

TALL NIMRĪN: PRELIMINARY REPORT ON THE 1995 EXCAVATION AND GEOLOGICAL SURVEY

by

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Introduction

The fourth season of excavation at Tall Nimrin in ash-Shūna South was conducted from May 25 through July 5, 1995. James W. Flanagan of Case Western Reserve University, David W. McCreery of Willamette University, and Khair N. Yassine of the University of Jordan again served as co-directors. The excavation staff comprised twenty-seven scholars and students from Jordan, the United States, and Canada.

The project's long term goal is to document the site's occupational sequences, with special emphasis on the environmental, ecological, and economic history of the Tall and its immediate vicinity. In this, the final season of the first phase of the project, four specific objectives were set. The first was to complete excavation and correlate findings in several squares that had been opened in previous seasons (N25/W50, N35/W20, N35/W25, N40/W20, N40/W25).¹ The intention was to gather more data from the Byzantine, Persian, Iron I-II, and Middle Bronze Age strata (Fig.1: location of squares excavated in 1995).

Second, in order to further document the context of the Byzantine coin hoard found in 1993 (Flanagan, McCreery and Yassine 1994b) we chose to excavate square N35/W30. The square is adjacent to and immediately west of the one that yielded the hoard and also immediately north of a square that produced ostraca in 1993.

A third goal was to pursue geological/

archaeological research both in the immediate region and along the eastern shoreline of the Dead Sea. For logistical reasons, this research was separated from the excavation season and took place in late August and early September.

The final goal was to advance and enhance the digital records of the project. Additional work was done on the computer programs used to record and report on field activity, and digital photography was used for important elements of the project. A Kodak/Nikon DCS200 camera was used in the field and camp in an effort to expedite electronic publication of results.

Stratigraphy

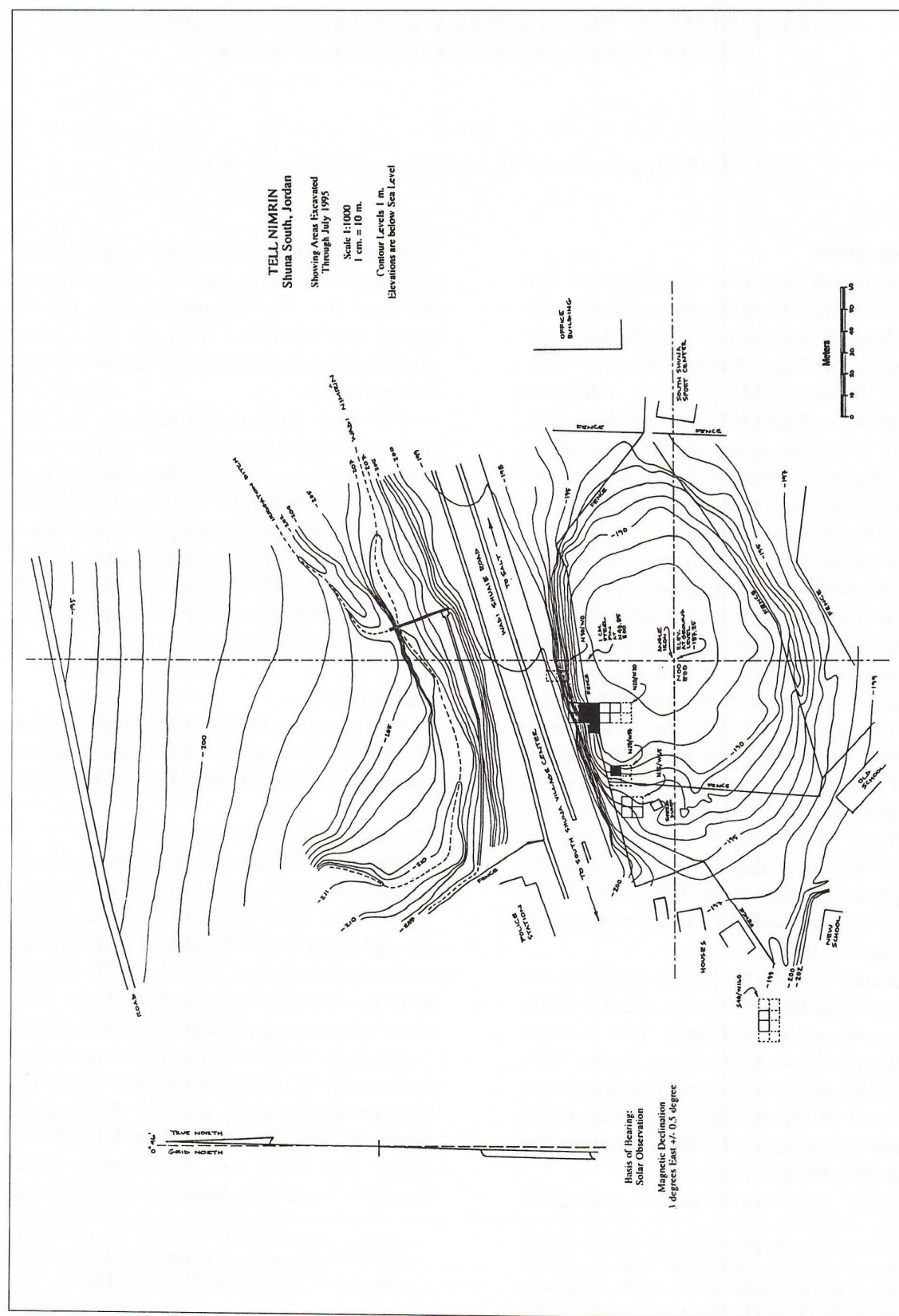
Preliminary stratigraphic analysis has identified eight major strata and thirteen phases of occupation from the 1995 excavation.

Modern (Stratum VIII)

Stratum VIII, consisting of modern topsoil and recently erected fence posts, was removed from N35/W30. Before excavation, the surface of N35/W30 sloped sharply from south to north (from -188.42m MSL at N35/W30 to -190.96m MSL at N40/W30). The loose surface soil containing plastic-coated copper wire, black PVC fragments, and other modern debris, attests to the post-1967 military presence on the site, but the shallow depth of this deposit (0.15m-0.30m) indicates that there was not extensive bulldozing or other disturbance in this square as

1. In accordance with the polar point system used to map and identify excavation squares at Tall Nimrin, each five meter square on the site grid is identified by the single point closest to the central

reference point (00/00), on top of the tall. Thus, N35/W30 refers to the five meter square whose SE corner lies 35 m north and 30 m west of 00/00.

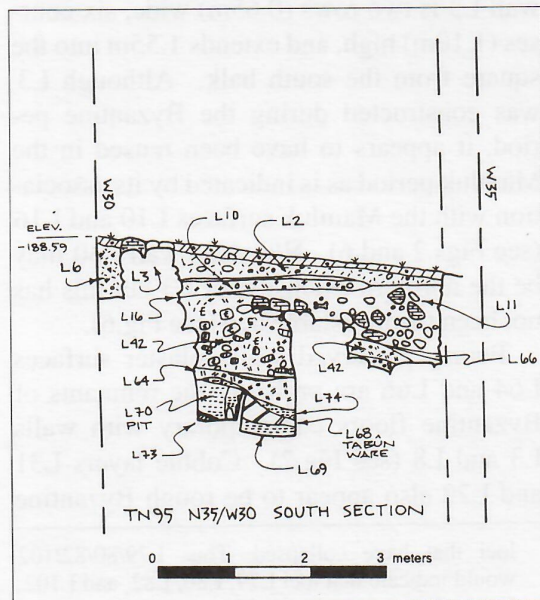


1. Topographic Map of Tall Nimrin. 1995 Excavation Squares indicated by shading.

was the case in N25/W20 to the south and N50/W00 to the east.

Mamluk (Stratum VII)

Glazed and painted Mamluk ceramics were found in abundance scattered on the surface of Tall Nimrin (Flanagan, McCreery, and Yassine 1990; Dornemann 1990). Although the Mamluk stratum appears to have been extensively damaged by bulldozing (especially near the summit of the tall), stratified material had been found during the 1990 and 1993 excavations in squares N15/W70, N20/W70, N20/W65, N25/W50, S40/W175, and S40/W170 (Flanagan, McCreery, and Yassine 1992:102-105; 1994a:207-208). Apart from Mamluk pottery recovered from balk trim in N25/W50, the only stratified late Islamic material found in 1995 came from N35/W25. The latest *in situ* occupational loci were a large pit, L39 (1.35m in diameter and 0.67m deep), and surfaces L10 and L16 (Fig.2). These loci produced distinctive Mamluk painted and glazed ceramics, providing the first documented examples of stratified late Islamic occupation near the summit of the mound. Due to their proximity to the mod-

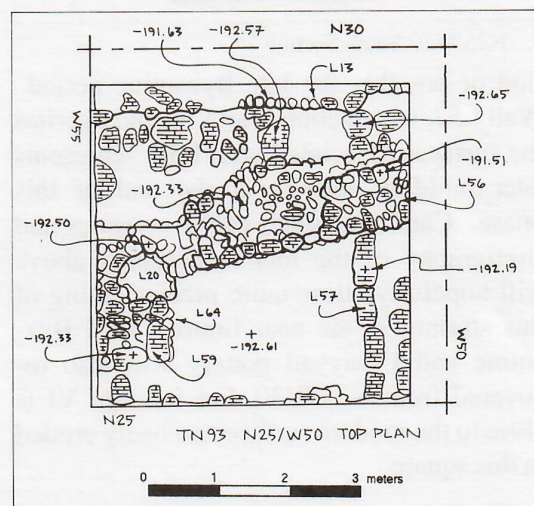


2. N35/W30 South Section.

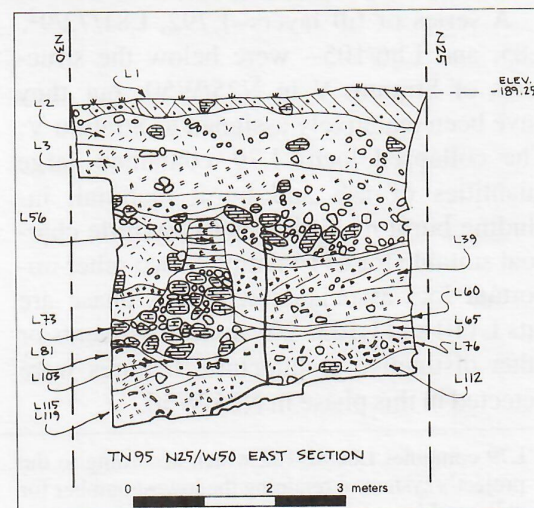
ern surface of the tall, all of these loci had suffered some damage and were only partially preserved.

Late Byzantine/Umayyad (Stratum VI)

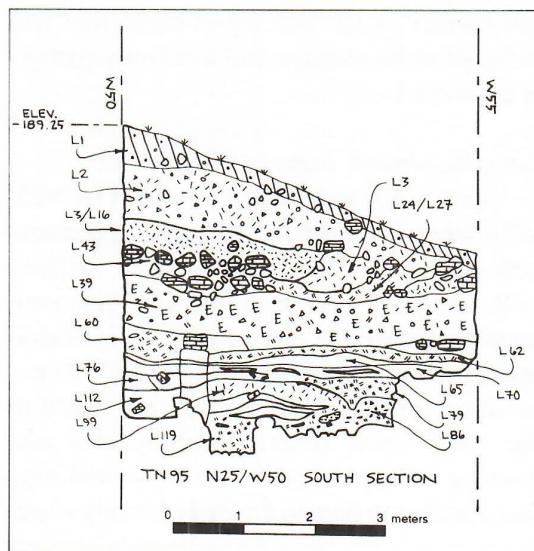
Stratum VI was best represented in N25/W50 where it consisted of stone alignments L56, L57, L59, L64 and associated surfaces L60, L62, L65, L67, L68, and L69 that were identified near the end of the 1993 season and removed at the beginning of the 1995 excavation (Figs.3, 4 and 5). As was noted in the 1993 report (Flanagan, McCreery and Yassine 1994a: 208), these walls and surfaces appear to date to the early Umayyad pe-



3. N25/W50 1993 Final Top Plan.



4. N25/W50 East Section.



5. N25/W50 South Section.

riod or possibly the late Byzantine period. Wall L57, which abuts wall L56 and overlies the surfaces associated with L56, represents later building activity at the end of this phase. Careful analysis of the ceramics and stratigraphy of the loci mentioned above will hopefully allow more precise dating of this stratum in the near future. Late Byzantine and Umayyad pottery was also recovered from N35/W30, but Stratum VI is close to the modern surface and badly eroded in this square.

Roman/Byzantine (Stratum V)

A series of fill layers--L792, L81/72/9², L85, and L86/105-- were below the structures of Stratum V in N25/W50, but they have been tentatively assigned to Stratum V. The collapsed locus L79 contained large quantities of ash and burnt material, including burnt mudbrick, but very little charcoal suitable for C-14 dating. Two other important loci associated with this phase are pits L110 and L123. No stone alignments or other distinctive architectural features were detected in this phase in N25/W50.

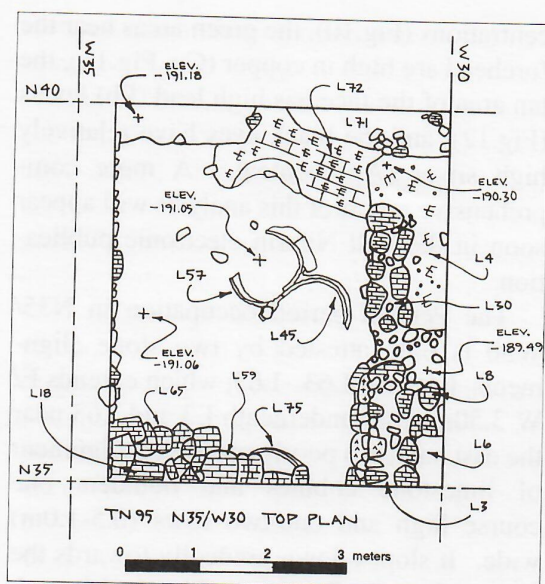
The mixed pottery readings from this stratum suggest that careful analysis is needed to determine whether the fill layers actually date to the Roman/Byzantine periods or to the Persian period. Pits L110 and L123 are either late Roman and/or early Byzantine, and they seem to be roughly contemporary. Although the fill layers contained some Roman and Byzantine ceramics, late Iron II and Persian period pottery was much more abundant. The fill layers may date to the Persian period (Stratum IV) and have been contaminated by the late Roman/early Byzantine pits (L110 and L123) cut into them.

Stratum V is well represented in N35/W30 although the remnants of this stratum have eroded away from the northern end of the square. Stone walls L8 and L3 are the most prominent Byzantine remains in N35/W30. L8 is an E/W oriented stone alignment two rows (0.65m) wide and four courses (0.69m) high. It extends 1.05m into the square from the eastern balk and corners with N/S stone wall L3. L8 appears to be an extension of walls L7 and L29/32 from N35/W25 (Fig.6), and like them, displays evidence of two construction phases. Stone wall L3 is two rows (0.65m) wide, six courses (1.10m) high, and extends 1.55m into the square from the south balk. Although L3 was constructed during the Byzantine period, it appears to have been reused in the Mamluk period as is indicated by its association with the Mamluk surfaces L10 and L16 (see Figs.2 and 6). N/S stone wall L30 may be the northern extension of L3 but this has not been firmly established (see Fig.6).

Poorly preserved white plaster surfaces L64 and L66 are probably the remnants of Byzantine floors contemporary with walls L3 and L8 (see Fig.2). Cobble layers L31 and L22 also appear to be rough Byzantine

2. L79 combines L80/82/102 which according to the project's system of retaining the lowest number for collapsed loci, constitutes L79. Elsewhere, two or more locus numbers separated by slashes indicate

loci that have collapsed. Thus L79/80/82/102 would indicate that loci L79, L80, L82, and L102, have collapsed into Locus 79.



6. N35/W30 Final Top Plan.

surfaces or possibly bedding for destroyed plaster floors. Occupational debris associated with these walls and surfaces includes L4 and L62. L4 is composed of reddish mud-brick material containing numerous plaster fragments, very similar to the Byzantine layers found south of wall L7 in N35/W25 in 1993.

Two factors frustrated attempts to clarify the stratigraphic context of the 1993 coin hoard: first, the erosion of the Byzantine stratum in N35/W30, and second, the fact that walls L3 and L30 run parallel to and very near (0.28-0.48m west) the east balk (see Fig.6). Excavation of the soil layers associated with the coins (L3/5/10 in N35/W25, 1993 excavation) was impossible. However, it does appear that walls L30, L3, and L8 in N35/W30 and walls L7 and L8 in N35/W25 constitute the west, south, and east walls of a Byzantine room in which the coins were discovered.³ As indicated in the 1993 report (Flanagan, McCreery and Yassine 1994a:210), the building appears to have gone out of use sometime before the coins were deposited in it.

3. No sign of a connecting north wall has emerged in either N35/W25 or N35/W30. Both the current slope of the hill and the stratigraphy at the N35 balk

Persian (Stratum IV)

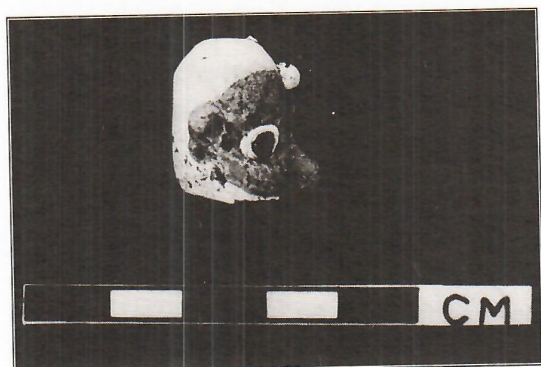
Very few Persian period architectural features were identified even though Persian pottery was found in abundance. In N25/W50, Stratum IV was represented by a series of surfaces L90, L106, L107, and L104/108, but none were found in association with contemporary architectural features. All of these surfaces slope down from south to north becoming much thicker in the northern part of the square. L90, L106, and L107 are all cut by the Stratum VI wall L56, foundation stones L100, and foundation trench L103. All of the surfaces are cut in the west by the Stratum V pits L110 and L123. The series of four surfaces cover Persian period fill layers L113, L115, L119, L120, and L122. These also slope up dramatically from north to south. The slope of the layers and overlying surfaces suggest the presence of a large structure, probably belonging to an earlier phase, located south or southeast of N25/W50.

A stamp seal with the incised profile of a lion (Fig.7) and a glazed, male figurine head (Fig.8) were found in the Persian period stratum (L104) in N25/W50. The objects were analyzed by Art Heuer at the Materials Science and Engineering (SEM) Laboratory at Case Western Reserve University. Initial results of this analysis are illustrated in Figs. 9-



7. Seal (RO no.1) from N25/W50 L104.

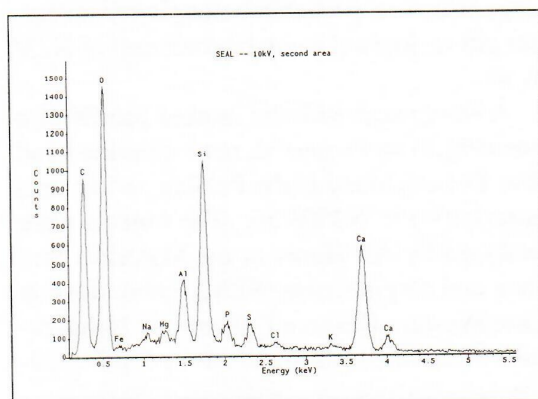
line indicate that all traces of the northern wall have eroded.



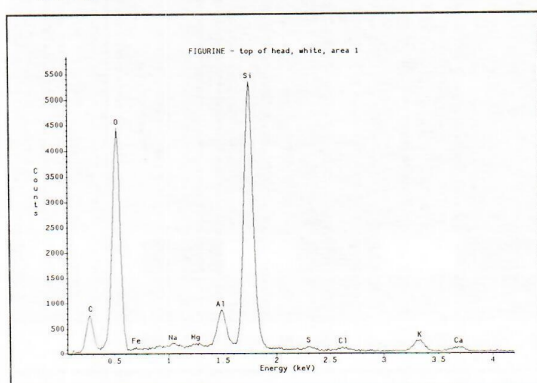
8. Figurine Head from N25/W50 L104.

12.

The preliminary analysis of the data indicates that the seal is composed primarily of calcium carbonate (calcite) and silica (Fig.9), and the chemical composition of the glazes on the figurine is variable (Figs. 10-12). The white area on the crown of the figurine head has high aluminum (Al) con-



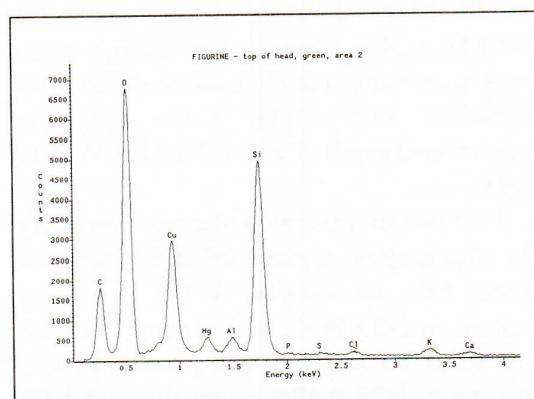
9. SEM Analysis of Seal (RO no.1) from N25/W50 L104.



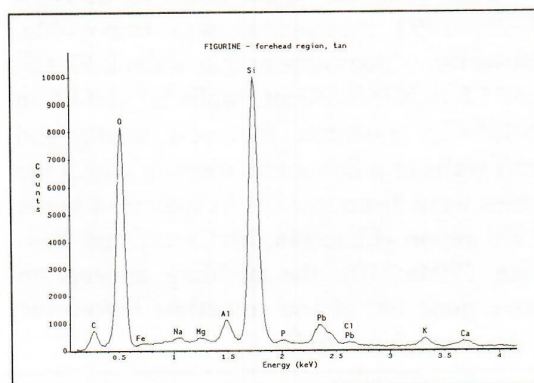
10. SEM Analysis of White Glaze on Figurine Head from N25/W50 L104.

centrations (Fig.10), the green areas near the forehead are high in copper (Cu, Fig.11), the tan area of the face has high lead (Pb) levels (Fig.12), and the black eyes have relatively high silver (Ag) content. A more comprehensive report of this analysis will appear soon in the Tall Nimrin electronic publication.

The Persian period occupation in N35/W30 is only attested by two stone alignments, L65 and L63. L65, which extends E/W 3.50m from underneath L3 and L63 near the east balk, is a poorly preserved alignment of limestone cobbles and boulders one course high and one-two rows (0.5-1.0m) wide. It slopes down gradually towards the west and was badly damaged by the Mamluk pit L39. L63 overlies L65 along the same alignment and may either be a later phase of L63 or equal to L65. Both L63 and L65 ap-



11. SEM Analysis of Green Glaze on Figurine Head from N25/W50 L104.



12. SEM Analysis of Brown Glaze on Figurine Head from N25/W50 L104.

pear to be the western extension of the lower courses of wall L32 in N35/W25 which was dated to the Persian period in 1993. No clearly defined living surfaces were detected in association with L63 or L65.

On the last day of excavation in N35/W30 a four letter ostracon was excavated in the trim of the western balk and identified during pottery reading. It consists of a four letter, single word inscription written on the exterior of a small (roughly 5cm x 4cm) jar sherd (Figs.13 and 14). The inscription is approximately 2cm long and the letters, each of which is clearly legible, range in height from 0.5cm to 1cm. The script is very similar to that of other ostraca found in nearby squares and appears to date to the late fourth century BC (Flanagan, McCreery and Yassine 1994a:221-222; Dempsey 1993).

Project epigrapher Deirdre Dempsey's preliminary field reading of the ostracon is "klyh" which may be a personal name meaning either "YH is perfect" or "YH has measured", where YH would be a theophoric element (pers. comm.). A similar ostracon found in N30/W25 in 1993 had an oddly shaped "yod" that was initially read as a "nun" (Flanagan, McCreery and Yassine 1994a: 222). In light of this year's inscription, which is clearer than the 1993 os-

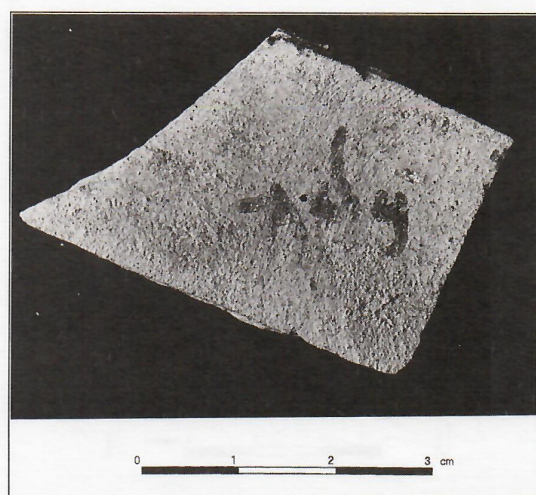
tracon, the previous reading should be amended from "klnh" to "klyh" (Dempsey, pers. comm.).

Iron II (Stratum III)

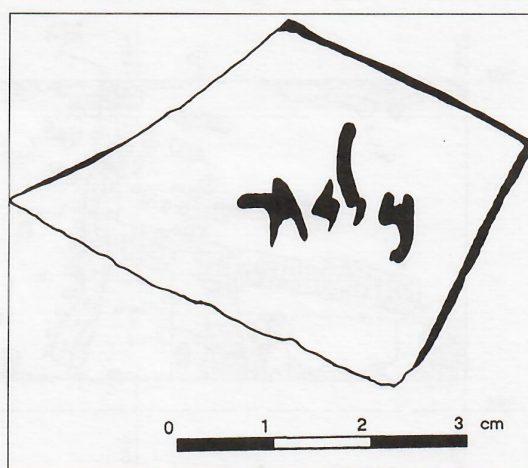
Four distinct Iron II phases were well attested in N35/W20, N35/W25, N35/W30, N40/W25, and N25/W50. Designated Stratum IIIA-III D in this report, the four phases span approximately 200 years from the early ninth to the late eighth/early seventh centuries BC.

The earliest Iron II phase (Stratum IIIA) is tentatively dated to the early ninth century. It consists of cobble surface L203/230 and mudbrick walls L234 and L171 along with their stone foundations L251 and L204 in N40/W25 (Fig.15). The cobble surface and the associated walls may be part of a single building. However, this is difficult to ascertain because of limited horizontal exposure and damage caused by the pits of Stratum IIIB.

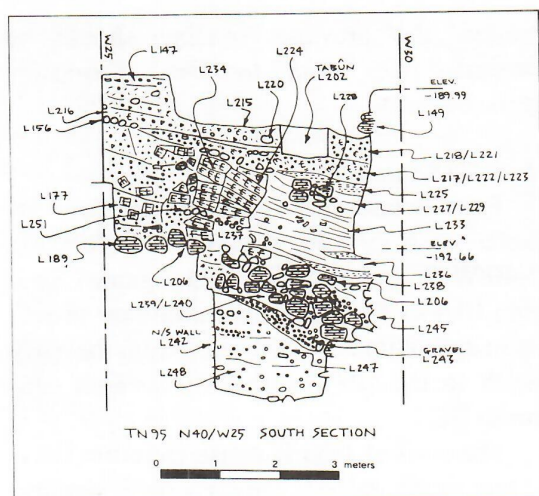
In N35/W20, the E/W oriented stone wall L91(=L181 in N40/W20), is the major Stratum IIIA feature. L91 is clearly associated with surface L69 in the east balk of N35/W20 and is contemporary with N/S stone wall L110 in the east section of N40/W20 and the ninth century mudbrick structure



13. Ostracon (RO no. 42) from N35/W30 West Balk Trim.



14. Ostracon (RO no. 42) from N35/W30 West Balk Trim.



15. N40/W25 South Section.

(L15 and L28) found in N25/W20 in 1989 (Fig.16). L91 follows the same alignment as wall L78(=L255 in N40/W20) beneath it. L91 appears to be rebuild of the tenth century wall (Fig.17).

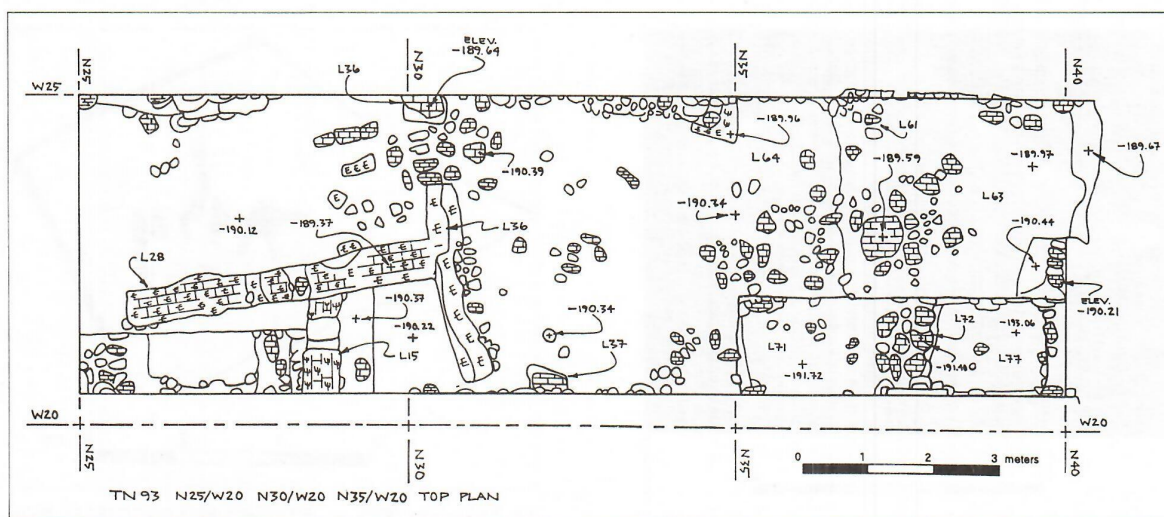
In the late ninth/early eighth centuries BC, a series of Stratum IIIB pits were dug, damaging the Stratum IIIA features described above (L173/186, L196/200, L231, and L235 in N40/W25 and L90 in N35/W20). The pits in N40/W25 range in diameter from 0.45m to 1.50m, from 0.49m to 1.05m in depth, and appear to be contemporary with the pits found in 1990 and

1993 in N25/W20 and N30/W20 which also cut into ninth century occupational layers (Flanagan, McCreery and Yassine 1994a: 216).

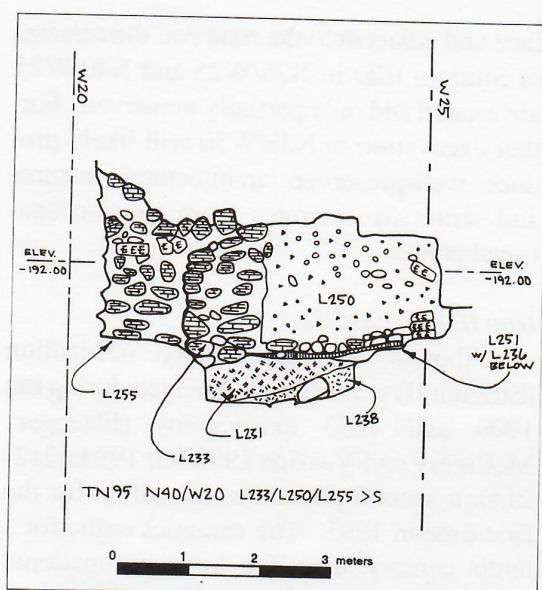
Extensive occupational remains of Stratum IIIC including walls, surfaces, and a number of *ṭawābīn*, immediately overlie the pits of Stratum IIIB. This phase is best preserved in N35/W30 and N40/W25. Two *ṭawābīn*, L202 and L165, and cobble surface L156 comprise the primary features of this phase in N40/W25 (see Fig.15). L202 (=L70 in N35/W25) is 1.0m in diameter, preserved to a height of 0.40m - 0.58m, and had 0.05m thick walls. *Ṭābūn* L165 was excavated in 1993.

The *ṭawābīn* contained, and were surrounded by, fine white ash (suggesting extremely hot temperatures), and sparse cultural material. The cobble surface associated with the *ṭawābīn* (L156 in N40/W25), extended into squares N40/W20 (designated L90), and N35/W20 (=L86). The E/W oriented mudbrick walls L95 and L66 in N35/W20 appear to be part of a structure associated with the exterior, cobble pavement L86 (L156 in N40/W20) and the *ṭawābīn* found in N40/W25.

In N35/W30, Stratum IIIC is represented by *ṭawābīn*, pits, and a mudbrick wall. L72 is



16. N25/W20, N30/W20, N35/W20 Top Plan.



17. N40/W20 L233, L250, and L255 >S.

a mudbrick wall with only one course of preserved bricks resting on a stone foundation. The wall has a NW/SE orientation, is from 0.85-0.97m wide, and extends from under the stone wall L30 near the east balk, 2.68m into the northern end of the square. At N38.80/W31.90, L72 is truncated by a large pit, L46 (ca. 1.25m diameter). To the south of L72, four *ṭawābīn* in various states of preservation were uncovered (see Figs.2, 6, and 18).

All of the *ṭawābīn* are roughly the same size (i.e. approximately 0.85m in diameter), and appear to have shifted slightly from their original position, sliding down-slope to the west, slightly distorting their circular shape to elliptical. *Ṭawābīn* L45, L55, and L57 are clustered near the center of the square, while L75 abuts and extends into the south section (see Fig.2). L45 and L55 have been damaged by pit L39, and L57 was cut by pit L46. *Ṭawābīn* L75 is particularly well preserved, having escaped damage from Mamluk pitting activity, and is distinguished from the other *ṭawābīn* by large storage jar body sherds that line the exterior of the *ṭawābīn*.

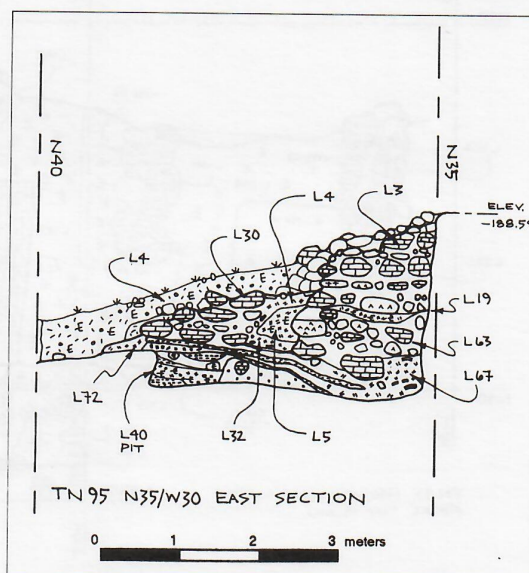
Despite the large quantities of ash, very little botanical material was recovered from



18. *Ṭawābīn* in N35/W30.

the *ṭawābīn*. Small quantities of *Zizyphus*, *Hordeum*, *Triticum*, and *Vicia* were found in association with L57. Pits L40 near the east section (Fig.19) and L70 along the south section (see Fig.2) appear to be associated with the *ṭawābīn*. The same is true of ash layers L38, L67, and L73. The bases of all four *ṭawābīn* stand at approximately -191m MSL, and they appear to be roughly contemporary with each other and with the *ṭawābīn* found in N35/W25 during the 1993 excavation. Our working hypothesis is that the "*ṭawābīn* phase" dates to the mid- eighth century BC.

It is interesting to note that a total of eight



19. N35/W30 East Section.

eighth century *ṭawābīn* have been uncovered within a relatively restricted area during the last two seasons (N35/W25, N35/W30, and N40/W25). And in 1993 another *ṭābūn* was identified eroding out of the road cut section immediately west of N35/W30.

The latest Iron II phase (Stratum IIID) was reached in 1990 in N35/W20 in the destruction layer that contained a distinctively decorated krater (Flanagan, McCreery and Yassine 1992:93, 95, and Figs.7 and 8; Dornemann 1995). The horizon was reached again this season some 30 m to the west with the emergence of a mudbrick platform L111 and stone alignments L121 and L124 in N25/W50. The stratum dates to the late eighth/early seventh centuries BC.

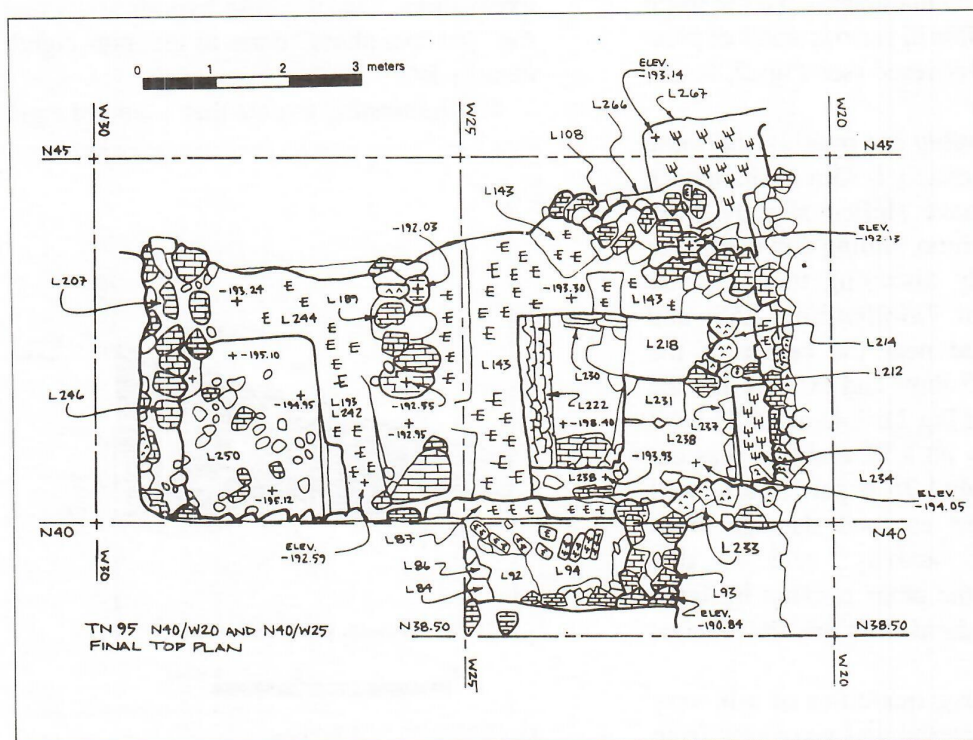
N35/W20 contains better preserved examples of Stratum IIID. Among them are mudbrick wall L28 (=L65 in N35/W25) and its stone foundation L56 (=L148 in N40/W20 and L66 in N35/W25). Surfaces associated with this wall are found in N40/W25 (L146) and N35/W25 (L68 and L69). Because they are close to the modern sur-

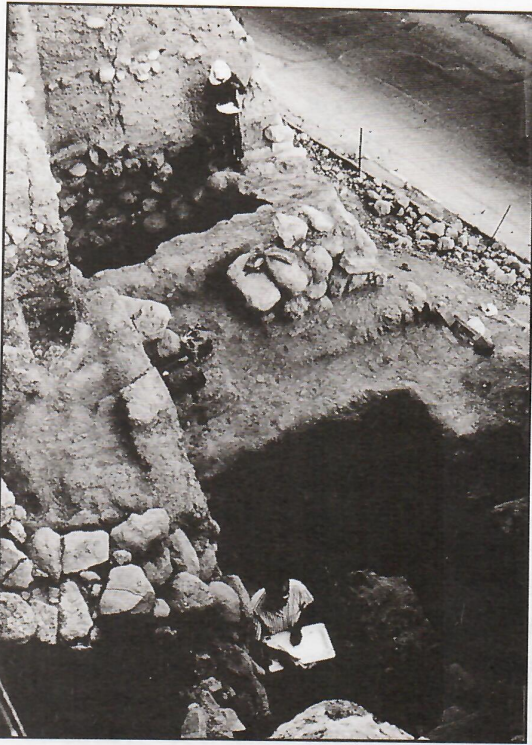
face and adjacent to the road cut, the remains of Stratum IIID in N35/W25 and N40/W25 are eroded and only partially preserved. Further excavation in N25/W50 will likely produce well-preserved architectural features and stratified ceramics from this occupational phase.

Iron IC (Stratum II)

Although a tenth century occupation (Stratum II) was well documented during the 1990 and 1993 excavations (Flanagan, McCreery and Yassine 1992:93; 1994a:212-214), a second phase was identified for the first time in 1995. The ceramics argue for a tenth century date for both occupational phases, but the architectural modifications make it possible to distinguish between early and late tenth century building activity.

The earliest tenth century features (Stratum IIA) in N40/W20 are N/S stone wall L125 (removed in 1993), E/W stone wall L233, and their associated plaster surfaces L140, L166, and L236 (see Figs.17, 20 and 21; and Flanagan, McCreery and Yassine





21. General View of N40/W20 and N40/W25.

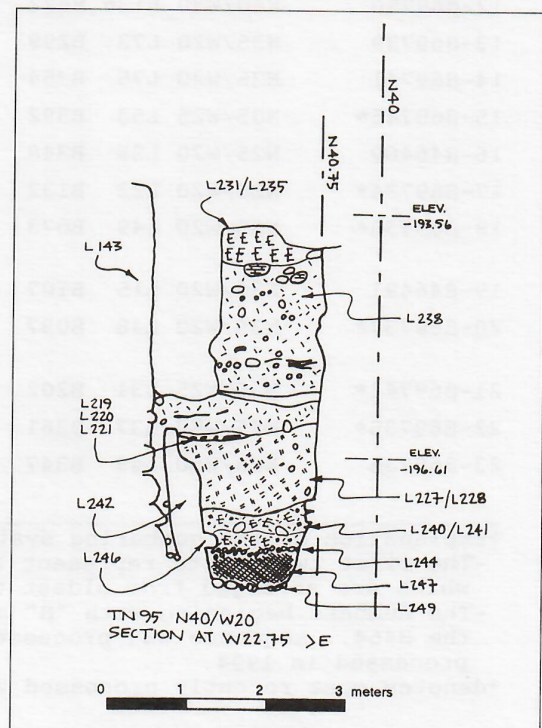
1992:92, Fig.2).⁴ These late Iron I walls and surfaces immediately overlie the monumental mudbrick walls of Stratum I. Sometime before the late tenth century destruction of this area, the doorway leading to the south (east of L233), was blocked by L255, and NW/SE wall L108 was constructed (see Fig.17). Plaster floor L236 running beneath L251 (see Fig.17) indicates that E/W oriented mudbrick wall L250 (=L87 in N35/W20) and its stone foundations L251 were built at this time. There is no evidence of damage to the earlier structures that might have necessitated these modifications. Considering the well-preserved mud plaster on L250 and L255, as well as on walls L72, L79, and L78 in N35/W20, it seems likely that the de-

4. In 1990, two designations were made for the plaster floors on either side of N/S wall L125. L166 was assigned to the floor east of L125 and L140 was the floor west of L125. In 1993, portions of L166 were excavated as L209. In 1995 the final remains of surface L166/209 and L140 were excavated as L236. L116, L209, and L236 all abut the bottom course of L125 and thus can safely be collapsed

struction represented by L120, L129, L130, L137, L138, and L139 in N40/W20 occurred shortly after the construction of L108, L250, and L255. Eight consistent C-14 dates from the destruction debris marking the end of Stratum II provide a secure date of late tenth century BC (see Table 1, samples 05-12).

Middle Bronze (Stratum I)

The earliest phase of occupation identified in the 1995 season came from a deep N/S probe in N40/W20. NE/SW oriented mudbrick wall L242 was the earliest architectural element. It clearly predates the monumental wall L222 which overlies it (Figs.22 and 23). L242 is 0.55m wide, 0.86m high, and rests on the one course high, two rows



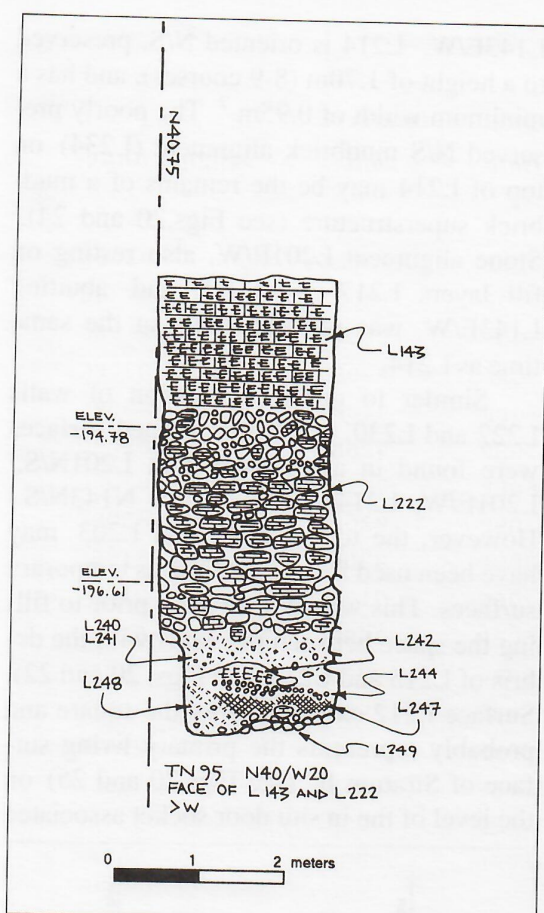
22. N40/W20 Section at W22.75 > E.

into L116. L140 also abuts L125 and is thus contemporary with L116 east of L125. Both of these surfaces extend under NW/SE wall L108 indicating that L108 is a later wall, probably contemporary with the blocking of the doorway to the south by L255, and that the plaster surfaces of the earlier phase were reused in the later phase.

Table 1. Summary of Carbon 14 Analyses from Tall Nimrin {as of December 1995}

<i>Sample #†</i>	<i>Provenance</i>	<i>C-14 Date</i>	<i>Intercept Date</i>	<i>2 Sigma Range</i>
01-β46493	N45/W20 L58 B455	3590±70BP	1347BC	2140-1750BC
02-β69740	N35/W20 L75 B311	2990±90BP	1220BC	1420 -930BC
03-β46490	N25/W20 L40 B136	2950±70BP	1180BC	1400 -942BC
04-β69733	N25/W20 L22 B113	2920±70BP	1110BC	1310 -910BC
05-β69746	N40/W20 L120 B49	2840±70BP	990BC	1200 -830BC
06-β69751	N40/W25 L188 B300	2820±60BP	940BC	1130 -830BC
07-β46495	N40/W20 L133 B339	2790±70BP	926BC	1155 -810BC
08-β46494	N40/W20 L88 B119	2780±50BP	921BC	1050 -830BC
09-β69748	N40/W20 L139 B131	2800±50BP	920BC	1040 -830BC
10-β69749*	N40/W20 L133 B368	2790±70BP	920BC	1120 -810BC
11-β69747*	N40/W20 L120 B100	2780±70BP	910BC	1110 -810BC
12-β69750	N40/W20 L136 B427	2760±60BP	900BC	1020 -810BC
13-β69739	N35/W20 L73 B299	2750±80BP	890BC	1070 -790BC
14-β69741	N35/W20 L75 B354	2740±60BP	850BC	1010 -800BC
15-β69745*	N35/W25 L53 B392	2690±60BP	820BC	930 -790BC
16-β46489	N25/W20 L25 B348	2630±70BP	807BC	920 -760BC
17-β69734*	N25/W20 L22 B132	2600±70BP	800BC	850 -530BC
18-β69738*	N35/W20 L49 B073	2620±60BP	800BC	850 -760BC & 640 -560BC
19-β46491	N30/W20 L15 B107	2520±90BP	770BC	840 -400BC
20-β69737*	N35/W20 L48 B037	2310±90BP	390BC	760 -670BC & 550 -170BC
21-β69744*	N35/W25 L31 B202	2270±90BP	370BC	520 - 70BC
22-β69735*	N25/W50 L37 B261	1050±70BP	1000AD	870-1160AD
23-β69736	N25/W50 L49 B347	990±90BP	1030AD	880-1240AD

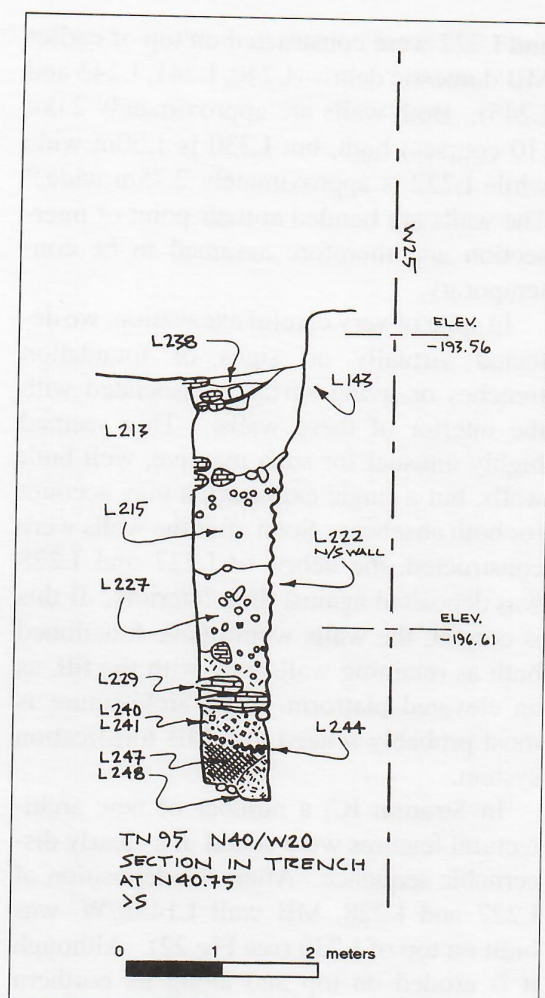
†Explanation of the numbering system:
 -The first two digits represent a sequential numbering of the samples which are arranged from oldest to youngest.
 -The numbers beginning with "β" are the Beta Analytic Inc. lab numbers. The β464.. sequence was processed in 1991, the β697.. sequence was processed in 1994.
 *denotes most recently processed samples, not previously published



23. N40/W20 Face of L143N/S and L222 >W.

wide stone foundations of L246. L246 in turn is resting on a gravel surface (L244) which immediately overlies bedrock (L247), a natural layer of compact silt/sand above a tightly packed layer of alluvial cobbles (L249).⁵ L244 appears to have been intentionally deposited in order to level the irregular bedrock, and the locus probably served as the original living surface for wall L242 (see Fig.22). In the SW corner of the probe, a pit (L248) was cut into bedrock. Pit L248 appears to be contemporary with wall L242 and contains ashy material from the early occupational layers L240 and L241 which overlie L244 and abut wall L242 (see Figs.22, 23, and 24).

With such limited exposure it is difficult



24. N40/W20 Section in Trench at N40.75 >S.

to interpret the features of Stratum IA. However, they appear to be consistent with the evidence of early domestic occupation found near this elevation in the adjacent squares N45/W20 and N45/W25 during the 1989 season (Flanagan, McCreery and Yassine 1990:137-144).

There is abundant evidence of the latest phase of the MBII occupation immediately below the Iron IC remains. This period, during which the monumental Middle Bronze Age walls were constructed, can be divided into sub-phases, Stratum IB and IC. At the beginning of Stratum IB, stone walls L230

5. Bedrock (L247) was found at elevations ranging from -197.80m to -197.96m MSL. This is 0.28m-

1.03m higher than the levels of bedrock found in N45/W20 and N45/W25 in 1989.

and L222 were constructed on top of earlier MB domestic debris (L240, L241, L243 and L245). Both walls are approximately 2.0m (10 courses) high, but L230 is 1.50m wide while L222 is approximately 2.75m wide.⁶ The walls are bonded at their point of intersection and therefore assumed to be contemporary.

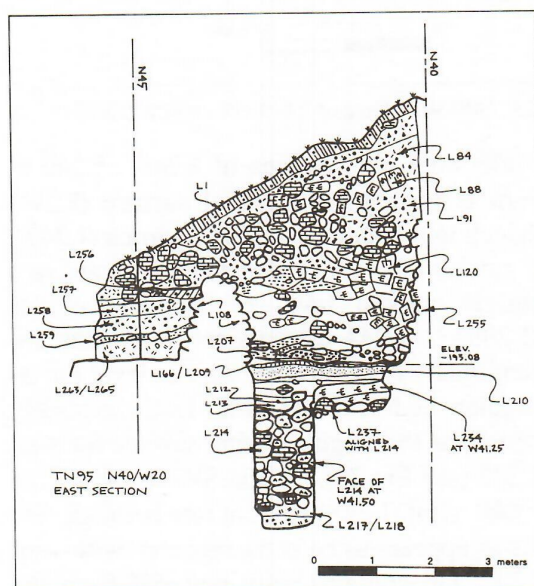
In spite of very careful excavation, we detected virtually no signs of foundation trenches or living surfaces associated with the interior of these walls. This seemed highly unusual for such massive, well built walls, but a single explanation may account for both absences. Soon after the walls were constructed, the debris of L227 and L228 was deposited against their interiors. If this is correct, the walls would have functioned both as retaining walls and, with the fill, as an elevated platform. The architecture is most probably related to a MB fortification system.

In Stratum IC, a number of new architectural features were added in a clearly discernable sequence. After the deposition of L227 and L228, MB wall L143E/W was built on top of L230 (see Fig.22). Although it is eroded on top and along its northern face, L143E/W stands 1.5-1.8m high (12-14 courses) and is 1.0m wide. Next, stone alignment L201N/S was built on top of L222 and mudbrick wall L143N/S was constructed over L201N/S (see Fig.23). Both L201N/S and L143N/S abut L143E/W which supports the conclusion that they were constructed slightly later. L201N/S is 6-7 courses high (0.90m) and of undetermined width. L143N/S is 10 courses high (1.5m) and 2.75m wide.

L214 was the next wall to be constructed, resting on fill layer L217 and abutting

L143E/W. L214 is oriented N/S, preserved to a height of 1.70m (8-9 courses), and has a minimum width of 0.95m.⁷ The poorly preserved N/S mudbrick alignment (L234) on top of L214 may be the remains of a mudbrick superstructure (see Figs.20 and 24). Stone alignment L201E/W, also resting on fill layers L217 and L218 and abutting L143E/W, was probably built at the same time as L214.

Similar to our interpretation of walls L222 and L230, no clearly defined surfaces were found in association with L201N/S, L201E/W, L214, L143E/W, or L143N/S. However, the top of L217 and L203 may have been used for a short time as temporary surfaces. This would have been prior to filling the space between the walls with the debris of L215 and L238 (see Figs. 20 and 22). Surface L212 extends across the square and probably represents the primary living surface of Stratum IC (see Figs.20 and 25) on the level of the in situ door socket associated



25. N40/W20 East Section.

6. The precise width of L222 has not yet been determined since its west face has yet to be exposed in N40/W25. Mudbrick wall L143 N/S, which overlies L222, is 2.75m wide so it is assumed that L222 is at least 2.75m wide. If L222 protrudes 0.20m beyond L143N/S along its west face as it

does along its east face, the width of L222 would be around 3.15m.

7. It is impossible to determine the precise width of L214 at this time since its eastern face runs parallel with, and under, the east section of N40/W20.

with L214. Again, as with L222 and L230, the paucity of living surfaces associated with the lower levels of L201N/S, L201E/W, L214, L143E/W, and L143N/S can be explained by assuming that these were retaining walls upon which people were living, rather than free-standing structures.⁸

The dating and sequence of construction proposed for Stratum IB and IC in this report is essentially the same as that suggested at the conclusion of the 1993 season (Flanagan, McCreery and Yassine 1994a: 217-219). We have gone beyond that report with our hypothesis that the walls of Stratum IB and IC never served as free-standing structures but as retaining walls to create a platform upon which the MB people lived.

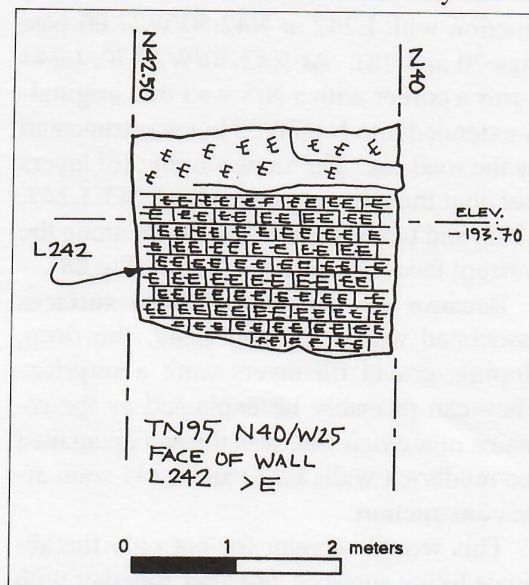
Although the order in which the structures of Phase II were erected is relatively clear, the length of time taken to complete all the walls is not easily determined. There may have been a single continuous construction project taking less than a year to complete. If this could be demonstrated, for example with firm C - 14 dates, then Stratum IB and IC could be collapsed into a single phase.

Stratum IC is represented in N40/W25 by E/W mudbrick wall L244 (=L143E/W in N40/W20), N/S mudbrick wall L193/242 (=L143N/S in N40/W20), and a series of fill layers (L243, L247, L248, and L249). South and west of the mudbrick walls, the loci contain large quantities of small to medium pebbles and cobbles mixed with 10YR 6/4 (light yellowish brown), 7.5YR 6/6 (reddish yellow), and 10YR 7/3 (very pale brown), medium compact to medium loose silt clay (see Figs.15 and 20). Particularly noteworthy is that the gravel layers slope steeply from east to west (approximately 30°). Pockets of soil whose color and composition are identical with L247 in N40/

W20 were found intermingled with these fill layers. This indicates that at least some of the fill came from pits dug into the local bed-rock.

By the end of the excavation season, 13-15 courses (1.70m-2.20m) of well-preserved mudbricks had been exposed along the west face of L242 (Figs.26 and 27). Although we had excavated below the elevation of the top of L201 on the east side of the same structure (L143) in N40/W20, we did not encounter stones in N40/W25 (-194.95m MSL compared with -194.47m MSL). Because L201 extends under wall L143, if it extends into N40/W25, it may be hidden behind a mudbrick facing. In any case, in N40/W20, the top of L222 stands at 195.52m MSL. Therefore, we would expect to encounter the western face of L222 within the next 0.55 m of excavation unless it is also covered by a mudbrick facing.

E/W oriented L244 (=L143E/W in N40/W20) was exposed to a height of 1.60m-1.65m (12-13 courses). It is 0.80m-1.00m wide, and extends west 0.70m beyond the



26. N40/W25 Face of Wall L242 >E.

8. Similar deep fill layers have been found associated with the MBII city wall at Pella (Bourke *et al.* 1994: 93-96). The interpretation of the monumental MBII walls at Tall Nimrin presented here,

corresponds closely to Ussiskin's conclusions in his analysis of the MBII fortifications at Jericho and Shechem (Ussiskin 1989).



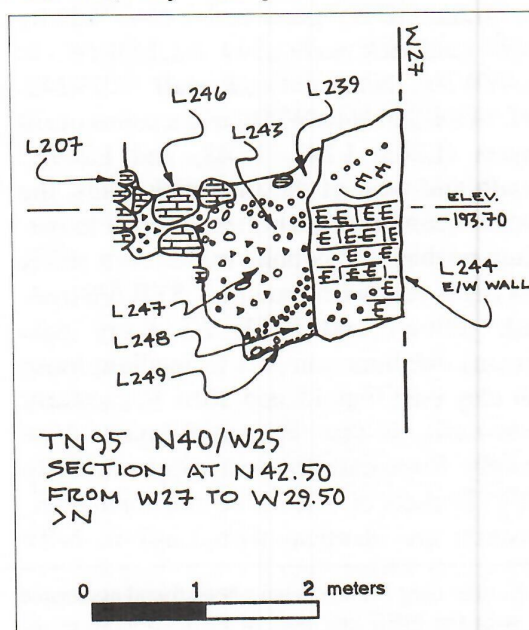
27. West Face of L242 in N40/W25 >E.

junction with L242 at N42.50/W27.00 (see Figs.20 and 28). At N42.50/W27.70, L244 forms a corner with a N/S wall that originally extended into N45/W25 but was truncated by the road cut. The same sloping fill layers that abut the west face of L242 (L243, L247, L248, and L249) extend northward along the western face (i.e. corner) of L244 (Fig.28).

Because we anticipated living surfaces associated with L244 and L242, the deep, sloping, gravel fill layers were a surprise. They can probably be explained as the remains of a *glacis* that was thrown up against the mudbrick walls L242 and L244 soon after construction.

This would account for not only the absence living surfaces, but also, together with fill in N40/W20) the well-preserved west and south faces of L242 and L244. They are in remarkable condition despite the 500 year occupational hiatus during the LB and early Iron I periods. Because the faces were cov-

ered by fill and the *glacis* soon after construction, they were protected from erosion



28. N40/W25 Section at N42.50 from W27 to W29.50 >N.

during the LB period of abandonment. The *glacis* in N40/W25 and the deep fill layers found in N40/W20 also explain why foundation trenches were not necessary for the massive MBII L230 and L222 walls.

After the 1989 excavation we proposed that settlement on the site expanded westward as time went on. The results of the 1995 excavation support this hypothesis, but also suggest that the late MBII city was smaller than we had suspected. More excavation is needed to clarify the precise function of the massive MBII walls, but it appears that L242/193 (=L143N/S in N40/W20) was part of the western fortification wall and that L244 (=L143E/W in N40/W20) may have been part of a square tower located at the northwest corner of the MBII settlement.⁹

More horizontal exposure is needed in order to define more precisely the nature and extent of the late Middle Bronze Age settlement. However, the information gathered thus far suggests that the fortified settlement was quite small (possibly less than one hectare) and was centered SE of N40/W25.

Ceramics

Ceramic field readings were made by Rudolph Dornemann, and staff members McCreery, Momani, and Jarallah. Following the field season, Cherie Lenzen also examined ceramics relevant to her research. Approximately 14,000 diagnostic sherds were recovered. 68 percent of the ceramics (487 bags), came from squares N25/W50 and N35/W30. Most of the stratified ceramics dated to the Iron II, Persian, and Byzantine periods, although N40/W20 and N40/

W25 also produced well stratified MBII ceramics. As in past seasons, all periods from EBIV/MBI through the modern era were represented in the ceramics assemblage with the exception of LB and early Iron I.

The stratified ceramic assemblages should be particularly important for clarifying the Iron II/Persian and Byzantine/Umayyad transitional periods. The MBII and Iron IC-II ceramic assemblages are also particularly rich and significant. The ceramics from the 1995 season are currently undergoing detailed analysis and will be published separately.

Flora and Fauna

David McCreery, assisted by Kristi Dahm, supervised the recovery of paleobotanical remains by means of a simple tub flotation system. A total of 85 flotation samples were processed. Overall, the 1995 flotation samples were not as rich as those from previous seasons, but a variety of cultigens was well represented, including wheat, barley, jujube (*Zizyphus*), lentil, bean, chickpea, flax, olive, grape, fig, and almond. The samples also produced a number of wild grasses and legumes. Preliminary field readings suggest that *Hordeum* and *Zizyphus* are the best represented species, both in terms of overall seed count and the frequency with which they appear in the samples. Wheat was found in all excavation squares but was not as abundant as barley. Very small quantities of fruits and legumes were found in N25/W50, N35/W30, and N40/W20.

The presence of almond and *Zizyphus* associated with Iron II and Mamluk *ṭawābīn* in N25/W50 and N35/W30 suggests that the

9. The theory that L244 (=L143E/W in N40/W20) might be the remnant of a square tower is based on the observation that in the road cut, L244 has an exposed north face 3.0 m long, bounded by two, 2.0 m wide N/S walls. Both N/S walls were truncated by the road cut. If one projects a symmetrical square tower extending to the north, the tower would have an interior space of 9.0m² (3.0m x 3.0m) and exterior dimensions of 7.0m x 7.0m.

This would place the northern face of the tower at N49.50, almost exactly where we have projected the northern limit of the mound to have been before bulldozers cut into the northern flank of the tall to make room for the modern highway. If this scenario is accurate, the north face of L244=L143E/W visible in the road cut would have been the interior face of the tower's south wall.

nutshells were being used as fuel. Although the Middle Bronze Age botanical assemblage in N40/W20 and N40/W25 is disappointing in some respects, it did contain sparse botanical remains, including a few barley, wheat, and *Zizyphus*. The scarcity, however, indicates that little domestic activity took place in the immediate vicinity of the monumental MBII walls. Similarly, the material from the squares constitutes a significant addition to the late Iron II, Persian, Roman/Umayyad, and Mamluk botanical assemblages.

Project osteologist Michael Finnegan, assisted by Robert Lane, conducted the faunal analysis. A total of 391 bone bags were collected containing approximately 11,000 readable bones.

Domesticated species represented in the faunal assemblage include *Ovis*, *Capra*, *Equus*, *Bos*, *Gallus*, and *Sus*.¹⁰ As expected, "medium mammal" (MM) was the most frequent field reading followed by sheep/goat when the specimen allowed more specific identification. *Bos*, *Equus*, and *Gallus* were also fairly common although not as well represented as sheep and goats. Wild species included *Cervus*, unspecified fish, unspecified small and medium birds, and possibly *Sus*. The small number of wild species suggest that hunting and fishing while practiced, were not a major source of animal protein.

Geological Survey

From August 28 through September 8, 1995, William Fritz, David McCreery, and

Sa'ad Hadidi conducted a limited geological survey of the Dead Sea Basin from Tall Nimrin to the Ghawr aş-Şāfi. Attention was focused on examining the ancient Lake Lisān shorelines at various elevations. Thirteen archaeological sites in the region were also visited and their locations and elevations carefully recorded using the ACOR Trimble Navigation G.P.S. Pathfinder Basic+ system.¹¹

The objective of this field work was to document the retreat of Lake al-Lisān/the Dead Sea over the past 15,000 years and to assess the impact the regression had on settlement patterns around the lake. The research is an important aspect of the Tall Nimrin Project's investigation of the paleoenvironment of the Dead Sea Basin. The project is specifically concerned with the effects that the paleoenvironment had on settlement and how it might be reflected in the archaeological record. As Lake al-Lisān shrank from a large, fresh body of water to a much smaller, highly saline lake, it must have had a tremendous impact both on the natural environment and human adaptive strategies. Determining the dates and rates of the shoreline retreat, as well as the extent of lake level fluctuations during the retreat, will significantly enhance our understanding of the environmental context in which Tall Nimrin was founded and developed.

From their preliminary study of the late Pleistocene/Holocene lake levels, geologists Johnnie Moore and William Fritz became skeptical of theories that propose major fluctuations in the lake level over the past few

10. The pig bones could be those of wild boar that are indigenous to the region and are still hunted for sport in the nearby Zor of the Jordan River. Although not abundant in the assemblage, it is noteworthy that the majority of *Sus* bones this year were found in the MBII fill layers in N40/W20 and N40/W25.

11. In light of several differentially corrected GPS reading and a re-evaluation of the maps in light of the GPS data, the following is a more accurate location for the benchmark (00/00) on the summit of Tall Nimrin than has been previously reported

(see Flanagan, McCreery and Yassine 1994a: 205): Latitude -- 31° 54' 3.134"N; Longitude -- 35° 37'28.761" E (WGS 84 Ellipsoid); UTM WGS-84, Zone 36, 3532453.7N, 748217.7E. The previously reported elevation (i.e. - 187.25 MSL) of the central reference point 00/00 appears to be accurate, but according to the readings of the GPS rover unit it may be as much as 0.45m too high. It should be noted that MSL is based on a bench mark in 'Aqaba rather than a Mediterranean Sea Level reference point as was that case in many of the older maps.

millennia. Rather, their evaluation of the evidence suggested a gradual filling of the lake to its maximum stand of -180m MSL around 13,000 BP, followed by a rapid, approximately linear retreat until ca. 3,000 BP when the lake reached a level of around -380m MSL. According to this model, the lake level has dropped a only 30 m during the past 3,000 years.¹²

In order to test the hypothesis, it was necessary to determine the location and elevation of archaeological sites that would have been near the shoreline in different periods. Neolithic Ghrubba, Chalcolithic Ghassul, and Early Roman Calouri were considered to be particularly important sites because of their low elevations. It was found that none of the locally available maps (1:50,000, 1:25,000, and 1:10,000 scale maps were consulted), were adequate to locate and determine the elevation of sites with the desired degree of accuracy. This made the GPS equipment a necessity. After differentially correcting and averaging a minimum of 180 points, we achieved locational accuracy of $\pm 2.00\text{m}$ and elevation accuracy of $\pm 0.50\text{m}$.

The results indicate that the locations and elevations of the sites examined closely correspond to the lake level curve proposed by Moore and Fritz. Still, a more detailed examination of the paleo-shorelines and closely associated settlements is needed to provide further collaborating evidence for the linear regression of the lake level curve. This would also make possible more precise determination of the lake level during different archaeological periods. To that end, in November 1995, McCreery collected C-14 tufa samples from a gravel quarry near Sūwaymah. These should allow more precision in describing the lake levels in the lat-

er periods.

The alluvial gravels from the Wādī Nimrīn/Shu'ayb at South Shūnah both pre-date and post-date Lake al-Lisān. Around 13,000 BP at the lake's high stand, the gravels around Tall Nimrīn were accumulating as part of a subaqueous alluvial fan covered by at least 20 m of water. Long before the first settlement ca. 4,000 BP, the lake had retreated from the -199m MSL elevation of the new village and probably stood at around -350m MSL some 6.5 km to the ESE. By this time also the lake was well on its way to becoming the lifeless, highly saline Dead Sea of today.

This might seem like an odd time to establish a new village. However, the abundant fresh water supply from the Wādī Nimrīn and its springs as well as the arable land around the site no doubt contributed to the selection of the location. The retreating lake may also have played a role in that for the first time there was easy access between Jericho on the west bank of the Jordan River and the region around Tall Nimrīn on the east bank. The Wādī Shu'ayb/Nimrīn had provided easy access between the eastern highlands and the Jordan Valley since at least the Neolithic period, but until the Middle Bronze Age, the northern extension of the lake posed a formidable barrier between the eastern and western ghors of the southern Jordan Valley. It is probably not coincidental that as soon as direct E/W travel from Jericho was possible, Tall Nimrīn was established at the mouth of the Wādī Nimrīn. Continued study of the geological and environmental history of the Dead Sea and its environs will no doubt shed further light on the settlement patterns and subsistence economies of the early occupants of the Jordan Valley, including those who founded Tall Nimrīn.

12. The average of two differentially corrected GPS readings taken on September 3 and 4, 1995, puts the current level of the Dead Sea at -410.85m MSL, approximately 10 m lower than it was twenty years ago. Undoubtedly, the lake is dropping

faster now than it has at any other time in the past 3,000 years. It should be noted that the lake does have annual fluctuations and its level in September is near the annual low following the long, dry summer season.

Conservation Measures

Various options were considered for repairing the erosion damage on the face of MBIIC mudbrick walls L143N/S and L143E/W in N40/W20. We decided to experiment with mudbrick plaster, the methods that protected the walls in antiquity. Mudbrick detritus from the excavation was mixed with shredded modern barley straw and used to patch the face of L143N/S and chink the stones of the north face of L230 in N40/W20 during the excavation season. Even though the repairs were made during the hottest part of the year (the worst time of the year to attempt mudbrick constructions), they held up well. As a result, in November similar mudbrick plaster was applied to the top and northern and western faces of the monumental MBII mudbrick walls L143E/W in N40/W20 and L242 and L244 in N40/W20 (Figs. 20 and 29).

In late November an earthquake with an epicenter 120 km south of 'Aqaba, measuring 6.2-7.2 on the Richter scale, rocked

the Jordan Valley. Despite widespread damage sustained by modern structures throughout the Valley, the recently consolidated walls at Tall Nimrin remained virtually intact. Although the use of mudbrick plaster for consolidation and preservation purposes does involve regular maintenance, it appears to be a viable option with the advantages of being inexpensive, attractive, and authentic. Hence, the strategy will be employed more extensively in the future at Tall Nimrin. The possibility of constructing a series of small drainage channels to divert winter runoff away from excavation squares and the road cut is also under study.

Conclusion

The 1995 excavation produced very gratifying results. N25/W50 and N35/W30 provided additional evidence for the Iron II/Persian and Byzantine/Umayyad transitional periods in the form of stratigraphy, architecture, ceramics, as well as floral and faunal remains. N25/W50 documented the pres-



29. >SE at Middle Bronze Walls in N40/W20 and N40/W25 Following Consolidation with Mudbrick Plaster.

ence of deep, well stratified deposits of Roman/Umayyad occupation on the western slope of the Tall. Although the expected Iron Age fortifications did not emerge in N25/W50, the Iron II/Persian period horizon was uncovered. Iron II walls may be found in further excavation. The absence of MB ceramics in N25/W50 in spite of excavation depth (that is -194.20m MSL) supports the findings in N40/W25 that the MBII settlement probably did not extend this far to the west.

The new square N35/W30 provided further evidence of *in situ* Byzantine, as well as Mamluk deposits near the summit of the site. Unfortunately, the Byzantine and Islamic strata are so close to the modern surface of the mound that they are badly eroded and only partially preserved. It is noteworthy that the only squares that have produced Persian period ostraca—other than N30/W25 where 80 percent of the ostraca were found—are N25/W20 and N35/W30 that are contiguous with N30/W25.

N40/W20 and N40/W25 further clarified the nature of the Iron IC occupation, documenting two distinct tenth-century phases of construction before the destruction of this stratum around 925 BC. These squares also yielded additional evidence for the extensive Iron II occupational phases. The construction sequence as well as the function of the monumental MBII walls were substantially clarified this season as well. The evidence from N40/W25 indicates that the western face of L242 was covered by a glacis almost

immediately after its construction. The fill layers in N40/W20 suggest that the occupation associated with L143N/S and L143E/W (=L242 and L244 in N40/W25) was near the top of these mudbrick walls with a possible short-term living surface being used at the base of L201N/S and L201E/W. The most surprising and somewhat controversial conclusion from this area is the hypothesis that these two squares (i.e. N40/W20 and N40/W25) are situated at the NW corner of the Middle Bronze Age city. As was suspected from the results of the 1989 excavation, the monumental stone walls L222 and L230 in N40/W20 were found to be resting not on bedrock, but on top of the remains of the late EBIV/early MBI settlement.

At the conclusion of four seasons of excavation many questions remain, but the project has met and exceeded its goals of documenting the occupational sequence of the site, demonstrating the site's significance in order to facilitate its preservation, and collecting archaeological and geological data needed for a preliminary reconstruction of the environmental and socio-economic history of the site and its environs.

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13. In addition to the three co-directors, the 1995 excavation core staff consisted of assistant field directors Paula M. McNutt and Thomas R. Lee; Department of Antiquities Representative Sa'ad al-Hadidi; square supervisors Kathleen S. Nash, Megan A. Perry, Mayyada Jarallah, and Ahmed el-Momani; assistant supervisors Deirdre A. Dempsey, Angela C. Hummel, Kristi A. Dahm, Robert W. Lane, and Margaret I. Gunn; draftspersons, Thomas R. Lee and F. Mayyada al-Nammary; ceramicist Rudolph H. Dornemann (assisted by Jarallah, Momani, and McCreery); osteologist Michael J. Finnegan; geologist Wil-

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In the 1995 season, as in the past, the Tall Nimrin Project was licensed by the Jordanian Department of Antiquities, approved by the Committee on Archaeological Policy of the American Schools of Oriental Research, and sponsored by the co-director's institutions, Case Western Reserve University, Willamette University, and the University of Jordan. Funding has been provided

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