

THE 1988 SEASON AT 'AIN GHAZAL A PRELIMINARY REPORT

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Introduction

In the four excavation seasons of 1982-1985¹ the principal focus centered on early Pre-Pottery Neolithic B (PPNB) layers. As a consequence, more than 200m² of PPNB deposits were investigated that provided a reasonable foundation to reconstruct the general outline of sociocultural developments from ca. 7,250 to 6,500 b.c. The 1984 season also included a sounding of some 45m² in the southern part of the site that produced some surprising results, for we encountered more than a meter of deposits from the Yarmoukian phase of the Pottery Neolithic period (ca. 5,500-5,000 ? B.C.) as well as a substantial series of aceramic Neolithic occupations that were decidedly different from all published accounts of PPNB manifestations. The latter constellation of artifacts, architecture, burial practices, and economic developments we termed the "PPNC"², a cultural development not recognized outside of 'Ain Ghazal at the time. The 1985 season, a concerted effort to recover two caches of PPNB plaster statuary similar to the 1983 cache, also revealed Yarmoukian layers at the top of the principal excavation trench, although the restricted area of the probe (ca. 12 m² at the top, narrowing to ca. 6 m² at the bottom) was too small to assert positively that PPNC occupations also occurred in the central part of 'Ain Ghazal.³

In 1986 and 1987 no excavations were conducted so that analysis of the previous seasons' archaeological material could be

pursued in depth, although a survey in the greater 'Ain Ghazal area was carried out in 1987⁴. In late 1987 we were informed that commercial and residential development plans drawn by the Municipality of Amman involved the outright destruction of the Neolithic settlement at 'Ain Ghazal, and our earlier plans for a systematic program of excavations at the site were utterly upset. Uncertain as to the pace and extent of the impending destruction of one of the world's most precious prehistoric sites, the co-directors of the 'Ain Ghazal project, in consultation with the Department of Antiquities of Jordan, arranged for a fifth season of emergency excavations at 'Ain Ghazal in 1988.

In view of the urgency of the situation, it was agreed that it would be best to concentrate our efforts on the Yarmoukian and PPNC occupation layers. This decision was governed by the state of inadequate information from these periods not only at 'Ain Ghazal, but from the greater Levantine region as a whole. Yarmoukian cultural developments were known principally from hamlet-sized settlements,⁵ and the PPNC layers at 'Ain Ghazal filled a "gap" of information between the collapse of PPNB settlements at the end of the 7th millennium and the emergence of the Pottery Neolithic sometime during the 6th millennium.

Consequently, the joint expedition of the Institute of Archaeology & Anthropology, Yarmouk University, San Diego State University, and the Desert Research Institute of the University of Nevada system

1. G. Rollefson 1983; G. Rollefson and A. Simmons 1984, 1985, 1986.
2. G. Rollefson & A. Simmons 1986.

3. G. Rollefson & A. Simmons 1987.
4. A. Simmons & Z. Kafafi 1988.
5. e.g. Z. Kafafi 1988; M. Muheisen *et. al.* (1988).

conducted a six-week season of excavations in June and July of 1988.⁶ A total of 278 m² was exposed in this short amount of time, including 80 m² in the South Field (121 m³) and nearly 200 m² in the Central Field (195 m³). The enthusiastic efforts of the Jordanian and international crew were very productive, and at the present time we have been able to analyze on a very preliminary level only a relatively small amount of the information.

Excavation and Site Stratigraphy

The excavations in 1988 concentrated on three areas, each of which varied in specific objectives. In the South Field we wanted to probe in greater detail the sequence of PPNC and Yarmoukian occupations that had been sampled to only a limited degree in 1984. To this end we extended four contiguous excavation trenches at the northwest corner of Square 4254 (Fig. 1), amounting to an area of 80 m² (121 m³). In addition, limited sub-floor testing of the PPNC structure in Squares 4253 and 4254, exposed in 1984, was conducted to learn more about the origins of the PPNC and to investigate in greater detail the nature of the earliest phases of PPNC architecture.

In the Central Field the goals were more exploratory, and two series of several contiguous trenches were excavated to provide as great an exposure of the later occupation phases as possible in the short amount of available time. Area I of the Central Field consisted of seven adjacent trenches just upslope of the section in which the 1983 statuary cache was recovered. One trench (Square 3275) was probed to a depth of nearly three meters through PPNC and Late PPNB levels to link up stratigraphically with the upper-

most deposits sampled in 1984 (Square 3273). For the other trenches, on the other hand, attention was confined to the uppermost 0.5-1.5 m of archaeological strata, with combined totals of 100 m² and 97 m³.

Area II of the Central Field comprised five contiguous trenches (Fig. 1) arrayed upslope of the 1985 sounding in Squares 3282/3482. The depths of the sampled deposits also ranged from 0.5 to 1.5 m, and a total area of 98 m² (97 m³) was investigated.

In both the South and Central Fields Yarmoukian deposits were found directly atop PPNC occupational layers, and it is now clear that the entire site, or at least that portion on the west bank of the Zarqa River, was continuously occupied from the late 8th millennium through the end of the 6th; during these more than 2,000 years of habitation the site enjoyed a continuous growth in terms of area. It can be stated confidently that no "gap" in the occupation of the site occurred, and that the changes from the PPNB to the PPNC to the Yarmoukian period transpired as local cultural adaptations and accommodations to the local environment.

Chipped Stone Artifacts

Table 1 provides a breakdown of the absolute and relative frequencies of chipped stone debitage classes that have been analyzed so far. (We estimate that the total of more than 73,000 specimens represents approximately three-fourths of the recovered artifacts. The sorting of the remaining 25%, or ca. 25,000 additional chipped stone artifacts, is continuing.). Table 2 examines the relative production of flakes and blades among the three major cultural periods sampled in 1988, and it is instructive to note that the flake: blade ratio

6. In addition to funds from the three sponsoring institutions, principal sources of financial support came from the National Endowment for the Humanities, the National Geographic Society, AMOCO Corporation, the Lindley Foundation, and the Department of Antiquities of Jordan. Also, this project was funded by Earthwatch and its Research Corps. We would also like to

express our gratitude to Dr. David McCreery and Dr. Bert de Vries, Directors of the American Center of Oriental Research (ACOR) in Amman for their aid in pre- and post-season arrangements and for their invaluable assistance in the negotiations with the Municipality of Amman and U.S.A.I.D.

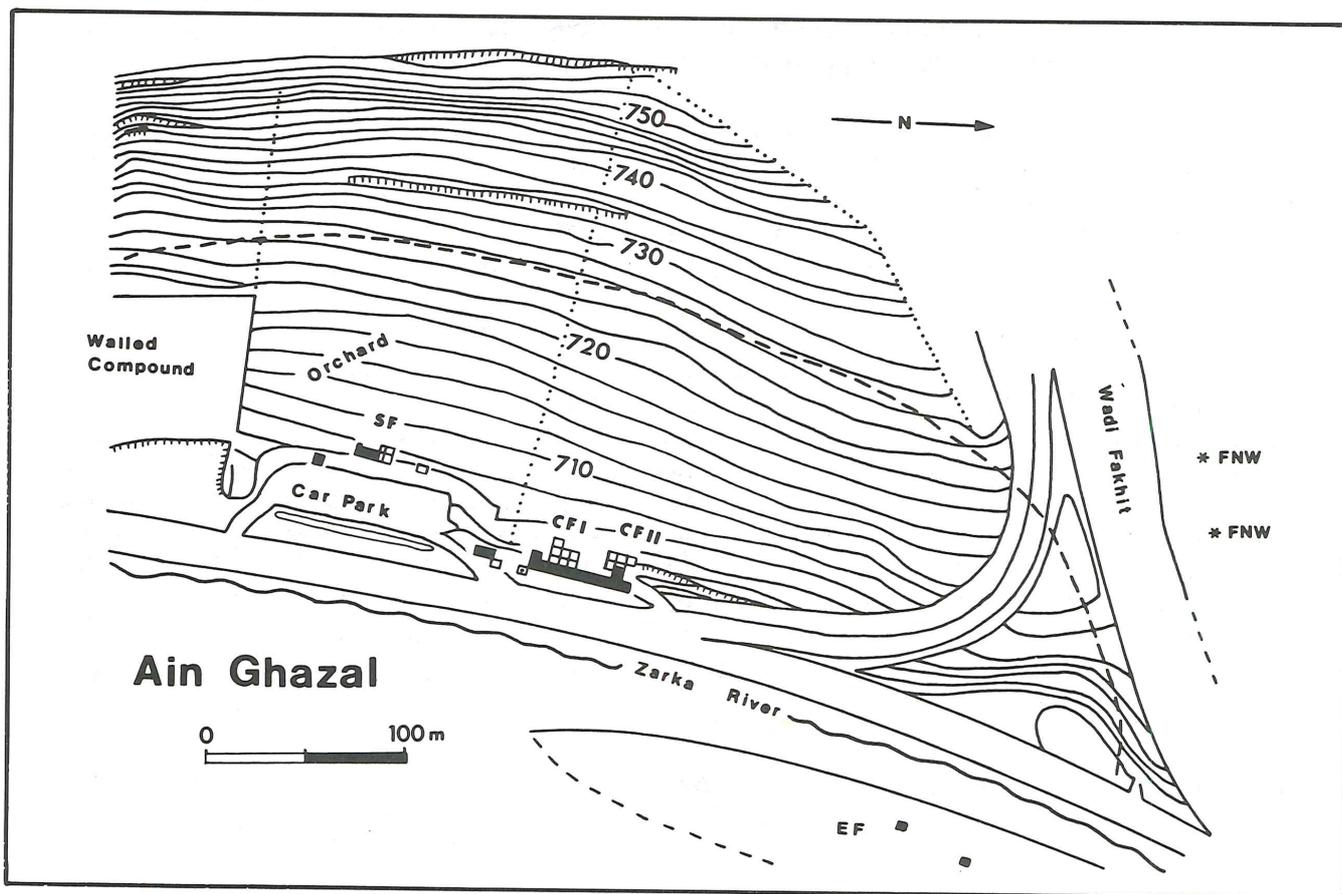


Fig. 1. 'Ain Ghazal site map showing location of the 1988 excavation areas (open squares and rectangles) and previous excavation areas (solid black). SF = South Field; CFI = Central Field, Area I; CFII = Central Field, Area II; EF = East Field; FNW = Far North West Area. The square with a dot inside it, at the bottom of the CFI area, is the location of the plastered skull recovered in 1988.

changes consistently towards higher flake representations throughout the sequence. Table 3 includes bladelets and cores in addition to flakes and blades, and two more trends are suggested here: that cores become more numerous through time, and that bladelets tend to increase in relative importance despite the relative decrease in blade production.

Table 4 places the 1988 samples in the context of the combined totals from the previous excavation seasons, and once again the flake: blade ratio trends are clear, although the changes in blade: bladelet ratios show a general trend towards decreasing quantities of bladelets until a sudden surge in their popularity once again in the Yarmoukian period. That these trends are not spurious is demon-

strated by the Chi-Square matrices in Table 5, where differences in the comparisons among all the major cultural phases are shown to be highly significant.

It has not been possible to analyze the tool typologies of the 1988 samples, although subjective impressions during the sorting of the artifacts suggest a growing dependency on flakes as the major tool blanks through time, an impression that matches the perceived changes in lithic technology. There is also the distinct impression, to be tested rigorously as typological analysis continues, that projectile point types contrast sharply among the PPNB, PPNC, and Yarmoukian periods (Pl. I: 1,2,3), a situation suggested by the analysis of small samples from the 1984 season.⁷

7. Cf. G. Rollefson & A. Simmons 1988.

Table 1: Absolute counts (above) and relative frequencies (below) for debitage classes among the analyzed chipped stone artifact samples, 1988 season at 'Ain Ghazal*'

	<i>BL</i>	<i>bl</i>	<i>FL</i>	<i>CTE</i>	<i>BS</i>	<i>MF</i>	<i>DE</i>	<i>OT</i>	<i>PL</i>	<i>COR</i>	<i>(TL)</i>	<i>TOTALS</i>
M	3,695	711	7,310	132	116	2,994	1,784	19	3	361	(1293)	17,125
Y	5,496	1,593	12,696	325	429	6,588	5,073	39	4	288	(1408)	32,461
C	4,832	894	9,193	292	234	2,547	2,905	52	1	173	(863)	21,123
LB	935	126	1,034	75	35	260	280	14	—	18	(198)	2,777
T	14,958	3,324	30,163	824	814	12,389	10,042	124	8	840	(3762)	73,486

	<i>BL</i>	<i>bl</i>	<i>FL</i>	<i>CTE</i>	<i>BS</i>	<i>MF</i>	<i>DE</i>	<i>OT</i>	<i>PL</i>	<i>COR</i>	<i>(TL)</i>	<i>TOTALS</i>
M	21.6	4.2	42.7	0.8	0.7	17.5	10.4	0.1	0.0	2.1	(7.6)	100.1
Y	16.9	4.9	38.9	1.0	1.3	20.3	15.6	0.1	0.0	0.9	(4.3)	99.9
C	22.9	4.2	43.5	1.4	1.1	12.1	13.8	0.2	0.0	0.8	(4.1)	100.0
LB	33.7	4.5	37.2	2.7	1.3	9.4	10.1	0.5	0.0	0.6	(7.6)	100.0

* Column codes: BL = blades; bl = bladelets; FL = flakes; CTE = core trimming elements; BS = burin spalls; MF = microflakes; DE = debris; OT = "Other flakes"; PL = paleolithic; COR = cores; (TL) = tools (not counted in totals).

Row codes: M = surface and mixed contexts; Y = Yarmoukian; C = PPNC; LB = Late PPNB (ca. 6,500-6,000 B.C.)

Table 2: Absolute and relative frequencies of blades and flakes among the analyzed *in situ* chipped stone artifact samples from the 1988 season at 'Ain Ghazal.

	<i>N</i>			<i>%</i>		
	<i>BL</i>	<i>FL</i>	<i>Totals</i>	<i>BL</i>	<i>FL</i>	<i>Totals</i>
YARM	5,496	12,626	18,122	30.3	69.7	100.0
PPNC	4,832	9,193	14,025	34.5	65.5	100.0
LPPNB	935	1,034	1,969	47.5	52.7	100.0

Table 3: Absolute counts (above) and relative frequencies (below) of blades, bladelets, flakes, cores, and tools from the analyzed *in situ* chipped stone artifact samples, 1988 season at 'Ain Ghazal. (See Table 1 for column codes).

	<i>BL</i>	<i>bl</i>	<i>FL</i>	<i>COR</i>	<i>(TL)</i>	<i>Totals</i>
YARM	5,496	1,593	12,626	288	(1408)	20,003
PPNC	4,832	894	9,193	173	(863)	15,092
LPPNB	935	126	1,034	18	(198)	2,113
YARM	27.5	8.0	63.1	1.4	(7.0)	100.0
PPNC	32.0	5.9	60.9	1.1	(5.7)	100.0
LPPNB	44.2	6.0	48.9	0.9	(9.4)	100.0

Table 4: Absolute counts (left) and relative frequencies (right) for blades and flakes (above) and blades and bladelets (below) for all analyzed chipped stone artifact samples from 'Ain Ghazal, 1983-1985 (Cf. Rollefson & Simmons 1988).

	N			%		
	BL	FL	Totals	BL	FL	Total
YARM	7,818	16,409	24,227	32.3	67.7	100.0
PPNC	8,077	15,229	23,306	34.7	65.3	100.0
LPPNB	935	1,034	1,969	47.5	52.5	100.0
EPPNB	23,851	22,864	46,715	51.1	48.9	100.0

	N			%		
	BL	bl	Totals	BL	bl	Total
YARM	7,818	2,122	9,940	78.7	21.3	100.0
PPNC	8,077	1,428	9,505	85.0	15.0	100.0
LPPNB	935	126	1,061	88.1	11.9	100.0
EPPNB	23,851	5,710	29,561	80.7	19.3	100.0

Table 5: Chi-Square matrices for blade: flake ratios (below) and blade: bladelet ratios (above) for the 1983-1985 chipped stone artifact samples from 'Ain Ghazal.

Chi-Squares, Blade: Bladelet Ratios

	YARM	PPNC	LPPNB	EPPNB
YARM	----	130.22	52.91	19.32
PPNC	.0000	----	7.54	88.77
LPPNB	.0000	.01	----	36.76
EPPNB	.001	.0000	.001	----

Chi-Squares, Blade: Flake Ratios

	YARM	PPNC	LPPNB	EPPNB
YARM	----	30.40	189.5	2278.4
PPNC	.001	----	130.3	1685.9
LPPNB	.0000	.0000	----	9.64
EPPNB	.0000	.0000	.01	----

Bone Tools

Table 6 tabulates the recovered bone tools classified so far. (Since a large amount of faunal remains are still being analyzed, it is expected that the number of bone tools will increase substantially).

Bone tools from the PPNC and Yarmoukian deposits are relatively numerous in contrast to the situation observed in 1984 in the small South Field exposures. Interestingly, the bone tools from the relatively minute Late PPNB trench account for a third of the 1988 total, although this

Table 6: Bone artifacts from the 1988 season at 'Ain Ghazal.

	<i>M</i>	<i>YARM</i>	<i>PPNC</i>	<i>LPPNB</i>
Awl fragments	1	26 ^a	11	6
Spatula fragments	7 ^{b,c}	2	12 ^c	13
Needles	1	1	4	5 ^d
Polished rib fragments	—	1	11	16 ^e
Polished bone fragments	3	—	10	4
Sawed bone fragments	—	2 ^f	9	2
Serrated Bones	—	—	2 ^g	—
Tooth + bone "spoon"	—	—	1	—
Incised bone	—	—	—	1
Totals	12	32	60	47

Notes: a- one awl on an animal incisor?
 b- two spatula fragments incised
 c- one spatula fragment perforated
 d- eye present on one needle
 e- six bear small notches along one or both edges
 f- one possibly inlaid at one time
 g- e.g. a "weaving beater"

may be a reflection of sampling error. In any event, the general "sewing and weaving" character of the bone tool repertoire carries throughout the occupational sequence. The two "serrated bones" from the PPNC have been cut at one end of a long bone, producing a denticulation that appears to be consistent with their use as "weaving beaters" to compact the weft material on a loom.

One type of bone tool, noted only in the Late PPNC deposits, consists of polished animal ribs that bear small incised notches placed at regular intervals along one or both lateral edges of the pieces. Although the use of these tools remains speculative, the notching resembles in some ways the "rasps" used as musical instruments among some recent ethnographic groups, although the notches are so small that a similar function for the Late PPNC specimens seems unlikely.

Groundstone Artifacts

Considering the volume of sediments investigated during the 1988 season, the number of groundstone artifacts is perhaps somewhat low (Table 7), at least in terms of the relatively high numbers of such artifacts recovered from the Middle PPNC deposits at 'Ain Ghazal in previous seasons. Nevertheless, the mullers, querns, pestles, and rubbing stones⁸ indicate that the processing of cereal grains continued to be an important part of the daily routine through at least the early phases of the Yarmoukian period. The Yarmoukian stone vessel in Table 7 may be a "wide-mouth mortar" common in the earlier PPNC sediments at 'Ain Ghazal, but the three Late PPNC vessel fragments cited in Table 7 refer to fine bowls, evidently similar to those reported from Tell Abu Hureyra.⁹

8. We would like to thank Karen Wright for providing us with the results of her preliminary

analysis of the 1988 groundstone specimens.
 9. Cf. A. Moore 1975.

Table 7: Groundstone objects from the 1988 season at 'Ain Ghazal.

	M	YARM	PPNC	LPPNB
Muller	4	7	7	—
Quern	6	3	6	—
Pestle	—	2	2	—
Rubbing stone	3	13	6	—
Vessel	1	1	—	3
Basalt/pumice fragment	—	1	—	—
Unidentifiable fragment	11	11	16	4

Human and Animal Figurines

Table 8 lists the figurines recovered in 1988, and although the numbers are small, they help to fill out the ritual/artistic aspects of the various archaeological periods. The human figurines are not well formed, and the quality of the pieces makes comparisons with the rich Middle PPNB material from earlier seasons difficult to effect. It is important to note the appearance of an exquisite equid during the PPNC (represented by the head only), and the heavily beaked bird(?) from the Yarmoukian is unique for this time period. Although cattle continue to be found in the later phases of occupation at 'Ain Ghazal, the few pieces suggest that the "cattle cult" indicated during the Middle PPNB at 'Ain Ghazal¹⁰ had lost much of its popular appeal by the onset of the PPNC period.

Ornaments/Jewelry

Of the pieces of jewelry recovered in 1988, (Table 9), it is clear that the majority consists of polished limestone "bracelets", accounting for three-fourths of the inventory (excluding *ex situ* material, chunks of raw material, etc.). Very poorly represented in the Middle PPNB period at 'Ain Ghazal, it is interesting to note the popularity of bracelets in the Late PPNB layers (indeed, this small probe produced more than a fourth of the total number of

bracelets).

Long-distance contact to obtain exotic raw materials for ornaments continued throughout the occupation of 'Ain Ghazal, reflected by Mediterranean sweet clam shells, Red Sea coveries and mother-of-pearl, Wadi Ramm (?) carnelian, and probable Wadi Dana copper ore. Of interest in terms of raw material acquisition is the presence of "Dab'a marble" in the later periods of occupation.¹¹ This material is a green-coloured limestone available in outcrops at the edge of the steppe just to the west of Wadi Jilat, approximately 55 km southeast of 'Ain Ghazal. The increasing importance of this stone in the later periods suggests a more intensive familiarity with the steppe region, a scenario that coincides with our interpretation of subsistence economy developments in the PPNC and Yarmoukian periods.¹²

Other Objects

Tables 10 and 11 list other stone objects and small finds recovered during the 1988 season. Of interest in Table 10 are the numerous pecked and ground stone objects that can be interpreted as weights. Varying in size from small spinning whorl-like objects (*ca.* 5 cm diameter) up to massive perforated pieces weighing nearly half a kilogram, these weights appear to be associated with a spinning and weaving industry, although this interpretation is

10. I. Köhler-Rollefson n.d. (b).

11. We would like to thank Dr. Andrew Garrard for bringing this material to our attention and for

arranging to show us a Dhabba marble "quarry" to the northwest of Wadi Jilat.

12. I. Köhler-Rollefson n.d. (a).

Table 8: Human and animal figures from the 1988 season at 'Ain Ghazal.

	<i>M</i>	<i>YARM</i>	<i>PPNC</i>	<i>LPPNB</i>	<i>EPPNB</i>
Human	—	1 ^a	2	2	1
Human?	—	1 ^a	—	—	—
Equid	—	—	1	—	—
Cow	—	1	1	—	—
Bird?	—	1	—	—	—
Animal?	—	—	1	—	—
Goat horn	—	—	1 ^b	—	—
Cow horn	—	—	—	2	—
Animal horn	—	—	1	—	—
Indeterminate	—	2	3	1	1 ^a
	1 ^a				
Totals	1	6	10	5	2

Note: All the figurines listed above are of baked or sun-dried clay except:

a- limestone

b- chalk/plaster

admittedly speculative at the moment. The stone mace heads listed in Table 10, some of which are polished very nicely, are rather clear as to their uses, for they match very closely mace heads from the Chalcolithic copper horde from Nahal Mishmar¹³ in Palestine.

The bronze/copper items and the glass bracelet fragment (Table 11) reveal that visits to 'Ain Ghazal continued after the close of the Neolithic. Long-distance contact with Anatolia continued into the later Neolithic periods as evidenced by the obsidian bladelets and fragments. White ware, which was first produced in the Middle PPNB layers at 'Ain Ghazal, continued to be manufactured in the PPNC and even during the Yarmoukian period; the latter circumstance is somewhat surprising in view of the excellent pottery traditions of the Yarmoukian people, but it is possible that white ware may have performed a special role during this time. Geometric objects of clay and plaster, which figured so prominently in the Middle PPNB period, are very rare in the later occupations, and it likely that these few

specimens served a different function from their PPNB counterparts.

Pottery

The pottery from the Yarmoukian layers investigated in 1988 repeated the inventory recovered in 1984 and 1985 at 'Ain Ghazal. The ware varied from very coarse to coarse to a few examples of fine ware. All of the pottery was handmade, and for the most part it appears that the firing temperature was relatively low in view of the general friability of the sherds. No intact vessels were encountered, but several loci produced restorable pots. The variety of shapes was very restricted, confined principally to jars with fewer examples of bowls and cups. Decoration consisted of the characteristic herring-bone incisions, sometimes associated with red paint.

The distribution of vessel types suggests that one Yarmoukian building may have served a special community function. While jars were ubiquitous across the site, small fine-ware cups were confined to an

13. P. Bar Adon 1962.

Table 9: Ornaments from the 1988 season at 'Ain Ghazal.

	M	YARM	PPNC	LPPNB	EPPNB
Stone bracelets	6	21	42	23	—
Stone bracelet "preforms"	1	—	2	1	—
Beads					
Limestone	1	—	—	—	—
Baked clay	1	—	—	—	—
Fossil urchin	—	1	—	—	—
Fossil belemnite	—	1	—	—	—
Butterfly, carnelian	—	1	—	—	—
Butterfly, DM*	—	1	—	—	—
Redstone (coral?)	—	1	—	—	—
Cowrie shell	—	—	1	—	—
Greenstone (CU**)	—	1	—	2	—
Greenstone (DM*)	—	—	1	1	—
"Whitestone"	—	—	1	1	—
Bone, tubular	—	—	1	—	1
Pendants					
Fossil shark tooth	—	1	—	—	—
Limestone	—	1	—	—	—
Sweet clam	—	1	2	—	—
Mother-of-pearl	1	3	3	—	—
Other shell	—	—	2	—	—
Bone	—	—	1	—	—
Other objects					
"Finger rings"	1	1	—	—	—
Bone "toggle"	1	—	—	—	—
Marine shell fragment	1	1	—	—	—
Redstone chunk	—	1	—	—	—
Greenstone (DM*) chunk	—	1	—	—	—

* DM = "Dab'a marble"

** CU = probable copper ore

apsidal building, and this structure also seemed to be the area where decorated bowls were concentrated. More intensive analysis of pottery distribution, stone tool types, other artifact materials, and micro-stratigraphic relationships across the site must be conducted before this perceived association can be followed up.

One final comment concerning the ceramics recovered at 'Ain Ghazal should be made here: it appears, on the basis of a very small sample of sherds, that there is an *in situ* transition from the aceramic PPNC to the ceramic Yarmoukian periods.

Rare sherds have been found in and beneath structures that to all outward appearances are PPNC in design and construction. These sherds are undecorated and they display the same crude fabric and firing temperatures that characterize Yarmoukian pottery. It is necessary to inspect the associated chipped stone artifacts before more reliance can be placed on the transitional nature of these potsherds, and certainly it will be necessary to expand excavations in these transitional horizons to increase the quantity and quality of evidence.

Table 10: Stone objects from the 1988 season at 'Ain Ghazal.

	<i>M</i>	<i>YARM</i>	<i>PPNC</i>	<i>LPPNB</i>
Perforated stone sphere	—	1	—	—
Stone disc	—	5	1	1
perforated stone disc ^a	1	6	3	—
Polished stone ring ^a	—	—	1	—
Massive stone weight	3	4	9	2
Mace head	—	2	9	—
Small stone sphere	1	—	1	—
Egg-shaped stone	—	—	1	—
Limestone cylinder	1	—	—	1
Limestone "punch"	—	—	1	—
Limestone "celt"	—	—	1	—
Shaft straightener	2 ^b	—	1 ^c	—
Incised stone	1	—	1	—
Incised chalk	—	—	1 ^d	—
Drilled stone fragments	—	1	4	—
Abraders	—	—	2 ^e	—

Notes: a- Small weights? Spinning whorls?

b- One basalt, one limestone

c- Limestone

d- Cruciform with circle at base

e- One limestone, one sandstone

Table 11: Miscellaneous objects from the 1988 season at 'Ain Ghazal.

	<i>M</i>	<i>YARM</i>	<i>PPNC</i>	<i>LPPNB</i>
Bronze coin	1	—	—	—
Bronze/copper pin	1	—	—	—
Glass bracelet fragment ^a	1	—	—	—
Red pigment ^b	—	12	1	—
Obsidian fragments	2	2	3	—
White ware fragments	1	4	3	—
Stone bowl fragment ^c	—	—	—	1
Clay lumps ^d	—	2	2	4
Clay disc	—	—	1	—
Clay geometric object	1 ^e	1 ^f	—	—
Chalk geometric object	—	—	1 ^g	—
Painted (?) fish vertebrae	—	—	1	—
Stone disc "stopper"	—	1	—	—
Drilled chalk fragment	—	—	1	—

Notes: a- Umayyad?

b- Probably hematite

c- Thin "fineware"

d- Intentionally shaped?

e- Hemisphere

f- subcuboid

g- cone

Architecture

South Field

One of the most notable aspects of the 1984 season was the discovery of complex PPNC architecture that differed so strikingly from Middle PPNB domestic dwellings at 'Ain Ghazal. Furthermore, no evidence of permanent structures from the Yarmoukian period were encountered in 1984, and the 1985 season produced only limited evidence of insubstantial, puddled-mud floored temporary dwellings that suggested only temporary habitation during this phase of occupation at 'Ain Ghazal. The 1988 season has considerably increased our appreciation of both the nature of construction and the character of settlement at 'Ain Ghazal in the 6th millennium.

In the South Field,¹⁴ we now have a clearer idea of the design of PPNC dwellings and how these buildings changed through the beginning of the Yarmoukian period. The sub-floor testing of the earliest PPNC architecture in Squares 4453 and 4454W produced some unexpected results. The floors and walls exposed here in 1984 suggested a resemblance to the "corridor buildings" of Level II at Beidha,¹⁵ and while it was not possible to confirm this aspect of architectural design, it was revealed in 1988 that the building had a complex history of renovation. The dwelling was constructed at least partially on virgin basal clay (earlier architectural features may have been removed, on the other hand), although possibly Late PPNB architectural elements probably underlay other parts of the building. Under the floors of the small chambers in the northernmost area of the building were at least two "channels" approximately 40 cm wide (Pl. II,1) oriented in a north-south direction, covered by stone slabs. The similarity to the "channeled buildings" found at Basta¹⁶ is very strong, at least on superficial comparisons.

In the main excavation trenches in the South Field the architectural developments proceed through at least one later phase of the PPNC, a "transitional" PPNC-Yarmoukian phase, and at least two phases of the Yarmoukian period. The PPNC structure, exposed in its entirety (Pl. II,2), is a small, compact "corridor building" approximately 3.5 m on a side, with a doorway facing the east (downslope). Exterior and interior walls averaged about 50 cm in thickness. The interior space was divided into three long rooms, each approximately 2.5 m (E-W) by 1.0 m (N-S) in extent with central doorways in the cross walls forming a corridor connecting all three rooms and subdividing them into northern and southern chambers. Although the floors of the rooms were plastered, the small size of each room suggests that they did not serve as the normal living and sleeping areas, but instead they were "basement" storage and work areas beneath an upper floor. A "floor assemblage" of three axes, a basalt discoidal muller, a broken conical pestle, and a flint polishing stone in the southwest corner of the structure lends support to this interpretation.

A couple of crude, undecorated pottery sherds appeared in the fill beneath later phases of renovation of this building, although *diagnostic* Yarmoukian sherds (i.e., with paint and/or herringbone incision) do not occur until after the final abandonment of the corridor building. This renovation phase, which marks the end of the consistent use of plastered floors in the South Field buildings, may represent a transition from the aceramic PPNC to the ceramic Yarmoukian Neolithic, although the confirmation of this interpretation will need a much larger body of samples from future work at 'Ain Ghazal.

The earliest definable Yarmoukian occupation of the South Field is associated with a relatively large but incomplete rectangular building made of stone walls

14. We would like to thank Dr. E. Ted Banning for his interpretation of the South Field architectural sequence.

15. B. Byrd & E. Banning n.d. cf. D. Kirkbride 1966.

16. H. Nissen, M. Muheisen, H. Gebel, *et al.* 1987.

and beaten earth floors (Pl. III,1). The frequency of potsherds is low, but diagnostic Yarmoukian material is present. The house has at least two rooms divided by a north-south cross wall, which has a connecting door 1.25 m wide in it. The east room, whose entrance was not found, had minimum dimensions of 3.5 m (E-W) by 5.0 m (N-S), with interior and exterior walls approximately 50 cm thick. The western room has preserved dimensions of about 2.5 x 5.0 m, but the westernmost wall was destroyed by later Yarmoukian pit-digging.

A rich floor assemblage was found in the southwest corner of the eastern room (Pl. III,2) and included three perforated and two unperforated stone discs, two perforated irregular stones, two abraders and a piece of groundstone, a stone cylinder (pestle?), a polishing stone, a bone awl, and several pieces of red pigment (hematite?). The size of this substantial building indicates that the earliest Yarmoukian inhabitants of 'Ain Ghazal maintained a permanent occupation of the settlement, although the latest phases of Yarmoukian presence probably had changed to temporary, perhaps seasonal occupation as suggested before.¹⁷

The last Yarmoukian architectural phase in the South Field is represented only by fragments of walls (some curvilinear) and isolated patches of plaster of variable quality. This later Yarmoukian phase remains poorly understood due to the enormous destruction wrought by the intensive and widespread pit-digging practiced by the final Yarmoukian inhabitants.

Central Field, Area I

Architectural developments in Area I are much less clear, principally (we believe) because of severe damage incurred from recent agricultural practices, including bulldozing, plowing, and "field stone" removal. Thus, Yarmoukian layers are generally shallow in Area I, and generally

only isolated wall remnants and scattered patches of mud or poor quality plaster floors could be attributed to this period.

Late (?) PPNC architecture was better preserved, including a large rectangular building in Square 3476 (and adjacent trenches). The exposed portion of this structure measures 5.6 m (E-W) by 4.0 m (N-S), although it is possible that another room lies under unexcavated soil to the west. The known limits of the building include one large room with doors opening both to the west and east with a floor area of 2.4 (E-W) x 2.8 m. The eastern exit leads to a three-sided "porch", with the open area facing the east. Measuring 1.6 (E-W) x 2.8 m, the porch may be a later modification of a large room that originally included the excavated room to the west. Exterior walls of the structure are about 80 cm thick, although the north-south cross wall is only about half as thick. The porch appears to be associated with an exterior work area and a circular stone-lined feature (1.2 m diameter) covered with plaster. The corner of another rectilinear PPNC house was also uncovered, but too little has been exposed to permit much interpretation of its size and function.

The most dominating feature of Area I is also its most puzzling feature. A massive stone wall 1.4 m thick, preserved to a height of 4-5 courses in places, extends from the eastern limit of Area I (where its extension was destroyed by bulldozers in 1974) more than 10 m towards the west-southwest where it continues to run into unexcavated sediments. No cross walls have been found branching off this wall, although a series of at least two "surfaces" (and/or floors?) of poor quality mud plaster mixed with lime cove up against both the southern and northern faces of the wall. The absence of pottery in association with these surfaces suggests a (late?) PPNC date for its construction, although it appears that later Yarmoukian inhabitants also used the wall in some fashion. The function of the wall is conjectural at the

17. A. Simmons *et al.* 1988.

moment, although it appears to separate one portion of the site from another; perhaps it is a large courtyard wall. The later Yarmoukian features on the wall (including circular and rectangular "insets") are curious, and at the present time we cannot suggest a plausible interpretation for them.

Late PPNB. The principal reason we selected Square 3275 as our deep probe in 1988 was to investigate the remains of a building visible in the bulldozer section that appeared to be a relatively intact Late PPNB (6,500-6,000 b.c.) structure. As it turned out, the wall was simply a "hollow shell"; several floor fragments indicate periods of renovation, but subsequent Late PPNB and PPNC activities virtually obliterated the interior of the building. One of the most damaging activities was a Late PPNB use of the abandoned building as a lime kiln, and later it was a PPNC area associated with several contemporaneous stone-lined firepits and massive grinding stones (Pl. IV,1) associated with a possible PPNC rebuild of the upper portion of the wall. The wall also extended eastward through adjacent trench Sq. 3276 and well into Sq. 3277, where a corner turned towards the east at a 90° angle. Artifactual evidence from the corner area argues for a continued use of this part of the building into the PPNC period.

Central Field, Area II

Area II appears to include at least two phases of the Yarmoukian and two phases of the PPNC period; no PPNB levels were reached in the 1988 season.

Yarmoukian structures in general were not well-preserved, at least in the latest phase of occupation, possibly as a result of later agricultural disturbance and as a consequence of the evidence for only temporary structures from the last centuries of the 6th millennium.

Earlier Yarmoukian construction was quite striking, on the other hand. It appears that PPNC building elements were incorporated into some of the Yarmoukian structures, emphasizing once again the

continuity and transitional nature of the change from the aceramic to the ceramic Neolithic periods.

Only a small portion of an earlier Yarmoukian dwelling was exposed in Sq. 3683, but it is clear that this building used existing PPNC walls (and floors?) in its construction. One massive PPNC corner, with walls 80 cm thick and a doorway 1.8 m wide, was used by the Yarmoukians after closing up the doorway. A curving interior partition wall, perhaps semisubterranean, gives one room of the building a "semi-apsidal" appearance in ground plan, although it must be admitted that the feature needs to be examined in more detail.

The building in Sq. 3482 is very imposing, primarily because it is unique in ground plan and because of its potentially special significance to the Yarmoukian inhabitants of 'Ain Ghazal (Pl. IV,2). The building is rectangular overall, although the southern end has a definite apsidal contour (Pl. IV,2). Exterior dimensions are 4.5 m (N-S) by 3.4 m (E-W), although it is possible that at one time another room existed on the northern end. Interior dimensions of the single room structure are 3.4 m (N-S) by 2.25 m (E-W), including the southern apse, which has a "radius" of ca. 1.4 m. The orientation of the building is clearly north-south, and it is the only known building from any period at 'Ain Ghazal that is arranged along this axis. Entrance to the building was evidently through the north end after descending some 75 cm along a ramp or stone stairway, although a definite doorway was not identified in 1988. The northeast corner of the building was removed in 1985, and it will be possible to reconstruct the entire plan based on records from that season.

The floor of the semisubterranean building was made of plaster, although the original quality of the floor is difficult to determine due to extensive damage in a later period of use. It is uncertain, but it appears that the building may have been well beneath the contemporaneous land surface, and that the floor was laid on a surface cut deep into the original PPNC

layers. This interpretation is suggested by the depth of the Yarmoukian deposits in this part of the Central Field (1.6 m, compared to an average of 0.75 m or less in the rest of the Central Field) and the shallowness of the underlying PPNC layers (less than 25-30 cm).¹⁸

That the apsidal building was something more than a "normal" Yarmoukian dwelling is suggested by several factors. First, the floor of the building appears to be of much thicker plaster than in other Yarmoukian structures (including "transitional" PPNC-Yarmoukian loci). Second, the design itself is unique. Third, most of the ceramic fineware cups and decorated bowls came from inside or immediately outside the building. And finally, the last use of the structure involved a filling-in of the apse with large stones (from the wall superstructure?) to form a relatively large circular platform ca. 2.5-3.0 m in diameter.

PPNC architecture in Area II is not well documented because of limited excavation beneath the Yarmoukian structures in this part of the site. We also suspect that much PPNC architecture was modified or robbed-out to such an extent that reconstructing the earlier phases will be extremely difficult.

Parts of one PPNC building in Sq. 3681 were exposed, although it has suffered severe damage in antiquity. An area of 3 m (N-S) by 2 m (E-W) was evidently an outdoor work area enclosed on three sides (north, west, and south; the east wall, if it existed, would be under an unexcavated balk); in this regard it resembles the porched house in Area I. The poorly preserved surface may have been plastered at one time, and the south and west walls were thin (30-40 cm thick), possibly with an opening in the southwest corner of the enclosure. Within this space was a rectangular, three-sided arrangement of stone slabs set on edge with interior dimensions of 40 x 60 cm. The feature is very reminis-

cent of "mealing bins" common in prehistoric pueblo rooms in the southwestern United States.¹⁹ On the other hand, the function of this feature remains obscure, for no artifacts associated with food processing were found in or near it.

Animal and Plant Remains

A tremendous amount of faunal remains was recovered in 1988, and since the samples are still being analyzed, only a few preliminary comments can be made at this time. It seems clear that interpretations of changing patterns of animal exploitation based on the first four seasons of excavation²⁰ are supported by the 1988 information. That is, the broad spectrum of wild animal species that characterized the Middle PPNB period (7,250-6,500 B.C.) collapsed to a fraction of that variety in the PPNC and Yarmoukian periods. The samples from the Late PPNB probe in 1988 indicate that the reduction had already taken place in the latter half of the 7th millennium. The great majority of the animal remains from the Late PPNB, PPNC, and Yarmoukian periods are from domesticated species, although wild taxa such as gazelle and equids remained important sources of food (and variety). Of particular importance in the Late PPNB deposits was a canid mandible that exhibited considerable crowding, and together with the small size of the mandible, it indicates that dogs were fully domesticated well before 6,000 B.C.²¹

In contrast to the dismal results of flotation to recover botanical remains in 1984 and 1985, PPNC and even Yarmoukian samples were productive in 1988. This is not to say that the samples are "rich" by any means, especially in comparison with Middle and Late PPNB samples, but they nevertheless afford some hope of learning more about the plant foods utilized by PPNC and Yarmoukian people. The samples are currently being inspected, and we

18. Cf. G. Rollefson & A. Simmons 1987: 102-103 and Fig. 2.

19. e.g. W. Ashmore & R. Sharer 1988: Figs. 5-14.

20. I. Köhler-Rollefson *et al.* 1988.

21. I. Köhler-Rollefson, personal communication.

hope for publishable results in the near future.²²

Human Burials²³

Human remains discovered in 1988 were few compared to earlier seasons at 'Ain Ghazal. For the Yarmoukian period there were only isolated and scattered fragments of human crania and post-cranial skeletal material, and we assume that this is the result of disturbing earlier burials (PPNC?) during the incessant pit-digging by Yarmoukian inhabitants.

Only one intact burial from the PPNC was recovered (Pl. V,1), a male of more than 35 years seated in a semi-fixed position in a burial pit outside a housewall in Sq. 3681. Typical for a PPNC burial, the skull was intact with the rest of the skeleton. The man suffered severely from arthritis in the spine (including fused vertebrae) and feet (with fused bones), and his mobility must have been painfully impaired. The burial pit evidently disturbed one or more earlier burials of a young person and at least one infant, for several isolated bones were found near the man's right leg. Another burial of an infant of less than a year occurred nearby in a corner of a building; the burial was severely damaged (only parts of the skull were found), perhaps during a floor renovation episode for the building.

We also recovered several Middle PPNB burials, exposed by erosion in the bulldozer sections of the Central Field. One was evidently a subfloor secondary burial of a 15 year old girl whose skull, atypical for the period, was included in the pit. Another badly eroded subfloor burial was of a 12-15 year old girl whose skull had been removed some time after initial interment.

The Plastered Skull

The most interesting "burial" of the 1988 season was an adult male skull that bore several cutmarks on the right temporal bone, probably the result of defleshing the cranium. What is more remarkable, on the other hand, is that it bore a splendidly realistic recreation of the facial features of the individual, a "plaster portrait" of considerable sensitivity and delicate artistic skill (Pl. V,2). It is unlike any of the plastered skulls from Jericho or Beisamoun²⁴ in its rendition, and there is no evidence of any cosmetic treatment to the plaster beyond delicate incisions to emphasize features of the eyes and nose.²⁵ The location of the pit from which the skull came is datable to about 6,800 B.C. The skull is currently on exhibit at the museum of the Institute of Archaeology and Anthropology at Yarmouk University.

Concluding Remarks

Negotiations with the Municipality of Amman during the 1988 field season were considerably successful, and through the generous efforts of the Mayor of Amman we managed to preserve at least 12 *dunums* (ca. 3 acres) of the "core" of the site. Plans have been submitted to USAID to develop, in cooperation with the Department of Antiquities, the preserved portion of the site as an "open-air" museum. We hope to begin this phase of 'Ain Ghazal's service to the public by 1990.

In the meantime, we still face the loss of approximately seven hectares (ca. 17.5 acres) of this splendid archaeological resource. In 1989 the joint expedition will return to 'Ain Ghazal with two principal goals: to continue the intensive examina-

22. The flotation samples are currently being analyzed by Reinder Neef, Groningen University.

23. Carol Butler, n.d. (a and b).

24. Cf. K. Kenyon 1979; E. Strouhal 1973; M. Lechevallier 1978. The plastered skulls from

Tell Ramad (H. de Contenson 1964) and from the 1983 season at 'Ain Ghazal were not preserved well enough for comparisons.

25. Cf. A. Simmons *et al.* n.d.

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tion of the sequence in the South Field and
to sample by numerous soundings those

areas of the site to be lost in the immediate
future.

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