EXCAVATIONS IN THE EARLY BRONZE AGE CEMETERY OF TIWAL ESH-SHARQI A PRELIMINARY REPORT

by
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Introduction

The site of Tell Umm Hammad esh-Sharqiya in the Jordan Valley was first systematically excavated in 1982 by Dr. Svend Helms on behalf of the British Institute in Amman for Archaeology and History (BIAAH).[1] During the course of his season, as a result of bulldozing activities in preparation for road construction, a number of tombs were exposed in the area to the south of the site, known locally as Tiwal esh-Sharqi. Subsequent investigations by Dr. Helms and later the Department of Antiquities revealed the presence here of an extensive cemetery of EBIV date.[2] Following this preliminary work, which resulted in the clearance of several tombs, a permit was granted to the writer to conduct excavations in the cemetery, now defined by the name Tiwal esh-Sharqi.

Seven weeks of excavations were conducted from March 14th-May 1st, 1984, under the direction of the writer. Geological and geomorphological studies of the physical background of the cemetery area were undertaken by Mr. P.G. Dorrell (Institute of Archaeology, London) who was also responsible for the photography and assisted with the excavations. Human skeletal material was studied *in situ* by Miss J. Henderson (Department of the Environment, London) whose full analysis will be presented in the final report. The cemetery area was surveyed and mapped by Mrs. B. Pritzkat (University of California at Los Angeles) and a preliminary working version of the plan is included in this report (Fig. 1). On-site conservation and limited restoration was undertaken by Miss M. Wright (Institute of Archaeology, London). All of the objects were drawn and the tombs planned by Miss S. Thorpe (BIAAH), who also served as field supervisor. Two further field supervisors were Dr. R. Chapman (Palestine Exploration Fund) and Miss A. Betts (Institute of Archaeology, London). The expedition staff was complemented by Mr. Ibrahim Haj Hassan, representative of the Department of Antiquities, who worked as field supervisor and whose presence ensured the continued smooth-running of the season. Our thanks are due to the Department of Antiquities of Jordan and most especially to the Director, Dr. Adnan Hadidi for all his help and enthusiastic support.

The 1984 season was sponsored jointly by the British Museum and the British Institute in Amman for Archaeology and History and funding was generously provided by the British Museum. The expedition staff was comfortably housed at Deir 'Alla, and thanks are due to Mr. Mohammad Jamra of the Department of Antiquities for his help in arranging this accommodation.

Results of the 1984 Season

Tiwal esh-Sharqi is situated about 7 km. south-west of Deir 'Alla at grid reference 205172 and extends for at least 1.5 km. along the north-west bank of the river Zarqa (Pl. X). The full extent of the cemetery has not yet been established. To the east of the modern road which cuts the site in a roughly north-south division (Fig. 1), the northern extent is defined by the limit of the occupation site Tell Umm

[1] S.W. Helms, Excavations at Tell Umm Hamad esh-Sharqiya in the Jordan Valley 1982, *Levant*, 16 (1984) p. 35-54.

[2] S.W. Helms, The EBIV (EB-MB) cemetery at Tiwal esh-Sharqi in the Jordan Valley, *ADAJ*, XXVII, (1983) p. 55-86.

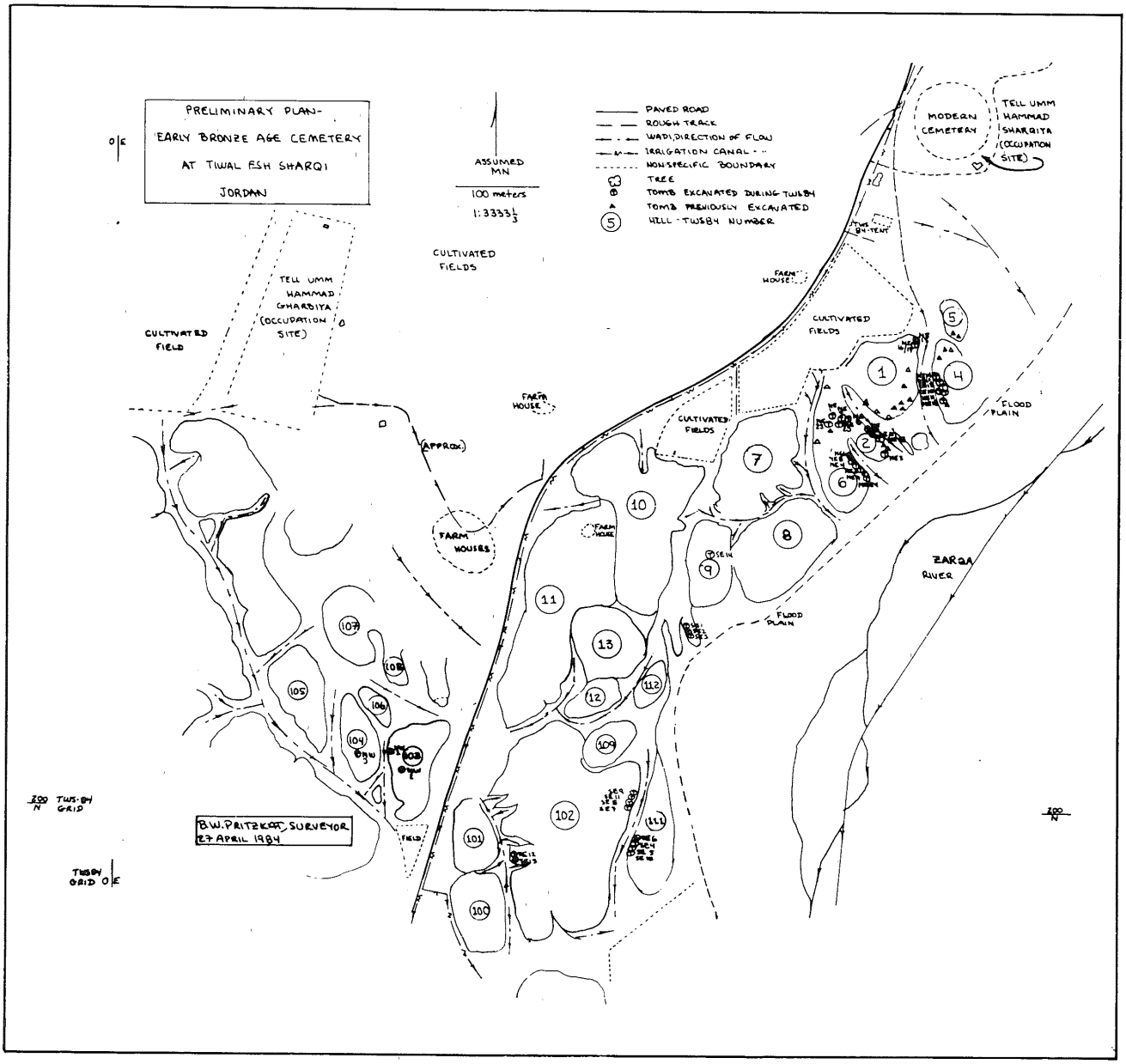


Fig. 1

Hammad esh-Sharqiya, and the southern by the cultivated fields beyond hills 100, 102 and 111. West of the road it seems likely that beyond the area of cultivation the cemetery curves around the occupation site of Tell Umm Hammad el-Gharbiya to the west and extends to the south for some considerable distance. The following is a preliminary report of the geological background of the site by P.G. Dorrell: a more detailed contribution will appear in the final report.

The bedrock underlying the site is the Lisan Marls, a series of bedded evaporites, now much cracked and faulted through contraction, slumping and earth tremors. The surface of the marl appears to have been linearly eroded in great antiquity and then covered and the erosion channels infilled by a thick deposit of silts and gravels, perhaps marking an early and more northerly course of the Zarqa. This alluvium, and the underlying marl, are now being aggressively eroded by wadis running in a south-westerly pattern to the modern Zarqa. In the older and wider re-excavated wadis, tombs appear to be aligned with their shafts on the downslopes of the wadi side and their chambers cut into the inter-wadi ridges (with the exception of the two built graves, chambers were always cut into the marl and not just into the alluvium) while tombs exposed in the steeper and newer wadis seem to be sited randomly. This suggests that in

EBIV times the morphology of the site followed the same general pattern as at present, although not so deeply cut.

Ground-water which percolates through the strata emerges at seepage lines and small springs above clay-bands within the marl, but its salinity is such that drinking water for man and stock must always have been taken from the river itself. This salinity, however, is not so great as to inhibit the growth of vegetation upon the marl surface.

There is an aggradation terrace some 5 metres above the present river level, at present being laterally eroded by the stream. This terrace cannot be dated at the site, but if it was formed in the same way as similar terraces elsewhere in the Levant, probably post-dates the EBIV occupation.

Since the area of the cemetery is extremely large, and to an extent indeterminate on the west, it was decided to concentrate solely on the area between the Zarqa river and the modern road (Fig. 1). Two excavation areas were here defined: North-east (NE) extending from Tell Umm Hammad esh-Sharqiya in the north to the *wadi* running approximately east-west along the southern slopes of hills 6 and 7 and the northern slope of hill 10 as far as the road. The area south, as far as the cultivated fields, was defined as South-east (SE). Tombs in each sector were numbered sequentially from one.

Altogether thirty-eight tombs were investigated, of which twenty-five produced dateable finds. Some tombs produced skeletal data only and others were left unexcavated beyond the definition of their shafts and entrances for reasons of safety: four others (NE9, NE14, SE12 and SE13) had to be abandoned after partial excavation for the same reason. The normal type of tomb encountered (see however NE8 and SE14 below) was a shaft tomb, a vertical shaft giving access to a chamber through a small entrance (Pl. XI: 1). In many cases only the eroded chamber was preserved, taking the form of a "scoop" in the side of the hill (Pl. XI: 2), but where the shaft was preserved, the normal form was seen to be rectangular or sub-rectangular in cross-section: only in the case of NE4 was the shaft roughly circular. The entrance into the chambers were arched and generally small, ranging from 0.50 m. to 1.10 m. in height, 0.40 m. to 1.00 m. in width. Blockings, where found intact consisted of large stones packed with hard brown clay, or in some instances, mud-brick. The chamber of NE9 was closed by means of a single large stone. Chambers tended to be rather irregular, but most commonly sub-circular or oval. NE22, which was the only tomb of the EBI period found, had a rather well-cut rectangular chamber.

With the single exception of NE4, in every case examined, the roof of the chamber had collapsed, filling the space inside with marl blocks and decayed marl rubble (see also the qualification regarding SE2 below). The deposits were largely or partially protected by a layer of natural silting laid before the collapse of the roof. The disposition of the bones (see below) and frequently also the pottery indicated that water had seeped into the chambers causing considerable disturbance. This resulted in some cases in the pottery vessels being lifted clear of the floor, having risen with the gradually elevating silt layer. The most extreme instance of this was in SE2 where the loop-handled amphoriskos (SE2:1) was found some 1.50 m. above the floor surface, still bearing in its mouth a perforated cup (funnel) (SE2: 2).

In terms of construction method, the tomb-builders were seeking the level of hard white marl into which they could cut chambers with some assurance that the roofs would remain secure. For tombs which were located on the side-slopes of existing *awdiyah,* this was a relatively straightforward process: the marl level could be, and still can be, seen outcropping. In such cases, the shaft could be sunk directly and the chamber constructed (see for example NE10). In all cases advantage was taken of the morphology by cutting the shaft on the downslope and then excavating the chamber beneath the inter-wadi

ridge. Some tombs possibly did not have a true vertical shaft, but rather the chamber was entered from the hillside horizontally by means of what is, in effect, a rectangular antechamber (see here NE16/17).

Where tombs were to be cut from a level surface (as for example NE9, NE20 and NE25), an irregular sounding was first made to locate the level of hard marl and then the shaft was sunk vertically from that level (see NE9 and NE20). The eventual collapse of the chambers of such tombs may have contributed, in itself, to the formation of more recent gullies. Certainly, tombs SE1, SE2 and SE3 could never have been located on an existing slope, as they are now disposed, since their chambers are cut in both directions and that of SE3 has been lost altogether.

Some of the very small juvenile burials such as NE6, NE11, NE12 and NE13 may not have had shafts at all, but simply blocked entrances directly on the hill sides. Subsequent erosion has, however, rendered this impossible to demonstrate.

Some of the deeper shafts were provided with foot-holds allowing easier access to their bases. Tool–marks were observed in the shafts and chambers of a number of tombs. Where they were best-preserved, as in the shaft of SE3, they showed as straight furrows up to 0.30 m. in length and 0.02-0.03 wide, semi-circular in section and running almost vertically. Since any pick-like tool could hardly have been driven into the marl for these distances. presumably the tools used were spikes or rods hammered down into the rock and then used as levers to rise away blocks or fragments of marl. Within the chambers the marks ran obliquely and some at least were slightly curved and shorter, suggesting the use of picks.

Re-use of tomb chambers was observed in four cases. SE12 and SE13, two adjacent tombs both showed the same feature: the shafts had been partly re-excavated leaving a deposit of very fine soft soil, and the blocking of the chambers had been disturbed. Directly behind the entrance of SE12 a lamp was found (SE12:1) resting on the floor and which can be assumed to belong to the second usage of the tomb. Although excavation of this tomb was not completed, a second lamp (SE12: 2) was found some 1.00 m. further into the chamber, lying about 0.20 m. above the floor on top of the layer of silting with which it had been carried up. It seems clear that this lamp was associated with the first period of usage of the tomb. SE13 had a similar re-cut shaft and disturbance of the blocking stones, but excavation was discontinued before the chamber could be cleared.

NE16 and NE17 are in effect two chambers of a bi-lobate tomb, access into which was gained by a common entrance. The more northerly chamber, NE17 had been re-used: a four-spouted lamp (NE17: 3) was found directly on the floor surface, extremely badly crushed - probably as a result of the deposition of the later interment, NE17 Upper, which lay some 0.23 m. above the floor on a surface of stamped silting. Three objects, a copper pin (NE17:1), a single carnelian bead (NE17:2) and a loop-handled amphoriskos (NE17:4) belong to this later deposit.

Perhaps the most interesting case of chamber re-use is that of SE2. Here, the original chamber was entered by a well-constructed doorway on the west, an irregularity having been made good by the use of evenly coursed mud-bricks (Pl. XII: 1). A second shaft was found high up on the slope which gave access to the back of the chamber by means of another entrance, found on excavation to be still completely sealed. The original stone blocking of the west entrance had been removed and the stones placed in a semicircle around the south and west sides of the chamber (Pl. XII: 2). These seem to have formed the foundation for a dense, crushed marl cement which was used to reduce the size of the chamber internally and to seal off the west entrance completely. This cement fill had sealed in position on the floor behind one of the "foundation" stones a necklace of reddish stone beads (SE2: 3) which represents the sole remains of the first usage of the tomb. The loop-handled amphoriskos (SE2: 1) with funnel (SE2: 2) and the four-spouted lamp (SE2: 4) all came from within the area bounded by the

marl cement and must be assumed to be grave-goods associated with the second period of use.

Perhaps the most significant discovery of the 1984 season were the two stone-built graves, NE8 (Pl. XIII: 1) and SE14 (Pl. XIII: 2). In both cases they consisted of a sub-rectangular pit, lined on all four sides with four courses of stones, and capped by three large limestone slabs. SE14 was unfortunately robbed before it could be fully excavated and the grave deposit was completely destroyed. Only a few fragments of bone remained, but sufficient to indicate that the body had been interred with head towards the west end. The spoil heaps left by the robbers were carefully sieved and this operation provided the vital dating information, for, broken into five pieces was found a complete riveted dagger (SE14: 1) typical of EBIV. Such a weapon was also found in NE8, a slightly smaller grave but constructed in exactly the same manner. Here, two skeletons were found with their skulls towards the wider south end. At this end of the grave was found, in addition to the dagger (NE8: 1), a loop-handled amphoriskos characteristic of EBIVB.

This type of stone-built grave, characterized by a general uniformity of constructional method, has been found at a number of sites in Palestine and Syria, but is most usually associated with the following MBIIA period. Well-known examples are from Baghouz on the Euphrates,[2A] Tell et-Tin in the Lake of Homs,[3] Yabrud in south-central Syria[4] and Ras al-'Ain in Palestine.[5] In all cases, the grave-goods are purely local to the area, but tend to be richer in nature suggesting perhaps that these graves were those of a social élite (but not necessarily a warrior class as proposed in Oren.[6])Only at Yabrud is there evidence that the stone-built graves were first used in EBIV: two painted "teapots" were found in one of the graves,[7] dating to late in EBIVC.

At Tiwal esh-Sharqi two points are relevant. Firstly, the dating of the material, certainly from NE8, and most probably from SE14, is clearly within EBIVB, contemporary with the shaft tombs. Secondly, the grave-goods are in no way remarkable. Compared with some of the larger shaft tomb deposits such as NE10A or SE1 they are distinctly poor. Since the concept of the stone-built grave marks such a radical departure from the normal tradition of shaft and chamber tomb, the suggestion must be made that these graves were introduced from outside. The evidence points, however, to only a peaceful settlement of a small number of people who became integrated into the local society, used the local artefacts of the area and yet adhered to a traditional form of burial. On the evidence of the finds, there is no reason to support that they had attained in this period any elevated level of social status.

One further tomb is worthy of special note. NE22 was the only tomb excavated which produced a deposit dating to a period other than EBIV. This tomb, as mentioned above, had a well-cut rectangular chamber rather than the usual sub-circular or oval form (Pl. XIV: 1). The remains of three skeletons were found, one of which held in its right hand a high loop-handled juglet, red-slipped and burnished, typical of EBI (NE22: 6). Another similar juglet was found elsewhere in the deposit (NE22: 5) and also a fragmentary ledge-handled vessel also showing the same surface treatment. However, the most remarkable find was a series of large conical alabaster beads, fifteen in all, lying in a position close to the pelvis of one of the skeletons, suggesting perhaps their use as a belt rather than a necklace (NE22: 1,2,4,7-18).

[2A] R. DuMesnil du Buisson, *Baghouz, L'ancienne Corsôtê--Le tell archaique et la nécropole de l'âge du bronze*, Leiden, 1948.

[3] J.-E. Gautier, Note sur les fouilles enterprises dans la haute vallée de l'Oronte, *Comptes rendus de l'académie des inscriptions et belles lettres*, 23, 4th séries, 1895, p. 441-464.

[4] A.A. Assaf, Der Friedhof von Yabrud, *Annales archéologiques arabes Syriennes*, 17 (1967) p. 55-68.

[5] J. Ory, Excavations at Ras el 'Ain II, *QDAP*, 6 (1937) p. 99-120.

[6] E.D. Oren, A Middle Bronze Age I Warrior Tomb at Beth Shan, *ZDPV*, 87 (1971) p. 111-139.

[7] Assaf, *ibid.*, pl. 3, p. 23-24.

A full report of the skeletal material by Miss J. Henderson will appear in the final report. The following is a preliminary statement.

> The skeletal remains from the cemetery were examined for information concerning the demography, anthropology and pathology of the population sample. Unfortunately the bones were found to be very poorly preserved in all cases and observations were necessarily restricted. In effect this means that whilst demographic data are available for analysis (sex, age and stature), discussion of the anthropology and pathology is not possible.
>
> In all, 34 tombs produced human skeletal remains, yielding a minimum number of 45 individuals. The difference in the above two figures may be accounted for by the presence of multiple burials. Thus, 25 tombs had single burials, 7 contained a minimum of two and 2 a minimum of three individuals.

All bone remains were as far as possible recorded and will appear on the final published plans. A certain degree of articulation was observed, but the high level of subsequent disturbance in all cases renders it impossible to pronounce on the burial practice: the evidence is completely ambiguous, suggesting either secondary burial or grossly disturbed primary.

The Tombs and their Contents

In the catalogue which follows, the number on the left, prefixed "R" is the sequential registration number. The bracketed figure on the right is the tomb designation followed by the plotted object number which corresponds to its position on the respective tomb plan.

NE1 Not a tomb: possibly circular sink-hole
No finds

NE2 Small eroded oval chamber. North slope hill 6 (Pl. XI: 2)
Single Juvenile, 12-15 years
R1 Ledge-handled store jar (NE2:1)
R2 Cup (NE2: 2)

NE3 Very eroded remains of chamber. East slope hill 2
Single adult, possibly female
No finds

NE4 Shaft tomb: circular shaft, oval chamber. North slope hill 6
Single adult, female
R45 Stone bead (NE4: 1)

NE5 Small shaft tomb: rectangular shaft, oval chamber
North slope hill 6
Single juvenile, 2-3 years
No finds

NE6 Small, very eroded chamber, probably oval. East slope hill 6
Single juvenile, 6 months-1 year
No finds

NE7 Shaft tomb: rectangular shaft, oval chamber. North slope hill 6
Skeleton A: Adult, female
Skeleton B: Adult, possibly female
No finds

NE8 Stone built grave. Surface hill 2. See discussion above (Pl. XIII: 1)
Skeleton A: Adult, male, stature estimated at 1.70 m.±.0879
Skeleton B: Male, 25-35 years.
R17 Copper riveted dagger (NE8: 1)
R22 Loope handled amphoriskos (NE8: 2)
R34 4 Copper rivets (NE8: 3)
R48 Stone bead (NE8: 4)
R33 2 Copper rivets (NE8:5)
R49 26 Beads of various materials (NE8:6)

NE9 Shaft tomb: sub-rectangular shaft, chamber probably circular Surface hill 2. Chamber only partially excavated owing to instability of roof. (pl. XI: 1).
Remains recognisable as adult only
R44 Stone bead (NE9: 1)
R51 Cup fragment (NE9:2) - from shaft

NE10A Shaft tomb with side chamber (NE10B below): rectangular shaft, narrow, ovoid chamber.

West slope hill 4
Skeleton A: Male, 20-25 years
Skeleton B: Juvenile, 5-10 years
R6 Four-spouted lamp (NE10A: 1)
R9 Four-spouted lamp (NE10A:2)
R16 Loop-handled amphoriskos (NE10A:3)
R8 Ledge-handled storejar (NE10A:4)
R26 Loop-handled amphoriskos (NE10A:5)
R27 Bowl (NE10A:6)
R31 Round-based storejar (NE10A: 7)
R7 Bowl (NE10A:8)
R5 Mug-amphoriskos (NE10A:9)
R11 Funnel (NE10A: 10)

NE10B Small oval chamber off south side of NE10A shaft
Single juvenile, 5-10 years
R4 Loop-handled amphoriskos (NE10B:1)

NE11 Eroded, irregular chamber. West slope hill 4
Single juvenile, 5-10 years
R46 Stone pendant (NE11:1)
R10 Stone bead (NE11:2)

NE12 Small eroded chamber, roughly oval. West slope hill 4.
Single juvenile, 3-5 years.
R13 Necklace - beads and spacers of various materials (NE12:1)

NE13 Small eroded chamber, semicircular. West slope hill 4
Remains identifiable as "human" only.
No finds

NE14 Shaft tomb: rectangular shaft, chamber probably similar to NE10A. West slope hill 4. Excavation of chamber discontinued owing to instability of roof.
No bone remains
No finds.

NE15 Shaft tomb with side chamber (NE15A below): rectangular shaft, large circular chamber. East slope hill 1
Skeleton A: Female, 25-35 years
Skeleton B: Juvenile, 5-10 years
R30 Funnel (NE15: 1)
R42 8 Fragments of copper sheet (NE15: 2)
R18 Four-spouted lamp (NE15: 3)
R19 Four-spouted lamp (NE15:4)
R35 2 Copper rivets and ? pinhead (NE15:5)
R24 Four-spouted lamp (NE15:6)
R43 Small copper blade (NE15:7)
R29 Funnel (NE15:8)

NE15A Small oval side chamber off north side of NE15 shaft
No bone remains
No finds

NE16/17 Bilobate tomb with single entrance: probably horizontal access without true shaft. North chamber, NE17, small and roughly circular. South chamber, NE16, larger and ovoid.
East slope hill 1

NE16 Single adult
R28 Loop-handled amphoriskos (NE16:1)
R38 Loop-handled amphoriskos (NE16:2)
R37 Four-spouted lamp (NE16:3)
R40 Funnel (NE16:4)
R52 Bowl (NE16:5)
R36 Cup (NE16:6)
R39 Loop-handled amphoriskos (NE16:7)

NE17 Lower No bone remains
R23 Four-spouted lamp (NE17:3)

NE17 Upper Single adult, possibly female
R41 Copper pin (NE17:1)
R47 Carnelian bead (NE17:2)
R15 Loop-handled amphoriskos (NE17: 4)

NE18 Shaft tomb: completely collapsed. Unexcavated. West slope hill 4
No bone remains.
No finds

NE19 Number not allocated

NE20 Shaft tomb: rectangular shaft

with high side ledges, large circular chamber. Surface hill 2. This chamber lies directly above that of NE25 and part of the floor had collapsed into that tomb.
Remains identifiable as "human" only.
R21 Cup (NE20:1)
R54 Loop-handled amphoriskos (NE20:2)
R53 Four-spouted lamp (NE20: 3)

NE21 Small, very eroded chamber only half of which survives: probably circular.
North slope hill 2
Single juvenile, 1-2 years.
R3 Loop-handled amphoriskos (NE21:1)

NE22 (EBI group) Shaft tomb: rectangular shaft, much eroded, rectangular chamber. North slope hill 2 (Pl. XIV: 1).
Skeleton A: Male, 25-30 years, stature estimated at 1.72 m. ±.0879
Skeleton B: Adult, female
Skeleton C: Juvenile, 10-15 years
R12 15 large, conical alabaster beads (NE22:1,2,4,7-18)
R32 Ledge-handled vessel fragment (NE22:3)
R25 Loop-handled juglet (NE22:5)
R20 Loop-handled juglet (NE22:6)

NE23 Small shaft tomb: rectangular shaft with side "wings", ovoid chamber.
North slope hill 2
Single juvenile, 5 years or under
R14 Cup (NE23:1)

NE24 Eroded chamber, roughly circular. North slope hill 6
Remains recognisable as "adult" only
No finds

NE25 Shaft tomb: shaft unexcavated, chamber irregularly circular. Surface hill 2. This chamber lies directly below that of NE20 Remains recognisable as "adult" only
R72 Copper riveted dagger (NE25:1)
R92 2 Copper rivets (NE25:2-3)
R79 Stone digging-stick weight (NE25:3)

SE1 Shaft tomb: sub-rectangular shaft, large circular chamber, lamp niche in north wall. West slope hill 9. It was discovered that the cutting of the lamp niche had broken into the chamber of an adjacent tomb, described below as SE1A. Having removed the lamp, SE1: 7, which clearly belongs to the deposit of SE1, three other finds were made, and it now seems certain that these belong to the deposit of SE1A (hence the equivalent numberings below). (Fig. 2).
Skeleton A: Adult, possibly female
Skeleton B: Adult, possibly male
R78 Ledge-handled storejar (SE1:1)
R69 Ledge-handled storejar (SE1:2)
R68 Cup (SE1: 3)
R76 Loop-handled amphoriskos (SE1: 4)
R77 Cup (SE1: 5)
R73 Copper riveted dagger (SE1: 6)
R70 Side-spouted lamp (SE1: 7)
R59 Four-spouted lamp (SE1: 8)
R60 Four-spouted lamp (SE1:11)
R71 Copper javelin (SE1:12)
R75 2 Carnelian beads (SE1: 13)
R93 Copper awl (SE1: 14)
R82 Ledge-handled storejar (SE1:15)

SEIA Shaft tomb: shaft unlocated, chamber largely unexcavated. This chamber was only discovered as a result of the excavation of the lamp niche in SE1 which cuts into it. Only very limited investigation of the SE1A cham-

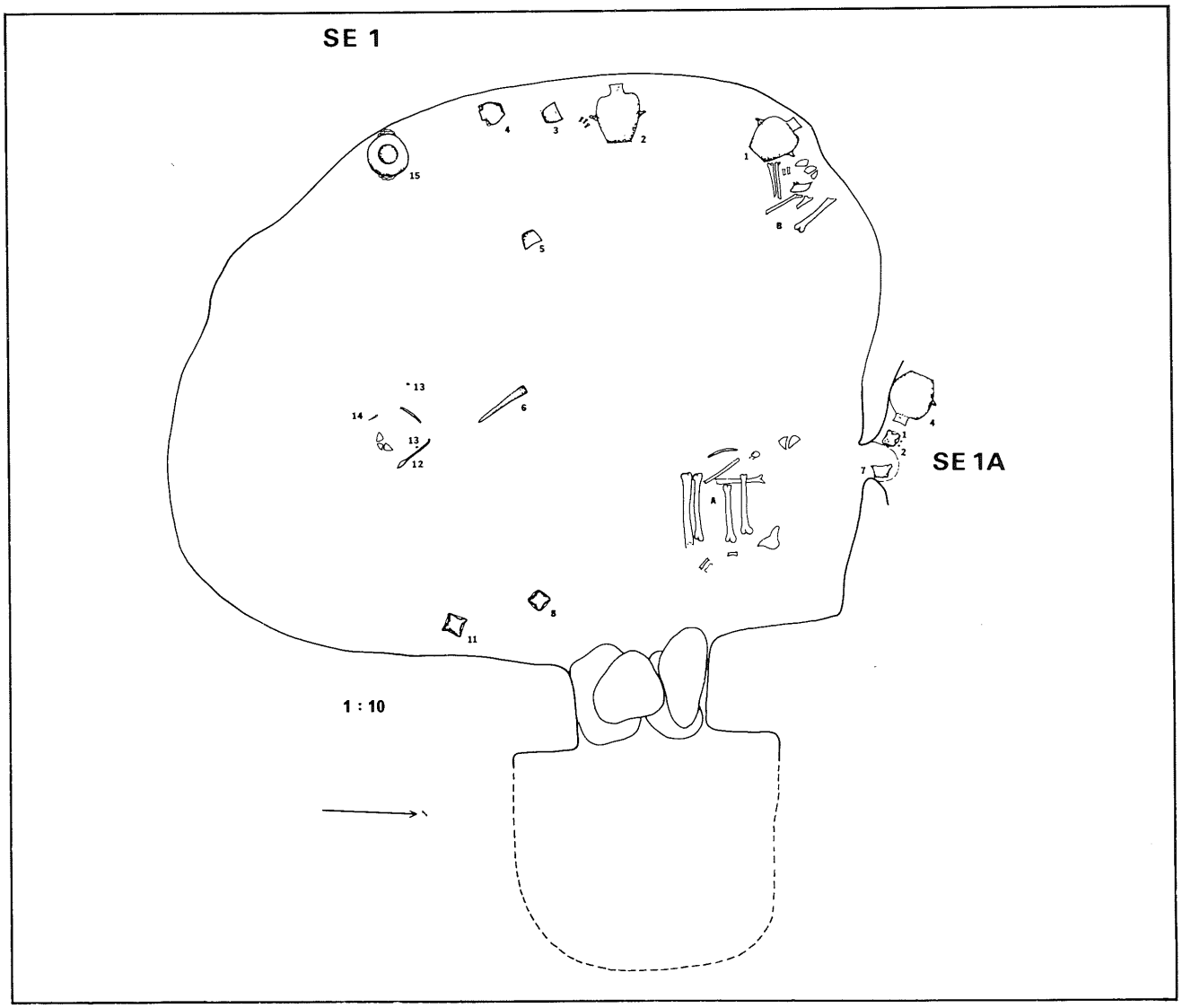


Fig. 2: Plan of Tomb SE1 showing lamp niche cut into chamber of adjacent tomb (SE1a).

ber was possible.
Remains identifiable as "human" only
R80 5 Carnelian beads (SE1A:2)=(SE1:9)
R67 Four-spouted lamp (SE1A:3)=(SE1:10)
R85 Ledge-handled storejar (SE1A:4)

SE2 Shaft tomb. Two phases of use. First phase - rectangular shaft on west, irregularly oval chamber. Second phase - rectangular shaft on east (not excavated), same chamber but contracted into sub-circular form (see discussion above). West slope hill 9 (Pls. XII: 1, 2; XIV: 2).
Remains identifiable as "human" only (phase 2)

Ph.1 R74 Necklace of red translucent stone beads (NE2:3)
R62 Loop-handled amphoriskos (SE2:1)
R63 Funnel (SE2:2)
R87 Four-spouted lamp (SE2: 4)

SE3 Shaft tomb: shaft only preserved, chamber on west lost through erosion, very large, well-cut rectangular doorway. West slope hill 9
No bone remains
No finds

SE4 shaft tomb: shaft largely eroded but probably rectangular, large ovoid chamber. West slope hill 111
Skeleton A: Adult, male, 25-35 years
Skeleton B: Adult, possibly female, 25-35 years
Skeleton C: Adult.
R50 Loop-handled amphoris-

kos (SE4:1)
R83 Ledge-handled storejar (SE4:2)
R55 Four-spouted lamp (SE4:3)
R56 Cup (SE4:4)
R57 Loop-handled amphoriskos (SE4:5)
R58 Loop-handled amphoriskos (SE4:6)
R94 Cup (SE4:7)
R61 Loop-handled amphoriskos (SE4:8)
R64 Cup (SE4:9)
R66 Four-spouted lamp (SE4:10)
R65 Four-spouted lamp (SE4:11)

SE5 Very eroded chamber, only about one third of which is preserved. West slope hill 111. SE5 cuts into west wall of SE10 chamber.
Skeleton A: Adult, 25-35 years.
Skeleton B: "Juvenile"
No finds

SE6 Shaft tomb: completely eroded down to floor level, leaving only three blocking stones on the present surface. Chamber probably sub-rectangular.
West slope hill 111
No bone remains
No finds

SE7 Shaft tomb: shaft largely lost through erosion but probably rectangular, chamber irregularly sub-rectangular. East slope hill 102. The copper point (SE7:1) was found sticking into the west wall of the chamber.
Remains identifiable as "adult" only
R91 Copper point (SE7:1)
R84 Four-spouted lamp (SE7:2)

SE8 Shaft tomb: rectangular shaft, roughly circular chamber. East slope hill 102. The northern end of the chamber is cut very slightly by the shaft of SE11, producing a small "window"
Remains identifiable as "adult" only
R90 Ledge-handled storejar (SE8:1)

SE9 Shaft tomb: shaft lost through erosion but probably rectangular, oval chamber. East slope hill 102. The east side of the chamber is cut by the shaft of SE11
No bone remains
R88 Side-spouted lamp (SE9:1)

SE10 Shaft tomb: shaft largely lost through erosion, but probably rectangular; oval chamber. West slope hill 111. The west side of the chamber is cut by SE5.
Remains identifiable as "adult" only
R81 Four-spouted lamp (SE10:1)

SE11 Shaft tomb: rectangular shaft with ledges, chamber not excavated. East slope hill 102. This shaft cuts the chambers of SE8 and SE9.
No bone remains
No finds

SE12 Shaft tomb: rectangular shaft, chamber probably circular. West slope hill 102. Excavation of chamber discontinued after severe roof collapse. Shaft re-cut for second (phase 2) usage of the chamber (see above).
No bone remains
ph.1 R89 Four-spouted lamp (SE12:2)
ph.2 R86 Four spouted lamp (SE12:1)

SE13 Shaft tomb: rectangular shaft, chamber not excavated. West slope hill 102. Shaft shows similar re-cutting to SE12.
No bone remains
No finds

SE14 Stone-built grave. Surface hill 9. This grave was robbed and damaged before excavation could be completed. Three objects were recovered from the spoil heaps left by the looters, but their numbering does not in this case represent plotted position. See also the discussion of this grave

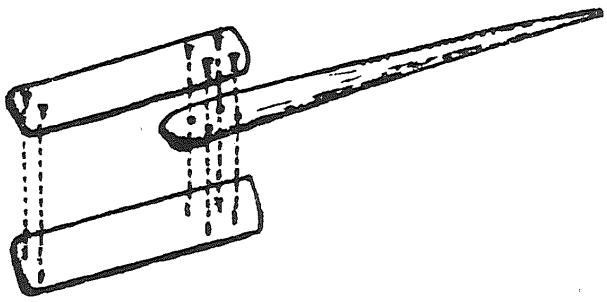
above. (Pl. XIII:2).
Single adult, 25-35 years.
R97 Copper riveted dagger (SE14:1)
R95 Stone bead (SE14:2)
R96 Shell - used as pendant (SE14:3)

Some Observations on the Finds

More will be said about the finds generally in the final section in connection with the dating of the cemetery. Here, it would seem appropriate to single out a few items for individual discussion.

In three tombs, NE10A, NE16 and SE2, loop-handled amphoriskoi were found with funnels (perforated cups) resting in their mouths (Pl. XIV: 2 - from tomb SE2). These funnels have been termed "leben cups" by Dever, who suggested that they contained the fermenting agent and were suspended by means of strings inside a jar of milk.[8] That they were used in the process of making leben seems highly likely, but some qualification can now be added as to the method of their use. In the case of SE2, when the funnel was removed from the mouth of the amphoriskos, traces of a fibrous material were observed at their junction. This strongly suggests that the funnel had been placed over a piece of cloth which rested in the mouth of the amphoriskos, thus permitting a steady dripping of the fermenting agent into the milk below.

Four copper daggers were found during the course of the excavations, each with four rivet holes and rivets still in place. The example from SE14 (SE14:1) was found out of context (see above), but the remaining three (NE8:1, NE25:1 and SE1:6) were found in position on their respective tomb floors. All three showed an interesting feature. About 0.15-0.20 m. away from the riveted end was found, in each case, a pair of additional rivets. This suggests that the hilt was attached in two sections, sandwiching the end of the blade and held together at the distal end by means of the two extra rivets.



A similar method might have been applied to the small blade from NE15 (NE15:7) which had no provision for rivets. Here it is likely that the blade was placed between two pieces of wood, secured at two points by the rivets (NE15:5) found in close proximity.

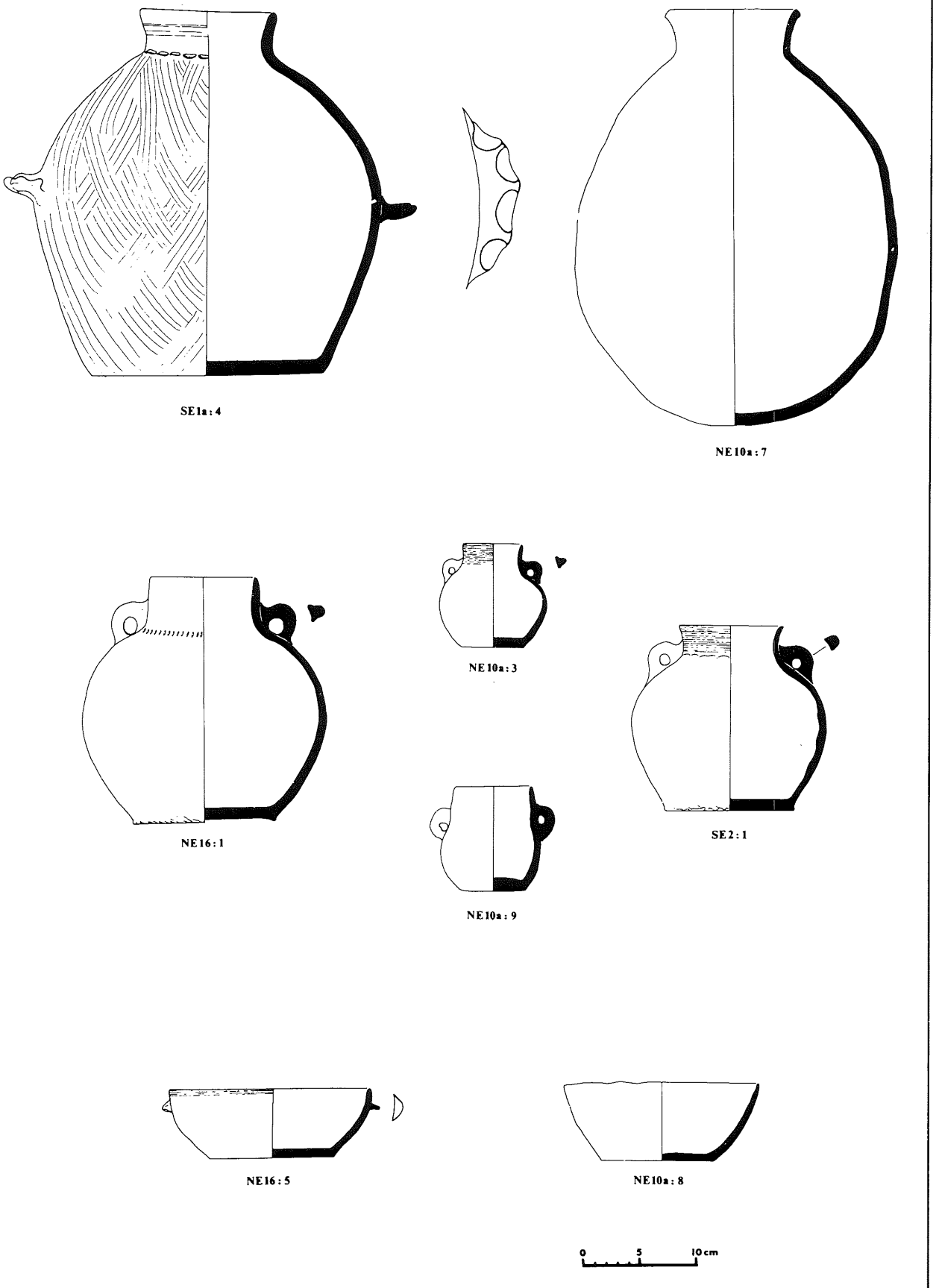
One further type of object encountered during the excavations deserves special mention on account of its peculiarity. Two examples of a most unusual lamp, termed here "side-spouted", were found in different deposits, one (SE1:7) in the lamp niche of SE1, and the other (SE9:1) in the chamber of SE9. This lamp has a perfectly usual four-spouted saucer on top, but it is set on a high base, an internal chamber in which connects with a spout of approximately square cross-section, positioned on the side of the vessel. In both cases the lamp part had clearly been used as such as evidenced by the quite extensive blackening of the spouts. No such blackening was found on the side spouts and the function of these with their connecting chambers remains obscure. Perhaps an aromatic substance was placed in the chamber, giving off a fragrant scent which issued from the side spout as the lamp on top became hot.

The Date of the Cemetery and Conclusions

A detailed analysis of the pottery will not be attempted here: instead it will suffice to make a few preliminary remarks.

Generally the pottery of Tiwal esh-Sharqi is technically well-made. The clay is well prepared, uniformly tempered with small-medium sand, ceramic and lime and is evenly fired. Many of the vessels are provided with a cream wash, tending in some cases towards a slip. There seems

[8] W.G. Dever, The EBIV-MBI Horizon in Transjordan and Southern Palestine, *BASOR*, 210 (1973) p. 53, n. 3.



Figs. 3 : Representative selection of pottery from the EBIV tombs.

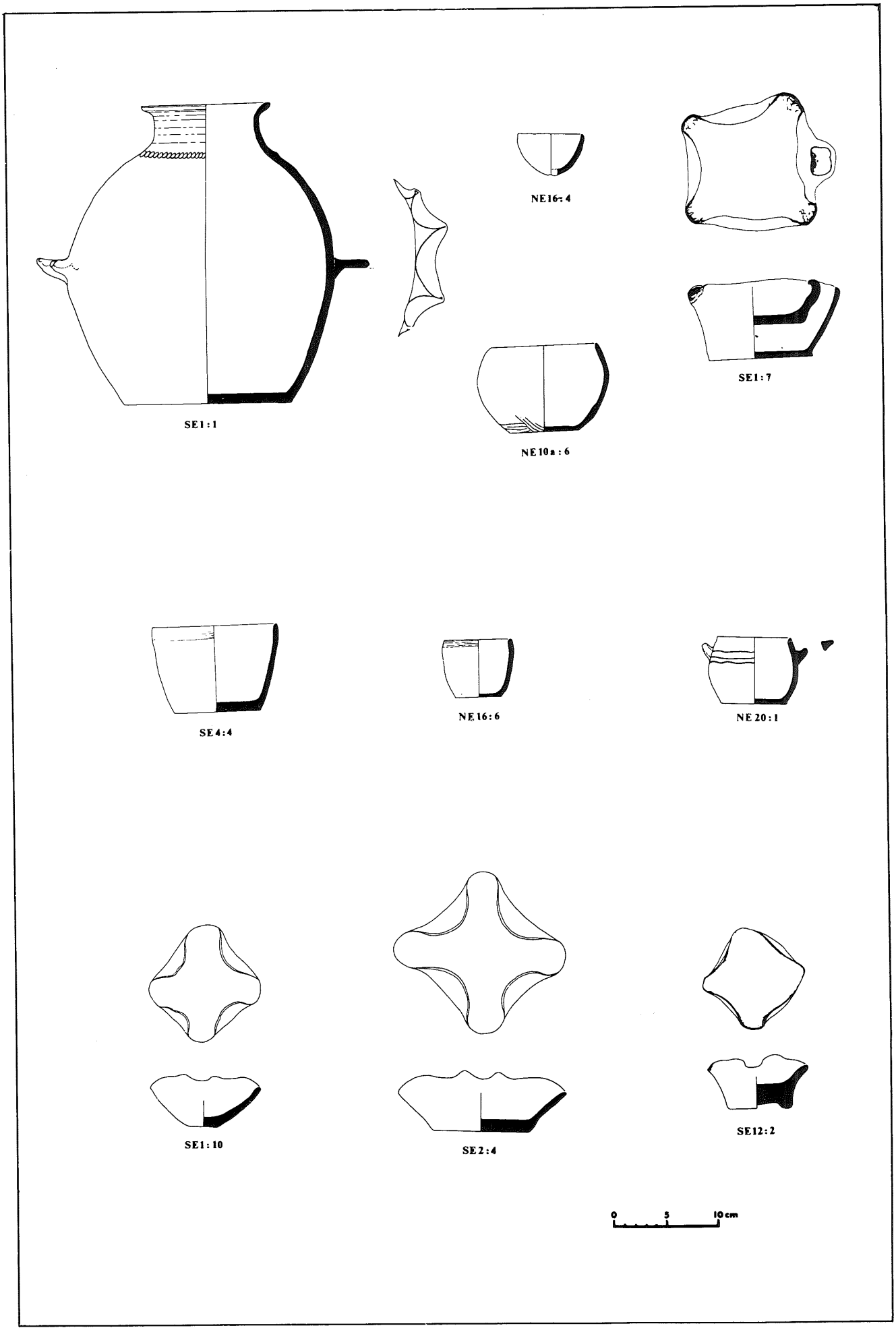


Fig. 4: Representative selection of pottery from the EBIV tombs.

little reason to doubt that the pottery was made locally.

As far as dating is concerned, given the reservations previously expressed by the writer[9] concerning the over-rigidity of Dever's scheme for subdividing the EB IV period into chronologically orientated regional groups or "families",[10] it is at least clear that the entire EB IV assemblage of Tiwal esh-Sharqi falls well within what is defined in his terms as EB IVB. All of the storejars have well-defined envelope-folded ledge handles which show no tendency towards becoming vestigial. Band-combing, a characteristic feature of amphoriskoi, storejars, teapots and cups of EB IVC, is absent, and none of the lamps, whether flat or round based shows the sharply pinched spouts and concavity of body wall typical of the latest in the series. There is some typological variation within the series of amphoriskoi (compare for example NE8:2, NE16:1 and NE20:2) but all have the generally straight neck, often with slightly inturned rim, characteristic of EB IVB: again, completely absent are the flaring necked varieties found in EB IVC deposits.

There is equally no evidence to suggest that the cemetery of Tiwal esh-Sharqi was used in EB IVA. But here a reservation must be expressed, for certainly in the writer's view it has yet to be demonstrated that this phase, represented by Dever's family TR and confined to more southerly parts of Transjordan, has indeed chronological rather than purely regional significance. In any event, it would seem likely that the cemetery of Tiwal esh-Sharqi was in use for a relatively short period between about 2250 and 2100 BC in absolute terms.

In regional terms, the material from Tiwal esh-Sharqi finds its closest parallels to the north, in the area defined by Dever's family NC. Here, similar ledge-handled jars and amphoriskoi with body combing and impressed and moulded neck ornament are found, as also is the same wide variety of lamp types.[11] It should be noted, however that the painted wares and single strap-handled jug forms which characterize these more northerly assemblages are all but absent from Tiwal esh-Sharqi. To the south and west there are also clear ceramic relations, especially in the forms of the loop-handled amphoriskoi and small ledge-handled jars.[12] Absent from Tiwal esh-Sharqi, however, are the ubiquitous handleless jars of these regions.

It may fairly be said, therefore, that the material from Tiwal esh-Sharqi is distinctive in its own right. Although elements of surrounding traditions are not surprisingly present, features such as the simple and delicate cups and bowls, the relatively high proportion of funnels and, of course, the unique side-spouted lamps argue for an individual and local tradition (not, it is to be hoped another new "family"), the parametres of which may be established by further research at neighbouring sites.

Jonathan N. Tubb

Appendix A.

Conservation: Preliminary report Tiwal esh-Sharqi, 1984 by Margot M. Wright

The two major categories of material excavated from the site which required conservation were ceramic and copper alloy artefacts. Beads composed of stone, shell, alabaster or bone/teeth constituted a relatively minor category.

Ceramic Vessels

At first appearance, the fabric of the vessel seemed to be quite robust but, in fact, upon closer examination, the fabric proved to be rather soft and friable,

[9] J.N. Tubb, The MBIIA Period in Palestine: Its Relationship with Syria and its Origin, *Levant,* 15 (1983) p. 56.

[10] This was most recently proposed in: W.G. Dever, New Vistas on the EBIV ("MBI") Horizon in Syria-Palestine, *BASOR,* 237 (1980) p. 35-64.

[11] See especially: E.D. Oren, *The Northern Cemetery of Beth Shan,* Leiden, 1973, figs. 18-24; G.L. Harding, An Early Bronze Cave at el-Husn, *PEF Annual,* 6 (1953) figs. 2-3.

[12] K.M. Kenyon, *Excavations at Jericho, Vol. I: The Tombs Excavated in 1952-4,* London, 1960, p. 180-262; P.W. Lapp, *The Dhahr Mirzabaneh Tomb: Three Intermediate Bronze Age Cemeteries in Jordan, AASOR,* 1966.

especially when the pottery contained many small inclusions as temper or when, as in some cases, it seemed to be made from a clay which, when fired, had the appearance of a fine red-orange fabric.

A standard form of conservation technique was adopted to treat the majority of the ceramics, both whole vessels and sherds.

1. Whole vessels were excavated and the fill examined.
2. The outer surface was cleaned gently by means of a variety of tools e.g. dental picks, stencil cutters, cocktail sticks. The clay marl which adhered to the surface of the vessel was removed with extreme caution so as not to cause damage to the vessel. In some cases, because of the softness of the object, cleaning was terminated and the ingrained dirt left *in situ.*
3. Some vessels were found to have large crystals adhering to both inner and outer surfaces. These insoluble salt crystals tended to disfigure the artefacts and therefore, when possible, they were removed from the surface (outer) of the object by scalpel blade or, when the crystals were large and hard, they were ground down by minidrill using a variety of metal bits. Often, the crystals were left *in situ* if their removal was considered to be damaging to the vessel. The crystals adhering to the interior surface of the vessel were not subjected to any such treatment.
4. The outer surface of the vessel or sherd was cleaned further by brushing the surface with tap water which, in the area where the conservation laboratory was established, appeared to be of good quality. Clay or marl adhering to the interior of the artefact was rinsed off when possible but often, the fine silt proved to be too difficult to remove and hence was left so as not to harm the fabric of the vessel.
5. The object was immersed in tap water for a period of about one hour to allow the fabric to become fully saturated with water and thus to prevent the body of the vessel from being affected by the dilute solution of acid which, in some cases, was used to remove carbonates from the surfaces (outer). The carbonates (insoluble salts) were removed by dripping 5-10% nitric acid from a Pasteur pipette onto the body of the object where they could be seen to have formed hard white deposits. The carbonates reacted with the acid causing effervescence and forming nitrates, soluble in water.
6. The ceramic was immersed in tap water for a period of four days to remove the soluble salts from the fabric. During this time, the water was changed at least twice per day and at all times care was taken to ensure that the object was submerged fully in the water to prevent areas appearing above the surface of the water from which evaporation could occur and thus result in efflorescence and damage to the object. Certain artefacts were considered to be too delicate to be treated with acid and hence they were subjected to a short period of soaking. The four day period of immersion in tap water was judged to be sufficient to remove the majority of soluble salts present and ideally, under laboratory conditions, the final soaking would have been in distilled water, and the level of salts present in the distilled water after soaking monitored by conductivity meter to decide whether the treatment should be continued or terminated.
7. The object was removed from the tap water and allowed to dry in the shade.
8. When the sherds or vessel had dried completely, usually after two or three days, the fabric was inspected to discover whether it was strong or weak. Some objects had to be consolidated because they were in a highly weakened state by immersing them in a solution of 10% Paraloid B-72 (ethyl acrylate-methyl methacrylate copolymer manufactured by Rohm & Haas) in toluene. Ideally the artefact would be immersed in the consolidating solution and subjected to vacuum to ensure penetration of the copolymer

but, due to lack of facilities, the object was immersed for a period of approximately 20 hours. The object was removed from the solution and the solvent allowed to evaporate slowly: toluene was selected as the solvent in which the consolidant was dissolved as it evaporates more slowly than acetone and therefore is less likely to cause the consolidant to migrate to the surface of the vessel or sherds.

9. Broken vessels were reconstructed and the sherds held in position with masking tape so that, when joined, they could be put together efficiently, without causing damage to the edges, and to prevent any sherds from being "locked out".
10. The sherds were joined with H.M.G. (cellulose nitrate adhesive). This adhesive is soluble in acetone or toluene and therefore the joins may be taken down at any point in the future.
11. When necessary, to give the reconstructed vessel strength or to enhance its appearance, gaps were filled with dental plaster, and in some vessels, small sherds were floated in. The dental plaster was ground down to form a smooth surface with various grades of abrasive films and the surface was painted with powder colours in Rowney Cryla Matt Medium Number 2 or with Cryla Acrylic Colours in water.

Copper Alloy Artefacts

1. Smaller objects such as rivets, points and blades were cleaned mechanically by mini-drill and scalpel blade under a binocular microscope.
2. Each object was degreased by immersion in acetone for 30-60 seconds.
3. The object was immersed in 3% benzotriazole in ethanol and subjected to vacuum for a period of approximately 12 hours, after which the vacuum was released and the object allowed to remain in the solution for a further 12 hours to try to obtain a stable state in which corrosion was inhibited.
4. Excess benzotriazole was removed by rinsing the object with ethanol, after which the solvent was allowed to evaporate.
5. The object was protected by the application of two coats of Incralac* (a solution of 20% in toluene), the first coat being allowed to dry before the application of the second.

Larger objects, such as daggers and javelins, were wrapped in acid-free tissue and packed with Silica Gel in an air-tight box to reduce relative humidity (RH) and hence reduce corrosion. Most of the objects appeared to be relatively stable but this was belied by the fact that when part of a dagger was mechanically cleaned, overnight the green corrosion products, indicative of active bronze disease, were observed to have developed. This observation is rather disturbing and emphasizes the point that copper alloy objects should be stored under controlled environmental conditions i.e. RH less than 45% immediately after excavation and that they should be treated to try to obtain stabilisation by trained conservators, after which they should be maintained in a stable environment with low RH. 'methyl methacrylate copolymer (Paraloid B-44), toluene, ethanol or butyl acrylate, benzotriazole, epoxidised soya bean oil.

Beads

All of the beads were cleaned by swabbing gently with cotton wool dampened with ethanol.

The beads excavated from Tomb NE 8: 6 which appeared to have been manufactured from the roots and lower parts of teeth were in a very poor state of preservation which necessitated immediate consolidation with 10% Paraloid B-72 in acetone so that they did not disintegrate; fragments were joined with H.M.G.

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