

# THE THIRD PRELIMINARY REPORT OF THE WĀDĪ AR-RAYYĀN ARCHAEOLOGICAL PROJECT: THE SECOND SEASON OF EXCAVATIONS AT AL-KHAWĀRIJ

*J.L. Lovell, D.C. Thomas, H. Miller, K. Wesselingh, A. Kurzawska, I.K. McRae, C. Elias, E. Obeidat  
and A. Abu Shmais (with a contribution by L. Weeks)*

## Introduction

The University of Sydney's excavations at al-Khawārij continued in 2005 with a six-week excavation season in November-December<sup>1</sup>. The site of al-Khawārij (estimated size: 20ha)<sup>2</sup> was identified as a Chalcolithic site in the Wādī al-Yābis survey (Palumbo *et al.* 1990: 101; Mabry 1992: 327; Fig. 1). The Wādī ar-Rayyān Archaeological Project (WRAP) began its work at the site in 2003. As stated in our previous reports (Lovell 2007b; Lovell *et al.* 2005, 2006), the project is driven by an interest in olive domestication and its implications for Chalcolithic settlement (Lovell 2002, 2007a).

## Architecture and Stratigraphy (JLL and DCT)

Our excavations in 2004 (Lovell *et al.* 2006) concentrated upon six main areas (A-F); in 2005 we continued our focus on Areas D, where we had architecture in association with rock-cut features, and E, where the major architectural remains lay. We also opened three new areas Area G (adjacent to E), Area H (to sound a possible cairn tomb), and Area I (to sound the area of highest artefact density in the 2003 survey). The locations of these areas in relation to the

excavation areas from 2004 are presented in Figure 2.

## Area D

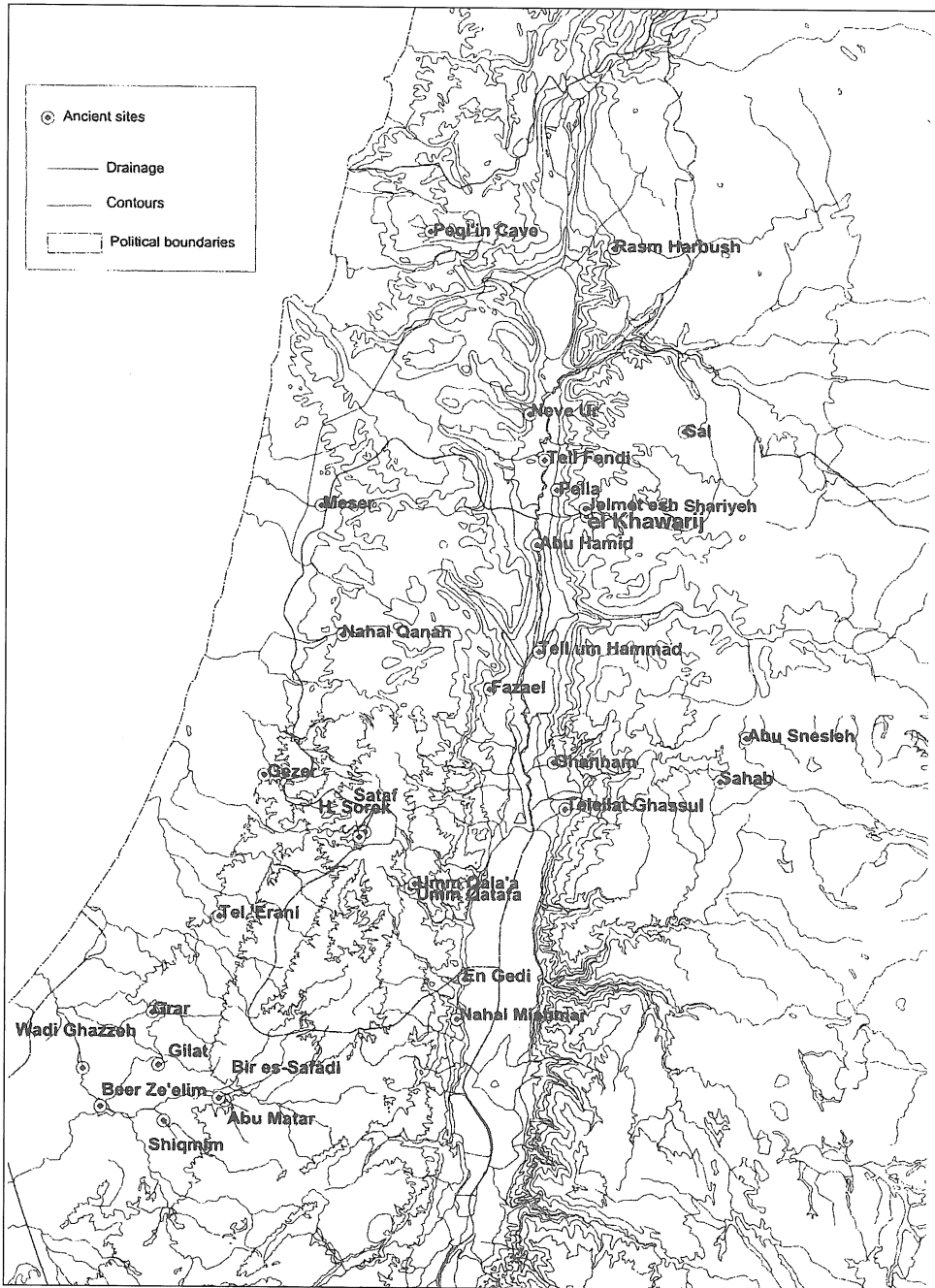
Five new trenches were opened in Area D in 2005, *ca* 30 m to the south east of D1 and 2 (see Figs. 2 and 3). D4 is a 5 x 5m trench located to sound the deposits near walls visible on the surface (Features 65 and 66). These two parallel walls [1370] and [1371] which were constructed on the bedrock and separated by a narrow passage of *circa* 1.10m covered with a surface excavated as [1556] (see Fig. 4b). This deposit covered a cut in the bedrock [1866] that appears to have been intentionally shaped – perhaps to catch surface run-off from the sloping bedrock. The walls are built over the cut, which connects to a second cut [1864]. A further wall [1859] is built against [1370], across the pit/cut [1866], perhaps as a supporting/retaining wall (Fig. 4a).

On the northern side of [1370] the deposits appeared to be of a more usual 'domestic' nature. A bench [1567] sat against [1370] on a rubble packing [1706] which sat within a cut in the bedrock. A series of stone installations and stone scatters, including [1373], [1375] and [1553],

1. We particularly thank Dr. Fawwaz Al-Khraysheh, Director General of the Department of Antiquities and his staff in the 'Amman and 'Ajlun offices for generous assistance during our time in Jordan. The assistance of the land owners and the people of Ḥalawa in the 'Ajlun district was particularly important and appreciated. The Wādī ar-Rayyān Archaeological Project is funded by the *Australian Research Council* and affiliated with the *Council for British Research in the Levant*. A reconnaissance survey in 2001 was funded by the *Australian Academy of the Humanities*. The research and fieldwork for this project was carried out while J. Lovell was an ARC Postdoctoral Fellow at the University of Sydney and we thank His Excellency,

John Tilemann, and his staff at the Australian Embassy in 'Amman, for invaluable logistic support. In addition we thank the site supervisors (G. Cincunegui (Area D); D.C. Thomas (Field Director and Supervisor of Area E); I.K. McRae (Area E); S. Pace (Area G); J. Fraser (Area H); and R. Regal (Area I)). I thank G. Cincunegui for her wonderful work on the plans and P. Kottaras for the photographs reproduced here.

2. Note that previous publication (Lovell *et al.* 2005: 190) a typographical error occurred. The size of al-Khawārij, as surveyed in 2003, is approximately 20ha as estimated by the Wādī al-Yābis surveyors – our survey area covered 23.5ha total.



1. Map of the region with al-Khawarij and other sites marked.

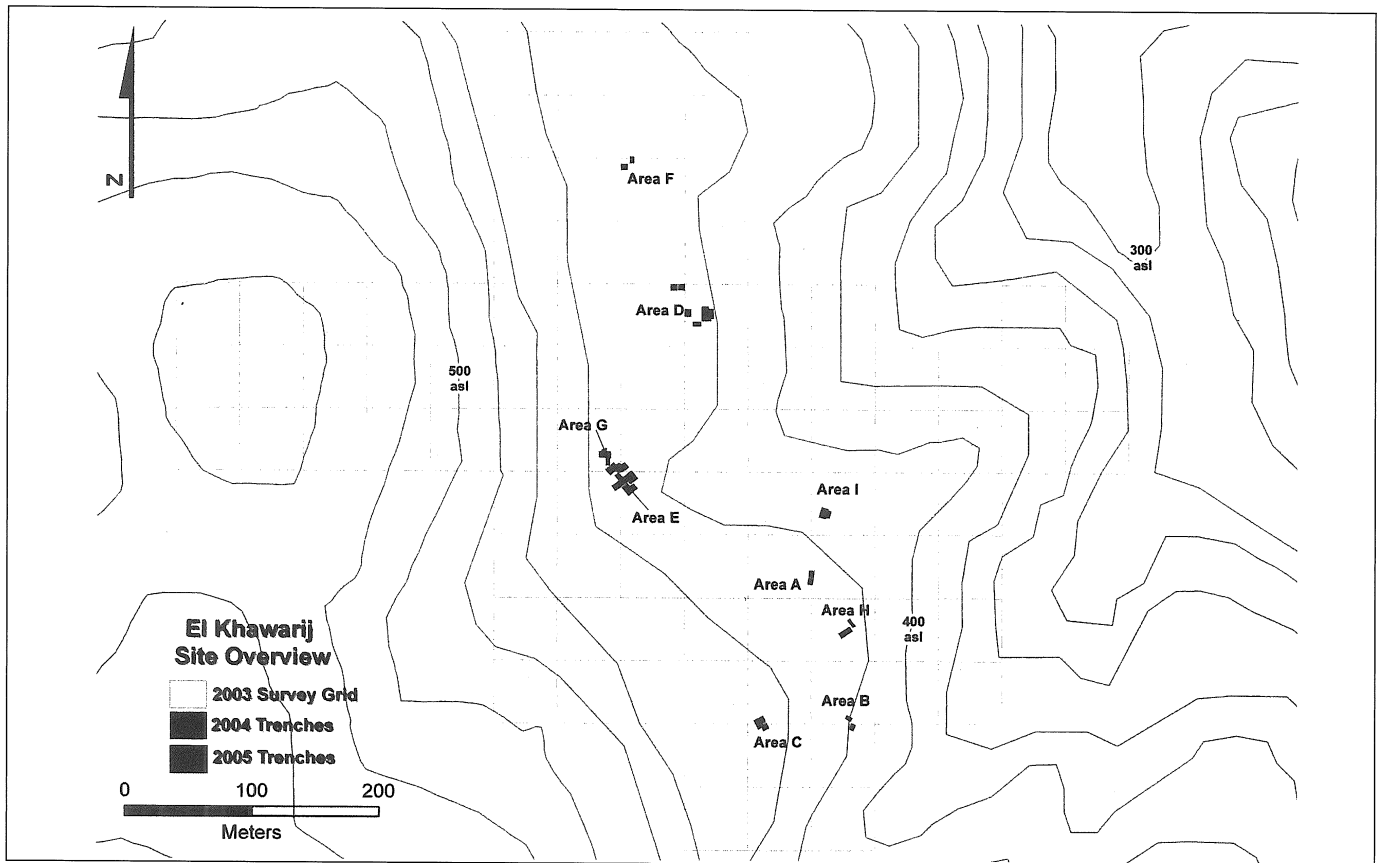
probably all part of one larger installation, lay on/in an ephemeral, and barely recognisable, surface excavated as [1560]. The fill above this surface was incorporated in topsoil [1372] and thus this area was quite badly disturbed. In the southern sector of D4, south of Wall [1371], excavations revealed ways in which the bedrock was flattened or modified for use as a surface and patches of flat stones were used as paving, e.g. [1572].

Trench D5 (Fig. 4b) was a 5 x 5m exposure directly to the north of D4 to further extend the exposure of features picked up in the northwest of D4 and locate the return for wall [1370].

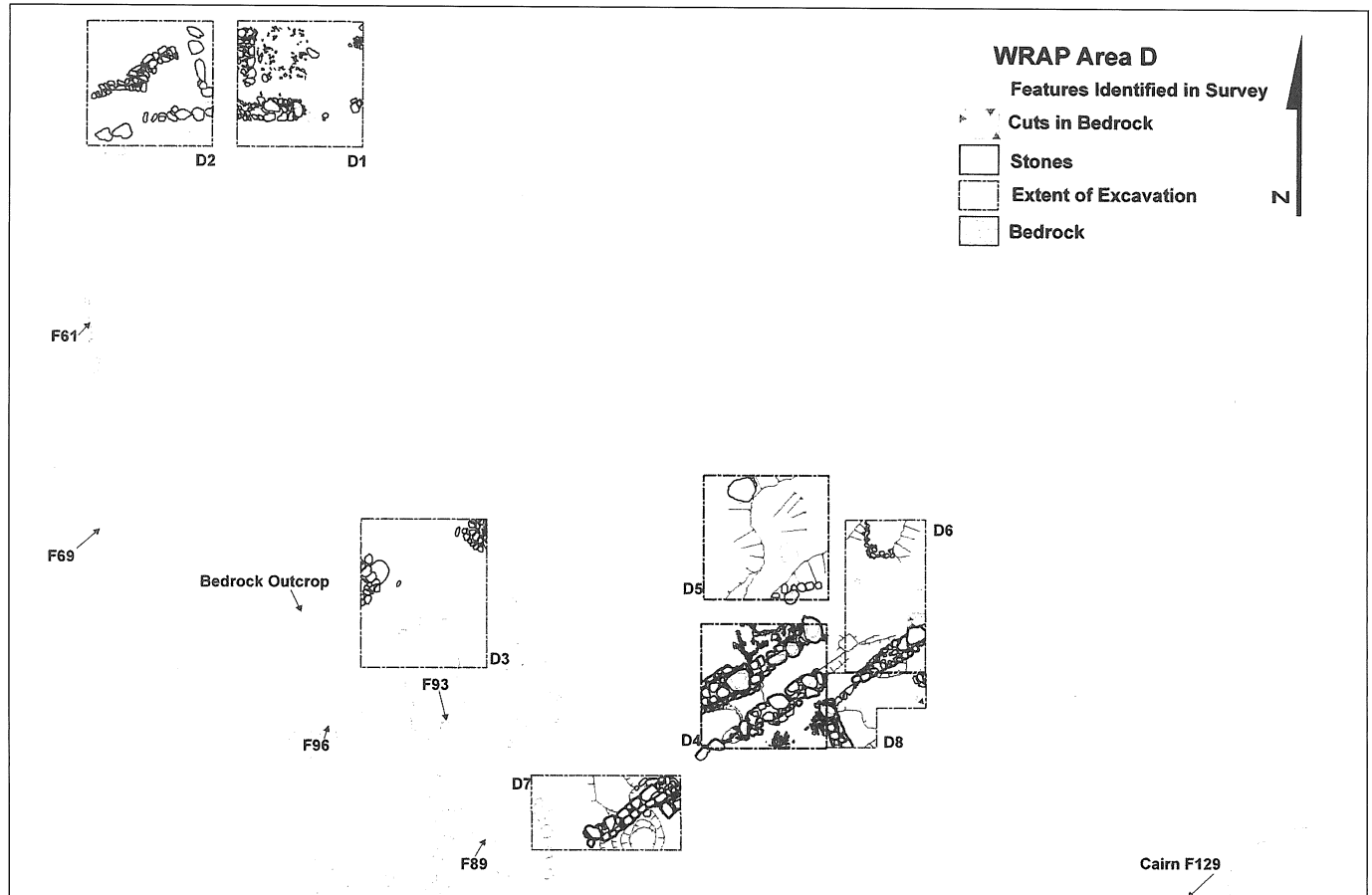
Unfortunately deposit above bedrock was very shallow and very few deposits with any integrity remained. A few stones [1945] may constitute the remnants of a structural feature.

D6, a 6 x 3m trench (Fig. 4a), was opened to the east of D4 and 5 to check for returns to walls [1370] and [1371]. A wall [1711] was found to run NE-SW across the SE corner. Bedrock was reached quite quickly and two postholes [1713-1716] and a narrow channel [1858] were found cut into it.

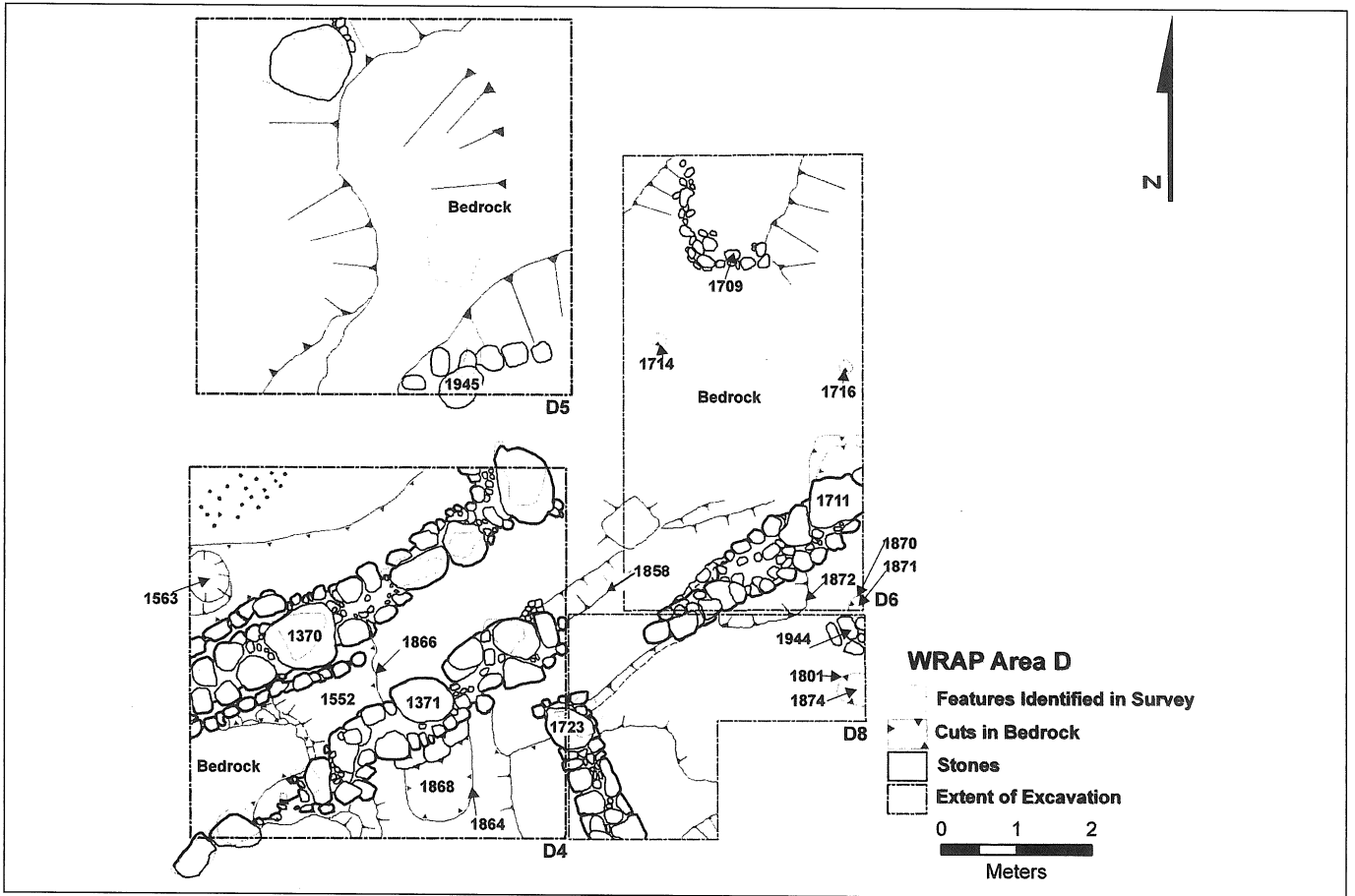
D7 (6 x 3m) was opened to further investigate the relationship between the bedrock cuts and structural features in D4 (Fig. 4a). Wall



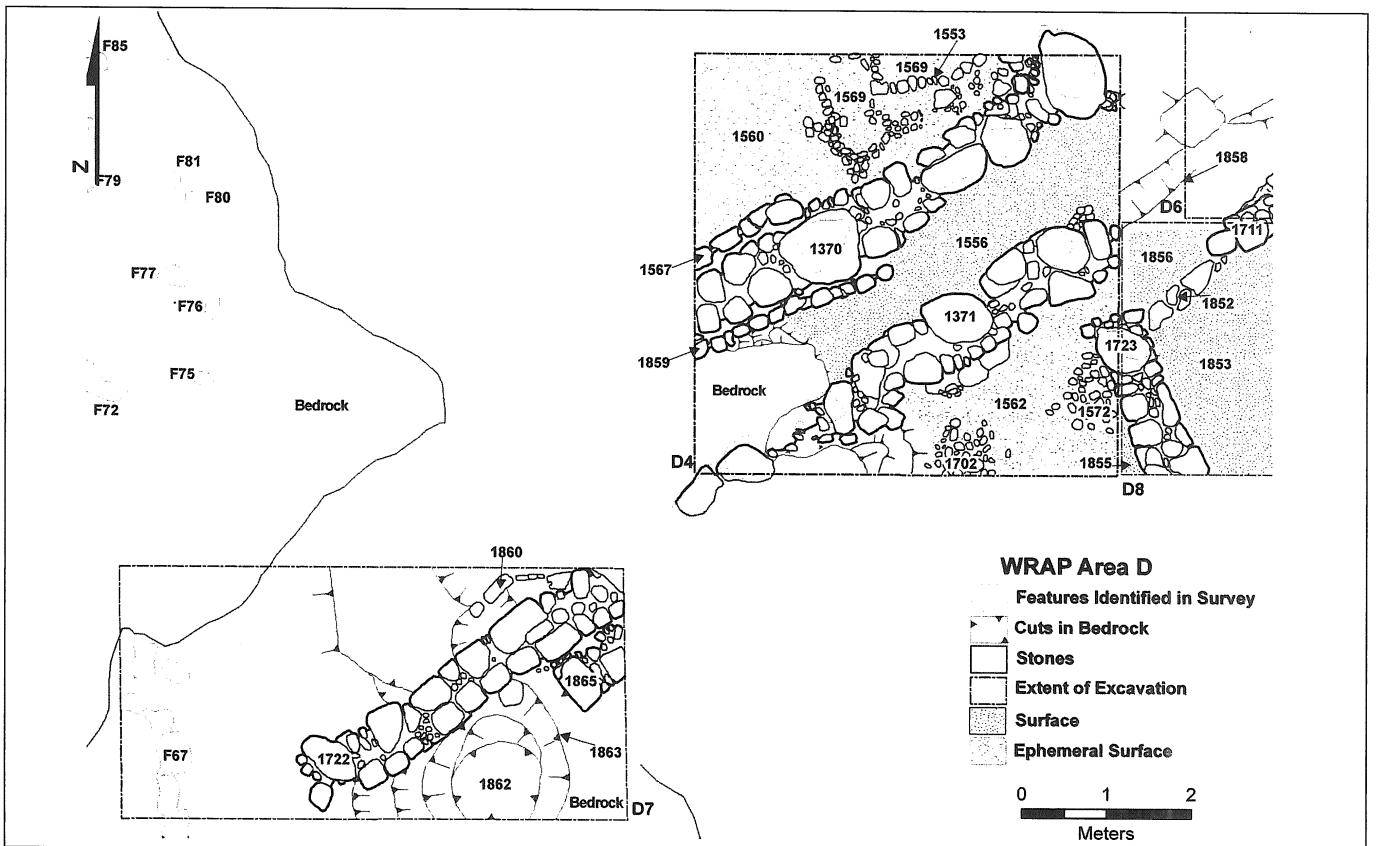
2. Plan of al-Khawārij showing the location of the excavated areas.



3. Plan of trenches in Area D.



4a. Detail plan of Trenches D4, 6 and 8.



4b. Detail plan of Trenches D5 and 7.



[1371] continues into this trench as [1722] and a further rock-cut channel [1860] was revealed to the north of this wall; to the south was a small 'buttress' or threshold which lay on degraded bedrock against a larger pit cut [1863] which, upon excavation to a depth of 1.13m began to fill with water.

D8 (Fig. 4a) began as baulk removal (an area of 2 x 3m between D4 and D6), but later expanded south to locate a return to Wall [1371], which was located as [1723]. The continuation of [1711] was also traced, along with a cut in the bedrock along its southern edge. The wall was built over other cuts [1871], [1872] and [1874]. [1872] may be a natural cut.

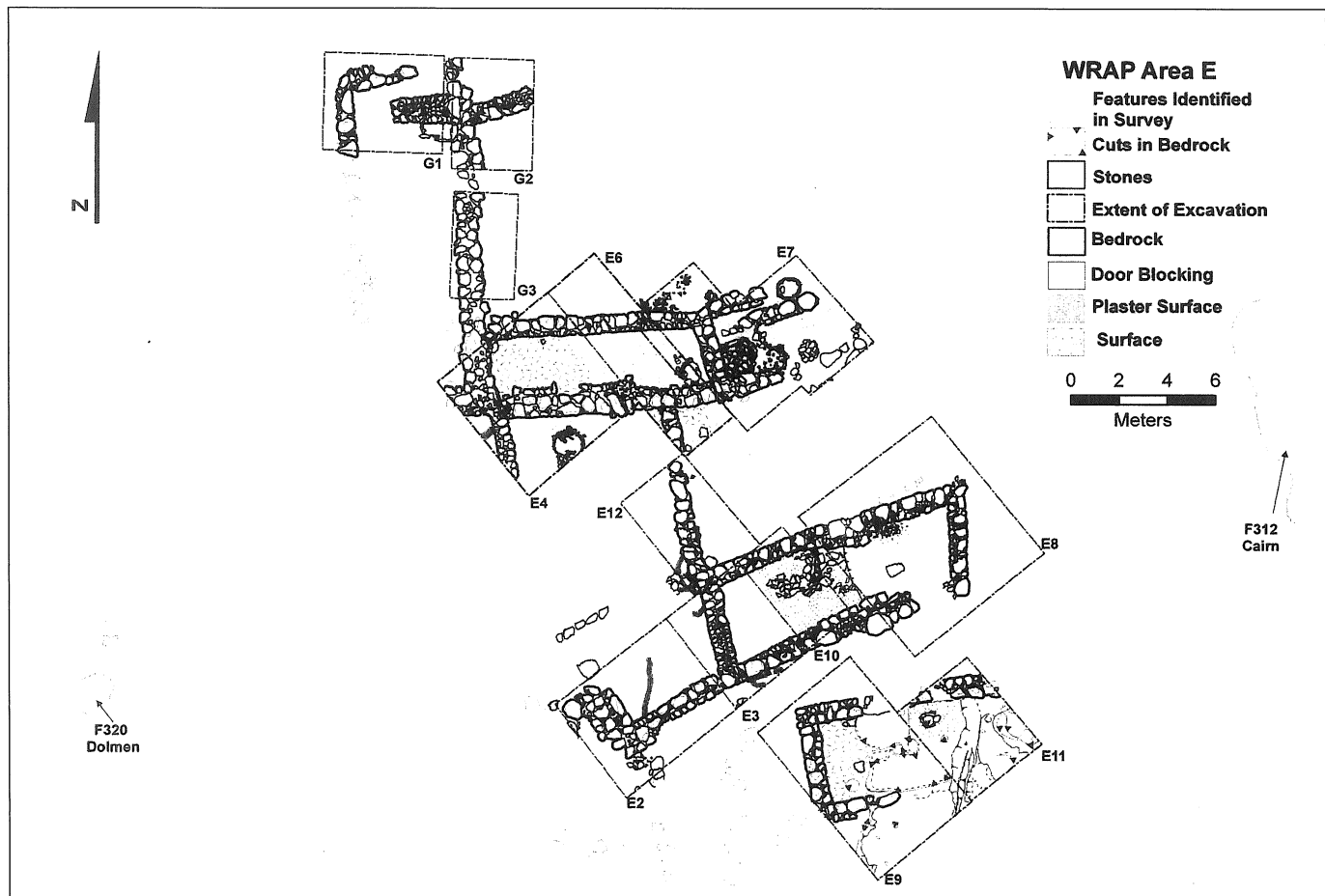
The excavations in Area D have revealed a complex of walls that were built in reference to rock-cut installations and outcropping bedrock. It appears that the Chalcolithic inhabitants made opportunistic use of sloping bedrock and modified natural water collection points – they also used rock walls to channel or perhaps even to screen off these collection points from others. A series of postholes may indicate more

ephemeral shading over bedrock working or living areas.

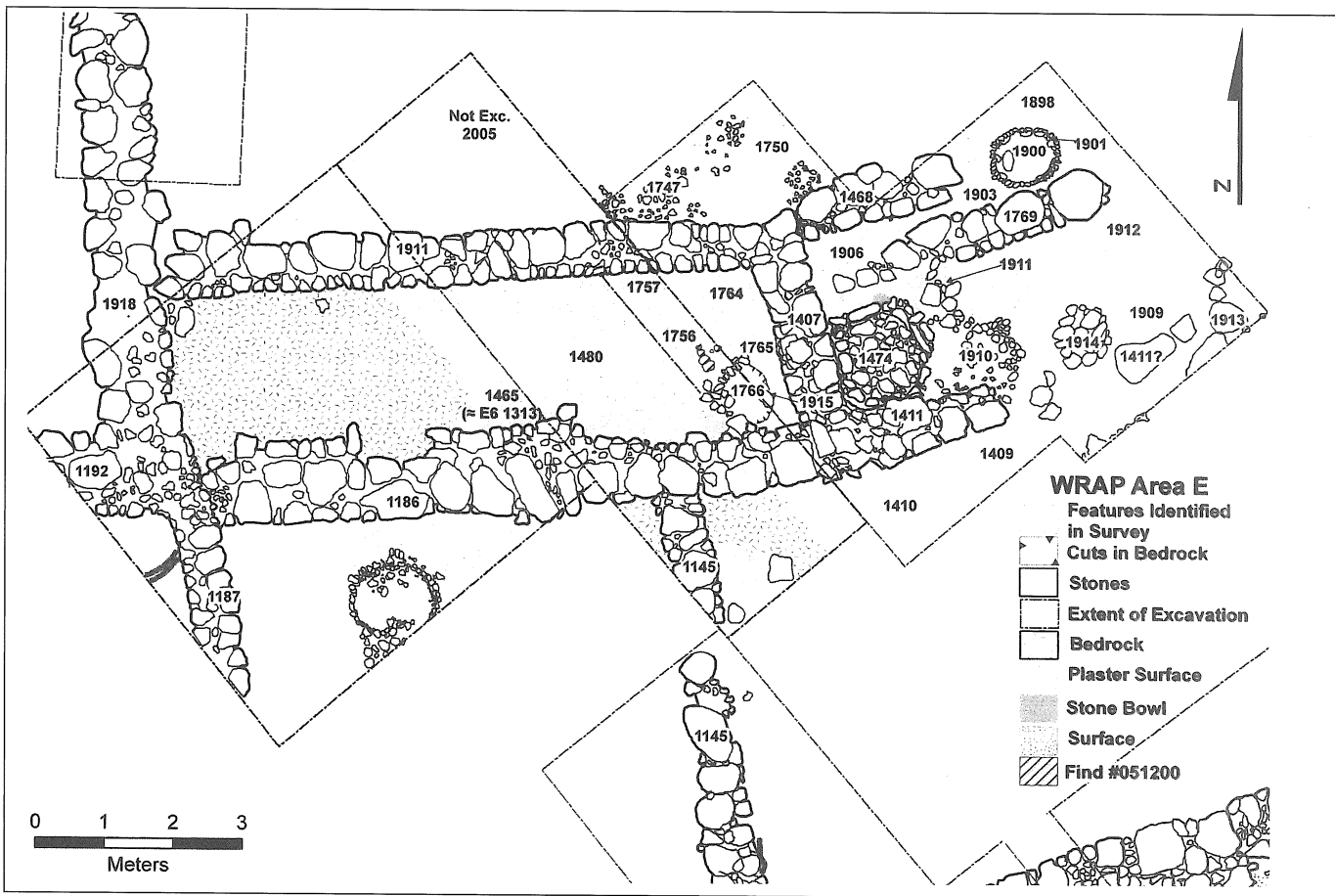
#### Area E

In 2005 excavations continued in the two trenches E4 and E6 commenced in 2004 (Lovell *et al.* 2006: 41, fig. 8). A long rectangular room had been exposed in these trenches and work in 2005 was concentrated on locating the eastern extent of this building and further sounding its botanical remains (see Fig. 5). In all, excavation of the complex has revealed a sequence of at least three plaster floor surfaces.

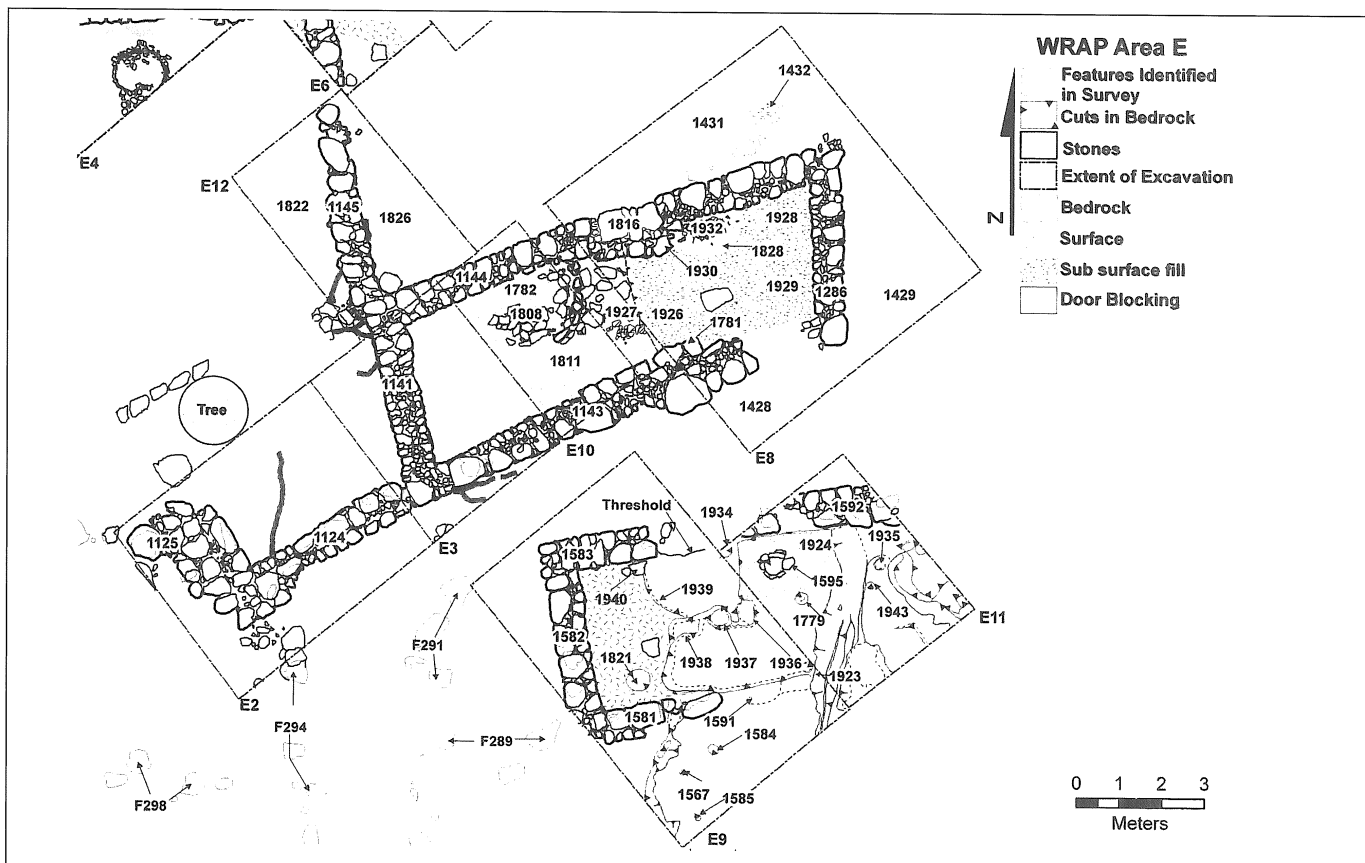
The baulk between E4 and E6 was removed in 2005, and excavations in the internal space revealed a plaster surface [1465] and its sub-surface packing [1472] associated with Wall [1191], corresponding to similar deposits [1311, 1312, 1313] excavated to the west in 2004 (see Fig. 6a). In E6 compacted floor surfaces excavated as [1480 and 1756/7] were revealed approximately 20cm below the surface excavated in 2004 [1313] (Fig. 6a). An organic deposit of possible wood fragments [1748], lay on this surface which ex-



5. Plan of Trenches in Area E.



6a. Plan of Area E (IKM).



6b. Plan of Area E (DCT).

tended into E7 (see below) as [1764].

Trench E7 began as a 7 x 3m area to sound for the return for Walls [1186] and [1191]. This was revealed as [1407] and runs obliquely through the trench approximately north/south. The small sample of internal deposits on the eastern side was heavily damaged by a more modern cairn which covered the area. Tumble and burnt plaster material was excavated in the south-east corner as [1479] at the same level as a deposit containing plaster, legumes and RN051200, the remains of organic material, interpreted as a roof beam or other wooden architectural fragment. This lay upon [1764], which is confined to the northern portion of the room. In the south the deposits were more disturbed and a brown clay fill deposit was excavated as [1765] in which a sub-circular feature was revealed [1915] filled with ashy silt [1766]. All of these deposits had been heavily impacted by the overlying cairn. Deposits beneath them remain to be excavated.

Most exciting was the discovery of a chain-like construction of a further room, formed by the return, Wall [1407], and Walls [1171] and [1468] which run off it to the east. Clearance of more cairn debris revealed a storage pit [1474] which was built into Walls [1407] and [1411]. The fill of this structure [1471] does not appear to have contained large amounts of organic material. Deposits surrounding the pit were excavated as [1470] and [1476]. A series of rocks within deposit [1899] may have formed a series of steps up to a platform into which [1474] was built. A rough surface [1906] sits against the pit and predates [1468]. The contemporary surface to the east [1907] (which was heavily compacted and lay upon a further surface [1908]) thus lies ca. 20-30cm below the original level of 'floor' surrounding the storage pit. To the east of the storage pit a further extension of the raised platform [1910] appears to relate to [1906] and was built into, or before, [1411]. [1911] appears to have formed simple steps up to this platform (Fig. 7). A third surface in the eastern area was excavated as [1912], as was a teardrop shaped group of stone cobbles [1914].

The discovery of a further wall [1769], roughly parallel to Wall [1468], makes the nature of this additional structure confusing (Fig. 6a). Between [1468] and [1769] a plaster surface was located [1903] but was not excavated



7. Boom photograph of Area E6 and E7.

due to time constraints. A further circular feature [1901] was located, and its fill was sampled as [1900] to a depth of 0.50m until a deposit of compacted small stones was reached. A possible eastern return for [1411] and [1468] was identified as [1913], comprised of 6 stones and exposed to a length of 1.10m.

External deposits have been sounded in a limited way in E7, but these seem to include possible ephemeral surfaces [1466] and [1475] suggesting that they form part of the living area. These overlie a stony fill [1747] and a surface it appears to cut [1750]. These deposits require further investigation to clarify the nature of the architecture and the full plan of the complex.

Further south in Area E new trenches were laid out (Figs. 5, 6b) to complete the investigation of a building known from 2004 (see Lovell et al. 2006: fig. 8). The western sector of the building was excavated to bedrock in 2004 as E5. In 2005 the remaining area was subdivided into E8 (5 x 3.4m in the east) and E10 (7 x 7.5m to west) with a 0.5m baulk separating them. Unfortunately, erosion has removed most of the *in situ* deposits in the east of the building. A series of rough, patchy surfaces, [1586] and [1593],

which probably correspond to [1149] (excavated to the west in 2004) form the first deposits encountered here. These and further patchy surfaces [1776], the tops of a stone bench [1781] along the north face of the building's south wall [1143], and an arc of stones [1808], extending from the northern wall [1144], towards the centre of the room form the basis of the latest phase of the building, and may relate to the possible re-build.

The surface associated with bench [1781] and stone-lined installation [1808] were excavated as [1811], and this lay upon the best-preserved surface found in this part of the structure, [1927]. This surface had sherds lying flat upon it, and a bovine metacarpal. The sub-surface fill lay upon bedrock. Two post-holes [1815] and [1933], 0.6m apart were noted cut in the bedrock to the south of [1808]. Fill deposits [1588] / [1807] in the rest of the building to the east were heavily disturbed by erosion. A grey ashy patch overlay an informal fireplace [1931] and surface [1828], which had sherds lying flat on it and olive pits visible in it. The fireplace runs across a blocked doorway in the north wall [1144] of the building. The blocking of the doorway may relate to the re-build of the building. Time constraints prevented us from excavating all the deposits in the east of the building, although sampling demonstrated that bedrock is only ca. 0.1m lower (in the NE corner of the building). A post-hole [1941] was found near the eastern end of wall [1143], and a large flat stone was located nearby.

The removal of topsoil from Trenches E9/11 demonstrated that a third Chalcolithic long-house lay to the south. The house consisted of a short stub of the southern wall [1581], the complete western wall [1582] and most of the northern wall [1583] (in E9) and [1592] (in E11), see Figure 6b. The bedrock was very close to the surface. Walls [1581] and [1582] were constructed of slightly different sized stones, but neither were persevered above 0.55m. Wall [1583] stops abruptly, for no apparent reason – if a doorway existed between it and its continuation in E11 [1592], it was at least 1.2m wide.

Excavation of topsoil within the building revealed bedrock in places, but some depositional fill was present [1819], as was a large post-hole [1821], to the SW of a large rock sit-

ting on the bedrock. The fill of the post-hole [1820] contained fragments of a medium-sized stone, which mostly re-fitted — this stone may be fire-shattered, suggesting that the feature was a boiling pit (fire heated stones put into water will keep it boiling for hours). The excavation of room fill [1825] revealed a series of rock-cut features — the main part of the room was sunken via a series of cuts/modifications of the bedrock, which is dotted with a series of postholes. In the centre of the building were three features running roughly east-west: [1936], [1937], [1938]. [1936] perhaps formed a comfortable kneeling area, if you were working in feature [1937] to the west. [1937] is a sub-circular slight depression, ca. 0.2m lower than the bedrock to the north, and had a 30mm 'lip' to the bedrock in the south. A raised rock-cut feature [1938] was possibly a bench.

To the north of this line of features, running through the centre of the building was a higher, relatively even bedrock surface, sloping gently from west-east. An arced shallow cut [1939] formed the western edge of this feature. As mentioned above, to the north of this area of bedrock was a possible threshold in wall [1583], which was 0.1m higher than the internal bedrock surface. A bench, [1949], lay to the west. The removal of the baulk between Trenches E9/11 exposed three more post-holes ([1779], [1923] and [1934]) and the rest of a stone-lined installation [1595], 0.55m deep, partially excavated in Trench E11. The function of the installation is unclear — a number of re-fitting sherds were found to the north of the installation. A definite trampled surface [1924] was identified to the north and south of [1595], and at the same level as the top of another cut in the bedrock [1922]. Cut [1922] created a 0.22m lip down from the bedrock on which wall [1592] was laid. The cut ran west along the wall before turning south towards rock-cut feature [1936] in the centre of the room. This turn in the cut might indicate an end in wall at this point, but we were unable to clarify this as the wall runs into the north baulk at this point. A post-hole cut [1934] was located in the bedrock to the west of cut [1922], before disappearing into the baulk in the north.

In total, the modified bedrock surfaces in the building measured 6.15m east-west by 3.5m north-south. The bedrock dipped in the east,

with two linear gullies running roughly north-south, which may have drained into a natural sink-hole by the east baulk. The western edges of the sink-hole appear to have been smoothed, so it seems likely that the building was deliberately positioned to utilise this natural feature. The area to the south of wall [1581] was the only external area that we excavated fully. The removal of topsoil/ lower topsoil exposed 4 post-holes, cut into the slightly uneven bedrock. The smallest post-hole, [1591], is in line with where wall [1581] would have run, suggesting that a doorway may have existed in this area.

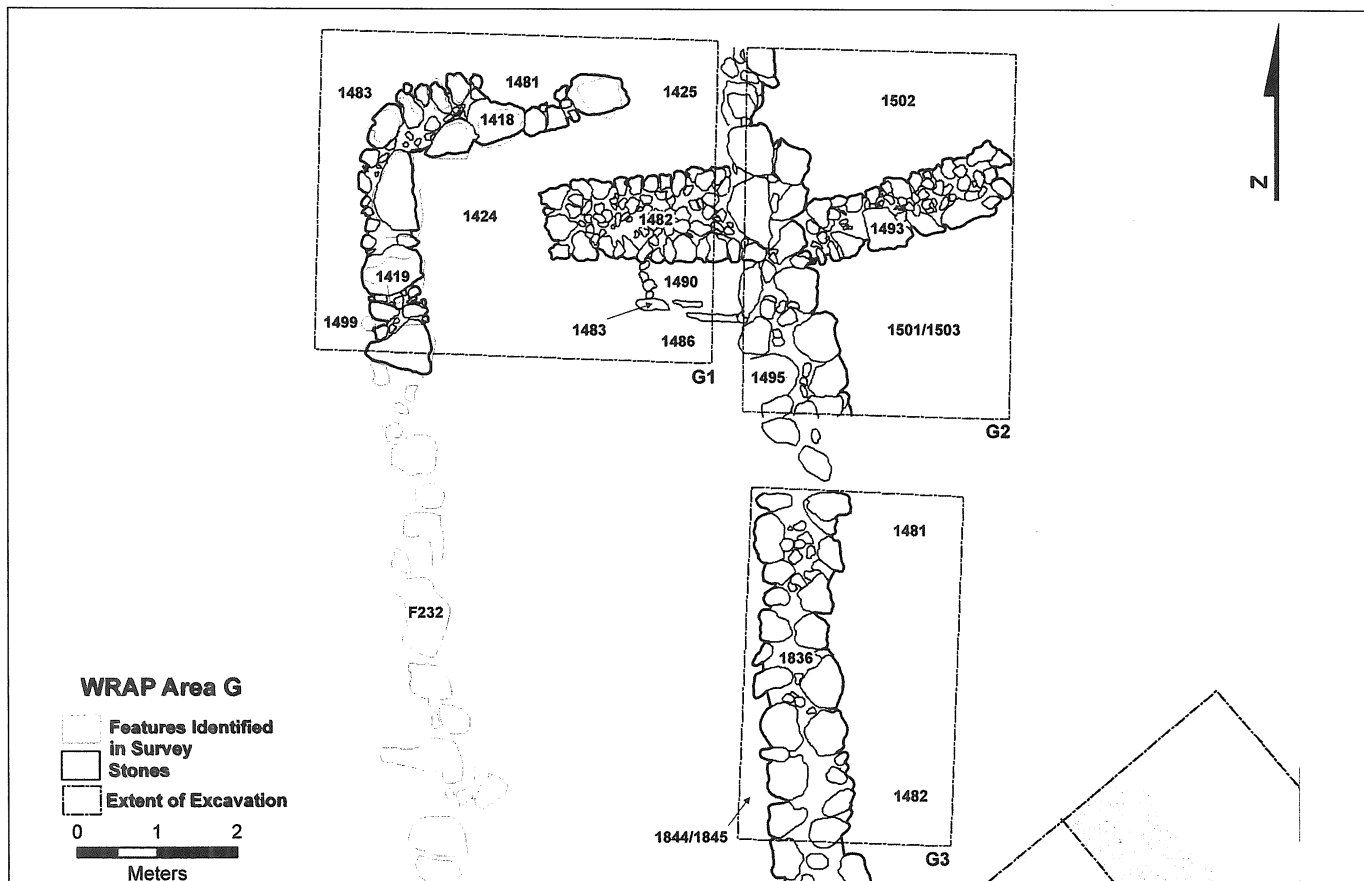
Finally, trench E12 (4.5 x 3.5m) was opened to investigate wall [1145], and to confirm that it runs north-south between both major structures (Fig. 6b). The wall clearly abuts both structures and was built in a later phase.

In summary, Area E contains three main structures with differing assemblages (see below for discussion of the ceramic assemblages), the southernmost building (in E9/11, Fig. 6b), appears to be deliberately placed to make use of a modified bedrock shelf, adjacent to a natural drainage. The bedrock appears to have

been modified for several work areas, including potential boiling pits. The available natural drainage may indicate that the area was used as a hide processing area. The building just to the north (in E8/10, Fig. 6b), contains a number of store jar fragments and is connected via the wall in E12 to the well-plastered longroom in E6/7 (Fig. 6a). In fact, the whole structure is really one large complex, which no doubt extends further to the west and north. Most significant for broader understanding of the Chalcolithic is the potential Golan-style chain architecture in E7 (Fig. 6a), which requires further excavation.

#### Area G

Excavation of Area E, from whence our primary evidence for architectural phasing at the site comes, had revealed a number of indices for considerable rebuilding and multiple phasing. Area G consisted of three trenches that were positioned to sound walls noted on the surface in the 2003 survey which appeared to form possible long room structures on a completely different alignment to those already discussed in Area E (Fig. 8).



8. Plan of Trenches in Area G.

Trench G1 (5 x 4m) is the most northerly trench and was positioned across Feature 232 from the 2003 survey, which became Wall [1418 and 1419] upon excavation of topsoil. Unfortunately no surfaces and very little fill of integrity were found — the deposits against these walls consisted largely of topsoil. A further wall, [1482], was revealed running east-west with a stone storage bin [1483] attached. The fill of this storage bin contained olive pits and was removed as [1487/1489/1490]. Wall [1482] and [1483] lay directly upon bedrock and the deposits associated consisted of topsoil only.

Trench G2 (3 x 4.5m) was laid out to the east of G1 in order to test whether the terrace wall observable on the surface, contained the eastern wall of the longroom. This proved to be the case and this wall was given the number [1495]. A second wall [1493] was revealed upon removal of topsoil. A pierced star scraper (**Fig. 14.21**) was found in [1498], lower topsoil. Again no floors or surfaces of any integrity were excavated in this trench and the only fill levels, [1501] and [1502], lay directly on bedrock.

G3 was a trench of 4.5 x 2.5m, positioned to clarify the relationship between Wall [1495/1836] in G1 and Walls [1198] and [1911] revealed in Area E (Lovell *et al.* 2006: fig. 8). After removal of topsoil the northern half was removed as [1841] and the southern half, grayish-brown silty clay [1842]. It appears that Wall [1836] clearly postdates the structure in Area E. During the construction of [1836] it would appear that the builders of this house modified and rebuilt the western wall of the longroom it crosses (see **Fig. 6a**). Context [1844] lay between wall [1836] and the baulk and overlay a dark grey silt [1845]. A red clay deposit (resembling natural) underlay this level, where excavations ceased.

The importance of excavations in this area lies in the discovery of a later phase than that sounded in 2004. Radiocarbon sampling of the olive pits in bin [1483] may help to define the time period involved, but given the integrity of the deposits here, strong results can not be guaranteed. In addition, Walls [1482] and [1483] predate the north-south structure as they lie on a different alignment. However, contexts [1844] and [1845] hold out the hope that, further south in the large longroom building deposits of more

integrity might be located and sounded at a later date.

#### Area H

Area H is located at the base of the spur at the southern end of the site, and gently slopes down from the west to the east; several oak trees grow across the slope. Networks of wall-lines were picked up in this area during the 2003 survey, with associated Chalcolithic and other pottery (Lovell *et al.* 2005). Two possible cairn tombs (*rujm*) overlie this complex of structures, and three trenches were opened adjacent to (and in amongst) one such cairn (survey Feature 413) with the intention of exposing a series of buildings visible on the surface and to date, by association, the possible cairn tomb that sits on top of these walls (see Lovell *et al.* 2005: fig. 5).

Trench H1 measured 4.0 x 6.0m: topsoil contained Bronze Age to Mamluke sherds and there was also evidence of modern reuse of lower phase walls. These walls form the primary occupation phase of trench H1 with discrete internal and external areas. Walls [1384] and [1387] were constructed on top an earlier buff silt level and with clear reference to the pre-existing Walls [1386] and [1390]. Wall [1384] formed the western side of a room, and was bonded with wall [1387], the northern side. A doorway separated wall [1387] from [1386], the eastern wall of the room. A stone threshold had been constructed inside the doorway between walls [1387] and [1386], feature [1626] (see **Fig. 9**). This doorway led to an external area to the north of the room, which contained two standing orthostats forming a second, now blocked, doorway [1540] to the west.

Two surfaces were discovered — [1539] in the main room and a corresponding exterior surface [1538]. A *ṭābūn* [1537], filled by ash [1536], sat on surface [1538] (see **Fig. 9**). These surfaces overlay a thin fill, which in turn overlay two other occupation surfaces. An earlier phase in this trench is represented by exterior fills, tan-buff deposits that overlay the only exterior surface of the phase, context [1639/1641]. These levels are associated with Walls [1386] and [1390] and are contemporary with the deposits in H2 represented in Figure 9. They also seal the underlying very fine, mid-brown silt: contexts [1637] and [1725], which overlay



bedrock. These sealed levels constitute the only Chalcolithic layers in the trench.

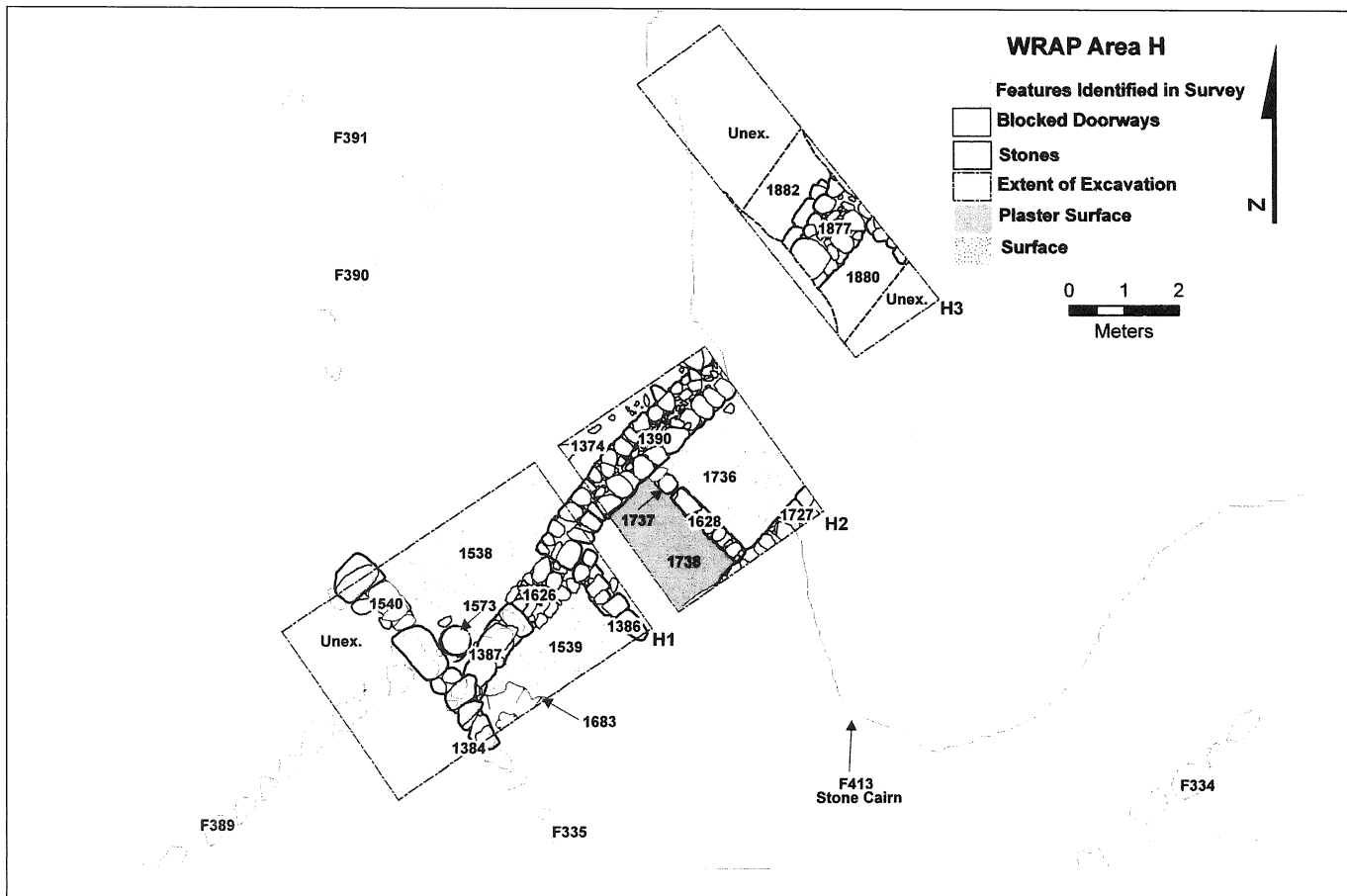
H2 is a 4 x 3.5m trench located with the same orientation as H1. The first levels excavated consist of topsoil and lower topsoil deposits with a high amount of tumble from the cairn and underlying Walls [1390], [1548], [1628] and [1727] which relate to Walls [1384], [1386], [1387] and [1390] from H1 (see Fig. 9).

Wall [1548] was first built as a single-row wall, similar to the back west wall [1386]. Wall [1548] forms the long, northern side of the building, wall [1386] forms the short, eastern back wall, and the walls are bonded. The long, southern side wall, wall [1727], was exposed running adjacent and into the south baulk, and this wall was linked to the parallel side wall [1548] by [1386], and also by a smaller cross Wall [1628]. Wall [1628] divided the building into two rooms: Room 1 in the west and Room 2 in the east. Room 1 was filled with a hard tan-buff room fill excavated in a series of contexts which bottomed onto a white lime-plastered surface, [1735] (Fig. 9).

Room 2 was filled with a similarly silty buff deposit, which bottomed onto the earthen surface [1736]. This surface most likely relates to the plastered surface [1735] because they both underlie buff room fill, and they both run up to the cross-wall [1628]. The cross-wall contains a 0.50m doorway between its northern end and wall [1548], filled by a rubble packing [1737] which bottomed at the same level as contexts [1735] and [1736]. A well-faced doorway links the underlying surfaces in Rooms 1 and 2 (contexts [1738] and [1739]) (Fig. 9).

An earlier phase again is constituted by two deposits that lie above bedrock. The bedrock slopes down to the west, and therefore the two fill deposits are only found in the western quarter of the trench. As in trench H1 the deposits of this phase are light brown clayey-silt, [1743/1744] and [1745]. Olive pits were extracted from flotation.

H3 was 7 x 2m trench, extending from the northern cairn-edge (Feature 413 from the 2003 survey) south into the pile itself. The trench was opened because excavations in H2 had not



9. Plan of Trenches in Area H.

uncovered an edge to the cairn and therefore it could not be determined whether it pre- or post-dated the structure.

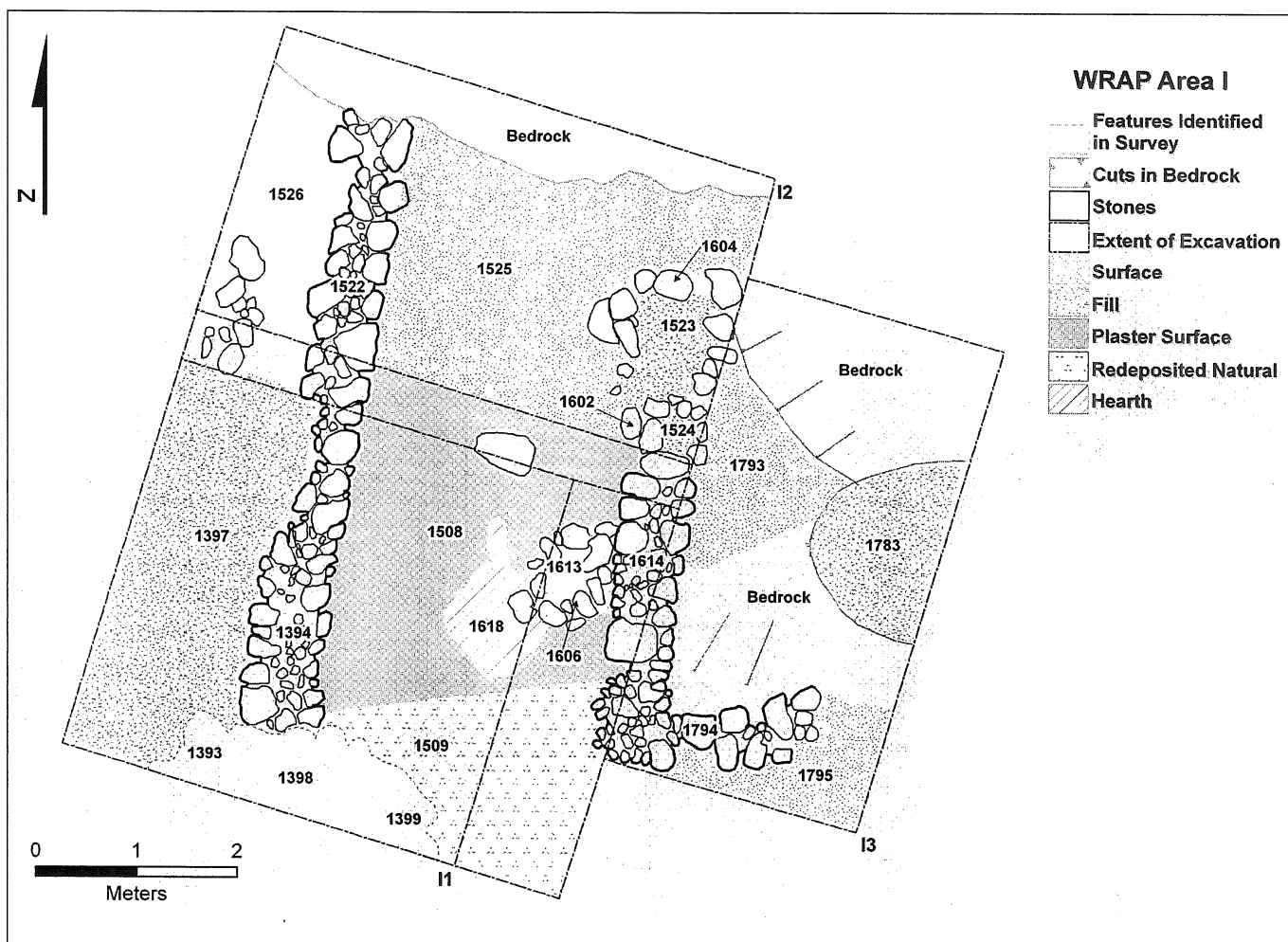
No internal walls or features were found when the topsoil and rocks were removed. Indeed, the only wall exposed, wall [1877], appeared to be in line with wall [1548] / [1390] in trench H2, and may have been an actual continuation of the wall itself, although it is wider. Wall [1877] seems too large and linear to be part of a cist or cell structure inside a cairn tomb. Wall [1877] thus divided two discrete areas that resembled the same stratigraphic sequence as those in trench H2, with the northern sounding reflecting the sequence north of wall [1390/1548], and the southern sounding resembling the sequence at the top of the room fill deposits south of wall [1390/1548]. Thus these deposits in H2 extended well beyond the line of the cairn, and the rubble in the cairn bottoms thus bottoms (without structure) onto earlier deposits.

Although our hopes of finding an intact cairn

tomb were disappointed, the excavation of Area H has revealed a large Middle-Late Bronze structure with two distinct phases (in Figure 9 the first is represented in H2, and the second in H1). This is clearly part of a much larger complex, whose basic structure is visible on the surface and was clearly planned in grid square F11 of the 2003 survey (see Lovell *et al.* 2005: fig. 5).

*Area I*

Area I was designed to sound the zone of highest artefact density as per our survey of 2003 (Lovell *et al.* 2005). We presumed that much of this high density was related to extensive plough damage, since no architecture was visible on the surface. To check this so a 4 x 4m trench was opened (I1) to investigate the level of damage to potential sub-surface deposits. Wall [1394] appeared almost immediately and later baulk removal revealed a parallel Wall [1614/1788] (see Fig. 10). After the removal of topsoil and



10. Plan of Trenches in Area I.



tumble from Wall [1394], circular stone, plaster-lined storage areas were exposed to the south ([1933], [1398] and [1399]), which cut Wall 1394 and associated deposits (see **Fig. 10**).

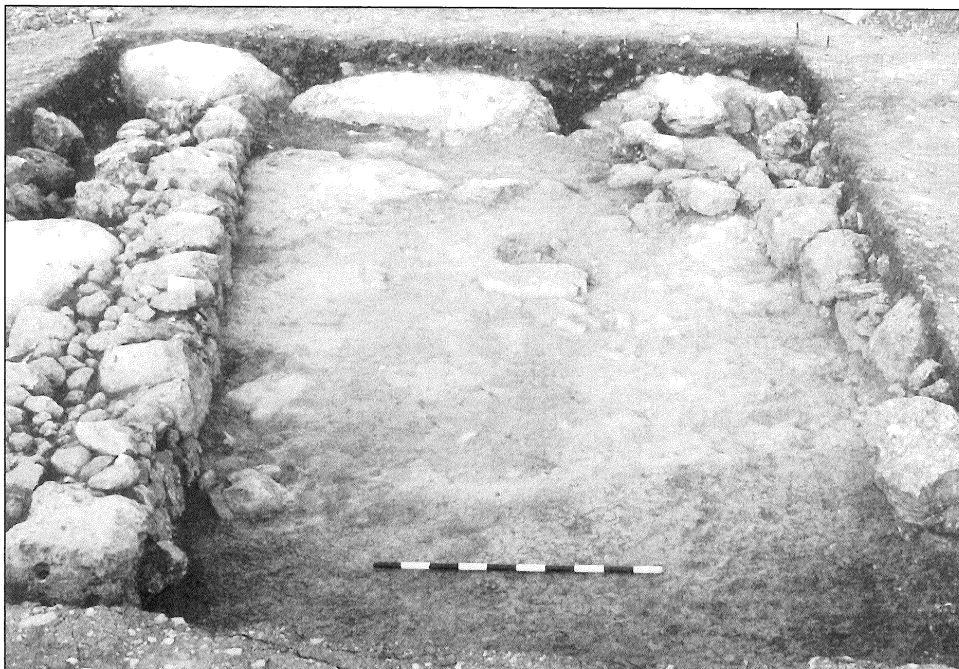
East of Wall [1394], a light ash deposit [1507] / [1610] containing a number of artefacts and a considerable amount of botanical remains. The removal of [1507] exposed floor surface [1508] which had a number of finds, including a fragment of a copper adze (**Fig. 16.6**) on the southern edge of the deposit between the edge of [1509] and hearth fill [1618], and a pierced disk on the northern edge of the deposit. Carbonised olive pits (complete and fragmented) were found cross the entire deposit with other botanical remains. To the east and slightly overlying hearth [1618], a storage area or other installation was excavated [1606]; its fill [1613], included carbonised olive pit fragments.

Surface [1508] overlay a second, compacted surface [1785] / [1786] into which a posthole was cut: [1792] was filled with deposit [1789], which also had some carbonised olive pit fragments. A further feature was a circular cut [1799] which cut [1785] and underlying deposits. Its fill ([1799] and [1800]) and the cut itself were disturbed by mole rat activity along its northern edge. Surfaces [1785] / [1786] overlay natural red clay [1509] and degrading bedrock.

I2 (5 x 3m) was opened to the north of I1 (separated by a 0.50m baulk). After the removal of topsoil and collapse from Wall [1522]

(contiguous with Wall [1394]) surface [1525] was revealed. This surface is contemporary with [1508] in I1 but seems to have been more ephemeral. Two rectangular possible hearth/dump areas were also uncovered: [1604] and [1602]. [1604] was filled by [1523], which in turn contained a large amount of lithics, and [1602] was filled with [1524] which contained a core and flake shatter – perhaps due to heat exposure. Removal of [1525] revealed deposit [1615], which bottomed onto bedrock and deposits [1790] and [1791], fill levels in between uneven bedrock.

Trench I3 (5 x 2.5m) was opened to further expose wall [1614/1788]. We did also uncover a return to [1614/1788], [1794] (see **Fig. 10**). There were no good surfaces in this trench and fill levels bottomed on bedrock. The alignment of walls points to further potential to the east and it would be useful to clarify what kind of architectural structures were in use here. Certainly Wall [1614] is not as long as [1394] and may form the western edge of another structure to the east. Despite the solid floor linking Walls [1394] and [1614] it would appear, from our limited exposure, that there is no northern wall to link [1394] and the structures to the north of [1614] – it is therefore possible that the building was open on the northern end. A flat stone and a small section of bedrock in the centre of the building (see **Figs. 10, 11**) probably formed bases to posts holding the roof supports, so it may be that this



*11. Area II and 2 after baulk removal showing floor 1508/1525 in association with Walls 1394 and 1614.*

area was a roofed, external area.

Excavations in Area I clearly demonstrated that this part of the site does contain in tact and extremely useful deposits. As such it may become a focus of work in future years. The fact that a few sherds of slightly earlier date appear within the Area I assemblage (see below) suggests that further excavation between this Area and Area A (see **Fig. 2**) may also reveal new information regarding the longevity of the site.

### Ceramics (JLL)

At the time of writing 15076 sherds have been catalogued; 7031 of these came from the 2005 excavations. Of these 7031 sherds: 427 were able to be classified within a specific form group, a further 604 were rims, bases or handles which were considered too fragmentary to catalogue, and the rest were classed as bodysherds and were recorded for fabric and decoration only. As with the material excavated in 2004 (Lovell *et al.* 2006), the ceramic material from the 2005 excavations is largely characterised by 'late Chalcolithic' types. A very few sherds of material bearing surface manipulation were found (e.g. **Fig. 12.2**) and these interestingly all come from Area I. In our previous season Late Neolithic 'throw-ups' were found in Area A, just nearby (Lovell *et al.* 2006: fig. 10.22; see **Fig. 2**) and this suggests that more intensive work on this side of the site may reveal earlier Chalcolithic material. Note that the incised material illustrated here (**Fig. 12.3, 12.10**) most likely relates to the later Chalcolithic Neve Ur tradition.

Middle-Late Bronze Age material was present in Area H. Full details on fabric selection and breakdowns of fabric percentages will be presented in the final report. Figure 12 provides a sample of the forms encountered in Chalcolithic contexts; Figure 13 presents additional Middle-Late Bronze Age material encountered in Area H and some Late Bronze-Iron Age examples from Area B (**Fig. 13.2-3**).<sup>3</sup> Percentages and other figures given below are based upon the sample of material from secure contexts.

### The Assemblage

The assemblage catalogued from the Chalcolithic trenches very much reflected the same proportions of open to closed vessels as 2004. The assemblage contains a number of closed vessels (35.27%, of these just less than 5% are storage jars) and open vessels (32.87%); the remaining part of the assemblage is made up of 29.79% handles and 2.05% miscellaneous. As in 2004, fabrics are generally similar to other Chalcolithic sites, the main temper being carbonates, with occasional use of basalt or crushed calcite. There are distinct fabric groups within the assemblage, but full characterisation of each group awaits a more detailed study. While the classic red painted decoration characteristic of a Chalcolithic assemblage is present, it is not present in large numbers. This may be partially due to taphonomy in the shallow deposits, but might also be an expression of regionalism. Thumb and other impression techniques are also in evidence, as are incision and other surface manipulation techniques.

In 2005 we also catalogued a number of ceramics from Areas B (2004) and H (2005), which encompassed material from later Middle-Late Bronze Ages and some later material from the Iron Age. A full discussion of this material will be presented in a further publication (in prep.), but we show a subset of the material in Figure 13.<sup>4</sup>

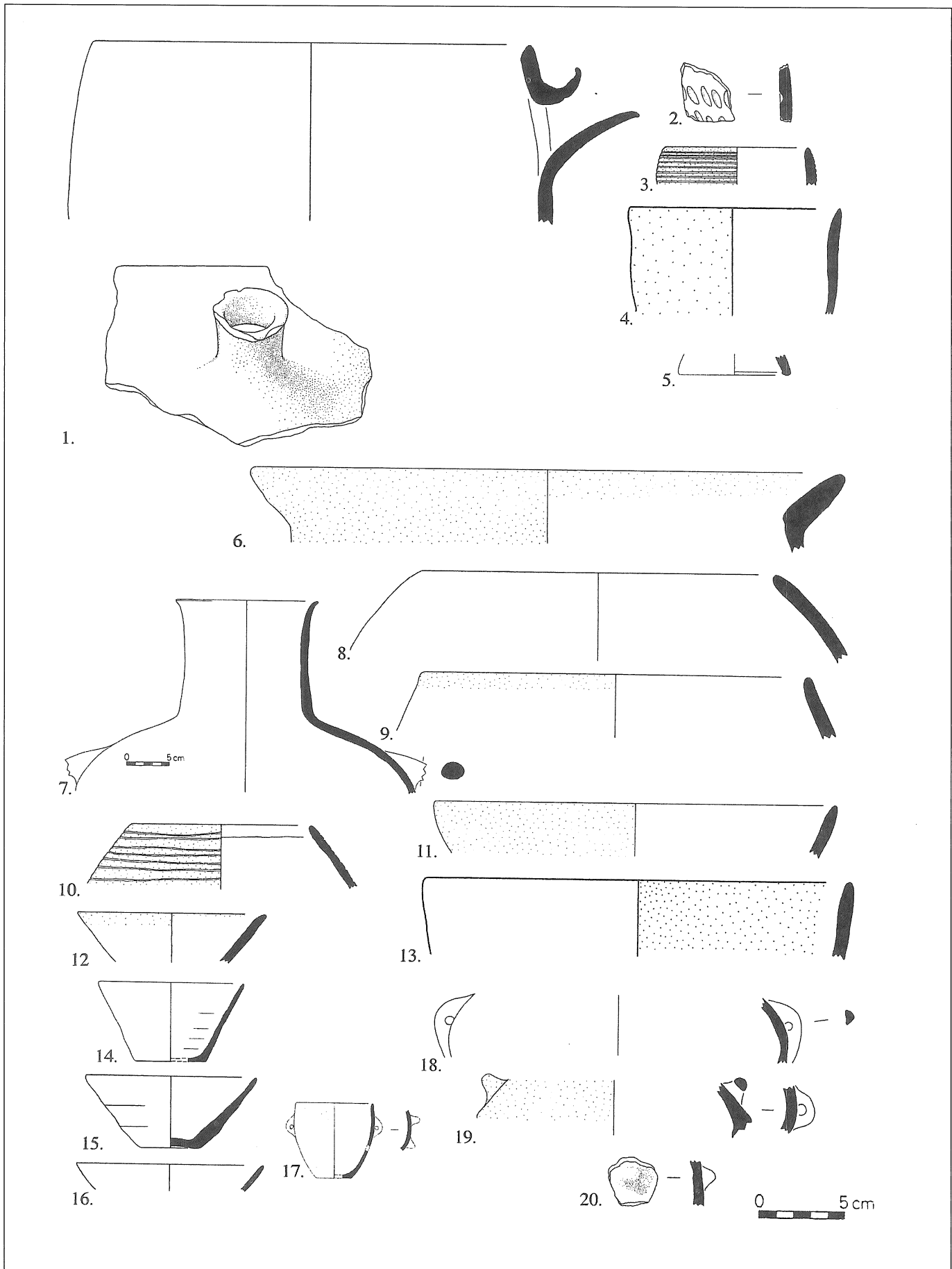
*Open vessels – bowls:* The Chalcolithic bowl repertoire is broad and contains the standard round-sided (**Fig. 12.11**) and 'v' shaped bowls (**Fig. 12.14**). There are also deep bowls (**Fig. 12.13**) and cups (**Fig. 12.17**). Paint in red bands (**Fig. 12.12**) or trickles (**Fig. 12.4**) is present but often not well preserved. The small wheel-fashioned 'v' shaped bowls are also present (Roux and Courty 1997), some with quite thick walls (e.g. **Fig. 12.15**).

*Basins:* Basins are rare within the assemblage<sup>5</sup>, but we do have a spouted krater or vat (**Fig. 12.1**). This type of vessel has been associated

3. Dates given in captions are approximate and based on parallels with published material from Pella (McNicol *et al.* 1982, 1992) and Amiran (1969).

4. I thank Lily Withycombe-Taperell for valuable assistance and hard work in cataloguing this material.

5. Please note that it is often difficult to assign some profiles as basins or jars, such that we previously included a 'basin' within our discussion of storage jars (Lovell *et al.* 2006: fig. 10.26).



12. Ceramics from Areas D, E, G, and I.

| Figure 12.# | Catalogue # | Form                      | Fabric  | Décor                   |
|-------------|-------------|---------------------------|---------|-------------------------|
| 1           | 20295       | Holemouth, spouted        | 1bM     | Red slip                |
| 2           | 20310       | Bodysherd                 | 13aF    | Impressed               |
| 3           | 20327       | Holemouth, simple, fine   | 3aF     | Red painted (Incised)   |
| 4           | 20298       | Jar / Bowl, deep          | 1aF?    | Red slip                |
| 5           | 20297       | Fenestrated stand, foot   | 3bF     |                         |
| 6           | 20330       | Jar, short neck – storage | 13cC    | Red paint               |
| 7           | 20326       | Jar, tall neck            | 6bM     |                         |
| 8           | 20316       | Holemouth, simple rim     | 2aM     |                         |
| 9           | 20339       | Holemouth, Out-turned rim | 2aC     | Red painted             |
| 10          | 20332       | Holemouth, pinched rim    | 5aM     | Red painted and incised |
| 11          | 20340       | Bowl/basin, pinched rim   | 2bM     | Red slip                |
| 12          | 20344       | Bowl, ‘v’ shaped          | 5aF     | Red painted (Bands)     |
| 13          | 20285       | Bowl/basin, simple rim    | 3aF     |                         |
| 14          | 20343       | Bowl, ‘v’ shaped, fine    | 1aF     | Incised?                |
| 15          | 20320       | Bowl, ‘v’ shaped          | 1aF     |                         |
| 16          | 20335       | Bowl, ‘v’ shaped, fine    | 7aFF    |                         |
| 17          | 20337       | Jar, c. lug handles, sml  | 2aM     | Red painted             |
| 18          | 20255       | Handle, lug               | 1aM     | Red painted             |
| 19          | 20309       | Jar, carinated, c. handle | Variant | Red slip                |
| 20          | 20325       | Handle, knob              | 14cM    |                         |

with olive oil processing in the past (Epstein 1998: 164), and interestingly, this vessel was found on a floor [1508], which also had olive pits scattered on it (see above).

*Fenestrated bowls/stands:* The base of a stand (Fig. 12.5) was uncovered from Area I. This example has scalloping around the rim, and the classic bands of red paint.

*Closed vessels – jars:* The jar repertoire includes the usual short and tall necked jars (Fig. 12.6-7). Many of these jars were handled and the handle repertoire contains both loop and lug handles (Fig. 12.18-19), but it also has some knob handles (Fig. 12.20).

*Holemouths:* Holemouths are present in the form of simple thick rims (Fig. 12.8) or the slightly up-turned rim common from the middle Chalcolithic phases (Fig. 12.9).

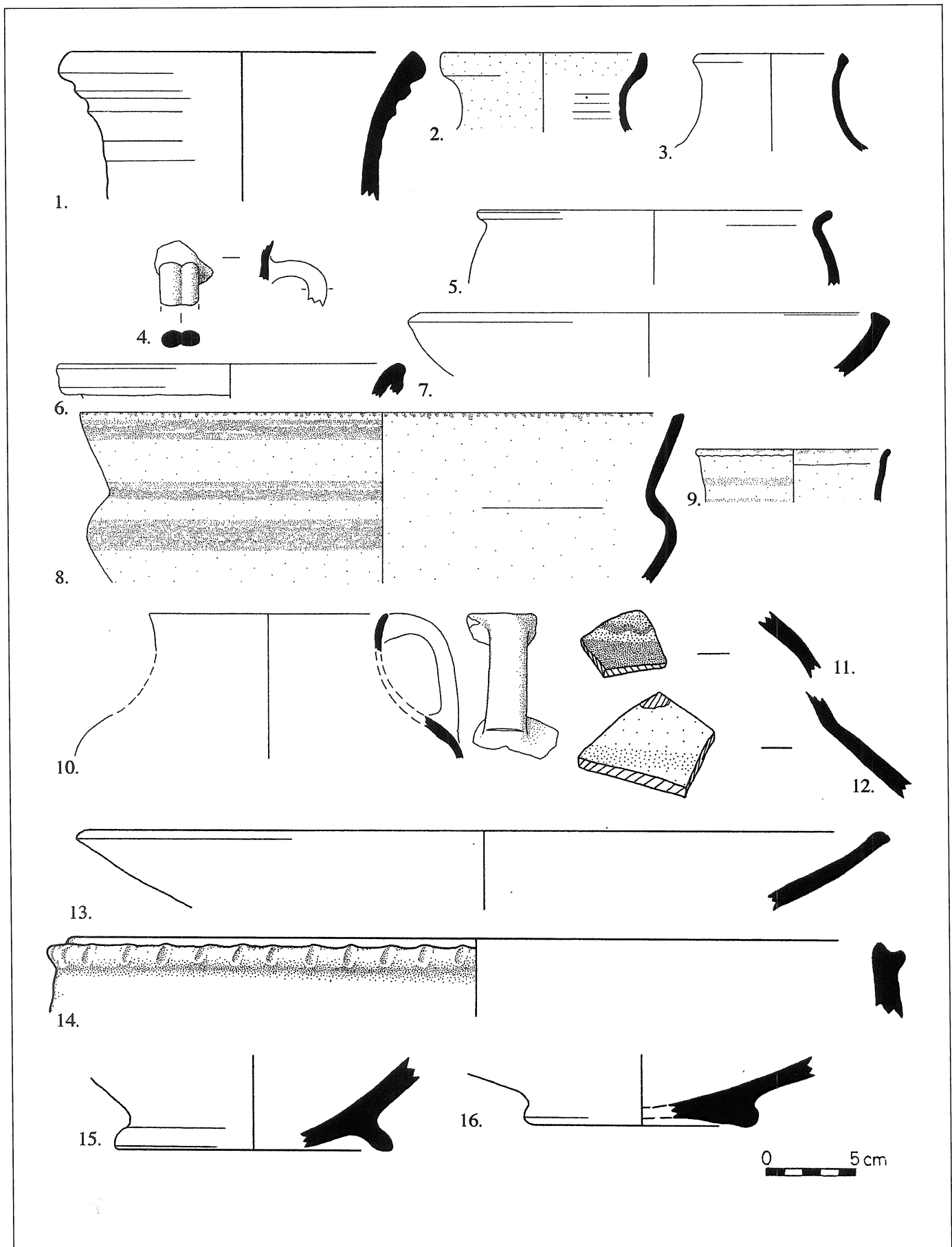
*Fossil indices:* The excavations have not uncovered any cornets, although there are a number of churns, both large (like those found at Be’er Sheva sites (see Lovell *et al.* 2006: fig. 10.18-19) and some smaller ‘bird-shaped’ vessels (Lovell *et al.* 2006: fig 10.20, 24).

### Chipped Stone (HM)

The lithic assemblage recovered during the 2005 field season is made up of 22,713 chipped stone pieces, the majority of which are retouched, followed (in order of frequency) by flakes, debris, cores, bladelets, core trimming elements and blades (Table 1). Retouched artefacts and cores were analysed at a further stage, classified according to Rosen’s typologies<sup>6</sup> (1997: 40). Previous studies of the site assemblages (Lovell *et al.* 2005, 2006) have established that

6. We added further types to Rosen’s list including further sub-types amongst the scraper tool class, as well as the borer class, accounting for different types of blanks (*i.e.*

blades, flakes or bladelets) used for the manufacture of these types of tools.



13. Ceramics from Areas B and H.

| Figure 13.# | Catalogue # | Form                     | Fabric         | Décor (Period)                   |
|-------------|-------------|--------------------------|----------------|----------------------------------|
| 1           | 20269       | Jar, tall neck           | Fine buff      | (LBA-IA?)                        |
| 2           | 20287       | Jar, tall neck           | Grey buff      | White slip (IA)                  |
| 3           | 20289       | Jar, tall neck           | Buff           | Red slip (LBA)                   |
| 4           | 20256       | Juglet, double handle    | Fine buff      | White slip (MB-LBA)              |
| 5           | 20347       | Cooking pot, everted rim | Cook pot       | (LBA)                            |
| 6           | 20348       | Jar, folded rim          | Orange buff    | (MB-LBA)                         |
| 7           | 20308       | Bowl, bevelled rim       | O buff         | (MB-LBA)                         |
| 8           | 20345       | Krater, carinated        | Fine buff      | Chocolate-on-white (MB-LBA)      |
| 9           | 20346       | Bowl, carinated (?)      | Fine pale buff | Chocolate-on-white (MB-LBA)      |
| 10          | 20349       | Jar, with loop handle    | Buff           | Red traces (LBA)                 |
| 11          | 20261       | Bodysherd                |                | White slip and bichrome (LBA?)   |
| 12          | 20262       | Bodysherd                | 9aC            | White slip, red painted (MB-LBA) |
| 13          | 20247       | Bowl, platter            | Buff           | White slip (MB-LBA)              |
| 14          | 20258       | Cooking pot              | Cook pot       | Applied impressed dec (MB-LBA)   |
| 15          | 20260       | Base, flaring            | Fine buff      | White slip (MB-LBA)              |
| 16          | 20335       | Base, disc               | Buff           | (MB-LBA)                         |

**Table 1:** Chipped stone - debitage counts.

| Type                    | Number |
|-------------------------|--------|
| <b>Debitage</b>         |        |
| Blades                  | 165    |
| Bladelets               | 281    |
| Flakes                  | 5462   |
| Cores                   | 379    |
| Core Trimming Elements; | 201    |
| Ridged blades           | 58     |
| Core tablets            | 46     |
| Surface rejuvenation    | 77     |
| <b>Debris</b>           |        |
| Chips                   | 1883   |
| Chunks                  | 4588   |
| <b>Retouched Pieces</b> |        |
| Tools                   | 9754   |

the chipped stone from al-Khawārij is consistent with other Late Chalcolithic and Early Bronze Age lithic assemblages from the southern Levant. It is characterised by a high abundance of ‘expedient’ flake tools, with more formal tool types including discs, star ‘scrapers’, tabular knives, and truncated, straight backed glossed pieces making up a smaller percentage of the

toolkit, and therefore appears to reflect the latest phase of the Chalcolithic.<sup>7</sup> Few intrusive elements, notably occasional Neolithic tools, have been recovered. For the most part, however the excavated chipped stone artefacts represent a chronologically homogenous assemblage, with limited contamination.

#### *Raw Materials*

The flint knappers of al-Khawārij relied on a range of locally procured raw materials. Expedient tools such as the abundant retouched flakes, scrapers, denticulates, notches and borers, as well as the celt group were made on locally available materials in the form of medium to small sized wadi cobbles. This re-deposited and largely rolled flint generally has abraded surfaces and repatination, where by the cortex has been partially removed due to depositional erosion. The knapping qualities of this material is generally of medium to poor quality as the flint is largely medium grained, rather than the fine grained, high quality stone used for more specialised products found on the site. Some

7. Prismatic blade technology is present but limited, and shows little evidence of having been used for agriculture due to a lack of sickle gloss. Again, this suggests a

very early, preliminary distribution of this type before their true floruit in the Early Bronze Age.

local production did draw on more purposeful selection of material, in particular a number of the more formal tools such as the celts and awls show selection of finer flints.

Tabular scrapers and knives, backed blades and more formal blade based tools appear to have been made offsite. In particular, common examples of the tabular technologies appear to be of the Eocene flint found in southern Jordan as they are on very fine-grained brown flints. For the disc, unifacial knives and star tools, the raw material source is currently unknown. They appear to have been knapped from material superior to that found in the direct vicinity of the site but may represent use of wider local resources. The fine-medium grained light grey flint may be a material procured from some distance — as very little of this finer quality grey flint turns up in the debitage, it is unlikely that these items were knapped within the current excavation areas.

### Technology

The assemblage can largely be characterised as expedient — the *ad hoc* technological style resulting for the most part in the production of flakes. Blade and bladelets occur in far fewer numbers and those recovered also tend towards an expedient production with few dedicated blade/bladelet cores and limited formal prismatic blank examples. Neither cores, nor core trimming elements indicate planned or rigorously intentional production of blades. Primary blades and bladelets are extremely rare (n=10), with secondary and tertiary blades occurring more frequently (Secondary: n=123, Tertiary: n=313) within the debitage counts. These were produced on site from mixed flake/blade cores. Among the retouched pieces, prismatic backed blades and glossed pieces are suggestive of blade production not executed at the site, or in a specialised area/workshop yet to be excavated.

The presence of a number of roughouts and bifacial pre-forms suggests local production of celts, discs, stars and unifacial knives. These roughouts seem to represent evidence of bifacial shaping and thinning of wadi cobbles, however large flakes used for blanks of these tools have also been recovered. Grinding and polishing were commonly employed to form the working edge of the celts, facilitating a longer use life than

flaked tools. This intentional process of preparation and skilful flake removal sequences differs sharply from the expedient production seen in much of the rest of the assemblage, which may suggest curation of these tools, also explaining their presence in fewer numbers.

### Typology

A breakdown of types is given in **Table 2**. What follows are brief comments on each main group.

*Projectile points*: Only one projectile point was identified in the assemblage (**Fig. 14.1**). The miscellaneous type was recovered from E9, the same area from which the microlithic lunate was recovered in 2004 (Lovell *et al.* 2006: 48, fig. 11). Due to the nature of the site, thought to be largely agricultural, this absence of projectiles is not unexpected and the limited recovery is likely to reflect these items true importance on the site.

*Glossed pieces*: The most prevalent tool type found with gloss are the backed and truncated blades (n=32). A number of different typologies are able to be distinguished, such as the arched, backed sickle blade (n=17) (**Fig. 14.2**) and simple blade segment pieces (**Fig. 14.3, 7**). The presence of prismatic blades (n=2), truncated and in one case backed is noteworthy and typical of the northern Chalcolithic (Rosen 1997: 50). One other retouched flake has also been designated 'sickle' by the presence of gloss on one margin which may suggest it was used for harvesting, although there are other explanations for the presence of this luster, including woodworking.

*Retouched blades and bladelets*: Simple retouched blades are the most common type (n=979) and are evenly distributed throughout the site (**Fig. 14.4, 6**); bladelets (n=255) are also common and widespread. The nature of the retouch varies greatly from piece to piece. Two microendscrapers were made on bladelet blanks.

Straight backed (n=49) and arched backed (n=32) blades both show a high degree of homogeneity and resemble examples with gloss, suggesting that they were spare parts for use in a similar activity, likely in a composite sickle type implement. Two examples of the Canaanite technology in the assemblage (**Fig. 14.5**) also suggest a late date for this group; the introduction of this blade industry is generally thought



**Table 2:** Chipped stone - breakdown of counts across tool types.

| Tool type                                  | Number |
|--|--------|
| <b>Projectile Points</b>                   |        |
| Miscellaneous point                        | 1      |
| <b>Glossed Pieces</b>                      |        |
| Prismatic, backed, truncated blade segment | 1      |
| Prismatic, simple, truncated blade segment | 1      |
| Backed, truncated simple blade segment     | 32     |
| Arched, backed sickle blade                | 17     |
| Simple blade and segment                   | 11     |
| Other sickles                              | 1      |
| <b>Retouched Blades and Bladelets</b>      |        |
| Retouched Canaanian blade or segment       | 2      |
| Straight, backed blade                     | 49     |
| Arched, backed blade                       | 32     |
| Bi-truncated blade                         | 1      |
| Simple retouched blade                     | 979    |
| Microendscraper                            | 2      |
| Retouched bladelet                         | 255    |
| <b>Borers</b>                              |        |
| Awl on flake                               | 27     |
| Drill on flake                             | 11     |
| Drill on blade                             | 8      |
| <b>Tabular Scrapers and Knives</b>         |        |
| Round tabular scraper                      | 5      |
| Oval tabular scraper                       | 10     |
| Elongated tabular scraper                  | 3      |
| Fanscraper                                 | 3      |
| Tabular knife                              | 3      |
| Irregular tabular scraper                  | 23     |
| <b>Knives</b>                              |        |
| Unifacial knives                           | 15     |
| <b>Disc Tools</b>                          |        |
| Disc                                       | 1      |
| Holed disc                                 | 2      |
| Star scraper                               | 1      |
| <b>Scrapers</b>                            |        |
| Simple endscraper on flake                 | 119    |
| Simple endscraper on blade                 | 2      |
| Tongue-shaped endscraper                   | 1      |
| Sidescraper on flake                       | 191    |
| Sidescraper on blade                       | 28     |
| Steep scraper                              | 1      |
| Small scraper on flake                     | 19     |
| Massive scraper                            | 3      |
| Simple scraper                             | 45     |
| <b>Notches and Denticulates</b>            |        |
| Flat notch                                 | 612    |
| Steep notch                                | 127    |
| Flat denticulate                           | 99     |
| Steep denticulate                          | 271    |
| <b>Retouched Flake/Piece</b>               | 6472   |
| <b>Celt Tools</b>                          |        |
| Straight edge axe                          | 6      |
| Round edge axe                             | 7      |
| Adze                                       | 12     |
| Chisel                                     | 24     |
| Pick                                       | 4      |
| Roughout                                   | 8      |
| <b>Varia</b>                               |        |
| Chopper                                    | 2      |
| Burin                                      | 4      |
| Threshing teeth                            | 1      |
| Pecked stone                               | 2      |
| Neolithic borer                            | 2      |
| Other                                      | 1      |

to straddle the late Chalcolithic to Early Bronze Age divide (for a recent appraisal see Milevski *et al.* in press).

**Borers:** Awls (Fig. 14.8-9) were only made on

flakes (n=27). Drills (Fig. 14.10) were also predominantly made on flakes (n=11), but also occur in small numbers on blades (n=8), including one that had been pierced. Distribution of these items showed no particular pattern.

**Tabular scrapers:** A range including round (n=5), oval (n=10), tabular knife (n=3), elongated (n=3), fan (n=3) and irregular (n=23) examples were recovered. These are likely to have been imported because the material is not local and little production evidence is seen in the debitage, although some limited production or modification can be inferred. Of the fanscrapers, all three examples were recovered from Area E, one of which was heavily pottlidded, having been burned (Fig. 14.11); no other heat altered lithic material was recovered with it. Given their frequency in Area E and previous suggestions that they may be associated with hides and/or wool (Quintero *et al.* 2002: 46) we plan a use wear study to test these suggestions. One oval tabular scraper from this trench had also been centrally pierced. Tabular scrapers occurred in all units; however, they were far less frequently recovered in Area G, which has only three examples.

**Knives:** In addition to the tabular knives, fifteen unifacial knives were also recovered (e.g. Fig. 14.13), although bifacial examples were absent. They occur in significant quantities in Area E, and are distributed evenly, though to a lesser extent in the other trenches. The absence of bifacial knives supports the Late Chalcolithic date as these are generally seen imported and produced from the EBA.

**Discs:** These enigmatic Chalcolithic tools appear in small numbers, although this is not unusual. One complete disc (Fig. 14.12), two pierced discs and a star scraper (Fig. 14.21) were recovered, their distribution across the site belying particular associations: the complete disc is from I2, the holed from D5 and E9, and the star from G3. The function of the tools has yet to be established – it is hoped that use – wear analysis of these examples will shed light on this.

**Scrapers:** These are largely made on flake blanks, although a few examples occur on blades. 409 examples in total were examined, including simple endscrapers, sidescrapers, simple, steep, small and massive scrapers. Their distribution was even and largely regular throughout the ex-



## Conclusion

The assemblage from the 2005 season at al-Khawārij represents a largely homogeneous group that suggest the typical toolkit of the Late Chalcolithic. Some pieces indicate that this may be transitional, *i.e.* limited representations of tools that become more common in the EBA. Many of the pieces were produced on site, but some appear to be more specialised in nature and the resulting waste products of these technological pursuits are not found on site. Primarily, these tools appear to fit within the picture of a community performing domestic and largely agricultural functions.

## Ground Stone (IKM)

The 2005 ground stone artefacts (n=107) belong to the same 'domestic' assemblage as recovered and recorded in previous seasons (Lovell *et al.* 2005: 196-7, fig. 8; Lovell *et al.* 2006: 51, fig. 12). The corpus has been subdivided into six broad categories following classification systems devised by Wright (1991, 1992) and parallels with contemporaneous Chalcolithic sites in the southern Levant.<sup>8</sup> These categories; basalt vessel fragments (with fenestrated stands and the single tripod vessel as sub-categories), mobile grinding implements,<sup>9</sup> perforated stone objects (including agricultural tools and weights), querns or grinding slabs, mortars and a collection of miscellaneous stone fragments, form the basis of this analysis.

## Raw materials

The raw materials in use at al-Khawārij (as stated in earlier reports) represent a typical blend of locally available and imported stones (Philip and Williams-Thorpe 1993: 15, fig. 1). Percentages are similar to those previously presented: basalt (accounting for approximately 49% of the 2005 finds), limestone (approximately 29%), sandstone (< 4%), flint (> 6%), conglomerate (< 3%) and chert (< 2%). Basalt, usually of a very fine-grain, is commonly used for vessels, whereas highly vesicular basalt tends to be reserved for grinding slabs (querns) as evident at other Chalcolithic sites (Philip and Williams-

Thorpe 2001: 26). Substantial basalt outcrops are found at ash-Shamah although without geochemical or petrological examination exact provenance for our material remains uncertain.<sup>10</sup>

## Typology

The following is a brief discussion of each of the types (forms) identified above. Domestic objects used in food processing (querns, mortars, pestles and pounders) and agricultural processes (hoes, weights) do not appear to have undergone any obvious change in form, distribution or use from the preceding Neolithic period through to the Chalcolithic. However there are a number of groundstone objects in this assemblage typical to the Chalcolithic.

*Basalt Vessel Fragments (n=8)*: The forms of basalt vessels represented in Chalcolithic assemblages follow the general morphology of ceramic proto-types. The al-Khawārij fragments can be identified as either V-shaped vessels (**Fig. 15.2-3**), typical of the Chalcolithic ground stone assemblage (see particularly Epstein 1998: 234; Gilead 1995: 311; Lee 1973: 260; Mallon *et al.* 1934: 67-70; Perrot *et al.* 1967: 216, fig. 13: 1-3) or simple rounded forms. The al-Khawārij fragments are composed of fine-grained basalt and have been finely ground and polished. The corpus includes three body, and five rim fragments. One example, from the Bronze Age levels in Area H is illustrated here and appears to represent a platter bowl (**Fig. 15.7**).

*Fenestrated stands (n=5)*: Equally the basalt fenestrated stand is typical of the Chalcolithic and comparable stands can be identified at many Chalcolithic sites (see Braun 1990: 87 for discussion). The 2005 finds are represented by three bases with a single knob or foot preserved, two of which have double shallow incised horizontal lines (**Fig. 15.4**) and one leg fragment. A fourth fragment represents a complete base (**Fig. 15.5**) with the beginnings of three feet.

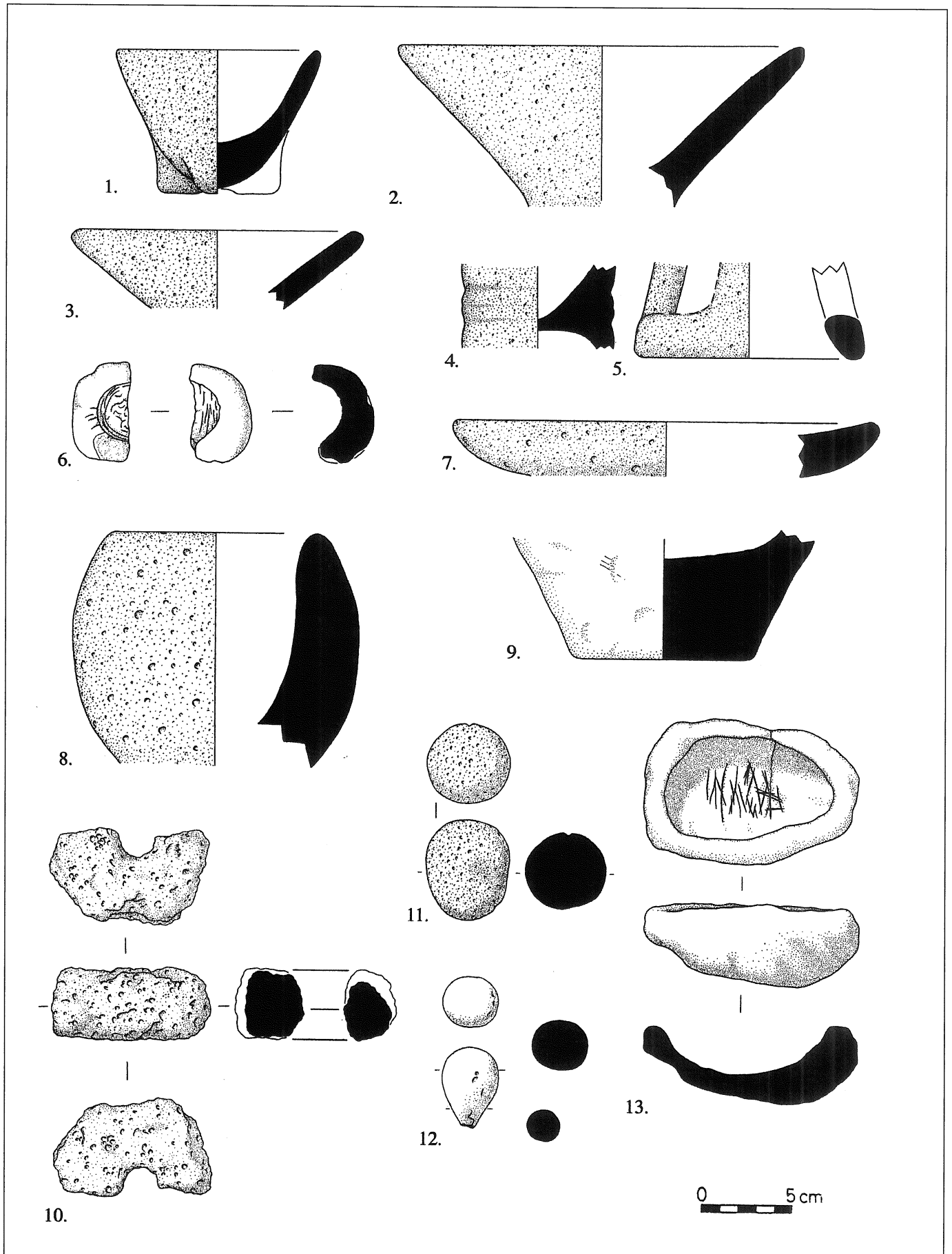
*Tripod vessel (n=1)*: Parallels for Chalcolithic tripod vessels can be found at a number of contemporary sites including Tulaylāt al-Ghassūl (Mallon *et al.* 1934: 68, fig. 23:7), Golani sites (Epstein 1998: 234, Pl. XXXVII: 10, 12, 13, 14)

8. As applied to the 2004 and 2003 al-Khawārij ground stone assemblages.

9. Termed 'grinding stones' previously (Lovell *et al.*

2006)

10. A representative sample of ground stone material from both seasons will be submitted for materials analysis.



15. Ground stone from 2005 excavations.

| Figure 15.# | Reg #  | Description                              | Context    |
|-------------|--------|--|------------|
| 1           | 051555 | Basalt tripod vessel                     | E9 1819    |
| 2           | 050811 | Basalt bowl, 'v' shaped                  | I1 1600    |
| 3           | 051060 | Basalt bowl, 'v' shaped                  | E11 1590   |
| 4           | 050633 | Basalt chalice fragment                  | E9 1575    |
| 5           | 050188 | Basalt stand, fenestrated                | E7 1459    |
| 6           | 050434 | Limestone mortar type 3 / 'socket stone' | I1 1512    |
| 7           | 050254 | Basalt bowl, platter                     | H1 1533    |
| 8           | 051208 | Basalt mortar type 1 / bowl, deep        | E11 1774   |
| 9           | 051393 | Limestone mortar type 2                  | E8 1807    |
| 10          | 050317 | Basalt weight / Perforated disc          | E8 1428    |
| 11          | 051551 | Basalt pounder                           | E9/11 1818 |
| 12          | 050187 | Chert, pear shaped nodule                | I1 1507    |
| 13          | 050496 | Mortar type 1                            | E7 1461    |

and Neve Ur (Perrot *et al.* 1967: 216, figs 13: 1, 2). The al-Khawārij example, from Area E, represents a full profile with near complete rim (Fig. 15.1).

*Perforated Stone Objects (n=14)*: This category includes those objects classified as miscellaneous perforated discs, possible agricultural tools (which may be interpreted as weights) as well as a few small miscellaneous perforated objects (Fig. 16.15). Similar to the 2004 finds, the 2005 corpus includes a number of un-worked chert and limestone pierced stones with a carefully drilled (but not centrally placed) perforation. These can be identified as weights and are similar to ceramic examples from al-Khawārij.

The five basalt perforated discs may be interpreted as agricultural tools or stone weights (Fig. 15.10).

*Mobile grinding implements (n=9)*: This category incorporates a number of different objects that would have been employed in the grinding and pounding of food stuffs, or for craft and industrial purposes.<sup>11</sup> The nine objects themselves are quite different in form and material. It can thus be assumed they were utilized for different tasks and functions. These forms represent a typical array of mobile grinding implements, for example; hammerstones, basalt pounders (Fig.

15.11) and pestles.

*Querns or grinding slabs (n=32)*: The objects classified here represent large grinding slabs, which may be considered as lower stationary grinding implements or querns. A considerable percentage of these items (84%) are composed of highly vesicular basalt, reflecting similar percentages as in the 2005 finds, and possibly indicating the types of materials that would have been ground on these surfaces. A number of the examples are small fragments (< 10cm) that have been identified as grinding fragments by the existence of a single smoothed upper surface (through use-wear).

*Mortars (n=26)*: Those artefacts classified as mortars have been sub-divided into a number of sub-types based on size, shape, working and possible function. Type 1 (n=11) are large (average rim size < 14cm) rounded, or oval vessels with deep cavities and thick walls (Fig. 15.8). Vessels in this type have been worked on both the interior and exterior surfaces, however the exterior surface is often roughly finished. This type includes a smaller more oblong variant (Fig. 15.13).

Type 2 is represented by a single vessel (Fig. 15.9). This form is more squared in shape, with a very sharply defined flat base, with rather thin

11. The function of these items may not be limited to food processing/production and it is possible these artifacts were used in the formation of other stone tools. A

more in-depth functional analysis will be presented in the final report.

walls in comparison to the thickness of the base.

Type 3 includes those vessels commonly identified as 'socket stones' (Fig. 15.6). These can be described as rounded or squared slabs, generally un-worked, although often smoothed with a small central divot. This category also includes a smaller variant that fits comfortably in the hand.

Due to their relatively uniform shape over time, these forms cannot be used as chronological markers or index fossils, nor can any comment of their dating be made. Interestingly, in comparison to the number of mortars, which presumably were used in conjunction with a hand-held grinding implement, there are relatively few artefacts that can be identified as pestles or pounders.

*Miscellaneous (n=13)*: Those objects identified here as miscellaneous represent a variety of objects, some of which may belong to one or another of the above categories. Six of these 'miscellaneous' artefacts could possibly be identified as grinding slabs, however due to their fragmentary nature it is difficult to identify them definitively. A single find in this category has been analysed and catalogued as an axe-celt: oval-trapezoidal in shape, it has a convex working edge with polishing and flaking at its base.

### Conclusions

The forms discussed here and in earlier reports represent typical domestic assemblage with a high percentage of artefacts used in food processing and production. Using the classificatory system based upon Wright (1991, 1992) and contemporaneous material, the final report will explore possible function more fully.

### Small Finds (CE)

The small finds in this report comprise worked bone, ceramic objects, glass, beads, building materials, metals, and other miscellaneous items.

*Worked bone (n=22)*: A far greater number of worked bone objects were recovered during this season of excavation than previously, 17 of the 22 items were bone points (Fig. 16:1-2). Bone points are by far the most common worked bone object recovered from other excavations. Chalcolithic examples have been

found at Tulaylāt al-Ghassūl (Hennessy 1969: 20), Shiqmim (Levy 1987: 512-513), Magas (Hanbury-Tenison 1986: fig. 22) and the Nahal Qanah cave (Gopher and Tsuk 1996: 126-127).

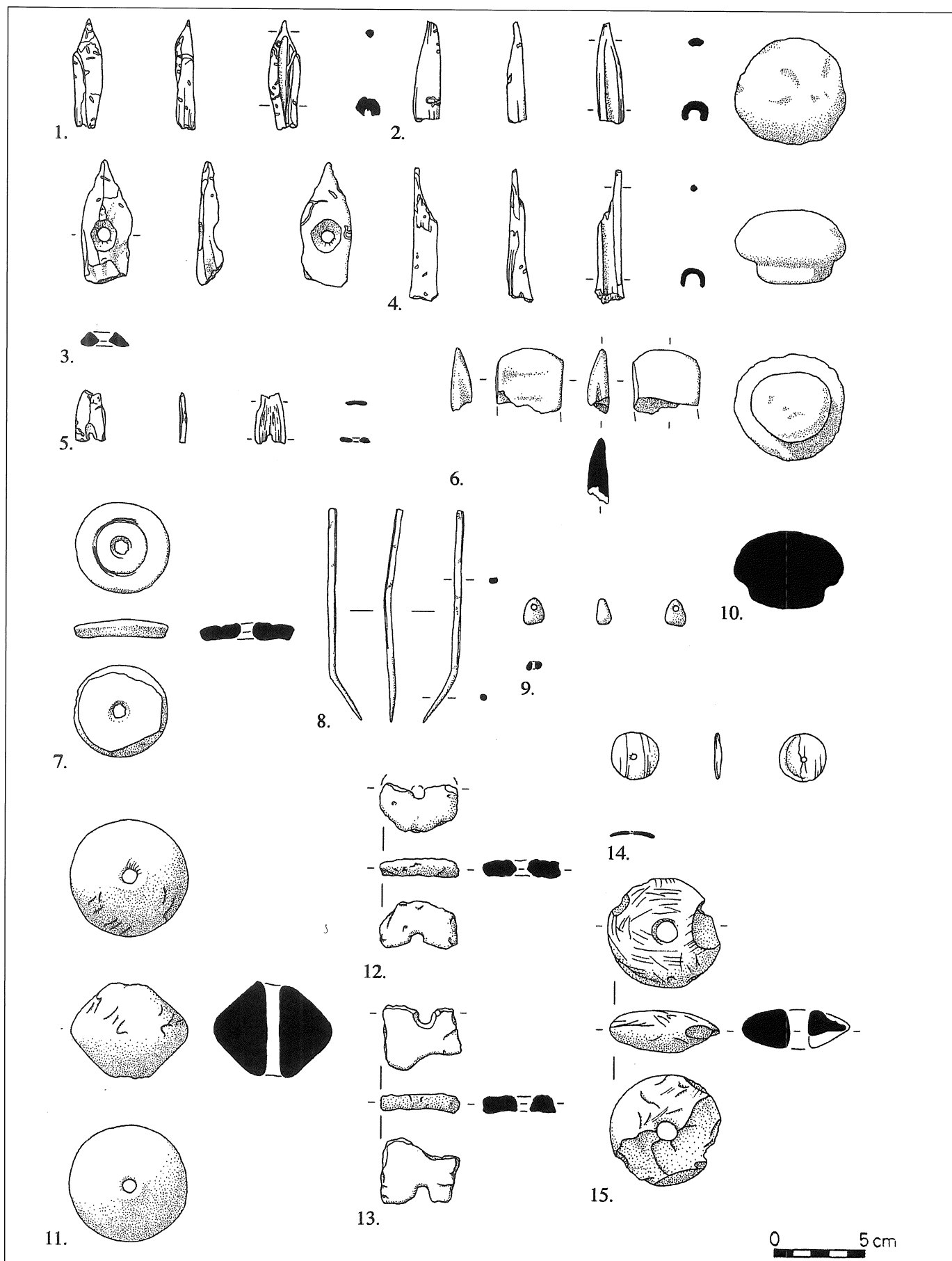
One object is slightly unusual. The point does not taper evenly from both edges of the bone piece, but tapers from one side only, to form a point which is circular in section (Fig. 16.4). The other items are fragments of shuttles or spatulas - Figure 16.5 is the best example. Two other pieces and one fragment (all from the northern longroom in Area E) could also be from the same type of object.

*Ceramic loomweights, discs and stoppers (n=20)*

*Pierced discs (n=5)*: The general consensus regarding the identification of pierced ceramic discs is that they were used as spindle whorls. A number of excavation reports have used the term to describe such objects, generally made from small lumps of clay, but also from recut sherds (Epstein 1998: 166). Chalcolithic examples of such objects have been recovered from Tulaylāt al-Ghassūl (Hennessy. 1969: 20-21), Shiqmim (Levy 1987: 514-515) and from a number of sites in the Golan (Epstein 1998: 166 and plate XXI). Our examples are spread across the site (e.g. Fig. 16.7).

*Recut sherds (n=5)*: Pierced recut sherds, like Figure 16.12-13, have also been identified in a number of excavation reports as having been used as spindle whorls (Epstein 1998: 166, pl. XXI) and (Levy 1987: 512-513). They appear alongside the pierced ceramic disc. Unpierced examples may have been used as counters or gaming pieces, or perhaps as makeshift lids for vessels.

*Loomweights (n=9)*: The term loomweight is used here to differentiate the size and form of this group of objects from the pierced ceramic discs, as quite often the two groups are identified as having been used as spindle whorls. Similar artefacts are known from other Chalcolithic sites, e.g. Tulaylāt al-Ghassūl (Hennessy 1969: 20-21), Shiqmim (Levy 1987: 514-515) and a number of sites in the Golan (Epstein 1998: 166, pl. XXI). Most come from Area E and are in two basic shapes – round or biconical (Fig. 16.11). Note that the only loomweight from Area H comes from topsoil and may also be Chalcolithic because loomweights from later periods (Middle



16. Other finds from 2005 excavations.

| Figure 16.# | Reg #  | Description                      | Context   |
|-------------|--------|----------------------------------|-----------|
| 1           | 050009 | Polished bone point              | E2 +      |
| 2           | 050970 | Polished bone point              | E7 1479   |
| 3           | 051135 | Chert shuttle (?)                | E8 1594   |
| 4           | 050568 | Worked bone point                | H1 1543   |
| 5           | 051388 | Worked bone - shuttle            | E8 1807   |
| 6           | 051257 | Cu 'chisel' fragment             | I1 1508   |
| 7           | 051253 | Ceramic pierced disc             | I1 1508   |
| 8           | 051350 | Bronze pin                       | D6 1710   |
| 9           | 051349 | Stone bead/pendant               | E10 1782  |
| 10          | 050909 | Ceramic stopper                  | E10 1586  |
| 11          | 050442 | Ceramic loom weight              | E10 1434  |
| 12          | 050875 | Ceramic pierced recut sherd/disc | E4/6 1472 |
| 13          | 050495 | Ceramic pierced recut sherd/disc | G1 1489   |
| 14          | 050426 | Shell disc bead                  | E10 1434  |
| 15          | 050186 | Ground stone disc                | I +       |

Bronze Age onwards), are generally much larger and weightier. The heaviest example recovered from the site (106g) would be considered quite small when compared to the weight of those objects more traditionally thought of as loomweights (Friend 1998: 9).

*Jar stopper (n=1)*: This ceramic jar stopper is unique. It comes from E10 [1586] and is circular in plan, mushroom shape in section (**Fig. 16.10**). The vessel mouth into which it fit would have been small, suggesting it contained something of value, and/or something used in only small amounts.

*Beads (n=2)*: Beads made of shell are discussed within the malacology report (below). The two other beads, one bone and one stone, were both found in Area E. The bone disc bead is circular, with flat upper and lower surfaces, and straight sides. It has a medium circular thread hole in its centre. The stone bead/pendant is almost pyramidal in shape; it has a small hole near the top for suspension (**Fig. 16.9**).

*Glass bangles (n=3)*: The glass items recovered during excavation appear to be modern. One of the two bangle fragments was found in topsoil (in Area I), the other as a result of baulk cleaning in Area E. It has a body of pale blue, with decoration of apple green and twisted black and white trail, topped with orange trail along length

of fragment. Not enough remains of it to date its manufacture, but it is likely to be modern.

*Metal (n=9)*: Most of the metal finds from this year are likely to be modern — iron fragments for the most part — but two copper adze fragments, one from [1508] in Area I1 (**Fig. 16.6**) and one from E10, and a bronze nail shank from D6 (**Fig. 16.8**) were also recovered. These have been subjected to detailed analysis, the results of which can be found in the report by Lloyd Weeks (see below).

**Archaeometallurgy (LW)**: Two fragmentary chisels (051257 - **Fig. 16.6** - and 051351) and a complete awl/pin (051350, **Fig. 16.8**) were subjected to metallographic and compositional analysis at the University of Nottingham using wavelength dispersive spectrometry (WDS) on an electron microprobe. The full data will be published in a forthcoming article, but we can report here that they fit well with data from previous compositional studies of Chalcolithic artefacts from the southern Levant.

The high purity of the Wādī ar-Rayyān copper artefacts is similar to Chalcolithic material from archaeological sites in the Feinan region (Hauptmann 1989: Tab. 14.3) and artefacts from Tall Abū Maṭar and Şafadi (Hauptmann

1989: Tab. 14.4) in the Beer Sheva Valley, although the Fe levels recorded in the Wādī ar-Rayyān artefacts are somewhat lower than these samples. Compositionally, the Wādī ar-Rayyān artefacts are most similar to three Chalcolithic artefacts from the Cave of the Sandal, Ketef Jericho, analysed by Segal *et al.* (2002: Tab. 1, in particular to the axe and chisel samples from that site), and to three pure copper tools from the Nahal Mishmar hoard analysed by Tadmur *et al.* (1995: Tab. 2, Nos. 26-28). The Wādī ar-Rayyān samples add to the growing evidence indicating that Levantine Chalcolithic tools such as axes, adzes, and chisels, are invariably made of relatively pure copper, whereas more elaborate “ritual” or “prestige” artefacts, such as the standards and maces of the Nahal Mishmar hoard, are generally (although not always) made from complex and likely foreign alloys incorporating high levels of arsenic and antimony (Tadmur *et al.* 1995; Segal *et al.* 2002).

#### *Building Materials and other Samples*

A further seven samples of slag were recovered from the 2005 excavations, six samples from area E and one from area D. For analysis of slag recovered from the site in 2004, see Lovell *et al.* 2006. In addition organic, mud brick (E9 and E10), plaster, and chalk samples were taken and are yet to be analysed.

#### **Fauna (KW)**

This preliminary report covers the faunal material recovered from both the 2004 and the 2005 excavation seasons. Faunal remains from reasonably secure contexts were collected by sieving using 5mm mesh in addition to recovery from the flotation residue. The following statistical information is derived from a study of the most secure Chalcolithic contexts. Other contexts were subjected to a superficial examination only.

Identifiable fragments are presented as MinAU (minimum anatomical units), after Halstead (1992). The MinAU (Table 3) for the combined contexts under study here is 469 (circa 20% of the total fragment count for those contexts). This low percentage is due to

preservation and the degree of fragmentation and the conclusions need to be considered in light of the size of the sample. The following discussion compares changes across space rather than changes through time and will therefore concentrate on comparisons between areas C, D, E and I.<sup>12</sup>

#### **Preservation and Recovery**

The programme of sieving employed makes it unlikely that any difference between the recovery of smaller and larger bones is due to sampling. The lack of neonatal material is either due to disposal outside the site boundary or lack of survival. Given the overall preservation of this material and the low density of neonatal bone it may be that most of this bone did not survive.

Over 45% of the fragments have surface lime concretions such that it is impossible, in most cases, to distinguish surface features. The degree of these concretions is significantly higher in Area E at 61% when compared with Areas C, D and I. This may be due to different soil conditions in that area at time of burial and post deposition factors. Gnawing has also affected this assemblage with an overall rate of around 25% – this is most likely due to dogs as there are some canine fragments present in the assemblage. There is a small amount of rodent gnawing. In Areas C and D there is over 45% gnawing compared with 18% in Area E. This may be due to the high rate of concretions obscuring surface details but given the degree of gnawing on most of the bones this is probably unlikely. It is probable that the bones in Areas C and D were more exposed to carnivores whereas in Area E differing mode of disposal may have made these bones less like to be gnawed and this may be reflected in the higher rate of concretions.

#### **Results**

*Species composition:* The assemblage is dominated by domestic mammals with little exploitation of wild animals. The small numbers of bones for each element and the lack of reference material available in Sydney has made it impossible to separate gazelle from

12. For the purpose of this report, Areas B (2004) and H (2005), which were largely Bronze Age, have been

excluded.



**Table 3:** Faunal - Minimum number of anatomical units (MinAU) for all species (Chalcolithic contexts only).

|                     | Cow | Pig  | Sheep/<br>Goat | Sheep | Goat | Gazelle | Sheep/Goat/<br>Gazelle | Dog | Bird | Total |
|---------------------|-----|------|----------------|-------|------|---------|------------------------|-----|------|-------|
| Horn/Antler         | 4   | 0    | 5              | 2     | 5    | 0       | 1                      | 0   | 0    | 17    |
| Mandible            | 0   | 9    | 0              | 0     | 0    | 0       | 35                     | 0   | 0    | 44    |
| Scapula             | 1   | 6    | 1              | 8     | 2    | 1       | 13                     | 0   | 0    | 32    |
| Humerus(proximal)   | 0   | 4    | 0              | 0     | 0    | 0       | 2                      | 0   | 0    | 6     |
| Humerus (distal)    | 2   | 10   | 3              | 8     | 1    | 1       | 18                     | 0   | 0    | 43    |
| Radius(proximal)    | 3   | 3    | 7              | 1     | 0    | 0       | 15                     | 0   | 0    | 29    |
| Ulna                | 1   | 6    | 5              | 1     | 0    | 0       | 2                      | 0   | 0    | 15    |
| Radius(distal)      | 1   | 2    | 3              | 0     | 0    | 0       | 10                     | 0   | 0    | 16    |
| Metacarpal (prox)   | 4   | 4    | 7              | 0     | 0    | 0       | 8                      | 0   | 0    | 23    |
| Metacarpal (distal) | 2   | 2    | 3              | 0     | 0    | 0       | 3                      | 0   | 0    | 10    |
| Pelvis              | 1   | 1    | 0              | 0     | 1    | 0       | 9                      | 0   | 0    | 12    |
| Femur(prox)         | 0   | 1    | 1              | 1     | 0    | 0       | 9                      | 0   | 0    | 12    |
| Femur (distal)      | 1   | 2    | 1              | 0     | 0    | 0       | 3                      | 0   | 0    | 7     |
| Tibia (prox)        | 1   | 2    | 2              | 1     | 0    | 0       | 6                      | 0   | 2    | 14    |
| Tibia (distal)      | 1   | 3    | 5              | 4     | 1    | 0       | 11                     | 0   | 0    | 25    |
| Astragalus          | 2   | 2    | 4              | 1     | 0    | 0       | 2                      | 0   | 0    | 11    |
| Calcaneus           | 2   | 0    | 5              | 11    | 3    | 2       | 0                      | 0   | 0    | 23    |
| Metatarsal (prox)   | 2   | 3    | 1              | 0     | 0    | 1       | 16                     | 0   | 0    | 23    |
| Metatarsal (distal) | 0   | 0    | 1              | 0     | 0    | 1       | 5                      | 0   | 0    | 7     |
| Phalange 1          | 7   | 5    | 28             | 0     | 0    | 1       | 12                     | 0   | 0    | 53    |
| Phalange2           | 3   | 0    | 7              | 0     | 0    | 1       | 2                      | 1   | 0    | 14    |
| Phalange 3          | 2   | 2    | 3              | 3     | 1    | 0       | 1                      | 0   | 0    | 12    |
| Metapodial (prox)   | 0   | 1    | 0              | 0     | 0    | 0       | 9                      | 1   | 0    | 11    |
| Metapodial (distal) | 1   | 1    | 0              | 0     | 0    | 0       | 7                      | 1   | 0    | 10    |
| Total               | 41  | 69   | 92             | 41    | 14   | 8       | 199                    | 3   | 2    | 469   |
| % Total             | 8.7 | 14.7 | 19.6           | 8.7   | 3.0  | 1.7     | 42.4                   | 0.6 | 0.4  | 100.0 |

the ovicaprids at this stage (Redding 1981). Only 2% of the assemblage could be positively assigned to gazelle and whilst this may be an underestimation (given that nearly 50% could not be assigned to ovicaprid or gazelle), on the basis of comparison with other contemporary sites, the gazelle population would not be expected to be greater than 4.5% (see Hellwing 1988/89; Mairs in Bourke *et al.* 2000). There is little evidence of exploitation of any other wild species, and only 2 bird fragments.

Of the common domesticates, ovicaprids predominate at ca. 75%. Due to the degree of concretions on many of the bones it was impossible, in most cases, to attempt to differentiate sheep from goat, however, where this was possible sheep outweigh goats by 3:1. The mortality data, based on epiphyseal fusion, for combined sheep and goat shows a 55% mortality by 42 months with the nearly 40% mortality over 18 months.

This does not suggest any reliance on secondary products, however the data are spread over a wide time interval and are based on a small number of bones and therefore exploitation of sheep or goats for fibre/milk cannot be ruled out. Season of death is impossible to assess from this assemblage due to the lack of mandibular data. Fallow and stubble fields provide favourable grazing for sheep and the higher proportion of this species would suggest that this was the predominant environment around the site.

Cattle only constitute 9% of the assemblage and of those 31% are foot bones, predominately found in Area D. The mortality data, based on a very small sample, shows 50% mortality by 36-48 months of age, consistent with a meat only regime of management. Cattle and goats can tolerate poorer quality diets and it may be that these species were used to exploit less favourable areas near the site. These species are



still used today to graze the poorer quality vegetation around olive trees and it is possible that they were utilizing this type of area.

Pigs comprise 15% of the faunal remains with 100% mortality by 36-42 months, again consistent with their use for meat only, as they offer no secondary products. The pig is an excellent forager in wooded areas and they may have been used for grazing or maintained near the site to feed on household waste. The presence of domestic pigs has been correlated with environmental conditions and suggests a rainfall of at least 350mm per annum (Grigson 1995: 254).

Superficial examination of other less secure contexts revealed the presence of equid bones from topsoil. The only bone in a condition to be analysed is a distal radius and it is only possible to classify this as equid. Previous studies indicate that it is not possible to differentiate equid species on this fragment (Davis 1987, Dive and Eisenmann 1986, Eisenmann 1986). Therefore there is no clear evidence for Chalcolithic donkey from al-Khawārij. However, osteological evidence for the donkey is now present from more than one Chalcolithic site in the southern

Levant (Grigson 1995; Mairs in Bourke *et al.* 2000: 79) and recent evidence suggests that the donkey was certainly well established in the EBIA in the southern coastal plain (Whitcher Kansa 2004).

*Consumption and deposition:* For domesticates all body parts are represented suggesting on site processing. This would be consistent with most animals grazing nearby – there is little evidence of any type of seasonal transhumance. Nor is there a great deal of evidence of butchery, but this may be due to poor preservation. What small amount of butchery is present is of stone tool origin.

Over two thirds of the faunal remains were founding Areas D and E, but in general most body parts are evenly represented for all species throughout the site (Table 4). The percentage of the common species for each context is similar except for a higher percentage of cattle bones in Area D. Over 30% of the 47 cattle fragments are phalanges and of those 75% were found in Area D. It is possible that there may have been some use of cattle for skins and that Area D was connected with this activity, as normally animals are skinned with the feet attached. However, for

**Table 4:** Faunal - Number and percentage of species present by individual Areas (MinAu).

| Species            |           | Area A | Area C | Area D | Area E | Area F | Area G | Area I | Total |
|--------------------|-----------|--------|--------|--------|--------|--------|--------|--------|-------|
| Sheep/Goat Gazelle | Count     | 10     | 33     | 47     | 209    | 2      | 10     | 35     | 346   |
|                    | %context  | 67     | 79     | 61     | 76     | 100    | 56     | 85     | 74    |
| COW                | Count     | 0      | 2      | 20     | 18     | 0      | 1      | 0      | 41    |
|                    | %context  | 0      | 5      | 26     | 7      | 0      | 6      | 0      | 9     |
| PIG                | Count     | 5      | 6      | 9      | 41     | 0      | 6      | 2      | 69    |
|                    | % context | 33     | 14     | 12     | 15     | 0      | 33     | 5      | 15    |
| GAZELLE            | Count     | 0      | 1      | 1      | 4      | 0      | 1      | 1      | 8     |
|                    | % context | 0      | 2      | 1      | 1      | 0      | 6      | 2      | 2     |
| DOG                | Count     | 0      | 0      | 0      | 0      | 0      | 0      | 3      | 3     |
|                    | % context | 0      | 0      | 0      | 0      | 0      | 0      | 7      | 1     |
| BIRD               | Count     | 0      | 0      | 0      | 2      | 0      | 0      | 0      | 2     |
|                    | % context | 0      | 0      | 0      | 1      | 0      | 0      | 0      | 0     |
|                    | Count     | 15     | 42     | 77     | 274    | 2      | 18     | 41     | 469   |
|                    | % Total   | 3      | 9      | 16     | 58     | 0      | 4      | 9      | 100   |

ovicaprids and pigs around 50% of the phalanges were found in Area E, where there may have been a hide processing/abattoir.<sup>13</sup>

### Conclusions

The Chalcolithic inhabitants of the site were exploiting the full range of domesticates, with a reliance on sheep, perhaps due to the type of grazing conditions available around the site. There appears to be little exploitation of wild species in keeping with results from other contemporary assemblages (see Mairs in Bourke *et al.* 2000). The presence of a smaller number of cattle, pigs and goats may indicate use of other grazing lands – perhaps more wooded areas or areas of poorer vegetation. The possible presence of olive cultivation in this area may provide suitable grazing for these species.

There is evidence for some specialised areas within the site, with Area D and E showing evidence of differential disposal. There is little evidence of transhumance or other nomadic practices. The presence of a moderate number of pigs rules out generalized community pastoralism as they are ‘not a component of nomadism’ (Grigson 1995: 254). However, season of kill has been impossible to determine from the assemblage and without this information nomadic pastoralism is impossible to clarify.

### Mollusc Shells (AK)

Mollusc shells are present in almost every archaeological site and usually are the most numerous among remains of invertebrates. Molluscs and their shells have been exploited for thousands of years primarily as a subsistence resource and for raw materials, but also as construction materials and, in the case of certain species, for dye production. Mollusc shells recovered at archaeological sites can be valuable source of information pertaining to palaeoclimate, environment, stratigraphy and chronology, as well as aspects of material culture and palaeoeconomy (Bar-Yosef Mayer 1995: 453, 2005: 1-3).

In the southern Levant marine shells originate from both the Red Sea and the Mediterra-

nean Sea. They frequently represent raw materials for object manufacture (ornaments, tools, utensils, *etc.*) and, when found far from their source, are often used to argue trade or exchange connections. Mollusc shells of freshwater origin brought in by humans usually derive from nearby source. However, there is one exception: *Chambardia rubens* (known previously as *Aspatharia rubens*) – a bivalve from the Nile River (Egypt) found on various Chalcolithic sites of the Levant. Land snails are usually of local origin and constitute suitable material for environmental or stratigraphic studies, though they might represent a food resource in some cases.

The malacological analysis was conducted on over 1500 shells and shell fragments collected during both excavation seasons.<sup>14</sup> The shell assemblage was recorded on the basis of number of identified specimens (NISP): an individual, in the case of a gastropod, is represented by a shell with a complete spire and the last whorl (after Thomas 1985), and, in the case of bivalves, by a shell with complete a valve (each valve was counted separately). Numbers of fragments are also given. However, these are unreliable given that they are affected by the type of deposit, differential preservation of certain species (e.g. fragility, shape and size of the shells).

### Results

The shells in this assemblage fall into two main taxonomic classes: *Gastropoda* and *Bivalvia*. They are described within four main groups:

1. land snails
2. freshwater molluscs
3. marine molluscs
4. fossil specimens

**Table 5** presents a summary count of shells from particular areas as an overview, both on the basis of NISP (number of identified specimens). At this stage of research the shells from sediment samples collected for archaeobotanical studies are not included.

1. *Land snails*: Most of the shells that were found at the site are land snails and represent

13. The ovicaprid bones have been listed as either sheep/goat or gazelle however, as discussed above, it is most likely that they are almost all either sheep or goat.

14. I thank Prof. J. Heller and H.K. Mienis from the Hebrew University's Zoological Museum for their assistance.

**Table 5:** Summary count by area (NB: Abbreviations within Origin = F- freshwater; L- land; MS- Mediterranean Sea; Fs- fossil deposit and within Area columns = C- complete; F- fragment).

| Species                                    | Origin | Area |   |    |    |   |   |   |   |     |     |   |   |    |     |     |     |     |     |
|--|--------|------|---|----|----|---|---|---|---|-----|-----|---|---|----|-----|-----|-----|-----|-----|
|  |        | A    |   | B  |    | C |   | D |   | E   |     | F |   | G  |     | H   |     | I   |     |
|  |        | C    | F | C  | F  | C | F | C | F | C   | F   | C | F | C  | F   | C   | F   | C   | F   |
| <b>Gastropoda</b>                          |        |      |   |    |    |   |   |   |   |     |     |   |   |    |     |     |     |     |     |
| <i>Theodoxus jordani</i>                   | F      | 1    |   |    |    |   |   |   |   |     |     |   |   |    |     |     |     |     | 1   |
| <i>Melanopsis buccinoidea</i>              | F      | 1    |   | 1  |    |   |   |   |   |     |     |   |   |    |     |     |     |     | 1   |
| <i>Buliminus labrosus</i>                  | L      |      |   | 1  |    |   |   |   |   |     |     |   | 2 |    | 1   |     |     |     | 1   |
| <i>Buliminus diminutus</i>                 | L      |      |   |    |    |   |   |   |   |     |     |   | 1 | 1  |     |     |     |     |     |
| <i>Buliminus sp.</i>                       | L      |      |   |    |    |   |   |   |   |     |     |   | 1 | 15 |     |     |     |     |     |
| <i>Euchondrus septemdentatus</i>           | L      |      |   |    |    |   |   |   |   |     |     |   |   |    |     |     |     |     | 4   |
| <i>Ceciloides sp.</i>                      | L      | 1    |   | 1  |    |   | 1 |   |   |     |     |   |   |    |     |     |     |     |     |
| <i>Oxychilus (Costoxychilus) profundus</i> | L      |      |   |    |    |   |   |   |   |     |     |   |   |    |     |     |     |     | 4   |
| <i>Eopolita protensa cf. jebusitica</i>    | L      |      |   | 28 | 2  |   |   |   |   |     |     |   |   |    |     |     |     |     |     |
| <i>Sphincterochila fimbriata</i>           | L      | 4    |   | 4  |    | 1 |   | 1 | 1 | 50  | 5   |   |   | 39 | 16  | 3   | 2   | 19  | 5   |
| <i>Xerocrassa langloisiana</i>             | L      |      |   | 1  |    |   |   | 1 |   | 3   |     |   |   | 1  |     |     |     |     | 5   |
| <i>Xeropicta vestalis joppensis</i>        | L      | 1    |   | 3  | 2  |   |   |   |   | 20  | 3   |   |   | 14 | 7   | 2   |     | 30  | 18  |
| <i>Monacha obstructa</i>                   | L      | 2    |   | 18 | 4  |   |   |   |   | 94  | 53  |   |   | 26 | 31  | 13  | 9   | 160 | 134 |
| <i>Monacha sp.</i>                         | L      |      |   |    | 2  |   |   |   |   |     | 2   |   |   |    |     |     | 1   | 2   | 22  |
| <i>Levantina spiriplana transjordanica</i> | L      |      |   | 11 | 6  |   |   |   |   | 19  | 38  |   |   |    |     | 120 | 156 | 7   | 49  |
| <i>Levantina sp.</i>                       | L      |      |   |    | 23 |   |   | 1 | 1 | 21  |     | 2 | 3 | 51 |     | 3   |     |     | 55  |
| <i>Helix engaddensis</i>                   | L      | 1    |   | 4  |    |   |   | 1 |   | 5   | 7   |   |   | 3  | 6   | 6   |     | 5   | 2   |
| <i>Helix sp.</i>                           | L      |      | 1 |    | 2  |   |   |   | 1 |     | 8   |   |   |    | 26  |     | 3   |     | 1   |
| <b>Bivalvia</b>                            |        |      |   |    |    |   |   |   |   |     |     |   |   |    |     |     |     |     |     |
| <i>Glycymeris insubrica</i>                | MS     |      |   |    |    | 1 |   |   |   |     |     |   |   |    |     |     | 4   |     |     |
| <i>Potomida littoralis</i>                 | F      |      |   |    |    |   |   | 1 |   | 1   | 1   |   |   | 1  | 1   |     |     |     |     |
| <i>Unio terminalis</i>                     | F      | 2    |   |    |    |   |   |   |   | 6   | 1   |   |   |    |     |     |     |     | 2   |
| Unionidae                                  | F      |      | 1 |    |    |   |   |   |   | 1   | 10  |   |   |    | 1   |     |     |     | 6   |
| <b>Fossil</b>                              | Fs.    | 1    |   |    |    |   |   |   |   |     |     |   |   |    |     |     |     |     | 1   |
| <b>TOTAL</b>                               | -      | 14   | 2 | 72 | 41 | 2 |   | 5 | 3 | 200 | 149 |   | 2 | 91 | 155 | 149 | 174 | 242 | 292 |

species living in the same area today. In general, larger numbers of shells were retrieved from the larger exposures, in Area E, G, H and I. The most numerous are shells of *Monacha obstructa*, *Sphincterochila fimbriata* and *Xeropicta vestalis joppensis*. A significant number of *Monacha obstructa* and *Xeropicta vestalis joppensis* were found in Area E and Area I. A small number (no more than 6 complete specimens) of *Helix engaddensis* were found in Areas E, H and I – most of these are recent (modern).

The final report will detail all of the land snail species found in all deposits, but this report will focus only upon those land snails that can be considered *in situ*. A large concentration of pre-modern shells of *Levantina spiriplana transjordanica* was discovered in Trench H2, in the fill of two adjacent rooms (Table 6) above the floor

surface, dating to the Middle-Late Bronze Age. These finds may relate to *Levantina spiriplana transjordanica* which are restricted to rock crevices (such as stone wall ruins). Such an accumulation may depict a large population of these snails living on ruins in the area after the site was deserted. However the fact that 208 shells and shell fragments were found in the tumble of one room (contexts [1726], [1731] and [1733]) and 35 in the adjacent room (contexts [1728] and [1729]) may indicate that these snails were collected purposefully. Moreover, apart from a few fragments of modern shells of *Monacha sp.*, 2 broken shells of *Helix engaddensis* and 2 artefacts of *Glycymeris sp.*, there were no other molluscs found in this phase in H2. No more than 20 complete *Levantina* shells were found in any other Area, thus the collection in H2 is

**Table 6:** Total count of shells (NISP) of *Levantina spiriplana transjordanica*, found in two rooms in Area H2.

| Room # | Context #          | Complete shells | Spire fragments | Last whorl | Very small fragments |
|--------|--------------------|-----------------|-----------------|------------|----------------------|
| Room 1 | 1726- rock tumble  | 42              | 14              | 21         | 57                   |
|        | 1731- rock tumble  | 28              | 5               | 8          | -                    |
|        | 1733- fill         | 16              | 9               | 8          | -                    |
| Room 2 | 1728- compact fill | 3               | 1               | 1          | -                    |
|        | 1729- compact fill | 11              | 5               | 3          | 11                   |

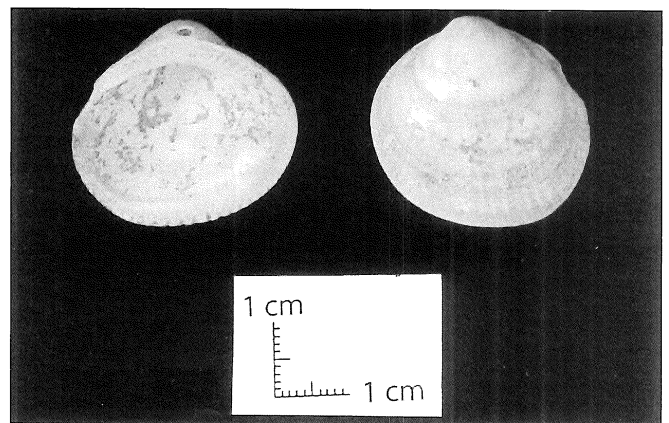
exceptional. In addition, in H2 there were only 5 juvenile specimens in the first room and 4 specimens in the second room. The average shell diameter for the collection is 3.1cm — typical for mature specimens. Given that *Levantina spiriplana transjordanica* is an edible species we can assume that these land snails were occasionally collected for food.<sup>15</sup>

2. *Freshwater shells:* Both freshwater gastropod and bivalve shells were identified. Freshwater shells of small gastropods bare no traces of human manipulation. These are two shells of *Theodoxus jordani* (found in Area A and I) and three shells of *Melanopsis buccinoidea* (Area A, B and I). Both species were probably brought to the settlement accidentally with water from the nearby spring, as was the case at many other settlements of the Levant (Bar-Yosef Mayer 2005:182, 2004: 2500).

Shells of two freshwater bivalves *Unio terminalis* and *Potomida littoralis* were found at the site. These derived from Areas D, E, G and I, from occupation and collapse contexts and therefore likely derive from the Chalcolithic occupation of the site. These were probably brought to the settlement from the Jordan River or another permanent stream. Most of the valves are complete. Five of them were artificially perforated (via drilling, gauging and/or hammering) just beneath the umbonal region of the shell — they can therefore be considered artefacts. They were probably brought to the settlement for use as ornaments. One artefact, a disc-shaped bead<sup>16</sup> measuring 2 cm in diameter, was made of mother-of-pearl from one of these

freshwater bivalves (Fig. 16.14).

3. *Marine shells:* Only five shells of marine origin were found at the site. These are valves of *Glycymeris insubrica*, now the most abundant bivalve species of the eastern Mediterranean coast. Complete valves of the species were used as beads (Fig. 17). The perforation in three of them was made via grinding and/or drilling the umbo. The other shells have natural hole in this place — they are beach-worn and may well have been collected at the beach. Four shells, similar in size (2.8 to 3cm in height), were found in the H2, in the two rooms where the large concentration of *Levantina* shells was found. These four beads could have been part of the same ornament, e.g. a necklace. The largest *Glycymeris* bead (4.2cm in height) is slightly abraded, especially on the outlines and is definitely an example of a beach-worn specimen. It derives from Area C1, from a deposit assigned to the Chalcolithic.



17. Bead made of *Glycymeris insubrica* from the eastern Mediterranean coast (this example derives from H2 [1731]).

15. Corroborative evidence from archaeological sites of *Levantina spiriplana transjordanica* as food comes from Pre-Pottery Neolithic Jericho (Biggs 1963: 128; cf. Lubell 2004: 86). In addition, other snails of *Levantina* species as well as *Helix engaddensis* were

consumed at Natufian Mallāḥa and historical Mare-shah (Mienis 2004: 114-115).

16. According to Beck's 1928 definition: length less than a third of the diameter.

4. *Fossil specimens*: Two specimens represent fossil mollusc species that most probably originating from local fossil deposits. Both were found in topsoil and collapse. They probably do not represent any special features at the site.

### Discussion

A large quantity of the land snail shells recovered during the excavations represent primarily species characteristic for the Mediterranean region (Heller 1988, 1993) and are quite possibly recent. They include both pre-modern and modern specimens — distinguished mainly by bleaching of its shells (after Peacock *et al.* 2005: 9). Some of the land snails, e.g. *Helix engaddensis*, estivate deeply and therefore may post-date the deposits themselves. Given that the archaeological strata are not deep, later disturbance is likely. Land snails can easily fall into holes and cracks and burrow into the soil (Mienis *pers. comm.*). It is therefore not surprising that the land snail shell finds are primarily concentrated in the deposits and fills above floor levels. It should be assumed that most of them entered the site after it was deserted in the Chalcolithic period. *Levantina spiriplana transjordanica* is probably the only land snail with direct connection to human activity at the site. At this stage it is difficult to be precise about any significance regarding environmental change which may be indicated from a difference in species composition between archaeological material and recent species. Samples collected within archaeobotanical residue (yet to be studied) may assist.

The artefacts made of freshwater bivalves — *Unio terminalis* and *Potomida littoralis* together with valves of *Glycymeris* sp., represent quite simple ornaments — the form of a shell was used as decoration itself and the effort was focused on obtaining and perforating them if this was required. Among the shell artefacts only one — the disc-shaped bead made of mother-of-pearl of freshwater bivalve of Unionidae — represents a different manufacturing concept, one that treats the shell as raw material. All of the artefacts are common forms of ornaments. Beads of *Gly-*

*cymerys insubrica* (previous name *Glycymeris violascens*), appear in significant quantities at other Chalcolithic and Middle and Late Bronze Age sites of the southern Levant, e.g. Gilat (Bar-Yosef Mayer 2006a: 322), Tulaylāt al-Ghassūl (Lee 1973: 313-315), Grar (Bar-Yosef Mayer 1995: 454), Beth-Shean (Bar-Yosef Mayer 2006b: 712), Lachish (Bar-Yosef Mayer 2004: 2493) and Tel Yoqne'am (Mienis 2005: 403). Perforated shells of freshwater bivalves are also known from Chalcolithic sites such as Tulaylāt al-Ghassūl (Lee 1973: 307) or Tall Qashish (pre-Early Bronze Age layer) (Bar-Yosef Mayer 2003: 416).

Unfortunately no Red Sea shells or *Chambaria rubens* from the Nile River were recovered. On the other hand, a few *Glycymeris* beads found at the site confirm [direct or down-the-line] exchange with the eastern Mediterranean in the Chalcolithic and Middle-Late Bronze Ages.

### Summary (JLL)

Excavations at al-Khawārij have revealed a striking new array of architectural and artefactual remains for this region of Jordan. Most significant perhaps is the discovery of Jaulan-like architectural forms (in Area E6-7) as well as other artefacts (e.g. star scrapers in Area G) that are also found in large numbers in this highland region. More intensive use of highland areas, now clearly documented in the Chalcolithic, both here and elsewhere, requires sophisticated understanding of water resources and water management (perhaps indicated by the rock cut installations and associated walling in Area D). More detailed studies to come will investigate the longevity of activity of the site: small clues to earlier activity have appeared in Area I, while Area H demonstrates that highland activity in this region increased again in the Middle-Late Bronze Age.

What occurred in the Early Bronze Age remains mysterious — despite soundings across the site and intensive survey no hint of Early Bronze Age occupation has been found (cf. Lovell *et al.* 2005: 197-9). The botanical<sup>17</sup>, faunal and mollusc finds reveal a broad subsistence base

17. Archaeobotanical results from 2005 reveal a similar suite of material as that from the 2004 season. As in 2004, several species typical of Chalcolithic assemblages were seen (emmer wheat (*Triticum dicoccum*), hulled barley (*Hordeum vulgare*), lentil (*Lens culina-*

*ris*), and 'brother of lentil', a variety of pea (*Pisum sativum*) or bitter vetch (*Vicia ervilia*), as well as olive (*Olea europaea*). Fragments of *Crataegus* cf. *monogyna* fruitstone were found in Area I, as was a fragment of what appears to be almond shell (*Amyg...*

entirely consistent with the diversifying economy characteristic of the Chalcolithic elsewhere in the region. However, it appears that the material remains at al-Khawārij present a picture of a particular exploitation of an ecological zone the final Chalcolithic phase which was primarily based upon secondary products (Area E8-12) and fruit tree exploitation (see Meadows in Lovell *et al.* 2006) allowing more intensive occupation of this highland zone.

Dr. Jaimie Lovell  
Amman Research Officer  
Council for British Research in the Levant  
P.O. Box 519  
Jubaiha, Amman 11941  
JORDAN  
email: [j.lovell@cbrl.org.uk](mailto:j.lovell@cbrl.org.uk)

## Bibliography

- Amiran, R.  
1969 *Ancient Pottery of the Holy Land*. New Brunswick: Rutgers University Press.
- Bar-Yosef Mayer, D.E.  
1995 The Molluscs from Grar. Pp. 453-462 in I. Gilead (ed.), *Grar: a Chalcolithic Site in the Northern Negev*. Beer Sheva: Beer sheva.  
2003 Shell Beads, Freshwater Clams and Landsnails from Tel Qashish. Pp. 415-423 in A. Ben-Tor, R. Bonfil and S. Zuckerman (eds.), *Tel Qashish, A Village in the Jezreel Valley, Final Report of the Archaeological Excavation (1978 – 1987)*. Jerusalem: Hebrew University, Qedem 5.  
2004 The Mollusc Shells. Pp. 2490-2503 in D. Ussishkin (ed.), *The Renewed Archaeological Excavations at Lachish (1973-1994)*. Tel Aviv: Sonia and Marco Nadler Institute of Archaeology Monograph Series Number 22.  
2005 The Exploitation of Shells as Beads in the Palaeolithic and Neolithic of the Levant. *Paleorient* 31/1: 176-185.  
2006a Marine and Riverine Shells at Gilat. Pp. 320-326 in T. E. Levy (ed.), *Archaeology, Anthropology and Cult. The Sanctuary at Gilat, Israel*. London: Equinox  
2006b Construction and Trade: The Shells from Tell Beth-Shean. Pp. 711-722 in A. Mazar (ed.), *Excavation at Tell Beth-Shean 1989-1996: From the Late Bronze Age II B to the Medieval Period*. Israel Exploration Society: Jerusalem.
- Biggs, H.E.J.  
1963 On the Mollusca Collected During the Excavation at Jericho, 1952-1958, and their Archaeological Significance. *Man* 153: 125-8.
- Becks, H.C.  
1928 Classification and Nomenclature of Beads and Pendants. *Archaeologia* 1: 1-76.
- Bourke, S.J., Lovell, J., Sparks, R., Seaton, P., Mairs, L. and Meadows, J.  
2000 A Second and Third Season of Renewed Excavation by the University of Sydney at Tulaylāt al-Ghassul (1995-1997). *ADAJ* 44: 37-89.
- Braun, E.  
1990 Basalt Bowls of the EBI Horizon in the Southern Levant. *Paléorient* 16: 87-96.
- Davis, S.J.  
1987 *The Archaeology of Animals*. London: Batsford.
- Dive, J. and Eisenmann, V.  
1986 Identification and Discrimination of First Phalanges from Pleistocene and Modern Equus, Wild and Domestic. Pp 278-331 in R. H. Meadow and H. P. Uerpmann (eds.), *Equids in the Ancient World* Vol II. Wiesbaden: Reichert.
- Eisenmann, V.  
1986 Comparative Osteology of Modern and Fossil Horses, Half-Asses and Asses. Pp 67-116 in R. H. Meadow and H. P. Uerpmann (eds.), *Equids in the Ancient World* Vol I. Wiesbaden: Reichert.
- Epstein, C.  
1998 *The Chalcolithic Culture of the Golan*. Jerusalem: Israel Antiquities Authority.
- Friend, G.  
1998 *Tell Taannek 1963-1968, III/2, The Loom Weight*. Birzeit: Palestinian Institute of Archaeology.
- Gilead, I.  
1995 *Grar: a Chalcolithic Site in the Northern Negev*. Beer Sheva: Beer sheva.
- Gopher, A and Tsuk, T.  
1996 *The Nahal Qanah Cave: Earliest Gold in the Southern Levant*. Tel Aviv: Tel Aviv University, Institute of Archaeology.
- Grigson, C.  
1995 Plough and Pasture in the Early Economy of the Southern Levant. Pp 245-268 in T. E. Levy (ed.), *The Archaeology of Society in the Holy Land*. London: Leicester University Press.

..... *dalus* sp.). Both of these are native trees that produce edible fruits, and it is assumed that at this date these were gathered from wild trees (as *Crataegus* fruit is still collected today). Again, there was no evidence of grape (*Vitis vinifera*) and durum wheat (*Triticum durum*), which were probably introduced in the Early

Bronze Age. Cereal chaff, and the seeds of potential weeds of arable crops, again appeared to be very rare, by comparison with archaeobotanical assemblages elsewhere in Jordan (Meadows n.d.). The final report will include further details after full analysis is complete.

- Halstead, P.  
1992 Dimini and the 'DMP': Faunal Remains and Animal Exploitation in Late Neolithic Thessaly. *Annual of the British School at Athens* 87: 29-59.
- Hanbury-Tenison, J.W.  
1986 *The Late Chalcolithic to Early Bronze I Transition in Palestine and Transjordan*. Oxford: Archaeopress, BAR Int. Ser. 311.
- Hauptmann, A.  
1989 The Earliest Periods of Copper Metallurgy in Feinan/Jordan. Pp. 119-136 in A. Hauptmann, E. Pernicka and G.A. Wagner (eds.), *Old World Archaeometallurgy*. Bochum: Der Anschnitt Beiheft 7.
- Heller, J.  
1988 Biogeography of the Land Snails of Israel. Pp. 325-353 in Y. Yom-Tov and E. Tchernov (eds.), *The Zoogeography of Israel*. Dordrecht: Junk.
- Heller, J.  
1993 *Land Snails of the land of Israel*. Tel Aviv: Ministry of Defence (Hebrew).
- Hellwing, S.  
1988/89 Animal Bones from Tel Tsaf. *Tel Aviv* 15/16: 47-51.
- Hennessy, J.B.  
1969 Preliminary Report on a First Season of Excavations at Teleilat Ghassul. *Levant* 1: 1-24.
- Lee, J.R.  
1973 *Chalcolithic Ghassul: New Aspects and Master Typology*. Unpub PhD dissertation, Jerusalem: Hebrew University.
- Levy, T.E.  
1987 *Shiqmim I: Studies Concerning Chalcolithic Societies in the Northern Negev Desert, Israel (1982-1984)*. Oxford: Archaeopress BAR Int. Ser. 356.
- Lovell, J.L.  
2002 Shifting Subsistence Patterns: Some Ideas about the End of the Chalcolithic in the Southern Levant. *Paléorient* 28/1: 89-102.  
2007a Horticulture, Status and Long-Range Trade in Chalcolithic Southern Levant: Early Connections with Egypt. Pp. tbc in B. Midant-Reynes and M.Y. Tristant (eds.), *Egypt at its Origins 2*, *Orientalia Lovaniensia Analecta*. Leuven: Peeters Publishers  
2007b The Wadi Rayyan Archaeological Project (WRAP): Investigating the Chalcolithic – Early Bronze Age transition. Pp 457-66 in H. Taher and S. Khouri (eds.), *SHAJ* 9. Amman: Department of Antiquities.
- Lovell, J.L., Richter, T., McLaren, P.B., McRae, I.K. and Abu Shmeis, A.I.  
2005 The First Preliminary Report of the Wadi Rayyan Archaeological Project: the Survey of al Khawarij. *ADAJ* 49: 189-200.
- Lovell, J.L., Meadows, J., Adams, T.J., Thomas, D.C., Richter, T., Miller, H., Elias, C., McRae, I.K. and Balwaneh, M.  
2006 The Second Preliminary Report of the Wadi Rayyan Archaeological Project: the First Season of Excavations at al Khawarij. *ADAJ* 50: 33-59.
- Lubell, D.  
2004 Prehistoric Edible Land Snails in the Circum-Mediterranean: the Archaeological Evidence. Pp. 77-98 in J.-P. Brugal and J. Dese (eds.), *Petits animaux sociétés humaines. Du complément alimentaire aux ressources utilitaires*. Antibes: Recontres internationales d'archéologie et d'histoire d'Antibes (XXIV).
- McNicoll, A., Smith, R.H. and Hennessy, J.B.  
1982 *Pella in Jordan I*. Canberra: Australian National Gallery.
- McNicoll, A.W., Edwards, P.C., Hanbury-Tenison, J., Hennessy, J.B., Potts, T.F., Smith, R.H., Walmsley, A. and Watson, P. et al.  
1992 *Pella in Jordan II*. Sydney: Meditarch Supp. No. 2.
- Mabry, J.B.  
1992 *Alluvial Cycles and Early Agricultural Settlement Phases in the Jordan Valley*. Unpub. doctoral dissertation: University of Arizona.
- Mallon, A., Koepfel, R. and Neuville, R.  
1934 *Teleilat Ghassul I*. Rome: Pontifical Biblical Institute.
- Meadows, J.M.  
n.d. WRAP 2005: Archaeobotany. Manuscript on file with the Wadi Rayyan Archaeological Project.
- Mienis, H.K.  
2004 When Shells Begin to Talk. Archaeomalacology: an Important Tool for Archaeologists, with Examples from the Excavations of Mallaha, Hula Valley, Israel. *Turkish Journal of Aquatic Life* 2/2: 111-116.  
2005 Malacological and Crustacean Remains. Pp. 402-404; 431-432 in A. Ben-Tor, D. Ben-Ami and A. Livneh (eds.), *Yoqne'am III, the Middle and Late Bronze Ages. Final Report of the Archaeological Excavations (1977-1988)*. Jerusalem: Hebrew University, Qedem 7.
- Milevski, I. Fabian, P. and Marder, O.  
*In press* Canaanite Blades in Chalcolithic Contexts of the Southern Levant? Pp. tbc in J. Lovell and Y. Rowan (eds.), *Culture, Chronology and the Chalcolithic: theory and transition*. Oxford: CBRL Monographs, Oxbow.
- Palumbo, G., Mabry, J and Kuijt, I.  
1990 The Wadi el-Yabis Survey: Report on the 1989 Field Season. *ADAJ* 34: 95-118.



- Peacock, E., Rafferty, J. and Homes Hogue, S.  
2005 Land Snail Artifacts and Faunal Remains: Understanding Site Formation Processes at Prehistoric/Protohistoric Sites in the Southeastern United States. Pp. 6-17 in D.E. Bar-Yosef Mayer (ed.), *Archaeomalacology. Mollusc in Former Environments of Human Behaviour*. Proceedings of the 9<sup>th</sup> ICAZ Conference, Durham 2002, Oxford: Oxbow.
- Perrot, J., Zori, N. and Reich, Y.  
1967 Neve Ur, un Nouvel Aspect du Ghassoulien. *IEJ* 17: 201-232.
- Philip, G. and Williams-Thorpe, O.  
1993 A Provenance Study of Jordanian Basalt Vessels of the Chalcolithic and Early Bronze Age I Periods. *Paléorient* 19: 51-63.  
2001 The Production and Consumption of Basalt Artifacts in the Southern Levant During the 5th-4th Millennia B.C: a Geochemical and Petrographic Investigation. Pp. 11-30 in A. Millard (ed.), *Archaeological Sciences 1997: Proceedings of the Conference held at the University of Durham 2nd-4th September 1997*. Oxford: Archaeopress, BAR Int. Ser. 939.
- Quintero, L. Wilke, P.J. and Rollefson, G.O.  
2002 From Flint Mine to Fan Scraper: The Late Prehistoric Jafr Industrial Complex. *BASOR* 327: 17-48.
- Redding, R.W.  
1981 The Faunal Remains. Pp 233-421 in H. T. Wright (ed.), *An Early Town on the Deh Luran Plain. Excavations at Tepe Farukhabad*. Ann Arbor: University of Michigan.
- Rosen, S.  
1997 *Lithics after the Stone Age*. Walnut Creek: Alta Mira.
- Roux, V. and Courty, M.-A.  
1997 Les bols élaborés au tour d'Abu Hamid: Rupture technique au 4<sup>e</sup> millénaire avant J.-C. dans le Levant-sud. *Paléorient* 23/1: 25-43.
- Segal, I., Kamenski, A. and Merkel, J.  
2002 The Cave of the Sandal, Ketef Jericho: New Evidence from Recent Chalcolithic Copper Finds. *IAMS Bulletin* 22: 7-10.
- Tadmor, M., Kedem, D., Begemann, F., Hauptmann, A., Pernicka, E. and Schmitt-Strecker, S.  
1995 The Nahal Mishmar hoard from the Judean desert: technology, composition, and provenance. *'Atiqot* 27: 95-148.
- Thomas, K.  
1985 Land Snail Analysis in Archaeology: Theory and Practice. Pp. 131-156 in N.R.J. Fieller, D.D. Gilbertson and N.G.A. Ralph (eds.), *Palaeobiological investigations, Research Design, Methods and Data Analysis*. Symposia of the Association for Environmental Archaeology No. 5B. Oxford: BAR Int. Ser. 266.
- Whitcher Kansa, S.  
2004 Animal Exploitation at Early Bronze Age Ashqelon, Afridar: What the Bones Tell Us - Initial Analysis of the Animal Bones from Areas E, F and G. *'Atiqot* 45: 279-29.
- Wright, K.  
1991 The Origins and Development of Ground Stone Assemblages in late Pleistocene Southwest Asia. *Paléorient* 17(1): 19-45.  
1992 A Classification System for Ground Stone Tools from the Prehistoric Levant. *Paléorient* 18/2: 53-81.



# THE INTERNATIONAL WĀDĪ FARASA PROJECT (IWFP) PRELIMINARY REPORT ON THE 2006 SEASON

*Stephan G. Schmid*

## Introduction and Acknowledgments

The field season 2006 of the International Wādi Farasa Project (IWFP) lasted from August 20th to 31st, followed by one week of studying the finds from this as well as from previous seasons. The IWFP 2006 was carried out by the Association for the Understanding of Ancient Cultures (AUAC: [www.auac.ch](http://www.auac.ch)), based in Basel (Switzerland) and was generously sponsored by the CNRS (French National Centre of Scientific Research) and the French Ministry of Foreign Affairs. We would like to thank the director general of the Department of Antiquities, Dr. Fawwaz Al-Khraysheh, for his support and for granting the working permit as well as Dr. Jacqueline Dentzer-Feydy (Paris), Dr. Christian Augé ('Amman), Dr. Fawzi Zayadine ('Amman), Prof. David F. Graf (Miami) and Dr. Bernhard Kolb (Basel) for their continuous interest in the project. We would also like to thank IFPO 'Amman and especially its director Dr. Jean-François Salles for lodging the team during its stay at 'Amman.

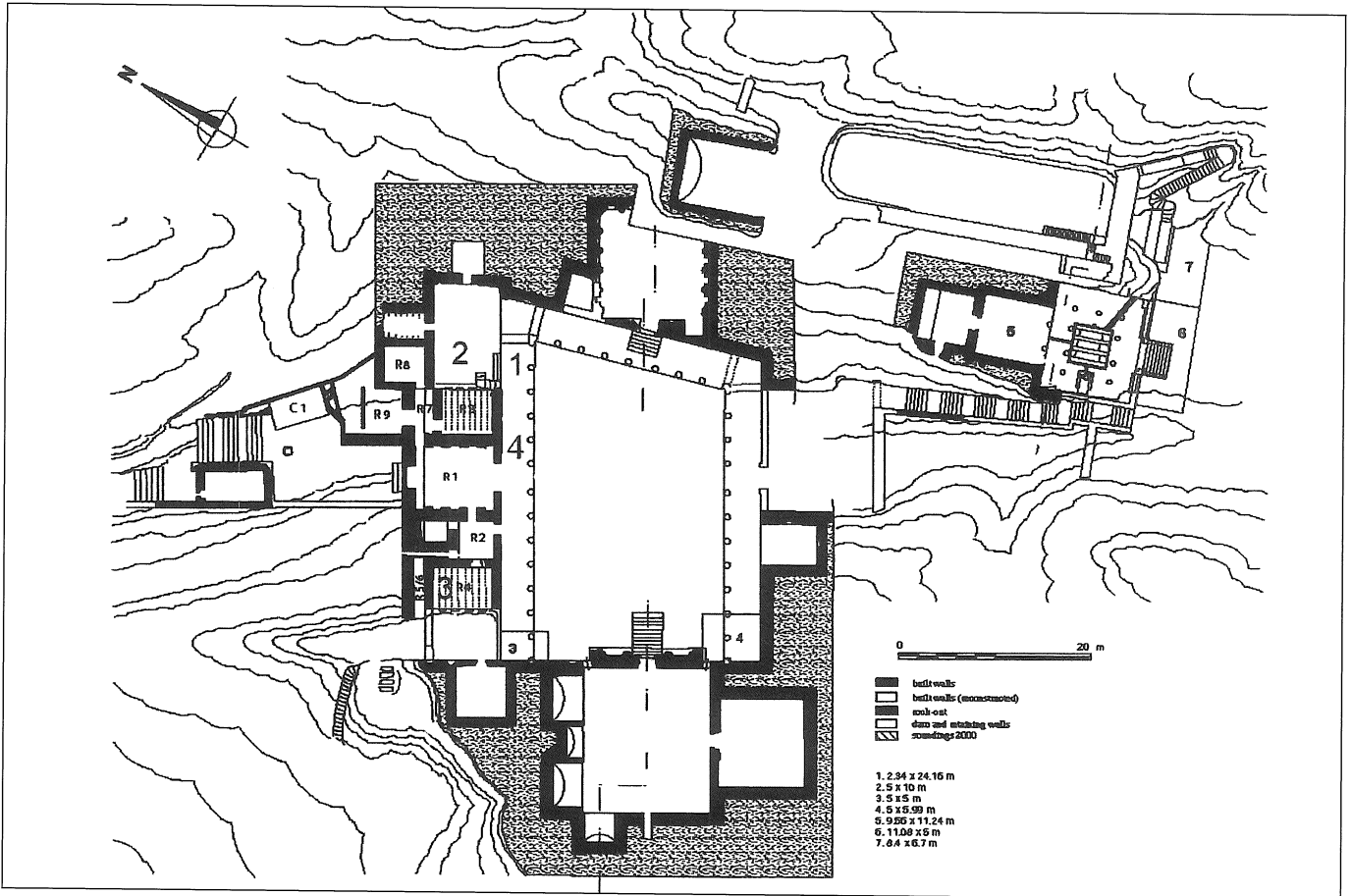
The following people participated in the 2006 season of the IWFP: the archaeologists Stephan G. Schmid (director), André Barmasse, MA (Basel), Dr. Caroline Huguenot (Lausanne), Bénédicte Renoult, MA (Montpellier), the photographer Dr. Jérôme Rizzo (Montpellier), the architect Pascal Wirth (Basel) and the software engineer Dominik Wirth (Basel). The representative of the Department of Antiquities was Samia Falahat, MA, whose help and advice were much appreciated. Nine workmen and one tea woman from the Bdool tribe were employed.

Following the results of the previous campaigns of the project (cf. IWFP 2005 for the results of the previous season as well as for further bibliographical references; see also the

preliminary reports of the consecutive seasons on [www.auac.ch/iwfp](http://www.auac.ch/iwfp)), the following trenches and soundings were opened (cf. **Fig. 1**): At the emplacement of the northern porticus a square was opened, mainly in order to facilitate the circulation of the other excavation activities (no. 1 on **Fig. 1**). Underneath the rocky plateau on the NE side of the complex, a rock cut room had appeared since the 2004 season of the project; however, the ancient level of that room had not previously been reached and, therefore, was one of the goals of the 2006 season, in order to clarify the chronology and the function of that room (no. 2 on **Fig. 1**). Another aspect relating to the further investigation of the chronology and function of the installations of the Soldier's Tomb complex was pursued with a small sounding in room 4 (no. 3 on **Fig. 1**). Beginning in 2005, a systematic attempt at a three dimensional digital reconstruction of the complex of the Soldier's Tomb was launched. The preliminary results obtained so far were verified *in situ* during the 2006 campaign and already some corrections and precise analysis were possible. Finally, some remaining questions related to the "Renaissance Tomb" (Brünnow and Domaszewski 1904: 158 no. 229; cf. Huguenot and Mohammed al-B'dool and Schmid 2004) further down the Wādi Farasa East were resolved during this year's campaign.

## NE-Corner of Complex

In order to facilitate the circulation of the excavation activities inside the rock carved room underneath the rocky outcrop in the NE-corner of the complex (cf. below), a square was opened at the emplacement of the N-porticus of the complex (no. 1 on **Figs. 1, 2**). On a surface roughly measuring 4.30m on 6.50m several



1. Wādī Farasa East, general plan of the Soldier Tomb's complex (A. Barmasse after Bachmann, Watzinger and Wiegand 1921).



2. Wādī Farasa East, Medieval rooms upon the N porticus of the complex (Schmid).

walls constructed using a rather haphazard technique started appearing. They obviously form two rooms (centre and right on Fig. 2) as well as a kind of corridor (left on Fig. 2). This corridor leads to the rock cut room that will be discussed below, a few visible steps indicating that

the level of the latter was lower than the one of the former.

The haphazard building technique implies reused stones and the large amount of the so-called Ayyubid-Mamluk pottery, dating to the 11th to 13th centuries AD indicate a Medieval