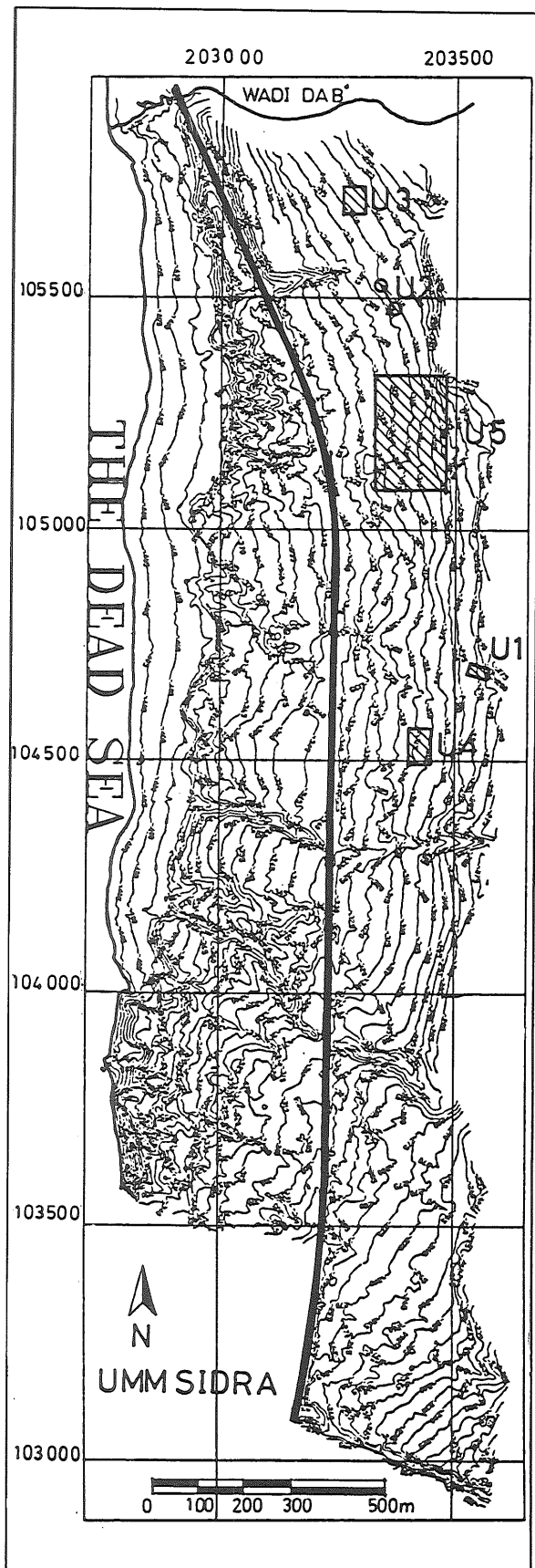
THE UMM SIDRA DEVELOPMENT AREA

The Umm Sidra sector consists of a narrow strip of land cut by deep wadis draining off the mountains to the east. A clear cliff face marks most of the eastern boundary of relatively flat land. Wadis and ground water seepage now support a small plantation near the northern end of the sector. The area to the west of the modern road is heavily eroded, making a steep cliff above the Dead Sea. Quarrying and road building have disturbed much of the part of this area. Survey, however, revealed no signs of any ancient occupation west of the highway, while five sites were recorded to the east (Fig. 22).

List of Sites

Umm Sidra 1

P.G. Coordinates: 104.695N; 203.559E. Altitude: -283m. Dimensions: 40m N/S x 20m E/W.



22. Archaeological sites in the Umm Sidra area.

The site is located on a rock shelf against a cliff face beside a deep wadi. Probably a camp site, it overlooks a plantation area and is presently used by bedouins. A stone revetment several courses high revets the western side of the terrace (c. 40 metres) and appears to return towards the rock face in the north, the south side being made by the natural cliff of the wadi. The revetment consists of a least three sections and there are signs of cross walls, suggesting a series of building and occupation phases. Flint scatter may indicate a Chalcolithic/ Bronze Age date. One Roman/ Byzantine(?) ribbed sherd was found.

Dating: Chalcolithic/Early Bronze Age; reused in modern times.

Umm Sidra 2

P.G. coordinates: 106.500N; 203.341E. Altitude: -311m.

A camp site built around a natural rock outcrop in open relatively flat land some distance from the cliff face in the east. The southwest side consists of a stone semi-circle (c. 8m in diameter) made of one to two courses and set against the rock outcrop. Flint scatter suggests a date in the prehistoric periods (Fig. 23:1); very small-scale debitage may indicate a possible Natufian attribution (we are grateful to Dr Alison Betts for comments on this debitage and other flint scatters at Umm Sidra). The site may be associated with a low terrace wall which begins c. 50m to the southeast and meanders for c. 100m to the south and east.

Dating: Natufian (?).

Umm Sidra 3

P.G. coordinates: 105.710N; 203.286E. Altitude: -311m. Dimensions: 60m N/S x 60m E/W.

Cemetery, tombs defined by oval layout of stones. A stone circle in the northwest, perhaps one of several, made of one (re-

maining) course and with a diameter of c. 10m. There may be a tomb in one side. Flint scatter indicates a possible Bronze Age date (Fig. 23:2).

Dating: Bronze Age (?).

Umm Sidra 4

P.G. coordinates: 104.631N; 203.432E. Altitude: -309m. Dimensions: 80m N/S x 50m E/W.

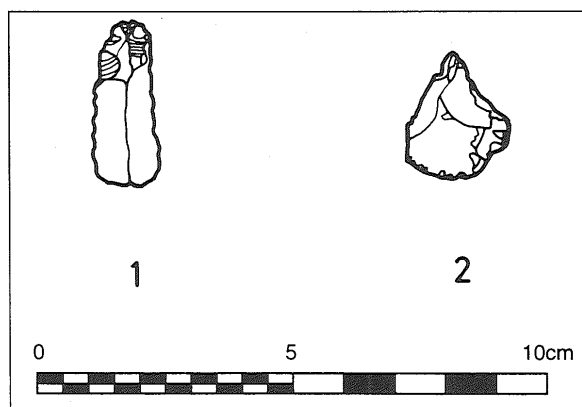
The site is situated beside a wadi. About 50 stone heaps, some rectangular in shape, are set out in nearly regular rows running north-south. These heaps may be graves. Un-diagnostic sherds may belong to the Bronze Age.

Dating: Bronze Age (?).

Umm Sidra 5

P.G. coordinates: 105.208N; 203.411E. Altitude: -321m. Dimensions: 250m N/S x 150m E/W.

The site is situated on the south bank of a wadi with steep sides toward the west; it is presently cut by erosion, making a northern and southern spur. Both northern and southern flanks are eroded. Two well-built stone circles are visible in the west and east ends of the site, measuring about 5m in diameter. The western circle has at least two stone courses. The west end of the northern spur



23. Flint tools from Umm Sidra. 1. Umm Sidra 2; blade fragment of light brown chert. 2. Umm Sidra 3; burin of pale brown chert.

consists of a series of low single-course stone terrace walls running north-south, about 10m apart. There are remains of other sub-circular structures (Fig. 24). The site is very shallow.

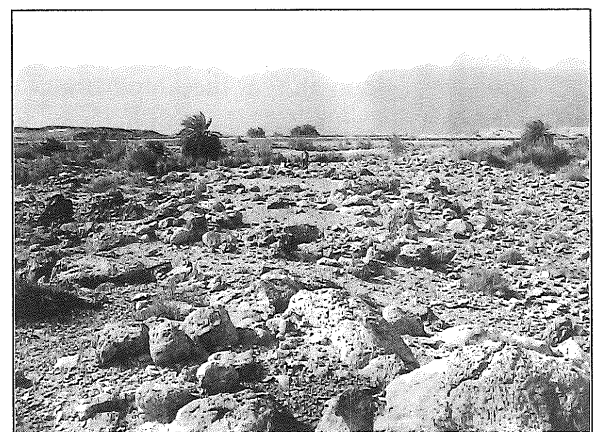
Dating: uncertain.

Comments

The area east of the modern road was never built up in any way but, as now, would have been used by bedouins for grazing and small-scale agriculture. As in other areas of the Dead Sea coast, and similar to the Suwayma area in this survey, many of the slopes overlooking the sea were used for burials, both in isolation and in 'cemeteries'.

CONCLUDING REMARKS

The signing of the Peace Treaty between the governments of Jordan and Israel in October 1994 has affected several aspects of life in the region. One of the more immediate results was an increase in the volume of tourism which promoted investment in this sector. The archaeological survey of the east coast of the Dead Sea is part of the environmental impact assessment for a project through which archaeologists and developers are now entering an undeveloped and very interesting area simultaneously. This new experience is still in its early stages but



24. Sub-circular structures in the centre of Site Umm Sidra 5.

is already producing significant results affecting both development and archaeological conservation in Jordan.

Since the presentation of the first archaeological report on the Suwayma development area, on 7 September 1995, a new master plan was prepared for Suwayma, restricting the tourist village to the southern part of the area where no archaeological remains were recorded and utilising more of the beach area (hence the survey on 15 and 19 October). The results of the survey at az-Zāra lead to the designation of the whole area as an "archaeological and natural park" in the master plan, and the developers decided to move further south to Umm Sidra. The sites discovered at Umm Sidra are to be

within open park areas of the development. Archaeological excavations at the Umm Sidra sites are planned to start prior to the initiation of any construction in the area –including infrastructure layout. These sites will be presented as a cultural experience within the development.

K. 'Amr
K. Hamdan
L. Mohamadieh
Department of Antiquities
Amman, Jordan

S. Helms
BIAAH
Amman, Jordan

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