

**THE WĀDī AZ-ZARQĀ' / WĀDī AD-ḌULAYL EXCAVATIONS  
AND SURVEY PROJECT:  
REPORT ON THE OCTOBER-NOVEMBER 1993 FIELDWORK SEASON**

by

Gaetano Palumbo, Massimiliano Munzi, Sarah Collins, Fouad Hourani,  
Alessandra Peruzzetto and Martin D. Wilson

**Introduction**

The following report outlines the activities conducted in the area of the Upper az-Zarqā' valley between October 19 and November 19, 1993 by a team of archaeologists of the University of Rome, Italy. Fieldwork was made possible thanks to two grants, one from the Cultural Office of the Italian Ministry of Foreign Affairs and the other from the Consiglio Nazionale delle Ricerche (CNR; National Research Council, Italy).<sup>1</sup>

The team was directed by Gaetano Palumbo (Università di Roma) and included Sarah Collins (British Museum), Mohammed Daire (Yarmouk University), Khaled Douglas (Yarmouk University), Fouad Hourani (INA -PG, France), Massimiliano Munzi (Università di Roma), Alessandra Peruzzetto (Università di Torino), Stefania Sofra (Università di Roma) and Martin Wilson. Department of Antiquities representative was Ibrahim Haj Hassan, from the 'Ammān office.

The fieldwork included the following:

1. Analysis of aerial photos and location of archaeological sites with structures;
2. Intensive surface collections and soundings at Jabal ar-Raḥīl (site JR1);
3. Surface exploration of previously known sites and of a selected sample of sites located on the aerial photos;
4. Intensive survey of selected areas for the

identification of sites not visible on the aerial photos;

5. Topographic survey of Khirbat al-Mak'hūl (site JR4).

**Aims and Methodology**

(M. Munzi and G. Palumbo)

The present article is a preliminary report of the first season of archaeological explorations in the Upper az-Zarqā' and Wādī ad-Ḍulayl valleys; none of the statements contained in this report can be considered conclusive: they are rather a first assessment of the type of archaeological features found in this area and of the periods of occupation they represent. Statistics that deal with the occupation of the area during different periods should also be considered a first attempt to identify trends in this occupation: they will be certainly modified as our knowledge of the history of this region progresses, but we do not expect future findings completely reversing the picture that is emerging after our first studies in the area.

Simply stated, the aim of the project is to reconstruct phases of human occupation in the region, by identifying the relationships between man and his environment during different historical periods, broadly identified according to traditional divisions.

In more detail, this research will try to

- understand the evolution of Pleistocene

1. We would also like to thank the Italian Embassy in 'Ammān, in the persons of HE Romualdo Bettini, Ambassador of Italy, Mr Giovanni Benenati, and Mr Emanuele Minardo for their support, and the American Center of Oriental Research in 'Ammān, in the persons of Drs Pierre and Patricia

Bikai, Dr Zbigniew Fiema, and Mr Glen Peterman for logistical and moral support. Our thanks also to Dominic Powlesland for producing the Raḥīl base maps used for Figs. 16 and 17, using his GIS software G-Sys, version 2.5.

landscapes in the region, in order to reconstruct the prehistoric human occupation and the relationships between site location and exploitation of natural resources;

- study the evolution of settlement from the Early Bronze to the Late Iron Age, both in terms of settlement hierarchy, land use, and intra-site organization at selected locations;
- study the Roman, Byzantine, and Islamic occupations and investigate the reasons behind the selection of settlement location; study the spatial organization of settlements and their rural counterparts;
- study the function and date of cairns and towers, the most common site type in the az-Zarqā' basin;
- understand land use and relationships between contemporary ethnic groups, in particular Bedouin (pastoral nomads) and Chechen (farmers), immigrated from Caucasus at the turn of the 20th century, fleeing Russian persecution, and founding the village of as-Sukhna and the city of az-Zarqā';
- reconstruct farmers-nomads relationships through the ages in this region, and the position of this "rural" element against the "urban" or centralized power components.

Our approach to the study of the region consists of 4 steps:

1. Analysis of the aerial photos and identification of "visible" sites;
2. Intensive archaeological and geomorphological survey and identification of periods of occupation at "visible" and "invisible" sites (sherd, flint scatters, buried sites, etc.), the latter found as a result of the ground survey;
3. Soundings at selected sites for the establishment of a stratigraphic record and the recovery of paleoenvironmental data;
4. Reconstruction of environmental and historic trends for the occupation of the re-

gion.

Tools for the achievement of these objectives include detailed survey forms, which describe the archaeological remains found (*site*, defined as an artificial anomaly in the natural landscape, due to the past use by man of a circumscribed area), as well as the larger environmental contexts where the "sites" are located (described as "survey units"). Retrieved data are organized into databases, and a full Geographic Information System (GIS) has been developed, which includes cartographic data and archaeological site location, and will soon contain environmental and geomorphological data.

After a complete analysis of the 1:10,000 aerial photos available for the area, which brought to the identification of 275 previously unknown archaeological sites (see below), a program of intensive archaeological surveys was organized, not only to check the periods and types of occupation of the sites identified on the aerial photos, but also to have a better understanding of the topography and environment of the region, and to identify sites that, because of their ephemeral nature or other reasons, could have escaped the analysis of the photos. The intensive survey, that already this year brought to the identification of numerous sites, some of which extremely important for the understanding of the history of human occupation and the evolution of historic landscapes, will continue in the future campaigns of the project.

At the same time the GIS which is being developed will help our team to identify patterns in the historic occupation of the region, but also, by applying statistical "predictive" models, to identify areas that may hide an archaeological presence. While the application of these models has not been attempted until now on the data set, the use of the GIS will help in identifying possible relations between sites and their environment, and, possibly, trends in the occupation of the region across periods.

The advantage of using high definition aerial photos for the identification of archaeological sites was enhanced, in our case, by the scarce vegetation cover of the region. In this context, the smallest ruin can be easily identified on the photos. This however, also introduces a biasing element, since almost all sites with structures are identified by simply scanning the photos, while most of the other sites (sherd or flint scatters, camps, deeply buried sites, or sites in alluvial deposits) have to wait for intensive surveys to be located.

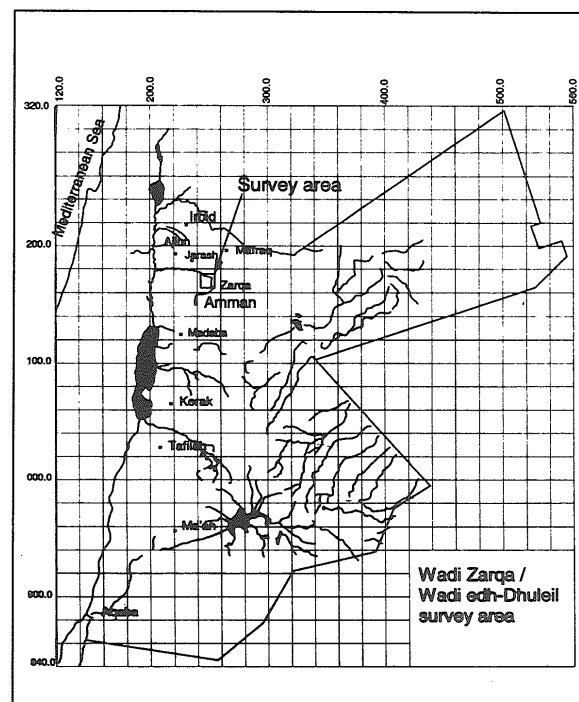
It can already be anticipated that after several campaigns of intensive surveys these "invisible" sites will characterize a more important slice of the overall record than it is possible to do today.

The first season of survey, however, already identified a possible methodological problem in the treatment of Paleolithic sites, since the area is strewn with a constant "background noise" of lithic material, to the point that is difficult to separate site from site, and to establish the boundaries and extensions of sites. This also introduces other problems: how much of the present surface is the ancient one, especially for the most ancient periods? How much of the surface remains are derived from deflation and erosion of hill slopes? The geomorphological studies will help to answer, partially at least, these questions, and a model will be developed in our GIS to compare data derived from direct observations with that inferred from similar land forms identified in the cartography and aerial photos. Further study may involve the analysis of multispectral imagery (Landsat and SPOT) and of radar data (SIR-C) obtained from the Jet Propulsion Laboratory in Pasadena. This analysis will be useful in the identification of macrophenomena, such as environmental episodes which may have affected the presence of human activity in the landscape, as well as more localized features which may escape attention while only analyzing panchromatic analogue imagery.

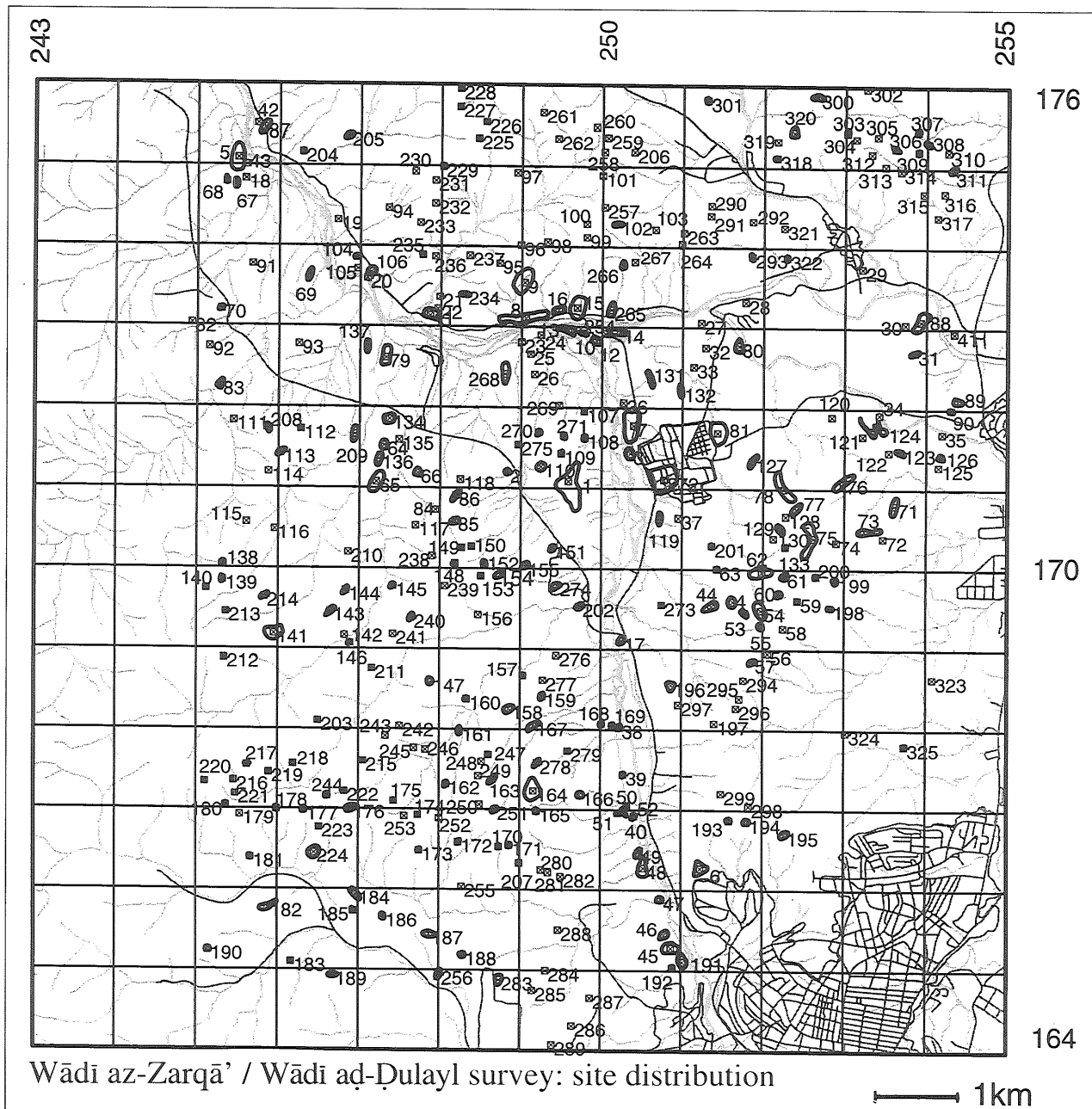
The soundings, as exemplified in the present article by the work conducted at Jabal ar-Raḥīl, will serve to identify stratigraphic and pottery sequences that will help to understand occupational sequences at other multi-period sites and in correctly dating other sites based only on their surface evidence. They will also serve the need to identify depth of occupations and functions of the sites tested, a useful result, especially for sites threatened by development.

### Description of the Area (G. Palumbo)

The survey area is comprised between coordinates 243E 164N and 255E 176N of the Palestine grid, covering an area of 144 km<sup>2</sup> (Fig.1) Its limits are approximately the northern periphery of the city of az-Zarqā', to the southeast, the village of al-Hāshimiyya and its refinery, to the east, the crest of the hills on the right bank of the az-Zarqā' river and Wādī aḍ-Ḍulayl, to the north, and the area of Tall al-Bīrah, to the west. Because of



1. Location of Wādī az-Zarqā' / Wādī aḍ-Ḍulayl survey area. The grid values are those of the Palestine grid. On this map, each square represents a 20x20 km area.



2: Site distribution. For site names, coordinates, and periods of occupation see appendix.

the recent expansion of the survey area 2 km towards the west, aerial photos could not yet be “read” for the area comprised between coordinates 243E 164N and 245E 176N (a total of 24 km<sup>2</sup>): this explains the absence of sites on the left side of the area maps (Fig. 2).

Detailed maps are available for the area: 1:10,000 (sheets 51/70, 51/64, 43/70, and 43/64 of the 1950 az-Zarqā' basin series produced by the Jordan Department of Lands and Survey), and 1:25,000 (sheets 3254-III-

NW and 3254-III-SW of the 1991 K737 series produced by the Royal Jordanian Geographic Center). Both these map series have been used for the production of the GIS (above). The old (1961) K737 series map of the area (sheet 3254-III, at a scale of 1:50,000) was not used because the scale could not allow the precision required.

The area is characterized by the presence of a semi-permanent water course (the az-Zarqā' river), which today is dry for most of



the year south of the confluence with Wādī aḍ-Ḍulayl. This, however, is a recent phenomenon due to the use of the springs in the area between 'Ammān and az-Zarqā' for direct human consumption and agriculture. Wādī aḍ-Ḍulayl today discharges into the az-Zarqā' the waters treated in the nearby sewage plant ponds of as-Samrā', about five kilometers to the east of the survey area, together with other highly polluted waters from the industrial area of al-Hāshimiyya.

The average rainfall in the area, between the years 1950 and 1980, was 166 mm, with a minimum of 58 mm (1950/51) and a maximum of 313 mm (1966/67). During those 30 years, 7 years had a rainfall of less than 100 mm, 14 years a rainfall between 100 and 200 mm, 6 years between 200 and 300, and only 2 years had a rainfall above 300 mm. Only in two circumstances there were two years in a row with a rainfall above 200 mm (Rainfall in Jordan: 218-219). The region can barely support, today, rainfed agriculture, and as a matter of fact only few patches around pastoral Bedouin camps are cultivated with this method, while more intensive agriculture is practiced on the banks of the az-Zarqā' river pumping water from the river bed and by irrigation, using water channeled from reservoirs filled from water pipes.

The soils can be classified as belonging to the xeric-aridic with transitional moisture regime and aeolian influence. Soil temperatures vary between 15 and 22°C. Because of the strong erosion of the hill slopes, the lithic component is extremely high. In many circumstances, soil cover is completely absent, or reduced to a shallow sheet overlying the bedrock. On the terraces above the az-Zarqā' alluvial bed, soils are of the Xerochreptic Camborthid type, containing a high percentage of clay (25%) and calcium carbonate (25%); in the area of Tall al-Bīrah they are of Xerochreptic Calciorthid type, containing an even higher percentage of calcium carbonate (30%). In over 80% of the area, soils are of the lithic subtype, un-

suitable for rainfed or irrigated agriculture (Soils of Jordan 1994). Overgrazing of the area and the extensive use of tractors on the lower slopes of the hills have caused the destruction of the typical steppic vegetation of the area, composed of two main species (*Poa sinaica* and *Carex pachystylis*). With a shallow rooting turf and a dense root mat, these two grasses are effective against erosion. Unfortunately, their destruction, coupled with their extremely slow recovery rate, is causing accelerated erosion of the hill slopes in most of the area under investigation.

Geomorphologically, the area is characterized by deeply incised wadis converging into the az-Zarqā' river basin. They create a very dissected landscape of rounded steep hills, especially in the western sector of the survey area, while to the northeast the landscape is characterized by more gentle hills, and flat topped basalt outcrops. Elevations range from 410m, in the az-Zarqā' river bed near Tall al-Bīrah, to 880m on the high hills in the southwestern sector of the survey area. The geology is characterized by Cretaceous limestone with marine fossils, and, in Wādī aḍ-Ḍulayl, by Upper Tertiary and Quaternary basalt layers which overlay the older limestone. The upper layers are characterized by Quaternary loess-like deposits.

Several terraces in the az-Zarqā' river basin have been recognized by Besançon and Hours in their survey: the highest at 45m above the present river bed, and containing in many cases Lower Paleolithic artifacts. The formation, named ad-Dawqara from a village in the area, is followed, at a lower elevation (about 30/35m) by another terrace (al-Bīrah formation), also containing Lower Paleolithic artifacts, generally Late Acheulean. Middle Paleolithic artifacts have been found in the as-Samrā' formation, at about 25m above the present river bed. Finally, the lower terrace (as-Sukhna formation) was found to contain Kebaran and PPN deposits (Besançon *et al.* 1984; Besançon and Hours

1985). During our fieldwork, this sequence will be tested and possibly refined, following stratigraphic soundings at representative sites.

### The Survey (G. Palumbo)

A complete set of aerial photos at the scale 1:10,000 was available to the archaeologists, with the exception of a strip 2 km wide by 12 long, between coordinates 243E 164N and 245E 176N. New photos will be retrieved for this area and examined for the presence of archaeological features. On the basis of the aerial photos and survey conducted on the ground, 294 archaeological sites were located. This number, added to the 9 sites known from Glueck's explorations and 26 sites from Besançon's study of the az-Zarqā' river terraces in the 1980's, brings the total of the sites known in the area to 329. This increase in site number shows how much still needs to be recorded of Jordan's national heritage.

The sites known in the area from Glueck's study (1951) are presented in Table 1.

With the exception of an-Nimrah, they were all visited during this year's survey (Khirbat as-Sil was destroyed 10 years ago during some terracing of the az-Zarqā' river bank). 26 sites are known from Besançon and Hours survey of the az-Zarqā' basin and

as-Samrā' area (Besançon *et al.* 1984; Besançon and Hours 1985). They are mainly Paleolithic and Neolithic sites on alluvial terraces along the az-Zarqā' river. Table 2 correlates the site numbers as given by Besançon and Hours with those of the present survey (key: LP=Lower Paleolithic; MP=Middle Paleolithic; Keb=Kebaran; PPN=Pre-pottery Neolithic; UD= undetermined; the names and codes of the geologic formations containing the sites are those given by Besançon and Hours)

Of the 294 new sites located so far (275 of these were identified with the help of the aerial photos), most are cairns and tumuli on hill tops, but there are some major sites which need extensive explorations. Almost every single ridge and hilltop has one or more cairn, stone piles which often conceal a small cist tomb. Their common identification as "towers" is generally to be discarded. Only 2 out of several dozens of structures recorded so far can be certainly identified as towers.

69 sites were explored on the ground (11 known from previous surveys, 39 located with the help of the aerial photos, 19 located by intensive survey). Other 24 sites known from previous surveys and 236 identified on the aerial photos could not be visited during this fieldwork season. The sites so far recognized in the survey area can be classified

Table 1.

Site name	JR (*) site n.	Glueck site n. and reference
Jabal ar-Raḥīl	site 1	Glueck site 314; 1951:210-212
Khirbat aj-Jāmūs	site 2	Glueck site 315; 1951:211-212
Tall as-Sukhna	site 3	Glueck site 316; 1951:212
Khirbat al-Mak'hūl	site 4	Glueck site 312, called by him Khirbat al-Breitawi; 1951:209,212
Tall al-Bīrah	site 5	Glueck site 320; 1951:213-214
Khirbat al-Wad'ah	site 9	Glueck site 318; 1951:213
Khirbat Zuqm al-Ghurāb	site 10	Glueck site 317; 1951:212
an-Nimrah	site 11	Glueck site 319; 1951:213
Khirbat as-Sil	site 17	Glueck site 313; 1951:212).

\* JR stands for Jabal ar-Raḥīl, site 1 of the survey; originally the survey was named from this site.

Table 2.

R n.	Besançon <i>et al</i> 1984:pages, site n.	Date	Geol. Formation
18	97, 131; site 124	LP	ad-Dawqara (Qf3)
19	98, 131; site 118	LP	al-Birah (Qf2)
20	98, 131; site 116	LP	al-Birah (Qf2)
21	98, 131; site 29	LP	al-Birah (Qf2)
22	99, 131; site 115	MP	as-Samrā' (Qf1)
23	110; site 32	UD	?
24	94; site 27	Keb.+PPN (?)	as-Sukhna (Qf0)
25	97, 131; site 31	LP	ad-Dawqara (Qf3)
26	94, 100, 131; site 30	LP, MP	surface
27	110; site 28	UD	?
28	110; site 17	UD	?
29	110; site 16	UD	?
30	100, 131; site 14	LP, MP	surface
31	110; site 15	UD	?
32	110; site 18	UD	?
33	97, 131; site 19	LP	ad-Dawqara (Qf3)
34	98, 131; site 106	LP	al-Birah (Qf2)
35	99, 131; site 107	MP	as-Samrā' (Qf1)
36	97, 131; site 110	LP	ad-Dawqara (Qf3)
37	98, 131; site 24	LP	al-Birah (Qf2)
38	97, 98, 131; site 22	LP	al-Birah (Qf2)
39	110; site 23	UD	?
40	97, 131; site 21	LP	ad-Dawqara (Qf3)
41	99, 131; site 13	MP	as-Samrā' (Qf1)
42	97, 98, 131; site 119	LP	al-Birah (Qf2)
254	99, 131; site 109	MP	as-Samrā' (Qf1)

as seen in Tables 3 and 4.

Periods at survey sites were recognized by identifying artifacts found on the surface. 1,786 pottery fragments were "read" in the field, and 946 of these were collected for further study. Particular attention was paid in our collection and sampling strategies, in order to avoid deflating the sites of their surface remains.

The breakdown by period of the diagnostic pottery "read" at the 40 sites which yielded this type of artifact is as follows (this calculation does not include the pottery collected at site 1, Jabal ar-Raḥīl; the percentages are calculated on a total of 1449, which excludes the undiagnostic pottery found at several sites) (see Table 5):

In very raw terms, this distribution re-

Table 3.

Settlements	Industrial/rural	"Military"	Cairns	Other structures
21 settlements (6%) 3 isolated buildings (1%)	1 mill 5 farms/hamlets (2%)	2 towers 3 forts (1%)	60 groups of cairns (18%) 108 isolated cairns (33%)	2 cemeteries 4 cave areas (1%) 37 stone circles (11%) 46 enclosures (14%) 26 unidentified structures (8%) 38 surface scatters (12%)
24 (7%)	6 (2%)	5 (1.5%)	168 (51%)	153 (46%)

(total is 356 and over 100% because some sites have more than one feature).

Table 4.

As regards the periods of occupation of the 69 sites explored this year, the following are represented:

Prehistoric	Bronze-Iron	Hell.-Byzantine	Islamic
5 Lower Pal. (7%) 5 Middle Pal. (7%) 3 Upper Pal. (4%) 6 Epipal. (9%) 5 PPN (7%) 1 Pottery Neol. (1%) 3 Chalcolithic (4%)	2 EB I (3%) 8 EB II (12%) 1 EB III (1%) 3 EB IV (4%) 1 MB (1%) 1 LB (1%) 9 Iron II (13%)	1 Hellenistic (1%) 17 Roman (25%) 20 Byzantine (29%)	6 Umayyad (9%) 3 Abbasid (4%) 20 Ayyubid/ Mamluk (29%)
28 (39%)	25 (35%)	38 (55%)	29 (42%)

Sites with unidentified flints or pottery only: 16 (23%)

Sites with structures but no artifacts: 5 (7%)

(Total is over 69 and 100% because some sites have more than one period of occupation)

Table 5.

Prehistoric	Bronze-Iron	Roman-Byzantine	Islamic
Pottery Neol.: 51(4%) Chalcolithic: 14(1%) Chal/EBI: 11(1%)	EB: 318 (22%) MB: 11 (1%) LB:38(3%)  Iron II: 152 (10%) Iron: 4	Roman: 171 (12%) Rom.-Byz.: 68(5%) Byzantine: 291 (20%)	Umayyad 34 (2%) Abbasid: 3 Ayyubid/Mamluk: 198 (14%) Mamluk: 85 (6%)
76 (6%)	523 (36%)	530 (37%)	320 (22%)

Undetermined: 337

flects the intensity of human occupation in this region, with “peaks” in the Roman-Byzantine periods (37% of all the diagnostics), followed by the Early Bronze Age (22%), the Early and Middle Islamic periods (22%) and the Iron Age (13%).

This pattern of human presence in the az-Zarqā’ basin reflects similar situations found elsewhere in northern Jordan: prehistoric sites are generally obscured by later occupations or heavy colluvial deposits, or largely deflated. A series of wadi terraces along the river az-Zarqā’ were identified by Besançon and Hours (above). These terraces are dated by prehistoric artifacts found *in situ*. Lower Paleolithic Acheulean sites are quite common in the basin. Middle Paleolithic artifacts were found in bulldozer cuts in apparently sterile layers below EB II occupational remains at sites JR7 and JR79. Epipaleolithic pre-Natufian sites were also found as surface scatters, and their relatively common presence is suggestive of quite an intensive occupation during the Late Pleistocene. Chalcolithic sites are also relatively common. While no dolmen fields were found (large dolmen fields are found only a few kilometers downstream along the river az-Zarqā’), some Chalcolithic villages were located near the confluence of the river az-Zarqā’ and Wādī aḍ-Ḍulayl. Early Bronze Age, and especially EB II represents the first intensive “colonization” of the area. Over 20% of the sites have an Early Bronze Age component, which is quite often the dominant one. Of the 8 EB II sites, 3 are fortified settlements. The MB and LB periods are not well represented, a pattern very common east of the Jordan river. Iron Age II sites are quite common, and some of them are important settlements (such as site 45), forts (such as site 2), or large fortified towns, such as site 5.

Site 87 is of potential major importance since is a relatively short-lived site dated between the fifth and the third century BC.

Roman occupation is found at 25% of the sites, and Byzantine presence is clear at al-

most 30% of the sites explored this year. Roman presence is higher than in other regions of Jordan, but this is not a surprise, given the presence of Khirbat as-Samrā’ few kilometers to the east and of Jarash only 20 kilometers to the west. The intensive use of the land in the Byzantine period is also a pattern reflected in other locations in Jordan, especially in the north of the country. The scarce Umayyad presence might be due to a bias in the sample, but it is quite interesting to observe that many Byzantine sites do not seem to have a presence after the sixth and early seventh century. It is a surprise, instead, to note a sharp increase in the number of sites during the Ayyubid and Mamluk periods, which equals the number of the Byzantine sites. Some of these Middle Islamic sites are quite substantial, such as Khirbat al-Mak’hūl (site 4) or Khirbat Abū az-Zayghān (site 147). It is also possible, however, that what we call “Mamluk” pottery is a local manufacture of pottery which continued well into the Ottoman period, which appears to be under-represented in our sample. Following is a more detailed description of the results of the survey, by period.

#### **Paleolithic to Chalcolithic Periods** (G. Palumbo)

Settlement in the Paleolithic period seem to be strongly associated with the presence of permanent water supply in the az-Zarqā’ and aḍ-Ḍulayl rivers. Lower and Middle Paleolithic sites are a relatively common occurrence, but their stratigraphic sequence, well described by Besançon and Hours (1984; 1985) still needs to be tested. In several areas, especially in middle and lower slopes, and near outcrops of chert and flint nodules, the presence of debitage and stone tools is almost constant, making it difficult to distinguish between a general “background noise” of prehistoric artifacts and the presence of true “sites”. New sites identified during our survey include surface scatters

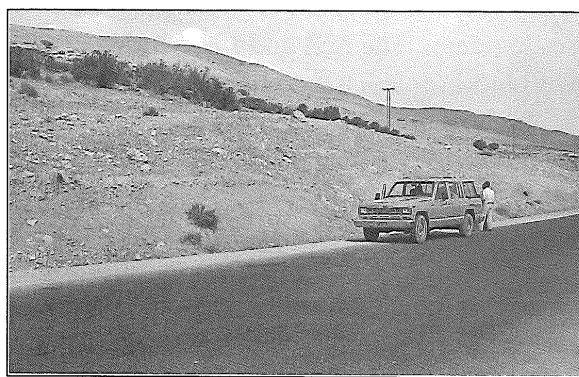
that “adjust” the original impression, derived from the fact that Besançon and Hours concentrated their survey on the banks of the az-Zarqā’, that the hills far from permanent water sources were uninhabited. Site 62 (JADIS 2516.033; grid ref. 251.98E 169.98N) is a vast Lower and Middle Paleolithic flint scatter at the confluence of two small wadis, while site 89 (JADIS 2517.053; grid ref. 254.40E 172.11N) is a Late Acheulean site on the top of a basalt plateau strewn with Paleolithic artifacts.

While Upper Paleolithic sites are not rare, several Epipaleolithic sites have been identified in the area, with quite distinct assemblages. Site 90 (JADIS 2517.054; grid ref. 254.24E 171.95N), is a potentially important site, since it could mark the location of a pre-Natufian settlement with circular structures and an extremely dense artifact concentration, of up to 160 artifacts per m<sup>2</sup>. The assemblage is characterized by great quantities of burins, also on retouched flakes and truncations. Site 70 (JADIS 2417.047; grid ref. 245.28E 173.21N), on a slope overlooking the az-Zarqā’ from a distance of 1.5 km, is an Early Natufian site. Artifact density is high, and the assemblage includes many *helwan* lunates with sheen, indicating their use as sickles.

While traces of Pre-pottery Neolithic use of the region have been found, the only settlement identified so far was unfortunately destroyed 2 years before our survey. The site covered a large area (approximately 4 hectares) on a low spur at the confluence of Wādī az-Zarqā’ and aḍ-Ḍulayl (site 13, Zuqm at-Taht, JADIS 2417.027; grid ref. 249.56E 172.96N). Only stone artifacts were found at the site, which has been recently bulldozed, according to some informants, to make way to orchards. The same informants spoke about the presence of a large number of dry stone walls removed during the bulldozing; this, and the material found by us, point towards the presence, at this location, of a typical medium-sized PPNB settlement. It

should be remembered here that a vast PPNB site was discovered a few years ago by Hanbury-Tenison on the right bank of the az-Zarqā’ only 3.5 kilometers downstream from Tall al-Bīrah, a site at the edge of our survey area (Kharaysin -JADIS 2417.001- grid ref. 244.0E 179.3N; Hanbury-Tenison 1978: 155, site 27; Edwards and Thorpe 1986: 85-87).

One of the most important discoveries of this survey was certainly the identification of one of the largest Pottery Neolithic Yarmoukian sites in Jordan, extending for almost a kilometer on a wide terrace on the right bank of the river az-Zarqā’, and overlooking from the north the confluence of the az-Zarqā’ and aḍ-Ḍulayl rivers (Fig. 3). The site, named Wad‘ah from the general toponym of the area, was initially located observing a bulldozer cut along the recently paved road serving the farms and small villages on the north bank of the az-Zarqā’. The site (JR8, JADIS 2417.025; grid ref. 249.16E 173.14N) was originally over 8 hectares in size (extensive road works in the area have destroyed much of the site, and its original extension cannot be determined). Stone foundations and other features are visible in the road sections and agricultural terraces, while the entire area is covered with typical Yarmoukian chipped stone tools, including highly polished knives on tabular flint. Pottery sherds, while relatively rare, were also found, and they have very strict parallels with pottery found at other Yarmoukian sites

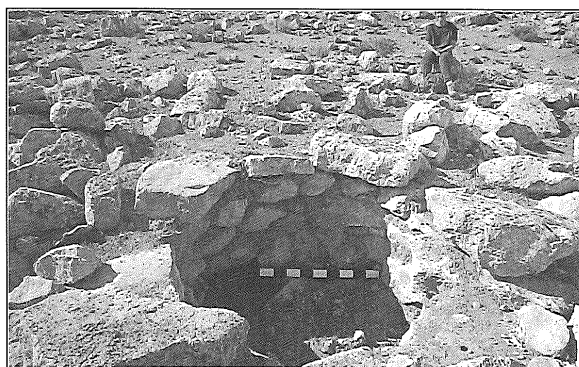


3: Al-Wad‘ah (site 8): bulldozer trench along modern road. View towards north-east.

(see pottery figures). Soundings at the site will be conducted in order to clarify the depth of the remains and the existence of a stratigraphic sequence within the Yarmoukian occupation of the site.

The Chalcolithic occupation does not seem to be represented by extensive villages such as those found in the Jordan Valley and the highlands of northern Jordan. The remains found at some of the sites, such as al-Ḥasiyya 1 (site 15, JADIS 2417.028; grid ref. 249.66E 173.23N), or site 80 (JADIS 2517.050; grid ref. 251.72E 172.82N) are quite limited in extent, and represent, perhaps, seasonal encampments. Given the nature of landscape use and occupation in the EB I and II periods in the same region, however, it cannot be excluded that a larger and more permanent site may have existed here during the fifth and early fourth millennium BC.

To conclude this brief summary of prehistoric occupation in the Upper az-Zarqā' basin, the presence of a number of stone structures should be mentioned, which might have originated in the Neolithic or Chalcolithic periods. One of them is a kite, probably the westernmost occurrence in Jordan of this type of hunting device (site 124, JADIS 2517.062; grid ref. 253.40E 171.75N), which is generally dated to the Neolithic. Other structures include stone circles, long walls, and cist tombs and tumuli, which could have originated in the Chalcolithic period (Fig. 4). While no dolmens are found in the survey area, this type of mortuary structures, as-



4. Site 54: cist tomb.

sociated with a large settlement, are found less than 5 km to the north, on a hill above the az-Zarqā' (Jabal al-Mutawwaq -JADIS 2418.011- grid ref. 244.2E 180.3N; Hanbury-Tenison 1987: 156-157, site 45). It is possible that this region marks the border between two different mortuary traditions in the Chalcolithic cultures of northeastern Jordan, with the prevailing, east of the az-Zarqā' river, of cist tombs and tumuli, possibly linked to a less permanent, more mobile element of the population.

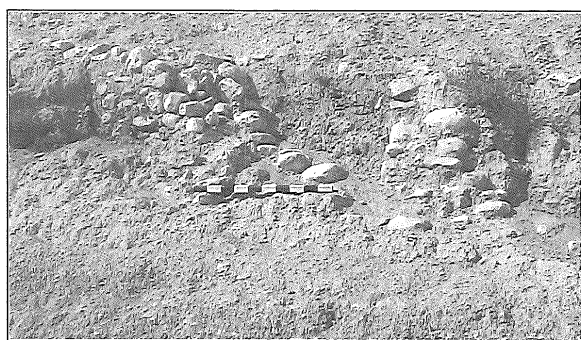
### Bronze and Iron Ages (G. Palumbo)

Several Chalcolithic sites may contain a late fourth millennium component, but only excavations will help in establishing a stratigraphic sequence for the transition between Chalcolithic and Early Bronze Age in this region. No clear EB I sites have been found in the survey area, and this might be due to a limited occupation, possibly mostly pastoral, of this region. Site 65 (JADIS 2417.042; grid ref. 247.24E 171.10N) could be one of these ephemeral "villages", or rather camps, located on a ridge, and probably frequented for a long period of time, since it seems to extend into the EB II, as confirmed from a type of rough pottery with basalt temper found in the ar-Raḥīl soundings in clear EB II contexts. While the "pastoral" component is still very visible during the EB II, the change in settlement patterns between EB I and II is stunning: not even during the Iron Age so many settlements populated the region as it happened during the EB II, and only during the Roman period the settlement density surpassed that achieved 30 centuries before.

The villages are all situated on hilltops or promontories, surrounded by enclosure walls or true fortifications: Jrayyah (site 6, JADIS 2516.011; grid ref. 251.24E 166.28N), Jebel ar-Raḥīl (site 1, JADIS 2417.022; grid ref. 249.62E 171.00N), as-Sukhna North (site 7; JADIS 2517.027; grid ref. 250.33E 171.86N) (Fig. 5), Site 79 (JADIS 2417.048;



grid ref. 247.37E 172.64N) (Fig. 6), Tall al-Birah (site 5; JADIS 2417.021; grid ref. 245.50E 175.06N) (Fig. 7) are all located along the *az-Zarqā'*, in defensible positions (with the exception of sites 7 and 79, which, however, were surrounded by fortifications or enclosures), and each in sight of at least one other site. This string of sites does not stop here, since the entire basin of the *az-Zarqā'*, from the 'Ammān Citadel to the confluence of the river in the Jordan (one of the largest EB sites found in Transjordan is located here, dominating the access from the Jordan to the *az-Zarqā'* valley: Tall Alla, or Tall Handaqūq south: JADIS 2117.032; grid ref. 210.85E 177.30N) is dotted with fortified EB II villages, some of considerable size, indicating a somewhat fragmented and unstable political condition. The soundings at ar-Raḥīl revealed relatively shallow deposits, and mainly EB II domestic occupations, while bulldozer cuts at sites 7 and 79 have shown over a meter of deposits with architectural remains of well preserved mud-



5. Site 7: bulldozer cut. The stone foundation of a structure and mudbrick remains are visible.

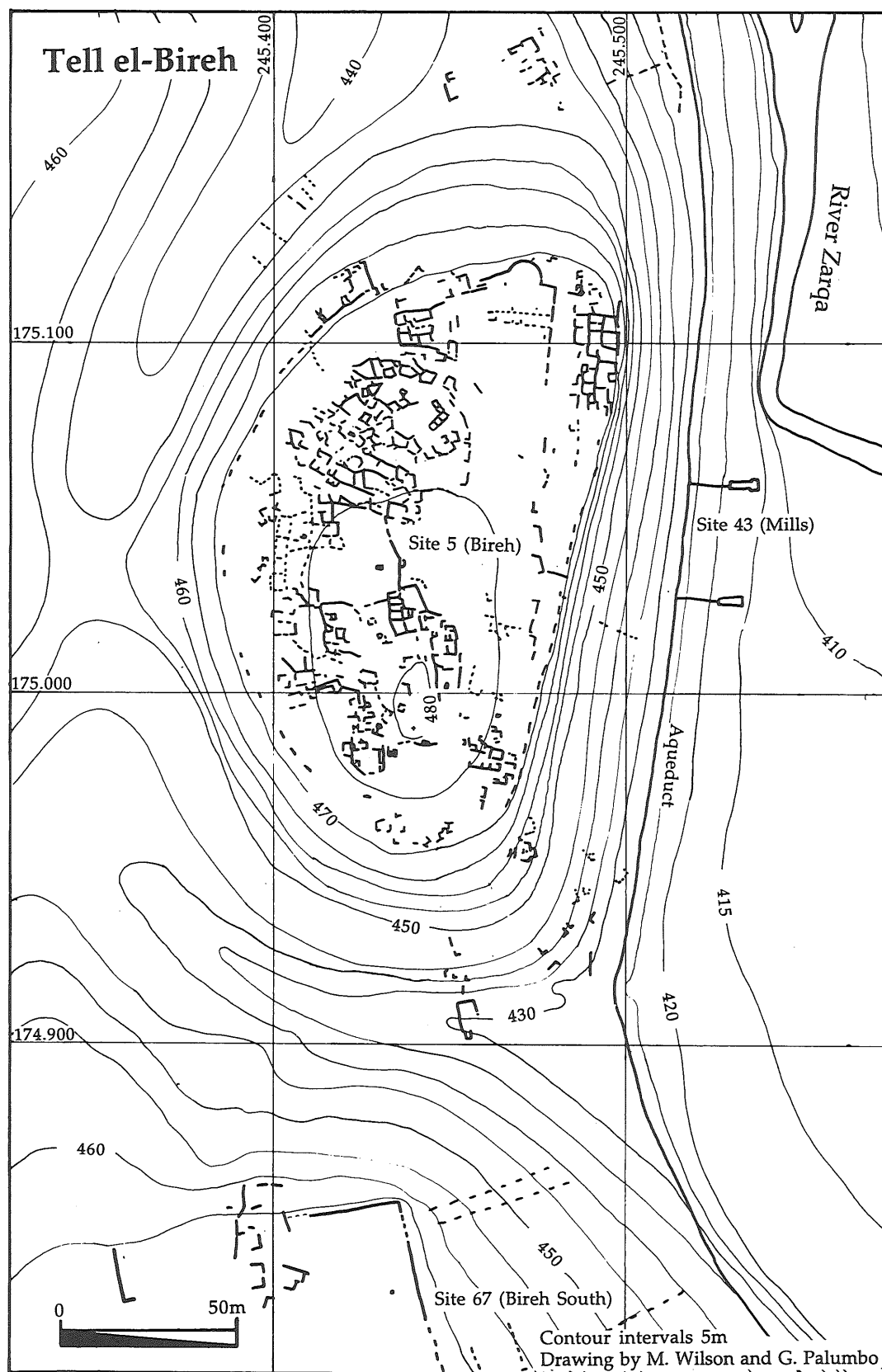


6: Site 79: EBII remains of mudbrick structures on stone foundations, visible in a bulldozer cut.

brick over stone foundations (at site 79 a wall is preserved for four courses of mudbricks above two courses of stone foundations). A microstratigraphic study conducted by Fouad Hourani on a series of layers sampled from the section exposed at as-Sukhna North (site 7), presented below, has revealed a series of uses associated with outdoor activities, alternating with phases of abandonment. At the same site a stamped jar neck with spiral motifs paralleled at other sites of the same period in Northern Jordan (Khirbat *az-Zarāqūn*) as well as on the Golan and Upper Galilee was found, being the easternmost occurrence of stamp seals identified in Jordan so far. Of all these sites, only Jrayyah (site 6) shows the presence of EB III material, which is very rare elsewhere in the survey area, reflecting a trend common throughout the highlands of Jordan. EB IV sites are slightly more numerous, and occupations both at Jrayyah and Jabal ar-Raḥīl may indicate the presence of a sedentary element in an otherwise predominantly pastoral and mobile environment.

The presence of only one MB and one LB site is not a complete surprise, but the progress of the survey may fill this gap, as it may fill also the surprisingly lack of Iron I sites, especially considering the consistent presence of Iron II villages, forts, and fortified settlements.

The MB IIB site of Tall as-Sukhna (site 3) is partially destroyed by bulldozing, but the MB deposits should still be partially preserved below the cultivated fields and remaining tall area. The newly discovered site of aṭ-Ṭuwayfiriya (site 87, JADIS 2417.054; grid ref. 245.80E 175.42N) is particularly important, because it is one of the few sites with a LB component located so far in north-eastern Jordan. The site, located on a terrace above the *az-Zarqā'* river, is unfortunately reduced to one large structure, visible in bulldozer sections created when the hill was almost flattened to widen some agricultural fields. The presence of some relatively re-



7. Topographic plan of Tall al-Birāh.

cent tombs of a Bedouin cemetery stopped the bulldozers. The section today shows approximately 2 m of archaeological deposits, and a 4-courses wall, visible mostly in the east section (Fig. 8). In future campaigns soundings will be conducted at the site to clarify the existence of a MB-LB or LB-Iron I transition.

While the two main Iron II sites of the area, Khirbat aj-Jāmūs and Tall al-Bīrah, were known since the explorations of Glueck (1951:211-214, sites 315 and 320), new sites have been added by the surface survey: site 45, for example, (JADIS 2516.016; grid ref. 250.88E 165.25N) is a large village, not fortified, unfortunately threatened by the expansion of the city of az-Zarqā'. The site lies on a flat promontory on the left bank of the az-Zarqā' river.

Khirbat aj-Jāmūs (site 2, JADIS 2417.007, grid ref. 248.84E 171.20N) (Fig. 9), now largely deflated and obscured by bulldozing, agricultural works, and the construction of the az-Zarqā'-Jarash highway, is a large tower surrounded by a perimeter wall. In the 1978 aerial photos the entire structure appears virtually intact, with many later stone circles and animal pens built in and around it (Fig. 9). While certainly originated in the Iron Age, the site was also frequented during Roman, Byzantine, and Islamic periods.

The main Iron Age II site of this region is certainly Tall al-Bīrah (already named for its EB occupation, see Fig. 7). Tall al-Bīrah is



8. Aṭ-Ṭuwayfiriya (site 87): remains of structures in a bulldozer cut.

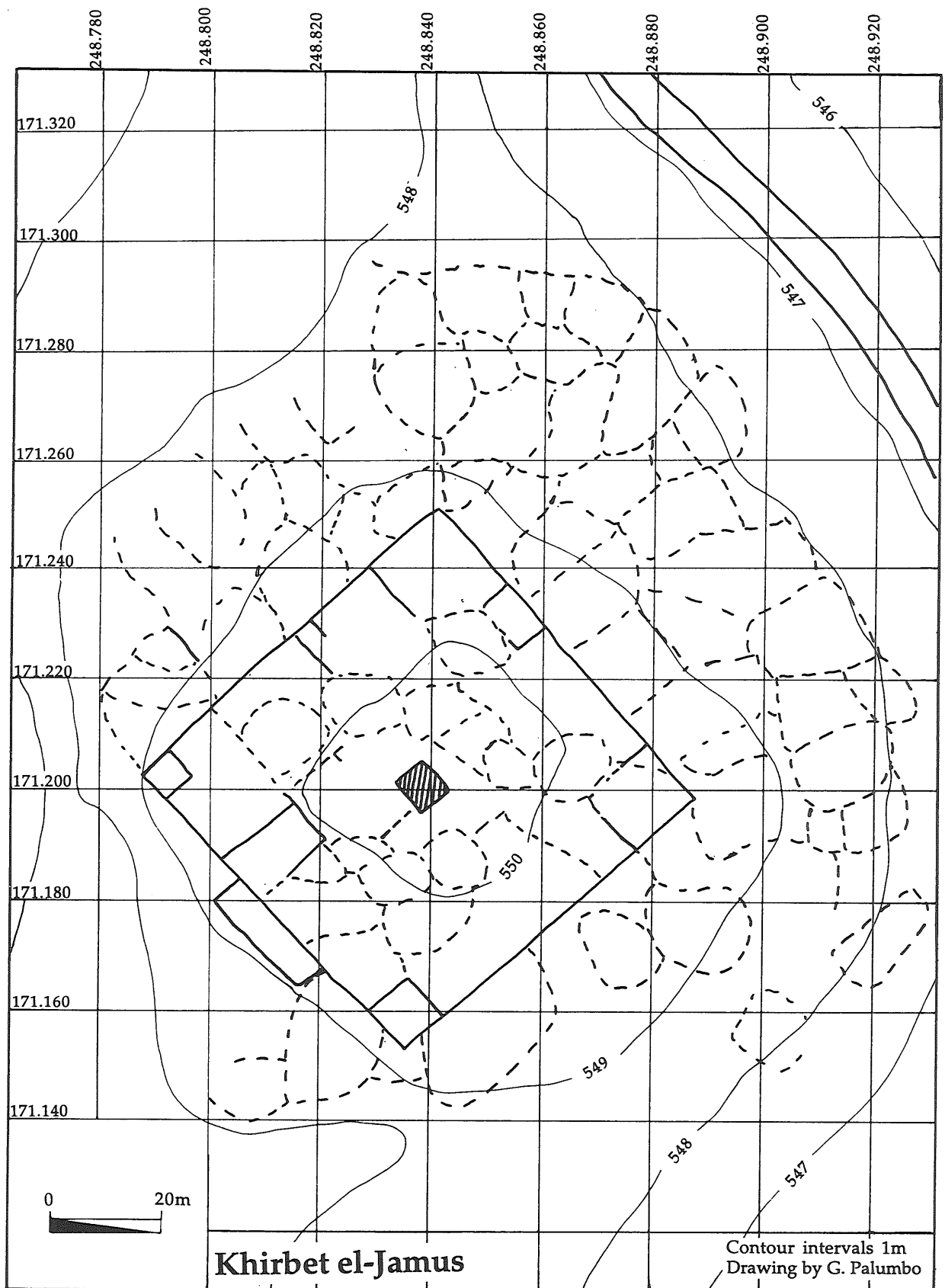
the only true "tall" site found in this part of the Upper az-Zarqā' valley. The Iron Age remains are impressive, consisting of massive fortifications built in huge basalt blocks, up to 2.5 m in length. The fortifications are especially well preserved in the north-east side of the hill, where a semi-circular tower also exists. On the hilltop, later remains, mostly Byzantine and Islamic, obscure the earlier remains. Clandestine excavations, up to 4 m in depth, have reached Iron Age layers, judging from the large amount of typical Iron Age jar sherds lying on the ground.

Tall al-Bīrah must have played an important role in the control of communication routes between the Jordan Valley and the eastern fringes of the Ammonite kingdom, and the fort of Khirbat aj-Jāmūs, only 5 km to the south-east, and dominating the wide bend of the az-Zarqā', must have supported al-Bīrah in its role of "sentinel" along the river.

### Hellenistic, Roman, and Byzantine Periods (M. Munzi)

The Hellenistic period, even if possibly under-represented because of pottery identification problems, represents the lowest point in the occupation of the area. Already at the end of the Hellenistic period and at the beginning of Roman influence, and, later domination (second-first century BC), with the introduction of *sigillata ware*, this situation changes. This growth, also found in other regions of Jordan (Ibach 1987:168; MacDonald 1988:190; Parker 1992) is represented by 6 sites. Of these, three were already occupied during the Iron Age II, possibly indicating a continuity still not identified in the field.

The intensification of settlement is even better represented during the Roman Imperial period (first to third century AD). The number of sites which can be dated to this phase is 17 (25% of all datable sites: sites 1 (?), 2, 3, 5, 9, 10, 12, 46, 47, 49, 66, 67, 68,



9. Topographic plan of Khirbat aj-Jāmūs.

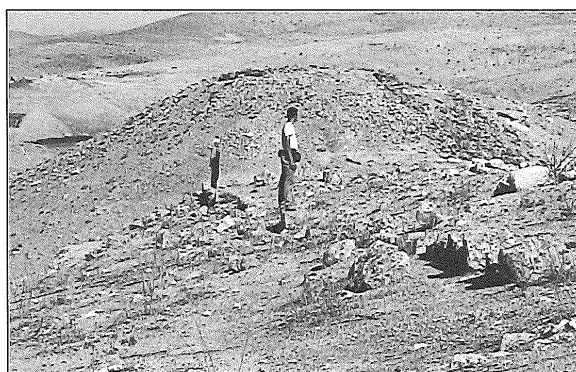
80, 82, 84, 147), with a growth coefficient of 2.83 compared to the Early Roman sites, which all survive in the Late Roman period. In the context of a rural landscape virtually unchanged, another slight increment can be observed during the Byzantine period, when there are 20 sites in the region that can be dated to the period (29% of all datable sites: sites 2, 3, 5, 8, 9, 10, 12?, 15?, 46, 47, 49, 50, 51, 55, 67, 68, 80, 84, 147, 161?), 14 of which were already occupied during the Roman period, and with a growth coefficient of 1.17 from the previous period. During this period, and in particular during the V and VI c. AD, rural occupation reaches its all-time maximum, as it happens almost everywhere in the Byzantine East (Cameron 1993:154, 162, 177-182).

The similarity in the rural landscape between the Roman and Byzantine period is also found in the continuity of the settlement patterns between the two periods. The majority of the sites (11 Roman, and 15 Byzantine) are located on the lower slopes of the hills overlooking the az-Zarqā' river, while only one is found along Wādī al-Ḥasiyya. All are within 1 km from the river. The differences, very subtle, but perhaps indicative of a change, are found with the sites located at more than 1 km distance from the az-Zarqā'. During the Roman period 4 sites (2, 66, 82, 84) are found on the hills at a distance between 1 and 2 km from the river az-Zarqā', while only one site is a "mountain top" site (147, at 747m as), and at only a little over 2 km distance from the river. During the Byzantine period, instead, only 2 sites are in the "intermediate" area (between 1 and 2 km from the river), while the mountain sites are now 3 (55, 147, 161), at around 2 km from the river. If this increase of the number of "mountain top" sites from the Roman to the Byzantine period is confirmed by future research, an explanation could be found in the needs for defense of the population towards the end of the Byzantine period.

The settlement patterns of the Roman and

Byzantine periods, then, is strongly associated with the topography of the area and the presence of the az-Zarqā' river. It is possible that, during those periods, cultivation was limited to the valley floor and lower slopes of the hills along the wadis az-Zarqā' and aḍ-Ḍulayl. This landscape is very different from other regions, such as Ḥisbān (Ibach 1987: 174) and Wādī al-Ḥasa (Mac Donald 1988: 232, 248), where settlements were mostly located on plateaus, a feature almost totally missing in this area.

The Roman and Byzantine sites are almost all relatively small, and without particularly interesting or abundant pottery associated with the ruins. The exception is found at sites 5, 9, and 67 (sites 5 and 9 already identified by Glueck 1939: 213, sites 320 and 318, respectively), which stand out for their dimensions and conservation of structures. Sites 5 (already described for the Bronze and Iron Age occupations) and 67 were probably related, and dominate from two high hills a meander of the az-Zarqā' (Fig. 10). Site 5, Khirbat al-Bīrah, is located on an almost completely isolated hill. It covers an area of almost 6 hectares, and its sequence of occupation is almost completely uninterrupted from the Early Bronze Age to the Islamic periods. The fortified village, which still shows part of the massive fortifications, could be dated at least partially to the Iron Age II, but it was almost certainly renewed and reinforced during the long Ro-



10. Al-Bīrah south (site 67): Roman camp and barracks. Tall al-Bīrah (site 5) is visible in the background.

man and Byzantine settlement. The general fortifications are still quite visible, built in megalithic technique using huge basalt blocks, over 2.5 m in length, and provided with circular towers (one, on its west side, has a diameter of 14.5 m). On its north side one possible gate is visible. Several buildings are recognizable within the fortifications. One of them, with an apse 9.7 m in diameter, could be a church. In another sector of the village a limestone block with simple cornice could be a small altar (Fig. 11). No inscriptions are visible on the block. Site 67 (JADIS 2417.044; grid ref. 245.46E 174.75N), located on a promontory 100m south of Tall al-Bīrah, has a much smaller size, and could be interpreted as a small military camp, probably for a garrison based at Tall al-Bīrah. The site is characterized by two buildings, well separated, on a north-south axis, that can be possibly interpreted as barracks. Their dimensions are close to a round 100 by 250 roman feet. The northernmost is directly in sight of Tall al-Bīrah, and has a dimension of 74.50 m (252 feet) north-south, by 27.50 (93 feet) east-west (see Fig. 10). There are no internal walls, but a single, large cistern towards the northern edge of the promontory. The second structure, few dozen meters to the south, and on the same general alignment, could only be measured on its length: 28.20 m (96 feet), while the width could not be determined. Three rooms, little more than 6 m wide, and perhaps a court are still visible, while the



11. Tall al-Bīrah (site 5): small altar.

wall are between 0.6m (2 feet) and 0.9m (3 feet) thick. In the area immediately to the west, three square structures, possibly towers, are aligned. Their sides are between 5 and 6 m in length.

The second village is site 9, Khirbat al-Wad'ah (JADIS 2417.005; grid ref. 248.96E 173.56N). It is located on a gradual slope above the river az-Zarqā', at about 400 m from the river, and covers an area of approximately 7 hectares. The site was probably never fortified. There are several buildings, however, that were certainly monumental, perhaps performing a public function, such as for example a 60m long structure which dominates the village from the eastern hill (an acropolis?). The presence of monumental buildings is also testified by the discovery of several architectural fragments, unfortunately removed by local treasure hunters after our visit (Fig. 12). To avoid its disappearance, a fragment of a basalt door, with bas-relief decoration, has been retrieved and documented. An inscription, perhaps in pre-Islamic Arabic, could indicate the presence at the site of Arab *foederati* (see below). The village shows the presence of a number of private structures, and numerous cisterns. It seems that each house had its own cistern, or was built above or besides a cave.

Other two sites, 2 and 147, are characterized by defensive structures. Site 2, Khirbat aj-Jāmūs, already identified by Glueck (1939: 211-212, site 315) is a fort, almost square in plan, originally built during the



12. Khirbat al-Wad'ah (site 9): architectural element.



Iron Age II (see coordinates above), and situated in the valley floor. Traces of late Hellenistic to Umayyad pottery may indicate that the site continued to be frequented during those periods, and that perhaps even its function did not change.

The second site (147), Khirbat Abū az-Zighān (JADIS 2416.001; grid ref. 247.88E 168.60N), is located on a high hill dominating the az-Zarqā' valley, and it is characterized by an articulated complex of structures, with a central structure, roughly square in plan, in well-built limestone blocks. The presence of Iron Age, Roman, and Byzantine pottery, together with a prevailing presence of Mamluk and later pottery (see below) witnesses the use of the site since at least the eighth century BC. Some of the structures still visible could be certainly linked to the pre-Islamic occupation of the site.

The trend observed in the increasing number of sites between the end of the Hellenistic period and the Late Roman and Byzantine periods is a consequence of the political and economic stability and the widening of the trade relations following the conquest of Syria and Judaea and the organization of the Decapolis by Pompeius in 64-63 BC.

This area of the Wādī az-Zarqā' was probably part of the territory of Gerasa, situated at about 20 km to the northwest. The border between the territory of Gerasa and Philadelphia ran along the Jabbok river, the ancient name of the az-Zarqā', according to Eusebius (*Onomasticon*. 102.21), or perhaps further south as highlighted by the IX milestone of the road Gerasa-Philadelphia (Avi-Yonah 1966: 175-177; on the milestone see Thomsen 1917: 63 n. 204). The agricultural production of this region, therefore, must have found its market into the important metropolis, in continuous expansion until the Severian period (Browning 1982: 36-52; Seigne 1992; Bejor 1993: 564-566). The region, close to but not on the front line of the *limes arabicus*, does not seem to have been provided with defenses during the Roman

and Byzantine rule. The few sites with defenses identified so far seem to have inherited these from the Iron Age period. The rural landscape, instead, was characterized by a number of small centers, around few larger villages. The latter could have had a status of *metrokomía*, in analogy with the Syrian system (Tchalenko 1953: 377-403; Bowersock 1991: 427-430; Kaplan 1992: 89-134). This landscape of farms, hamlets, and villages was not eliminated by the Arab conquest. This conquest was preceded by an increasing presence of Arab *foederati* since the fourth century AD (Parker 1986: 143-147; Shahid 1984a: 62-63, 160-161; Shahid 1984b: 500-503), which does not seem to have had a negative influence on the population growth of the area. As we will see (Islamic periods, below), the rural landscape lost importance along with the strong decline of the nearby urban centers.

### Islamic Periods (A. Peruzzetto)

The Islamic period presents in the az-Zarqā' Valley common problems with other regions of Transjordan. The survey revealed fewer sites of Umayyad date than those of the Byzantine period. These are eleven: no. 2-5, 9, 44, 50, 51, 67, 68, 147. Unfortunately this datum is still temporary for the scarce quantity of pottery of the Umayyad period found during the survey which, however, certifies the presence of settlements in the valley in this phase.

The Abbasid period is equally problematic for the almost complete absence of diagnostic pottery. The continuity of ware tradition between Late Umayyad and Early Abbasid has been recognized in recent studies of Early Islamic pottery from excavation in southern (Aqaba: Whitcomb 1989: 273-275) and central Jordan (Muwaqqar: Najjar 1989: 311-312).

For this reason at present the extent of the Abbasid settlement in the valley has not been ascertained.



By contrast the later Islamic periods are well represented in the recovered material as in other parts of Jordan (King *et al.* 1987: 439-459; Mabry and Palumbo 1988: 275-305).

21 sites have been recorded: no. 1, 2, 4, 5, 9, 10, 12, 16, 43, 44, 46, 49-51, 55, 60, 67, 68, 70, 147, 161.

It is noted that there is similarity of ware and decoration between Ayyubid/Mamluk and Ottoman pottery at this moment of the research. The later sites are located near or upon earlier structures, often overlaying a part of the area of the old settlement, most probably as a result of convenience for building materials, existing water supplies, and resources (more evident in sites no. 2, 5, 9, 147).

One of the well preserved sites, characterized by an unbroken occupation in all the Islamic phases (based on the recovered material), is Khirbat al-Mak'hūl (JR4, JADIS 2516.005; grid ref. 251.62E 169.60N), situated on a hill top south of as-Sukhna (Fig. 13).

The settlement, however visible, consists of two concentric rows of one-room houses, built one against the other, arranged in an oval shape which turn toward an inner courtyard (Fig. 14). The outer wall of these rooms, characterized by different shapes and dimension, appears to be the curtain wall of the complex. To date no openings have been documented towards the outside, while each "room" has a door or an opening towards the "courtyard" (Fig. 15). Outside of the central court, to the east, there is another range of rooms.

In the center of the court there is an L-shaped arrangement divided into five rooms. In the same court there are cisterns for the water supply of the settlement. The extraordinary state of preservation of the site and its life span are an important element for the establishment of a stratigraphic sequence for the Middle and Late Islamic periods of northeastern Jordan. In future campaigns the

survey of al-Mak'hūl will be completed, and soundings will be conducted to establish its chronological sequence. The documentation of this unique example of rural Islamic settlement will possibly help to protect it.

The second significant late Islamic site is Khirbat Abū Zeighan (no.147), in which an earlier occupation than Khirbat Mak'hul, from the Iron to the Ottoman period, with an apparent lack in the Early Islamic phase, has been documented. A description of this site is in the Roman/Byzantine report of this survey.

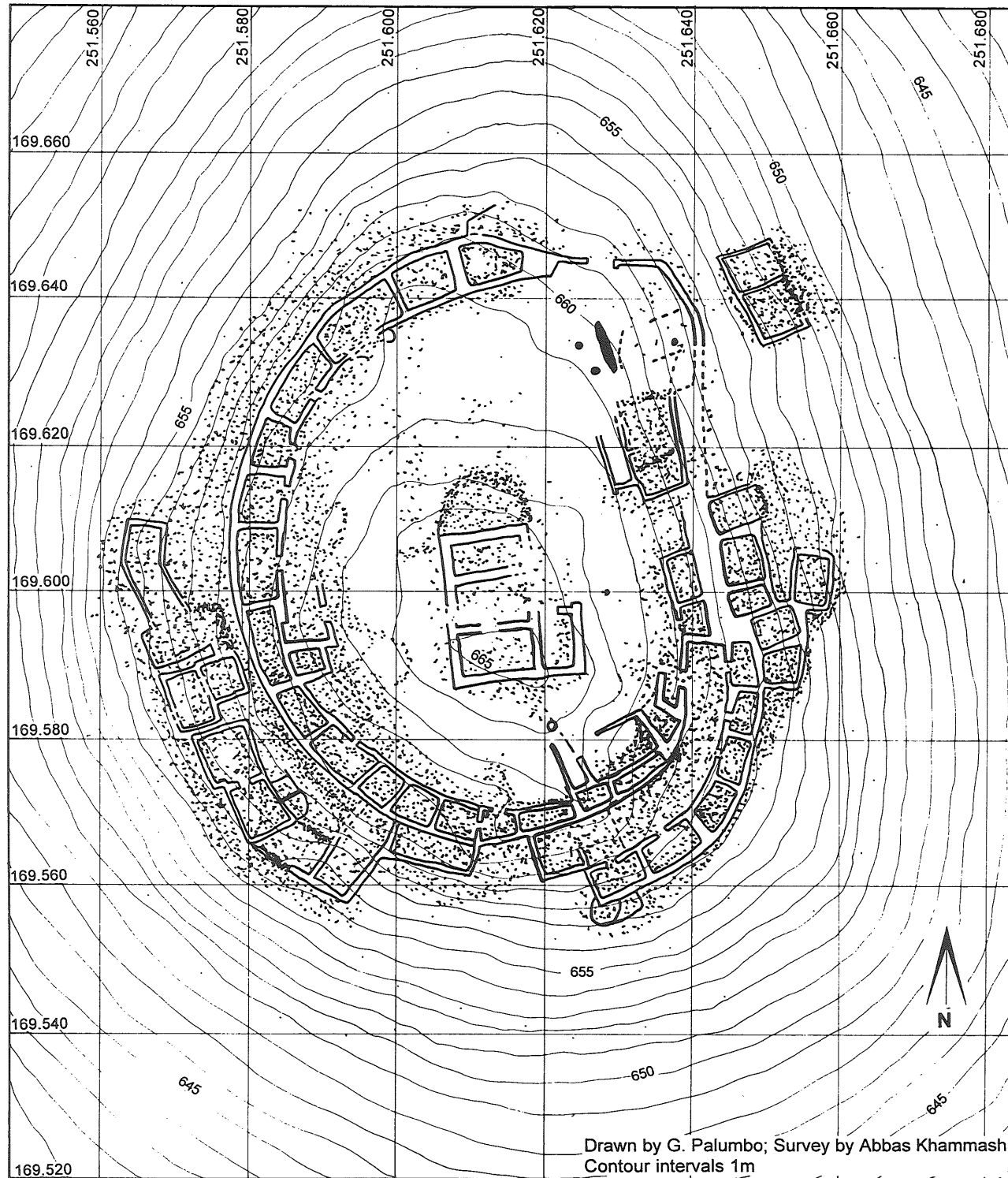
### **Soundings at Jabal ar-Raḥīl**

(G. Palumbo and S. Collins)

Jabal ar-Raḥīl (site JR1) is located at Palestine grid coordinates 249.69E 171.00N (JADIS 2417.022). The site was recorded for the first time by Glueck in 1935 (1939: 210-212, site 314), but was not visited again by other scholars until 1988, when a surface collection was conducted there by Palumbo during a survey of EBIV sites in Jordan. The site is located on a high hilltop west of the village of as-Sukhna, at an elevation of 647 m asl. It is covered by an extensive mass of ruins (Fig. 16). Many walls and structures belong to a Mamluk village, concentrated especially on the north-west slopes of the site, but the main periods of occupation were EB II and EB IV. The project had the aim to clarify the relations between the EB II and the EB IV occupations, and the depth of the archaeological deposit. In order to reach these aims, three soundings were opened in different areas of the site. Before the soundings, however, an intensive surface collection was conducted in several areas, in order to understand possible variations in the distribution of artifacts and periods of occupation across the site.

The collection, as well as the soundings, were conducted in controlled areas according to Palestine grid locations, verified during the preparation of the 1:500 topographic plan of the site. 10x10 m squares

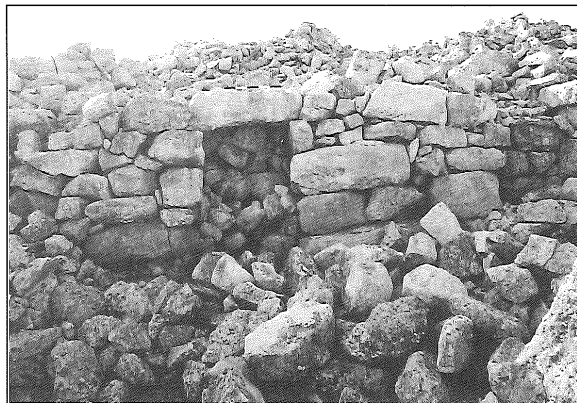
# Khirbat al-Mak'hūl



13. Topographic plan of Khirbat al-Mak'hūl.



14. Khirbat al-Mak'hul. (site 4): aerial view of the ruins, looking east.



15. Khirbat al-Mak'hul. (site 4): particular of a ruined house on the hilltop.

are defined by two couples of numbers, being the fourth and fifth digit of the East and North Palestine grid coordinates, respectively. These two numbers identify the southwestern corner of each square. Square 62-92, for example, is located between Palestine grid coordinates 249.62 and 249.63 East and coordinates 170.92 and 170.93 North. Each 5x5 m excavation unit is identified by its relative position within a 10x10 m square, according to the four quadrants: NE, SE, SW, and NW. Total surface collections were conducted at twenty 10 x10 m squares (totaling a 2,000 m<sup>2</sup> area):

65-88 / 64-89 / 60-90 / 62-90 / 61-91 / 63-91 / 60-92 / 62-92 (square and robber's spoil heap) / 60-93 / 61-93 / 62-93 (robber's spoil heap) / 63-93 (square and robber's spoil heap) / 56-98 / 58-98 / 56-99 / 57-99 / 59-99 / 57-00 / 59-00 / 56-01 / 58-01 (Fig. 17)

A total of 7608 sherds for a total weight of 48.65 kg were collected in the squares. Of

the 251 diagnostics found, 117 are EB II, 99 EBIV, and 35 Mamluk. The fact has to be mentioned, however, that 40 EB II diagnostics come from one of the robber's spoil heap, in 62-92, where Trench 2 was eventually opened (below). Flints were also collected in each square, for a total weight of 29.8 kg. The soundings had the following dimensions and location:

Trench 1: 5x3 m near topographic point 16

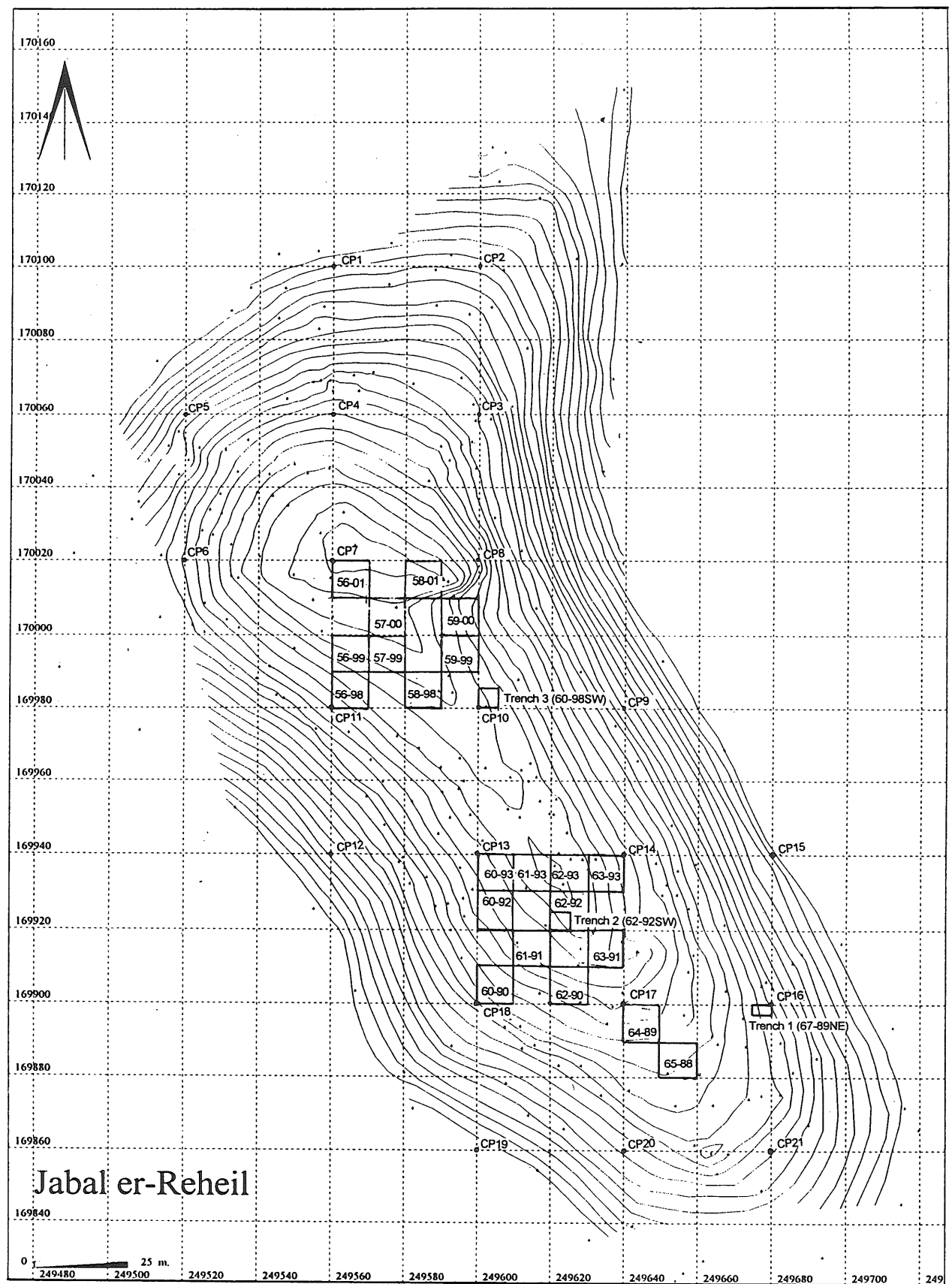
Trench 2: 4x3 m in 62-92 SW

Trench 3: 4x4 m in 60-98 SW

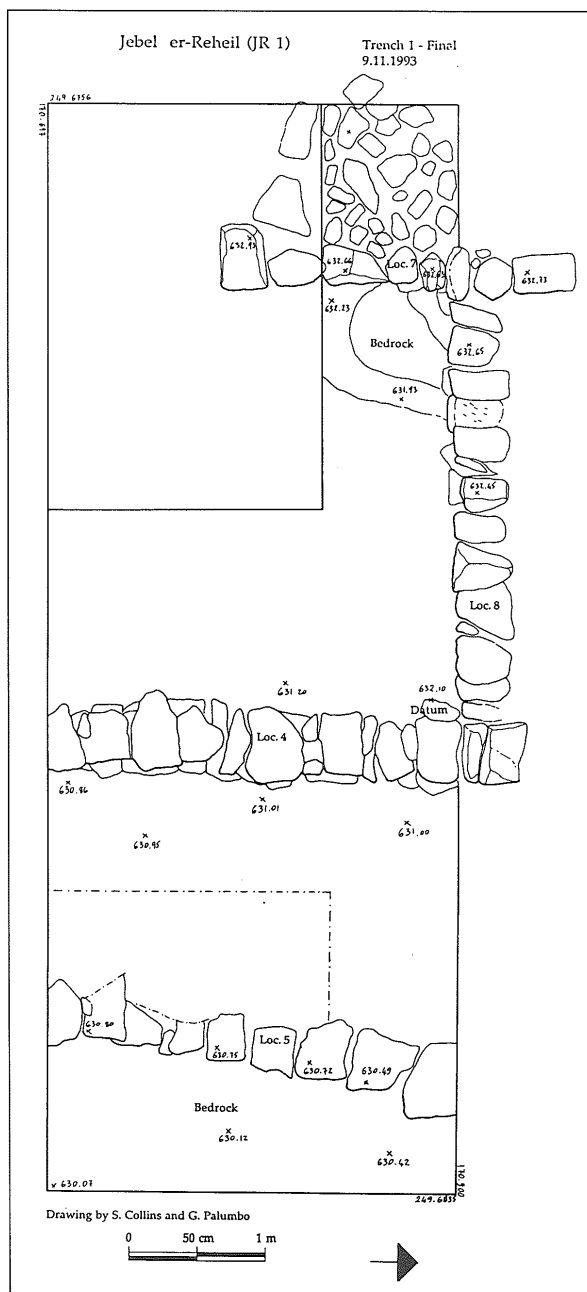
Trench 1 (Figs. 18-20): This trench was opened near topographic point 16, across a possible fortification wall, clearly seen on the surface along the eastern slope of the hill. The deposits here resulted to be between 30 cm and 1 m deep, with two parallel walls, approximately 2 m apart, resting on bedrock and without traces of foundation trenches. The lower wall (locus 5) was only one course high and one row wide, while the upper one (locus 4) was only one row wide, but three to five courses high. The fact that similar deposits of stone chips and packed earth were found between the two walls and above the upper wall, as well as the fact that no internal face could be distinguished in the upper wall suggested the fact that a third wall could be located uphill. An extension was then opened, 1 m wide and 3 m long, and a third wall was located 3 m above wall 4 (locus 7). A perpendicular wall, only one row wide, was also found connecting the two upper walls, locus 4 and locus 7. Unfortunately this upper wall also was only one row of stones wide and 4-5 courses high, founded on bedrock. It is then possible that a series of terrace walls exists on this side of the hill, rather than a well-defined fortification. While the perpendicular wall may suggest a casemate wall type of structure, we feel that in this case its function was to reinforce a series of terrace walls along this steep slope. This problem will have to be clarified with a longer and wider trench in the next season of ex-



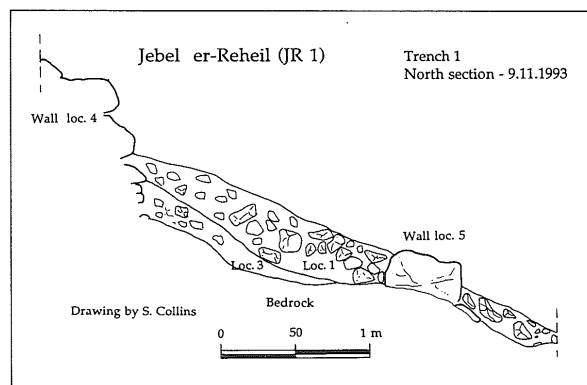
16. Topographic plan of Jabal ar-Rahil.



17. Jabal ar-Rahil: location of the intensive collections (IC) and soundings (TR).



18. Jabal ar-Rahil: Top plan of trench 1.



19. Jabal ar-Rahil: North section of trench 1.



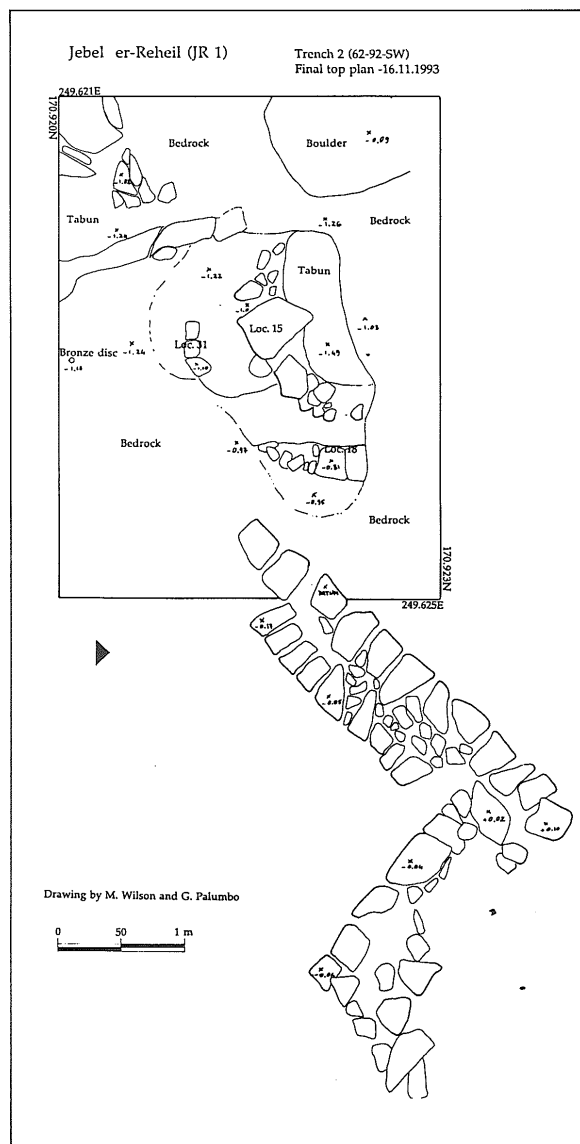
20. Jabal ar-Rahil (site 1): the EB IV enclosure wall in trench 1, looking west.

cavations.

A total of 715 pottery sherds were found, 110 of which were diagnostics. Of these, 35 are dated to EB II, 74 to EB IV, and 1 to the Mamluk period. Every single locus, from surface to bedrock showed a marked predominance of EB IV material, which helps in dating the construction of the fortifications or terracing on this side of the Khirbat to the late third millennium BC.

Trench 2 (Figs. 21-23): This trench, in square 62-92 SW, was excavated in order to understand the stratigraphic sequence of a 1 m deep robber's trench, which had exposed a large quantity of sherds and mudbricks. The trench was cleaned and intact deposits were found. Two major strata were located: the upper one, associated with a wall (locus 1) visible on the surface, should be dated to EB IV. The lower stratum, resting on bedrock, is to be dated to EB II. In EB II this area was probably a courtyard, partially cut into bedrock: a wall was found in the east balk, sitting directly on bedrock, two ovens were located near the north and the west balk, and a refuse pit full of pottery sherds and ashes, dug in a Cretaceous limestone bedrock with sea orchids fossils. Ashes from the ovens (rich in botanical remains) and from the pit were taken for analysis.

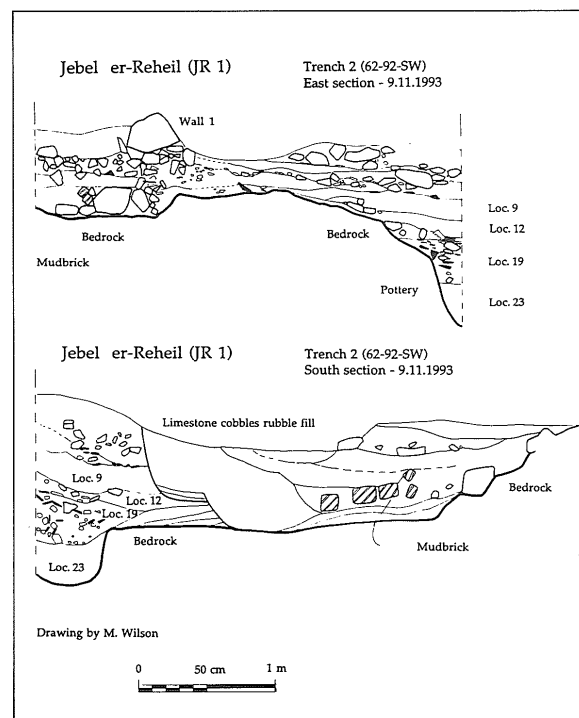
A total of 1035 pottery sherds were found during the excavations of trench 2. Of these, 119 are diagnostics (92 EB II, 26 EB IV, and 1 Mamluk). With the exception of the up-



21. Jabal ar-Raḥīl: Top plan of trench 2.

permost layers, almost all the loci were exclusively EB II. Besides pottery, basalt, and chipped stone artifacts, a copper disc was found in a clear EB II context. The disc (reg. no. JR1-93-2-1) is 7.68 cm in diameter, 1.29 cm thick, and weighs 347.96 g. The disc is possibly a small copper ingot. The analysis of its chemical composition will be done, in order to identify its origin.

Trench 3 (Figs. 24 and 25): This trench is located near topographic point 10 in square 60-98 SW. Two wall lines (loci 3, to the south, and 5, to the west) were visible at the present ground level in the southern half of the square. They meet, forming a right angle



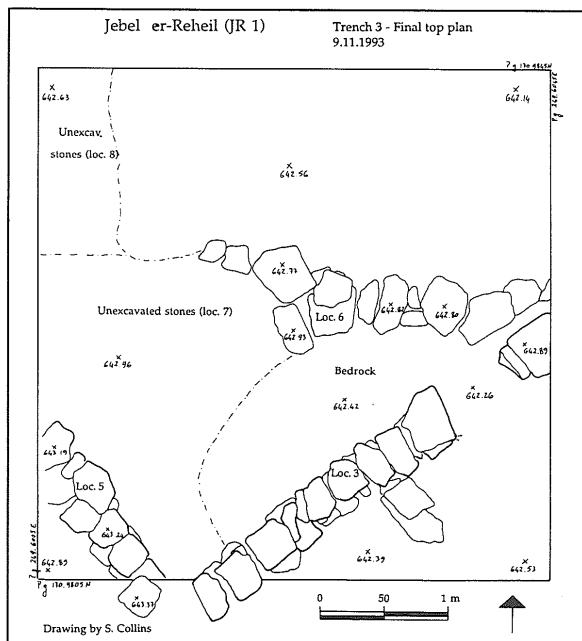
22. Jabal ar-Raḥīl: East and South sections of trench 2.



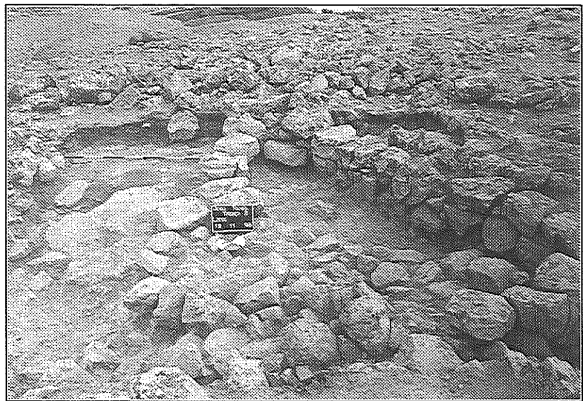
23. Jabal ar-Raḥīl (site 1): view of trench 2, looking to the southwest.

just outside the south balk of the square. The sounding here had the purpose to clarify the depth of the deposit and the relationship of the wall structure with its archaeological deposit. Here, bedrock was found only 30 cm below topsoil. The walls visible on the surface were both founded on bedrock. There was no evidence of a foundation trench. Both walls are only one row wide and preserved for two to three courses. They are both built with large boulders and some smaller "fillers". An opening through the southern wall (locus 3) was revealed after the removal of several blocking stones (locus





24. Jabal ar-Rahil: Top plan of trench 3.



25. Jabal ar-Rahil (site 1): view of trench 3, looking east.

13), which, unlike wall locus 3, were not positioned on bedrock. A possible floor surface associated with these walls and above bedrock was revealed in the excavated area to the north of wall 3, and in the entranceway, beneath the blocking stones. This floor surface was covered by a mass of fallen stones. No other deposits within the square seemed to be indicative of any evidence of habitation. The angle of collapse of the fallen stones suggest that they were originally part of walls 3 and 5. Time constraints did not allow the expansion of the trench towards the north and the east, where the rest of the structure is still buried. As for the date, it is possible that the original occupation is to be dat-

ed to EB II, and that the large quantity of EBIV sherds found, even at lower levels, represents a reoccupation of the EB II structure.

426 pottery sherds were found in the trench. Of these, only 32 are diagnostic (7 EB II, 25 EB IV). One of the diagnostics is an almost complete EB II juglet, found on bedrock south of wall 3.

## Discussion

A study of the EB II and EB IV wares from the surface collection and the soundings is in progress. As a preliminary indication, EB II wares are mostly plain, with limestone and basalt grit tempers (basalt is available at a short distance from the site, approximately one kilometer to the north). In trench 2 large quantities of cooking pot sherds were also found. EB IV wares can be divided into three major classes: gray (very high fired), cream/brown (medium/high fired), and red (low/medium fired). The first and the third are quite typical of the EB IV complex of the 'Ammān-az-Zarqā' area, as already recognized by Palumbo (1991) and Palumbo and Peterman (1993). The analysis of these classes of pottery from a stratified context will be useful to understand differences in pottery production and possibly goods circulation. Further excavations are however needed, in order to find more and better EB IV stratified deposits. As a matter of fact, all three trenches failed to reveal clear EB IV contexts: the fill in trench 1, while possibly EB IV in date, is apparently deliberate, the clandestine excavation in trench 2 severely disturbed the uppermost layers, leaving intact only the EB II deposits on bedrock, and the shallow deposit in trench 3 did not help in separating occupational layers, which are possibly to be dated to EB II, considering the presence of an almost intact juglet close to bedrock.

During fieldwork, robbing operations were conducted on the site. Another trench was dug by treasure hunters near trench 2.

The section exposed by the robbers, over one meter high, was cleaned and drawn. A wall built of relatively small stones was exposed on the west side of the trench (called "Trench 4"). The wall was faced with daub, which also showed impressions of reeds and small tree branches (Fig. 26).

#### Micromorphological Analysis of Site 7 (as-Sukhna North) (F. Hourani)

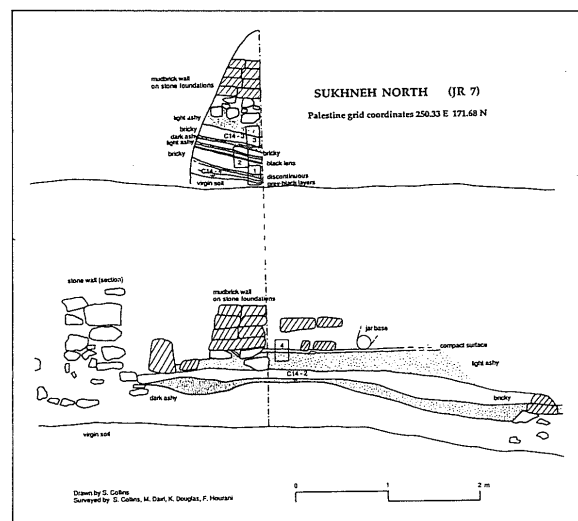
A test of four undisturbed soil samples were collected from site 7 (as-Sukhna North), from an exposed section of the wall (Fig. 27). The section is visible along the paved road immediately to the north of the village of as-Sukhna. The maximum depth of occupation is approximately 2 m, and structural remains are visible, consisting of mudbrick walls on stone foundations. Several layers of what appear to be floors separated by sediment are also visible in the section. The site seems to be contained within



26. Jabal ar-Raḥil (site 1): Trench 4, daub on wall face.

the EB II period (29th-27th century BC). The purpose of the sampling was to clarify the nature of the possible phases of occupation identified at the site. While 15 to 20 samples are usually needed for this kind of analysis, the scarcity of time did not allow us to obtain a more extensive sampling. Thus, lateral variations of the sedimentary units remain unknown, and some of the following interpretations should be considered preliminary.

The samples were taken from the exposed section, after cleaning and straightening of the section itself, for a width of approximately 1 m. In order to understand the sequence of occupation, the first three samples were cut in a continuous column running from the virgin soil upward, to the bottom of a stone wall foundation. Since the sediment between the top of sample 3 and the floor of the structure above is homogeneous, the fourth sample was taken in front of the wall's base, a few centimeters to the right of the preceding sample column. The floor belonging to the structure is included in the middle of this sample 4. As for the fill between the floor and the surface, this is also homogeneous, and is represented on the upper part of sample 4. Each sample is between 22 and 25 cm high.



27. Bulldozer section at JR7, as-Sukhna North, and profile of the trench where the 4 samples for the microstratigraphic studies were taken.

Samples were treated and prepared at the *Laboratoire de sciences des sols et d'hydrologie*, INA P-G, in Thierval-Grignon, France.

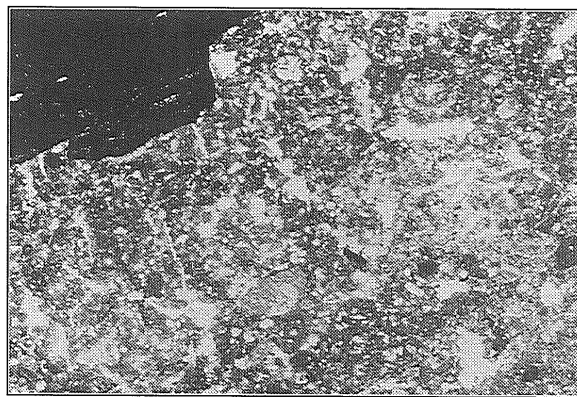
The micromorphological approach consisted in studying thin sections of the soil samples, to identify the nature and the organization of the mineral and organic fraction of the samples, and the relationships between this fraction and the voids in the same matrix. The aim is to identify features derived from natural and man-made actions. Following is a condensed report on the results of the study.

#### *Sequence of occupation*

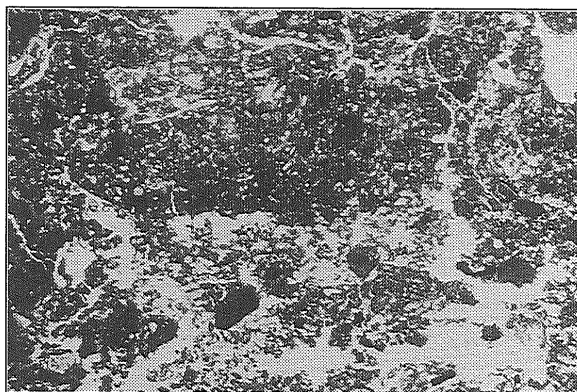
A sequence of more than 20 thin layers of occupational deposits have been identified. They reveal a rhythmical range of phases of occupation and abandonment. The occupational sequence of the first three samples (first occupational phase, below the foundations of the large structure exposed in the cut) shows that the space had been used in different ways:

- the lower units (1.1.2 - non-prepared floor) and 1.2.1 show characters which indicate short open space activities, with abundant anthropic elements, gypsum lenses, intermediate compacted horizons, and a small thickness of the residual accumulation (2-5cm) (Figs. 28 and 29).
- Unit 1.3.1 and probably 2.5.1 are constructed floors underlying the occupational units 2.1.1, 2.2.1 and 2.6.1, of similar character to the previous (1.1.2 and 1.2.1); thus they might be interpreted also as derived from activities in an open space (courtyard or verandah).

The occurrence of small aggregates (1-20mm) of purged sediment with vegetal pseudomorphs and with vesicular microstructure, qualified as detrital mudbrick material, occurs in small amounts in the first units, it becomes gradually more important in the upper units, starting particularly from



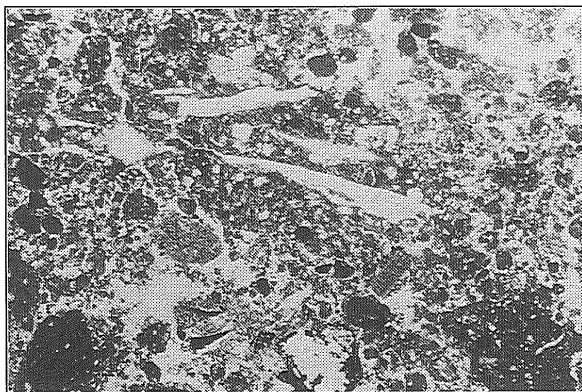
28. As-Sukhna North (site 7): microstratigraphic view of the transition between virgin soil and occupation level, micro unit 1.1.2



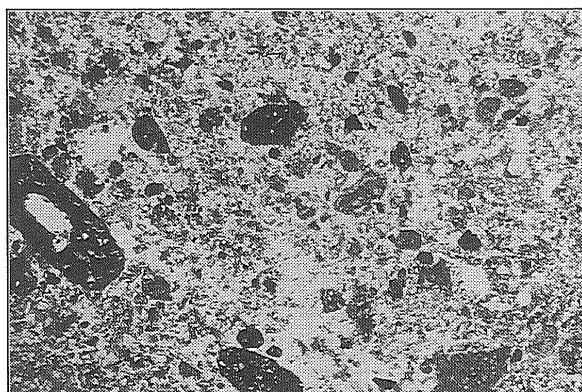
29. As-Sukhna North (site 7): microstratigraphic view of the transition between micro unit 1.2.1 and 1.3.1: constructed floor overlaying occupation level.

unit 2.7.1 (Fig. 30). That means constructions were scarce at that moment, or perhaps they were located far from the sampled sector. The upper units, on the contrary, show that construction activities were more intense, or closer to the sampled unit (Fig. 31).

We suggest that the mode of occupation in the lower layers might have been a camp. The rhythm of occupation and abandonment as evidenced in the sample area can indicate either repeated occupations during short periods of time or a continuous occupation with ephemeral structures and with modifications of the use of the space. In any case, between the two main phases of occupation and at the end of the upper one there are two obvious facies of abandonment which are much longer than the previous ones, judging from the accumulated de-



30. As-Sukhna North (site 7): microstratigraphic view of a facies of abandonment with fragments of construction material (mudbrick), micro unit 2.7.1.



31. As-Sukhna North (site 7): microstratigraphic view of a facies of abandonment, micro unit 3.3.1.

posits.

While the samples are insufficient to obtain final evidence about climate, gypsum crystallization and the high intensity of biological activity, particularly by insects in the units of abandonment of the four samples suggest a rather dry climate.

#### *Mudbrick material*

None of the samples was taken directly out of a mudbrick context, but the following interpretation is obtained from some detrital fragment or aggregate which was identified in the matrix.

This material, except the fourth sample, is similar in the different units where it occurs. It is composed of calcitic loam, obtained at the site itself since it contains many anthropic elements, well mixed with a high quantity of dry vegetal stalks. In sample 4 the materi-

al seems better sorted: anthropic elements in the mudbrick are found in smaller quantities, and the calcitic loam is purer.

#### *Floors and trampled surfaces*

They can be divide in two main types: constructed floors (A) and trampled surfaces (B). Each can also be divided in two sub-types:

A1. Selected material: this type is found in unit 4.2.1. The prime material used here is composed of calcitic loam (same as in the virgin soil), mixed with chalky sediment. Some fine fragments of charcoal are well integrated into the purged material; vegetal stalks were used in small quantities.

A2. Rough material: found in units 1.3.1 and 2.5.1. The material used in this type of floor is the anthropic sediment itself: fine fragments of charcoal, bones, mudbrick material, and flint are integrated in the matrix. Vegetal stalks were not used in these floors.

B1. Topped by an ashy accumulation: units 1.1.2, 3.1.1, and 3.5.2; these units are characterized not only by compaction but also by the integration of ash and fine fragments of charcoal as a transition to the occupational unit. This kind of accumulation suggest a surface where activities were performed.

B2. Without occupational accumulations: units 2.4.1 and 3.7.1; here the upper parts of the units are more compacted than the lower ones and incorporate some anthropic material. Those units are overlaid by units of sediment which do not find a parallel in the typical facies of occupation. The absence of occupational accumulation and the occurrence of trampling indicate the use of this space as a passage.

#### **Other**

*Virgin soil:* the substrate of the site consists of clayey calcitic loam. The very well sorted quartz grains incorporated in the matrix indicate that the sediment is of primary eolian origin; it was eroded from surrounding

mountains and then transported and deposited by the az-Zarqā' river.

*Pottery:* Two fragments of pottery, big enough to be studied, are incorporated into the samples 1 and 3. The ware is made of red clayey sediment, very well purged and compacted; quartz is almost absent, temper consists of crushed shells. This clay does not seem to be found in the vicinity of the site. Other small fragments are of a different nature (calcitic loam with small fragments of charcoal and grains of quartz of a more important size relatively to those found in the virgin soil). The subrounded outline and the small size of these fragments does not allow us to consider them as pottery, unless they were strongly altered by fire or other causes. They might also be detritic fragments of construction materials, not mudbrick, but perhaps an oven.

*Flint:* Many small angular and sub-angular fragments of flint are found in the samples, and especially in 1 (unit 1.2.1). They are probably debitage, suggesting flint knapping activities.

The attached chart includes brief macro and micro scale descriptions of the sedimentary units and their micromorphological interpretations. Sample 1 is the lower one, and the micro units in each sample are presented from the lower to the upper ones (see Table 6).

### **A Sculptured Basalt Fragment from Khirbat al-Wad'ah (Site 9) (M.D. Wilson)<sup>2</sup>**

A fragment of sculptured basalt was recovered during the preliminary survey of Khirbat al-Wad'ah (site 9, grid ref. 248.96E 173.56N). This is presumed to be the upper portion of a door and probably of a funerary context (Fig. 32).

It is doubtful whether the stone was in its original resting place of antiquity, but most

probably transported to its place of discovery, (lying upon the ceiling material of a collapsed natural limestone cavern) at a recent time. However, in view of its weight the former location may not be any great distance.

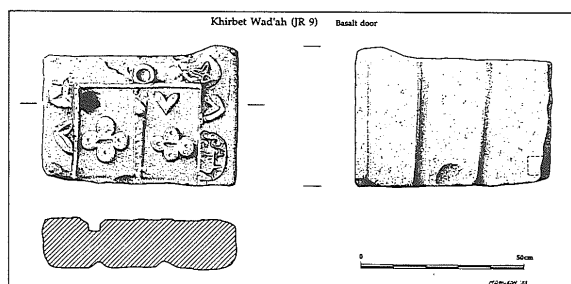
#### *Description*

The surviving fragment, measuring approximately 60 x 40 x 15 cm, probably represents roughly one third of its original size, and there is the possibility that it was originally one of a pair. There is evidence of a pivot joint having existed at the far side of the top (assuming correct orientation) of the stone.

One side of the stone, presumably the front, or outer surface displays an arrangement of crudely carved and rustic looking symbols, all in low-relief. Horizontal and vertical, square-profiled bars which form a frame with internal divisions, separate the symbols into two groups; those inside the framework or panels and those bordering. A small ring occupies a central position at the top exterior of the framework. Accompanying the bordering symbols is an inscription.

Each of the internal symbols (three) have a floral appearance, whilst those around the outside (five), in a poorer state of preservation, appear to display both floral and zoomorphic characteristics.

The rear of the door has two vertical v-shaped grooves, approximately 5 cm wide by



32. Basalt door from Khirbat al-Wad'ah, site 9.

2. I would like to thank Dr Ibrahim Surty of the Department of Islamic Studies, Selly Oak Colleges,

Birmingham, for his examination and comments on the inscription.

Table 6.

## Site JRS 7 (Sukhne North): microstratigraphic sequence (samples 1-2)

Sample	Macrolevel. Description	Microlevel. Units	Interpretation
1	1.1 - Virgin soil. Hard granular red soil with prismatic structure	1.1.1: Fluvial calcitic loam with 5-8% of very well sorted quartz grains.	Original loessic deposition transported from mountains by water
	1.2 - Gray-green mixed with some charcoal	1.1.2: Same components of 1.1.1, more compacted, integration of some fine anthropic elements, mainly charcoal	Contact with the occupation surface and trampling
	1.3 - Light brown loam with small pebbles	1.2.1: Occupation surface: fragments of charcoal, bones, flint, pottery, and some detritic aggregates of construction material; very rich in gypsum lenses and strongly disturbed by insects; compacted horizons in intervals. 1.3.1: Compacted calcitic loam; contains a very small quantity of fine fragments of charcoal. Towards the top there is more charcoal, associated with sub-horizontal pores and cracks.	Domestic activity in open installations and dry conditions.
2	2.1 - 3cm. Slightly compacted brown-gray loam with charcoal fragments	2.1.1: See 1.3.1	Reorganization of the space; constructed floor without vegetal incorporation
	2.2 - 1cm. Powdered gray ash sediment	2.2.1: Similar to top of 1.3.1	See 1.3.1
	2.3 - 4cm. Powdered gray-brown sediment	2.3.1: Micro aggregated, pulverulent at the base and a bit compacted on the top; here it contains some sub-horizontal voids and a few charcoal fragments 2.3.2: Repeated sequence of 2.3.1	Break in use and sporadic trampling
	2.4 - 1cm. Light gray ash	2.4.1: Calcitic loam mixed with small fragments of charcoal and silex	Same
	2.5 - 3cm. Brown-gray slightly compacted loam with some pieces of charcoal	2.5.1: Calcitic loam compacted in a wet state with rare anthropic elements. More compacted on its upper part with more abundant anthropic elements.	Sediment derived from other nearby areas, possibly by trampling
	2.6 - 4cm. Gray-black sediment	2.6.1: Micro-aggregated unit very rich in ash and charcoal, and completely disturbed by biological activities. A very thin sorted quartz unit is present in its upper part	Roughly prepared floor or trampling in humid or wet conditions
	2.7 - 5cm. Light brown granular loam	2.7.1: Unit of physical disaggregation. Rich in mudbrick aggregates, strongly pulverized by gypsum crystals and insect activities	Abandoned occupation surface in open space, subsequently eroded by rain
			Abandonment



Cont. Table 6.

## Site JRS 7 (Sukhne North): microstratigraphic sequence (samples 3-4)

Sample	Macrolevel. Description	Microlevel. Units	Interpretation
3	3.1 - 3cm. Light brown slightly compacted loam	3.1.1: Mostly disaggregated mudbrick material, with compaction	Trampled detritic elements.
	3.2 - 2cm. Loose brown-gray loam mixed with charcoal and ash, mainly on the top	3.2.1: residual micrometric to millimetric fragments of charcoal mixed with detritic mudbrick material	Elements of compaction redistributed by trampling
	3.3 - 5cm. Grayish-brownish loam with few pebbles and ash	3.3.1: Detritic aggregates of mudbrick material strongly altered by insects	Abandonment
	3.4 - 2cm. Light brown ashy unit.	3.4.1: Vegetal pseudomorphs, discontinuous bed associated with detritic mudbrick material	Collapsed roof?
	3.5 - 4cm. Mixture of ash and dark brown loam	3.5.1: Similar to 3.3.1	Abandonment
	3.6 - Discontinuous centimetric ashy unit	3.5.2: Very fine fragments of charcoal well incorporated in recompact detrital mudbrick material	Trampling
	3.7 - 4cm. Dark brown layer	3.6.1: Truncated accumulation of about 2cm of ash	?
4	4.1 - Brownish-grayish fairly loose sediment	3.7.1: recompactation of disaggregated mudbrick material	Trampling
	4.2 - 3cm. Beige-whitish compacted unit (floor)	4.1.1: Microaggregated unit with some detrital mudbrick material. Very impregnated of gypsum microcrystals	Abandonment
	4.3 - Dark-brown slightly compacted sediment	4.2.1: Unit composed of calcitic loam with high quantity of calcareous fragments and little charcoal	Constructed floor
		4.3.1: Disaggregation with strong alteration by insects	Abandonment



2.5 cm deep and equally spaced across its width. These may have been for supportive battening. A square shaped slot of ca. 8 cm in depth and width on the inner side of the door is probably inserted as a means of securing the closure of the door. A further, smaller, rectilinear slot with chamfered edges is located in the upper left-hand corner of the left interior panel on the front of the door; its function is unidentified.

#### *Interpretation and dating*

Despite the inferred function of the carved basalt lending itself to comparison with apparently better crafted versions of 'Roman' date (e.g. Umm Qays), the unusual and un-Romanlike character of the decoration suggests an idiosyncratic emulation. The door is likely to be the product of an alien concept of a monument of official or institutionalised inspiration.

During the fourth and fifth centuries there was undoubtedly a large *foederati* presence between Philadelphia and Bostra (Parker 1986), and a strong argument supports the maintenance of Arab cultural identity within these groups (Shahid 1989b: 412-4). It is reasonably inferable that the craftsmanship of this stone belongs to a member of one of such groups. The ceramic evidence of Khirbat al-Wad'ah indicates site utilisation from the third century AD until the sixth century AD.

The script, which is accepted as pre-Islamic in character (pers. comm. I. Surty), may also support the proposed *foederati* association with the site.

Although the art of the peoples of Oriens may be sometimes interpreted as operating within extremely difficult constraints (e.g. Avi-Yonah 1945: 78), it is questionable as to the extent that individual groups of the *foederati* conformed to the eccles and the law (Shahid 1989b: 164), in spite of their 'institutionalised' representation (Shahid 1989a: 331-345).

The arrangement of the internal divisions and symbols on the Khirbat al-Wad'ah stone

may have significance in the development of religious and funerary symbolism in the early Roman-Christian period of the region. It is plausible that the internal divisions are formed by the upper part of a cross, the arms only partially surviving. The upward and outward increase in thickness of the vertical bar may therefore, denote more than a mere crude carving of the internal division, but a deliberate cruciform.

The 'floral' motifs which flank the upper arm may be feasibly interpreted as conceptual forms of the petalled rosette. In the Christian period the rosette is denied its former symbolic value as it is either replaced by the cross, or moved to a flanking, and more ornamental position (Avi-Yonah 1945: 67-72).

However, it is arguable that the symbols represent a form other than 'floral', given the enigmatic circular indentation in the centre of each 'petal' and the horizontally positioned slit which passes through the centre of each of the two symbols.

Whilst the contemporaneity of the carvings is indeterminable, it is observed that the inscription, which does not respect the alignment of the framework (the latter terminating short of the inscription), may indicate a reuse. Alternatively, this may be due to an inadequate allowance of space in the execution of the work. The meaning of this inscription is at present unknown.

#### POTTERY

*Neolithic to Iron Age periods* (G. Palumbo)

The pottery found at the Pottery Neolithic site of Wad'ah (site 8) is the first occurrence of this period found in eastern Jordan. The pottery forms, surface treatment, and decoration assign the material found to the Yarmoukian period of the Pottery Neolithic. Very coarse bowls or vats (the one represented in Fig. 33:1 is at half the scale than the rest of the illustrated fragments) are accompanied by relatively fine, cream slipped

and red painted jugs and cups, often decorated with incised oblique lines and fishbone patterns, set between two parallel incised lines. The variety of forms and the quantity of materials found suggest the presence of a well-established settlement at the location of al-Wad'ah.

While Chalcolithic pottery was found at several sites, none of it is illustrated here, due to the fact that no diagnostics have been found, with the exception of some small rim fragments of marginal significance. The wares are usually coarse, tempered with small basalt grits, and sometimes cream-slipped; no paint or other decoration has been observed on the fragments found.

No clear EB I material has been found, even though some Chalcolithic material could in fact be assigned to the EB I after more detailed study still to be performed. EB II material is found at several sites, including of course excavation layers at Jabal ar-Raḥīl (site 1). The most common types are hole-mouth jars and large necked jars. A piriform juglet was found *in situ* in Trench 3 at Jabal ar-Raḥīl, and fragments of small cups and juglets have been found both at this site and at Jrayyah (site 6), as-Sukhna North (site 7), and at site 79. Interestingly enough, pottery found on the surface at site 66, which could not initially be dated, because of the absence of diagnostics, was assigned to the EB II on the base of similar wares found sporadically but consistently in other all-EB II contexts, such as site 79, or in stratigraphic layers, such as at Jabal ar-Raḥīl. This ware, not recognized elsewhere so far, is characterized by a cream to light brown color and by the presence of a thick temper of small basalt grits. We are perhaps in presence of a local "nomadic" manufacture that does not follow the trends of more sedentary communities, and carries on a tradition of a rough handmade pottery more similar to the wares of the Late Chalcolithic and Early Bronze Age I than to the more refined types and wares of the early third millennium BC. At as-Sukhna North a

jar neck was found with a stamp seal impression representing a spiral motif. The impression is very similar to other found at Khirbat az-Zarāqūn and in the West Bank and at Hazor. This particular fragment is discussed by Chesson *et al.* (1996).

The EB III is probably represented only at Jrayyah, site 6, but its separation from late EB II types will require more study. The Early Bronze Age IV pottery is characterized by the presence of relatively few holemouth jars compared to other regions, and especially by the presence of a large number of jars and amphoriskos. As discussed already by Palumbo (1991) and Palumbo and Peterman (1993) the EB IV materials of this region suggest the presence of a separate "group" or style, which has contacts with the Jordan Valley, but is differentiated by the presence of very characteristic types, such as the jar with vertical strap handle and folded-envelope ledge handles, and wares, such as the red-brick wares, very common at ar-Raḥīl. The survey finds and the soundings at ar-Raḥīl are confirming this pattern and the extremely localized nature of this pottery "family".

Middle Bronze Age material was only found at one site, Tall as-Sukhna (site 3). The four fragments represented here are very important, not only because they confirm a pattern of MB occupation at the margin of the desert, emerging from the surveys of Betts in the regions east of Umm aj-Jimāl, but also because they are an indirect indication of the fact that small rural villages could exist during this period in remote areas, and perhaps not necessarily under the control of an urban center.

Aṭ-Ṭuwayfiriyya (site 87) an assemblage possibly dated to the LB II period has been collected. This assemblage is represented here by a large carinated cup with one vertical handle, straight sides and convex base, for which we could only find generic parallels (Fig. 36:19).

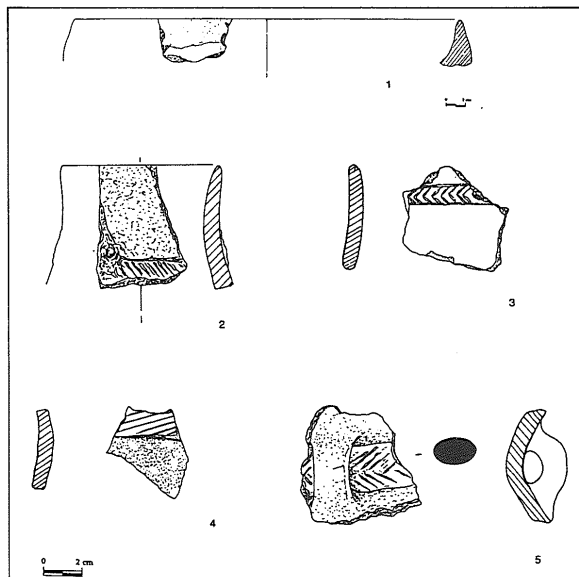
The Iron Age pottery found is quite typ-

ical and does not present particular problems: all the most common forms are represented: bowls, cups, cooking pots, pithoid jars, grooved necked jars. These types are mostly found in this combination at several sites in northern Jordan.

### Fig. 33 - Pottery Neolithic

All wares have a coarse temper, coarser in the non-decorated pottery. Decorated pottery is cream-slipped, with the frequent presence of a red-brown trickle paint, usually between the incised decorative band and the rim of the juglet or cup.

1. Bowl or vat, cream ware, very coarse temper, scale is half of the other illustrated fragments .
2. Juglet, cream slip, red paint between incised band and rim, coarse temper; handle attachment below rim.
3. Fragment of juglet (?), cream slip, coarse ware, incised herringbone pattern.
4. Fragment of juglet or cup, cream slip, red paint, incised herringbone or oblique lines pattern.
5. Fragment of juglet or amphoriskos, vertical handle, cream slip, coarse ware, incised herringbone pattern and red paint , mainly above incised decoration.

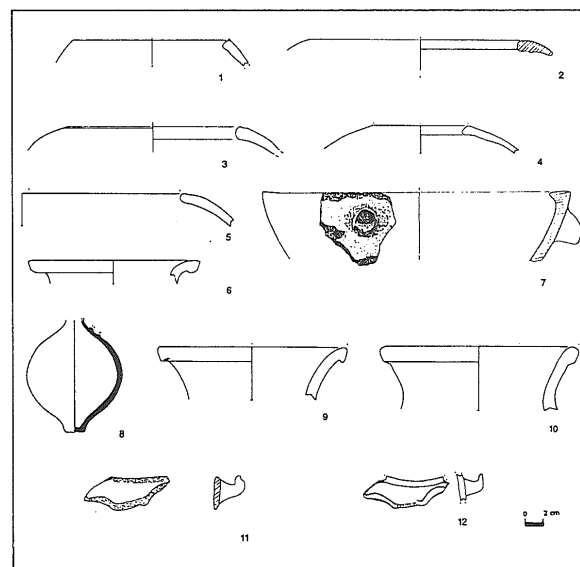


33. Yarmoukian pottery from al-Wad'ah (site 8).

### Fig. 34 - EB II

Wares are coarser for the holemouth jars, and vary from light to very dark brown. Some reddish to brown-red wares exist, mainly in jars and juglets. Cream slip is frequent, while painted decoration was not found in our sample. The illustrated material shows the most common types found during the survey. The fact that the illustrated jars are both from as-Sukhna North and most of the holemouth from Jrayyah does not mean that these are necessarily the types prevalent at those sites.

1. Tall al-Birah (site 5) Holemouth jar, coarse temper, brown ware, recessed rim.
2. Tall al-Birah (site 5) Holemouth jar, semi-coarse temper, light brown ware, rounded rim.
3. Jabal ar-Rahil (site 1) Holemouth jar, semi-coarse temper, light brown ware, rounded rim, small groove below rim.
4. Jrayyah (site 6) Holemouth jar, fine temper, reddish ware, recessed rim.
5. Jrayyah (site 6) Holemouth jar, semi-coarse temper, brown ware, rounded rim
6. Jrayyah (site 6) Jar neck and rim. Everted rim, light brown ware, cream slip, fine temper.

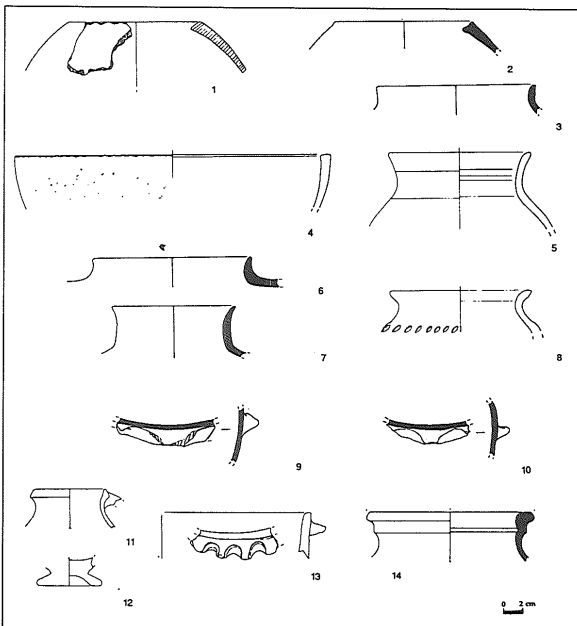


34. EB II pottery from Jabal ar-Rahil (site 1: nos. 3, 8); Tall al-Birah (site 5: nos. 1-2); Jrayyah (site 6: nos. 4-7, 11-12); as-Sukhna North (site 7: nos. 9-10).

7. Jrayyah (site 6) Spouted vat, flat rim, slightly inverted, brown ware, cream slip.
8. Jabal ar-Raḥīl (site 1) Piriform juglet, neck, rim, and handle missing. Fine temper, brown to red-brown ware, cream slip. From excavation: Trench 3.
9. As-Sukhna North (site 7) Jar neck and rim, everted rim, semi-fine temper, reddish ware, cream slip
10. As-Sukhna North (site 7) Jar neck and rim, slightly everted rim, semi-coarse temper, brown ware, traces of cream slip.
11. Jrayyah (site 6) Pushed-up ledge handle, reddish ware, fine temper, cream slip.
12. Jrayyah (site 6) Pushed-up ledge handle, brown ware, semi-fine temper, traces of slip.

**Fig. 35 - EB IV (1-10) and MBIIB (11-14)**

EB IV wares are mostly reddish in color, relatively fine tempered, especially for the smaller pottery forms such as juglets and cups. Larger jars, however, are still relatively fine-tempered. The folded envelope ledge-handles are small, with flaps not overlapping, a distinct type from that prevailing



35. EB IV (1-10) and MBIIB (11-14) pottery from Jabal ar-Raḥīl (site 1: nos. 2-10), Jrayyah (site 6: no. 1), and Tall as-Sukhna (site 3: nos. 11-14).

in the Jordan Valley where the handles are wide and the flaps overlap.

The four diagnostic MBIIB fragments found at Tall as-Sukhna belong to four different pottery types: jars, cooking pots, dipper juglets, and pedestaled bowls or cups. Even if four fragments are not statistically significant, this range of types is possibly an indication of a site with more or less permanent occupation, rather than a nomadic encampment, which would probably exhibit a more restricted pottery assemblage. Given the fact that the site is presently threatened by agricultural expansion, soundings will have to be conducted soon in order to establish its significance in our still limited knowledge of the Middle Bronze Age in the eastern fringes of the "sown".

1. Jrayyah (site 6) Holemouth jar, recessed rim, finger impressions on rim, fine temper, red-brick ware.
2. Jabal ar-Raḥīl (site 1) Holemouth jar, recessed rim, grit temper, brown ware.
3. Jabal ar-Raḥīl (site 1) Jar, short vertical neck and rim, fine grit temper, brown ware, cream slip.
4. Jabal ar-Raḥīl (site 1) Large bowl, flat rim, impressed finger decoration on rim, grit temper, reddish ware, traces of creamy slip.
5. Jabal ar-Raḥīl (site 1) Jar, short neck and everted rim, incised parallel lines on body, fine grit temper, light brown ware, cream slip.
6. Jabal ar-Raḥīl (site 1) Jar, very short neck and rim, wide shoulder, fine grit temper, reddish ware.
7. Jabal ar-Raḥīl (site 1) Jar, vertical neck, slightly everted rim, grit temper, brown ware, cream slip.
8. Jabal ar-Raḥīl (site 1) Jar, short neck, everted and thickened rim, nail impressions on shoulder, fine grit temper, reddish ware.
9. Jabal ar-Raḥīl (site 1) Folded envelope ledge handle, grit temper, reddish ware.

10. Jabal ar-Rahīl (site 1) Folded envelope ledge handle, grit temper, red-brown ware, traces of cream (?) slip.
11. Tall as-Sukhna (site 3) Dipper juglet, short neck, missing handle from rim to shoulder, fine temper, cream ware, cream slip.
12. Tall as-Sukhna (site 3) Cup or bowl foot, fine temper, cream ware, cream slip.
13. Tall as-Sukhna (site 3) Cooking pot or vat, rounded rim, large band below rim, with deep finger impressions, grit temper, brown ware.
14. Tall as-Sukhna (site 3) Jar, large everted rim, fine temper, brown-reddish ware, cream slip.

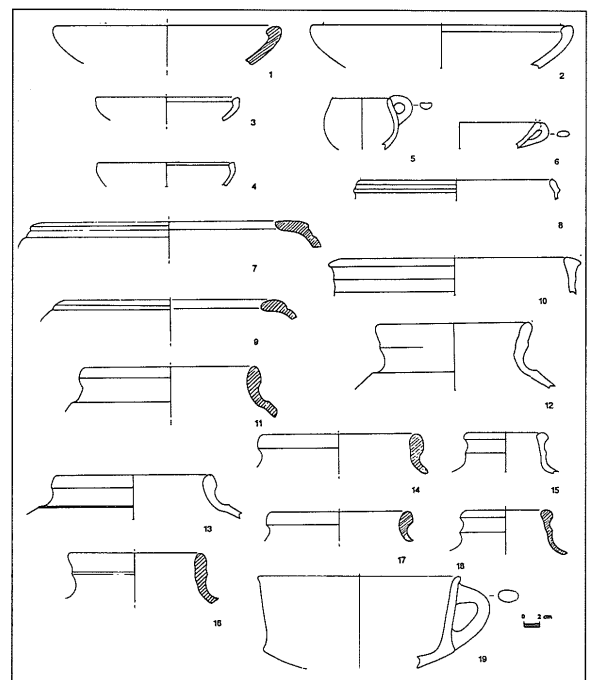
### Fig. 36 - Iron Age II (1-18) and LB II (19)

The Iron Age pottery found at several sites in the survey area shows a wide range of forms and wares, which are generally reddish, but can also be light to dark brown, with small to medium grit tempers. Bowls, pithoid jars, jars are all known types.

1. Site 45; Bowl, inverted rim, small grit temper, reddish ware, traces of red slip.
2. Site 45; Bowl, inverted rim, medium grit temper, brown ware, traces of red slip.
3. Site 45; Bowl; vertical rim, small grit temper, brown ware.
4. Site 45; Bowl, recessed rim, small grit temper, reddish ware.
5. Site 46; Cup, vertical rim, handle from rim to mid-body, medium grit temper, brown ware.
6. Site 45; Cup, rounded rim, small vertical handle; medium grit temper, reddish ware.
7. Tall al-Bīrah (site 5) Pithoid jar, grooves below rim, fine grit temper, reddish ware, cream slip.
8. Khirbat aj-Jāmūs (site 2) Cooking pot, rounded rim, medium grit temper, dark brown ware.
9. Tall al-Bīrah (site 5) Pithoid jar, grooves below rim; fine grit temper, reddish

ware.

10. Site 45; Jar, small grit temper, reddish ware.
11. Site 45; Jar, rounded rim, fine grit temper, red brick ware.
12. Tall al-Bīrah (site 5) Jar, rounded, slightly everted rim, small grit temper, brown ware, cream slip.
13. Site 45; Jar, rounded rim, medium grit temper, reddish ware.
14. Tall al-Bīrah (site 5) Jar, rounded rim, small grit temper, brown ware.
15. Site 45; Jar, rounded rim, fine grit temper, red ware.
16. Tall al-Bīrah (site 5) Jar, rounded rim, fine grit temper, reddish ware
17. Tall al-Bīrah (site 5) Jar, rounded, slightly everted rim, fine grit temper, brown ware.
18. Site 45; Jar, fine grit temper, reddish ware.
19. Aṭ-Ṭuwayfiriyya (site 87) Carinated cup, vertical walls with everted rim, convex base, medium grit temper, brown ware, cream slip. LB IIB?.



36. Iron II pottery from Khirbat aj-Jāmūs (site 2: no. 8), Tall al-Bīrah (site 5: nos. 7, 9, 12, 14, 16-17), site 45 (nos. 1-4, 6, 10-11, 13, 15, 18), site 46 (no. 5); LB pottery from aṭ-Ṭuwayfiriyya (site 87: no. 19)

### Hellenistic to Byzantine period <sup>3</sup> (A. Peruzzetto and M.D. Wilson)

The report concentrates primarily upon three main sites of the az-Zarqā' Valley. The sites were selected by reason of substantial indications of the periods of settlement being made available from the recovered ceramics.

Also included are sites where fairly close ceramic dating has been established, though less substantial in quantity, and therefore perhaps not entirely representative of the periods of settlement.

The ceramics represented in the report are the results of surface surveys and the dating methods comprised comparative analysis. The ceramic chronology of the region is an area of study which requires more closely dated indices made available through excavation. Good dating indices are indeed both few and exceptional; only a few published excavation reports are available where accurate stratigraphic dating sequences have been established. Reports very often give only the broad and approximate chronological parameters (e.g. Hellenistic - Roman).

Some of the vessel types represented may in fact reflect local stylistic developments and responses in the az-Zarqā' Valley region.

Some imported wares such as amphorae, where wider and more detailed studies have been made, enable fairly good indicators of the periods of occupation.

The main sites are Tall al-Birah (site 5), Khirbat al- Wad'ah (site 9) and al-Birah South (site 67). Site code numbers are been used consistently throughout the ceramic report.

#### Fig. 37

All diagnostic and potentially diagnostic sherds from the three main sites have been illustrated. Coarse wares are numbered 1 to 62 (including amphorae, 60 to 62); fine wares 63 to 72. Munsell color numbers are given

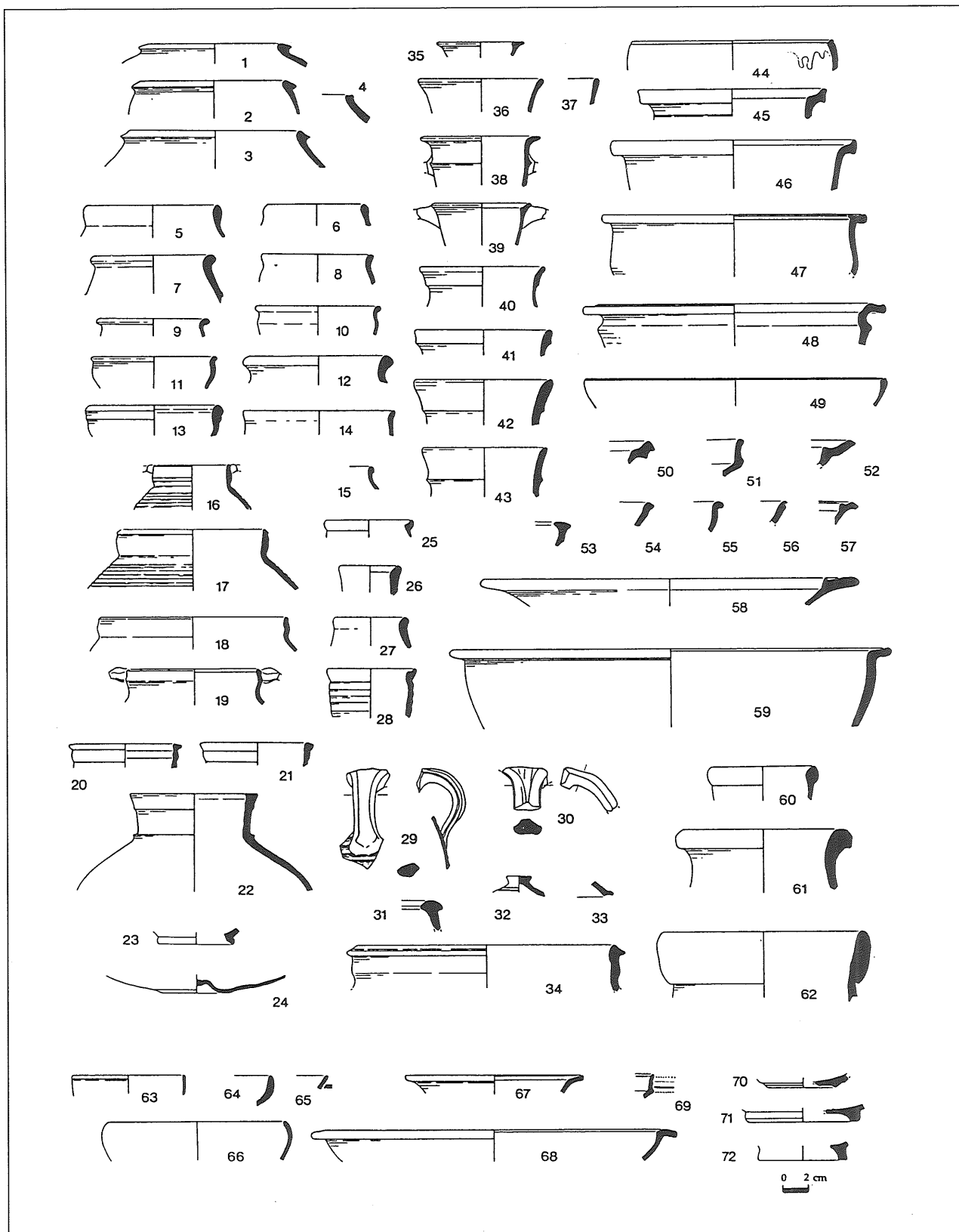
where possible to fine wares and amphorae.

Coarse ware fabric colors range widely from pale yellow/buff to reddish yellow and pale reds to reddish browns and grays, and as also noted at Jarash (Falkner 1983: 3), tend to vary considerably on individual vessels. Where this is the case, the colors of surface and surface treatment are given only. Site code number precedes the description of each vessel.

1. Site 9, red-brown, hard with fine calcite, quartzite and basalt inclusions, neckless jar/cooking pot.
2. Site 67, light red (int), red-gray (ext), hard with fine calcite, quartzite and basalt inclusions, neckless jar/cooking pot. Ca fourth century AD. Parallels: Parker 1987: fig. 94: 36.
3. Site 5, pinkish gray, semi-hard, with frequent fine basalt inclusions, neckless jar/cooking pot. ? sixth century AD. Parallels: poss. Parker 1987: fig. 113: 181-183.
4. Site 5, pink, hard with fine calcite, quartzite and basalt inclusions, neckless jar/cooking pot with indented rim.
5. Site 9, light reddish brown, semi hard and compact, jar.
6. Site 9, reddish yellow with pink slip on rim, hard, compact with minute calcite and basalt inclusions(?), jar.
7. Site 67, light red, hard with frequent calcite and basalt inclusions(?) jar/cooking pot.
8. Site 9, red, hard, compact with minute calcite and basalt inclusions, jar with rounded rim.
9. Site 9, reddish yellow (int), gray (ext), hard and compact, jar with slightly everted rim.
10. Site 9, red, hard, compact, with minute calcite and basalt inclusions, jar.
11. Site 9, reddish yellow, hard, compact with fine calcite and basalt inclusions, jar. Late fifth to early sixth century AD.

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3. Many thanks to Pamela Watson who provided valuable advice for the analysis of the pottery.



37. Roman and Byzantine pottery from Khirbat aj-Jāmūs (site 2: nos. 26), Tall as-Sukhna (site 3: nos 43, 53), Khirbat al-Mak'hūl (site 4: nos. 24), Tall al-Bīrah (site 5: nos.3-4, 16-17, 22, 29-30, 32, 40, 42, 46-48, 64, 66-72), Khirbat al-Wad'ah (site 9: nos.1, 5-6, 8-13, 15, 18, 20-21, 27-28, 31, 33, 35-39, 45, 50-52, 54, 56-60, 62), Khirbat Zuqm al-Ghurāb (site 10: no.65), al-Bīrah South (site 67: nos 2, 7, 14, 19, 23, 25, 34, 41, 44, 49, 55, 61, 63).



12. Site 9, reddish yellow (int), gray (ext), semi-hard, jar, diam. approx.
13. Site 9, reddish yellow (int), pinkish gray (ext), hard, compact with fine calcite and basalt inclusions, jar.
14. Site 67, reddish yellow, hard, compact, with frequent calcite, quartzite and basalt inclusions, jar.
15. Site 9, red, semi-hard and compact, jar with rounded rim, diam. indeterminate.
16. Site 5, reddish yellow with red slip, compact, brittle with fine calcite and basalt inclusions, jar. Mid third to early fourth century AD.
17. Site 5, pink with dark brown slip, compact, brittle with fine calcite and basalt inclusions, jar. Prob. mid-third to early fourth century AD. Parallels: Parker 1987: 82-83, fig.100.
18. Site 9, light red, compact, brittle with fine calcite and basalt inclusions, jar.
19. Site 67, reddish yellow (int), light red (ext), hard with occasional fine inclusions of calcite, quartzite and basalt, cooking pot. Parallels: Parker 1987: fig.94: 33-35. late third-fourth centuries AD.
20. Site 9, hard, compact with occasional calcite and basalt inclusions, jar. Early fourth century / early sixth century AD. Parallels: Parker 1987: 63, fig.98; Parker 1987: 190; fig.115.
21. Site 9, hard and compact with occasional calcite inclusions, jar. Date as fig. 20. Parallels: as fig. 20.
22. Site 5, pink with dark brown slip (outer), hard, compact, with occasional basalt inclusions, jar. Parallels: Parker 1987: fig.109,154. Fourth - fifth centuries AD.
23. Site 67, light red, semi-hard and compact, base.
24. Site 4, pink (int), reddish gray (ext), fine, hard and compact, jar with omphalos base. Parallels: Parker 1987: fig. 119,215. Byzantine - first half sixth century AD.
25. Site 67, light red (int), reddish gray (ext), hard, compact with occasional calcite inclusions, small jar with ledge on interior.
26. Site 2, red, semi-hard with frequent basalt inclusions, large jug/amphora. Parallels: Piazza 1983-1984: fig.G, 24. common type in Byzantine period.
27. Site 9, very pale brown, hard, compact with calcite and quartzite inclusions, jar.
28. Site 9, light red, compact, hard, with frequent calcite and occasional red/brown (ceramic?) inclusions, jar with plain rim, internal ledge, ribbed wall. Parallels: Falkner 1983: fig.17, 224 (rim characteristics), third century AD.
29. Site 5, dark gray, brittle and compact, handle of ribbed jar. ? sixth century AD - Byzantine.
30. Site 5, fine pale brown terracotta, light red slip, hard and compact, handle of cooking pot. Parallels: Parker 1987: fig. 100, 82. Mid-third to early fourth centuries AD.
31. Site 9, red, semi-hard and compact, large bowl/basin, diam.approx. 390mm.
32. Site 5, creamy orange, semi-hard, compact with rare and fine basalt inclusions, lid with indented knob and incised bands around outer surface. Late fourth - fifth centuries AD.
33. Site 9, reddish yellow, compact and hard, fine basalt inclusions. Lid. Parallels: Parker 1987: 151; fig. 109. Late fourth - fifth century AD.
34. Site 67, light red, brittle and compact, (water pitcher?).
35. Site 9, red, hard and compact, jug, diam. indeterminate.
36. Site 9, pink (int), reddish yellow (ext), semi-hard, jug.
37. Site 9, red, hard, compact with frequent calcite, quartzite and basalt inclusions, jar. Parallels: McNicoll and Hennessy 1982: pl. 129: 4: first quarter of first century AD; pl. 127: 3: Antiochus III - early first century BC.
38. Site 9, reddish yellow, semi-hard with frequent calcite inclusions, jug with ev-

- verted rim and ridge on exterior wall.
39. Site 9, light red, hard, brittle, with fine basalt inclusions, jug with ledge on interior of rim.
40. Site 5, pink very pale brown, hard, brittle, fine basalt inclusions, jug. Parallels: McNicoll and Hennessy 1982: pl. 127: 8: "Hellenistic" to c. early first century BC.; Kenyon and Crowfoot 1957 fig.71, 2 and 3: "Roman 3a" (third centuryAD).
41. Site 67, reddish yellow, hard and compact with occasional fine calcite, quartzite, and basalt inclusions, jar/jug. Poss. Byzantine.
42. Site 5, pink, hard with occasional calcite and quartzite inclusions, jug. Parallels: McNicoll and Hennessy 1982: pl. 127: 8: "Hellenistic" to early first century BC.; Kenyon & Crowfoot 1957: fig.71: 2 & 3: "Roman 3a" ( third centuryAD).
43. Site 3, reddish yellow, semi-hard, jar. Parallels: Kenyon and Crowfoot 1957: fig.71,3. Poss. third century AD.
44. Site 67, reddish yellow with yellow slip, semi-hard with infrequent calcite and basalt inclusions. Poss. late fourth to fifth century AD.
45. Site 9, light reddish brown (int), gray (ext), hard and compact, with frequent fine calcite and basalt inclusions, Site cooking pot/pitcher. Parallels: Kenyon and Crowfoot 1957: fig.71: 4, "Roman 3a Period" poss. third centuryAD.
46. Site 5, pink, semi-hard, infrequent inclusions, ? water pitcher. Period: until the turn of the first century.
47. Site 5, hard, compact, no visible inclusions, large carinated bowl/basin with everted and ledged rim. Parallels: Kenyon and Crowfoot 1957: fig.39: 41. Poss. second century AD.
48. Site 5, semi-hard, light red, carinated bowl. Parallels: Falkner 1983: figs. 15, 18, 19 and 20 (typological). Prob. third to late fourth centuries AD.
49. Site 67, light red, semi-hard and compact with frequent fine calcite, quartzite and basalt inclusions, bowl with incised line immediately below rim on exterior. Parallels: Falkner 1983: fig.7: 76-78 (rim).
50. Site 9, reddish yellow (int), gray (ext), hard and compact with occasional calcite and quartzite inclusions, bowl. Parallels: Krealing, fig.41, Tomb 8. (Roman).
51. Site 9, hard, with frequent basalt inclusions, carinated bowl. Parallels: Falkner 1983: fig.7, 67-69 (typological). Prob. early third centuryAD; Orssaud 1986: pl. 3: 3, Roman to Byzantine.
52. Site 9, reddish yellow, semi-hard, occasional calcite and quartzite inclusions, dish. Poss. Hellenistic.
53. Site 3, light red, semi-hard, bowl. Parallels: Orssaud 1986: pl.1: 3 and poss. pl.2: 29-36, Hellenistic to Roman; McNicoll and Hennessy 1982: pl.140: 3 (p.161); pl.145: 6 (p.170); pl.149: 2 (p.178). First half of eighth century AD.
54. Site 9, reddish yellow, semi-hard, bowl.
55. Site 67, red, hard and compact with frequent fine calcite and quartzite inclusions ? bowl, diam. indeterminate.
56. Site 9, pink (int), light red (ext), hard, occasional inclusions, bowl with incised band immediately below rim on exterior, diam. indeterminate. Parallels: Falkner 1983: fig. 7: 74 (rim). Prob. third century AD.
57. Site 9, semi-hard and compact with frequent fine calcite, quartzite and basalt inclusions, dish. Diam. indeterminate.
58. Site 9, large bowl, Parallels: Watson fig.4, ware C, 34 - 7th centuryAD; Falkner 1983: fig. 3: 24-26 - "possibly into early sixth century".
59. Site 9, reddish yellow, semi-hard with infrequent fine calcite and basalt inclusions, basin. Parallels: Falkner 1983: fig.12. ? third centuryAD.
60. Site 9, light red 2.5YR 6/8 (ext), pink 5YR 8/3, hard, compact, very fine calcite and quartzite inclusions, large jar/amphora. Parallels: Orssaud 1986: pl. 7:

2. Hellenistic - Roman.

61. Site 67, very pale brown 10 YR 8/3, hard, amphora. Parallels: Keay 1984: type XXVP, 10, provenance Tunisia. last quarter. third century until mid-fifth century.
62. Site 9, reddish yellow 5YR 7/6, semi-hard, amphora. Parallels: Carandini, Pannella 1969-1972: fig.29, provenance Tunisia, Africana II-III Agay (Var). Second-fourth centuries AD.
- 63 Site 67, red 10R 4/8, hard, compact, cup/bowl. ? imitation sigillata.
64. Site 5, pink 7.5YR 7/4, reddish brown 2.5YR 4/4 (surface), hard and compact, wall-sided bowl. Sigillata A. Parallels: Kenyon and Crowfoot 1957: fig.65: 3. "Pre-Herodian" (57-55 BC).
65. Site 10, hard and compact, bowl with rounded rim and two fine horizontal grooves below rim on exterior. Sigillata A.
66. Site 5, very dark gray 10YR3/1, semi-hard, compact with occasional fine calcite inclusions, bowl. ? imitation black glazed ware. Parallels: Kenyon and Crowfoot 1957: fig.49:10. Third century BC.
67. Site 5, very pale brown 10 YR 3/3, red 10YR 5/8 (inner surface), red 2.5YR 5/8 (outer surface), semi-hard and compact, bowl. Sigillata A. Parallels: Orssaud 1986: pl. 8: 7. Hellenistic/ Roman.
68. Site 5, light red 2.5YR 6/8, semi-hard, compact with very fine occasional black inclusions, dish. ? imitation sigillata. Parallels: Kenyon and Crowfoot 1957: fig.37 (p.221). Poss. Hellenistic to mid-second century AD.
69. Site 5, red, carinated bowl with rouletting on rim and three fine incised bands on wall. Sigillata Italica. Parallels: Kenyon and Crowfoot 1957: fig. 81: 27. 30 BC-30 AD. Atlante Forme Ceramiche vol I, Formel X, 5-10. 12 BC - Tiberius (undecorated).
70. Site 5, gray 7.5YR 6, reddish yellow slip

7.5YR 7/6, base of jar. Sigillata A. Parallels: Atlante Forme Ceramiche vol II, Tav.III, 3. Prob. mid-second centuryAD.

71. Site 5, reddish yellow 7.5YR 2/6, red 2.5YR 5/8 (surface), base of dish. ? imitation sigillata. Parallels: poss. Kenyon and Crowfoot 1957: fig.37 (p.221). Hellenistic - mid-second century AD.
72. Site 5, pink 5YR 8/4, light red 2.5 YR 6/8 (surface), base. Imitation sigillata. Poss. Hellenistic - mid-second century AD.

**The Early Islamic Periods.** (A. Peruzzetto and M.D. Wilson)

An insufficient retrieval of diagnostic material at the present level of survey work precludes the study of ceramics of the Umayyad and Abbasid periods. Whilst body sherds form the bulk of collected material purported to be of the Early Islamic period there is also the possibility of overlap, to some degree, in some of the locally manufactured forms with those of the Byzantine period of occupation. The application of a stratigraphic dating mechanism in the az-Zarqā' Valley would greatly enhance the study of locally produced wares in the early Umayyad period.

**Ayyubid/Mamluk Wares.** (A. Peruzzetto and M.D. Wilson)

Four main groups have been defined:

I. Hand made undecorated coarse ware (Fig. 38: 73-76);

II. Hand made coarse ware with linear-banded decorations (Fig. 38: 77-82);

III. Hand made coarse ware with geometric decorations (Fig. 38: 83-100);

IV. Monochrome glazed ware (Fig. 38: 101-105). Fig. 38: 106 is of the same fabric type as the majority of vessels in groups II and III.

The chronology is based upon that suggested by Brown (Brown 1989), the styles and forms are seen as typical products of

Transjordan between the 12th century and the Ottoman Period and as Brown stresses, accurate dating may only be established from stratigraphical contexts.

Group I: 12th century ( see Brown 1989, phase IA).

Group II: possibly the antecedent of Group III.

Group III: typical products of the 13th- 15th centuries.

Group IV: typical products of Transjordan from 12th to 15th centuries.

### Fig. 38

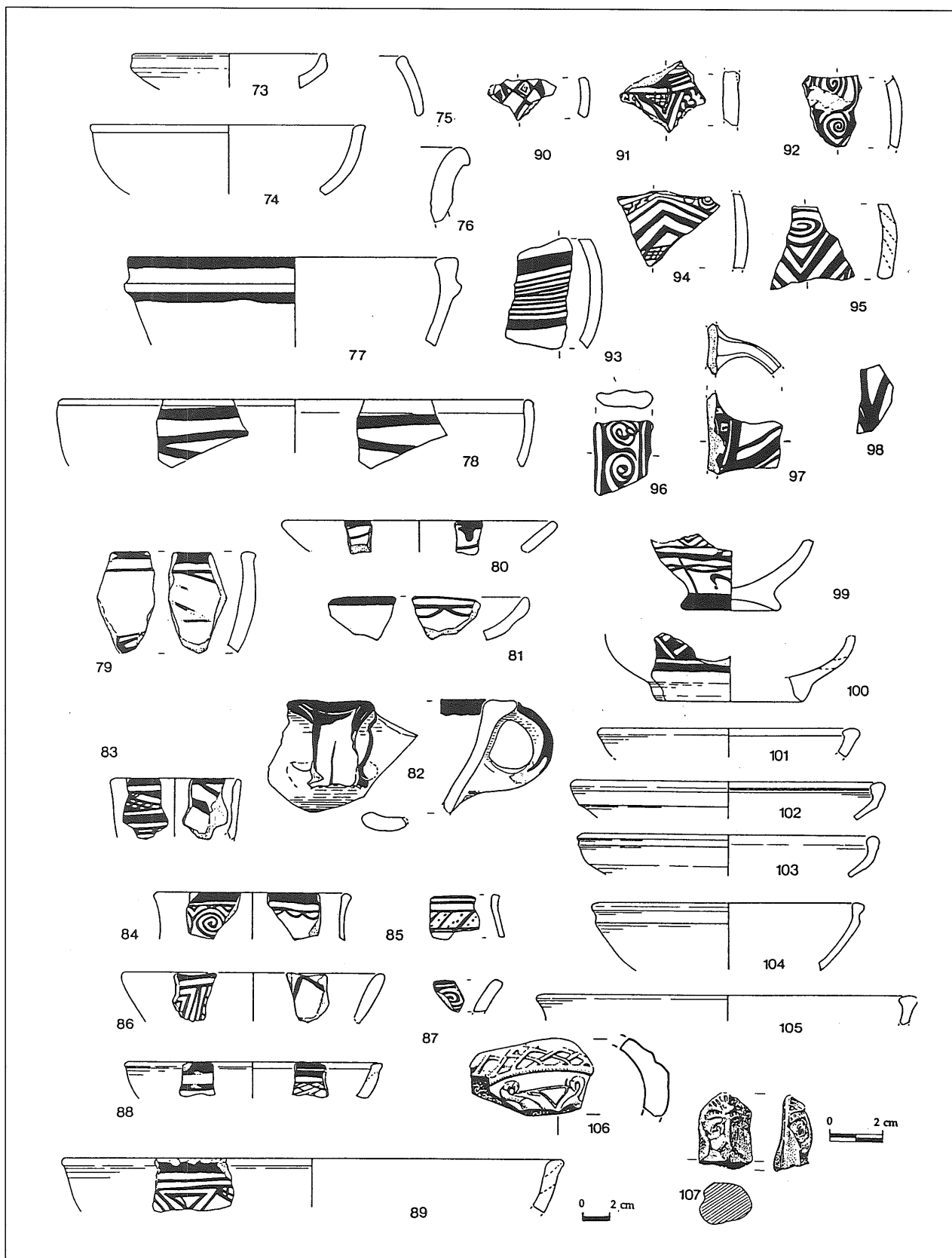
The majority of sherds represented are from Site 4, Khirbat al-al-Mak'hūl, where substantial indications of the periods of settlement were retrieved. Unless otherwise stated (e.g. 101-105), all vessels have been produced by slow-wheel method, many displaying build marks. Fabric color is generally of a pale yellow-brown but ranging to light red and gray depending upon firing. Fabric of Groups I - III is coarse, porous, with frequent inclusions of basalt, quartzite and calcite, and temper of crushed calcite/shell and grass. Fig. 38: 101- 105 are wheel thrown.

Please note that numbers 106 and 107 are represented at a scale twice than the other illustrated pottery.

73. Site 4, very pale brown, wall-sided shallow bowl with rounded rim.
74. Site 4, light red outer slip, light gray inner slip, bowl.
75. Site 4, light reddish brown outer slip, white inner slip, neckless jar.
76. Site 5, reddish brown slip, large jar with rolled over rim. diam. indeterminate.
77. Site 10, pinkish red with reddish yellow inner slip and pale red outer slip, basin/ ?cooking pot with inverted rim and ridge/ ledge below rim on exterior. linear band- ed painted decoration (light brown).
78. Site 60, cream slip, light brown paint, large bowl with rounded rim and incised

line immediately below rim on exterior, approx. 360 mm, linear-banded decoration int. and ext.

79. Site 4, very pale brown slip, reddish brown paint, bowl/basin with beaded rim, diam. indeterminate, linear-banded decoration int. and ext. (NB: decoration is worn and very faint).
80. Site 4, light red slip, dark reddish brown paint, shallow bowl/dish with rounded rim, linear banded decoration int. and ext.
81. Site 4, pale yellow slip, pale red paint, shallow bowl/ dish with rounded rim, linear-banded painted decoration int. and ext. diam. indeterminate.
82. Site 5, very pale brown, pale yellow slip, brown paint, basin with everted rim and handle(s), linear-banded painted decoration.
83. Site 4, very pale brown slip, reddish black paint, ? drinking vessel with ridged rim, linear-band and geometric painted decoration int. and ext.
84. Site 4, creamy inner slip, very pale brown outer slip, light red paint, ? jar, linear-band and spiral painted decoration.
85. Site 49, cream slip, light brown paint, ? jar, linear-band and geometric painted decoration.
86. Site 4, light red inner slip, pink outer slip, light brown paint, dish/bowl with rounded rim, linear-band and geometric painted decoration int. and ext.
87. Site 4, pale yellow brown slip, dark reddish brown paint, dish/bowl with rounded rim, linear-band and spiral painted decoration.
88. Site 5, cream slip, brown paint, bowl with slight indentation below rim on exterior, linear band and geometric painted decoration int. and ext.
89. Site 5, cream slip, brown paint, large bowl with beaded rim, linear band and geometric painted decoration on ext.
90. Site 5, white, pale yellow slip, pale red



38. Islamic pottery from Khirbat al-Makh'ul (site 4: nos. 73-75, 79-81, 83-84, 86-87, 106), Tall al-Birah (site 5: nos. 76, 82, 88-90, 92, 94-97, 99-100, 102-104), Khirbat al-Wad'ah (site 9: no. 107), Khirbat Zuqm al-Ghurab (site 10: nos. 77, 101), site 46 (nos. 91, 93), site 49 (n. 85), site 50 (nos. 98, 105), site 60 (no. 78).

- paint, body sherd (vessel type indeterminate), painted geometric pattern on ext.
91. Site 46, reddish gray inner slip, pink outer slip, body sherd with trace of handle (vessel type indeterminate), linear-band and geometric painted decoration.
  92. Site 5, cream slip, dark brown paint, body sherd of ? jar/? cooking pot, spiral painted decoration.
  93. Site 46, cream slip, light red brown paint, body sherd of ? jar/? cooking pot, linear-band decoration.
  94. Site 5, light red ,white slip, reddish brown paint, body sherd (vessel type indeterminate), geometric painted decoration.
  95. Site 5, creamy slip, light red brown paint, body sherd of carinated vessel, geometric and spiral painted decoration.
  96. Site 5, yellow slip, black paint, handle, linear-band and spiral painted decoration.
  97. Site 5, light yellow, white slip, light red paint, handle, linear-band and geometric painted decoration.
  98. Site 50, light red inner slip, white outer slip, pale red paint, body sherd (vessel type indeterminate), linear-band and geometric painted decoration.
  99. Site 5, pinkish white slip, brown paint, low-pedestalled base of ? jug/ ? beaker, linear-banded and geometric painted decoration.
  100. Site 5, reddish yellow slip, red paint, base of bowl, geometric painted decoration.
  101. Site 10, monochrome glazed ware, fine fabric, light red, creamy outer surface, traces of green glaze on inner surface, carinated bowl/dish with beaded rim swelling inwards.
  102. Site 5, monochrome glazed ware, fine fabric with frequent fine basalt inclusions, inner surface white with green glaze, outer surface dark brown with green glaze, carinated bowl/dish with beaded rim swelling inwards.
  103. Site 5, monochrome glazed ware, fine fabric, light red, fine basalt inclusions, green glaze, carinated bowl with beaded rim swelling inwards.
  104. Site 5, monochrome glazed ware, fine fabric, pink, fine basalt inclusions, green glaze on interior, carinated bowl with beaded rim.
  105. Site 50, monochrome glazed ware, fine fabric, green glaze, large bowl/basin with beaded rim swelling inwards and outwards.
  106. Site 4, lamp, molded, relief depicting two birds bordered by interwoven lattice work.
  107. Site 9, fine, gray-brown, clay head/? part of lamp, ? sculptured anthropomorphic design.

G. Palumbo  
M. Munzi  
S. Collins  
F. Hourani  
A. Peruzzetto  
M. Wilson

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## Appendix: Survey Site List

(\* = Approximate location; G = Glueck; B = Besançon and Hours; A = located on aerial photos; S = surveyed)

Site JRS	Site Name	P.G.E.	P.G.N.	Periods of occupation and Type of site
1 (G314)	Jabal ar-Raḥīl	249.62	171.00	UPal?, UD flints, EB II, EB IV, Rom?, Byz, Ay/Maml (settlement)
2 (G315)	Khirbat aj-Jāmūs	248.84	171.20	IrII, LR?, Byz, Um, Ay/Maml, UD (fort)
3 (G316)	Tall as-Sukhna	250.45	171.41	MBA, Rom, Byz, UD (tell)
4 (G312)	Khirbat al-Mak'hūl	251.62	169.60	IrII, Um, Abb, Ay/Maml, UD (settlement)
5 (G320)	Tall al-Birah	245.50	175.06	Chal?, EB?, EBII, IrII, Rom, Byz, Um, Ay/Maml (settlement)
6 (S)	Jrayyah	251.24	166.28	EBII, EBIII, EB IV (settlement)
7 (S)	as-Sukhna North	250.33	171.86	EBII (settlement)
8 (S)	al-Wad'ah	249.16	173.14	PNeol (Dom), Byz, UD (settlement)
9 (G318)	Khirbat al-Wad'ah	248.96	173.56	Rom, Byz, Maml, UD (settlement)
10 (G317)	Khirbat Zuqm al-Ghurāb	249.74	172.94	LPal, UD flints, Rom, Byz, Maml, UD (fort?)
11 (G319)	an-Nimrah	248.2	173.1	Not visited (settlement)
12 (S)	Zuqm ash-Sharqi	249.90	172.88	MPal, PPN?, UD flints, Rom, Byz?, Abb?, Maml (scatter)
13 (S)	Zuqm at-Taḥt	249.56	172.96	PPNB? (settlement)
14 (S)	No name	250.22	172.94	UD flints (scatter)
15 (S)	al-Ḥasiyya 1	249.66	173.23	Chal/EB I, Byz, UD (settlement)
16 (S)	al-Ḥasiyya 2	249.44	173.20	Maml, UD flints (scatter)
17 (G313)	Khirbat as-Sīl	250.25	169.12	Destroyed (settlement)
18 (B124)	No name *	245.6	174.8	Not visited (scatter)
19 (B118)	No name *	246.7	174.3	Not visited (scatter)
20 (B116)	No name *	247.1	173.6	Not visited (scatter)
21 (B029)	No name *	247.9	173.4	Not visited (scatter)
22 (B115)	No name *	247.9	173.2	Not visited (scatter)
23 (B032)	No name *	249.0	172.8	Not visited (scatter)
24 (B027)	No name *	249.2	172.9	Not visited (scatter)
25 (B031)	No name *	249.1	172.6	Not visited (scatter)
26 (B030)	No name *	249.1	172.4	Not visited (scatter)
27 (B028)	No name *	251.2	173.0	Not visited (scatter)
28 (B017)	No name *	251.7	173.3	Not visited (scatter)
29 (B016)	No name *	253.2	173.7	Not visited (scatter)
30 (B014)	No name	253.74	173.05	LPal (Late Acheulean; scatter)
31 (B015)	No name	253.86	172.73	UPal?, UD flints (scatter)
32 (B018)	No name *	251.2	172.7	Not visited (scatter)
33 (B019)	No name *	251.1	172.5	Not visited (scatter)
34 (B106)	No name *	253.4	171.9	Not visited (scatter)
35 (B107)	No name *	254.1	171.7	Not visited (scatter)
36 (B110)	No name *	250.3	172.0	Not visited (scatter)
37 (B024)	No name *	250.9	170.6	Not visited (scatter)
38 (B022)	No name *	250.2	168.0	Not visited (scatter)
39 (B023)	No name *	250.3	167.5	Not visited (scatter)
40 (B021)	No name	250.44	166.93	LPal, UD flints (scatter)
41 (B013)	No name *	254.3	172.9	Not visited (scatter)
42 (B119)	No name *	245.7	175.5	Not visited (scatter)
43 (S)	No name	245.62	175.00	Ott (water mills)
44 (S)	No name	251.38	169.55	Ir, Um, Maml, UD, UD flints (tower, scatter)
45 (AS)	No name	250.88	165.25	IrII (settlement)
46 (AS)	No name	250.80	165.42	IrII, Rom, Maml (building)
47 (AS)	No name	250.75	165.87	Rom, Byz, Mod (farm)
48 (S)	No name	250.54	166.28	Epipal?, Mod (scatter)
49 (S)	No name	250.50	166.47	Rom/Byz, Maml (caves)
50 (AS)	No name	250.24	167.06	Byz, Um, Abb?, Maml (building)
51 (AS)	No name	250.23	166.98	Byz, Um, Maml, UD (hamlet)
52 (S)	No name	250.30	166.98	MPal? (scatter)
53 (AS)	No name	251.78	169.47	(structures)
54 (AS)	No name	251.86	169.64	UD flints (stone circles, cairns)
55 (AS)	No name	252.00	169.30	UD flints, Byz, Maml, UD (stone circle)
56 (AS)	No name	252.08	168.96	UD flints (cairn)
57 (AS)	No name	251.88	168.86	Epipal? (cairn)
58 (AS)	No name	252.26	169.38	UD flints, pottery (cairn)
59 (AS)	No name	252.43	169.64	MPal? (cairn)
60 (AS)	No name	252.20	169.70	Maml, UD flints (stone circles)
61 (AS)	No name	252.28	169.92	UD flints (stone circles)
62 (S)	No name	251.98	169.98	LPal, MPal (scatter)
63 (AS)	No name	251.45	170.01	UD flints (cairns)
64 (AS)	No name	247.29	171.53	Epipal?, UD flints (stone circles)

Site JRS	Site Name	P.G.E.	P.G.N.	Periods of occupation and Type of site
65 (AS)	No name	247.24	171.10	UD flints, EB I/II, UD (cairns, stone circles)
66 (AS)	No name	247.74	171.20	EB II?, Rom, UD (stone circles)
67 (AS)	al-Birah South	245.46	174.75	UD flints, Ir?, Rom (Dom), Byz, Maml, UD (fort)
68 (S)	No name	245.35	174.78	Rom/Byz, Maml, UD (caves)
69 (S)	No name	246.39	173.62	MPal?, UD flints (scatter)
70 (AS)	No name	245.28	173.21	Epipal (Natuf), Maml, UD (tower)
71 (AS)	No name	253.59	170.80	(cairn)
72 (AS)	No name	253.46	170.40	UD flints (enclosure)
73 (AS)	No name	253.30	170.50	UD flints (cairns)
74 (AS)	No name	252.93	170.24	UD flints (cairns)
75 (AS)	No name	252.58	170.60	UPal, Epipal (cairns)
76 (AS)	No name	253.10	171.20	(cairns)
77 (AS)	No name	252.40	170.76	(cairns)
78 (AS)	No name	252.20	171.18	(cairns)
79 (AS)	No name	247.37	172.64	EB II, UD flints (settlement)
80 (AS)	No name	251.72	172.82	Chal (Dom), EBIV, Rom/Byz, Mod, UD (settlement)
81 (AS)	as-Sukhna East	251.48	171.70	IrII, Mod (camp)
82 (AS)	No name	244.94	173.04	Rom, UD flints (cairns)
83 (AS)	No name	245.27	172.27	PPNB, UD flints (stone circle)
84 (AS)	No name	247.96	170.74	UD flints, EBII?, Rom/Byz, UD (stone circle)
85 (AS)	No name	248.24	170.57	UD flints (cairn)
86 (AS)	No name	248.20	170.90	UD flints (cairn)
87 (AS)	at-Tuwayfiriyya	245.80	175.42	LB II? (settlement)
88 (AS)	No name	253.35	173.10	UD flints, UD pottery (cairns, circles)
89 (S)	No name	254.40	172.11	LPal (Acheulean; scatter)
90 (S)	No name	254.24	171.95	Epipal (settlement?)
91 (A)	No name	245.68	173.77	Not visited (cairn)
92 (A)	No name	245.15	172.72	Not visited (structure)
93 (A)	No name	246.25	172.78	Not visited (stone circle)
94 (A)	No name	247.35	174.48	Not visited (stone circle)
95 (A)	No name	248.74	173.79	Not visited (cairn)
96 (A)	No name	248.99	174.01	Not visited (cairn)
97 (A)	No name	248.93	174.95	Not visited (cairn)
98 (A)	No name	249.33	174.06	Not visited (cairn)
99 (A)	No name	249.80	174.11	Not visited (cairn)
100 (A)	No name	249.80	174.28	Not visited (cairn)
101 (A)	No name	250.00	174.90	Not visited (cairn)
102 (A)	No name	250.20	174.29	Not visited (cairn, stone circle)
103 (A)	No name	250.67	174.23	Not visited (cairn)
104 (A)	No name	246.95	173.87	Not visited (enclosure)
105 (A)	No name	246.96	173.72	Not visited (small tell)
106 (A)	No name	247.10	173.68	Not visited (cemetery)
107 (A)	No name	249.78	171.95	Not visited (enclosure)
108 (A)	No name	249.78	171.63	Not visited (hamlet, stone circles)
109 (A)	No name	249.50	171.45	Not visited (stone circles)
110 (A)	No name	249.35	171.28	Not visited (stone circles)
111 (A)	No name	245.45	171.82	Not visited (cairn?, stone circle)
112 (A)	No name	246.29	171.73	Not visited (enclosure)
113 (A)	No name	246.01	171.42	Not visited (cairns)
114 (A)	No name	245.88	171.20	Not visited (cairn)
115 (A)	No name	245.60	170.56	Not visited (cairn)
116 (A)	No name	245.97	170.49	Not visited (rect. structure)
117 (A)	No name	247.69	170.55	Not visited (cairn)
118 (A)	No name	248.26	171.10	Not visited (cairn)
119 (A)	No name	250.72	170.65	Not visited (structures)
120 (A)	No name	252.83	171.90	Not visited (cairn)
121 (A)	No name	253.23	171.66	Not visited (cairn)
122 (A)	No name	253.54	171.48	Not visited (cairn)
123 (A)	No name	253.68	171.48	Not visited (enclosure)
124 (A)	No name	253.40	171.75	Not visited (enclosures)
125 (A)	No name	254.14	171.30	Not visited (cairn)
126 (A)	No name	254.16	171.43	Not visited (enclosure)
127 (A)	No name	251.87	171.35	Not visited (terrace wall?)
128 (A)	No name	252.29	170.68	Not visited (structure)
129 (A)	No name	252.20	170.50	Not visited (cairns)
130 (A)	No name	252.13	170.60	Not visited (cairn)
131 (A)	No name	250.58	172.38	Not visited (structure)
132 (A)	No name	250.98	172.22	Not visited (circles)
133 (A)	No name	252.30	170.28	Not visited (circle)
134 (A)	No name	247.38	171.84	Not visited (cairn)

Site JRS	Site Name	P.G.E.	P.G.N.	Periods of occupation and Type of site
135 (A)	No name	247.48	171.60	Not visited (enclosure)
136 (A)	No name	247.25	171.35	Not visited (cairns)
137 (A)	No name	247.10	172.75	Not visited (structures)
138 (A)	No name	245.31	170.04	Not visited (enclosure)
139 (A)	No name	245.30	169.84	Not visited (enclosure)
140 (A)	No name	245.12	169.74	Not visited (cairn)
141 (A)	No name	245.94	169.20	Not visited (cairns)
142 (A)	No name	246.28	169.30	Not visited (enclosure)
143 (A)	No name	246.65	169.45	Not visited (cairns)
144 (A)	No name	246.84	169.72	Not visited (cairns)
145 (A)	No name	247.42	169.76	Not visited (stone circles)
146 (A)	No name	246.86	169.06	Not visited (enclosure)
147 (AS)	Khirbat Abū az-Zayghān	247.88	168.60	PPNB, UD flints, Ir, Rom/Byz, Ay/Maml, UD (settlement)
148 (A)	No name	248.18	170.05	Not visited (structure)
149 (A)	No name	248.26	170.23	Not visited (enclosure)
150 (A)	No name	248.37	170.25	Not visited (cairn)
151 (A)	No name	249.40	170.25	Not visited (stone circles)
152 (A)	No name	248.54	170.05	Not visited (cairn)
153 (A)	No name	248.50	169.90	Not visited (circular structure)
154 (A)	No name	248.72	169.92	Not visited (cairn)
155 (A)	No name	249.05	170.04	Not visited (cairn)
156 (A)	No name	248.48	169.42	Not visited (enclosure)
157 (A)	No name	249.03	168.67	Not visited (structure)
158 (A)	No name	248.85	168.25	Not visited (cairns)
159 (A)	No name	249.29	168.45	Not visited (cairn)
160 (S)	No name	248.35	168.38	UD flints, pottery (stone circles)
161 (S)	No name	248.26	167.96	PPNB?, UD flints, Byz, Ay/Maml, UD (enclosures)
162 (A)	No name	248.10	167.34	Not visited (cairn)
163 (A)	No name	248.66	167.40	Not visited (cairns)
164 (A)	No name	249.15	167.25	Not visited (cairns)
165 (A)	No name	249.20	166.97	Not visited (cairn)
166 (A)	No name	249.75	167.20	Not visited (cairns)
167 (A)	No name	249.20	168.07	Not visited (structures)
168 (A)	No name	250.02	168.08	Not visited (enclosures)
169 (A)	No name	250.15	168.05	Not visited (circular structure)
170 (A)	No name	248.76	166.54	Not visited (enclosure)
171 (A)	No name	248.90	166.55	Not visited (enclosure)
172 (A)	No name	248.26	166.58	Not visited (cairn)
173 (A)	No name	247.74	166.48	Not visited (cairns)
174 (A)	No name	247.73	166.93	Not visited (cairn)
175 (A)	No name	247.45	166.11	Not visited (cairn)
176 (A)	No name	246.92	166.02	Not visited (cairn)
177 (A)	No name	246.33	166.98	Not visited (enclosure)
178 (A)	No name	246.00	167.03	Not visited (enclosure)
179 (A)	No name	245.55	166.98	Not visited (structure)
180 (A)	No name	245.38	167.07	Not visited (enclosure)
181 (A)	No name	245.67	166.40	Not visited (enclosures, structures)
182 (A)	No name	245.90	165.76	Not visited (cairns)
183 (A)	No name	246.18	165.10	Not visited (cairn)
184 (A)	No name	247.00	165.88	Not visited (cairns)
185 (A)	No name	246.94	165.72	Not visited (structure)
186 (A)	No name	247.32	165.65	Not visited (enclosures)
187 (A)	No name	247.90	165.44	Not visited (cairn, enclosure)
188 (A)	No name	248.34	165.18	Not visited (cairn)
189 (A)	No name	246.70	164.92	Not visited (cairns)
190 (A)	No name	245.14	165.26	Not visited (enclosure)
191 (A)	No name	251.00	165.10	Not visited (structures)
192 (A)	No name	250.90	165.02	Not visited (enclosure)
193 (A)	No name	251.59	166.88	Not visited (cairn, structure)
194 (A)	No name	251.81	166.86	Not visited (cairn)
195 (A)	No name	252.30	166.70	Not visited (cairn)
196 (A)	No name	250.86	168.57	Not visited (cairns)
197 (A)	No name	251.43	168.08	Not visited (cairns)
198 (A)	No name	252.85	169.52	Not visited (cairns)
199 (A)	No name	252.89	169.85	Not visited (enclosure)
200 (A)	No name	252.65	169.90	Not visited (structure, cemetery)
201 (A)	No name	251.39	170.29	Not visited (cairn)
202 (A)	No name	249.74	169.54	Not visited (caves, structures)
203 (A)	No name	246.48	168.12	Not visited (cairn)
204 (A)	No name	246.29	175.18	Not visited (enclosure)
205 (A)	No name	246.84	175.38	Not visited (cairn, enclosures)
206 (A)	No name	250.30	175.25	Not visited (cairns)

Site JRS	Site Name	P.G.E.	P.G.N.	Periods of occupation and Type of site
207 (A)	No name	249.00	166.35	Not visited (cairn)
208 (A)	No name	245.90	171.72	Not visited (enclosures)
209 (A)	No name	246.94	171.65	Not visited (stone circles, cairns)
210 (A)	No name	246.84	170.20	Not visited (cairn)
211 (A)	No name	247.16	168.76	Not visited (cairn)
212 (A)	No name	245.33	168.90	Not visited (cairn)
213 (A)	No name	245.36	169.47	Not visited (cairns)
214 (A)	No name	245.82	169.65	Not visited (cairns)
215 (A)	No name	247.06	167.61	Not visited (enclosure)
216 (A)	No name	245.47	167.39	Not visited (enclosure)?
217 (A)	No name	245.64	167.58	Not visited (cairns)
218 (A)	No name	246.19	167.58	Not visited (cairn)
219 (A)	No name	245.89	167.49	Not visited (cairn)
220 (A)	No name	245.12	167.38	Not visited (cairn)
221 (A)	No name	245.49	167.22	Not visited (cairn)
222 (A)	No name	246.83	167.22	Not visited (stone circle)
223 (A)	No name	246.52	166.74	Not visited (cairn)
224 (A)	No name	246.46	166.45	Not visited (cairns)
225 (A)	No name	248.46	175.35	Not visited (cairn)
226 (A)	No name	248.55	175.55	Not visited (cairns)
227 (A)	No name	248.23	175.71	Not visited (cairn or structure)
228 (A)	No name	248.24	175.94	Not visited (cairns)
229 (A)	No name	248.03	175.00	Not visited (cairns)
230 (A)	No name	247.67	174.91	Not visited (cairns)
231 (A)	No name	247.93	174.80	Not visited (cairns)
232 (A)	No name	247.92	174.54	Not visited (cairn)
233 (A)	No name	247.73	174.30	Not visited (cairn)
234 (A)	No name	248.30	173.40	Not visited (cairns)
235 (A)	No name	247.74	173.91	Not visited (cairns)
236 (A)	No name	247.92	173.88	Not visited (cairn)
237 (A)	No name	248.36	173.88	Not visited (cairn)
238 (A)	No name	247.88	170.15	Not visited (cairn)
239 (A)	No name	248.05	169.76	Not visited (cairn)
240 (A)	No name	247.64	169.40	Not visited (cairns)
241 (A)	No name	247.42	169.19	Not visited (cairn)
242 (A)	No name	247.51	168.04	Not visited (cairn)
243 (A)	No name	247.33	167.90	Not visited (cairn, stone circle)
244 (A)	No name	246.61	167.16	Not visited (circular structures, enclosures)
245 (A)	No name	247.68	167.76	Not visited (cairn)
246 (A)	No name	247.83	167.74	Not visited (cairn)
247 (A)	No name	248.63	167.68	Not visited (circular structures, enclosures)
248 (A)	No name	248.54	167.60	Not visited (cairn)
249 (A)	No name	248.51	167.44	Not visited (cairn)
250 (A)	No name	248.52	167.06	Not visited (cairn)
251 (A)	No name	248.70	167.00	Not visited (circular structures, enclosures)
252 (A)	No name	247.99	166.89	Not visited (cairn)
253 (A)	No name	247.59	166.91	Not visited (cairn)
254 (B109)	No name	250.04	172.92	Not visited (MP scatter)
255 (A)	No name	248.27	166.03	Not visited (cairn)
256 (A)	No name	247.99	164.94	Not visited (animal pen)
257 (A)	No name	250.02	174.50	Not visited (cairn)
258 (A)	No name	250.02	175.19	Not visited (cairns)
259 (A)	No name	250.07	175.38	Not visited (cairn)
260 (A)	No name	249.91	175.48	Not visited (cairn)
261 (A)	No name	249.26	175.66	Not visited (cairn)
262 (A)	No name	249.43	175.35	Not visited (cairn)
263 (A)	No name	250.99	174.18	Not visited (cairn)
264 (A)	No name	250.98	174.05	Not visited (cairn)
265 (A)	No name	250.13	173.20	Not visited (settlement?)
266 (A)	No name	250.26	173.78	Not visited (cairn)
267 (A)	No name	250.41	173.81	Not visited (cairn)
268 (A)	No name	248.83	172.46	Not visited (animal pen / stone circle)
269 (A)	No name	249.47	172.02	Not visited (animal pen / stone circle)
270 (A)	No name	249.22	171.70	Not visited (animal pen / stone circle)
271 (A)	No name	249.53	171.65	Not visited (animal pen / stone circle)
272 (AS)	as-Sukhna (modern village)	250.75	171.15	modern village (Late Ottoman, Modern)
273 (A)	No name	250.74	169.56	Not visited (animal pen / stone circle)
274 (A)	No name	249.43	169.80	Not visited (animal pen)
275 (A)	No name	248.96	171.54	Not visited (animal pen)
276 (A)	No name	249.44	168.94	Not visited (cairn)

Site JRS	Site Name	P.G.E.	P.G.N.	Periods of occupation and Type of site
277 (A)	No name	249.28	168.63	Not visited (cairn)
278 (A)	No name	249.23	167.58	Not visited (cairn)
279 (A)	No name	249.60	167.75	Not visited (animal pen)
280 (A)	No name	249.26	166.24	Not visited (cairn)
281 (A)	No name	249.35	166.20	Not visited (cairn)
282 (A)	No name	249.50	166.18	Not visited (cairn)
283 (A)	No name	248.75	164.85	Not visited (cairns)
284 (A)	No name	249.33	165.97	Not visited (hut and animal pen)
285 (A)	No name	249.16	164.72	Not visited (animal pen)
286 (A)	No name	249.66	164.31	Not visited (cairn)
287 (A)	No name	249.88	164.65	Not visited (cairn)
288 (A)	No name	249.49	165.49	Not visited (cairn)
289 (A)	No name	249.41	164.06	Not visited (cairn)
290 (A)	No name	251.34	174.53	Not visited (cairn)
291 (A)	Jabal Abū al-Hulwah	251.33	174.40	Not visited (cairn)
292 (A)	No name	251.84	174.33	Not visited (cairn)
293 (A)	No name	251.86	173.92	Not visited (cairn)
294 (A)	No name	251.77	168.64	Not visited (cairn)
295 (A)	No name	251.71	168.40	Not visited (cairn)
296 (A)	No name	251.70	168.28	Not visited (cairn)
297 (A)	No name	250.97	168.31	Not visited (cairn)
298 (A)	No name	251.81	167.05	Not visited (cairn)
299 (A)	No name	251.49	167.21	Not visited (cairn)
300 (A)	No name	252.65	175.90	Not visited (animal pen/stone circles/huts)
301 (A)	No name	251.40	175.84	Not visited (cairn)
302 (A)	No name	253.26	175.99	Not visited (cairn)
303 (A)	No name	253.02	175.46	Not visited (modern house, animal pen, cairn)
304 (A)	No name	253.13	175.37	Not visited (cairn)
305 (A)	No name	253.39	175.41	Not visited (cairn)
306 (A)	No name	253.60	175.25	Not visited (cairn, long wall)
307 (A)	No name	253.89	175.48	Not visited (modern hamlet)
308 (A)	No name	254.00	175.35	Not visited (animal pen / stone circle)
309 (A)	No name	253.89	175.23	Not visited (animal pens)
310 (A)	No name	254.25	175.21	Not visited (cairn)
311 (A)	No name	254.32	174.00	Not visited (animal pen, modern hamlet)
312 (A)	No name	253.32	175.19	Not visited (cairn)
313 (A)	No name	253.48	175.04	Not visited (cairn)
314 (A)	No name	253.68	174.98	Not visited (cairn)
315 (A)	No name	253.95	174.71	Not visited (cairn, long wall)
316 (A)	No name	254.21	174.72	Not visited (cairn)
317 (A)	No name	254.12	174.42	Not visited (cairn)
318 (A)	No name	252.18	175.13	Not visited (cairn, animal pen)
319 (A)	No name	252.18	175.34	Not visited (cairn)
320 (A)	No name	252.38	175.44	Not visited (animal pen / stone circle)
321 (A)	No name	252.26	174.26	Not visited (cairn)
322 (A)	No name	252.29	173.90	Not visited (cairns)
323 (A)	No name	254.07	168.64	Not visited (cairn)
324 (A)	No name	253.03	167.99	Not visited (cairn, animal pen)
325 (A)	No name	253.75	167.83	Not visited (animal pen / stone circle)
326 (A)	Rujum at-Tāj	250.80	176.00	Not visited (animal pen / stone circle)
327 (A)	No name	248.52	166.14	Not visited (cairn)
328 (A)	No name	248.97	165.22	Not visited (cave shelters, walls)
329 (A)	No name	249.00	165.33	Not visited (animal pen)

Note: sites 326-329 are not displayed on the site distribution maps.