

# TEST EXCAVATIONS AT WADI SHU'EIB, A MAJOR NEOLITHIC SETTLEMENT IN CENTRAL JORDAN

by

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## Introduction

Wadi Shu'eib (Fig. 1) is the name that has been given to a large Neolithic complex located in central Jordan. The site apparently has been known since the 1920s, and was "archaeologically" discovered by Diana Kirkbride in the 1950s. It was briefly mentioned by Zeuner (1957:23) in his discussion of prehistoric sites in Jordan, where he referred to it as "Site 44". He described the site as being located near the Wadi Shu'eib bridge and possessing Pre-Pottery Neolithic plaster floors and chipped stone implements. The site also was mentioned in Mellaart's (1975:63, 68) summary of the Neolithic, but he only noted the presence of white wares (*vaiselle blanches*) at the site and its apparent abandonment at the end of the 7th millennium B.C. More recently, the site has been discussed by one of us (Rollefson 1987b), who noted that it could possibly rival the large Neolithic settlements of 'Ain Ghazal and Jericho.

In recent years, there has been a renewed research interest in the Neolithic of Jordan with the intensified investigations at major centers such as 'Ain Ghazal (Simmons *et al.* 1988) and Basta (Gebel *et al.* 1988). Because Wadi Shu'eib had never previously been professionally investigated, a joint team from Yarmouk University, the Desert Research Institute, and San Diego State University, which has been excavating at 'Ain Ghazal for the past several years, undertook limited test excavations at Wadi Shu'eib during the summer of 1988. This paper represents our initial report of these investigations. Analysis of the materials recovered is still underway, and all of the conclusions presented here should be considered as pre-

liminary.

## Environmental Setting

The site is approximately 20 km west-northwest of Amman and is cut by the Salt-Shuna road. It is located roughly 8 km south of Salt and less than a kilometer north of the small village of Wadi Shu'eib, located at the Wadi Shu'eib bridge. Portions of the site may, in fact, extend into the modern village.

The site is located on the north bank of Wadi Shu'eib at an elevation of *ca.* 375 m above sea level. It is situated on a slope of moderate steepness that, near the edge of the wadi, falls dramatically into a gorge. The site is "saddle-shaped" in cross section; this center depression might represent the effects of a relatively recent erosional event. This area of Jordan receives *ca.* 400 mm of rainfall during the year (Beaumont 1985). Much of the site is today under cultivation, with tobacco being the main crop grown. The area immediately surrounding the site is relatively lush, and prior to modern development, local informants have indicated the presence of springs less than a kilometer from the site.

## Site Description

From surface indications alone, there is not a great deal of cultural material visible. Indeed, as recently as 1986, (Rollefson 1987b) examined exposed portions of the site but did not observe abundant cultural deposits. Increased road building activity and erosion, however, has recently exposed more of the site, and in 1987, another of us (AHS) visited the site with Dr. David McCreery, former director of

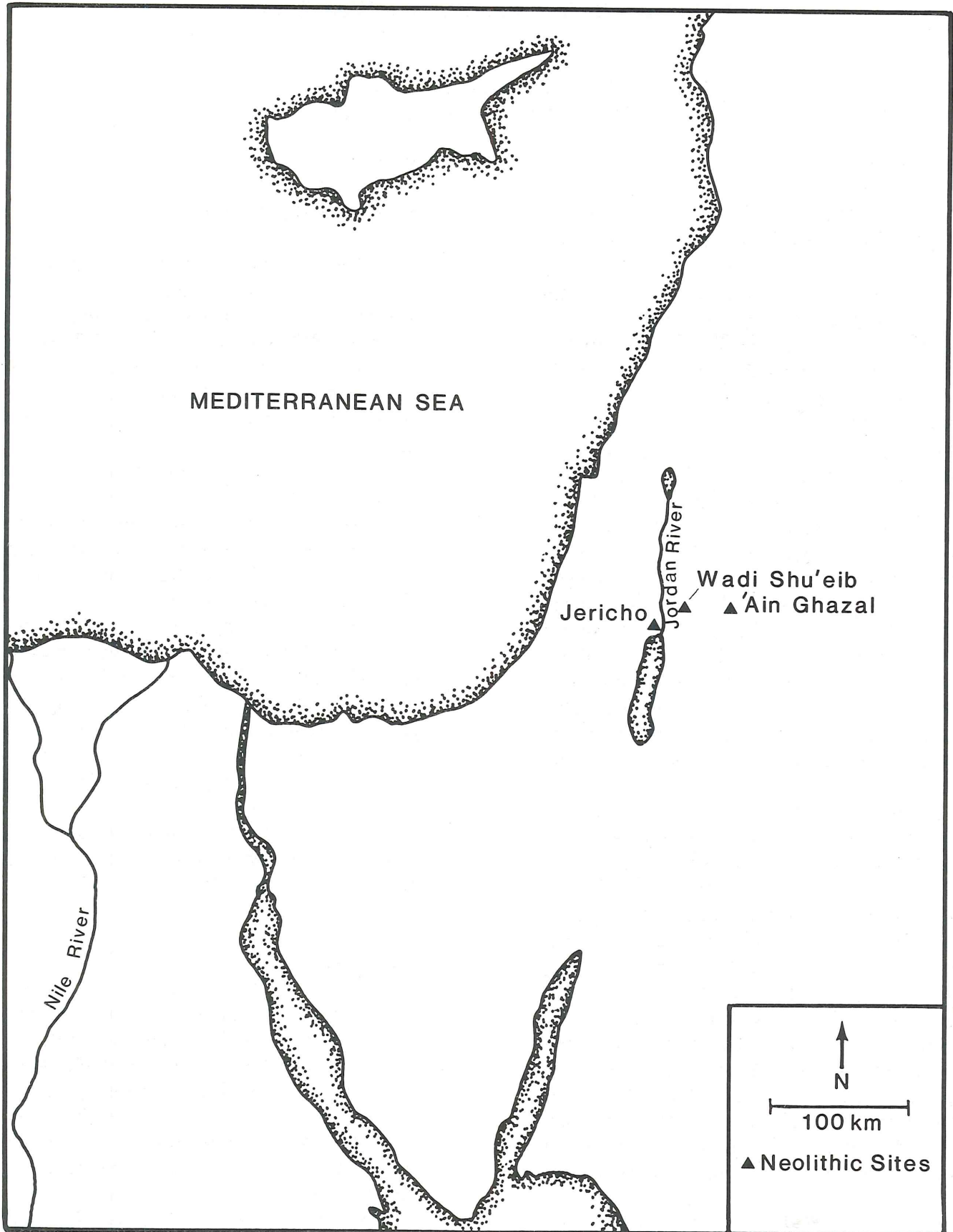


Fig. 1. Location map showing Wadi Shu'eib, 'Ain Ghazal, and Jericho.

the American Center of Oriental Research, and was impressed by the thickness of apparent Neolithic deposits (approximately 4 m) and by the similarity of the stratigraphy to that of 'Ain Ghazal. The length of the site following the roadcut is approximately 800 m.

The stratigraphy exposed by the road cut is dramatic. Cultural deposits include grey ashy sediments mixed with rubble, flint artifacts, and architectural features. These deposits rest on a reddish-brown clay deposit visible in the southern portion of the site. In the northern portion, the cultural materials appear to be deeper than the level of the modern road.

The architectural features revealed in section consist of a series of superimposed plaster floors, some of which are painted red. These are relatively thin (*ca.* 5 cm), and many appeared to be of relatively poor quality. This, however, could be due to prolonged exposure. Human burials were observed beneath some of these floors.

Flint artifacts are abundant in the exposed section of the site, especially those areas recently exposed. These consist of Pre-Pottery Neolithic B (PPNB)-like materials, including fine blades with punctiform platforms and a few tools. The raw material is dominated by a good quality brown flint.

During the 1988 investigation, a site map (Fig. 2) was prepared. Due to the limited nature of our excavation, the site's boundaries must remain estimates. The entire area was, however, thoroughly walked over and has permitted us to estimate a minimal site area of at least 6 hectares. The maximum area of the site is estimated at 12 hectares. This size, while not as large as 'Ain Ghazal (*ca.* 14 hectares), is considerably larger than Jericho (the Neolithic limits of which are estimated at *ca.* 4 hectares). This makes Wadi Shu'eib a major center.

### Research Strategy

Several research objectives structured our investigations at Wadi Shu'eib. Of particular interest is the site's position

almost exactly midway between two of the most famous Neolithic centres known in the Near East, Jericho and 'Ain Ghazal. Since the site has been damaged recently, it became more critical to retrieve information before more destruction occurs. Accordingly, in 1988 our primary objectives were to: 1) determine the cultural sequence at the site; 2) estimate the extent of the site, and 3) examine the relationships between Wadi Shu'eib and both Jericho and 'Ain Ghazal.

Being intimately familiar with the massive difficulties and commitments required for the excavation of large Neolithic settlements, it was not our intent to initiate a large-scale project at Wadi Shu'eib. Rather, we wished to excavate a small number of sondages of limited size to determine the nature of the deposits at the site. Our 1988 investigation consisted of the excavation of three separate areas of the site, all located along the road cut. These were labeled Areas I, II, and III, and were, respectively, 12 sq m, 18 sq m, and 1 sq m in size. Their depths varied, but each area was excavated to at least 4 m below the present ground surface.

### Stratigraphy

It is important to stress that our interpretation of the stratigraphy of the three soundings, which were spread across 225 m of Wadi Shu'eib, must be considered preliminary. We can, however, recognise three distinct Neolithic phases. These are the Pottery Neolithic, the Pre-Pottery Neolithic C (PPNC), and the Pre-Pottery Neolithic B (PPNB).

The upper cultural strata with associated pottery made it relatively easy to recognize those samples that had suffered post-depositional mixing (*i.e.*, with varying amounts of Byzantine, Chalcolithic, Pottery Neolithic, and other ceramic periods) from Pottery Neolithic samples that were uncontaminated by post-Neolithic disturbances. Nevertheless, the presence of *both* Yarmoukian and typical Pottery Neolithic A (Jericho facies) ceramics in several of the apparently undisturbed upper layers

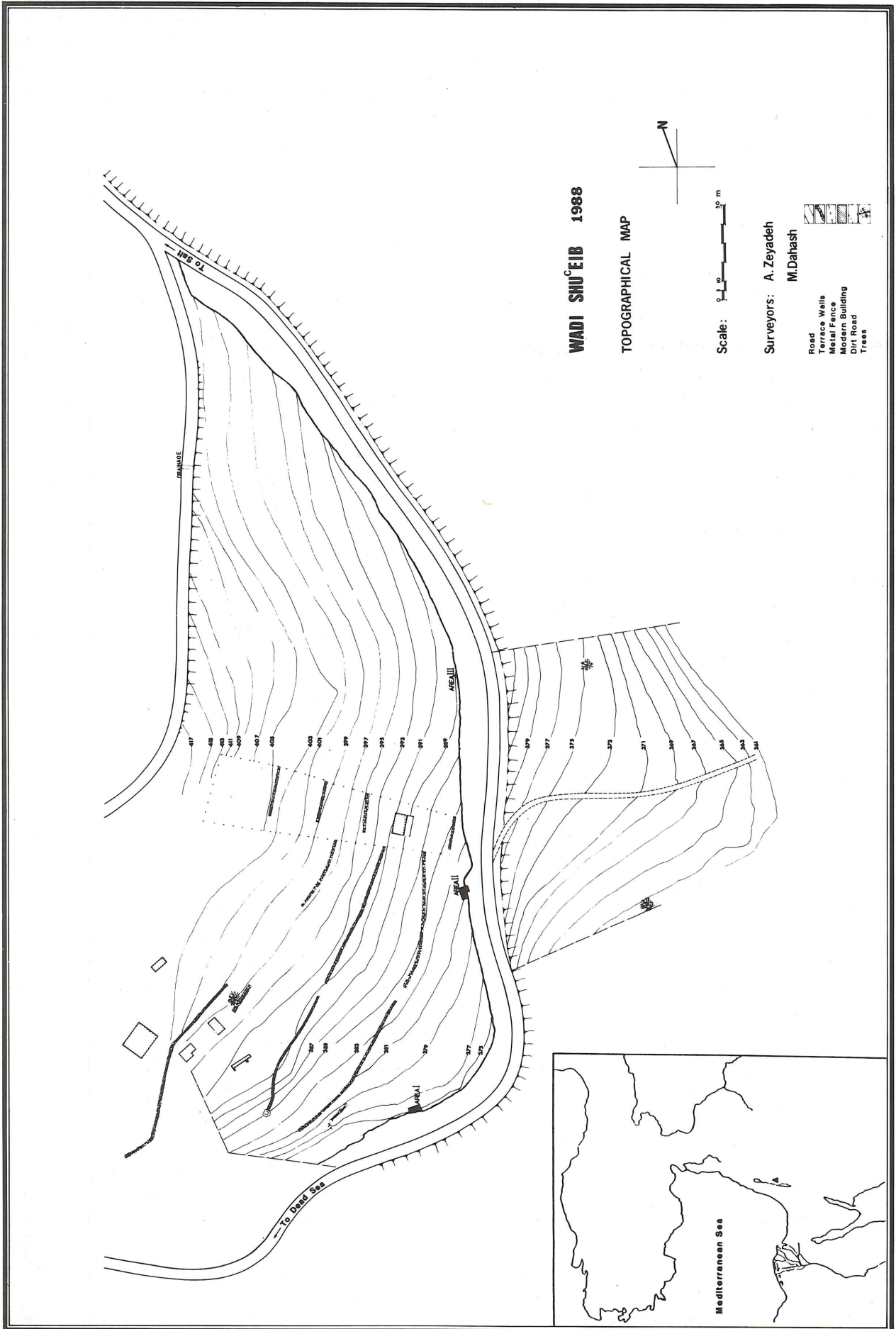


Fig. 2. Topographic Site Map of Wadi Shu'eib.

introduces a degree of uncertainty into the interpretation of the Wadi Shu'eib sequence. That is, are the two ceramic traditions contemporary but discrete cultural entities? Or is one tradition ancestral to the other? In either case, too little is known of the PNA lithic practices in techno-typological and metric parameters to judge what effects a mixing of the potentially independent chipped stone artifact samples might entail.

The situation is even more tenuous for the aceramic Neolithic layers at Wadi Shu'eib. The cultural distinctions between the PPNB and PPNC phases recognized at 'Ain Ghazal involved a combination of several sociocultural aspects beyond lithic manufacture. The limited area of the 1988 soundings at Wadi Shu'eib did not provide sufficient architectural remains to indicate differences in PPNB and PPNC occupational episodes. Similarly, human burials and evidence of other ritual practices were too rare to be diagnostic. Faunal exploitation between the phases is also dramatically different at 'Ain Ghazal, but analysis of the Wadi Shu'eib faunal remains is still in progress; in any event, the samples from such restricted areas of excavation may not provide reliable information on PPNB-PPNC differences in hunting and animal husbandry. Until independent absolute dates are available, we must rely on the seriation potentials of the well-documented sequence of changes in lithic technology and typology demonstrated at 'Ain Ghazal to interpret the Wadi Shu'eib sequence.

### Chipped Stone Artifacts

More than 30,000 stone artifacts have been sorted according to debitage classes (Table 1), and we estimate that another 6,000 to 8,000 specimens are still unclassified. Classification follows the system used at 'Ain Ghazal to facilitate comparisons between the two sites. Until ceramic analysis can be refined, we have included both Yarmoukian and PNA samples together as a "Pottery Neolithic" category. Among the preceramic layers, PPNB and PPNC sam-

ples were distinguished by 1) stratigraphic superposition in each of the three soundings and 2) by perceived "breaks" in the blade: flake ratios that are so significant at 'Ain Ghazal.

Table 2 shows the results of this stratigraphic sorting for all three soundings as a combined sample. The "break" between the PPNC and PPNB is evident and significant (see Table 5). Although the trend is continued in later occupational episodes, distinctions between the PPNC and Pottery Neolithic are not significantly different. This failing we might attribute to the restricted sampling area, although we admit some degree of wishful thinking is possibly in effect here.

Changes of the major debitage classes at Wadi Shu'eib are reflected in Table 3 and are similar to those at 'Ain Ghazal (*cf.* Rollefson *et al.* this volume). Trends in the blade: bladelet ratio at Wadi Shu'eib (Table 4) are also consistent with 'Ain Ghazal, although as Table 5 indicates, the PPNB-PPNC difference is not meaningful in statistical terms.

Overall, Tables 1-5 show strong congruences of technological developments at Wadi Shu'eib and 'Ain Ghazal. The lack of statistical significance in the PPNB-PPNC blade:bladelet ratio may indicate that virtually all of the investigated PPNB samples from Wadi Shu'eib date to the last several centuries of the 7th millennium. On the other hand, small samples from the deepest strata in Area I (with very high blade: bladelet and blade: flake ratios) appear to be from the Middle PPNB period (*ca.* 7,200-6,500 B.C.).

There has not been sufficient time to undertake a typological analysis of the Wadi Shu'eib tools, which include typical Neolithic types. Such an analysis will eventually help to corroborate, or to require adjustments to, the stratigraphic interpretation based solely on technological criteria. As tools were being separated for later analysis, on the other hand, a subjective impression emerged that little modification of the preliminary stratigraphic results will be necessary. A detailed typo-

**Table 1:** Absolute counts (above) and relative frequencies (below) for the analyzed chipped stone artifact samples, 1988 season at Wadi Shu'eib.\*

	<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>COR</i>	<i>TL</i>	<i>Totals</i>
M	1,146	307	1,387	48	23	1,596	977	10	191	523	6,208
P	1,224	296	2,249	93	49	852	449	15	91	351	5,669
C	2,574	825	4,432	253	155	4,469	2,764	11	118	966	16,567
B	657	205	699	38	50	620	523	5	22	181	3,000
T	5,601	1,633	8,767	432	277	7,237	4,713	41	422	2,021	31,444

	<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>COR</i>	<i>TL</i>	<i>Totals</i>
M	18.5	4.9	22.3	0.8	0.4	25.7	15.7	0.2	3.1	8.4	100.0
P	21.6	5.2	39.7	1.6	0.9	15.0	7.9	0.3	1.6	6.2	100.0
C	15.5	5.0	26.8	1.5	0.9	27.0	16.7	0.1	0.7	5.8	100.0
B	21.9	6.8	23.3	1.3	1.7	20.7	17.4	0.2	0.7	6.0	100.0

\* Column Codes: BL = blades; bl = bladelets; FL = flakes; CTE = core trimming elements; BS = burin spalls; MF = microflakes; DE = debris; OT = "Other flakes"; COR = cores; TL = tools.

Row codes: M = surface and mixed contexts; P = Pottery Neolithic; C = PPNC; B = PPNB.

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

	<i>BL</i>	<i>N</i> <i>FL</i>	<i>Totals</i>	<i>BL</i>	<i>%</i> <i>FL</i>	<i>Totals</i>
PN	1,224	2,249	3,473	35.2	64.8	100.0
PPNC	2,574	4,432	7,006	36.7	63.6	100.0
PPNB	657	699	1,356	48.5	51.5	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 Wadi Shu'eib. (See Table 1 for column codes).

	<i>BL</i>	<i>bl</i>	<i>FL</i>	<i>COR</i>	<i>TL</i>	<i>Totals</i>
PN	1,224	296	2,247	91	351	3,860
PPNC	2,574	825	4,432	118	966	7,949
PPNB	657	205	699	22	181	1,583
PN	31.7	7.7	58.3	2.4	9.1	100.1
PPNC	32.4	10.4	55.8	1.5	12.2	100.1
PPNB	41.5	13.0	44.2	1.4	11.4	100.1

**Table 4:** Absolute counts (left) and relative frequencies (right) for blades and bladelets for all analyzed chipped stone artifact samples from Wadi Shu'eib.

	<i>BL</i>	<i>N bl</i>	<i>Totals</i>	<i>BL</i>	<i>% bl</i>	<i>Totals</i>
PN	1,224	296	1,520	80.5	19.5	100.0
PPNC	2,574	825	3,399	75.7	24.3	100.0
PPNB	657	205	862	76.2	23.8	100.0

**Table 5:** Chi-square matrices for blade: flake ratios (above) and blade: bladelet ratios (below) for the chipped stone artifact samples from Wadi Shu'eib.

<i>Chi-Squares, Blade:Bladelet ratios</i>			
	<i>PN</i>	<i>PPNC</i>	<i>PPNB</i>
PN	---	13.741	6.147
PPNC	.001	----	0.090
PPNB	.02	----	----

<i>Chi-Squares, Blade:Flake Ratios</i>			
	<i>PN</i>	<i>PPNC</i>	<i>PPNB</i>
PN	---	2.251	75.545
PPNC	---	----	95.332
PPNB	.0000	.000	----

logical breakdown will be available in the near future.

**Ceramics**

A considerable ceramic assemblage was recovered from the 1988 test excavations. This is still under analysis, and the following represents only preliminary remarks. Ceramics were recovered from the upper levels of the excavation and several were collected from the surface. The surface sherds include examples from the Yarmoukian, Chalcolithic, Roman, and Byzantine periods.

The excavated top levels in Area I and Area II yielded Roman and Byzantine sherds mixed with Yarmoukian ones. The later period sherds could have been mixed with the Neolithic ones, having washed in from upslope. No post-Neolithic architectural remains were associated with these latter ceramics.

The Pottery Neolithic period ceramic assemblage consisted of Yarmoukian and Jericho Pottery Neolithic A specimens, with the Yarmoukian sherds being dominant. Figs. 3 and 4 illustrate some of the vessel forms. In Area II, Yarmoukian pottery was encountered inside and outside

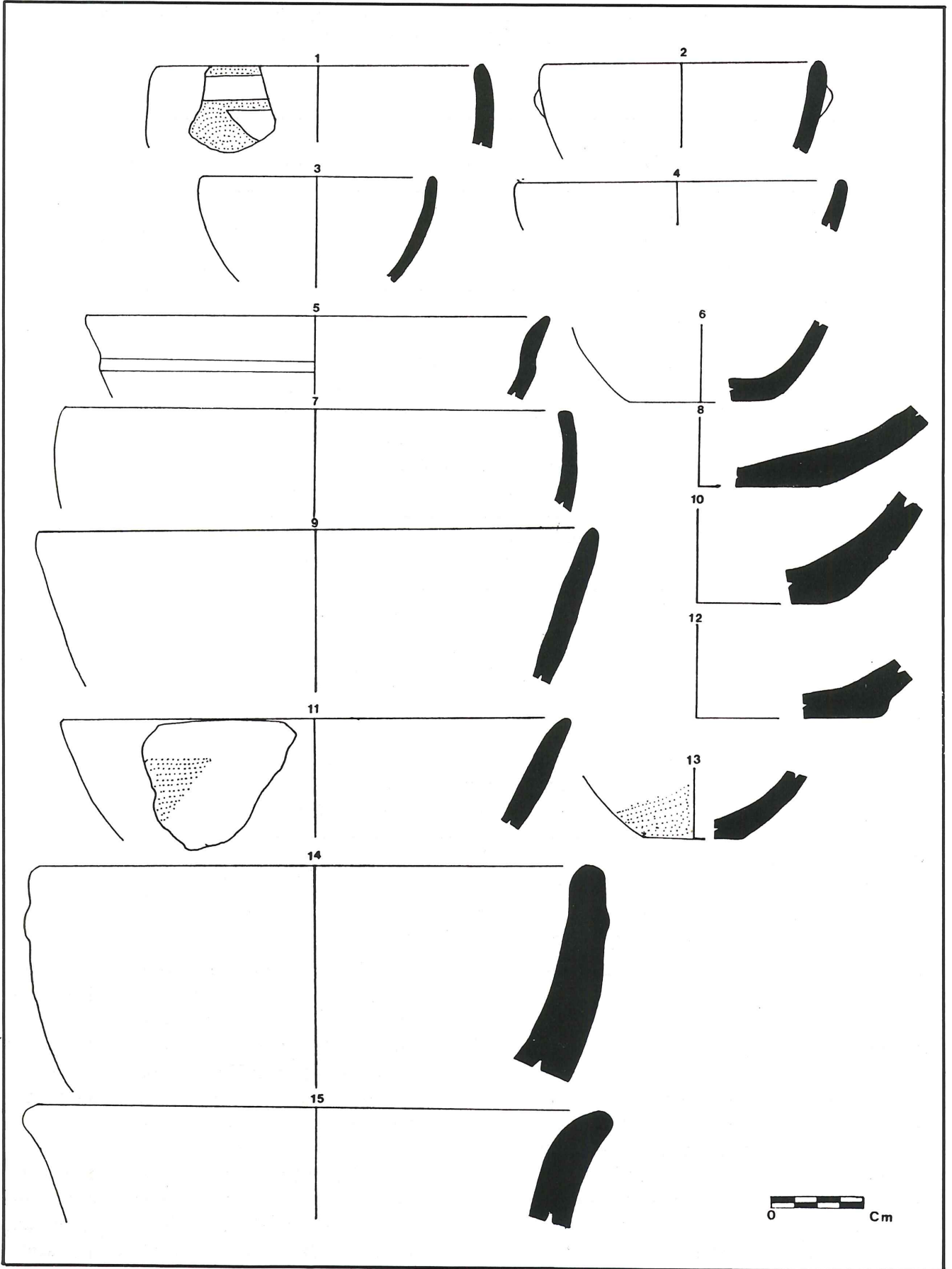


Fig. 3. Representative Ceramic forms from Wadi Shu'eib. 1-4 and 6-14- bowls; 5- carinated bowl; 15- jar.



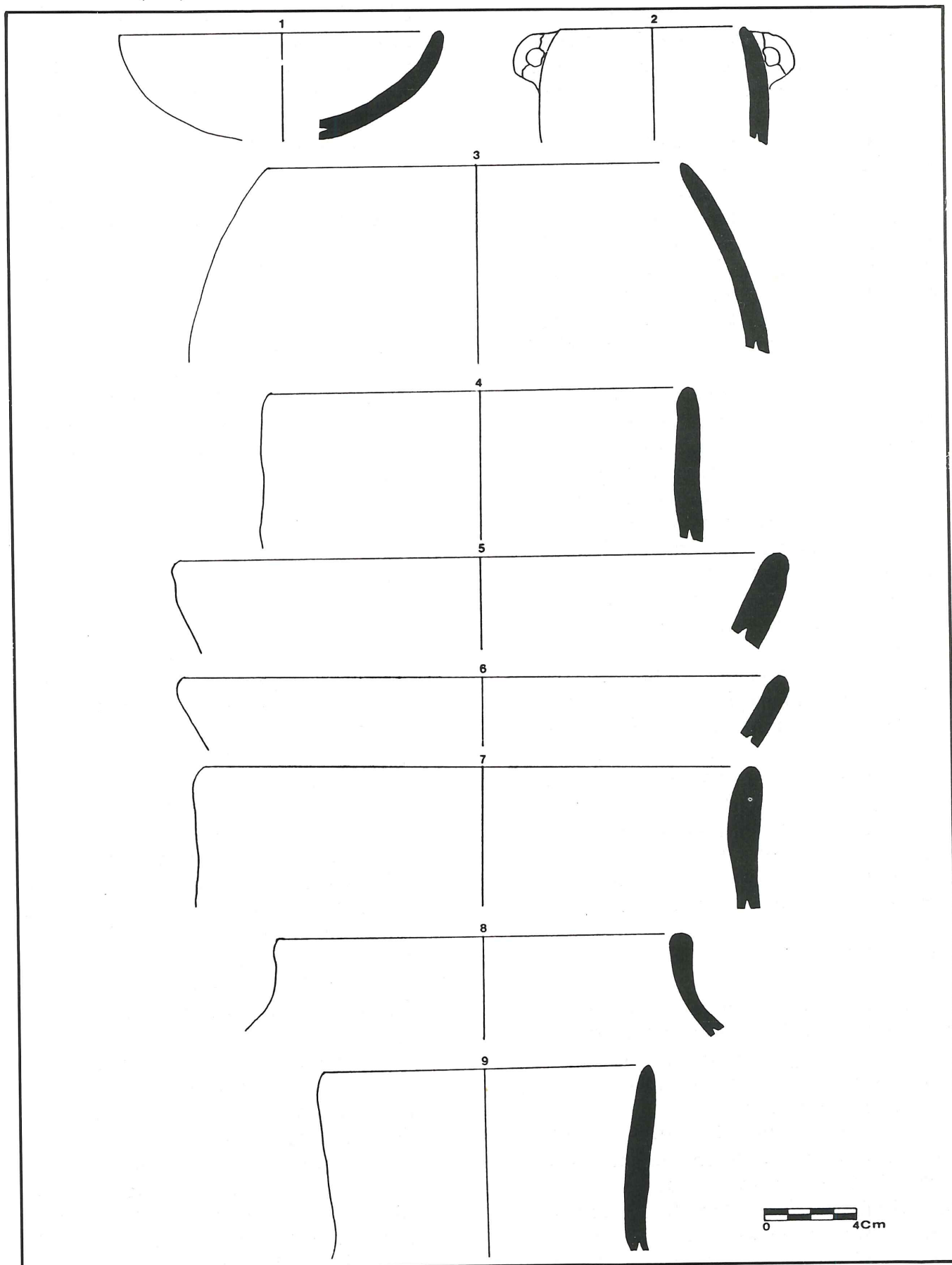


Fig. 4. Representative Ceramic forms from Wadi Shu'eib. 1- bowl; 2- small jar; 3- whole mouth jar; 5-6- bowls; 7-9- jars.

structures built on stone and having a rectangular shape. The Pottery Neolithic A ceramics were recovered from a pit in Area II and were mixed with Yarmoukian pieces.

The Yarmoukian ceramic inventory from Wadi Shu'eib is similar to that found at 'Ain Ghazal (Rollefson and Simmons 1986; Kafafi *ndb*), Abu Thawwab (Kafafi 1988), and 'Ain Rahub (Kafafi *nda*). This type of pottery is usually dated to *ca.* 5500-5000? B.C. It consists mostly of bowls and jars, and is characterized by herring-bone incisions, sometimes accompanied with red paint.

The Pottery Neolithic A sherds were primarily recovered from Area II. This type of pottery is characterized by very coarse ware with straw temper. The forms consist of bowls and small jars decorated with a red or red brownish paint on a creamy slip. Similar pottery vessels were excavated at Jericho IX (Kenyon and Holland 1983), Dhra' (Bennett 1980), and at Dharih (Bossut *et al.* 1988).

The two Pottery Neolithic assemblages at Wadi Shu'eib — that is, the Yarmoukian and the Pottery Neolithic A — may be contemporaneous. This is based on their association from the same loci. However, additional analysis is required that may enable us to draw a line between the two phases, whose precise chronology is poorly understood. Wadi Shu'eib is one of the few sites that contains both traditions known from Jordan and Palestine.

### Architecture

Architectural remains are abundant at Wadi Shu'eib, although the limited excavations only revealed portions of structures. The following comments represent only a preliminary summary.

In Area I, rectangular structures with well-made plastered floors, undoubtedly PPNB in date, are overlain by a series of later Neolithic pits. In Area II, a stratified series of stone walls was uncovered. These appear to represent rectangular Pottery Neolithic, PPNC, and PPNB structures. A small sounding in a portion of Area II

exposed a well-constructed wall over one meter in height, underlain by another, unrelated wall, only the top of which was exposed in 1988. These structures are approximately two metres beneath the level of the modern Wadi Shu'eib road and will be investigated further in 1989. In the small section excavated in Area III, a series of stratified plaster floors was exposed. More detail on the Wadi Shu'eib architecture will be provided in future reports.

### Human Remains

Human skeletal remains were recovered from all areas excavated. In addition, some bones were recovered from the sections of the site that were exposed during construction of the adjacent highway.

### Area I

#### *Burial 1*

This multiple burial was not completely excavated; portions were removed to prevent damage by erosion since the burial is located in the section exposed by road construction. It contains at least three individuals: a child, aged between 5-10 years, an adolescent approximately 15 years old, and an adult male, approximately 22-24 years old. Future excavation of Area 1, Unit 1, will expose the remainder of this burial. The burial is located below the third plastered floor exposed in section. The fill of the burial pit is composed of a loose and dry sandy silt. The bones are extremely dry and friable.

Work on this burial took place in two phases, the first occurring in the first two days of excavation at the site, during the initial clearing of the section that would later be excavated. Only those bones that protruded from the cut were removed. This was done to prevent their erosion during the excavation of Area I directly above the burial. The second phase of work occurred on the last day of excavation. Again, only that portion of the burial

that was in danger of erosion was removed. It was not possible to determine what amount of skeletal material was left *in situ* in Burial 1.

The following bones were recovered during the first phase of work on Burial 1. Axial remains consisted of one thoracic arch, two crenulated vertebral bodies, one cervical vertebra, and one cervical arch fragment (both of which are small and gracile). Sacral fragments included the promontory articulation, dorsal fragments of the body, and the coccygeal vertebrae. Innominate fragments included the outer rim of the acetabulum and the complete symphyseal region of the right pubis (down to the distal border of the obturator foramen). On the basis of the public symphysis, it was determined that one of the individuals in Burial 1 was a male, approximately 22-24 years of age.

The arms were represented by the mid-shaft fragments of one radius and one ulna. The legs were better represented and included: two right patellas, an anterior tibia fragment, femoral fragments consisting of the lesser trochanter from a left femur, a nearly complete left femur including the head and the shaft (with a well-defined and robust *linea aspera*), a left femoral diaphysis (just below the lesser trochanter), the highly fragmented posterior portion of a proximal tibia, and two fibular shaft fragments.

The following hand and foot bones were recovered during the first phase of work on Burial 1: an adult metacarpal fragment, the left third, fourth, and fifth metacarpals with the associated first phalanges, a left hamate, a left third cunieform, a right calcaneous, and 11 whole or fragmentary loose phalanges.

The bones recovered during the second phase of work on Burial 1 included the following: 40 rib fragments, the distal end of a left humerus, the shaft and distal end of a right humerus, the distal end of a radius (side undetermined), the shaft and proximal end of a left ulna, the proximal end of an immature tibia (side undetermined), the shaft and proximal end of a left fibula, three hand phalanges, one navicu-

lar, and one foot phalanx.

The stratigraphic location of Burial 1, as well as its placement beneath a structure floor, suggest a PPNB affinity.

### *Burial 2*

Burial 2 consisted of a scatter of human bones over several loci within Area 1, Units 1 and 2. No burial pit was evident nor were any of the bones articulated. Due to its nature, this burial was not recognized as such until much of it already had been excavated. The following list of bones includes materials from the three loci identified in the field as being associated with Burial 2. Following this list is an inventory of additional remains from Area 1 that, due to their location, may be associated with Burial 2.

A nearly complete adult mandible was found, missing only the right ascending ramus, both coronoid processes, and both condyles. All of the molars had been lost and their sockets were resorbed. There is an abscess (7 mm) around the apex of the left second premolar, exposing the root. This would be a continuation of the disease process that destroyed the other tooth sockets. The presence of concretions on the bone make it difficult to determine when the incisors, canines, and premolars were lost. The left canine and right premolar are present. The occlusal surface of the enamel is severely chipped.

The axial skeleton was represented by six fragments of lumbar vertebrae, five rib fragments, and a fragment of the acetabulum. The remains recovered from the arms included the shaft and partial distal end of a left humerus, the shaft of a humerus (side unknown), and four fragments of radial shafts. The legs were represented by two femoral shaft fragments, a right tibial shaft fragment, a fibular shaft fragment, and the distal end of a tibia (side unknown) that, due to its unusual shape, might be pathological. In addition, six phalanges (four from the hand, two from the foot) were recovered, as were four metacarpals, five metatarsals, a navicular, and two large talus bones.

The following inventory of loose finds within Units 1 and 2 of Area 1 may also be part of Burial 2. The bones from one locus are small and gracile, and the breaks in the bone were moderately calcified, indicating that the burial had been disturbed in the past. The bones included 12 rib fragments, the shaft of a right humerus, the shafts of a left radius and ulna, the shaft, near the proximal end, of an ulna (side unknown), the shafts of a tibia and fibula (side unknown), and two phalanges. The bones found in another locus included two cranial fragments (one of which had a thickened outer table, evidence of either pathology or a very old individual), and a permanent molar crown.

The stratigraphic context of this burial is unclear. Most of the pertinent loci appear to be mixed. Based on presently available data, however, we tentatively place this burial within the PPNC.

## Area II

### *Burial 3*

This burial was located in Area II below a compact mudfloor. It was situated to the southwest of a wall and was enclosed by a circle of stones. The individual was a child, and the body was in a flexed position with the head oriented approximately to the northwest. The bones were fragmented, but most were not friable. The soil within the burial pit was a compact sandy silt.

The cranium was absent, but the body of the right portion of the mandible was recovered with two teeth (the molar and erupting canine) in place. In addition, four loose incisors were found. Based on the dentition, the age of the child was approximately 18 months,  $\pm$  6 months. The axial skeleton was represented by two rib fragments and the left ilium. The left shafts of both the radius and the ulna were the only extant remains from the arms. The remains of the legs included the shaft and proximal end of the right femur and the shaft of a tibia. In addition, a phalanx from the hand was recovered.

The stratigraphic position of Burial 3 suggests a Pottery Neolithic affiliation, although this remains have to be verified.

### *Burial 4*

This burial was located directly adjacent and to the west of a wall and northeast of Burial 3. It was a secondary burial, with the long bones arranged parallel to one another and their axes oriented approximately north/south. Overall, the bones were in good condition, with slight deterioration on the ends. The remains appear to be of one adult individual. The soil was a compact sandy silt, light brown in color. The mandible of an animal was immediately beneath, and extending eastward beyond the burial.

No cranial material was present with this burial. The axial skeleton was represented by one cervical vertebra, the right scapula, and one rib fragment. The arms and legs were represented by the following bones: the shaft and proximal end of the left humerus, the complete right humerus, the complete right femur, the complete right tibia, and the distal end of the left fibula. In addition, one phalanx from the hand was recovered.

As with Burial 3, the stratigraphic location of this burial suggests a Pottery Neolithic affinity.

## Area III

### *Burial 5*

Burial 5 was located immediately adjacent and to the south of Area III. The burial was visible in the profile of Area III and was excavated to prevent damage from erosion. The soil was light brown, fairly compact, and contained an abundance of white flecks (plaster) and very small charcoal bits.

Two individuals were present in this burial: 5A was an adult, probably male, and was located above and slightly to the north of Burial 5B, a child approximately one year old. There was no difference in the color or texture of the soil between the

two individuals, nor was there a discernible outline of the pit(s) associated with this burial. The bone was extremely dry and friable.

Individual 5A was interred in a flexed position, with the crania (not present) oriented approximately to the north. The recovered portions of the axial skeleton included fragments of six thoracic and two lumbar vertebrae (one of which demonstrated signs of arthritic lipping), the right and left scapula, the right and left clavicle, and 59 rib fragments. The right shoulder girdle was complete and articulated. One of the rib fragments exhibited extra lipping, giving it an almost "canal-like" appearance.

The arms were represented by the shaft of the left humerus, the nearly complete right humerus, and the shaft and proximal end of the right radius. The legs were represented by the shaft and proximal end of the left tibia and the right patella. Finally, three carpals, one metacarpal, and one phalanx were recovered.

Portions of the second individual in this burial, 5B, began to appear in the lower limits of individual 5A's remains. The cranium was oriented to the east and was represented by a mandible fragment, several loose teeth, a fragment of the zygomatic arch and of the maxilla. The axial skeleton was represented by 16 vertebral body fragments, 43 rib fragments, the left and right ilium, and portions of the right ischium. Only the legs were represented and included both complete tibias and both fibulas.

Both burials appear to be associated with PPNB deposits.

### Exposed Section

#### *Burial 6*

This burial lies in the unexcavated region of Area 1, Unit 2. It is approximately 50 cm east of Burial 1 and appears to be earlier, since it lies beneath the floor that was cut for the pit in Burial 1. The complete individual was not removed; only those portions that were exposed and in

danger of erosional damage were excavated. The recovered portions of the skeleton include one fragment of the spinous process from a thoracic vertebra, the coracoid process of the left scapula, a fragment of the right clavicle, the shaft of the right radius, and 29 rib fragments. In addition, one phalanx was recovered. The individual appears to be a young adult. The stratigraphic location suggests a PPNB affiliation.

#### *Burial 7*

This burial is located in the south-facing section of the highway cut. The burial appears to be contained within a stone-lined pit, which itself lies within a cobble layer. There is a layer of white plaster at the bottom of the pit, possibly the remains of a lining, but it does not appear to continue up the sides of the pit. The pit's fill is granular, clayey, and greyish-brown in color.

Due to time constraints, very little skeletal material was recovered. Only those bones in immediate danger of erosion were removed. Of them, only the distal end of the right radius and a fragment of the tibia were identifiable. The individual was an adult.

#### *Burial 8*

This burial also is located in the south-facing section of the highway cut. It appears to be in a pit located below a plaster floor visible in the section. Only the exposed portions of the burial were removed, due to time constraints. The mandible was recovered in fair condition, being partially fragmentary, but nearly complete on the left side. In addition, seven loose teeth and one maxillary fragment were recovered. The right hand was collected and was in excellent condition, with six carpals, five metacarpals, and nine phalanges recovered. Both innominates were recovered: the right hip included the ilium, pubis, and sciatic notch; only the ilium and pubis were present from the left hip. Finally, the shaft and proximal end of the

**Table 6:** Inventory of Loose Human Remains.

<i>Area</i>	<i>Locus</i>	<i>Tentative Affiliation</i>	<i>Item</i>
I	058	Late PPNB	21 loose cranial fragments
	067	PPNC	3 maxillary fragments, molars intact; 3 additional loose teeth; age-late adolescence
II	013	Pottery Neolithic	left clavicle-very small (8 mm at mid-shaft)
	014	Pottery Neolithic	1 canine-right maxillary, moderate wear; cranial fragment; sacral fragment; 1 hand phalanx
	018	Pottery Neolithic	1 hand phalanx
	022	Pottery Neolithic	fibular shaft fragment
	027	Pottery Neolithic	right femoral shaft fragment, robust
Area III	004	PPNC	1 foot phalanx, mature
	021	PPNB	fragment of zygomatic arch, infant

right femur were recovered. The individual was an adult male.

Both burials 7 and 8 appear to be associated with PPNB deposits.

#### **Additional Bones**

Finally, several other loose human bones were recovered during the test excavations. These are inventoried in Table 6.

#### **Conclusions**

The 1988 test excavations at Wadi Shu'eib confirmed the presence of over five meters of Neolithic deposits. The site, covering an estimated 25 acres, is yet another huge Neolithic settlement that may rival centers such as Jericho, 'Ain Ghazal, and Basta. Of particular significance is the presence of Pre-Pottery Neolithic C (PPNC) materials at Wadi Shu'eib. Previous to our studies, these have only been clearly documented at 'Ain Ghazal. Their presence at another major site indicates that some refinements may be necessary in our view of the previously presumed hiatus between the aceramic and ceramic Neolithic. The PPNC suggests an unbroken, or nearly unbroken, sequence

between these two phases.

Our studies at Wadi Shu'eib investigated only a tiny portion of the site. Subsequent excavations will complete the soundings begun in 1988, but we presently have no plans to undertake major excavations at the site. Even the limited information recovered, however, indicates that Wadi Shu'eib was a major Neolithic population center, and our interpretation of the Neolithic will require major revision as more of these large centres are documented.

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