

# THE 1995 SEASON AT 'AYN GHAZĀL: PRELIMINARY REPORT

by

Gary O. Rollefson and Zeidan Kafafi

## Introduction

In previous excavation seasons at 'Ayn Ghazāl it was clear that the Late Pre-Pottery Neolithic B (LPPNB, 6,500-6,000 bc, uncalibrated) was consistently under-represented in the Central and South Fields (Rollefson, Simmons and Kafafi 1992), although probes in the North Field in 1989 and 1993-94 suggested that this part of the site held considerable promise for undisturbed LPPNB deposits. Work in 1993 in the North Field revealed a large LPPNB building that in 1994 was shown to have had two stories, although it was not possible to completely expose the floor plan of this complex structure (Rollefson and Kafafi 1994; Kafafi and Rollefson 1995). Furthermore, the North Field LPPNB deposits lay under a considerable amount of complex PPNC stratigraphy, so that the LPPNB architecture remained isolated from surrounding courtyards and other contemporaneous structures. One of the principal aims of the 1995 season, then, was to complete the excavation of the two-story house and to investigate the distribution of LPPNB features and buildings in the immediate vicinity. To these ends, an area of ca. 180 m<sup>2</sup> was excavated to varying depths.

A second principal aim of the 1995 season concerned the East Field, a 2-3 hectare expanse across the az-Zarqā' River from the main settlement at 'Ayn Ghazāl. Two small test probes in 1984 provided a brief glimpse at multi-phased PPNB architecture at the northern end of the East Field, and one C-14 date (6620 ±180 bc, uncalibrated, as are all other dates mentioned in this report) indicated a MPPNB/LPPNB age for part of this sequence (Rollefson, Simmons and Kafafi 1992: 444 and Table 1). But what remained

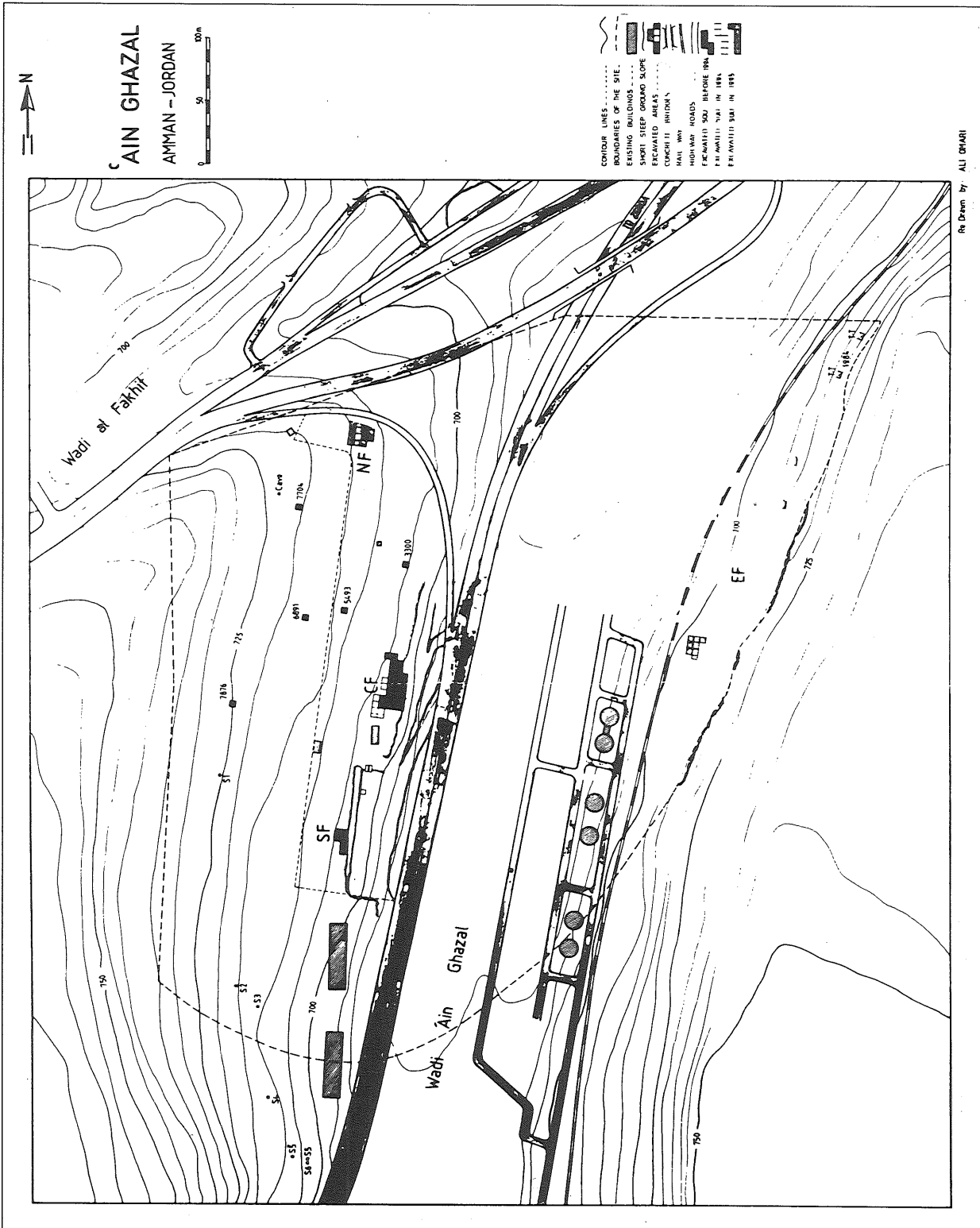
unclear was when the occupation in the East Field first began, how long it lasted, and to what degree the sociocultural elements of this part of the settlement resembled the sequence in the areas across the river. During the 1994 season, a remapping of the East Field revealed several stone alignments, including a 15 m long wall at the southern end of the area. An area of 190 m<sup>2</sup> was opened above and downslope from this wall (Fig. 1).

One aspect of the sequence in the East Field now seems clear: the absence of Yarmoukian pottery in any of the layers (including surface collections) demonstrates that this section of 'Ayn Ghazāl was not a housing area of the settlement during the Pottery Neolithic period. However, the rest of the stratigraphic succession remains somewhat obscure in the sense that it has not yet been possible to segregate the sequence into clear and unmistakable phases of MPPNB, LPPNB, and PPNC (if the latter exists in the East Field at all). Since radiocarbon dates from the 1995 season will not be available for at least a year, stratigraphic phase assignments must rely mostly on lithic seriation.

## ARCHITECTURE

### North Field, LPPNB

*The Large Terraced House.* The layout of the large LPPNB building is shown in Figs. 2 and 3. Entry to the house was via two shallow steps at the southwest corner. Along the southern wall are four rooms, numbered 1-4 from east to west, with Room 1 being almost completely destroyed by erosion sometime after the end of the LPPNB. A doorway led from Room 4 north into Room 5 along the western wall, and doorways also connected



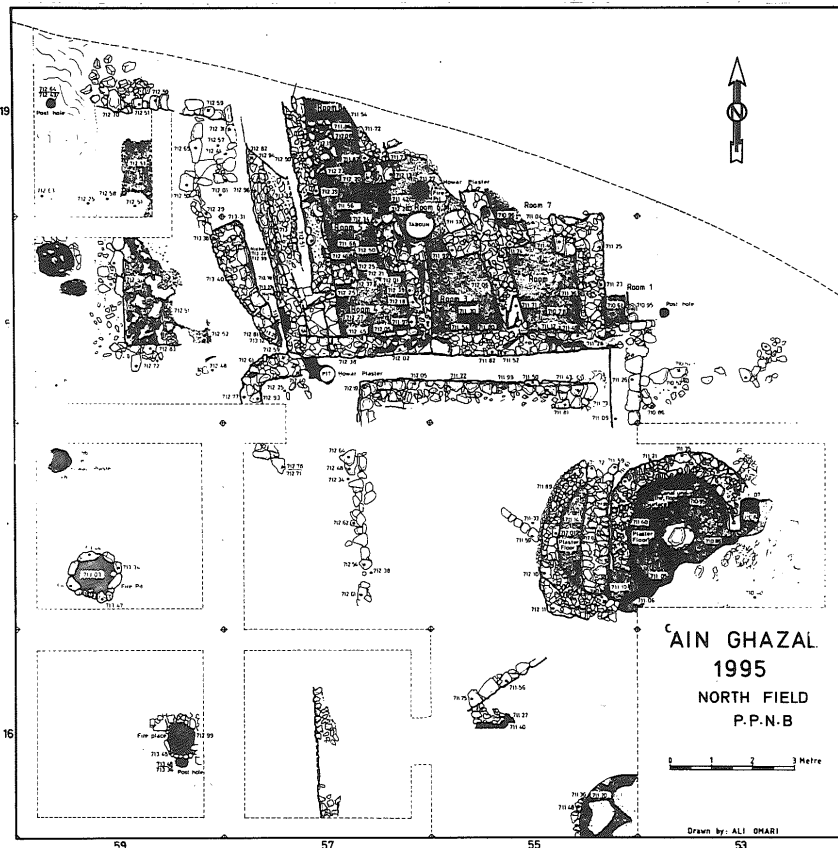
1. 'Ayn Ghazal site map showing the locations of the 1995 excavation trenches in the North and East Fields (Drawing: Ali Omari).



2. The large LPPNB building in the North Field, view to NW. (Photo: Yousef Zoubi).

north from Room 3 into Room 6 and from Room 2 into Room 7; presumably there was also access from Room 1 into a room that once existed to the east of Room 7, unless Room 7 itself continued to the former eastern wall of the house. Room 5 had two other doorways besides the one to adjacent Room 4: one of them faced eastwards into Room 6 across a low plaster curb, directly opposite a small (ca. 34 cm in diameter) circular floor hearth, while the other opened northwards into Room 8, all but destroyed by bulldozer activity.

Room 5 appears to have been at one end of an axis of symmetry of the house, and if the floor plan is folded along the line formed by the Room 5-6 doorway and hearth, much of the original floorplan of the house can be conjectured. In effect, Room 8 would have been the westernmost of a group of four small rooms along the northern wall of the house, mirroring the arrangement of Rooms 1 - 4. The ground floor would have had a minimum of 11 (if Room 7 extended to the eastern wall) or 12 rooms, and the dimensions



3. Floor plan of the large LPPNB building in the North Field (Drawing: A. Omari).

would have been approximately 7.4 m (N-S) by 9.5 m (E-W). All of the rooms had well-made lime plaster flooring painted red.

The fill in Rooms 3, 4, 5, 6, and, to a lesser extent 8 contained dense amounts of charred pulses<sup>1</sup> intermingled with fist-sized stones, burned clay slabs with beam impressions, and thick segments of red painted lime plaster flooring that could only have come from a second story above these rooms. It is clear that the western half of the structure was two-storied, but it is not certain if the eastern half had more than a single floor.

The house had a long and complex history. Once the small passageway was cleared between the southern wall and a ruined building just to the south, it became evident that originally the house consisted only of the western half; that is Rooms 3, 4, 5, 6, 8 and presumably a ninth room. Later, Rooms 1, 2 and 7 were added on, as is clearly shown by the use of smaller stones in the southern wall. The alignment of the wall between Rooms 3 and 2 also parallels the western wall of the house more closely than the wall between Rooms 2 and 1, which is aligned more directly to the north. A doorway once penetrated the wall between Rooms 3 and 2, but this was later blocked, although it cannot be determined if this was when the new rooms were added or sometime later. An interesting aspect of the construction is the relative elevation of the floors: in Room 4 the floor is 20 cm higher than in Room 3, which in turn is 52 cm higher than in Room 2, which is 17 cm higher than the floor in Room 1. Altogether, the floor in Room 1 is 88 cm below the floor in Room 4, a reflection of the slope of the hill and a terracing of the rooms to accommodate it.

Outside the southwest corner of the house was a lime plaster surface that sloped towards a ca. 40 cm in diameter circular lime plaster feature about half a meter deep. It is unclear what the function of this feature was (Fig.4).



4. Lime plaster surface and cylindrical basin at the SW corner of the large terraced LPPNB house (Photo: Y. Zoubi).

After the house was destroyed by fire, the same building was used for a new structure that incorporated the southern wall as a foundation for a new one, although the new western wall was placed about 1.0 m west of the original wall. An entry wall with a pronounced arc was built that led to the southwest corner of the building where the previous door existed. This curving wall had two small niches built into it, each about 35 x 40 cm at roughly waist height. The rubble inside the burned rooms was leveled off and a new red-painted lime plaster floor was laid. This building apparently did not have a very long life, for the new western wall began to tilt threateningly towards the interior of the house. In an attempt to prop up the faulty wall, a long buttress was built inside the house, but this was inadequate to counter the stresses, and the house had to be abandoned.

*The Southern Building.* Immediately to the south was the wall of another LPPNB structure that was constructed sometime after the large house but was at least in partly contemporaneous use. A narrow (ca. 60 cm) passageway separated the two buildings. Little more can be said of this structure, since much of the eastern and southern areas was destroyed by the construction of the four-phase cult building (cf. Rollefson and Kafafi 1994),

1. The paleobotanical material is currently being studied by Reinder Neef, German Archaeological Institute, Berlin.

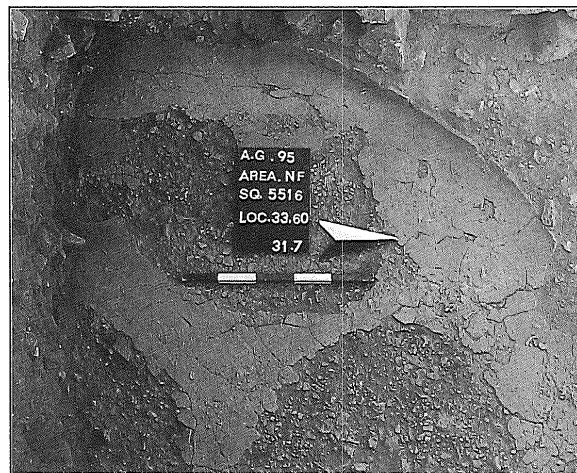
and those areas not razed remain hidden beneath substantial PPNC deposits.

*The Apse Building.* In the closing two weeks of the season, a plaster floor with a pronounced apse was partially exposed in the extreme SE corner of Sq. 5516 (see Fig. 3, lower right corner and Fig. 5). The northern wall was completely robbed out, and only a few stones of the western end remained in place. The building was constructed immediately against a two-phase, N-S terrace wall that had a combined thickness of ca. 70 cm.

The floor is curious in that it consists of two applications of almost pure lime plaster but with no foundation layer. (It was normal in domestic buildings for a thick basal layer of gravel mixed with lime plaster to serve as a foundation for the final application of a thin coat of plaster with few additives). Clearly the floor could not have withstood normal domestic traffic, and the circumstances indicate that this room, if not the entire building, served a special purpose. Since it is located only four meters south of the four-phase cult building, it is tempting to suggest that it played an analogous role, particularly since Phase 2 of that structure had an apse at the west end. However, it is wisest to reserve judgment in view of the fact that probably 90% of the building still awaits excavation.

*The Western Plaster Floor.* To the west of the large house are the remains of the lime plaster floor of a large room with a N-S dimension of 5.0 m (see Fig 3, upper left). The width of this room is not known since the eastern part was destroyed, perhaps in connection with the construction of the large house. The floor was also painted red, although prolonged exposure after abandonment had bleached the color considerably. Built on redeposited terra rosa just a few centimeters above bedrock, the floor is situated almost a meter higher than the floor in Room 4 of the large house.

It is difficult at the present time to assign



5. LPPNB apse-shaped lime plaster floor, North Field (Photo: Y. Zoubi).

an age to this architectural remnant, although the large size is reminiscent of MPPNB structures from the Central Field. On the other hand, we still do not have a clear idea of the architectural variability during the LPPNB, so no conclusions can be offered. A large circular firepit just to the west of the plaster floor has produced radiocarbon samples that can provide a *terminus post quem* for the floor.

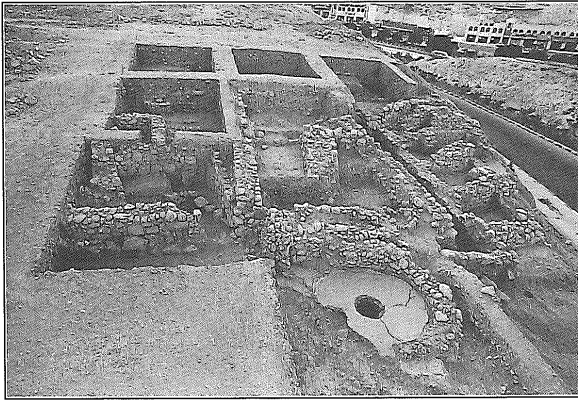
*LPPNB Courtyards.* Several large firepits and some faint stone alignments occur in open areas west and southwest of the large house. Unfortunately, so much damage was inflicted by later PPNC inhabitants of the site that there is little integrity of the original courtyard arrangements. Notably, we found no evidence of chipping floors, which is in sharp contrast with the courtyard areas of the East Field (see below).

### North Field, PPNC

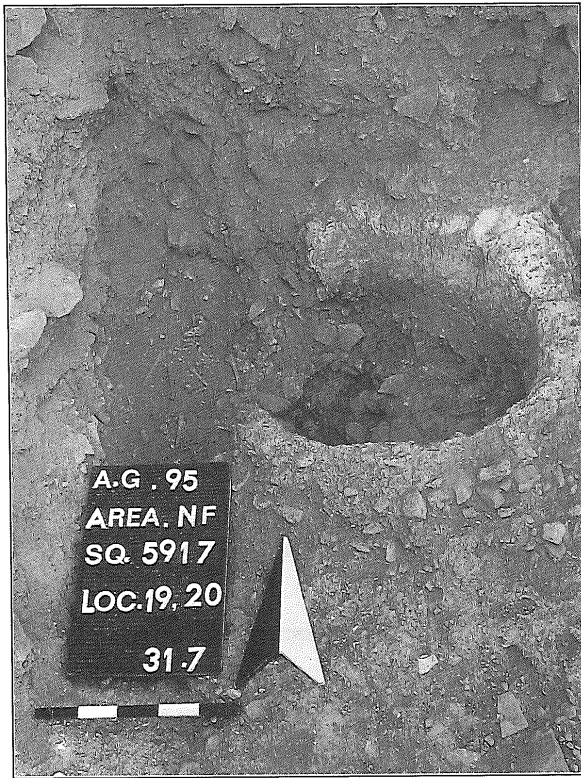
Fig. 6 shows a composite illustration of PPNC architecture exposed in the North Field during the 1993-1995 seasons of excavations. The thick-walled complex in the northern half of the area is characterized by large and small firepits and courtyard and compound walls. There are several walls that are probably associated with domestic structures, such as the rectangular room at the







7. General view, looking west, of the North Field excavations. The large terraced LPPNB house is at right, the LPPNB cult building at lower center, and various LPPNB/PPNC and PPNC walls at center and left (Photo: Y.Zoubi).



8. PPNC *huwwār* cylindrical basin in Sq. 5917 (Photo: Y. Zoubi).

corner of the large LPPNB house described above.

While it is probable that there were common domestic structures in this area at times during the PPNC, it is also clear that at other times much of this part of the settlement was given over to some “industrial” use in view of the density of fireplaces in the outdoor areas. What the nature of this industrial activity

was remains obscure.

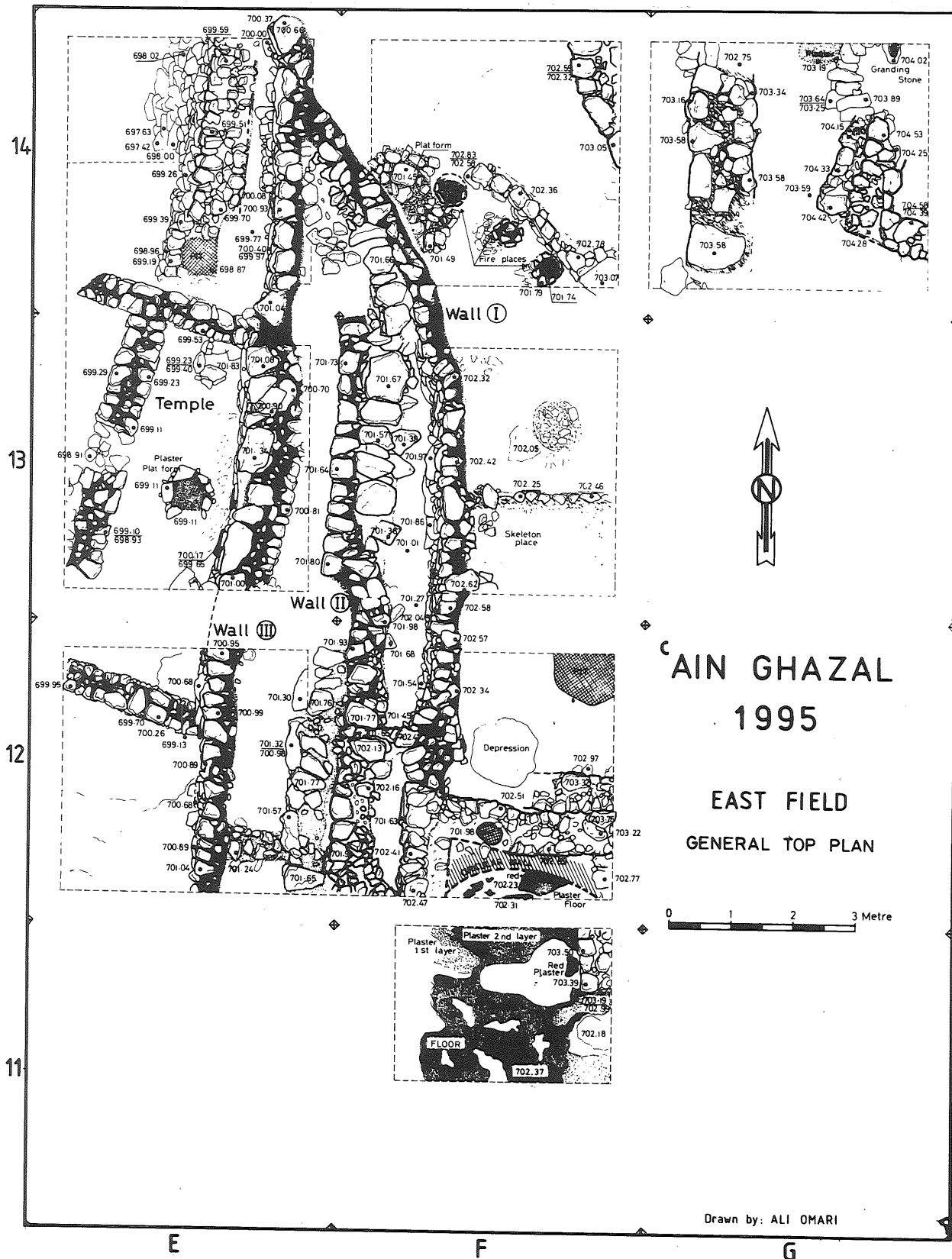
### East Field PPNB

*Terrace Walls.* It is not surprising that as a consequence of the steepness of the East Field slope (35%), terrace walls played an important role in the use of this part of ‘Ayn Ghazāl. Fig. 9 reflects how dominating these walls were. At the center of Fig. 9 is Wall I, a curving feature a single stone thick (ca. 40 cm) that extends 15 m from its northern end until it disappears into the section at the south. The wall was built on sterile basal clay and is preserved to a height of 2.4 m (Fig. 10).

Wall II was built just 50 cm to the west of Wall I and is nearly as long. Much thicker (ca. 1.10 m) than Wall I, this terrace wall incorporated enormous blocks of stone, some nearly a meter in maximum dimension. Wall II was partially dismantled, but the bottom was not reached during the 1995 season; probably, it stood approximately 2 m high at the time we began the excavation. Wall III is at the left of the three-wall complex and is also at least 15 m long. Also using immense stone blocks, the wall increases in thickness from top (a single stone wide) to bottom (two or more stones wide).

There is a clear chronological relationship among the three terrace walls. Wall I is the earliest, Wall II somewhat later, and Wall III the latest of the trio. As is described more fully below, Wall I and the temple or sanctuary to the left of Fig.9 are probably contemporaneous. All but the uppermost deposits to the east of Wall I are earlier than this sequence, since Wall I truncated these earlier layers.

Another terrace Wall IV was sampled in the far NW corner of the excavation area (see Fig. 9, upper left and Fig.10, lower left). Wall IV is at least two stones thick at the top, but it increases markedly in thickness with depth to an “apparent” thickness of ca. 1.8 m; “apparent”, in that the wall may cover a sloping earth foundation much like a glacis wall. The battered angle was so great that Wall IV



9. Plan of the terrace walls and various structures in the East Field. The temple or sanctuary is located at the left side of the plan. Terrace Wall I is in the center of the plan, Wall II just to the left, and Wall III still farther to the left (Drawing: A. Omari).



eventually filled the probe trench, and after reaching a depth of 2.7 m beneath the top of the wall, the base still had not been reached (Fig.11). The stratigraphic relationship of this terrace wall to the others is not clear, although Wall IV is probably older than the temple and thus antedates Wall I. It is also likely that the layers that accumulated against the wall after it was built are also older than



10. View to east of the East Field excavations. Terrace Wall I is in the center and Wall III near the bottom. At lower left is the battered terrace Wall IV (Photo: Y.Zoubi).



11. The probe in front of East Field terrace Wall IV reached 2.7 m without finding its base (Photo: Y. Zoubi).

the Wall I - temple sequence. How Wall IV and the deposits in front of and behind it relate temporally to the cultural deposits behind Wall I is specifically uncertain at the present stage of analysis.

One more probable terrace wall was encountered in the excavation area, although we were not able to determine much of its nature. Located in Sq. G 14 at the NE corner of the excavation area, this wall was ca. 1.20 m thick and more than 4 m long, disappearing into both the north and south sections of the trench. The depth of this wall is still unknown, as is its stratigraphic relationship with the other terrace components in the East Field.

*The LPPNB Apse Building.* In the SE corner of the East Field excavations (Sqs. F 11 and F 12), a series of heavily damaged lime plaster floors was encountered that may represent multiple reflooring episodes of a single building. At the northern end an *in situ* 50 cm long fragment of the earliest phase remained intact, and it was of high quality burnished plaster with a red border about 8 cm wide painted along the join of the floor and the wall. (The stones of the wall were completely robbed out, but the characteristic bath-tub coving indicated where the wall was formerly). Despite the small size of the floor fragment, there is a clear E-W curvature of the wall join, indicating that it had an apse-like shape at the northern end of the building. Although the floor series to the south of the apse is badly deteriorated (probably at least partly as a result of the steep slope), one can project that the room size was at least 3 m wide E-W and minimally 3.5-4.0 m long N-S. No indications of other walls were found, although the eastern and southern edges of the room remain under unexcavated sediments, and the western side was severely eroded.<sup>2</sup>

2. It is interesting to note that a PPNB building excavated and used by the Yarmoukians in the Central Field (Rollefson, Kafafi and Simmons 1990:

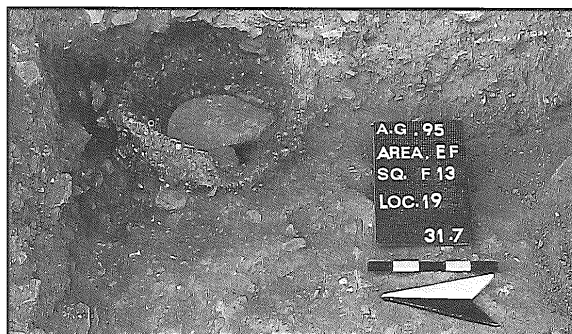
110-111, Fig. 12) has a room with an apse at the south end, and that the floor area of the apse room is ca. 2.5 x 3.5 m (E-W x N-S).

Later flooring episodes also bore red paint, but since the floor(s) were evidently exposed for some time, weathering has made any possible patterns difficult to identify. Near the eastern edge, however, once the area may have been decorated in a check-board fashion, with red squares approximately 8 x 8 cm on a white background.

*The Plastered Pavement Floor.* At the northern end of the excavation area, one or more flooring episodes bearing patchy evidence of red paint were found over a pavement of rounded river cobbles. The floor was truncated on the west by terrace Wall I, and the northern, eastern and southern extensions were thoroughly eroded; there is no way to estimate either the former size or the shape of this structure.

*LPPNB Courtyard Areas.* Intensive outdoor activities were conducted throughout the area to the east of terrace Wall I and north of the apse building. Some areas were set off from others by flimsy walls a single stone thick, including one such wall preserved to a height of 65 cm that could have served as a wind-break for several associated small, stone-lined and slab-based firepits in Square F 14. In Square F 13 a fragmentary outdoor lime plaster surface led to a bowl-shaped basin 40 cm in diameter and ca. 25 cm deep (Fig.12). The walls of the basin were made of a mixture of mud, fine gravels, and fragments of lime plaster, and perhaps crushed soft limestone (see Fig. 12). While not *ḥuwwār* in the classical sense, the basin's raw material may be a forerunner of cheaper construction of such features.<sup>3</sup>

Exposures of features in Square G 14, in the northeast corner of the 1995 East Field excavation area, are included here with "Courtyards", although it is not certain if this



12. Stone-based basin of mud, gravel, and fragments of lime plaster in Square F 13 in the East Field. Just above the sign is a thin lime plaster surface that leads to the opening of the basin (Photo: Y. Zoubi).

trench actually represents a courtyard. A broad wall (Locus 005), preserved to a height of seven courses, runs in a NE-SW direction to the east of the terrace wall. (A narrower NW-SE wall (Locus 007) at the southern end of Wall 005 is evidently not associated with the principal use of Wall 005). The area between the terrace wall and Wall 005 contained 10 grinding stones, and four others were noted in nearby contexts. A flat surface paved with yellow clay plaster was in direct association with several grinding stones, and it is clear that this was a special activity area for processing food.

*The Temple or Sanctuary.* As mentioned above, the western part of the excavation area was truncated for the construction of Terrace Wall I, which was founded on sterile basal clay. This was a massive undertaking in view of the depth and length of the terrace wall, and the reason for so much effort must have been compelling. It appears that religion played a significant role in this enterprise, for a rectangular structure just to the west of Terrace Wall I is clearly associated with ritual.

The structure has not been completely excavated due to the enormous stones of Terrace Walls II and III, but enough has been ex-

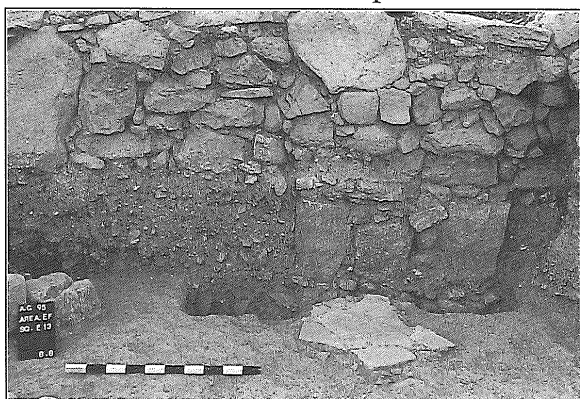
3. This example of a subterranean basin is the fifth found at 'Ayn Ghazāl, including the other two found this season in the North Field (see above), an LPPNB or LPPNB/PPNC basin in the South Field

(Rollefson 1990: 42-43, Fig. 7), and a basin made of yellow clay attributed to the Yarmoukian period in the Central Field (Rollefson and Simmons 1987: 105).

posed to predict its size and layout. Two parallel NW-SE walls are joined by a wall on the west and form a partial rectangle with a N-S dimension of 7.5 m (interior dimension 5.65 m). The distance from the NW corner to Terrace Wall I is just over 5 m, which yields a maximum possible E-W dimension for the room. Due to features of symmetry of the structure (see below), the exterior E-W dimension is probably ca. 4.75 m, with an interior room dimension of ca. 3.2 m. There is a possible second room at the western side of the structure, for the northern wall extends westward for just over a meter, where it was truncated by bulldozer activity associated with the laying of a sewer line.

The floor of the principal room is made of clayey mud, in contrast to the normal use of lime plaster in LPPNB buildings. Near the center of the room is a low pentagonal lime plaster surface with a maximum width of 65 cm, surrounded by flat limestone slabs (Figs. 9 and 13); the surface of the plaster bore clear signs of burning, and it is likely that it served as an altar.

Just to the SE of this plaster feature, and directly below Terrace Wall III, are three large rectangular stones standing on end and aligned in a N-S direction. The northern and southern stones are about 50 cm high and 20 cm thick; the center stone is approximately 30 cm tall. A one meter wide pavement of rel-



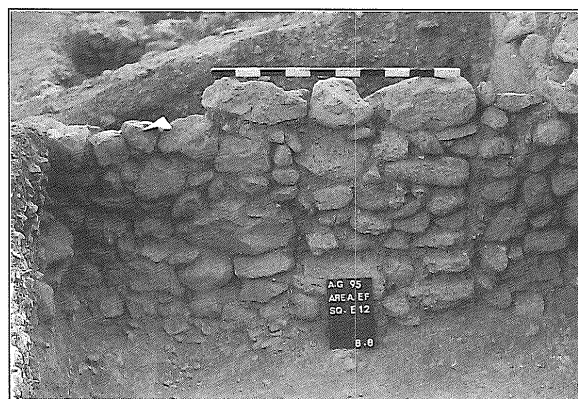
13. The three “standing stones” (erected on a thin pavement of river cobbles) and the lime plaster altar in the center, and the stone “cubicle” at the left. Terrace Wall III is built directly atop the standing stones. View towards the east (Photo: Y. Zoubi).

atively thin river cobbles served as a foundation for the standing stones. This pavement (placed directly atop sterile basal clay) extends towards the west under the plaster feature, and it was also found under the threshold of the doorway in the western wall. A stone “cubicle” was built against the northern wall, although excavation showed this feature to be empty (Fig. 14).

There was at one time an entrance 65 cm wide near the center of the southern wall, but this doorway was later blocked with stones (Fig. 15). A doorway just under a meter wide was opened in the western wall at this time to provide access to the room, and it is possible that this was when the western room was add-



14. View towards the northeast of the temple or sanctuary at 'Ayn Ghazāl showing the plaster altar and standing stones (lower right), the stone “cubicle” adjacent to the northern wall (center), the western extension of the northern wall (upper left), and the earlier Terrace Wall IV (upper left, behind the northern wall). Terrace Wall III is above the standing stones (far right) (Photo: Y. Zoubi).



15. Former doorway in southern temple wall blocked with stones, probably when the entrance in the western wall was opened (Photo: Y. Zoubi).

ed to the structure. The doorways, the cubicle, and the space between the plaster altar and the middle standing stone form two axes of symmetry: the eastern doorway to the cubicle and the western doorway to the central standing stone.

### Human Burials

Seven human burials were recovered during the season, including three from the East Field and four from the North Field.

### East Field

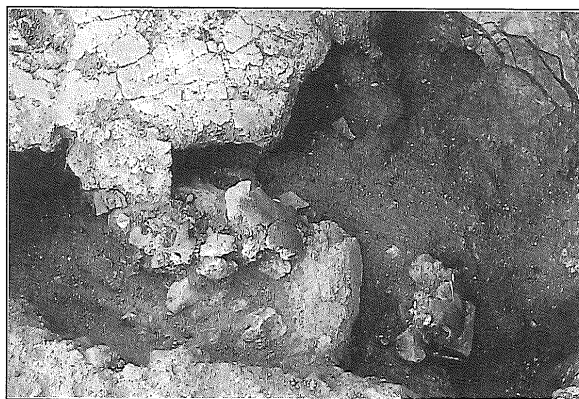
All three in the East Field were adults, and all appear to be “trash burials” common during the PPNB period. One of the burial pits had actually cut through the floor of the LPPNB apse building, but this clearly occurred after the building had already been abandoned; the floor had not been repaired. This burial was badly disturbed, and only the left side and the skull were present; the skull fragments were scattered over an area ca. 50 cm in diameter. The second burial, found in a trash pit in a courtyard, was also badly disturbed, with only most of the long bones, a vertebra, and pieces of the skull present in the pit. The mandible had lost many teeth, and those that remained were very heavily worn.

The third LPPNB burial in the East Field was of an adult male who evidently had suffered a violent death. Also found in a trash pit, the skeleton was articulated from the skull to the clavicle and upper two ribs; this part of the body rested in a vertical position, and the skull had slipped over the upper vertebrae, so that they were inside the brain case. The rest of the body was heavily disturbed, and many elements were missing; notably most of the bones that were present were broken, although it is not clear if this resulted post-depositionally. But what was striking about this person was the apparent cause of death: a thin flint blade fragment (snapped off at both ends) was imbedded in

the left side of the skull, and the weapon had penetrated with sufficient force to drive a ca. 3 cm diameter piece of the interior of the skull into the brain (Figs. 16 and 17).<sup>4</sup>

### North Field

All four burials in the North Field were adults and all were disturbed in various degrees. The earliest burial is loosely associated with the plaster floor uphill and to the west of the large terraced house and likely dates to the LPPNB period. It was placed in a poorly defined pit to the north of the floor, and many elements (including the skull) were missing. Two other burials came from the same trench (Sq. 5916) from LB/PPNC layers. One of



16. Exterior surface of human skull with a flint blade penetrating the left side. (Note: the skull surface includes dirt and debris adhering to the bone preservative) (Photo: H.-D. Bienert).



17. Interior surface of the left side of the skull showing the penetration of the flint blade; note the concavity in the bone around the blade (Photo: H.-D. Bienert).

4. This is the first case of violent death noted at ‘Ayn Ghazāl and one of two known in the entire Levant

(cf. Roehrer-Ertl *et al.* 1988).

them consisted only of leg bones (both tibiae and fibulae and one femur) and was probably a secondary burial disturbed at a later time; the second comprised only four ribs and two arm bones.

The fourth burial was the most complete and dates to the PPNC period. It lay in a flexed position in a stone-ringed pit. It was articulated and the skull was present, but no vertebrae were found and most of the phalanges were missing, as were the right arm and many of the teeth. Found in the pit was a partial pig mandible, a form of "grave offering" noted frequently in PPNC burials in the South Field (Rollefson and Köhler-Rollefson 1993: 38). A later pit disturbed the lower part of the skeleton, but it seems that many of the missing elements of the rest of the body may be due to loss during transport from the location of death to 'Ayn Ghazāl for (secondary) burial.

**Lithic Analysis**

The density of chipped stone artifacts was very high this season, particularly in courtyard contexts in the East Field, where several chipping floors were exposed. Samples of

chipped stone were selected from both the North and East Fields, and the results of the analyses are provided in Tables 1-3.

Table 1 shows the distribution of debitage classes for the various phases. (Note: the column headings in Table 1 have the subscripts "e" and "n" to distinguish the samples from the East and North Fields). Of principal importance in this table are the comparisons at the bottom of blades (BL + bl) and flakes, on the one hand, and of naviform and ordinary blades, on the other. In the North Field the blade:flake ratio for the LPPNBn (27.8 to 72.2) is lower than for the PPNC sample, a result that contradicts the trends of blade:flake ratios in other parts of the site, where this ratio appeared to decline consistently from the MPPNB through the Yarmoukian phases (Rollefson, Simmons and Kafafi 1992: Table 3). We agree now that the blade:flake ratio is not a reliable seriation factor, as has been suggested by other researchers (e.g. Goring-Morris 1991: 96 and Table 1; 1994: Table 1), since the relative abundance of either debitage class is highly dependent on specific activities undertaken at any particular area or a site, and that the apparent trend seen in ear-

**Table 1.** Absolute and relative frequencies of debitage classes in the analyzed samples from the 1995 season at 'Ayn Ghazāl. Abbreviations: C.T.E = core trimming elements, BL = blades, bl = bladelets, FL = flakes, Navi. = naviform, and ord. = ordinary.

Class	M/LPPNBe	LB/PPNCe	LPPNBn	LB/PPNCn	PPNC	M/LPPNBe	LB/PPNCe	LPPNBn	LB/PPNCn	PPNC
	n	n	n	n	n	%	%	%	%	%
Blades	1884	374	322	393	238	26.4	22.1	18.2	22.6	20.8
Bladelets	140	41	27	42	29	2.0	2.4	1.5	2.4	2.5
Flakes	3115	787	906	792	598	43.7	46.4	51.4	45.5	52.3
C.T.E.	164	13	29	17	12	2.3	0.8	1.6	1.0	1.0
Burin Spalls	63	17	14	10	5	0.9	1.0	0.8	0.6	0.4
Microflakes	841	207	206	213	101	11.8	12.2	11.7	12.2	8.8
Debris	780	233	227	225	131	10.9	13.7	12.9	12.9	11.5
Other	42	12	14	21	10	0.6	0.7	0.8	1.2	0.9
Cores	103	12	19	27	19	1.4	0.7	1.1	1.6	1.7
(Tools)	(703)	(175)	(157)	(133)	(114)	(9.9)	(10.3)	(8.9)	(7.6)	(10.)
TOTALS	7132	1696	1764	1740	1143	100.0	100.0	100.0	100.0	100.0
BL+bl	2024	415	349	435	267	39.4	34.5	27.8	35.4	30.9
FL	3115	787	906	792	598	60.6	65.5	72.2	64.6	69.1
Navi. BL	1404	107	123	124	40	86.0	40.7	51.7	40.7	27.6
Ord. BL	228	156	115	181	105	14.0	59.3	48.3	59.3	72.4



lier 'Ayn Ghazāl samples was simply a coincidence.

But the ratio of naviform to ordinary blades is a better indicator of temporal change, for it reflects the relative importance of the kind of blade technologies that were being used.

In a preliminary study of the cores from 'Ayn Ghazāl, Quintero noted that of the blade cores, 90% were naviform in the MPPNB, 45% in the PPNC, and only 24% in the Yarmoukian phase (personal communication; Rollefson, Forstadt and Beck 1994: 454). With this ratio, the naviform:ordinary blade ratio for the 1995 PPNC sample falls to the low end of the spectrum, as is to be expected. It is also instructive to note the relationship of the ratios for the other samples, which indicate that the North Field LPPNB is probably later than the East Field M/LPPNB, and that the two LB/PPNC samples are virtually identical in their values and thus are roughly contemporary.

The results of the chipped stone tool sorting is given in Table 2. Projectile points vary considerably in relative frequency, possibly reflecting different activity foci in the courtyards through time and from the North Field to the East Field. The points in the East Field M/LPPNB sample are dominated by large Byblos and Amuq variants, with some exquisite typical examples of both. In particular, there is a plurality of a variation on the Jericho point where the barbs form a right angle with the base rather than the more typical swept-back style commonly associated with this point type; they resemble examples from Nahal Hemar (Bar-Yosef and Alon 1988: Fig. 5, nos. 1 and especially 4-5; Gopher 1994: Fig. 5:33, no. 3).

The distribution of other tool types also argues for considerable activity variation among the samples. Perhaps the most remarkable example is in the knife class, where the East Field M/LPPNB sample was dominated by knives (24.7%). Sickles were notably rare, although sampling error may have

played a big role in this respect. Two sickles from the East Field were particularly interesting. In Sq. F 11, a typical Yarmoukian sickle blade (bi-truncated, bifacially backed, with bifacial macrodenticulation) came from relatively high up in the deposits, an area that included rodent disturbance; perhaps this particular example is intrusive. But the other example is from an undisturbed M/LPPNB context, and still it shares a few design elements with Yarmoukian sickle blades (bifacial macrodenticulation and truncation on one end, at least, although the other end is broken off). What sets this example apart is that it is made on a naviform blade, is not backed, and is 7.2 cm long (i.e., about twice the length of typical Yarmoukian specimens).

Burins were also important elements of all the samples, although the absolute numbers were low in three of them. Table 3 compares the burins from the East Field with a recent study that suggested a potential seriation aspect for burin analysis (Rollefson 1995). Overall, the East Field M/LPPNB sample fits the general trends, although the LB/PPNC sample is too small for reliability.

### Faunal Remains

Animal bones were relatively abundant in 1995, as they have been since the beginning of the excavations in 1982. Due to restricted budgets for the 1993 and 1994 seasons, little faunal analysis was conducted. But in 1995 the staff was joined by A. von den Driesch, and all of the material from 1993-1995 was inventoried by her. Von den Driesch is writing a separate report for publication.

### Other Finds

Bone tools are tabulated in Table 4, and they require little comment except to note that many more bone tools are expected to be identified during faunal analysis. The "rasps" noted in Table 4 are ribs with notches or incisions regularly made along the edges. Similar examples were found in the 1988 and



**Table 2.** Absolute and relative frequencies of tool classes in the analyzed samples from the 1995 season at 'Ayn Ghazāl. Abbreviations: M/LBe = M/LPPNB, East Field; LB/Ce = LB/PPNC, East Field; LBn = LPPNB, North Field; LB/Cn = LB/PPNC, North Field; PPNC = North Field samples.

Class	M/LBe	LB/Ce	LBn	LB/Cn	PPNC	M/LBe	LB/Ce	LBn	LB/Cn	PPNC
	n	n	n	n	n	%	%	%	%	%
Spear pt.	39	2	-	2	1	7.8	2.0	2.11		1.3
Arrowhead	2	2	-	2	2	0.4	2.0	2.11		2.7
Sickle	17	-	-	-	-	3.4				
Burin	102	23	16	19	11	20.3	22.8	16.0	20.0	14.7
Truncation	12	1	3	4	5	2.4	1.0	3.0	4.2	6.7
Scraper	43	17	20	13	14	8.5	16.8	20.0	13.7	18.7
Denticulate	473	16	14	14	12	8.5	15.8	14.0	14.7	16.0
Notch	56	17	22	14	12	11.1	16.8	22.0	14.7	16.0
Borer	24	9	13	11	10	4.8	8.9	13.0	11.6	13.3
Biface	2	-	1	1	-	0.4		1.0	1.0	
Ax/Adz	4	1		12	3	0.8	1.0	1.0	2.11	4.0
Pick	1	-	-	1	--	0.2			1.0	
Chisel	2	-	1	-	-	0.4		1.0		
Chopper	3	1	-	1	-	0.6	1.0		1.0	
Wedge	10	2	3	1	-	2.0	2.0	3.0	1.0	
Knife	124	8	6	7	5	24.7	7.9	6.0	7.4	6.7
Backed BL	-	1	-	1	-		1.0		1.0	
Tanged BL	15	-	-	-	-	3.0				
Other	4	1	-	2	-	0.8	1.0		2.1	
Subtotal	503	101	100	95	75	100.1	100.0	100.0	100.0	100.0
Ret. BL	89	36	16	14	5	(12.0)	(20.6)	(10.2)	(10.7)	(4.4)
Ret. FL	59	21	20	7	11	(8.0)	(12.0)	(12.7)	(5.3)	(9.7)
Util. BL	45	8	7	4	9	(6.1)	(4.6)	(4.5)	(3.0)	(8.0)
Util. FL	7	2	5	2	5	(0.9)	(1.1)	(3.2)	(1.5)	(4.4)
Indet.	40	7	9	9	8	(5.4)	(4.0)	(5.7)	(6.9)	(7.1)

**Table 3.** Comparison of 1995 season burin group indices from the East Field (M/LBe, LB/Ce) with previously analyzed samples from 'Ayn Ghazāl (cf. Rollefson 1995: 517). Abbreviations: trans. = transverse; dihedral; trnc. = truncation.

Burin Group	MPPNB (n = 527)	LPPNB (n = 78)	M/LBe (n = 94)	LB/Ce (n = 22)	PPNC (n = 184)	Yarmouk. (n = 395)
I = Simple	10.9	20.5	27.7	36.4	29.9	18.7
II = Trans.	74.9	34.6	30.9	13.6	14.7	11.5
III = Dihed.	12.5	25.6	33.0	13.6	28.8	20.5
IV = Trnc.	1.6	11.5	8.5	36.4	26.6	49.0

1989 seasons (cf. Rollefson, Kafafi and Simmons 1990: Table 7; 1993: Table 5).

Worked stone objects are presented in Table 5. The "linguaforms" are small ax-shaped pieces of soft limestone of unknown function. Three examples were found in 1994 and another in 1988. Attention is drawn to the recovery of a smoky gray obsidian blade fragment and a small (ca. 5 cm in diameter) stone cup with a short stalk-like handle, both from LPPNB deposits in the North Field.

Ornaments of stone, bone and shell are listed in Table 6. The popularity of stone "bracelets" in the East Field is another indication that the artifacts in the M/LPPNB layers are likely to be from the LPPNB, for such objects were very rare from MPPNB deposits in the main settlement west of the az-Zarqā' River; the same argument applies

to the presence of mother-of-pearl. For the beads, the raw material in the North Field is diverse, including one malachite bead, one animal tooth (?), one bird-bone bead, and one burned specimen of indeterminate material. In the East Field, one bead was of malachite and three of "red stone" that superficially resembles coral. The restriction of *Cerithium* (?), small coiled marine shells, to the East Field is curious; this is the first time this species has been recovered from 'Ayn Ghazāl. The prevalence of fossil shark teeth (possibly used as pendants, although none were drilled) in the East Field may be related to the specific age of the exposed limestone formations on the eastern and western sides of the wadi. Table 7 shows the fired clay objects excavated in the 1995 season.

**Table 4.** Bone tools from the 1995 season at 'Ayn Ghazāl. "P.B.F." = polished bone fragment; "P.R.F." = polished rib fragment.

Class	M/LBe	LB/PPNCe	LPPNBn	LB/PPNCn	PPNCn
Awl	20	10	12	14	15
Spatula	14	1	2	7	4
Needle	3	-	-	-	-
"Rasp"	2	-	1	-	1
P.B.F	8	2	2	2	2
P.R.F.	16	-	2	3	-

**Table 5.** Worked stone objects from the 1995 season at 'Ayn Ghazāl.

a - globular shape; b - elliptical shape, one perforated; c - 1 smoky gray obsidian blade, one small stone cup with stalk handle.

Class	M/Le	LB/PPNCe	LPPNBn	LB/PPNCn	PPNCn
"Linguaform"	1	-	-	4	3
Macehead	-	-	1	-	-
Cone	-	-	-	1	-
Perf. stone disc	2	-	2	4	4
Stone ring wgt.	2	4	1	3	-
Perf. stone wgt.	6	-	1	2	-
"Sling stone"	1	-	-	-	-
Incised stone	1	-	-	-	-
Other	1a	2b	2c	-	-

**Table 6.** Ornaments from the 1995 season at 'Ayn Ghazāl. (M.o.P. = Mother-of-Pearl)

Class	M/LBe	LB/PPNCe	LPPNBn	LB/PPNCn	PPNCn
Stone "bracelets"	18	17	1	16	45
Beads	4	-	2	1	1
M.o.P.	3	1	-	3	6
"Sweet clam" shell	3	2	2	5	5
"Cardium" shell	-	-	-	-	1
Cerithium? shell	5	2	-	-	-
Unident. shell	-	-	1	-	1
Fossil shark teeth	12	1	2	1	1
Bone finger ring	-	-	-	-	4

**Table 7.** Fired clay objects from the 1995 season at 'Ayn Ghazāl. ("impr" = impressions).

Class	MB/Le	LB/PPNCe	LPPNBn	LB/PPNCn	PPNCn
"Stalk" figurine?	-	-	-	1	-
Animal figurine	1	-	-	-	2
Animal fig. horn	-	-	1	-	-
Clay sphere	1	-	1	-	-
Clay cylinder	-	-	1	-	-
Clay, beam impr	-	-	many	-	-

### 'Ayn Ghazāl's Future

'Ayn Ghazāl has suffered severely from damage since the 'Ammān az-Zarqā' highway was constructed in the 1970s, and since the late 1980s it has been under threat of outright destruction by commercial and residential construction. After a tour of the excavations in 1995, representatives of the Municipality of 'Ammān and the Ministry of Tourism and Antiquities agreed on the need to preserve at least the "core" of 'Ayn Ghazāl as an open-air museum to promote educational, touristic, and research benefits. Discussions are currently underway to set this objective on its way to fruition.

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Gary Rollefson  
Peabody Museum  
Harvard University  
U.S.A.

Zeidan Kafafi  
Institute of Archaeology  
and Anthropology  
Yarmouk University  
Irbid - Jordan

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