

# ARCHAEOLOGICAL SURVEY AND EXCAVATIONS AT THE WĀDĪ AL-YUTUM AND AL-MAGAŞŞ AREA – AL-‘AQABA (ASEYM): A PRE-LIMINARY REPORT ON THE THIRD AND FOURTH SEASONS EXCAVATIONS AT TALL HÜJAYRAT AL-GHUZLĀN IN 2002 AND 2003 WĀDĪ AL-YUTUM

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*With an Appendix on the Pottery by S. Kerner*

## Introduction

The modern town of al-‘Aqaba is situated on the northern shore of the Gulf of al-‘Aqaba at the base of dramatically ascending mountains, which emphasizes the contrast between the Red Sea and the desert. Spanning a time of more than 6000 years, archaeological evidence has been recorded for Iron Age II at Tall al-Khalifah (تل الخليفة), the Classical period at *Ailana*, the Byzantine and Islamic periods at *Aila* or *Ayla*. These periods have been the focus of various excavations, which were carried out by different institutions (see Whitcomb 1997).

The oldest settlements known so far in al-‘Aqaba region are the Chalcolithic-Early Bronze Age sites of Tall al-Magaşş (تل المقص) and Tall Hūjayrat al-Ghuzlān (تل حجيرة الغزلان) (Fig. 1). Both sites are located a few kilometers north of al-‘Aqaba and were first mentioned by the German scholar Fritz Frank (1934: 245 and Plan 27). Archaeological research had started in 1985 by Lutfi Khalil at Tall al-Magaşş (Khalil 1987; 1988; 1992; 1995; Khalil and Riederer 1998). In 1990 Khalil opened two small trenches at Hūjayrat al-Ghuzlān, which is contemporaneous with al-Magaşş. Excavations at both sites revealed architectural structures of stone, mud-brick and pisé-walls, which represent rectangular and circular buildings. In 2000, the complete stratigraphy from the top to the deepest layers of the settlement at Hūjayrat al-Ghuzlān could be observed and several building levels distinguished. The site was inhabited during the time, when systematic copper metallurgy first appeared in southern Jordan, according to a series of C14-dates (Görsdorf 2002) roughly between 3900 and 3500 BC cal.

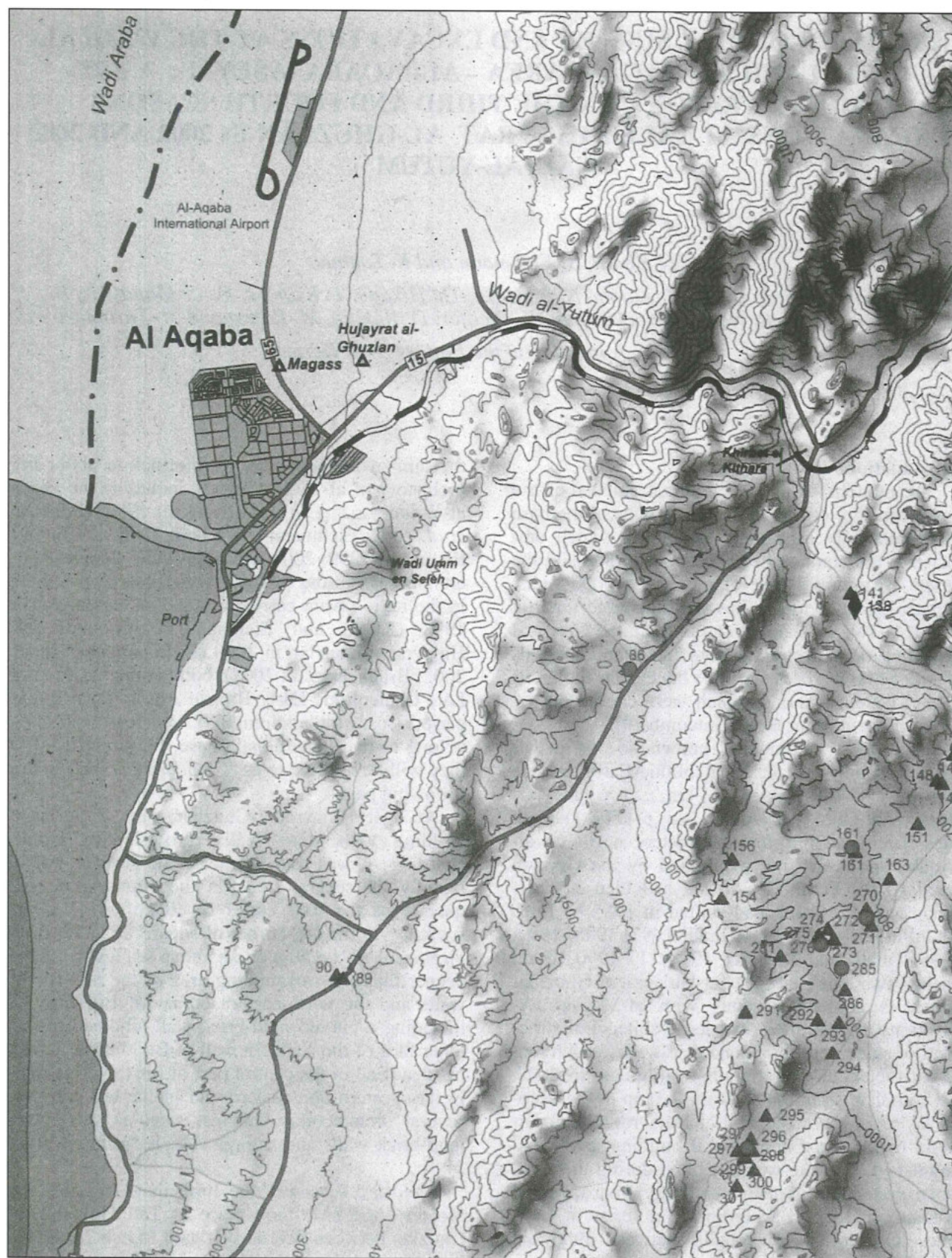
The ASEYM project was created in 1998 with

the aim of collecting more information about the prehistory of al-‘Aqaba region, including the Wādī al-Yutum (وادي اليتيم) area (Brückner 1999; Brückner *et al.* 2002; Eichmann and Khalil 1998; Khalil and Eichmann 1999; 2001; Herling 2000). Besides several surveys in the region, excavations at two sites in the region were carried out at Tall al-Magaşş in 1998 (Khalil and Eichmann 1999) and Tall Hūjayrat al-Ghuzlān in 2000 (Eichmann and Khalil 2002; Brückner *et al.* 2002), both dating back to the Late Chalcolithic-Early Bronze Age I. Transitional period (forth millennium BC). Whereas both sites belong to that transitional phase, for simplification they will be referred to as “Chalcolithic” only in the following pages.

At Tall Hūjayrat al-Ghuzlān part of a large building with stone walls, provisionally called Building A, was found beneath the surface. Additionally, in several trenches the stratigraphic sequence of the Tall could be identified. A deep sounding in the NE-corner of square E6: 2 reached virgin soil at 108.50m depth above sea level, 1.50m deeper than the surrounding area of the tall. Stone walls and the north-eastern corner of Building A, including a curved mud-brick wall adjoined to the inner face of the northern wall of Building A, could be identified in the central part of the tall. Trenches in the western and eastern end of the tall exposed several architectural features, such as stone and mud brick walls and storage vessels “*pithoi*” (Fig. 2).

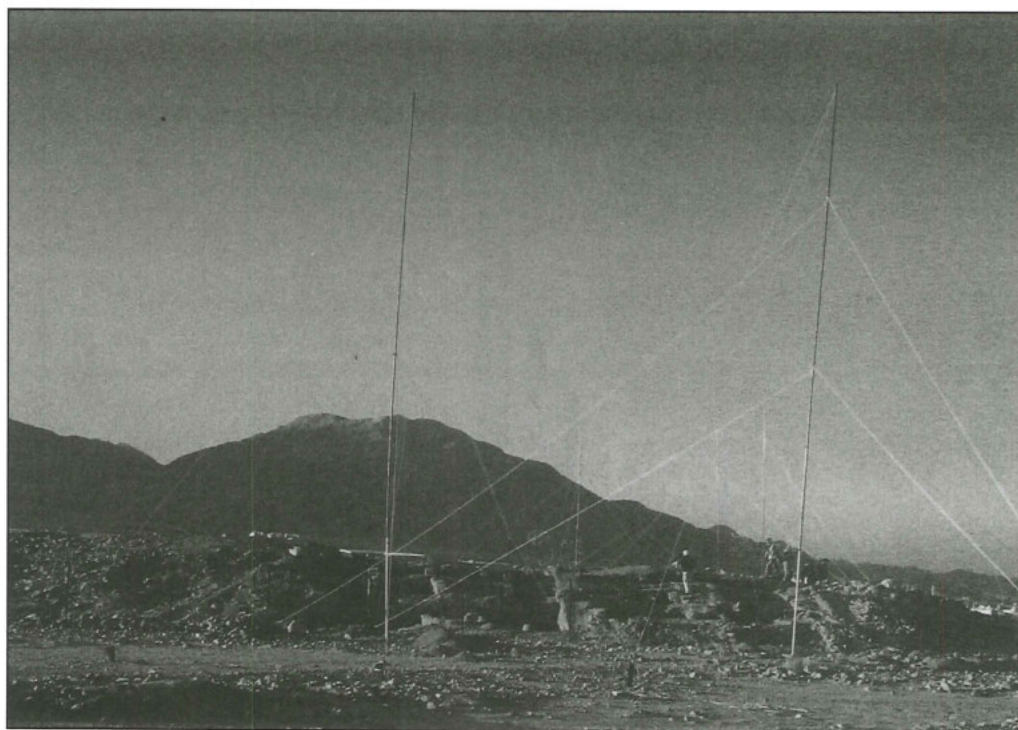
The third season of the Jordanian-German joint project (ASEYM) took place at Tall Hūjayrat al-Ghuzlān between February 10 and March 28, 2002, and the fourth season between February 3 and March 28, 2003. The project is sponsored and fund-





1. Map of al-'Aqaba region showing the location of Tall al-Magaṣṣ and Hujayrat al-Ghuzlān.





2. Hujayrat al-Ghuzlān from the north.

ed by the *Deanship of Research of the University of Jordan* and since 2003 also by the *Deutsche Forschungsgemeinschaft* (Germany) and the *Higher Council of Science and Technology* (Jordan) the *Orient-Abteilung* of the *Deutsches Archäologisches Institut* in Berlin in cooperation with the Department of Antiquities of Jordan. The staff included the above mentioned authors and contributors. In addition, Manal al-Basyouni and Susan al-Fakhari acted as representatives of the Department of Antiquities, and Darar Depolasky worked as foreman and field technician; Irmgard Wagner was the photographer of the project for both seasons.<sup>1</sup>

The main objectives of the project were to excavate at Hujayrat al-Ghuzlān in order to:

1. Extend the excavation horizontally on a large scale and to expose architectural features to the north and the south of the stone Building (A).
2. Understand the structural and chronological relationship between the stone Building A and the mud-brick and mud walls.
3. Determine the stratigraphical evidence in relation to metallurgical activities.
4. Examine the palaeobotany and palaeozoology in the area.
5. Trace any possible connections to Predynastic Egypt or other regions.

To achieve the above mentioned goals, 17 squares (9 x 9 meter each) were excavated: B6, B7, B8, C6, C7, C8, D7, D8 and E7 in the northwest sector, and F4, F5, F6 and F7, G7, H7, I6 and I7 in the southwest (Fig. 3).

### Architecture and Stratigraphy

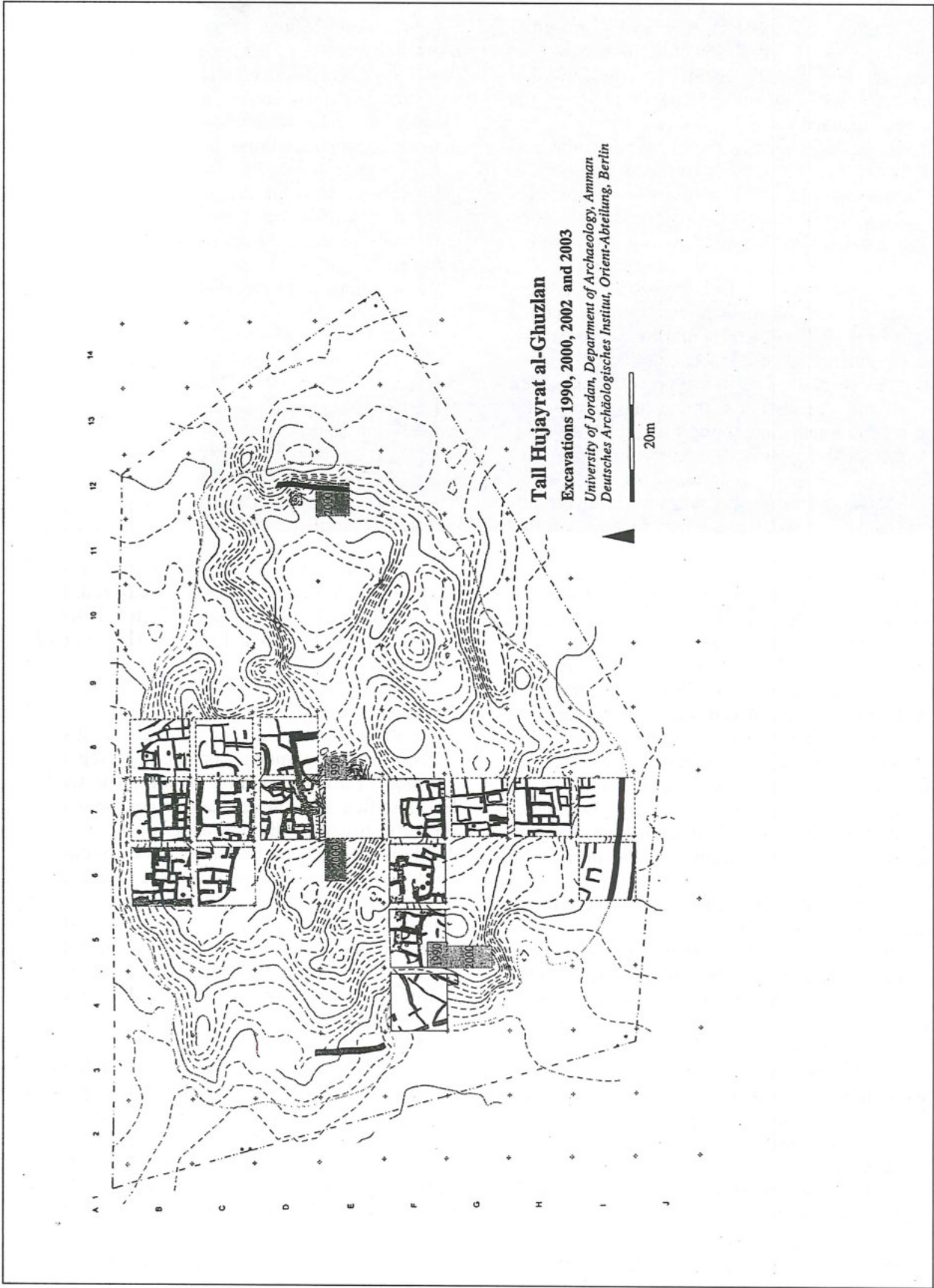
When removing the topsoil layers in all squares, several wall alignments appeared, giving the impression of a high building density. The walls can be classified into three main types according to their construction materials as follows:

1. Mud-brick: There are two types of bricks which differ in size: A: 35 x 25 x 8cm, and B: 52 x 35 x 22cm. Sun-dried mud-bricks could have been produced at many places near the site in the alluvial fan of Wādī al-Yutum. Mud was also used as mortar for the construction of walls and as plaster for their facades.
2. Stone: Undressed, water-worn boulders were used. This type of stone is still available in Wādī al-Yutum. Mud was used as a bonding material between the stones.
3. Stone and mud or stone and mud-brick: A combination of both materials was used.

The first type of walls is dominant in the N-W sector (squares B6, B7, C6 and C7), while stones

1. In addition, Viola Podsiadlowski took part in 2002, and Franziska Block, Focke Jarecki, Ute Koprive, Cigdem Kok-

sal, Helmet Richter and Claudia Schmidt in 2003.



3. Contour map showing excavated trenches and plan of the architectural features.



and stone-mud walls were preferred in the S-W sector (squares F5 and F6). The walls are either straight or curved. They are built in one row in most cases and sometimes in two rows. Neither floor levels nor foundation trenches of the walls have been reached yet.

In the northern part of the excavation, the network of the mud-brick walls formed a large building complex (Building B), with walls oriented N-S and E-W. Parts of the walls had been damaged by an earthquake and collapsed; the walls retrieved are preserved up to more than one meter in height. The complete dimensions of Building B are not clear yet; it consists of a number of room-like structures that are either regular or irregular in shape. Rooms with a regular outline can be classified into two main types (Fig. 4). The first type is characterised by small and almost square floor plans, and its average measurements are approximately 90 x 90cm, while the second type is rectangular in shape with average measurements of approximately 2 x 1.5m. In both cases, no doorways or entrances were observed with the exception of two features of rectangular shape in squares C6 and C7.

Room-like structures of an irregular type differ in shape and measurements. Some have an entrance and are connected with corridors such as in squares B6, C6 and C7. In several of these room-like cells, remains of ceilings are indicated by wooden beams (Fig. 5). The function of these cells is still unclear. Presumably they were not built with the purpose of living or working; more likely they were used for storage. No indications are available yet about the materials that were stored.

Another aspect of a storage system could be exposed in the northern part of Building B, where large storage jars (*pithoi*) were discovered *in situ* in square B7 (loci 52 and 57). In one of the eastern square rooms a further shouldered *amphora*-like jar was exposed (B7 locus 49). In addition, excavation in the southern part of Building B uncovered *pithoi* in square C6 (loci 7, 8, 10, 26 and 27). It is quite clear, that Building B does not represent ordinary village architecture, but was probably part of a complex of an organised large household comprising storage facilities that surpassed the needs of a family. It seems probable that Tall Ḥujayrat al-Ghuzlān was a settlement with a stratified social-economic organization.

In the southwest sector of the site, excavation in squares F4, F5, F6 and F7 exposed several stone walls made of boulders that represent Building C and are probably stratigraphically related to stone Building A.

In addition, several mud-brick walls were revealed beneath a layer of stone debris; they form room-like features of the irregular type. Some large *pithoi* were also discovered in this sector and represent storage facilities in this area. Crucibles, moulds, several artifacts made of copper and numerous copper metallurgical remains were found, clearly demonstrating that metallurgical activities took place in these buildings or in their vicinity. A large stonewall in the south might be connected with walls in the west and east to be a defensive wall surrounding the site.

In the south-eastern corner of Square F4, a wall decoration was discovered, preserved on the north-west façade of the mud-brick wall (locus 2).

Fingertip impressions had been made in the soft clay plaster of the wall. The impressions are arranged in continuous line and depicted two ibexes. In addition, several hand impressions were noted (Fig. 6). It has been suggested that these depictions are magical or ritual representations.

Ibexes and hands depictions are common in rock-carving art in the area. During the 2000 ASEYM campaign the survey recorded a number of ibex-petroglyphs (Khalil and Eichmann 2001: fig. 9). Also, in the Wādī Iram epigraphical survey engravings showing four hands with arms were found on rocks (Fares-Drapeau and Zayadine 2001: fig. 7). Furthermore, such petroglyphs are represented on rocks in the deserts of Sinai and Negev, e.g. at Timna (Anati 1981; Rothenberg 1972: figs. 36 and 38), and on rocks from northwest Saudi Arabia. These petroglyphs can be dated from Neolithic period onwards (al Kabawi et al. 1989: Pl. 37A and B). As will be mentioned later, faunal studies on bones from the site indicate the presence of gazelle and ibex.

Thick ashy layers were excavated beneath the topsoil layers and between walls of various types in the squares: B6 (loci 10, 29, 41, 46 and 51); B7 (loci 25, 34, 37, 38 and 54); C6 (loci 12, 20 and 28), C7 (loci 28 and 48), D7 (loci 25, 26, 30, 32, 56 and 63), F5 (loci 1, 22, 24, 26, 27 and 30), F6 (loci 1, 22, 25, 28, 36 and 60), F7 (loci 16, 17, 21, 27, 47, 48, 55 and 64). These layers were light-dark grayish or light dark brown-grayish in colour, loose in texture with many lumps of charcoal and very rich in finds.

Most of the artifacts discovered in this season were found in the ashy debris. They include various shapes of jars and storage vessels, e.g. *pithoi*, bowls and many pottery sherds, flint, grinding stones, animal bones, shells and finds related to copper metallurgy. The metallurgical remains rep-





4. Aerial photograph of trench B7, showing two types of room-like structure.

resent different stages of copper production and include ores, sherds of clay crucibles different types of moulds, ingots and slags. Few copper artifacts were found, such as an axe in square F5 (locus 1).

The ashy layers in squares B6, B7, C6, C7 and D7 were found inside the cell-like structures. They represent a destruction caused by an extensive fire that burned the wooden ceiling. The destruction may have been caused by an earthquake, as evidenced by cracked and fallen mud-brick walls, especially in square D7 (locus 61). Further study will be undertaken.<sup>2</sup> Tall Hujayrat al-Ghuzlān seems to provide the earliest traces of earthquakes in *Wādī ‘Arabah* known today (cp. Korjenkov and Mazor 1999; Niemi 2001).

In addition, similar ashy layers were excavated

in squares F5, F6 and F7. They were deposited above debris of compact layers of mud such as those in square F6 (loci 48 and 58). Further excavation, however, is required in these squares in order to better understand the cause of the ashy layers.

### The Finds and Trade Relations

Although no floor level was revealed during this year's excavations, several finds were uncovered and samples were taken from the upper destruction layers, which provided information about craft specialisation, conditions of nutrition and environment and long-distance trade links.

The pottery found at Tall Hujayrat al-Ghuzlān is generally of quite a coarse fabric with chaff and

2. Detailed analysis will be carried out by Andrej Korjenkov.





5. Wooden beams in a wall, traces of a ceiling.



6. Wall decoration in trench F4, depicting two ibexes and hand impressions.

mineral temper.<sup>3</sup> There are few burnished wares. Also very few pieces were decorated with incised lines, but decoration of rows of finger-imprints is common. Polished or painted pottery is not existent. Pottery shapes include platters, bowls, and

large jars, often with loop or ledge handles; the rims are simple in profile. There are very few parallels to the pottery known from Tulaylāt al-Ghassūl (تليلات الفسول) or other sites of the Central Jordanian Chalcolithic culture (cp. Kerner 2000;

3. Detailed analysis will be carried out by Susanne Kerner (see appendix).



2002). But more comparisons are possible with sites from southern Jordan of a slightly later date, such as in Wādī Faynān (وادي فينان) 100 (Wright *et al.* 1998: 33-60).

**Ground stone** artifacts, such as mace heads, hammers, and grinding stones are as common as stone vessels of a different shape. Also, an artifact in shape of a spoon made of sandstone was found (Fig. 7). One dish-like fragment (Fig. 8a) is decorated in geometric relief. Similar objects are known from the ASYEM survey campaign 2000 in Wādī al-Yutum (site 244, Yitim A) (Fig. 8b), and from Khirbat Rizqah (خربة رزقة), so far a rare ritual site in the desert east of al-‘Aqaba (Kirkbride 1960; 1969; cp. Carter 1970).<sup>4</sup> At Rizqah such vessels are present in great numbers.

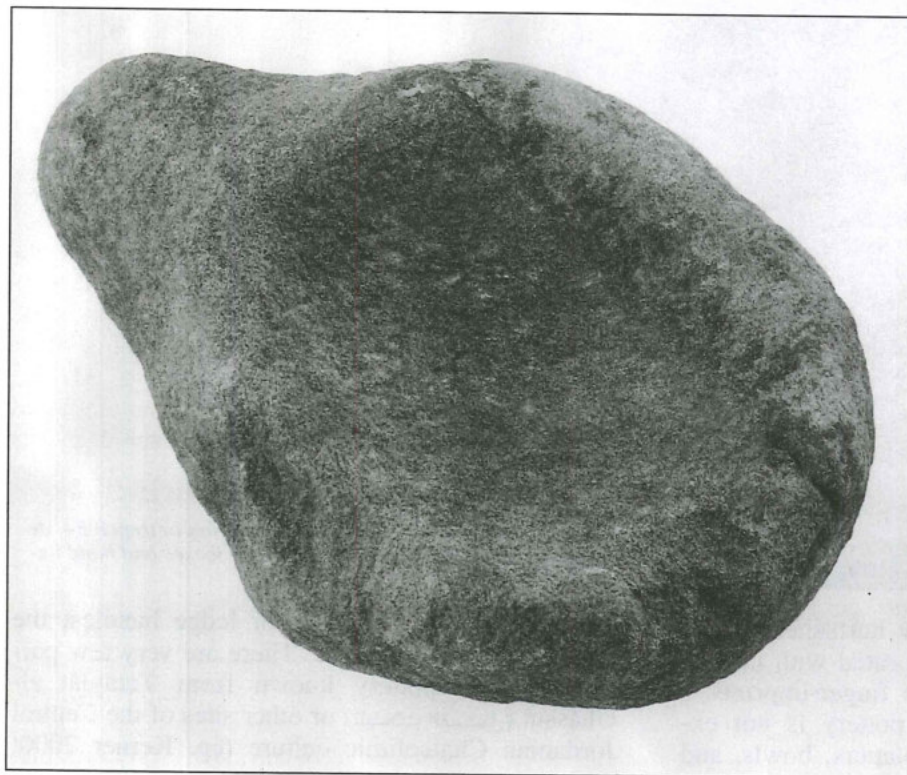
The fragment of a basalt vessel (Fig. 9a) seems to be of Egyptian origin. It is part of a wide brimmed jar, which represents a type originally designated in Egyptology as “Libyan Vase” (Fig. 9b.). Today we know that the “Libyan Vase” are a typical feature of the Chalcolithic Buto-Maadi Culture of Lower Egypt (e.g. Rizkana and Seeher 1988: Pls. 106, 1-12; 107, 1-12; XI, 6-11).

In the 2002 and 2003 campaign around 3000 chipped stone artifacts were uncovered. A final statistical analysis of the **lithic industry** is planned after the whole site has been excavated. Thus, the

aim of this preliminary report is to provide a first insight into the lithic assemblage.

The common **raw material** was mid-brown flint and darker flint, which is homogenous and was the preferred raw material for special tool types. Rock crystal is present in the form of a few tools and some debitage. So far the newly discovered material generally does not represent a major primary production, although core remnants, chips and shattered pieces exist already from previous investigations (Herling 2002b: fig. 29). By contrast, it seems that the bulk of the material consists of tools and resharpening debitage.

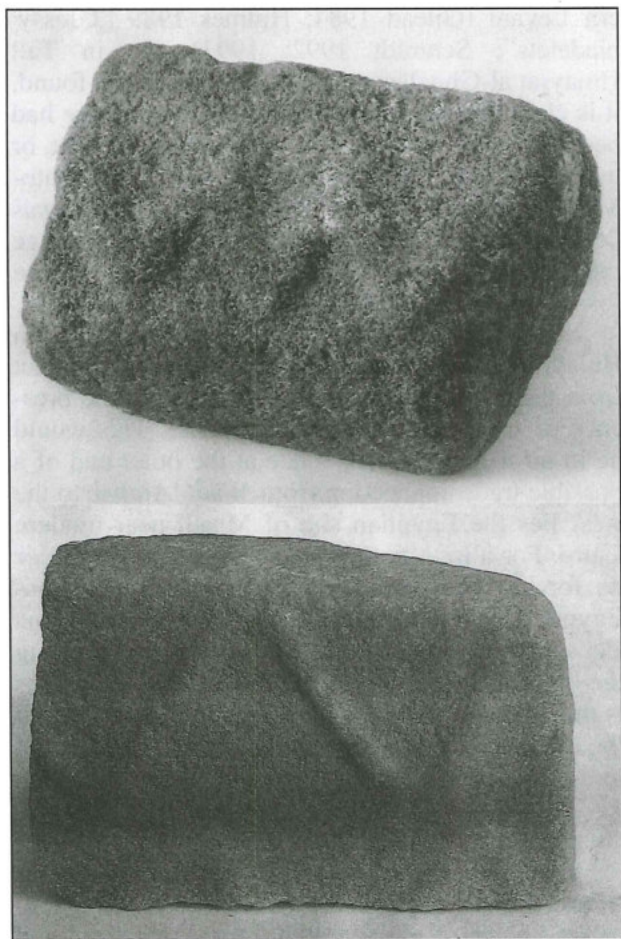
One of the very obvious tool types is made from large blades and flakes, often leaving the wider part (up to around 90%) of the dorsal covered with cortex. These **cortical flakes** (Fig. 10) are typical of the Chalcolithic and the Early Bronze Age in the Levant (Rosen 1983; 1997; Schmidt 1996: 89-100, “Plattensilexabschlaggeräte, PSA”) but of unknown function. At Tall Ḥujayrat al-Ghuzlān they were discovered in abundance. A , production centre of cortical flakes was recently localised in the al-Jafr Basin in southeastern Jordan (Quintero, Wilke and Rollefson 2002) and in the Wādī ar-Ruwayshid (وادي الرويشد) area in eastern Jordan (Deutsches Archäologisches Institut 2001: 684-685), and other sites seem to exist in the southern Sinai (Schmidt



7. Stone object in form of a spoon.

4. Detailed report about the ASEYM-Survey and work in Rizqah by Lothar Herling.





8. Two decorated dish-like fragments of stone;  
a: From Hujayrat al-Ghuzlān.  
b: From Wādī al-Yutum A.

1984). These artifacts also have parallels in Predynastic Egypt. In Maadi they are known in large numbers and regarded as an import from the East (Rizkana and Seeher 1988: Pls. 49-67; Pl. IV, 1-6).

For these tools made from flakes Lothar Herling has coined the term 'cortex tools' (Herling 2002c: 286). According to his definition the dorsal is generally covered almost entirely with cortex, and the tools were knapped off the core without any previous core manipulation. The shapes and sizes vary considerably and their only common feature is the remaining widespread cortex. The 2002/03 campaigns yielded dozens of this type that are comparable with the published material.

Two remarkable collections of very regular tabular-like scrapers come from trench F6 on the south side of the site. The first (area F6 locus 54) consists of four complete scrapers with faceted striking platforms. Two have an oval, oblong outline, one is fan-shaped in form, and the fourth is an almost round specimen. The oval scrapers have different retouching patterns: either left margin with almost

no retouching at the terminal or right margin with the same retouching encroaching at the terminal end. The fan-shaped scraper, on the other hand, shows retouching on all sides except at the narrow base. The roundish scraper differs from the others in that it has two large flake negatives on the dorsal, leaving the dorsal covered with less than 50% cortex. The dark brown raw material with chalky white cortex is, nevertheless, common to all of them.

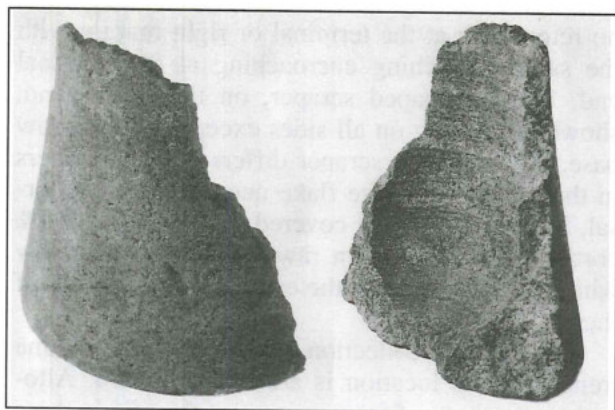
The second collection comes from the same trench and its location is area F6 locus 24. Altogether there are five scrapers in this find: three oval-shaped (Fig. 11.1) and two round ones (Fig. 11.2). All were made of dark brown flint and the cortex is chalky white. The striking angle lies between 80-90°. Also common for the five scrapers is the retouching pattern, which was made around all margins in a fine to a slightly invasive mode. Their discovery in F6 locus 24 showed, that the scrapers were aligned side by side, and obviously they originally had been in one organic container or bag.

**Scrapers** often have a long life and thus are altered and changed in regard to their shape. Some of the artifacts from al-Hujayrat provide evidence for this. (Fig. 11. 3-4) presents two scrapers with retouching along all edges and a good deal of cortex left on the dorsal. In both cases the striking platform is missing, but the direction of the blow can be detected. This indicates that they were either made on a side blow flake or more likely that their shape and size changed over time due to use and re-sharpening. This means that we are looking at these scrapers in their 'discard stage' and, thus, their original form and size cannot be determined.

Another frequent group of tools are **splintered pieces** (pièces esquillées). Their general shape is rectangular, and at al-Hujayrat they were made from rectangular flakes but also by reusing older tools such as scrapers from blades (Fig. 11. 5). Some of the splintered pieces were manufactured from rock crystal (Fig. 11. 6). Splintered pieces have been known from the Palaeolithic and were widespread. Their function can be seen as chisels for making bone tools (Schmidt 1996 : 45).

Other tool types, such as simple borers, retouched blades and lunates, are a further confirmation of assemblages already known from the Wādī 'Arabah. Sickle blades are present, but until now there is no microwear analysis available as to which plants had been harvested. Quite large blades had been used to produce sickle implements, but the blanks were not made in the Canaanite blade technology.





9a. Fragment of a basalt vessel from Hujayrat al-Ghuzlān.



9b. Stone vessel named "Libyan vase" from Maadi (Rizkana and Seeher 1988).

Finally, there are two other well-known types (Herling 2002b: 294), which however, are clearly not a genuine Chalcolithic south Jordanian type: the twisted bladelets and the micro endscrapers, common in both regions, in Egypt and in the south-

ern Levant (Gilead 1984; Holmes 1989 "Glossy bladelets"; Schmidt 1992; 1993). As in Tall Hujayrat al-Ghuzlān no bladelet cores were found, it is clear that the twisted bladelets found there had been produced elsewhere in the southern Levant, or even in Egypt. Both are fossil types of the Buto-Maadi culture in Egypt. The latter, however, was defined using Chalcolithic and Early Bronze Age material of the Levant and declared to be a type fossil for this area as well (Gilead 1984).

Nevertheless, it is obvious that the few pieces in Hujayrat al-Ghuzlān (Fig. 11. 7-10) were distinct from the other material and may indicate the presence of Egyptian influence at the site. This would be in no way a surprise, since at the other end of a possible trade connection from Wādī 'Arabāh to the west lies the Egyptian site of Maadi near modern Cairo. For a long time this site has been known for its foreign contacts, evidenced not only by non-Egyptian subterranean dwellings but also by the Canaanite ceramic and lithic imports. Regarding the lithic industry, one of the dominant blank forms is the bladelet and amongst the tool types at Maadi the micro endscraper makes up around 20% of all tools. The pieces from Maadi shown in Figure 11. 11-13 resemble the objects from Hujayrat al-Ghuzlān quite convincingly.

Another hint for a possible connection comes from a further object from trench F6. It is the segmented piece of a blade with a trapezoid form and with the left and right margins backed like the very typical Egyptian arrowhead of the transverse type (Hikade 2001).

Other evidence of trade relations with Predynastic Egypt is provided by **worked shells**, especially *Tridacna* sp. (a shell that does not occur in the Mediterranean Sea) and other species. Many fragments of bracelets and other items including pre-products made from these materials indicate local production (Fig. 12). Similar bracelets are also known from the nearby site of Tall al-Magaṣṣ (Khalil 1988: fig.17.6-8) and other places in the southern Levant, as well as from Maadi, Wādī Digla (وادي دجلة) and al-Omari in Egypt (Rizkana and Seeher 1989: 21, 29 and Pls. 6, 10-11; IV,9-10).

Due to the arid conditions **artefacts made of bone and horn** were preserved in excellent condition. Bone artifacts are represented by several spindle whorls, mostly discovered in specific areas, thus documenting textile-production activities in Tall Hujayrat al-Ghuzlān. Additionally, two different types of awls were discovered. The first type is made from the axially cut proximal *metapodiae* of small ruminants, the second type from splinters of *tibiae* of small ruminants. Special and rare types of





10. A number of cortical flakes.

bone artifacts are represented by short *ulna*-awls with uncut *diaphysis*, spoon-shaped artifacts and *ad hoc*-awls.

The spectrum of bone tools is characterised by a high degree of standardisation with few special types. Obviously, in addition to all the other find-groups, even the bone awls fit into the picture of a highly specialised craft-industry in Tall Ḥujayrat al-Ghuzlān in the forth millennium BC.

Further evidence of contact with Predynastic Egypt — and especially craft-specialisation — is represented by artefacts as proof of metallurgical activities on the site.<sup>5</sup> Various types of copper remains were found, which appear in abundance everywhere on the surface and in the excavated areas of Tall Ḥujayrat al-Ghuzlān. Pieces of slag and ore have been collected by the kilogram. There is little doubt that the sources of the raw material is in Timna and/or Feinan (Hauptmann 1986; 1989a-b; 2000; Hauptmann, Bachmann and Maddin 1996). Several fragments of **crucibles** made of clay, some with a socket for a wooden handle, were also found, often coated with a thick layer of vesicular vitrification and traces of copper. A fragment of a similar crucible with socket is known from Tall al-Magaşş.<sup>6</sup>

The clay **moulds** show little, if any, signs of vitrification. Traces of green corrosion products of copper at a certain level below the rim attest that the pieces had been used as moulds. The shape of

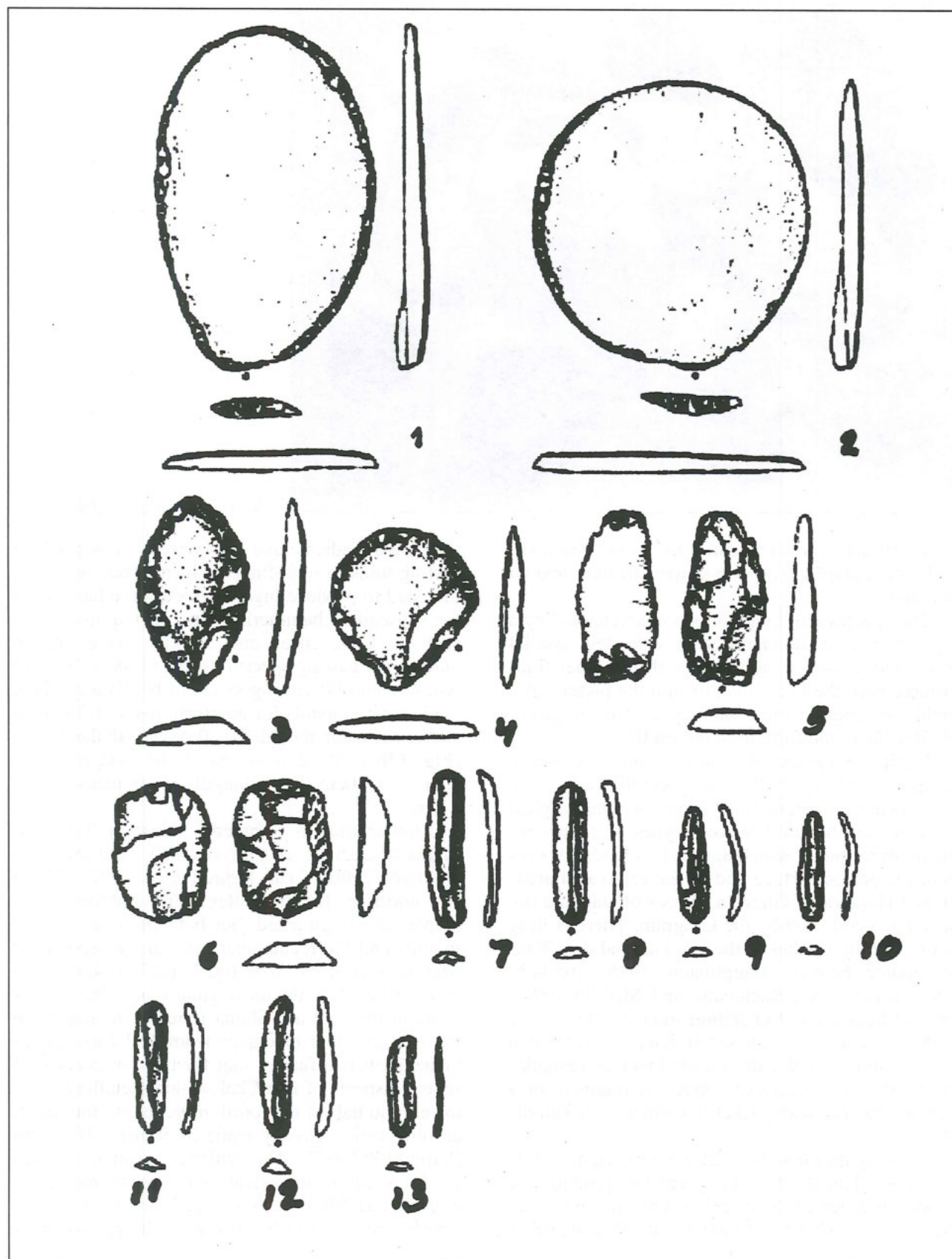
the moulds indicate that they were not designed for casting tools in near-finished form. They had been intended to produce ingots, which served as blanks for subsequent hammering into the required tools, such as axes, adzes and chisels. There are no moulds for casting specific forms of tools, but two types of moulds for ingots could be distinguished: oval-shaped moulds for naviform ingots (**Fig. 13a**) and rectangular moulds for flat and tabular ingots (**Fig. 13b**). The dimensions of the oval form are about 5 x 10cm the rectangular ones measure 8 x 11cm.

Similar moulds apparently exist at Tall ash-Shūna (تل الشونة), an Early-Bronze I site (between 3400 and 2900BC cal; Rehren *et al.* 1997: 625) in the northern Jordan valley. The published examples are fragmented, but both the oval type of moulds and the rectangular one can be recognised (Rehren *et al.* 1997: 626, fig. 2 and Pl.1, 4, the oval type, and Pl. 1, 3, the rectangular type). The dimensions of the Tall ash-Shūna moulds are similar to the slightly older examples from Tall Ḥujayrat al-Ghuzlān. It is a further hint for the continuance of several aspects of late Chalcolithic metallurgy into the second half of the fourth millennium, into EB I, an observation already made by Rehren, Hess and Philip (1997: 637). The evidence of some continuity between metallurgical practices in the Chalcolithic and EB I periods (e.g. Levy *et al.* 2001), which have hitherto been seen as sharply contrast-

5. Analyses are in process by Andreas Hauptmann.

6. Unpublished, Museum 'Aqaba.





11. Different lithic implements (1-13).

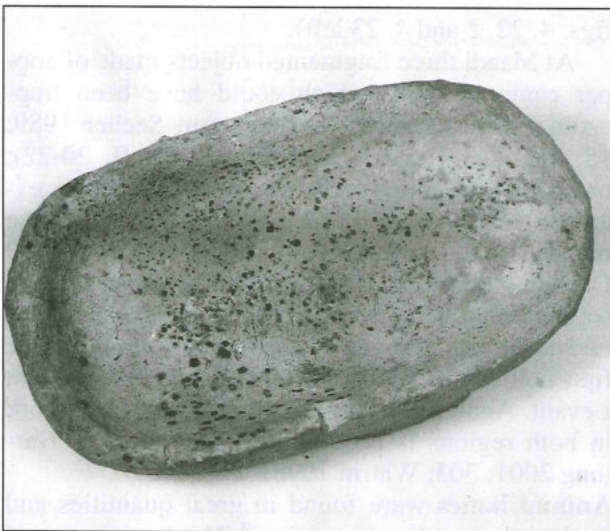




12. A worked shell artefact.



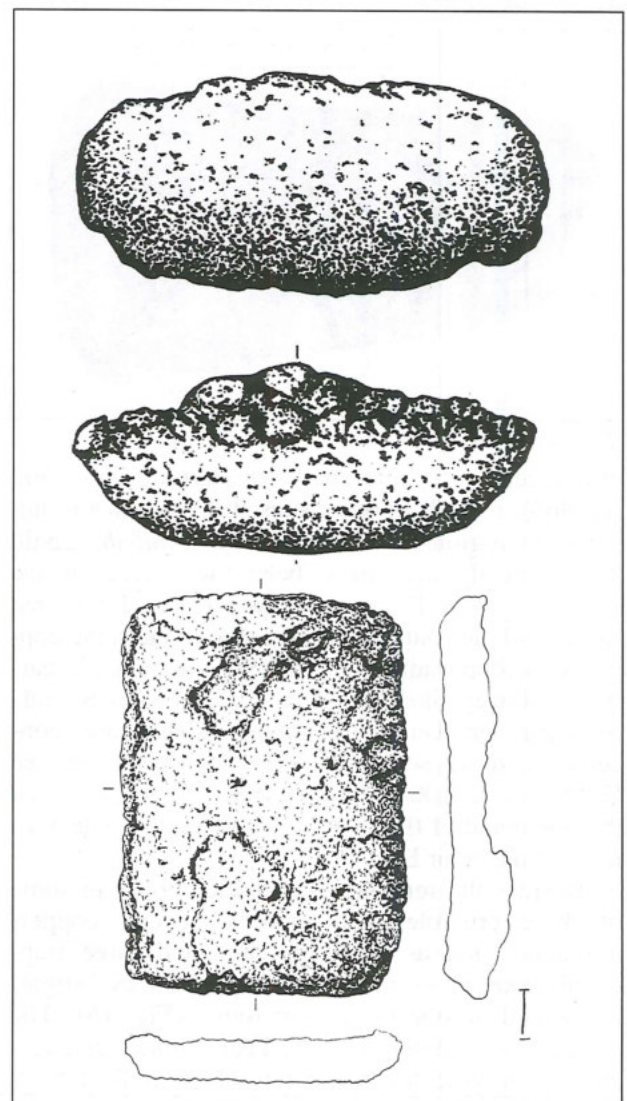
14a. A corroded oval ingot from Hujayrat al-Ghuzlān.



13a. Oval pottery mould.



13b. Rectangular pottery mould.



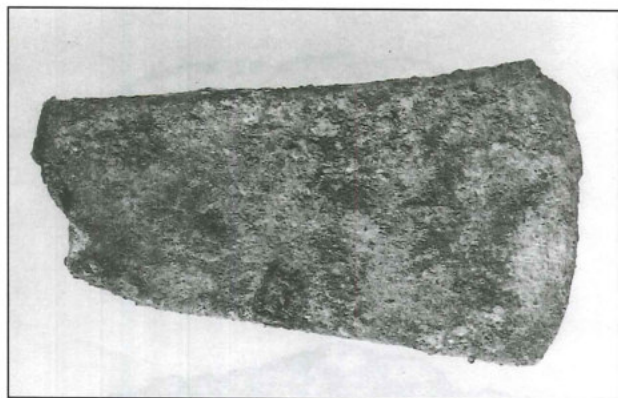
14b-c. Ingots from Maadi (Rizkana and Seeher 1989: Pls. 4, 9-11).



ing, is growing.

A complete oval copper ingot was retrieved in square I 6, locus 10 (Fig. 14a). It is corroded and its weight is 1.1kg. In its shape and size the example can be related to oval moulds, which were discovered in large quantity at the site. In addition, a fragmented ingot was discovered at Tall al-Magaşş (Khalil 1988: fig. 17, 11).

Oval and rectangular ingots of exactly the same dimensions are known from Maadi (Fig. 14 b-c). Their weight is around 800g each. The Maadi ingots have not been analysed so far (cp. Pernicka and Hauptmann 1989), but the moulds from Hujayrat al-Ghuzlān provide sound evidence that this site at least belonged to the same workshop tradition, from which Maadi received its copper. The mines and workshops in Wādī Dara in the north-eastern desert of Egypt, which has been explored



15. Copper axe.

only recently (for references see Hartung 2001: 304 ref. 964), as well as other sites still unknown in unexplored regions, including Wādī 'Arabāh, could hypothetically also have been the source of the Maadi copper. There is, however, no doubt that Egypt and the southern Levant shared the same copper workshop traditions. Since sites involved in early metallurgy like Tall Abū Maţār, Bīr aş-Şafādī, Shiqmīm or Tall Hujayrat al-Ghuzlān are concentrated in the southern Levant (for references see Golden *et al.* 2000: 961), it seems to be clear that the homeland of this tradition was not the Nile Valley, but the Near East.

Besides the remains of metallic copper in some of these crucibles and moulds, several copper-artefacts, such as rods and pins and three trapezoidal axes or — more probably — adzes,<sup>7</sup> slightly flanged on one face, were found (Fig. 15). The original butt seems to have been broken and lost and the fragmented blade reused, as indicated by

7. The terms 'axe' (the cutting edge is parallel to the haft) and 'adze' (the plain of the blade is at right angles to the shaft) are not used consistently in literature.

8. The only proper comparison is a very large trapezoidal axe

traces of use.

Trapezoidal axes or adzes made of copper are well known from the southern Levant, especially from the Beersheba valley, Shiqmīm, Abū Maţār, Bīr aş-Şafādī and Neve Noy. In the north and east of the Beersheba valley they were found at Giv'atayim, Meser, Tulaylāt al-Ghassūl, Nahal Selim and Nahal Mishmar (for references see Shalev and Northover 1987: 361).

Nevertheless, there is still a need for a more detailed typology of the axes and adzes, as quite different shapes are usually grouped together. The trapezoidal axes from Tulaylāt al-Ghassūl are very thick in section and heavy, whereas the examples from Shiqmīm are slender. Another type of trapezoidal axe, which is thick and narrow at the butt and widens towards the cutting edge, was found at Nahal Qanah cave (Gopher and Tsuk 1996: 115, figs. 4. 22, 2 and 4. 23 left).

At Maadi three fragmented objects made of copper came to light, which could have been trapezoidal axes or adzes (Rizkana and Seeher 1989: 15, Pls. 4, 3-4 and "sketch 1934"; Pl. II, 20-22); one small fragment may be part of a fourth example (Rizkana and Seeher 1989: Pls. 4-5). These objects are the earliest heavy metal tools in Egypt.<sup>8</sup> Despite the lack of a sophisticated typology there is some similarity to be observed between the pieces of Maadi and the trapezoidal copper axes of the first half of the fourth millennium in the southern Levant. Again, the common tradition of metalwork in both regions is becoming perceptible (cp. Hartung 2001: 303; Watrin 1998).

**Animal bones** were found in great quantities and studied during the excavation.<sup>9</sup> The largest part of the fauna (around 80%) derives from domestic animals with sheep and goat (*Caproviden*) being the dominant species. Domestic cattle (*Bos*) could be identified too. The evidence of young animals (calves) may indicate that this species was actually raised in the area under investigation — or, that living animals were brought from other regions to be slaughtered at Tall Hujayrat al-Ghuzlān. The wild fauna is represented by the onager (*Alcelaphus buselaphus*), gazelle (*Gazella spec*), ibex (*Capra nubiana*), deer (*Dama mesopotamica*) and hare (*Lepus capensis*). Surprisingly, there are no carnivores and no fish remains. Molluscs (*Tridacna sp.*, *Conus sp.*) were apparently used only for ornaments, not for food.

Especially in section D7 an abundance of **botanical remains** was recovered.<sup>10</sup> Both flotation

from Matmar grave 3131 (Brunton 1948: 21, Pl. XVI,47), dated to the first half of Naqada II.

9. Analyses by Norbert Benecke.

10. Analyses by Reinder Neef.



and dry sieved soil samples were taken. Remains of typical desert plants were found, such as bitter apple (*Citrillus colocynthis*), a cucumber-like plant still used in medicine. Hence, climate and precipitation amounts in the late Chalcolithic were not very different from today (less than 50mm). Most of the botanical remains were preserved in carbonized state. Due to the very low annual precipitation some materials like the wood of the tamarisk were also preserved uncarbonized. The identified cultivated plants are barley, emmer, wheat and flax. Shrubs and trees are represented by the acacia, tamarisk, wild fig, Phoenician juniper and wild pistachio nuts.

Most of the find-groups were concentrated in specific areas of the excavated site, proving **different spatial activities** at the site. Storage facilities are represented by storage rooms and *pithoi*, which were discovered in different shapes and sizes. In Building B an amphora with a slender long base and a row of finger-imprints around the mouth (B7 locus 52), a large basin-like vessel (B7 locus 57), a shouldered amphora (B7 locus 49) and other *pithoi in situ* were identified (C6 loci 7, 8, 10, 26, 27). Several large *pithoi* were discovered in Building complex C.

Most of the spindle whorls were found in Building B, attesting probable textile production in this area. Metallurgical activities can be localised in the western part of Building C, where moulds and crucibles and some copper artifacts including the small adze were found. A sample of unretouched fan-scraper blanks in one storage room in Building B and one of the retouched fan-scraper from a locus in Building C point to a spatial differentiation in storing goods of the same material in different stages of production.

### Conclusion

There are two outstanding results from the 2002 - 2003 seasons. Firstly, it became quite obvious that the metallurgical activities at Tall Hujayrat al-Ghuzlān were not connected to a cottage industry of a small village community, but had been undertaken by an hierarchically organised society, involved in intensive trade activities as documented by the partially excavated large Building B with its storage rooms. The second result is that there are strong connections to Predynastic Egypt. Several complete oval and rectangular open moulds recovered had been used to produce two kinds of ingots: cake-shaped oval ingots and tabular rectangular ones. Oval and tabular ingots of exactly the same dimensions have been found in the settlement of Maadi in Lower Egypt.

The base fragment of a basalt vessel with slightly incurving profile found in the filling debris of the western storage room of Building B is without doubt of the type of the so-called *Libyan vases*. It is clearly an Egyptian import and — following the study of Rizkana and Seeher 1988 and 1989 — an import from the Buto-Maadi Culture of Lower Egypt. As there are several other groups of artifacts that connect the Buto-Maadi-Culture with Tall al-Magaṣṣ and Tall Hujayrat al-Ghuzlān (e.g. copper axes, cortex tools, rings and ornaments made of Red Sea shells, and others), it seems quite clear that a well developed trading system existed between Lower Egypt and al-ʿAqaba region in the first half of the forth millennium.

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## APPENDIX: THE POTTERY OF ҲУJAIРАТ AL-GHУZLĀN 2000 TO 2003 - A FIRST SUMMARY

Susanne Kerner

### Introduction

During the survey in 1998 and in the excavation seasons of 2000, 2002 and 2003 a large body of



pottery was found, with around 33,000 pieces so far and an increasing amount of complete vessels and larger sherds allowing a more certain reconstruction of the vessel shapes. The overwhelming characteristic of the ceramics from Hujayrat al-Ghuzlān (and also of Tall al-Magaşş is its coarseness and low quality of manufacturing. Generally, the material seems to be locally made with clearly visible temper consisting of local rock. But a final statement will only be possible after some chemical analyses, which will be carried out during the coming months. All pottery is first sorted by fabric and then the diagnostic pieces such as rims, handles, bases, and any decorated material are sorted following a typology specifically developed for this material.

### *Fabric*

The fabric definition is based on temper quality and quantity, quality of the clay, coarseness of the mixture, treatment and finishing of the surface, existence of any decoration and colour (see also Kerner 2002). The definition of the fabrics in Hujayrat al-Ghuzlān is difficult, because colour, quantity of temper and surface finishing seem not to be closely defined, but vary strongly. The different fabrics are therefore arranged into groups and several sherds might belong to two fabrics of one particular group, because it is difficult to differentiate. For this short article mainly the fabric-groups will be presented here.

All the pottery is handmade and shows clear signs of the production techniques. The single coils are still very visible in the vessels, as the connections between the coils have not been smoothed out completely. Particularly the inside of the vessels has thus a surface with horizontal running waves. Handles and necks were made separately and were then fixed to the vessel's main body, which is again visible by bulbs, depressions and sharp edges mainly on the inside of the vessels. The bases were also manufactured independently; the connection between base and wall often still shows the finger imprints on the soft clay when both pieces were pressed together. The lower side of the base frequently displays either mat-impressions or still recognisable lines between the clay-lumps, which had been used for the production of the base.

The fabric-groups are: A/B reddish-blackish wares, which are mainly tempered with grits and even small pebbles. Fabric A-1 is a very coarse, thick ware, with large gaps visible in the break and a high amount of very coarse temper. The temper consists mainly of blackish and whitish granite gravel and can be up to 2cm diameter. The temper

is often visible on the surface, which has not been smoothed very well. The fabric is not very hard but crumbly, and easily breaks into pieces when touched. Fabric A-15 is blackish-red or grey-red. The sherds are generally thinner than those of A-1 (mostly under 1cm) and very hard. The temper is smaller but very frequent and consists of sharp-edged, light-coloured gravel and shell. The surfaces have been smoothed, but not very well and the temper often breaks through the surface. Numerous vessels show ashy outer surfaces and the ware seems to have been used mainly for cooking-pots. Fabric B is the finer variation of fabric A. B-1 is a thinner, coarse ware with small, whitish, mineral temper. B-1 is softer and crumbly and nearly always brownish-red or greyish-red. B-12 is very similar but nearly completely burned and very crumbly. Both wares A and B together build between 36% and 44% of the wares in the different years.

The second fabric group includes all variations in the wares, D and E. Ware D-1 is again very coarse, but not as coarse as Ware A, the mineral temper is a little smaller and the body holds together better. The surfaces show all hues of reddish-buff and brownish-buff, while the core is often grey to black, as the single sherds are relatively thick. Ware D-50 is finer, has a much denser fabric and better finish. It often includes straw as a temper, but always a large amount of smallish, light-coloured gravel. D-50 has always a proper surface finishing, which does not create any shine but closes the pores and covers most of the temper. The definitional border between D-50 and F-70 is not always clear. Ware D is still quite common and has a percentage between 12 - 16 % of all pottery. Ware E is much finer than ware D, but has a similar temper. The temper is overwhelmingly mineral with very little, often no straw material at all. Clay and temper show a very fine structure and the break of fabric E-1 is very dense. The outside colour is buff or reddish, but the core is very often black. Surface finishing is very good. Ware E makes only 2,5 - 4 % of the material.

The third large fabric group includes all variations of ware F, as well as wares G and J. All of those wares are mostly straw tempered and buff. Ware F is the second most common ware in Hujayrat al-Ghuzlān. The fabric is middle to coarse, but quite dense with a relatively even break. The pottery was not fired at very high temperatures, as the straw is partly still visible in the breaks. The temper is small and consists other than straw of very small granite and often a little mica. The surfaces are not very thoroughly wet-smoothed. Ware F-55 is much finer with a far better finishing, while



ware F-70 is coarser with a higher percentage of gravel temper. Ware F is all together around 25 % of the pottery material. Ware G is only tempered with straw and very porous and lightweight. The colour varies between whitish-green and a purplish-white. The fabric is middle fine and the surfaces are hardly smoothed at all. Ware G must have had an even lower firing temperature than ware F. Ware J is the finest of those straw-tempered buff wares. Most sherds are relatively thin, but they can be over 1cm in which case they have often a grey core. The small straw temper is always evenly distributed, the breaks are even and the surfaces are very well finished, without any lustre.

The last fabric group consists of wares I and N. Ware I was reddish, hard and well fired. The surface is irregular, but wet-smoothed. The temper consists of very fine straw and very small sandy material. The fabric comes close to the well-known "hard red ware" from Chalcolithic sites such as Tulaylat al-Ghassul (Lovell 2001), and the transition to fabric N-13 is gradual. Ware N-1 is reddish-blue or blackish-grey and very hard. The clay is very dense and temper consists of a small amount of straw and different mineral materials including limestone. The mineral temper seems to have changed during the firing process further analysis will clarify this. The outer surface is always smoothed; the finishing strokes are often still recognisable. The fabric can have a white slip (N-16). Fabric N-13 is finer and often harder. The temper is hardly visible, only small limestone particles (under 0.2mm diameter) can be recognised. The surface is mostly red and always very well finished without any traces of the process visible. The fabric can have a white slip (N-14). Most incised sherds are made from one of the N fabrics. Wares I and N are together 9-10 % of the material.

The wares show a greater similarity with Chalcolithic material than with Early Bronze Age material, there is not a single piece of the so-called typical *Proto-Urban* material. But some of the pottery can be compared with the particular kind of buff as well as red Chalcolithic pottery (e.g. from Tulaylat al-Ghassul), although the percentage of the buff wares is much higher in Hujayrat al-Ghuzlān, than in most of the Chalcolithic sites.

### Forms

All pottery is handmade and very little attention went into the production of the vessels. Most vessels are not well made and have rather irregular rims and bases (Fig. 16:14). It is therefore very difficult to measure the diameter of small sherds, different parts of the same vessel's rim gave diameters

differing up to 4cm. The profiles are quite simple, with the exception of those made from ware N. There are more open than closed vessels in Hujayrat al-Ghuzlān, a characteristic connecting the material again closer to the Chalcolithic than the Early Bronze Age, although the shapes themselves are not necessarily "typical" Late Chalcolithic and can only be compared with those in very general terms.

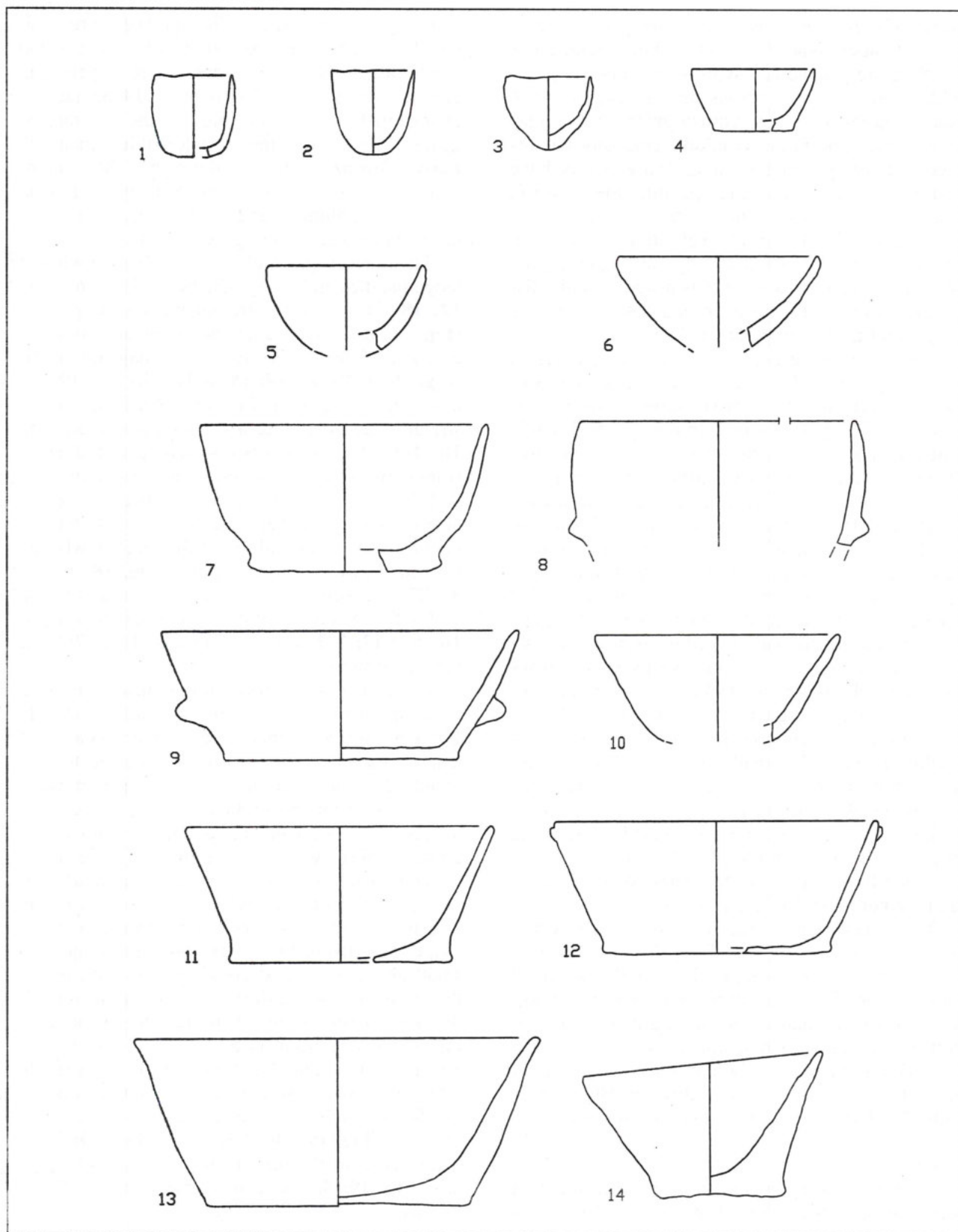
The open shapes include wide, open bowls with ledge handles and a large diameter (Fig. 16: 9, 11-12; 18: 2), and very straight walled, deep bowls (Fig. 16: 13), while shallow dishes are rather uncommon. The bowls are in the majority middle (Fig. 16: 7, 10, 11, 14; 18: 6-8) to large, with only a few small examples (Fig. 16: 4-6). Small, mostly straight-sided cups are also not uncommon (Fig. 16: 1-3). The open vessels have a rim diameter from 6cm to over 50cm, but mostly between 16cm and 30cm, which corresponds with the bases' diameter mainly between 12cm to 16cm, but frequently up to 25cm. Many of the large bowls have rope-applications below the rim (Fig. 18: 1, 2, 6-8). The majority of the bowls has straight walls with a few examples of more globular shapes (Fig. 16: 7-8; 17: 7, 10). S-shaped walls (Fig. 17: 9) are very uncommon.

Interesting is one form, a completely flat, very large dish with only sometimes a small rim (Fig. 17: 1-5), which seems to have had contact with heat on the lower side, so one is inclined to think about bread-preparation or something compatible as a function for this particular form. These dishes are always over 30cm large and made from a rather crumbly fabric, which is a variation of ware A.

The closed shapes consist of hole-mouth vessels, jars and pots with wide necks and small rims. The hole-mouth-jars vary widely in diameter and shape (Fig. 18: 9, 11, 12; 19: 1-4). The majority is small and was used as cooking-pots, indicated by the large amount of ash still sticking to the outside; the larger ones (up to 40cm diameter at the opening) must have been used as storage vessels (Fig. 19: 11). The same function can be assumed for large pithoi with a short wide neck, a wide opening (35-50cm), and nearly always a rope-decoration at the neck (Fig. 19: 10). Small jars (Fig. 19: 7) are nearly exclusively made from ware N, while larger jars (Fig. 19: 5, 8-9) can be made from different fabrics.

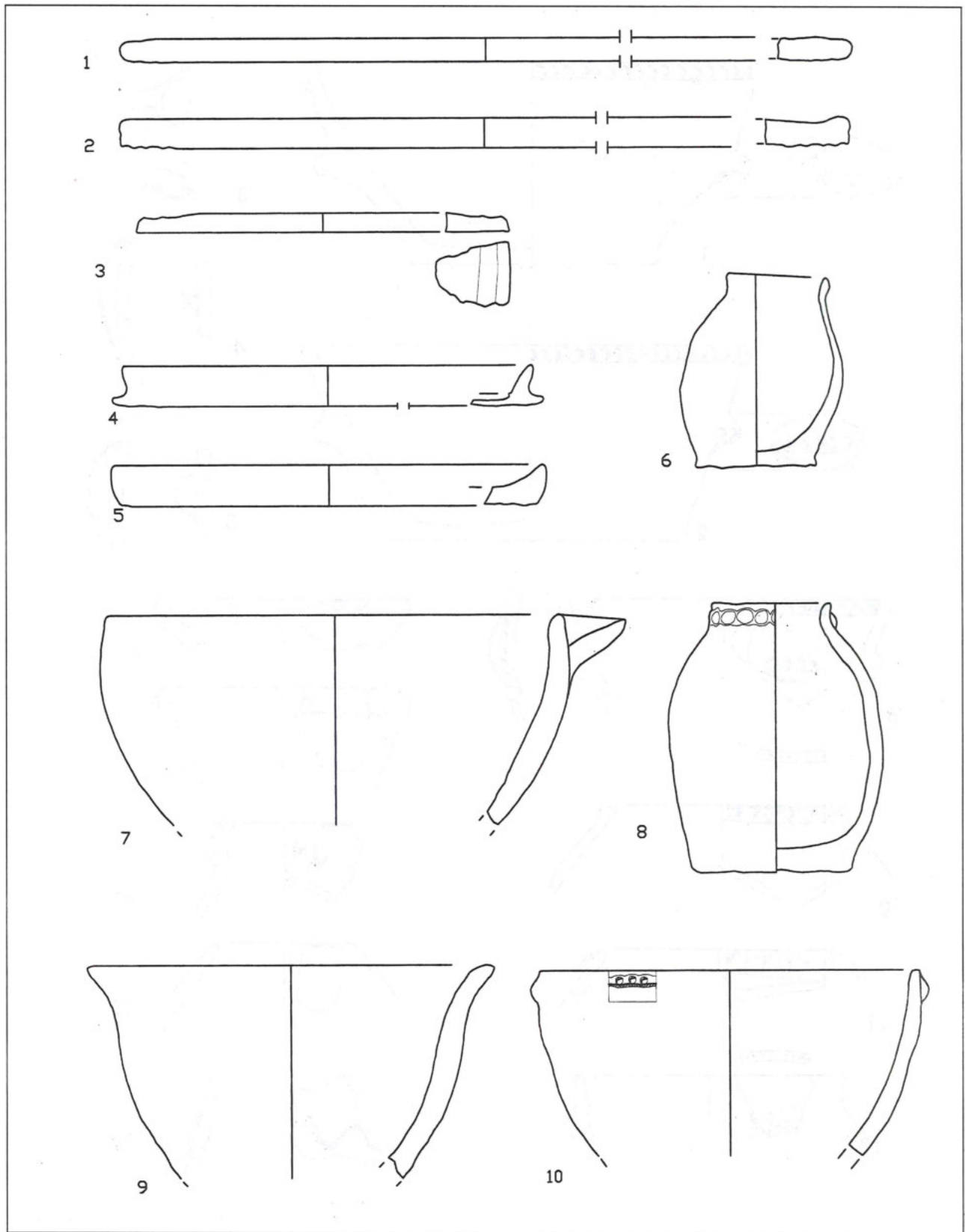
Some of the jars and cooking-pots have loop handles, while bowls have mainly ledge handles (Fig. 18: 4, 5), which are often decorated with impressions (see Amiran 1969: Plate 8.12).





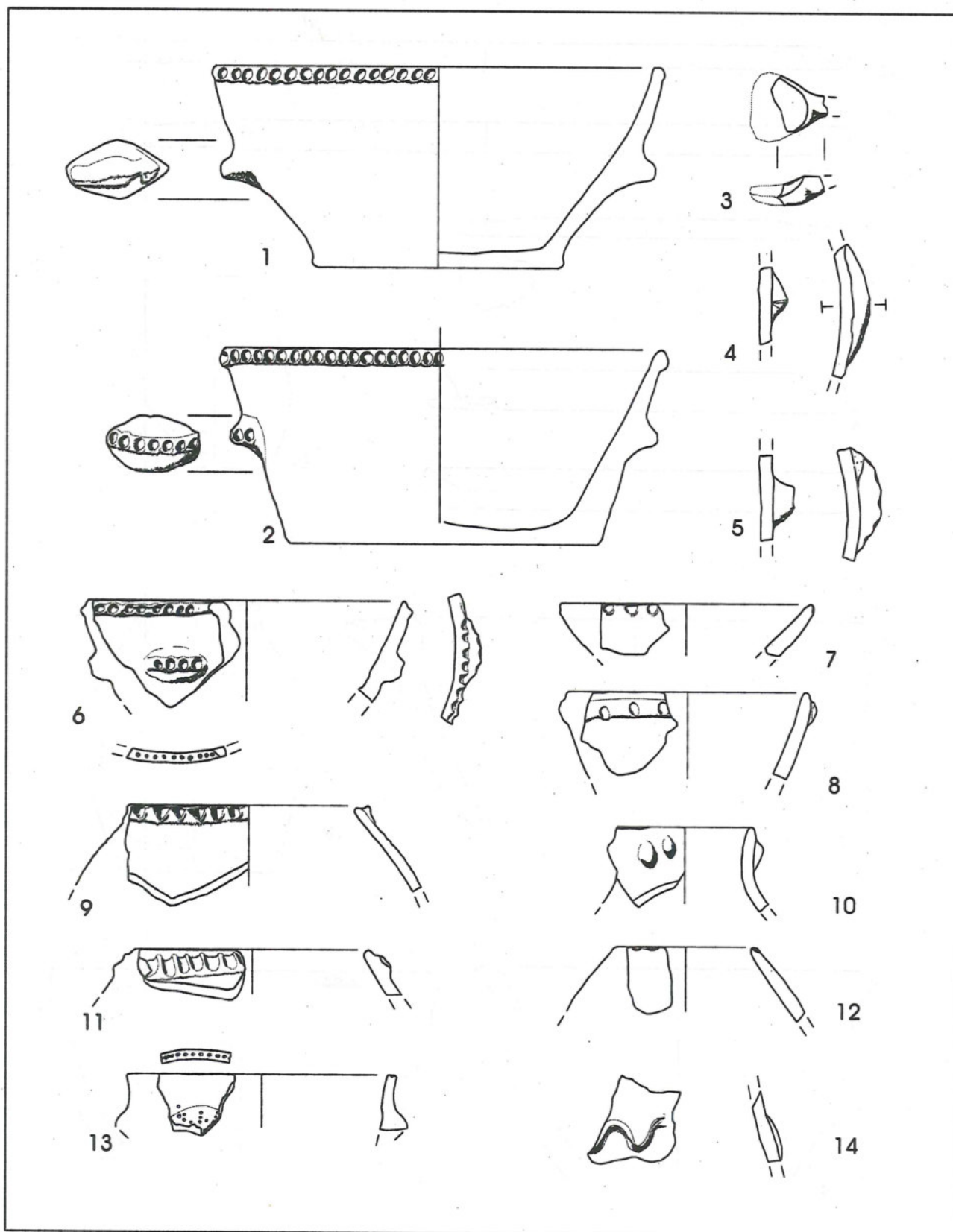
16. Bowls 1: B7, 7.5cm, ware F; 2: surface, 7.5cm, ware F-55; 3: B7, 7.5cm, ware F; 4: D8, 11cm, ware A-15; 5: E6, 14cm, ware D; 6: C7, 18cm, ware E-53; 7: D7, 26cm, ware F; 8: E6, large, ware F; 9: B7, 33cm, ware F; 10: F7, 22cm, ware F; 11: E12, 27cm, ware F; 12: E12, 30cm, ware F; 13: E12, 38cm, ware D-50; 14: F4, 22cm, ware D.





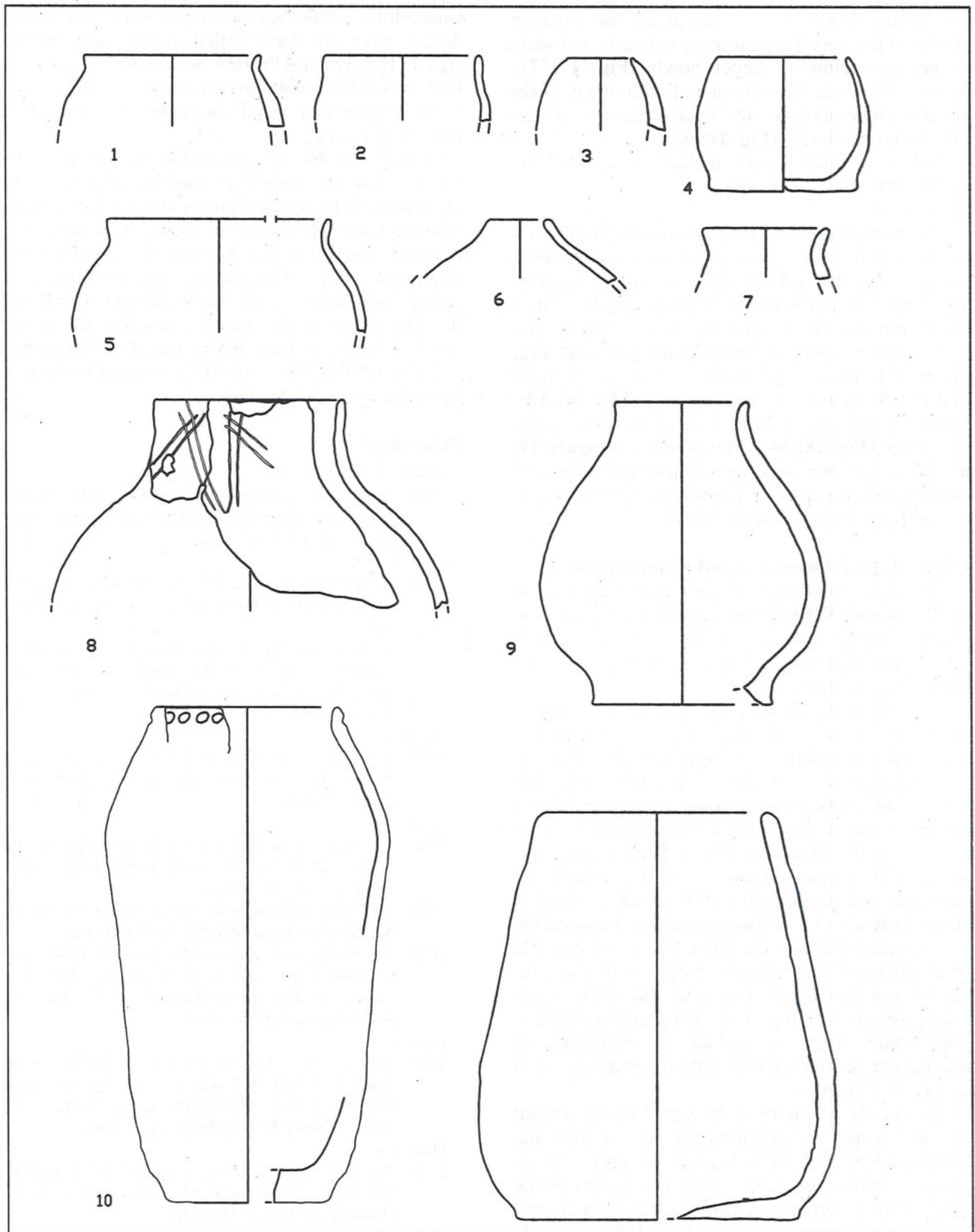
17. Bowls, jars, plates 1: C8, very large, ware A-64; 2: C8, very large, ware A-64 ; 3: G4-5, very large, A ; 4: E6, very large, A-64; 5: E6, 36cm, ware A; 6: F4, 8.5cm, 16.5cm high, ware D; 7: B7, 40cm, ware F; 8: G7, 10.5cm, 23.5cm high, ware D-50, 9: F7, 34cm, ware F; 10: E12, 33cm, ware D.





18. Bowls, hole-mouth-jars, handles, decoration 1: E6, 44cm, ware D-50; 2: E12, 42cm, ware D-50; 3: E6, spoon, ware F-55; 4: E6, ledge, ware A; 5: E6, ledge, ware A; 6: D8, 28cm, ware F; 7: E6, 22cm, ware D; 8: E6, 21cm, ware F; 9: D8, 19cm, ware A-15; 10: D8, 12cm, ware N; 11: E6, 21cm, ware A-15; 12: E6, 12cm, ware A-15; 13: E12, 2 cm, ware J; 14: G4-5, application, ware J.





19. Hole-mouth-jars, jars, pithoi 1: E6, 16cm, ware E; 2: E6, 14cm, ware F-70; 3: D7, 6cm, ware F; 4: E12, 12cm, ware A-15; 5: E6, cm, ware A-15; 6: G4-5, 5cm, ware F; 7: E6, 11cm, ware G; 8: B7, 18cm, ware N; 9: F7, 10cm, ware D; 10: B8, 17cm, 45cm high, ware D; 11: B8, 20cm, ware D.



Tubular spouts do not exist at all, but spouts at the lip of the vessel appear quite regularly and seem to belong mainly to larger bowls (Fig. 17: 7). Spoons, a regular but infrequent find in many of the roughly contemporary sites, have come up in different shapes and forms (Fig. 18: 3).

Other ceramic finds include crucibles and moulds for metal processing.

#### Decoration

Decoration appears most commonly in the form of impressed applications, which can be very regular (e.g. Fig. 18: 1-2) or more irregular (e.g. Fig. 18: 7-8). Small round impressions, made with a small thin instrument, directly on the rim are also common for bowls and hole-mouth-jars (e.g. Fig. 18: 6, 13). Small, oval knobs exist mostly in pairs and are positioned close to the rim (Fig. 18: 10). Other applications seem to come in a wavy, snake-like shape (Fig. 18: 14). The incision on Figure 19: 8 is not a very precisely incised herringbone pattern and reminds therefore of Yarmukian-pottery, a similarity that is repeated in the fabric.

#### Chronological Questions and Comparisons

The best comparisons of the pottery material can be drawn with Wādī Fidān 4 and Wādī Faynān 100 (Adams and Genz 1994; Wright *et al.* 1998), while the slightly later site of Nahal Tillah brought so far no close comparisons.

The end of the Chalcolithic and the beginning of the Early Bronze Age period in the Southern Levant, and particularly in its southernmost area, are not clear (Kerner 2000; 2001). The initial idea that foreign intruders brought about the entire change has been abandoned at least since Hennessy's influential study (Hennessy 1967). The transition between both periods leaves us with a number of questions (see also Gophna 1995), such as the possible existence of a chronological gap between the Late Chalcolithic and the EBA IA, or the possible overlapping of both periods, partly or in some regions? And the change in material and social organisation between both periods still requires explanation, which ought to include an evaluation of internal change against external influence (e.g. such as trade with Egypt)?

One of the problems is the very limited amount of sites, which are continuously settled from the Chalcolithic to the EBA I; even the preferred regions of settlement change from one period to the other. This is particularly true for the southern part of the region, where very few sites of these periods have been excavated at all. Most Early Bronze Age settlements are newly founded or appear after a hiatus (like Arad), while the areas with the fullest

Chalcolithic settlement activities (like the Judean desert) have not been settled in the Early Bronze Age I. Hujayrat al-Ghuzlān is therefore one of the first sites, which might give us an insight into the internal development and at the same time the regional trade with Egypt.

It will also be very interesting to see, how this site fits into the model of more prestigious metal production in the Chalcolithic and more functionally oriented metal production of the Early Bronze Age. It could also fill a gap between the complex, but small sites of the Chalcolithic and the larger, so-called "city states" of the Early Bronze Age II and III. Philip has lately tried to describe the socio-political model of the EBA as based on "corporate villages" (Philip 2001: 166-167), a model worth testing in Hujayrat al-Ghuzlān.

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