

THE 1982 EXCAVATIONS AT 'AIN GHAZAL: PRELIMINARY REPORT

by
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Introduction

The Department of Antiquities of Jordan conducted nine weeks of excavations at the PPNB village of 'Ain Ghazal from January through mid-April, interrupted during February by inclement weather.

'Ain Ghazal is an extensive site located in the Wadi Zarqa in the municipality of 'Alya near the eastern limits of Amman.¹ The hillside on which the site is situated has been cut by highway and commercial construction, revealing plaster floors, stone walls, and other architectural features which extend 600 metres in a north-south direction (Fig. 1). Although flint artefacts are found throughout the area from the 'Amman-Zarqa highway west to the top of the hill (*ca.* 275 metres E-W), the density of flakes, blades, and cores drops off sharply in the vicinity of the limestone escarpments and outcrops approximately 200 metres west of the highway. *In situ* plaster floors occur 80 metres west of the road near the northern roadcut, and chips of plaster with red ochre have been found approximately 150 metres west of the highway near the northernmost modern house on the hillside. The area of the site is nearly 12 hectares (*ca.* 30 acres) in extent, ranking in size with Tell Abu Hureyra in northern Syria (Moore, *et al.* 1975: 52) and roughly three times the size of contemporary Jericho (Kenyon, 1960: 39).

Site Setting

The Zarqa River valley, the longest

drainage in Jordan, contains a permanent stream fed by numerous springs in the 'Amman area and others farther downstream. Steep-sided in much of the upstream sections near 'Amman, the area around 'Ain Ghazal (Spring of the Gazelle) opens into a relatively shallow basin on the western side of the valley near the junction of two large tributary *awdiyah* (wadis) that originate from the west and southwest. This area constitutes an ecotone between the high *jibal* (mountains) and deep *awdiyah* (wadis) to the west and southwest and the rolling hills and plains to the east and northeast. The area receives sufficient rainfall today for dry-farming on the tops and slopes of nearby hills, although the sides of the Wadi Zarqa are generally too steep for effective agriculture. Aerial photos of the region, taken in 1952, reveal that the bottomlands along the river bed were highly productive areas for farming in the past.

Excavation Goals And Procedures

The construction of the 'Amman-Zarqa highway in 1974 removed the easternmost fringes of the PPNB village, and the removal of large sections of the southern and northern sectors of the site for commercial and other highway construction, destroyed even larger areas in subsequent years. Bulldozer sections left by these activities were quite steep, some being vertical and even undercut in some places. All of these sections represented a continued threat in the future due to erosion.²

¹ Dr. M. Khair Yassine of the University of Jordan first brought the site to our attention in late 1981. We would like to thank him for his interest, and we hope that soon he may become a partner in the 'Ain Ghazal Project.

² It is to Dr. Adnan Hadidi's credit that potential damage in the future by commercial development on the site has been prevented by his rapid and forceful intervention.

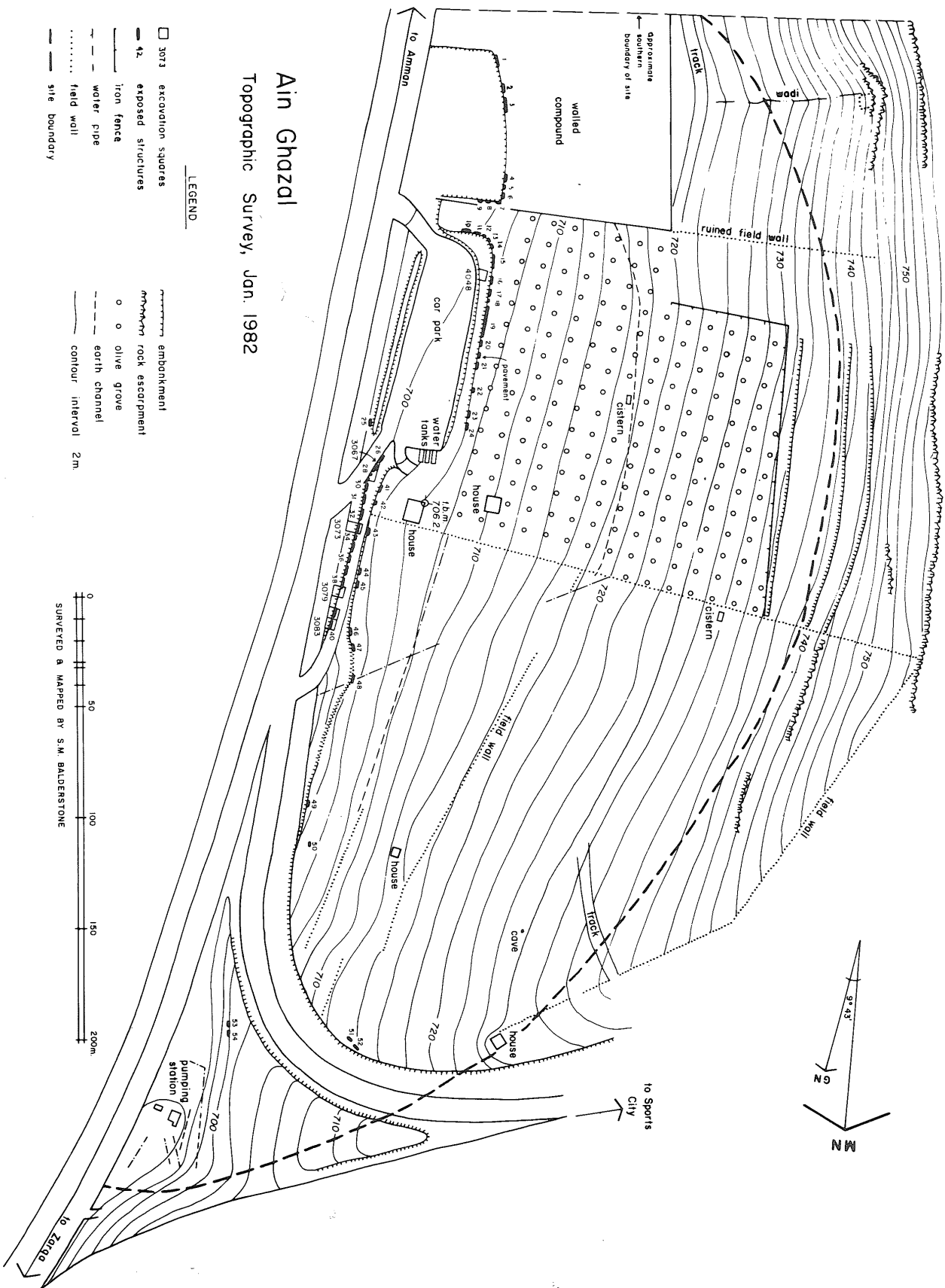


Fig. 1: Site map of 'Ain Ghazal.

One of the primary goals of the 1982 season, therefore, was to mount a salvage operation to retrieve as much information as possible in the threatened areas of the site. At the same time, a step trench in the east-central portion of the site would provide detailed information on the chrono-stratigraphic history of the site through some three metres of accumulated archaeological deposits. In addition, an unexcavated section adjacent to the west and upslope from the Step Trench provided another two metres of visible stratigraphy. A number of sub-floor burial pits was noticed early in the season, and a considerable effort was expended to salvage this crucial information. A series of three superimposed plaster floors in one area was selected for excavation in hopes of learning about domestic arrangements and construction in a limited amount of time. Finally, two adjacent plaster floors were selected for relatively broad exposure.

An imaginary 5.00 x 5.00 m. grid 1 km. on a side (Squares 0001-40,000) was placed over the site fixed to a series of datum points, and all excavation areas were located according to this grid. The northwest corner of each square was selected as the local elevation datum, all of which were measured in to a fixed datum near the center of the site.

Excavation proceeded according to natural strata, using 0.10 m. horizontal levels in natural layers more than 0.15 m. thick. All excavated sediment was dry-

sieved through half-centimetre mesh screen to retrieve as much faunal and archaeological material as was possible. Sediment from particular features, such as burial pits, hearths, and house floors, was saved for flotation to recover charred paleobotanical material from the water surface and small artefacts from the heavy fraction that did not pass through the *ca.* 0.001 m. mesh screen.

Preliminary Results

An abundant array of information concerning the occupation of 'Ain Ghazal resulted from the short period of time spent at the site. The following sections provide a summary of the preliminary analyses of the data.

1) Artefacts

a). Chipped stone artefacts (Fig. 2). The 1982 season produced a total of 22,871 chipped stone artefacts (Table 1). Discounting debris, tools comprised nearly 12% of the material, a healthy relative frequency for a permanent settled village. In contrast, cores occurred at a surprisingly low level of only 1.6%, suggesting either that the primary location of tool manufacture was outside the areas sampled by the excavations or, alternatively, that the flintworkers at 'Ain Ghazal were skillful users of this raw material (cf. Rollefson and Abu Ghaneima, this volume).

Table 1. Major Chipped Stone Artefact Classes From The Excavations At 'Ain Ghazal

	<i>n</i>	%	%'	%''
Flakes	8302	36.3	46.4	47.2
Blades	9303	40.7	52.0	52.8
Cores	277	1.2	1.5	
Debris (Tools)	4989 (2119)	21.8		(11.8)
Total	22,871	100.0	99.9	100.0

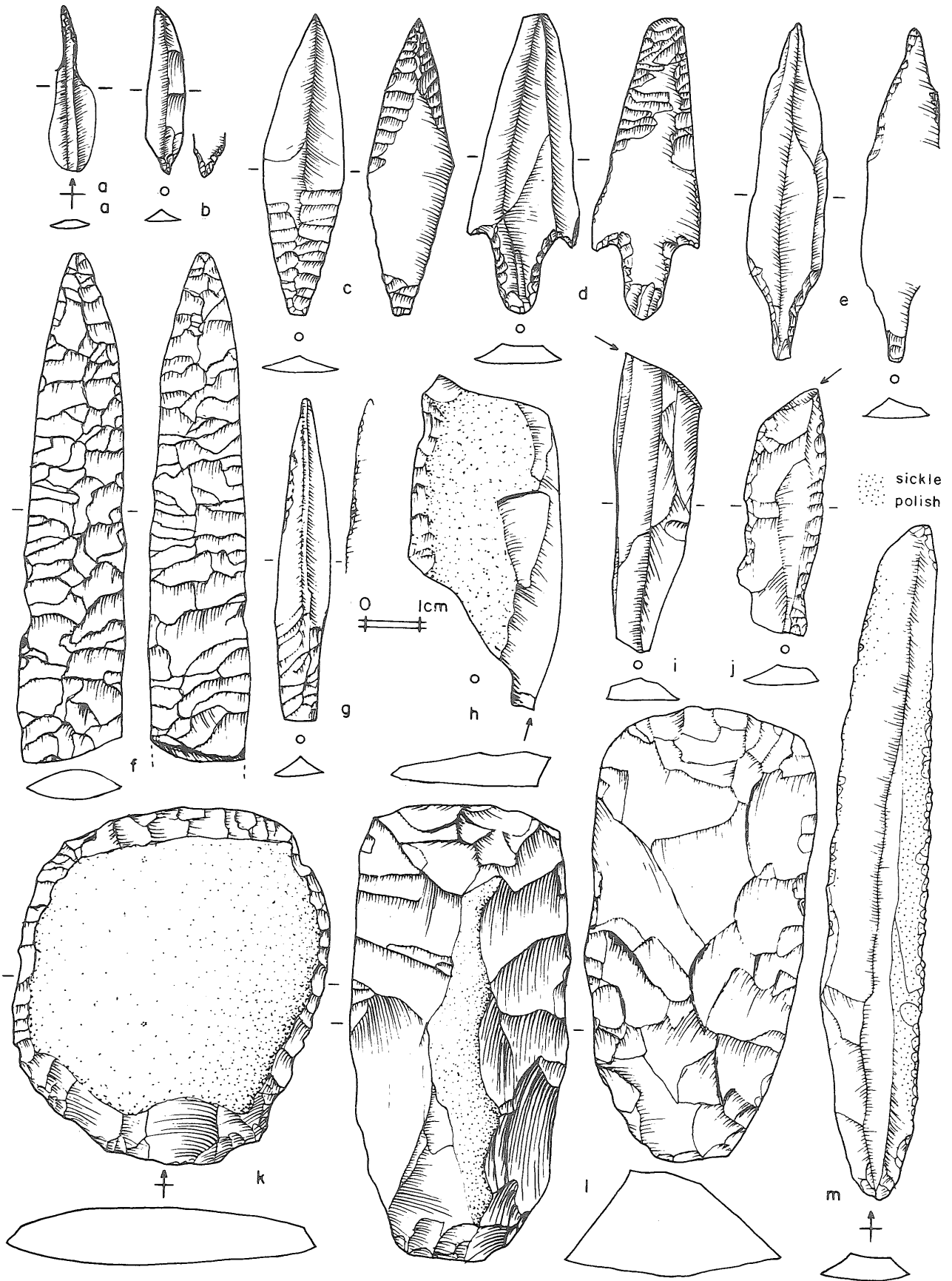


Fig. 2: Chipped stone tools from 'Ain Ghazal. a) bead drill; b) arrowhead; c-g) spear points; h) obsidian knife; i-j) transverse burins; k) cortical scraper; l) axe; m) sickle blade.

In terms of the tools, the surprising result of the analysis centers on the relatively high numbers of burins (Table 2).³ At 42%, tool use in the excavated areas indicates a high degree of bone tool manufacture and/or the shaping of wood for implements and utensils. If the burins were used primarily for bone tool fashioning, the low numbers of bone tools recovered from the excavations do not bear this out (Table 4): either the bulk of the bone tools made with the burins was used elsewhere on the site (or off it), or the use of burins for shaping wood has heretofore been underestimated. Comparative figures of tool percentages are rare, but at Beidha burins account for only 4.2% of the chipped stone tools (Mortensen, 1970: 5-6), a figure that suggests a major difference in the domestic economies of the two social groups.

Table 2. Absolute And Relative Frequencies Of Chipped Stone Tools From 'Ain Ghazal. %' Refers to the total, less "common" utilized flakes and blades. See Note 3.

<i>Class</i>	<i>n</i>	<i>%</i>	<i>%'</i>
Axes	33	1.6	1.9
Burins	724	34.2	42.2
Scrapers	182	8.6	10.6
D/Notches	284	13.4	16.6
Truncations	11	0.5	0.6
Awls/Drills	60	2.8	3.5
Choppers	92	4.3	5.4
Utilized blades	420	19.8	2.7
Sickles	160	7.6	9.3
Points	91	4.3	5.3
Knives	19	0.9	1.1
Diverse	11	0.5	0.6
Indeterminate	32	1.5	—
Total	2119	100.0	99.8

Larger woodworking tools (axes, adzes, and chisels) were relatively rare at 1.9%. While superficially this might mean that a major woodworking industry was absent at 'Ain Ghazal, it is necessary to stress that the excavated areas represent less than 1% of the total site area. It is possible that other parts of the site may reveal a focus on tree-chopping and wood shaping.

Scrapers, choppers, and denticulates and notches, all of which may have been used for processing animal skins, plant remains, and for butchering, represent a combined total of nearly a third of the chipped stone tools. Utilized flakes and blades accounted for nearly a fifth of the overall total, but it is difficult to determine if the "utilization" is real or if the edge alteration was caused by accidental trampling or other damage after being discarded. Sickles represent a healthy 9%, reflecting a moderate emphasis on cutting grasses and other plant resources.

The ninety-one projectile points are well-fashioned and indicate continued reliance to some degree on the hunting of wild game. Surprisingly, the projectile points comprise only 5.3% of the chipped stone inventory, much less than the 24% figure for Beidha (Mortensen, 1970). At first glance this suggests that the Beidha people relied far more heavily on game, while the 'Ain Ghazal population may have enjoyed more stable meat protein from domestic animals. But this is not the case, probably, for the possible sampling error at 'Ain Ghazal must be taken into account. Certainly, at this preliminary stage of analysis, the animal bones from 'Ain Ghazal are testimony to a high contribution of wild game to the diet (see below).

³ Table 2 is an abbreviated typelist of a more detailed typology used during the analysis. Axes, for example, include axes, chisels, picks, and celts; scrapers include end- and sidescrapers; "D/Notch" refers to all denticulates and notches, "Awl/drill" includes awls, drills, perforators, and borers; and utilized blades includes utilized blades and flakes, retouched blades and flakes, and tanged blades.

We would like to point out that the status of the last category is somewhat suspect, since edge damage to many of the pieces is not necessarily due to utilization, but could have developed as the result of trampling or other damage after being discarded. Further intensive analysis is necessary to confirm whether the artefacts in this category were, in fact, used at all.

One other point should be made at this stage concerning the projectile points at 'Ain Ghazal. Compared to incomplete reports from Jericho, it would seem that there, hunters used true arrowheads more frequently than at 'Ain Ghazal. At 'Ain Ghazal the vast majority of the points probably served as spear or dart points, since their size and weight would make their use as arrowheads very problematical. Only a few true arrowheads have been found so far at 'Ain Ghazal.

b). *Ground stone artefacts.* The ground stone objects found at 'Ain Ghazal are listed in Table 3, and only a few remarks are appropriate here. The amount of basalt used at 'Ain Ghazal is notable, especially for use as hand-held mullers. (It should be pointed out that the closest source of basalt outcrops are in the Mafraq vicinity, some 50 kms. to the northeast). Two of the mullers had evidently changed their function from the processing of grain to the finishing stages of spear and arrow shafts: a groove down the center of each muller fragment conforms to the "shaft straighteners" commonly found at sites in southwestern North America which are roughly contemporary with the Near East Neolithic. One rim fragment of a basalt stone bowl or palette is slightly more than a centimetre thick, attesting to the delicate hand and skill of the maker. Of the four pestles found this season, three are of basalt, with only one made of limestone.

Limestone was the predominant resource for the manufacture of stone bowls and mortars. Two of the mortars are relatively small in interior diameter and could conceivably be door sockets, although this interpretation is suspect in view of the lack of corroborating architectural evidence. One mortar fragment was heavily coated with red ochre. While two of the stone bowls are complete, the evidence of the other eleven pieces is fragmentary, and it is possible they could represent querns.

Two discoidal sections of a coarse pinkish mottled limestone (?) were found on the surface near the eastern edge of the parking lot. In cross-section they resemble a "stone donut", and it is probable that these are failed attempts in the production of polished stone bracelets (see "ornaments" below).

One piece of cylindrical limestone was (Pl. I; 2) found, which was covered over most of the surface with striations. In addition, a small but noticeable bulge juts out near one end, set off with curvilinear scoring at the base of this small prominence. It is probable that this is a highly stylized figurine (human?), but other similar pieces will have to be found in the future to confirm this status.

A singular tapered cylindrical piece, listed as a "plaster cylinder" in Table 4, may in fact be fashioned in soft limestone, outcrops of which occur in the vicinity of 'Ain Ghazal. Like the limestone piece mentioned above, heavy scoring in parallel patterns converges near the tapered end of the piece, although no projecting features characterize the object. If the piece is indeed plaster, it may be a cast from a peculiar mold, although what function it may have served is very speculative.

Two pieces of pecked limestone are sections of tapering crescents. (If these pieces had been fashioned in clay, they could easily be confused with stout handles of some large storage vessel). The role of these stone crescent sections is difficult to interpret in the absence of other data, but it is possible that they are pieces of the horns of large stone animal figurines.

Finally, three cobbles which may bear evidence of grinding are covered over most of their surfaces with heavy black organic stains. Further analysis is necessary, but it appears that this stain may be asphalt, obtainable from the Dead Sea. The use of these stones remains conjectural, if they were used at all: it is possible that the black material spilled onto these stones accidentally.

Table 3. Ground Stone Summary

<i>Description</i>	<i>n</i>	<i>Comments</i>
Stone bowl, limestone	13	Ten are fragmentary, and some may be quern fragments
Stone bowl, basalt	1	Rim fragment
Stone mortar	5	One is coated with red ochre
Pestle	4	Three basalt, one limestone
Quern	11	Fragments only. 6 sandstone (one with red ochre), 3 limestone, 2 uncertain.
Muller	14	10 basalt, 1 quartzite, 3 indeterminate
Basalt grinders, discoidal	8	One with heavy red ochre stain on edge
Palettes	2	Limestone
Hammerstones/pounders	6	4 quartzite, 1 flint, 1 basalt
Rubbing stone	1	Limestone
Shaft Straightener	2	Deep groove in each basalt muller fragment
Stained stone	3	Black stain: asphalt?
Perforated discs	2	Initial states of bracelet production
Crescents	2	Pecked limestone; possibly pieces of horns of large animal figurines?
Figurine	1	Limestone. Highly stylized, cylindrical, heavily striated, with one prominence at one end.
Basalt fragments	2	One possibly used, the other not used.
Total	77	

c). *Small finds and objects.* (Fig. 3, Pl. I). One small plaster figurine was found on the surface of Sq. 4048, and it is probable that it is a stylized human statuette. Another broken piece of plaster may be the head of another humanoid statuette, although the fragment is so small that its status is questionable.

At least thirteen animal figurines fashioned in clay have been recovered, four of which were baked, possibly accidentally. Of the nine which were not fired, one bears some red ochre stains. The material appears to be a mixture of fine clay and plaster which formed a yellowish malleable product; in at least one case a small pebble was incorporated into the matrix that coincides with the abdominal section of the animal. Five other lumps of similar material, all unbaked, may also be animal figurines, but the crumbly state of preservation makes conclusive determination impossible. Wild cattle are represented in at least two cases, and

sheep/goat has been modeled in another, but the rest of the figurines are too stylized or fragmentary to identify. Two small horns of baked clay were also discovered, as well as one small "crescent" that may have been the horns of a bull.

Clay objects. Several small flat discs, cylinders, cones, and a small baked clay ball were also found (similarities to the last two kinds of objects have been reported from Jarmo; see Braidwood and Howe, 1960: 44; cf. Fig. 35 in Mellaart, 1975: 81). Their roles are speculative, ranging from gaming pieces to objects of ceremonial significance. One of the unbaked clay discs has reed impressions on one side, and it may have originally served as part of a water-proof covering of a reed basket. Finally, one thin piece of baked clay takes the form of a marine bivalve shell or "walnut shell". Evidently formed over the pad of the thumb, the convex surface was repeatedly rocker-stamped with either a finely toothed bone or wooden tool or the

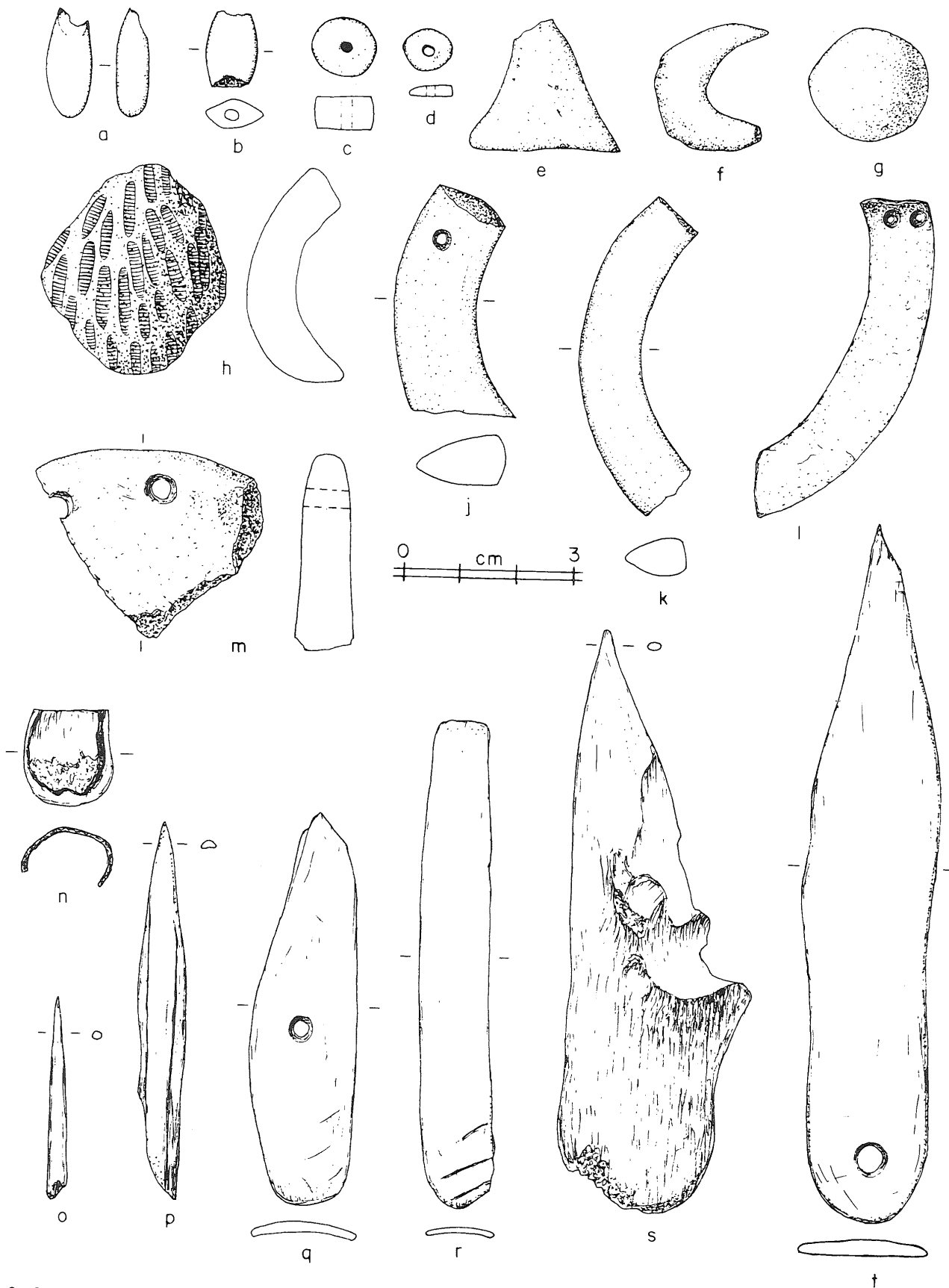


Fig. 3: Small objects and bone tools from 'Ain Ghazal. a) polished tooth bead pendant; b) carnelian bead; c-d) greenstone beads; e) fired clay cone; f) fired clay crescent; g) fired clay ball; h) fired clay object, rocker-

stamped; j-k) polished stone bracelet fragments; l) mother-of-pearl pendant; m) perforated plaster pendant; n) bone "thimble"; o) bone needle; p,s) bone awls; q-r,t) bone spatulas.

edge of a marine shell.

Bone tools. Only twenty bone tools and objects were found this season, underscoring the curious attention to burin production at 'Ain Ghazal. One very thin and sharp fragment of bone, highly polished, is apparently the pointed end of a needle, although the "eye" is broken off. Only one bone spatula is pointed; the others resemble tools used in weaving. Together with the bone awls probably used to perforate leather, the bone industry at 'Ain Ghazal seems restricted to use in the production of cloth, mats, and skin coverings. The small bone "thimble" might be part of such a sewing kit.

Ornaments. A total of twenty polished stone bracelet or circular pendant fragments was recovered, a plurality of which came from the surface in Sq. 4048. Two pieces of rough pinkish limestone, evidently broken in the initial stages of bracelet manufacture, have been discussed in the Ground Stone section. Similar shapes of stone material have been found at Jericho (cf. Fig. 35 in Mellaart, 1975: 81). One bracelet or pendant fragment, bearing two drilled holes, was made of plaster. There is also a small section of a limestone ring, perhaps intended to be worn on the finger, which broke before final polishing began.

A total of seven beads was found this season. Three are small flat discs made of a green stone (malachite?), one is a tubular barrel-shaped bead of carnelian, another is a thick disc of red material (coral?), a bead pendant was made of a perforated and polished animal tooth, and finally there is a small spherical bead of rough limestone. Notably, both red beads came from burials, and the possible association of the red color with burial rituals is one that needs further exploration in the future. Three small plaster lumps, roughly spherical, have holes through them, but whether these are "bead preforms" or simply pieces of "plaster slag" with air holes cannot be definitely stated at this time.

*Shell.*⁴ Two *Cardium* sp. ("cockleshell") and two *Glycimer* sp. ("sweet clam") shells were recovered from surface and subsurface contexts at 'Ain Ghazal; these shells indicate contact with the Mediterranean. Two cowrie shell fragments (one *Cypraea annulus*, the other *Cypraea* sp. indet.), which may have had some relationship with the ritual of plastered skull imagery, demonstrate a southern maritime contact with the Red Sea, as does a fragment of a large shell known popularly as "helmet shell". Two *Dentalium* sp. fragments appear to be fossilized and are evidently derived from the limestone matrix in the 'Ain Ghazal vicinity.

Plaster utensils. The use of plaster for the manufacture of bowls, platters, palettes, and troughs is indicated by nine fragments. Several of the platter fragments are heavily scored, and it appears that this treatment occurred before discard. The use of plaster in this way is relatively common in Syria and Lebanon, but it is absent at Beidha and Jericho. This suggests an intermediate position for 'Ain Ghazal between the northern and southern spheres of the PPNB. Plaster was also used for non-portable containers, as evidenced by a plaster-lined pit visible in the bulldozer section in the southern parking lot area (see Rollefson and Suleiman, this volume).

Pigments and associated artefacts. Two small lumps of clayey red ochre (ca. 0.05-0.06 m. in maximum dimension) were recovered from *in situ* deposits, both of them bearing several smooth angular facets that would have resulted from rubbing the pieces against other hard objects. One flint blade had obviously been used to cut through red ochre, for red stains occurred along the medial portion of both surfaces of one sharp edge. Another flint blade, found in a burial pit, bore "dribbled liquid" red ochre stains. One piece of clayey pigment is unique: although it has the consistency of the red ochre rubbers mentioned above, the color

⁴ We would like to thank Ms. Patricia Crawford for the identification and determination of provenances for the shells.

is a dark aqua or greenish tourquoise. No artefacts bearing this color were found during this season.

Miscellaneous objects. Nearly forty other pieces are miscellaneous in nature, and little amplification is necessary for the list in Table 4. The "micropestle" is a small (ca. 0.05 m. in length) tapered tubular piece of banded stone with evident use at the narrow end. The flint blade comes from the same burial pit as the one stained with red ochre. The four flakes of exotic stone are singular: they are made of a dark green material, coarser in texture than flint, and they seem to be trimming flakes from a larger chipped stone artefact. No such raw material has been noticed in the vicinity of the site nor has any similar material been noted in any other lithic collections from Jordan. Finally, there are numerous cylindrical fossils (belemnites?) and water-worn smooth pebbles that appear to have been brought purposefully to the site, but for what purpose is impossible to tell.

Obsidian. A knife made of obsidian (Fig. 2: h) was recovered from Sq. 3082, demonstrating some form of trade relations with (probably) Anatolia.

Blade Cache. A cache of flint blades was noticed eroding out of the road cut from beneath a plaster floor in Sq. 2871. All of the blades were aligned in a north-south direction, and the compactness of the collection of artefacts suggests that they had originally been wrapped in a tight bundle. Eighty-three blades came from this cache, and four more were discovered on the slope immediately below the cache. None of the artefacts had been retouched to form tools. The bundle of blades may have served as some sort of dedication offering before the house was constructed.

2) Animal Remains⁵

Some sixteen mammalian species have been identified among the more than 4000 classifiable bones recovered during the 1982 season. In addition, numerous remains of unidentified carnivores, rodents, and birds, as well as a *Testudo*

tortoise, were also present. Although additional research is necessary, goat (*Capra aegagrus hircus*) appears to be the dominant faunal element, with sheep (*Ovis* sp.) much rarer. Gazelle is also quite numerous as is, surprisingly, fox (*Vulpes vulpes* and/or *V. rupelli*). Many of the fragments of fox bones are charred with numerous butchering marks, indicating the use of this carnivore as a food resource.

Also present, but in relatively smaller amounts, are the following: lagomorphs, aurochs, wild boar, deer, and equid, caracal lynx, jackal and/or wolf, fennek, badger, beech marten, and hedgehog.

The determination of the status of domestication of goats and other animals must await further metric and morphological analysis. Among the wild animals present, especially the carnivores, Dr. Köhler notes the remarkably wide range of species that included typical Palearctic as well as true desert species. The heavy contribution to the diet of the inhabitants of the site by wild animals adapted to mutually antagonistic environments demonstrates the uniquely beneficial location of 'Ain Ghazal at an ecotonal crossroads.

3) Human Remains⁶

So far, fifteen separate burial pits have been located beneath house floors at 'Ain Ghazal (Sqs. 2875, 2877, 3067, 3079 (four), 3080, 3082 (two), 3083, 3120, 3279, 4450, and 4454). Three of these were discovered on the last day of excavation and remain to be excavated in the near future; another is protected by approximately three metres of overburden. In addition, surface remains of at least four other individuals (not necessarily all Neolithic in age) have been found in various areas of the site.

To date, extensive analysis has been carried out on thirteen individuals from nine burials (double and multiple interments are not uncommon). Briefly, three people were adult males ranging in age from under 30 years to more than 50 years; five females ranged from the late teens to early 40's; two children were between 6

⁵ The following section is the author's summary of a preliminary report written by Dr. Ilse Köhler. Any mistaken inferences are mine.

⁶ The following is a summary of a report submitted by Mr. Scott Rolston and Mr. Dani Petocz. The caveat in Note 5 also applies here.

Table 4. List of Small Finds and Objects From 'Ain Ghazal

<i>Item</i>	<i>n</i>	<i>Comments</i>
Figurine, plaster	1	Anthropomorphic
Figurine (?), plaster	1	Anthropomorphic?
Figurine, clay, animal	13	Four baked, nine not baked
Figurine horns, animal	2	Both baked clay
Crescent, clay	1	Baked
Cone, clay	4	Three baked, one unbaked
Ball, clay	2	One baked, <i>ca.</i> 2.5 cm. diameter
Disc, clay	4	Two baked, one with reed impressions
"Shell", clay	1	Baked, rocker stamped
"Objects", clay	6	Possible animals: one flat piece with reed impressions
Cylinders, clay	3	One baked
Bone awls	11	
Bone spatula	7	Two perforated, one pointed
Bone needle	1	"Eye" missing
Bone "thimble"	1	Function speculative
Polished stone bracelets	20	Fragmentary; two drilled
Polished stone ring	1	Fragment, unfinished
Greenstone beads	3	Malachite? Flat discs
Carnelian bead	1	Tubular barrel. From burial
Redstone bead	1	Coral? Discoidal. From burial
Limestone bead	1	Rough. Spherical
Bead pendant	1	Polished animal tooth, perforated
Plaster cylinder	1	
Plaster pendant	1	Circular fragment, two drill holes
Plaster lumps, perforated	3	Possibly natural, rolled plaster
Bivalve shells, perforated	4	Mediterranean provenience
Large shell fragment	1	Red Sea provenance
Cowrie shell	2	Red Sea provenance; fragmentary
Dentalium shell	2	Fragmentary, fossilized
Plaster palette	3	One possibly soft limestone
Plaster trough/pit lining	1	Thin, fragmentary
Plaster bowl fragments	5	
Ochre-stained flint blade	2	One cut red ochre, the other stained
Red ochre rubber	2	Angular rubbing facets
Green pigment	1	Material unknown
Carnelian chunk	1	Not worked
Flint blade	1	From burial pit. Not a tool.
Ball, limestone	1	<i>Ca.</i> 2.5 cm. diameter
"Micropestle"	1	Tapered tubular stone, <i>ca.</i> 5 cm. long
Fossile bivalve shell	1	From Tertiary limestone
Paleolithic flints	8	All heavily rolled
Flakes of exotic stone	4	Dark green color, not native to area
Cylindrical fossil	12	Belemnites? All fragmentary
Smooth pebbles	9	One may be a small hammerstone
Total	150	

and 13 years old at death; and there were three infants. In one burial, a woman in her late teens, suffering from congenital hip problems, was accompanied by a new-born infant. Evidently both died in childbirth.

4) Plant Remains ⁷

Although more than a metric ton of flotation samples was collected during the 1982 season, little time (and water) was available for processing and subsequent analysis. Several samples from burial pits and house floors were processed and found to be relatively rich in charred remains. To date lentils, peas, barley, fig, and possibly wheat and chickpea (roughly in order of abundance) have been identified. Additional morphological and metric analysis is necessary to establish the state of domestication of the species.

5) Architecture

The Step Trench in Sq. 3073 has revealed six major occupational levels at 'Ain Ghazal. The lowest floor in the trench was cut by the southern wall and floor of a slightly later house; the walls of this second phase were used in the third phase after some 0.70 m. or more of debris and eroded sediment had accumulated. After this building was abandoned, nearly a metre and a half of soil and rubble built up before a fourth floor was laid. Above and behind the Step Trench (upslope to the west), in the bulldozer cut, two more building phases can be seen.

Except for the oldest floors at the site (seen, for example, in Sqs. 3073, 3082, and 3083), the remainder of the house floors underwent at least one later phase of replastering. This is especially evident in the three superimposed floors (and hearths) in Sq. 3067. The phases of replastering can be easily detected by the existence of separate layers of red ochre finish in many of the floors.

Sunken plastered hearths appear to be a consistent feature in the 'Ain Ghazal houses. Often the hearths are colored with

red ochre, but this is not always the case. A curbed feature in the fourth phase floor in the Step Trench may be a hearth, but there is no evidence of ash or burned plaster here; in fact, the curb around the feature resembles a drain more than a hearth. Not all of the floors visible in the road cut have sunken hearths, but this is probably due to the damage to the floors during highway construction. Only about 0.50 m. of floor width were found in Sq. 3073 (Occupation Phases I, II, and III), for example.

The location of sunken hearths in house floors has proved to be extremely significant. In every case where enough of the house floor remained to include a sunken hearth, a sub-floor human burial was found within several centimetres to slightly more than 1.50 metres to the south. This correlation of hearth-and-burial pit should prove very beneficial in subsequent seasons of excavation at the site. The most notable demonstration of this correlation was revealed in Sq. 3079, where four sunken hearths were exposed during the excavation, and separate burial pits lay just to the south in each case.

Details of house construction proved to be rather redundant from structure to structure (see Rollefson and Suleiman, this volume). Walls were made of natural stones set in mud mortar, which were then coated with a layer of mud plaster (on the interior, at least), which was subsequently finished with a thin application of white plaster. Red ochre was applied to at least the lower portions of some of the house walls. Along the western edge of the floor-walls joins in the second and third occupation phases in Sq. 3073, three post-holes were located in the southern and northern ends as well as at the centre. (Not only did these two phases share the same wall, they may also have shared the same posts). The posts, approximately 0.20 m. in diameter, evidently rose along the height of the wall to support primary roof beams.

⁷ We would like to thank Dr. David McCreery for taking some of his valuable time to analyze the samples. The caveat in Note 5 also applies here.

The house in Sq. 3083 is the most complete one sampled in our excavations. It consists of at least two rooms divided by a thick wall 0.40-0.60 m. which is penetrated by a metre-wide doorway. In the eastern room, which has a sunken plastered hearth and associated sub-floor burial, there is a small alcove in the north-western corner, possible a cupboard installation. The western room has a plaster floor of inferior quality compared to that of the eastern room; it is also evident that when the eastern floor was replastered following the intramural burial, the replastering stopped at the doorway. On the floor of the western room, directly opposite the doorway, an apsidal wall was constructed. Rather than providing structural support, this semicircular wall may simply be a low bench on which domestic utensils and containers rested. Within the space between the curved wall and the doorway, eleven grinding stones (one stained with red ochre) on the floor attest to the domestic nature of this room. In the northeastern corner of the western room was a stone lined storage pit, and another stone lined feature exists behind the bench to the northwest. Although the northern and southern walls of both rooms have been located, the western wall of the western room remains hidden in the baulk.

Summary

The inhabitants of 'Ain Ghazal shared many of the elements of the PPNB culture with contemporary populations in Syria, Lebanon, Palestine, and Jordan. Except for occasional differences of detail, this cultural similarity is expressed throughout the domestic repertoire. Projectile point styles at 'Ain Ghazal would fit well into the hunting implement inventories at Beidha, Jericho, Ramad, and Tell Abu Hureyra, although the number of arrowheads at 'Ain Ghazal is relatively small. Like Jericho, heavy-duty woodworking tools are rare but well-fashioned. Burins, which figure so prominently at 'Ain Ghazal, were probably used extensively as light-duty woodworking tools since the bone tool industry was so limited.

The rectangular structures at 'Ain Ghazal were multiroomed and characterized by the use of plaster floors finished with a highly sophisticated technique. The use of red ochre on floors varied from house to house (and probably through time). Some floors appear to have been completely coated with the mineral, while others displayed virtually no use of the red material. Interpretations of any designs are very limited in view of the restricted areas of most of the excavated floors. On some floors "polka dot" patterns occur, and plaster fragments from other houses suggest alternating rectilinear fields of red-stained and unstained areas. The Phase III floor in Sq. 3073 revealed a melange of patterns, ranging from curving narrow swaths of red ochre to rectilinear stippling and sporadic blotches.

Subfloor burials occur within 1.50 metres of sunken plastered hearths. Primary single, double, and multiple flexed burials occur, with individuals ranging in age from new born infants to middle-aged women and elderly men. Although two red beads are associated with two individuals, other grave goods are scarce and possibly accidental. In most cases, bulldozers removed the upper torso, so little definitive information concerning decapitation and possible plastering of skulls is available at this stage of the investigation.

While domesticated goat probably constituted a large part of the animal protein eaten by the 'Ain Ghazal people, the hunting of wild species of animals remained an important part of the economy. The exploitation of diverse ecozones is particularly noticeable at 'Ain Ghazal.

In terms of agriculture and plant collecting, the analyzed plant samples are so few in number that firm conclusions are not possible at this time. Lentils and peas are relatively numerous in contrast to other identified plants, possibly suggesting a reliance on pulses not seen at other sites in other environmental zones in the Near East.

Human and animal figurines provide a small glimpse into the ceremonial sphere

of the social groups at 'Ain Ghazal, although the picture remains obscure. Baked clay animal figurines are in the minority, suggesting that this ceramic treatment is accidental and not purposeful. Other clay objects, of speculative function, seem to be routinely fired, so this technique of preservation may have been well known to the inhabitants.

The possibility of economic specialization at 'Ain Ghazal is suggested by two factors. First, although polished stone bracelets were found in many areas of the site, the cluster from the vicinity of Sq. 4048 points to a possible bracelet shop in the area. Second, the heavy accumulation of ash and burned debris between the southern and central clusters of houses (see Rollefson and Suleiman, this volume) indicates a localization of some industrial activity.

Regarding implement typology, 'Ain Ghazal follows patterns of permanent villages to the south and north. The sharing of techniques of lithic manufacture remains to be tested, however. Certainly it is

evident that contemporary transhumant groups in the eastern deserts of Jordan produced their tools according to methods widely different than those used at 'Ain Ghazal (Rollefson and Abu Ghaneima, this volume).

It must be stressed, however, that all of the conclusions expressed above are preliminary and tentative. After all, excavations this season sampled far less than 1% of the site area, and considerable diversity is to be expected across the spaces occupied by the inhabitants in both contemporary and diachronic times. Plans are underway to expand the scope of investigations at 'Ain Ghazal in a multi-season effort to learn more about the people who lived there, to study the changing ways they interacted with their environment, and to understand the factors that influenced their social life in this critical period of human cultural development.

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