

EXTERNAL INFLUENCES AT FAYNAN DURING THE EARLY BRONZE AGE: A RE-ANALYSIS OF BUILDING 1 AT BARQA EL-HETIYE, JORDAN

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Research in the Faynan region of southern Jordan during the last fifteen years has significantly expanded our knowledge of the developmental phase of copper metallurgy in the Levant during the Early Bronze Age. Investigations by the German Mining Museum (Deutsches Bergbau Museum, hereafter DBM) in the period 1985–93 have detailed the technological development of mining and extractive metallurgy in this region (Hauptmann 2000). The DBM research concentrated principally upon the mining and smelting sites of the region with only a limited investigation of occupation sites. Excavations by the author in the period 1989–93 supplemented this work by developing a cultural/chronological sequence for this region and putting these technological developments into a local and regional context (Adams 1999). The results of this research lead to a re-analysis of one of the sites excavated by the DBM at Barqa el-Hetiye, since this site reveals important data on a key period in the developmental sequence of copper production and upon the possible relations between Faynan and the western Levant during the later Early Bronze Age (2900–2000 B.C.). This paper will review the results of this study and the evidence from Barqa el-Hetiye to show its importance for understanding developments at Faynan during the early third millennium B.C.

THE SITE OF BARQA EL-HETIYE

The site of Barqa el-Hetiye (hereafter Barqa) is located approximately seven kilometres to the southeast of 'Ain el-Fidan just to the east of the southernmost extension of the Jabal Hamrat Fidan (Figure 1).¹ The site is located on the southeastern end of a group of hills composed of Umm Rijan Limestone-Chert of Eocene date, which rise above the surrounding alluvial deposits and modern scattered seif dunes (Rabb'a 1994).² The surrounding landscape of the site is characterized by a mixture of alluvial and fluvial deposits of Quaternary date and dune movement of the late Holocene, which has only partly covered the sedimentary deposits of Cretaceous and Tertiary date, of which the chert hills are one of the latest deposits.

The ridge of chert on which the site is located actually contains two distinct archaeological sites of different periods, which were discovered during the DBM survey project in the late 1980s (Figure 2). Both of these sites were investigated by the DBM in early 1990, under the direction of Volkmar Fritz. These sites, however, should not be divorced from the complex landscape in which they are situated, and of which they are only a small, yet highly visible part. The surrounding landscape is quite rich in archaeological deposits, and the investigation of these two sites, Barqa 1 and Barqa 2, was primarily due to their high visibility.

The site of Barqa 2 — an Iron Age structure dating to the early Iron Age II — will not be discussed in this paper.³ This structure, at the western end of the ridge on which both structures sit, is primarily of interest in that it shows evidence of a continuity of use of this landscape through an extended period, well into the first millennium B.C. This evidence of

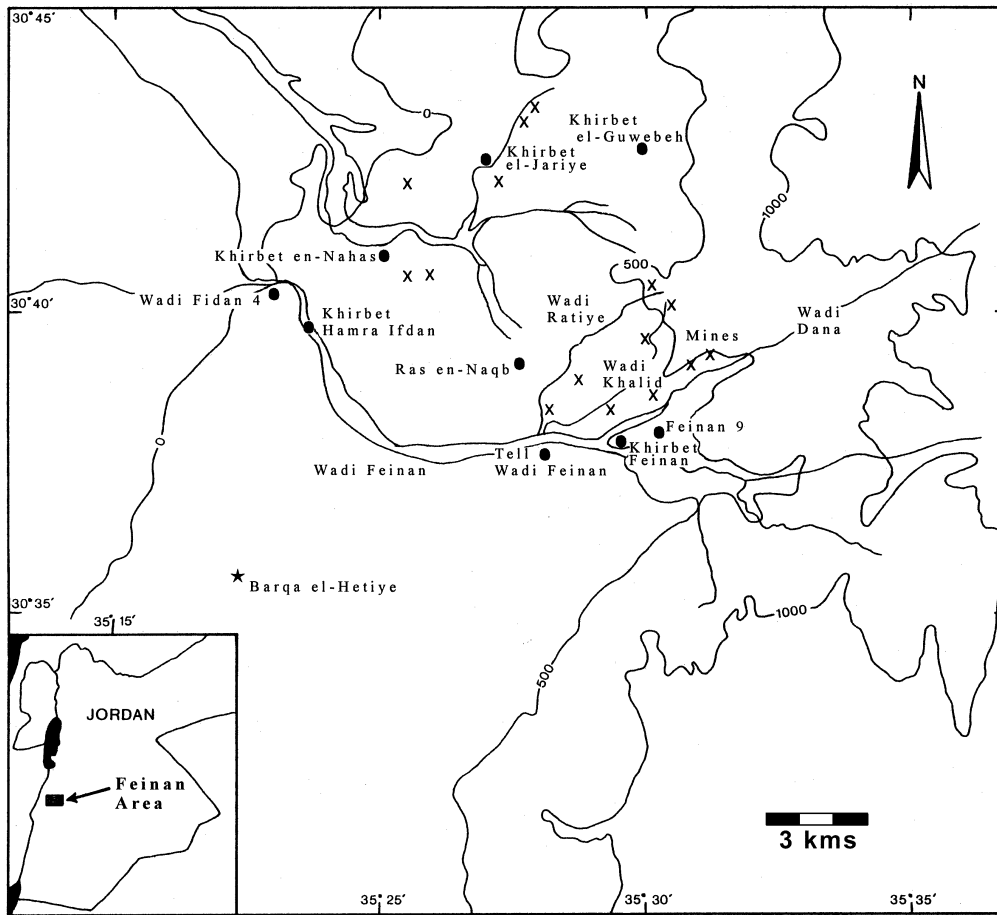


Fig. 1. General site map showing the location of Barqa, after Fritz 1994b: fig. 1.

Iron Age occupation in the Faynan region has recently been strengthened by evidence from the Wadi Fidan 40 cemetery, dated to the tenth century B.C., and from the ceramic evidence from the Wadi Faynan Landscape Survey (Levy *et al.* 1999; Adams in Barker *et al.* 1998, 1999).⁴

The primary focus of this paper is the structure located at the extreme eastern end of the ridge, and dated to the later Early Bronze Age. This site (hereafter referred to as Barqa 1, to distinguish it from the general vicinity of the same name) and its deposits are, owing to the nature and significance of the archaeological data, crucial to understanding cultural and technological developments in the Faynan region during this formative period of the later Early Bronze Age (Early Bronze II–III). The transition from the Early Bronze I to the Early Bronze II, which takes place about the turn of the millennium (*c.* 3000–2900 B.C.), is a period during which major societal developments occur, including the development of urban centres. This incipient urbanization process in the southern Levant, and the associated centralization of control and organization, appear to coincide with an increased contact with external cultures, such as the newly unified kingdom in Egypt, which began in the late Chalcolithic and expanded significantly during the Early Bronze Age I (Gophna 1987;

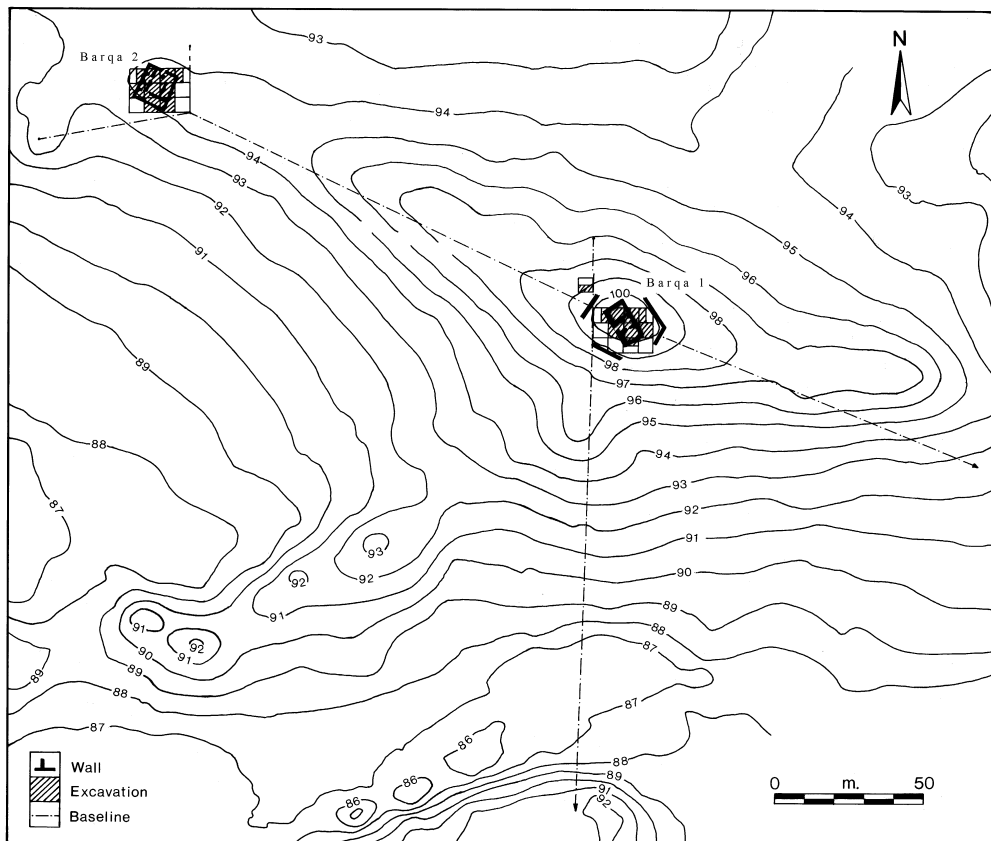


Fig. 2. Barqa el-Hatiye contour map (Adams 1999, fig. 6.2, after an unpublished plan by permission of the DBM excavations).

Brandl 1992; Braun in press). In Faynan these developments, although not directly visible in terms of direct cultural contact as elsewhere in the western Levant, can be seen in abrupt changes in the material culture of the region at this time, and in particular in the rapid changes which occur in the exploitation of copper resources in the area.

These changes to the copper industry during this transition to the later Early Bronze Age are observable through developments in virtually all areas of copper exploitation, from mining, to beneficiation and smelting, and ultimately in an increased level of production which reflected the growing demand for copper, far beyond the region of Faynan, in order to fulfil an ever increasing demand for copper products by expanding elites within increasingly hierarchical societies in the Levant and elsewhere (Adams 1999).

THE 1990 EXCAVATIONS AT BARQA EL-HETIYE

As noted above, extreme visibility was a significant factor in the excavation at Barqa 1 by the DBM team. To this should be added the fact that the site is in close proximity to a high hill, which was found to have the remains of a series of EBA smelting installations, similar to those at Faynan 9, located on a hilltop adjacent to Khirbet Faynan which the DBM project

excavated during 1986 (Hauptmann 2000, 74–78). At Barqa, as at Faynan 9, the summit of the hill and its windward slope are covered with the remains of this smelting activity, with large amounts of visible slag and related furnace debris which cover the hill in places up to 50 cm in depth. Also associated with this site were deposits at the foot of the hill, beside the nearby wadi bed which runs between the smelting site and the site of Barqa 1, where evidence was found for slag crushing.⁵ Small amounts of slags, copper prills, and other smelting by-products were found overlying the entire hill on which the site is located, and it was thought that the excavation would provide evidence of copper production associated with both the nearby smelting operation and also evidence of the use of the finished smelted copper metal.

The dating of the site from the beginning seemed to indicate an Early Bronze Age date owing to the presence of surface pottery finds near the exposed walls of Barqa 1. Early comparison of the Barqa 1 pottery with the pottery found at sites such as Wadi Fidan 4 (Adams and Genz 1995; Adams 1999), which in 1990 was still unexcavated and thought to be of a Late Chalcolithic date, made it clear that the Barqa pottery represented a period well into the Early Bronze Age. Since the re-dating of Wadi Fidan 4 to the Early Bronze I period, following the excavations there in 1993 and subsequent radiocarbon dates, and the more extensive excavations by Levy and Adams in 1997 (Levy and Adams, in preparation), the pottery from Barqa 1 can now be seen in the context of a much broader body of data, which has also been supplemented by excavations and radiocarbon dating of the archaeological deposits at the site of Khirbet Hamra Ifdan dated to the Early Bronze Age III/IV (Adams 1999, 2000; Levy *et al.* 2002). The site at Barqa 1, then, is intermediary to both the Wadi Fidan 4 deposits and those from Khirbet Hamra Ifdan, with the three sites providing a full range of sites spanning the entire Early Bronze Age. These general impressions on the date of the pottery from Barqa 1 are also borne out by the radiocarbon dates from the site, which clearly indicate an early third millennium date for the site.⁶

The excavation grid was laid out over Barqa 1 in an east–west direction, with two trenches separated by a baulk of 0.5 metres (see Figure 3). The trenches laid out did not cover the entire building at Barqa 1, leaving the northern and southern corners of the structure outside the grid. The awkward alignment of the grid to the structure provided several problems for excavation, not the least being the poorly placed baulks, within and without the structure, which proved to be inadequate for a controlled excavation of the building. For instance, in Room 3 — the only room almost completely excavated — the baulk was in the northern corner, and this was of limited use owing to both its size and alignment to the principal walls of the building. This was similarly true for the other two rooms (5 and 6) although to a lesser extent. Without this control of the stratigraphy, it was difficult to ascertain with any certainty the relationship of the internal contexts to the structure, and both its external and internal walls. In order to provide further documentation, a subsequent excavation was undertaken at this site in 1993 under the direction of Matthias Flender, and the sections and plans were re-drawn (Figure 4). These plans, confirmed by the author during salvage work at the site in 1998, reflect the current understanding of the structure.

ARCHITECTURE

The structure at Barqa 1 is relatively enigmatic, in that it is what could be considered a ‘normative’ broadroom style building, with overall external dimensions of 14 x 7.5 m. with its entrance in the middle of one of the long sides (Fritz 1994a, 88). Unlike the majority of broadrooms, however, this structure is further divided into three rooms by dividing walls

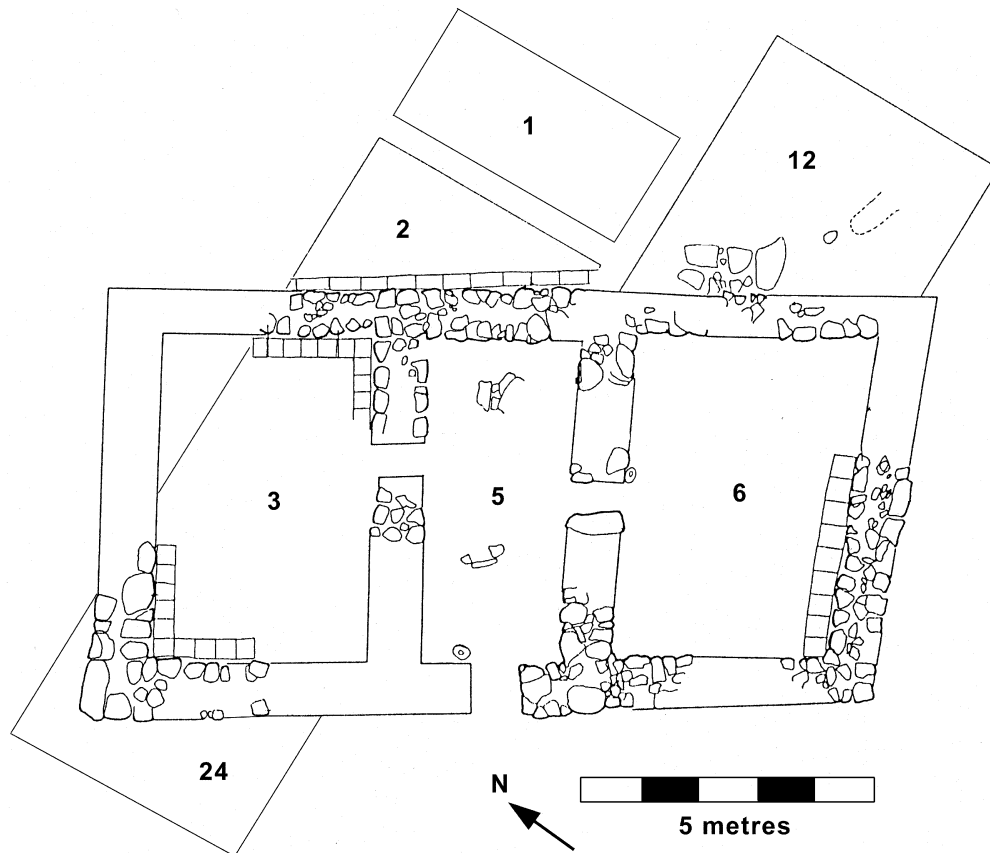


Fig. 3. Barqa House 1 Plan (Fritz 1994b, nd.).

placed just to the right and left of the main entrance (see Figure 3). Fritz describes the interior of the structures as being :

...divided by two walls of the same thickness of construction, thus forming three rooms. Room 5, which is situated between rooms 3 and 6 has a width of around 2.5 metres, and is significantly narrower than the two side rooms, which have a width of around 3.6 metres. A length of 5.6 metres is however common to all three rooms. (Fritz nd, 3; 1994b, 127)

The internal wall arrangement had the effect of isolating the two end rooms from the main entrance, or in effect making the central room into a corridor between or anteroom to the other rooms of the structure. The entrances to the other rooms off the central room are not aligned, but whether this is by design or by chance is not possible to determine from the excavation evidence. In fact the excavation interpretations of Fritz and Flender differ on the location of the entrance for room 3, with Fritz placing it near to the rear wall of the structure, and Flender adjacent to the main entrance (compare the plans of Fritz [Figure 3] and Flender [Figure 4]).

The entire structure has the appearance of being extremely well built for a domestic installation. The foundation course is largely made of undressed local stone, but in places uses some semi-dressed pieces, and overall the foundation courses are preserved in places to

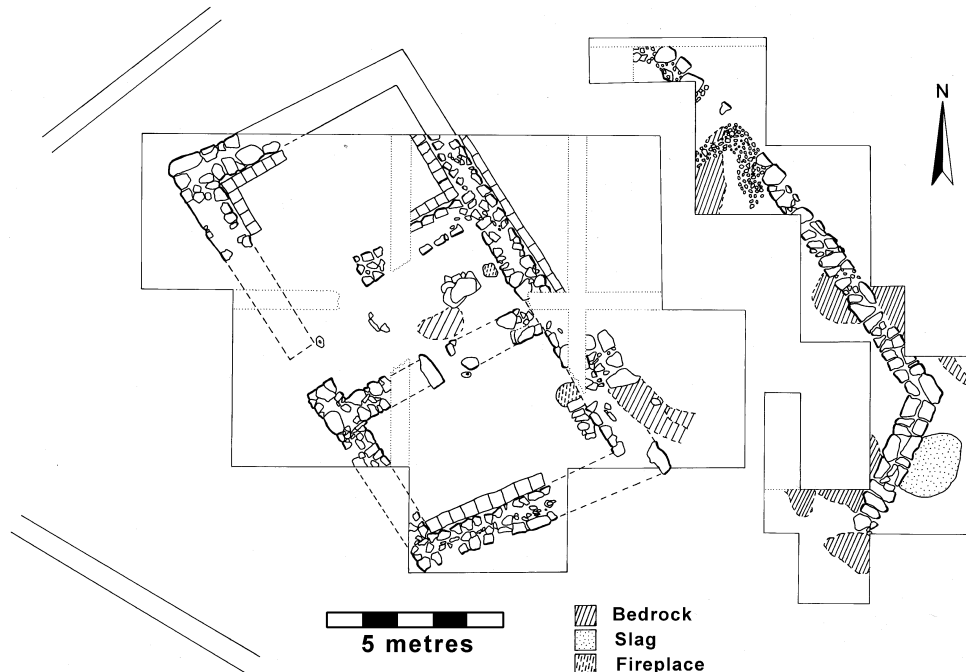


Fig. 4. Flender's extended excavation plan of Barqa House 1, 1993 (Adams 1999, fig. 6.4, after an unpublished plan by M. Flender and by permission of the DBM excavation).

about sixty centimetres. There was minor robbing of parts of these walls subsequent to the building going out of use, but the robbers' trench was clear and the plan of the building is not in doubt (Fritz 1994b). The overall plan shows a not quite squarely-built rectilinear structure, which except for its internal divisions would fit well into the general house plan of the period from many sites in the southern Levant. The structure at Barqa 1 is remarkably similar to the well documented 'Arad house', with its characteristic central entrance on one long side. The site of Arad in southeastern Palestine is the best known type-site of the Early Bronze II period in southern Palestine, and Phase III here is seen as marking the beginning of the Early Bronze II. The large number of houses from Arad makes it the best site for direct comparisons⁷.

In his article 'Eine neue Bauform der Frühbronzezeit in Palästina', Fritz (1994a) surveys the development of the broadroom house as it appears throughout Palestine, and examines the occurrence of various structures at key sites throughout the southern Levant. He surveys the full range of broad-room structures, domestic, temple or cultic, and funerary.

Fritz also stresses what he believes to be the uniqueness of the structure at Barqa 1, by suggesting that this is a new style of architecture, representing two broad-room structures built facing each other, which were later joined by walls, to form a new structure. There is no archaeological evidence to suggest that this is the case. In fact, the continuity of the external walls at Barqa 1 suggests just the opposite, that the entire outer wall sequence was built at the same time, and that the internal walls were added later.⁸ As Fritz observes (1994a, 86), the tendency, as shown by numerous examples of structures at Arad and elsewhere as at Tell el-Farah North, is for multi-roomed structures, where additional rooms were successively added to an existing structure, rather than for a single structure to be sub-divided into

several rooms. These rooms often led from one to the next, or more commonly at Arad, at least, shared a common courtyard.

Yet Barqa, unlike Arad and Tell el-Farah North, does not belong to an urban landscape, but rather is an isolated, single structure on a prominent hill. It could be questioned whether this structure should be viewed as a 'normative' domestic structure at all, given that virtually no other isolated structures of this period are known. How then should this rather enigmatic architecture at Barqa 1 be interpreted?

Interestingly, Fritz compares this structure at Barqa 1 not only with the usual domestic dwellings of the period, such as at Arad and Tell el-Farah North, but also with several structures which have been interpreted as temples (Fritz 1994a, 87–88). 'Temples' of this period — which should perhaps be more realistically termed 'cultic buildings' not to overstate the case — are not overtly different from other domestic structures of the period in both size and proportion. It is only minor differences in both architecture, finds, and relationships to other structures and installations which have set these 'temples' apart from other domestic structures. Fritz lists several 'temples' in his article (1994a, 87–88), which he cites as comparisons to Barqa 1, including Temples 4118 and 4040 in Megiddo Strata XIX and XV respectively,⁹ the 'double temple' (5192 and 5269) in Megiddo Stratum XV (Lamon and Shipton 1935; Loud 1948), and the Acropolis Temple at Ai (Callaway 1972).

If we examine each of these structures mentioned by Fritz, they all share the broadroom tradition, although in no single case are there any internal wall divisions, with the possible exception of the so called 'sanctuary' at Ai, whose identification as a cultic installation is in doubt.¹⁰ Nonetheless, for Fritz the point seems to be that, of all known Early Bronze Age structures both domestic and cultic, the Barqa structure stands out as both a unique example and a new innovation for the period, in an area remote from the mainstream of the developing urban society, on the fringes of Early Bronze Age culture. The underlying tone of his argument might suggest that he believed the structure to be functionally distinctive, and more than a domestic installation, but Fritz came to the overall conclusion that the structure was in fact a domestic house, albeit of a new and peculiar style, and that despite its location next to a copper smelting site, it played no direct role in this activity and had not apparently been used for copper processing (Fritz 1994b). Fritz's contention that the structure is unique seems at odds with his overall conclusion that it is simply a domestic structure.

Despite the interpretation of Fritz regarding the function of the Barqa 1 structure, the question remains: is this an accurate assessment of the function of the structure? Is it likely that the Barqa 1 building, with its distinctive style and isolated location, was simply a domestic building? The presence of a surrounding or 'temenos' wall around the structure, which appears to sit in the centre of a 'courtyard', is also an unusual feature for a domestic structure of the period. Additionally, one of the few examples (not mentioned by Fritz) of internally divided structures with which the structure at Barqa can be compared is the so-called large twin temple (1831, 1894) from Stratum III/II at Arad. The Stratum II temple 1831 is a rebuild of the earlier temple 1876 of Stratum III, which has been sub-divided into three rooms. Room 1884 is formed in the southern half of the original temple hall (1876), by the building of a wall (809). This room measures 2.40 x 4.25 m, and entrance to the room is through a centrally located passage. Benches were found along the walls of the western end of the room. The second room (1844), created in the original hall (1876), measured 2.0 x 3.2 m and (like Flender's reconstruction of the Barqa structure) had its entrance adjacent to the entrance to room 1884. This room also had a bench along the wall it shared with room 1884 (Amiran 1978, 38–40, pls. 190–91). This temple building, part of the larger twin temple complex which included temple 1894 and a courtyard with a raised stone platform (*Bamah* 1818), is similar in its general layout and features to the Early Bronze Age Megiddo temples,

sharing also the fact of being separated from the domestic areas of the city by a wall and having an eastern facing orientation.

The structure at Barqa, while not as elaborate as either the Arad twin temple or as monumental as the Megiddo temples, is still a complex structure, which could be argued to be outside the mainstream of normal domestic structures, and possibly even to have some cultic function. In support of this interpretation are its location on an isolated hill next to a prominent peak, rising above the immediate landscape, its unique architectural design, and the fact that the structure has a surrounding wall which encircles the hill top site,¹¹ all of which would be extremely unusual for a normal domestic dwelling.

STRATIGRAPHY

The overall stratigraphy of the site is not very complicated and should allow for a very precise analysis of the occupation and post-occupation history of the house. According to Fritz, the principal structure seems to have had a limited occupation span, and although there was evidence of residual pottery sherds in the excavations which could indicate continued occupation, he suggested that this would not in any likelihood have been more than a generation or two (Fritz 1994b, 127–132; nd, 7).¹²

The floors of the structure are recorded by Fritz to have been of compressed earth, and relatively uneven throughout the structure. He noted that the actual floor level in the central room rose from the entrance to the back wall by approximately 0.5 m, gradually sloping upwards towards the back of the room (Fritz 1994b; nd). In all three rooms, there was evidence of a violent destruction by fire, and the central roof support of the house lay across the structure. The wooden roof supports, made from unworked tamarisk trunks, were burnt *in situ* and a large volume of ash attests to the remainder of the burnt superstructure of the building.

Fritz also recorded the presence of benches along the walls in rooms 3 and 6, made from square mudbricks measuring 30 x 30 cms. He suggests that these benches were at floor level, but it could be argued that this is unlikely, since all other benches known from broadroom structures are known to serve as low benches along the interior of walls. They must therefore have risen above the original floor level, and may suggest that the original floor level was not reached in parts of the structure.¹³

In the central room (3), the northeast corner was not excavated in 1990 owing to the fact that the baulk in this section was not removed. The soundings in 1993 revealed that this baulk had covered a low platform in the centre of the room near the back wall of the structure, which along with the encircling wall and the uniqueness of the building design, may warrant consideration of the structure as a cultic installation.

Overall, it is difficult, on the basis of the available evidence, to arrive at a firm conclusion as to the function of this structure. That it is not domestic in nature but serves some cultic function must be left as a distinct possibility.

FINDS

A large number of pottery vessels were found in the structure, including several reconstructable vessels. These vessels, predominantly storage jars (Fritz 1994b, figs. 5, 6) but also including one spouted vat (Fritz 1994b, fig. 4: 7), a jug (Fritz 1994b, fig. 8: 14) and four lamps (Fritz 1994b, fig. 8: 15–18), were found in the collapse of the structure and were presumably largely intact before the destruction of the building. The remainder of the pottery from the structure was considered to be residual, and Fritz has suggested that the structure had been abandoned prior to its destruction, and that most of the moveable finds (excluding the larger

storage vessels and a few small pots) had been removed prior to the destruction of the uninhabited building (Fritz 1994b; nd). This hypothesis is difficult to substantiate in that the structure was not completely excavated, and also because only the diagnostic portions (rims, bases, handles etc.) were kept for analysis. The conclusion that the vast majority of the remainder of the selected pottery was of a residual nature and reflected debris within the build-up of occupation levels may well be correct, but difficult to prove conclusively. The complete list of the catalogued pottery, both reconstructed and sherds, provides a very broad list of types, and is representative of a MNI of 128 vessels, 55 of which are illustrated (Fritz 1994b, nd). The following limited discussion is based on examination of this pottery, now housed in the DBM in Bochum.¹⁴

CERAMICS

As Fritz points out, the pottery from Barqa 1 fits well into the later Early Bronze Age, that is the Early Bronze II and III, or *c.* 2950–2350 B.C. (Fritz 1994b; nd). The length of these periods and the continuity of the ceramic tradition throughout have long provided scope for scholars to discuss the ceramic markers of the later Early Bronze Age, and the possibilities of sub-phases of each period. The problem of how (or whether) to differentiate between these two periods (Early Bronze II and III) in the southernmost portion of the Levant is now more than ever relevant to discussions of the pottery of this region. Esse (1991, 63–67) rightly pointed out that the ‘chronological indicator par excellence’, Khirbet Kerak ware, long thought to mark the transition from Early Bronze II to III, has never been very useful in the southern half of the Levant, owing to its limited geographical distribution, centred around Northern Palestine. The usefulness of any single ceramic ‘chronological indicator’ should therefore be abandoned in favour of a more balanced correlation of the stratified ceramics from key sites, preferably in conjunction with radiocarbon dates, in order to provide useful comparative ceramic collections.

While it is not immediately possible to distinguish whether the Barqa pottery should be considered Early Bronze II or Early Bronze III in date without a more detailed analysis of the whole assemblage, it is possible to differentiate between the Barqa assemblage and earlier Early Bronze I ceramic types of the southern Levant, and the indigenous Early Bronze Age tradition known from Wadi Fidan 4 (Adams and Genz 1995; Levy and Adams, in preparation). Most scholars are now agreed on the major distinguishing types which serve to illustrate the change at the end of the Early Bronze I and the beginning of the Early Bronze II, which include the appearance of platters, the abundance of red polished ware and Light Faced Painted Ware, as well as presence of the so-called ‘Abydos’ style of juglet. The following section details the Barqa assemblage and places it in the context of the wider southern Levant.

TYOLOGY

The most common pottery form in the assemblage at Barqa, as in most sites of the Early Bronze Age, is the holemouth jar. In total, of the 128 MNI pots of the Barqa assemblage, 41 were holemouth jars, making up 32% of the total assemblage. The holemouth jars are most likely cooking pots, as evidenced by burning and charring of many of these sherds.

The next most common form in the assemblage are jars (35 examples, 27%), both medium to large storage jars (Fritz 1994b, figs. 5, 6, 7) and smaller varieties (Fritz 1994b, fig. 8: 9–12), some of the latter of which have a characteristic burnished red slip on the exterior surface. There is a variety of storage jar shapes (see Fritz 1994b, figs 5 and 6), but in general the globular, flat bottomed variety is most common. All of these storage jars have two ledge

handles, and for the most part have slightly outward flaring rims (Fritz 1994b, fig. 6:1). One complete example (Fritz 1994b, 6:2) is rather elongated, with a sharply everted neck/rim, which is similar to several examples from phase II and III from Arad (Amiran 1978 pls. 39:2, 41:1). The ledge handles of the Barqa storage jars are all finger indented along the edge, but lack the distinctive scalloping of later Early Bronze III examples.

There are eleven examples of bowls, including shallow bowls (Fritz 1994b, figs. 3: 11–12, 4: 1–4) as well as deeper bowls, with upright sides (Fritz 1994b, figs. 3: 9, 4: 6), and sloping sides with ledge handles (Fritz 1994b, 4: 5). There are five examples of lamp bowls (Fritz 1994b, fig. 8: 15–18), one of which (8: 16) is red slipped on the interior, and one which is shell-shaped (not drawn). The shell-shaped example is unusual for the Early Bronze II, although Early Bronze III examples are known (there are examples of this form from Khirbet Hamra Ifdan), and could be used to argue for a date late in the Early Bronze II or early Early Bronze Age III for at least part of the Barqa 1 assemblage.

Other pieces from the assemblage include a spouted vat (drawn in Fritz 1994b, fig. 4: 7 without its spout), and two platters with burnished red slip (Fritz 1994b, fig. 3: 13–14), which as indicated above are a key indication of the later Early Bronze Age. Amongst the unpublished pottery there are other interesting pieces, including two piriform juglets, one of which has a burnished red slip and the other which is black. There is also a body sherd probably from an 'Abydos' style juglet, with a distinctive vestigial handle, or vertical applied decoration, which is quite common at Arad from the EBA II levels.

The general impression of dating on the basis of the pottery is that it represents an assemblage from the later Early Bronze Age, probably from the late phase of the Early Bronze II or very early in Early Bronze III (2800–2700 B.C.). The vast majority of the assemblage fits well into the Early Bronze II but several later pieces, like the shell-shaped lamp, and the piriform juglets, could argue for the later Early Bronze III date. The two available radiocarbon samples for Barqa 1 both indicate a date around the beginning of the Early Bronze II period (HD13975, 3080–2910 B.C.; HD13976, 2910–2875 B.C.), but these are based upon the burnt roof beams of mature tamarisk tree trunks. It could be argued, therefore, that the early Early Bronze II date represented by the radiocarbon sample should be considered an earliest possible date, and that on the basis of the pottery, a slightly later Early Bronze II date is more likely, probably 2800–2700 B.C. as a realistic date range.

Having established an approximate date for the structure at Barqa 1, it is important to note that this is the earliest known site from the later Early Bronze Age from the Faynan region, with the earlier Early Bronze Age sites such as Wadi Fidan 4 and Faynan 100 (Wright *et al.* 1998), both being from the Early Bronze I period, probably Early Bronze Age Ia.

The pottery from Wadi Fidan 4 (and also from Faynan 100) represents a fairly limited range of forms and fabrics, which can be seen as primarily local in manufacture. The corpus is composed of both large storage vessels which include necked jars, flaring rimmed jars, and holemouth jars, as well as a limited range of smaller vessels, including small jars, cups, beakers, and bowls. The vast majority of all but the smaller vessels are grit-tempered with local wadi sand, and are in general low to medium fired. In general terms the larger the vessel at Wadi Fidan 4, the poorer the firing, with the result that few large portions of storage jar are represented in the assemblage, and this is indicated by the ratio of total sherds to useful diagnostic pieces in the assemblage.

In general the corpus from Wadi Fidan 4, owing largely to the lack of evidence of this period in the south of Jordan, stands as a unique assemblage in the region, with both forms and decoration of the pottery being quite distinctive. In time, further excavation at Faynan 100 may well add to this group of ceramics, but at present the limited exposures and surface collections have simply duplicated types already known from Wadi Fidan 4. Distinctive aspects of decoration at Wadi Fidan 4 include finger impressions below the rim on the

exterior of holemouth jars (for a detailed analysis see Adams 1999). This distinctive form of decoration does not occur on any later holemouth jars in the region. Also quite distinctive are the ledge handle forms from Wadi Fidan 4, which are composed of 'knobbed' ledge handles and finger impressed ledge handles. Some forms of ceramics seen at Wadi Fidan 4, such as the necked jars, with their distinctive upright necks, as well as the numerous cups and beakers, are absent from the later Early Bronze Age assemblages in the region.

This comparison between the Wadi Fidan 4 pottery and the pottery from Barqa 1 reveals more than simply chronological differences, however, with the earlier Early Bronze Age pottery being of a clearly local variant, and distinctly regional in manufacture and appearance. By contrast, the Barqa 1 pottery assemblage could be described as *typical* of the 'developed mainstream' of Early Bronze Age pottery, having numerous stylistic similarities with forms from the western Levant. This change from a locally derived or indigenous style of ceramics to the broader mainstream of pottery forms of the western Levant is an important development in the Faynan region, largely because it shows for the first time an external influence in the local culture.

CERAMIC PETROLOGY

The typological analysis of the ceramics, which indicated a shift from local indigenous to externally influenced forms, is also borne out by a petrographic study of the ceramics¹⁵ from both the local Faynan district Early Bronze I sites, and the Barqa 1 pottery. An analysis of the pottery from Wadi Fidan 4 has revealed a local origin for the pottery based primarily upon the non-plastic fraction of the ceramics.

The Barqa 1 pottery assemblage is both different typologically, and also petrographically from the Early Bronze I sites in the Faynan region. The petrographic analysis of 26 sherds of the assemblage has shown a wide origin of these ceramics, with part of the assemblage being locally-produced, based largely upon the presence of distinctive plutonic and volcanic rocks. The remaining portion of the assemblage has a diverse origin, with some ceramics certainly coming from the western Levant in general, and from both the Negev and western central Levant in particular. The non-plastic fraction of the perceived locally-made pottery is dominated by arkosic rock fragments, which are derived from the Faynan region. Additionally, some of this pottery also contains the local basalts and andesites. Of particular interest are examples in the assemblage from further afield in the western Levant. There are two in particular which are quite diagnostic, these being derived from the Ora shale formation of the Negev desert, and also from the Motza formation near Jerusalem (Goren 1997, 48).

The early work by Glass (Amiran 1978; Amiran *et al.* 1973; Amiran and Glass 1979) attempted to put the pottery from the excavations of the Early Bronze Age city of Arad into perspective of the pottery of the southern Levant. This early petrological study helped to prove the usefulness of petrology in studying the ceramics of the southern Levantine Bronze Age, and paved the way for further research and refinement of the study. Glass's analysis of the Arad pottery focused primarily upon the Phase I–III pottery, and found petrological features common to specific forms or styles of pottery. In particular, he found one major factor which sparked a debate about the importance and external influences of the city of Arad. Glass found that the holemouth jars (flat bottomed) and holemouth cooking pots (round bottomed) of Arad had separate distinguishing petrological features. The holemouth jars were made of a calcareous clay to which crushed calcite was added as a temper. This clay and temper, while not specifically 'local' to Arad, was to be found within the general region of the city. The holemouth cooking pots, however, had a petrological profile which

could not be reconciled with the local or regional geology, and which proved that these vessels were manufactured elsewhere and transported to the city from a great distance.

The distinguishing feature of these cooking pots was a non-plastic fraction of poorly sorted arkosic sand, which had as a dominant compositional feature alkali feldspars, many of which exhibited micropertitic intergrowths. Many of the feldspars were also filled with coarse quartz intergrowths, either as single crystals or as deformed aggregates. These arkosic sediments are known in particular from regions of the Levant such as Sinai and southern Jordan where the sedimentary deposits of arkosic sandstone originate from the local granitic rock formations. The fact that no granitic rocks are to be found in the region of Arad clearly meant that this whole class of pottery must be assumed to have an external origin. Glass (Amiran 1978) suggested that the origin of these cooking pots must be from either east of the Arabah valley or from southern Israel in the Eilat region. This hypothesis was later changed (Amiran and Glass 1979), to support an origin of the arkosic cooking pots in the Sinai peninsula, largely on the basis of the local geology and the finding of similar Early Bronze II cooking pots at sites in this region (see also Amiran *et al.* 1973). The hypothesis of the possible eastern origin of the cooking pots was abandoned, owing largely to lack of data from this region in southern Jordan. This early study of the Arad pottery was expanded by Porat, who refined the analysis of the pottery, and provided a comprehensive summary of the composition of the main pottery types, and detailed the full range of clay and temper types found in the assemblage (1989a, 1989b, in press). Nonetheless, the Sinaitic hypothesis for the cooking pots origin was still upheld on the basis of insufficient detail from southern Jordan. While there may have been little archaeological information available from sites in southern Jordan for both of these petrological studies, the geology of the region of southern Jordan was well known. The fact that the Jordanian geological setting provided a more logical source for this arkosic material, owing to its much closer proximity to Arad, seems to have been overlooked entirely.

The large corpus of metal objects from Arad led Amiran at an early date to propose that Arad had been an important centre for the early copper trade (Amiran *et al.* 1973). An analysis of the distances between Arad and the three known sources of copper of the period — Sinai, Timna, and Faynan — reveals that Faynan is by far the closest at 70 km, Timna second closest at 130 km, and Sinai by far the furthest source at well over 200 kms to the nearest possible ore source, and much further to the assumed sources of central southern Sinai (Glass 1992a, 1992b, 2–3). This factor, combined with the suitable geological conditions, should have suggested that Faynan be the preferred origin for the arkosic cooking pots of Arad.

Despite all of this, the possibility of a Faynan–Arad link has only recently been suggested again, primarily upon the basis of lead isotopic evidence for copper from Arad and Faynan (Hauptmann *et al.* 1992, 1999). Hauptmann *et al.* conclude that a sample of 21 objects from Arad and a small yet significant sample from Sinai prove that the dominant signature associated with copper from Arad falls within the range of the Faynan Early Bronze II/III sources, and that all of the Sinai sources could be excluded from consideration on the basis of the isotopic dissimilarity of the samples.

This finding of a close link between Faynan and Arad for copper trade, therefore, opens yet again the question of the origin of the arkosic cooking pots from Arad. It is suggested here, that the similarity of the dominant temper fractions in both the Barqa 1 ‘local’ pottery and the Arad arkosic cooking pots, combined with evidence of a range of ceramics from outside of the Faynan region in the Barqa 1 assemblage, makes the balance of probability favour the Faynan region for the origin of the Arad arkosic cooking pots.

In summary then, the pottery from Barqa 1 is key to understanding the changes taking place in Faynan at this period during the Early Bronze Age. The appearance of a distinct

typology of ceramics at Barqa 1 during this period influenced by the western Levant, and the direct connection between several ceramic petrological samples from Barqa 1 and both discrete regions of the western Levant in general and with the Early Bronze Age city of Arad in particular, make it clear that during Early Bronze II period at Faynan an external contact or influence began to take shape. This development can be seen in both the changes taking place within the ceramic assemblage, as well as in the adoption of architecture of a western Levantine style. This influence, however, can also be seen in terms of changes and development of the copper industry at Faynan, which undergoes a significant transformation during this period. Evidence of significant innovations of mining and smelting technologies as well as increased scale and intensity of production at this time suggests a high degree of social control and organisation (Adams 2002).

RELATIONSHIP OF BARQA EL-HETIYE TO SURROUNDING SITES IN FAYNAN

It is important to understand the site at Barqa 1 in the context of its surrounding landscape. Most of the area around Barqa, and indeed most of the western Faynan drainage, remains unsurveyed on a systematic basis. The immediate vicinity of the Wadi Fidan has been surveyed (Levy and Adams, in press), and some small portions of the area around Barqa have been surveyed in 1993 by Flender. The overall impression from these two surveys is that the site of Barqa 1 should be seen in the context of a very active landscape, where although no 'urban' centres are yet known, the population may be assumed on the basis of available evidence to have been significant in the later Early Bronze Age.

Flender's survey covered approximately one square kilometre in the Barqa area, and the number of finds, both ceramic and metallurgical, was quite large (Flender pers. com.). This should be seen in the context of the area having both active dune and other coverage problems, which makes the visibility of the retrieved materials even more significant. In the remainder of the Faynan area, systematic survey is now underway, with two major survey projects currently active in the eastern Faynan area since 1995 (Barker *et al.* 1997, 1998, 1999; Wright 1998), and a renewed project in the western Faynan drainage, in the Jabal Hamrat Fidan (Levy and Adams, in press). Wright's survey and trial excavations in a limited area in the eastern Faynan valley provided little information regarding the Bronze Age occupation. More successfully the work undertaken by the Wadi Faynan Landscape Survey has revealed the very extensive Bronze Age landscape of the region, with numerous types of sites (domestic, industrial, pastoral, and funerary) covering the full range of the Early Bronze Age. The material from this survey is now being studied and in conjunction with the archaeological and environmental survey data and supplemented by the work of the Jabal Hamrat Fidan Project in the western Faynan drainage is likely to produce one of the best documented and studied prehistoric landscapes in the Levant.

THE RELATIONSHIP OF FAYNAN TO THE WIDER LEVANT

In summary, on the evidence from Barqa 1 the relationship of the Faynan area in terms of the wider Levant can now be placed on a firm footing. It is clear from the unequivocal evidence from Barqa 1 that, during the Early Bronze II, largely indigenous cultural development in the Faynan region gave way to a broadly mainstream Early Bronze Age culture with ties to the western Levant. This change is reflected in the change from a distinctly local ceramic tradition and apsidal architectural, as seen at Wadi Fidan 4, to the broadroom style of architecture and mainstream more standardized ceramic forms of western Levantine style found at Barqa 1. That these ceramic forms are not simply imports can be seen from the use of local non-plastic fractions in the fabric of a portion of the pottery.

This non-plastic fraction reflects the typical granitic wadi sands of the region, proving that the local population was actively engaged in local production of pottery, and not simply a 'expeditionary force' in the region for mining purposes. Further evidence of the role of the Faynan area is also seen in provenance studies of copper from Levantine and Egyptian sites. These studies indicate that the copper from Faynan, mined largely from the Dolomite Limestone Shale formation at Faynan, was reaching sites much further afield. Evidence for the increased copper production at Faynan in this period indicates that there was increasing demand for copper and it was likely traded through major 'urban' centres of the region, including the site of Arad, which may have played a dominant role in the east-west copper trade from Faynan to Egypt via the north Sinai overland trade route (Oren 1973, 1989).

ABSTRACT

This paper reviews the evidence from the Deutsches Bergbau Museum excavations at Barqa el-Hetiye 'House 1', located in the Faynan district of southern Jordan. It presents a re-interpretation of the site and its data and links technological changes in the production of copper that take place at Faynan during the later Early Bronze Age (EBA II-III) to changes in the material culture at Barqa el-Hetiye which suggest influences from the western Levant as a key factor in these developments.

Keywords: Early Bronze Age, Faynan, copper metallurgy, ceramics.

NOTES

¹ The site is located at 30° 35' 53" N; 35° 22' 54" E., and the Palestine Grid co-ordinates for the site are 186500/001300.

² For a more detailed overview of the region, see the 1:50,000 geological map and accompanying report by Rabb'a (1994).

³ Although Fritz dated the site at Barqa el-Hetiye 2 to the Iron Age I, a radiocarbon date from the site (HD 13977) places it firmly in the ninth century (Hauptmann 2000, 66).

⁴ One radiocarbon date is so far available, which was taken from a desiccated pomegranate fruit as a short life sample, and provided a date of 1010–842 BC (cal. 1 sigma) (Levy, Adams and Shafiq 1999).

⁵ Investigation of this area by the DBM team has been superficial, but on available evidence there is no reason to suggest that the wadi or seasonal flow in it were utilised in the processing of copper.

⁶ The radiocarbon dates from Barqa 1 are (Hauptmann 2000: 65, table 8):

Sample	Context	¹⁴ C Age bp	¹⁴ C Age BC (cal. 1 sigma)
HD13975	27/91, Locus 13	4376 ± 57	3080–2910
HD13976	8/90, Locus 3	4267 ± 43	2910–2875

⁷ For a sample of these various layouts see Amiran 1978, 14–17, fig. 2.

⁸ The reader is directed to the plan of the 1993 salvage excavation of Barqa 1 (Figure 4), where Flender clearly draws the internal walls as secondary in nature, on the basis of both stone placement and stratigraphy.

⁹ Fritz incorrectly assigns temple 4040 to Strata XVI–XIV, when in fact recent scholarship places the temple in Stratum XV, that is an EB III context (*New Encyclopaedia of Archaeological Excavations in the Holy Land*, Vol. 3, 1006–07).

¹⁰ The sanctuary at Ai is a debatable matter, since, although the original excavator (Krause 1949) interpreted the structure as a sanctuary (i.e. temple) on the basis of a platform believed by her to be an 'altar', re-excavation by Callaway (1972) dispelled a cultic explanation for the structure on the basis of detailed reappraisal of the stratigraphy and phasing of the structure and its relationship to an adjacent tower. In any event, no conclusive proof of a cultic function has ever been offered, and although Wright (1970) stated that the burden of proof that the structure was not a sanctuary lay with those who would claim some other function, it is clear that a non-cultic explanation should be preferred here, in the absence of more direct and compelling evidence.

¹¹ Despite the fact that this wall was clearly visible on three sides, it was not investigated by Fritz in any detail. The wall was partially investigated by soundings on the eastern side by Flender in 1993, and the western walls were mapped on the surface, but left unexcavated. One of the soil tips from the excavation of Fritz covers the northern corner of this wall, while it is clear from the 1993 trench that the southern corner has been eroded.

¹² The site was further investigated in 1998 by the writer, and it is now clear that the site stratigraphy is more complex than originally envisaged by Fritz, and evidence uncovered in 1998 suggests the site has a lengthy history, with the possibility of multiple phases suggesting the uppermost structure may have been preceded on this site by an earlier phase of construction.

¹³ This was confirmed in at least part of this structure by further limited salvage work in 1998 by the author. Floor levels were reached some 5–8 cm below the lowest levels reached in 1993, and a considerable amount of burnt organic matter, probably matting or baskets, was recovered. Further work in this area, now

disturbed in places, may yet reveal further information on the phases of occupation.

¹⁴ The writer is very grateful to Professor Gerd Weisgerber and Dr Andreas Hauptmann for allowing access to the Barqa 1 ceramics, and for agreeing to the publication of Figures 2 and 4 based on the DBM excavations. I am also grateful to Mathias Flender for providing additional information on the 1993 work at Barqa el-Hetiye and the Barqa survey.

¹⁵ In this analysis, the pioneering work of Goren (1995, 1997) in pinpointing the major petrographic groups for assemblages in Israel during the Early Bronze Age was key. Similarly the work of Porat (1989a, 1989b, in press)

in identifying both foreign (mainly Egyptian) and locally distinguishing features in the third millennium B.C. assemblages of southern Israel, allowed the writer to put these Jordanian assemblages in context and to compare the Jordanian assemblages to key sites of southern Israel. The early work on petrographic analysis of pottery of this period, largely by Glass, on both the early pottery from Arad (Amiran 1978, Amiran *et al.* 1973, Amiran and Glass 1979) and Sinai but also from the surveys of Beno Rothenberg (Glass 1992a, 1992b), has provided a useful counter hypothesis for direct comparison to the one put forward in this paper.

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