

TELL ZEIDAN

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2010 Field Work

The third field season of the joint Syrian-American excavations at Tell Zeidan, in the Euphrates River valley of north central Syria, was conducted from July 10 to August 8, 2010. The Tell Zeidan Project explores the roots of urbanism in Upper Mesopotamia (modern-day northern Iraq, north Syria, and southeast Turkey) by excavating a large regional center or town dating to the Halaf, Ubaid, and Late Chalcolithic 1–2 periods in the sixth and fifth millennia BC. Our excavations focus in particular on the Ubaid period, when we see the first evidence for the development of true towns, social stratification, irrigation-based economies, and centralized

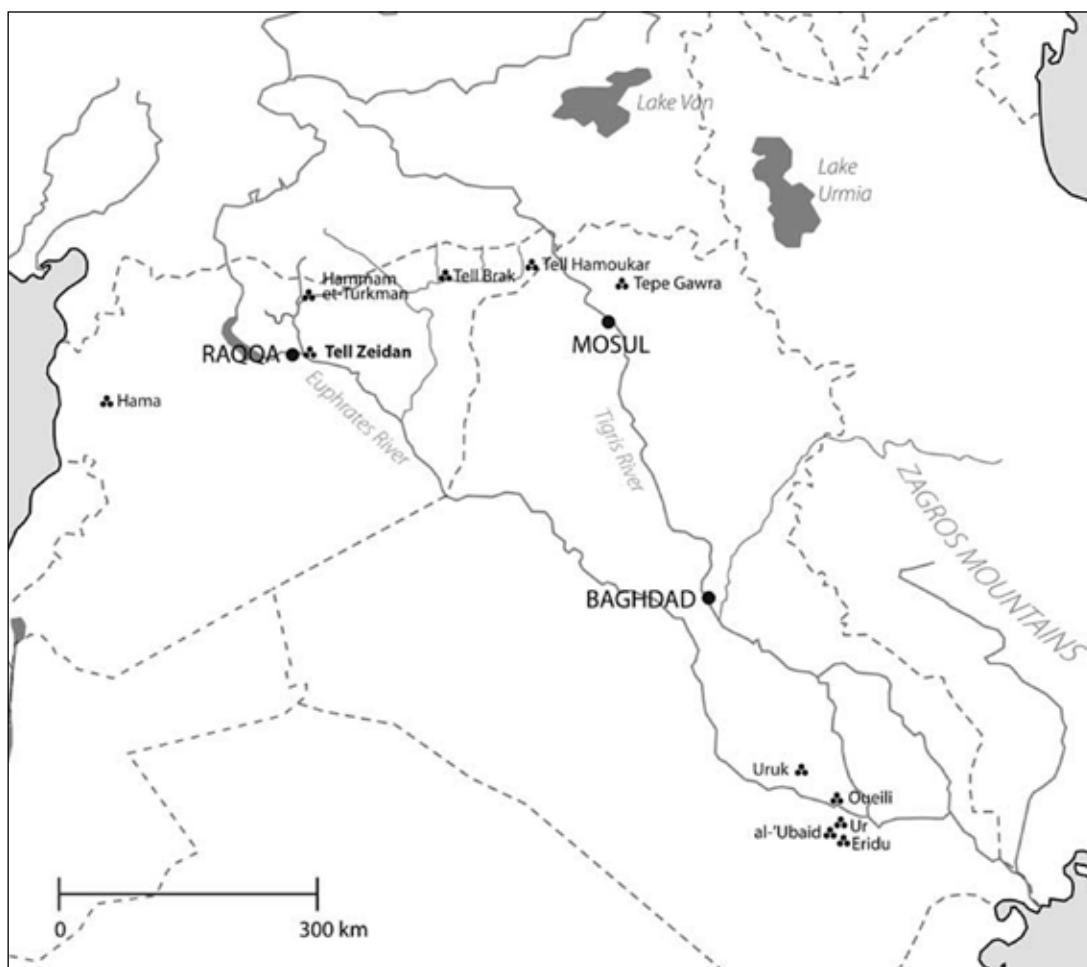


Figure 1. Map of Near East showing major Ubaid sites of the sixth and fifth millennia BC and the location of Tell Zeidan

political leadership in the Mesopotamian world. Together, these Ubaid-period developments of the fifth millennium BC laid the foundation for the later emergence of the world's first true cities and states in Mesopotamia during the fourth-millennium Uruk period.

Tell Zeidan is a 12.5 hectare prehistoric mound located approximately 5 km east of the modern city of Raqqa at the confluence of the Balikh River with the Euphrates (fig. 1). The site is a long triple mound oriented northwest to southeast located directly on the east bank of the Balikh. Tell Zeidan consists of a large southern mound 15 m in height, a lower town, and two smaller mounds — the northeast mound and the northwest mound. The first two seasons of excavation, in 2008 and 2009, identified four main occupation periods at the site: Halaf, Ubaid, Late Chalcolithic 1 (LC1), and Late Chalcolithic 2 (LC2) in a continuous radiocarbon-dated sequence ranging from about 5800 to 3800 BC. After an occupation gap lasting for almost a millennium, parts of Tell Zeidan were briefly re-inhabited in the early third millennium BC before the site was finally abandoned around 2800 BC.

Excavations at Zeidan are conducted jointly by the Syrian General Directorate of Antiquities and Museums through the Raqqa Museum, and by the Oriental Institute of the University of Chicago. We thank the General Director, Dr. Bassam Jamous, and the Director of Excavations, Dr. Michel al-Maqdissi, for their assistance and support in conducting these excavations.

The 2010 field season had four main goals:

- 1) Expand excavations to expose broader areas of the Ubaid and Late Chalcolithic 1 settlements
- 2) Geophysical/magnetometric mapping of subsurface features of the site
- 3) Field laboratory analyses of ceramics, chipped stone, animal bone, human remains, and carbonized plant remains
- 4) Test pits to assess damage to Zeidan by modern agricultural activities

Excavations

Excavations were conducted in nine 10 x 10 m trenches (called “operations”) located in five areas across the site (areas A–E), along with three additional test trench sounding in areas F–H (fig. 2).

Area A: Operations 10 and 13 (northwest mound)

Area B: Operations 11, 14, and 18 (northeast mound)

Area C: Operation 9 (south mound)

Area D: Operation 17 (south mound)

Area E: Operations 15 and 16 (south mound)

Area F: Test trench — Operation 21

Area G: Test trench — Operation 20

Area H: Test trench — Operation 19

Area A: Northwest Mound – Operations 10 and 13

The 10 x 10 m Operation 10 continued to excavate fifth-millennium BC late Ubaid levels. In the southwest corner of the trench, excavations focused on an outdoor area enclosed by

Tell Zeidan 2010

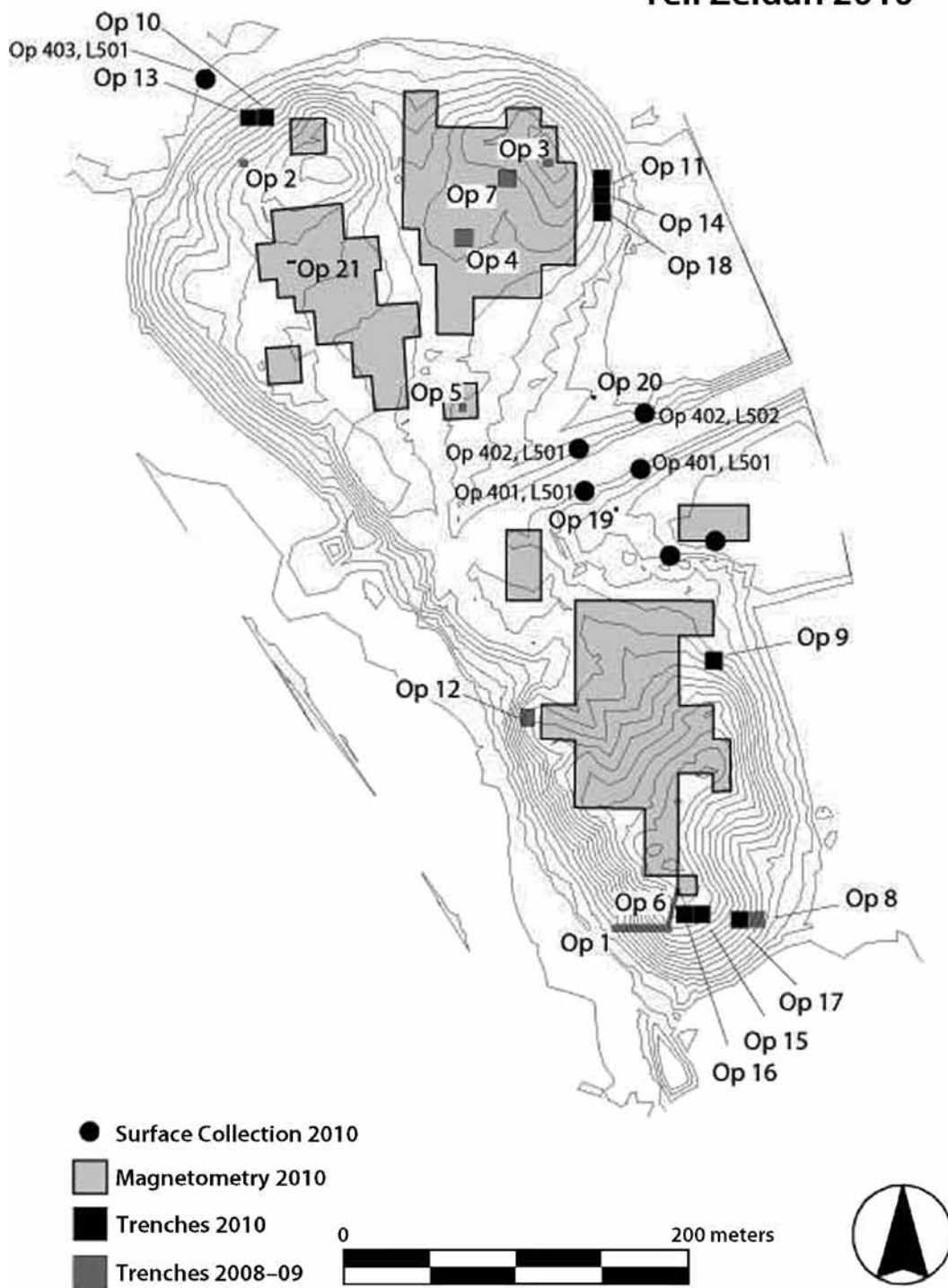


Figure 2. Topographic map of Tell Zeidan showing main excavation trenches, test pits, surface collection units, and areas where magnetometry/geophysical prospection was conducted. Note modern irrigation canal and triangular bulldozer cuts on the east side of the site

low walls, with a large above-ground oven or tannur (locus 81/89) made of packed clay and hardened by fire (fig. 3). The oven seems to have been constructed on top of a low platform made of packed mud. Accumulating up against the walls of the tannur structure, and also sealed off below it, were a series of thick wash layers with large amounts of ceramics, chipped stone, and some bone.



Figure 3. Ubaid-period oven or tannur with surrounding mudbrick wall. Area A (northwest mound), Operation 10

Excavations in Operation 13 (immediately to the west of Operation 10) exposed the corner of two mudbrick walls, loci 17 and 19, built on outdoor/ex-

terior surface 28. The northwestern half of Operation 13 was cut through by a very large modern borrow pit (locus 18) to take earth for road construction at some point in the last twenty years. The pit was removed down to the intact underlying Ubaid stratigraphy, which consisted of a series of thick wash layers with large amounts of ceramics, chipped stone, and some bone. The artifacts from these wash deposits match well with what one would expect in a domestic neighborhood of non-elite (commoner) households.

Overall, Area A seems to have been an exterior area, either a large courtyard or else an open space between houses. We can hypothesize that the actual houses were located in the (as yet) unexcavated area immediately to the south of Area A, based on the high volume of eroded trash, and on the presence of the tannur structure, wall fragments, pits, and compact surfaces found in Operation 10. Although occasional isolated Halaf sherds appeared in these wash layers, more than 99 percent of the ceramics were securely Ubaid, suggesting that Ubaid deposits in this open-air area continue downward in the two operations.

Area B: Northeast Mound – Operations 11, 14, and 18

Area B consists of three adjacent 10 x 10 m trenches (Operations 11, 14, 18) aligned north-south along the east slope of the northeast mound. All three operations have exposed domestic architecture dating to the Ubaid period. The walls and rooms can be linked between trenches, so that we can see Area B as a coherent complex of 300 sq. m of Ubaid houses in several overlapping phases (fig. 4).

Operation 11 had been opened as a 10 x 10 m trench in the 2009 field season and revealed several rooms of an Ubaid house (northernmost trench, on the right in fig. 4). In 2010, excavations uncovered a better-preserved earlier underlying level of Ubaid domestic architecture, consisting of at least seven rooms and a courtyard, constructed in two phases. This is the best and most completely preserved Ubaid domestic architecture recovered so far at Tell Zeidan. Three of the rooms in the house contained hearths that were in use contemporaneously, suggesting that an extended family might have lived here. One infant burial was found in the courtyard of the house. Calibrated accelerator mass spectrometry (AMS) radiocarbon dates

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Figure 4. Photomosaic and composite top plan of Ubaid houses in (right to left) Operations 11, 14, and 18 in Area B (northeast mound)

from room floors and room fill date this house to a very early phase of the Ubaid occupation at Tell Zeidan — between 5100 and 5300 BC (table 1). The rooms and courtyard of this house continue into the west and south baulks of the trench. We hope to complete the exposure of the entire house in future seasons.



Figure 5. Ubaid ceramic boat model (ZD8215). These models are known from other Ubaid sites, such as Eridu and Mashnaqa. From Area B (northeast mound), Operation 14

Operation 14 was opened in 2010 as a 10 x 10 m trench immediately to the south of Operation 11 in order to expand the exposure of Ubaid domestic architecture. The uppermost levels of Operation 14 reached Ubaid levels immediately and yielded an extremely rare find: a ceramic boat model (ZD8215; fig. 5). Very few Ubaid boat models are currently known, with the most notable examples deriving from Eridu, the Ubaid type site in southern Iraq, and from Mashnaqa in north Syria. In tandem with this distinctively Ubaid find, we also recovered a lightly baked clay figurine of a seated female, executed in a local north Syrian style (fig. 6). Excavations in Operation 14 reached Ubaid house levels from two superimposed

Table 1. Tell Zeidan 2009-2010 calibrated radiocarbon dates

ZD Number	Beta Number	Deposit Type	Op.	Loc.	Lot	Conventional Radiocarbon Age BP	2-Sigma BC Calibrated Maximum	2-Sigma BC Calibrated Minimum	2-Sigma BC Calibrated Mean	Cultural Period
3328	288105	Massif	12	4	—	4190 +/- 40 BP	2890	2630	2760	Early third millennium BC
5186	288110	Oven/kiln	16	4	9	4240 +/- 40 BP	2910	2710	2810	Early third millennium BC
1858	288097	Human burial	6	2	2	4340 +/- 40 BP	3080	2890	2985	Early third millennium BC
9187	288115	Mudbrick collapse	21	15	31	5120 +/- 40 BP	3980	3800	3890	Late Chalcolithic 2
9145	288111	Room/floor deposit	16	79	113	5730 +/- 40 BP	4690	4470	4580	Late Chalcolithic 1
9339	288109	Mudbrick collapse	15	97	224	5780 +/- 40 BP	4720	4530	4625	Late Chalcolithic 1
3189	288102	Trash pit	10	57	95	5820 +/- 40 BP	4780	4560	4670	Late Chalcolithic 1?
7633	288112	Room/floor deposit	17	25	24	5880 +/- 40 BP	4840	4690	4765	Ubaid
5296	288101	Human burial	9	85	132	5960 +/- 40 BP	4940	4730	4835	Ubaid
3221	288100	General room buildup	9	59	81	6010 +/- 40 BP	5000	4800	4900	Ubaid?
3150	288099	General room buildup	9	59	103	6040 +/- 40 BP	5040	4840	4940	Ubaid?
5626	288106	Wash	13	6	12	6060 +/- 40 BP	5050	4840	4945	Ubaid
3067	288098	Pyrotechnic feature	8	32	94	6120 +/- 40 BP	5210	4940	5075	Ubaid
6655	288107	Pit fill from two separate pits	14	6	61	6110 +/- 40 BP	5210	4940	5075	Ubaid
9451	288114	Mudbrick collapse	18	4	14	6120 +/- 40 BP	5210	4940	5075	Ubaid
8536	288113	Mudbrick collapse	18	4	9	6110 +/- 40 BP	5210	4940	5075	Ubaid
8193	288108	Floor/outdoor surface	14	33	142	6140 +/- 40 BP	5210	4970	5090	Ubaid
6468	288104	Room floor	11	75	96	6200 +/- 40 BP	5290	5040	5165	Ubaid
5698	288103	Room fill of room bound by walls 59-58-43 and west baulk	11	61	84	6270 +/- 40 BP	5320	5210	5265	Ubaid
2209	288095	Human burial	1	319	327	6550 +/- 40 BP	5600	5470	5535	Halaf
2782	288096	Indeterminate	1	340	365	6660 +/- 40 BP	5640	5520	5580	Halaf

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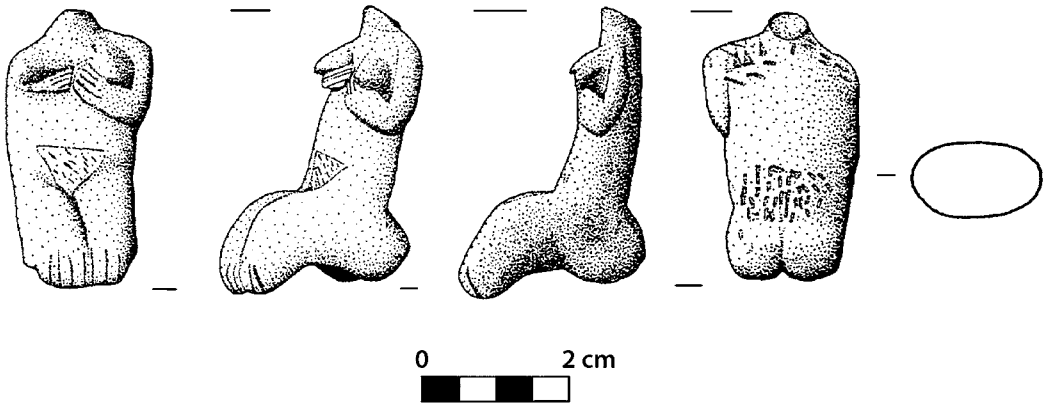


Figure 6. Lightly baked clay figurine of a seated female (ZD5545). Rendered in a north Syrian art style reflecting the localized character of the Ubaid-period culture at Tell Zeidan. From Area B (northeast mound), Operation 14. Drawing by Jack Scott

building phases. The upper phase consisted of three gray brick walls (loci 30, 35, 39), an associated floor surface (locus 36) and an infant jar burial that link to the latest building phase in adjacent Operation 11, but unfortunately were not as well preserved. These house walls immediately overlay an earlier building phase of yellowish brown mudbrick, forming four rooms and a possible courtyard. The uppermost floors in these rooms were reached. The architecture of this “yellowish-brown brick” phase is oriented northwest–southeast along the same lines as the architecture in adjacent Operation 11 to the north.

Finds from the yellowish-brown brick building level in Operation 14 included at least four spherical clay tokens and numerous over-fired kiln wasters of Ubaid bowls and other vessels. Possible prestige goods made from exotic raw materials were also found in this building level — notably a hematite mace-head fragment (ZD7790) and pieces of two chlorite/steatite carved stone bowls (ZD7762 and ZD7018).

Operation 18 was opened immediately to the south of Operation 14 as a 10 x 10 m trench, and was only excavated for a week at the end of the 2010 season. The uppermost well-preserved architecture in Operation 18 differs from the earlier houses in Operations 11 and 14 in that it is oriented directly north–south and east–west. Two adjacent rooms were defined. The western room had all four walls preserved (loci 3, 6, 8, 9), defining a space 4.3 m (north–south) x 2.5 m (east–west).

The most important discovery in Operation 18 was the remains of a chipped-stone tool production workshop. In room deposit 4, overlying the floor, we recovered a concentration of blade cores, flake cores, cortical flakes, production debris (“debitage”), and finished blades, blade tools, and flake tools (fig. 7). Most importantly, we also found, in association with the flint manufacturing debris, three pieces of carefully worked and polished deer antler (ZD9479), which were used as the punches to manufacture the blades either by indirect percussion with the “soft hammer” technique or by pressure flaking (fig. 8). Beneath the concentration of stone tools, manufacturing debris and antler punches, on floor 15 we found the preserved impression of a 2 x 1 m reed mat inside the room; this was clearly the actual workspace where the tools were made. This deposit and its related building phase can be radiocarbon dated to 5075 +/- 40 BC (table 1). It is extremely rare to find a securely dated workshop with the complete array of manufacturing tools, production debris, and finished chipped-stone



Figure 7. Chipped-stone tools, antler punches, and workshop debris recovered from a floor deposit on top of the remains of a reed mat inside an Ubaid house. From Area B (northeast mound), Operation 18, locus 4

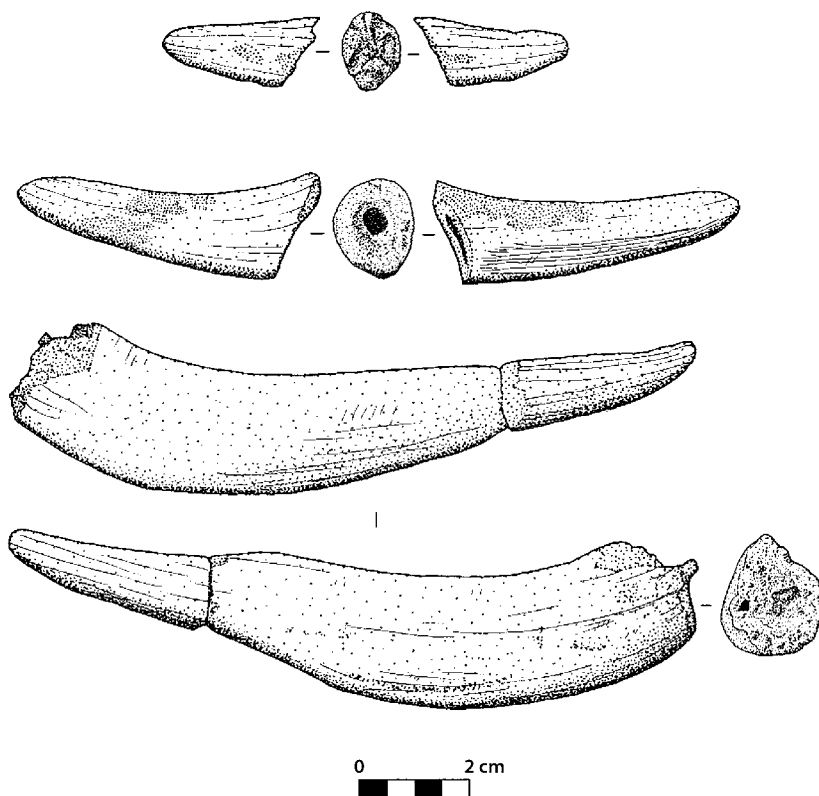


Figure 8. Shaped and polished deer antler punches used for the manufacture of chipped-stone tools (ZD 9479). Area B (northeast mound), Operation 18, locus 4. Drawing by Jack Scott

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tools in the Ubaid period. This is good evidence for the existence of specialized craft production — an important line of evidence for emerging social and economic complexity at this time.

Area C: South Mound – Operation 9

Operation 9 excavations reached Ubaid levels and exposed a large 1.10 m thick mudbrick wall with 1 x 1 m buttresses on its north face (fig. 9). This wall may be the enclosure wall surrounding a large public building. Ceramics in deposits running up to both the north and south faces of the wall were securely dated to the Ubaid period. The wall is quite large but is poorly preserved at its northwest and southeast ends. In future field seasons we hope to excavate farther inside the possible enclosure to determine whether a temple or other large public building was present here.



Figure 9. Butressed wall 1.10 m thick from the Ubaid period. This may have been the enclosure wall for an area containing a large public building. Area C (South mound), Operation 9

Area D: South Mound – Operation 17

Work in Operation 17 recovered a complex of mudbrick rooms oriented north-south and east-west. The walls were generally one brick-course wide and are preserved to a height of at least 1.0 m (fig. 10). The rooms were used for a long time, as can be seen in the number of superimposed floors and in the addition of later thin subdividing walls on the upper floor surfaces. The construction and use of these rooms date to the later Ubaid period. The uppermost in the sequence of associated room floors dates to the beginning of the Late Chalcolithic 1 period, while all floors below it can be securely dated to the Ubaid period. Operation 17 thus has the potential to give us valuable information about the Ubaid-Late Chalcolithic 1 transition. As an example, the baked clay “mullers” from Operation 17 pro-



Figure 10. Late Ubaid mudbrick architecture on southeast slope. Area D (south mound), Operation 17



Figure 11. Typical Ubaid-period ceramic “mullers” with plain, rounded heads (bottom) and Late Chalcolithic 1 mullers with crosshatch incised rounded heads (top)

vide good evidence for a stylistic change from mullers with smoothed, undecorated heads in the Ubaid period to mullers with crosshatch incised heads at the end of the Ubaid and in the Late Chalcolithic 1 (fig. 11).

Area E: South Mound – Operations 15 and 16

Operations 15 and 16 were opened as two adjacent 10 x 10 m trenches at the southern edge of the top of the south mound of Tell Zeidan. These trenches were opened to investigate the Late Chalcolithic 1 and 2 occupations of Zeidan from 4500 to 4000 BC. Im-

mediately beneath the surface, excavations revealed a cemetery area stretching across both trenches and containing approximately forty primary, secondary, and infant jar burials dating largely to the Late Chalcolithic 2 period, around 4200–4000 BC, although some burials are earlier (Late Chalcolithic 1) and some are almost certainly later in date (fig. 12). Only three of the forty burials contained any grave goods, and these were extremely simple – tiny white beads, a copper bead, and a bronze wire bracelet. The difficulty in dating these burials is compounded by the fact that they were cut down from Late Chalcolithic 2 and later floor

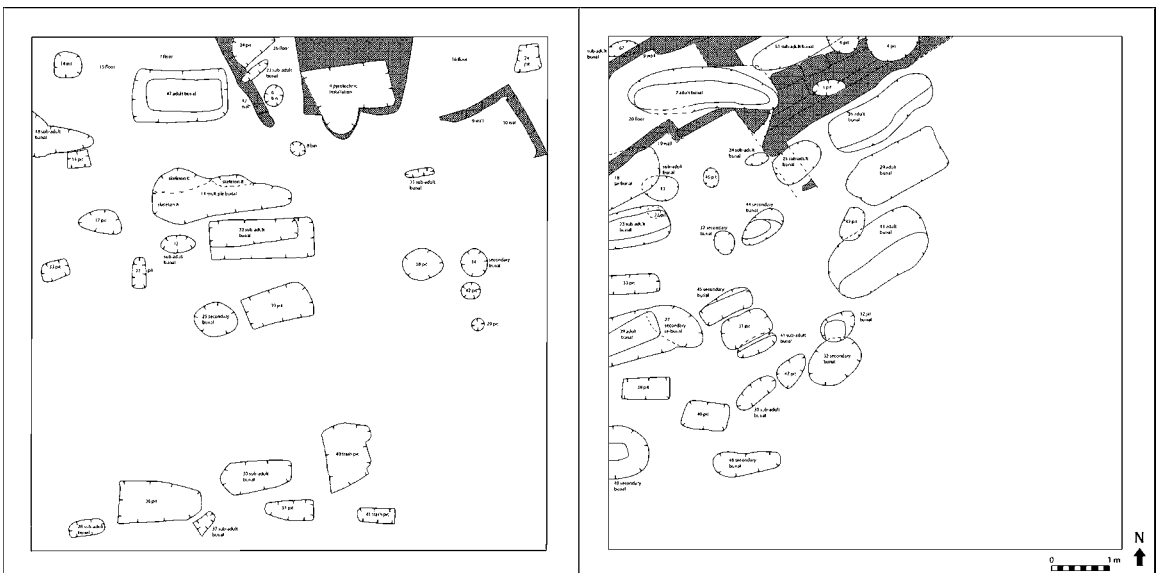


Figure 12. Operations 15 and 16 in Area E (south mound). Burials and other pit features were cut down from (now eroded away) Late Chalcolithic 2 and later levels cutting into Late Chalcolithic 1 architecture

levels that have been eroded away by the powerful winds that blow from the west across the site. The burials cut down into mudbrick architecture and associated deposits dating to the Late Chalcolithic 1 period, around 4500–4200 BC.

Once the forty burials in Operations 15 and 16 had been excavated, recorded, and removed, the underlying Late Chalcolithic 1 architectural levels were exposed. The uppermost two Late Chalcolithic 1 building levels in Operation 15 had been severely damaged by the intrusive burials and by erosion of the site slope. However, Late Chalcolithic 1 structures were much better preserved in the adjacent Operation 16. In the northern half of Operation 16, excavations exposed a row of three multiple-room structures whose mudbrick walls were a single course wide and oriented north–south and east–west (fig. 13). The easternmost of these three structures had two rooms, one with red-painted white plaster still surviving on its walls. The structures were built on compact, mud plastered floors from which microarchaeology samples were taken. The block of rooms appears to have been oriented east–west, and opened to the south onto what may have been a street or alley.

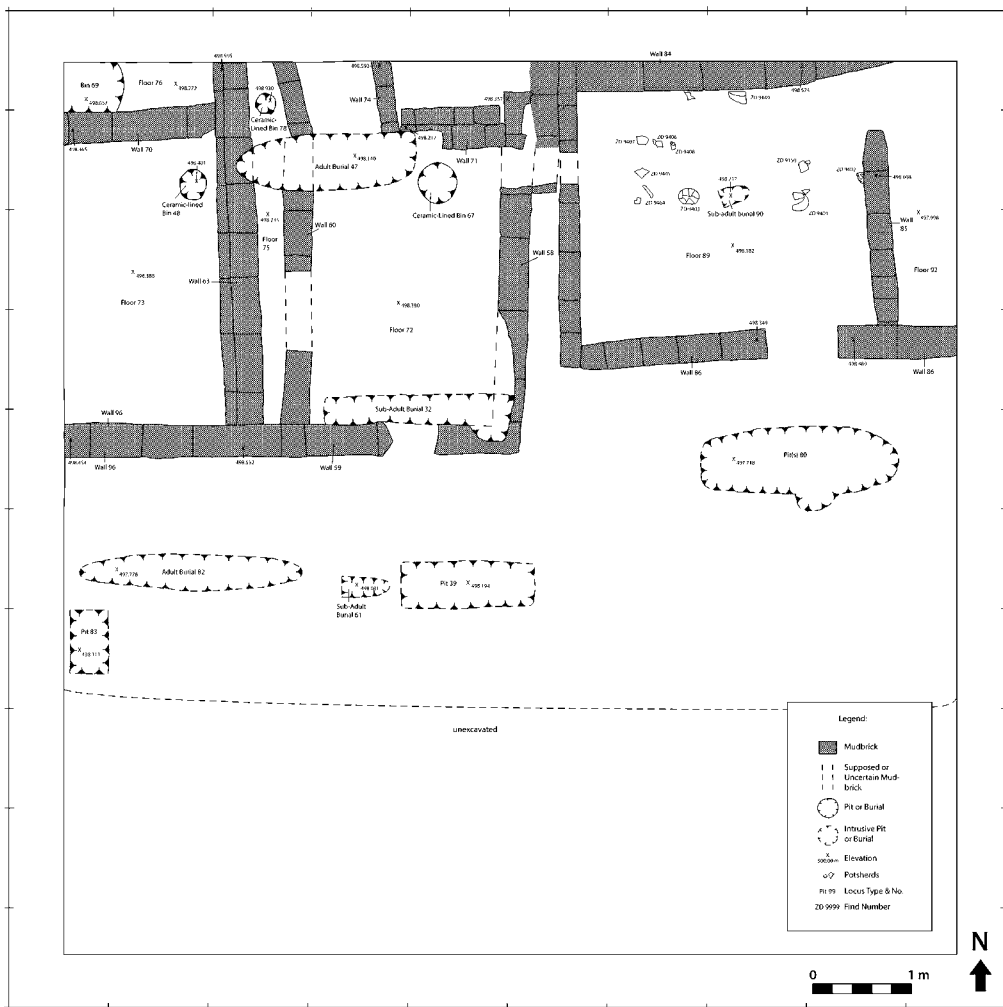


Figure 13. Operation 16 in Area E (south mound). Late Chalcolithic 1 period architecture – a series of rooms aligned east-west, facing onto a street or alley to the south

Area F: Northwest Mound – Operation 21

Operation 21 was a 1 x 5 m test trench on the south slope of the northwest mound excavated to investigate a possible ancient architectural feature detected by the magnetometry survey (see below). Immediately beneath the surface, excavations revealed a mudbrick structure with large amounts of coarse, wheel-made ceramics apparently dating to the early third millennium BC. Beneath this level was approximately 0.7 m of windblown (aeolian) silts, reflecting the post-Chalcolithic abandonment of Tell Zeidan after 4000 BC. Beneath the abandonment phase was a very large pyrotechnic feature consisting of a north-south-running wall of full-size bricks that had been heated to the point of vitrification. This wall seems to have marked the western edge of a kiln structure. Additional collapsed reddened brick and green-vitrified brick lay to the east of this wall. Although only a few ceramics were recovered from these deposits, diagnostics such as burnished gray ware carinated bowls and beaded lip hole-mouth jars allow us to securely date the use of the kiln to the latest phase of the Late Chalcolithic 2 occupation at Zeidan, contemporaneous with the latest Late Chalcolithic 2 phase in Operation 3, excavated in 2008.

Areas G and H: Lower Town – Operations 19 and 20

Parts of Tell Zeidan have been damaged over the past fifty years by agricultural development. Local farmers report that a portion of the northwest mound was bulldozed away to flatten the land to make it more suitable for irrigation. Much greater damage was done in 1958 by the construction of a raised irrigation canal that originates at almost the exact center of the mound, and then extends eastward to irrigate adjacent fields. Two large triangular areas in the lower town of Tell Zeidan were extensively dug out by bulldozers to borrow the large amounts of earth needed to create the berm or raised causeway for the canal. Based on the topographic mapping of the site, we estimate that the top three meters of archaeological sediments in these two parts of the lower town were removed in the excavation of the two bulldozer cuts to the north and south of the canal. A series of controlled surface collections and test pit excavations were conducted to assess the degree of site damage from these agricultural developments, while also determining whether any intact archaeological deposits still survived at the base of the north and south bulldozer cuts.

Operation 20 is a 2 x 2 m test pit excavated in the lower town, in the north bulldozer cut (fig. 2). The results of this test pit were extremely important and encouraging. Immediately beneath the surface, excavations recovered intact Late Chalcolithic 1 deposits characterized by high percentages of beaded lip flint-scraped bowls (37 out of 49 examined diagnostic ceramics in locus 2). Below 1.4 m, flint-scraped bowls no longer occurred, and this apparently marks the transition from Late Chalcolithic 1 to Ubaid deposits. By a depth of 1.9 m, ten out of eleven diagnostic ceramics were typologically Ubaid. These results are important in showing that: a) cultural deposits still survive intact in the bulldozed part of the site, b) the lower town was occupied in the Ubaid period, and c) Ubaid deposits are easily accessible in this area, just 1.4 m below the surface at the bottom of the north bulldozer cut. Apparently, the earth-moving activities associated with the construction of the irrigation canal removed all of the Late Chalcolithic 2 and possibly early third-millennium deposits, while leaving significant portions of the Late Chalcolithic 1 deposits intact, and all the underlying Ubaid deposits.

In parallel with Operation 20, a second 2 x 2 m test pit — Operation 19 — was excavated in the lower town, in the south bulldozer cut (fig. 2). Operation 19 sought to determine if any cultural deposits were still preserved. As with Operation 20, Operation 19 contained in-

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tact, stratified Late Chalcolithic 1 deposits immediately beneath the surface. Several intact mudbrick walls were located in the test pit, all securely dated by diagnostic ceramics such as beaded lip flint-scraped bowls to the Late Chalcolithic 1 period. By 1.4 m below the surface, secure trash deposits contained entirely Ubaid ceramics (with an occasional intrusive Halaf sherd, presumably re-deposited from earlier Halaf levels).

Together, Operations 19 and 20 confirm that the lower town was occupied in the Ubaid period, and that these deposits are accessible for excavation. We hope to open up 10 x 10 m trenches in one or both of these areas in future field seasons to explore the Ubaid of the Zeidan lower town in greater detail.

Magnetometry

Magnetometry or geophysical prospection is a remote-sensing technique used to search for architecture or other features beneath the surface of an archaeological site. Dr. Andrew Creekmore conducted these analyses (fig. 14). About 5 ha of Tell Zeidan's 12.5 ha area are flat enough to be amenable to magnetometric prospection. Of these 5 ha, 3 ha — 30,000 sq. m — were mapped and analyzed (see fig. 2 for locations). Sub-surface mudbrick architecture can be difficult to detect with magnetometry, but other features such as kilns, ovens, stone walls, sherd-packed streets, or monumental architecture can be detected under the right conditions. A large number of magnetic anomalies were detected, but most of these seem to be modern — for example, the remains of modern houses, or modern metal trash (cans, pipes, wires, etc.).

Three magnetic anomalies were detected that seem to reflect ancient sub-surface features. To investigate a strong magnetic anomaly on the northwest mound (fig. 15), Operation 21 was excavated and in fact did locate the remains



Figure 14. Andrew Creekmore conducting the geophysical (magnetometric) survey of Tell Zeidan, using a hand-held gradiometer

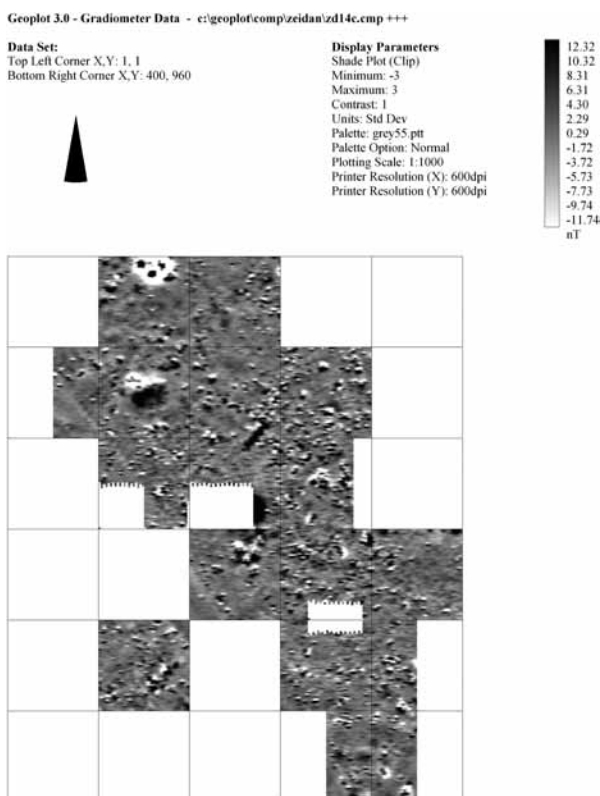


Figure 15. Magnetometry map of the northwest mound of Tell Zeidan. Each grid square is 20 x 20 m. The black areas indicate magnetic anomalies caused by stones, metal, or very high heat. The large oval-shaped anomaly at the upper left was explored in Operation 21, which determined that it represented a kiln dating to the Late Chalcolithic 2 period

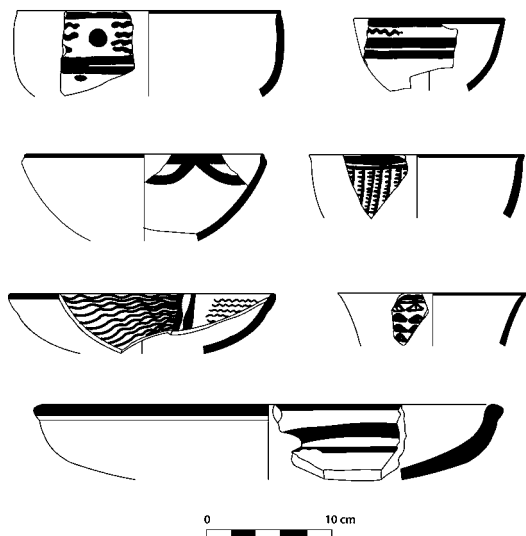


Figure 16. Earlier Ubaid painted pottery from Operation 11

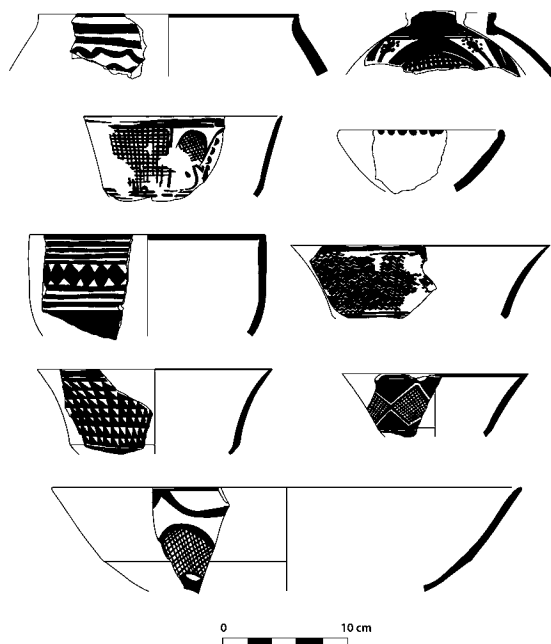


Figure 17. Earlier Ubaid pottery from Operation 14

of a large kiln whose associated ceramics dated it to a late phase of the Late Chalcolithic 2 period (see above).

In-field Laboratory Analyses

Ceramics (Philip Karsgaard and Khaled Jayyab)

During the 2010 field season, 24,500 ceramic sherds (including 4,000 diagnostic rims, handles, bases, and painted ceramics) were analyzed. Ceramics were sorted by ware type, vessel function, and surface decoration. The ceramic analysis focused on recording the Ubaid pottery from both the earlier Ubaid levels in Operations 11 (fig. 16) and 14 (fig. 17) and the later Ubaid deposits in Operation 17 (fig. 18). The recording of Late Chalcolithic 1 and Late Chalcolithic 2 material focused on ceramics from Operations 3, 10, and 16. In addition, we worked on an intra-site comparison of Ubaid ceramics from the south and northwest mounds. Finally, work continued on the development of a ceramic typology for Tell Zeidan. One of the most interesting aspects of the Ubaid pottery at Tell Zeidan is the way it combines geometric stylistic motifs that are absolutely typical of southern Mesopotamia (figs. 16–17) with distinctively local north Syrian motifs, such as figural decorations of humans, birds, mammals, and even scorpions (figs. 19–21).

Chipped Stone (Dr. Elizabeth Healey)

More than 3,200 pieces of chipped stone were analyzed and recorded from Ubaid contexts in Operations 8, 11, and 14 from both the 2009 and 2010 field seasons. The chipped stone is overwhelmingly flint or chert of two varieties — rolled cobbles from the Balikh River and a very high-quality, fine-grained nodular flint, presumably from the limestone bluffs of the

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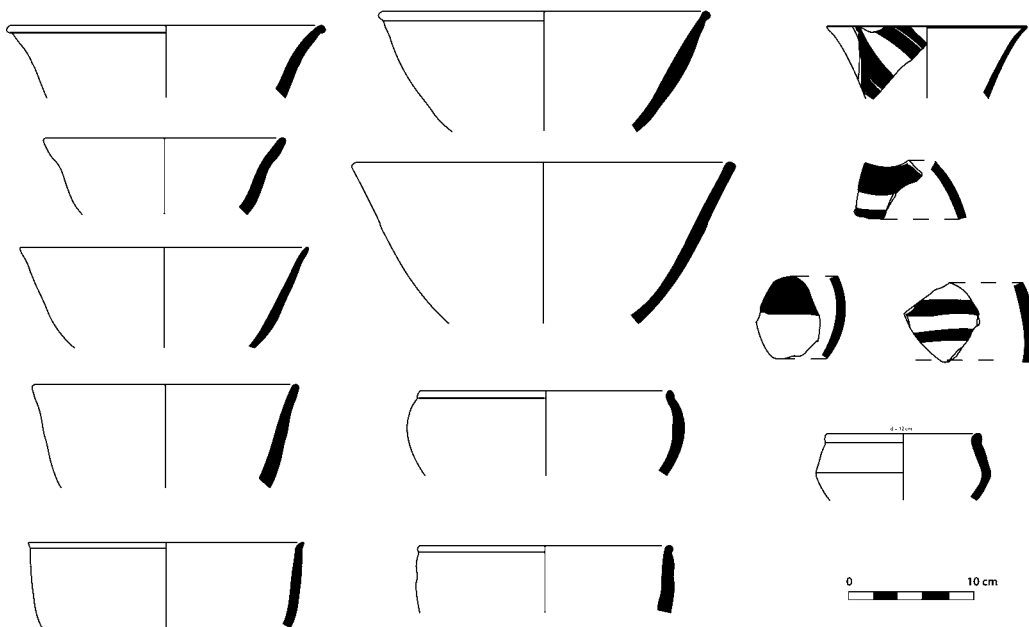


Figure 18. Later Ubaid pottery from Operation 17



Figure 19. Painted Ubaid sherd showing a group of dancers holding hands. Note the possibly elongated or deliberately shaped skull of the dancer



Figure 20. Painted Ubaid sherd showing a large bird, apparently an ostrich



Figure 21. Painted Ubaid sherd showing a segmented figure with appendages, probably a scorpion

Euphrates valley 3–4 km to the south of Zeidan. Obsidian (mostly from the Lake Van area in eastern Turkey) forms only about 4 percent of the analyzed chipped stone so far. The single most common type of flint tools are sickle blades made of fine chocolate-colored nodular flint, with silica gloss or polish on the cutting edge, proving that these blades were used to harvest cereals. This is good evidence for the importance of agriculture at Zeidan in the Ubaid period.

Human Remains (Dr. Kirsi Lorentz)

Seventy-four contexts with human skeletal material have been identified at Tell Zeidan from 2008 to the present. Thirty-eight partial and more complete skeletons were examined



Figure 22. Sub-adult skull from Operation 6, burial 2, whose elongated form shows clear signs of deliberate cranial shaping

from deposits spanning the Halaf, Ubaid, Late Chalcolithic 1, and Late Chalcolithic 2 periods. Males and females are both well represented, and there are far more sub-adults (juveniles, infants) than adults represented — suggesting high rates of infant and juvenile mortality. Whenever possible, we collected soil samples from the stomach area of the burials to see if we could recover the remains of intestinal parasites as a way to study ancient health conditions and pathologies. In addition, scrapings of subgingival calculus (dental plaque below the gum line) were taken from the teeth of as many burials as possible. The calculus scrapings can actually preserve food residues in the form of plant phytoliths, thereby giving us direct evidence for the different kinds of

plant foods eaten in the ancient diet of the people at Tell Zeidan.

One of the most fascinating skeletal finds was the skull of a young child that had been deliberately shaped or molded into an elongated form (fig. 22). Cranial shaping can only be done while the bones of the skull are still pliable — up to the age of three. The shaping is usually done by swaddling a child in a cradleboard to flatten the back of the head, or by wrapping the head in cloth. The practice of cranial shaping does not seem to have any negative effects on brain size or intelligence. Cranial shaping serves as an unchangeable culturally created mark of a person's ethnic or tribal identity. Although cranial shaping seems alien and unusual to modern Westerners, in fact this practice is known from a number of seventh- to fifth-millennium BC sites across the Near East, and is known ethnographically among indigenous peoples in Africa, Asia, Andean South America, and even among relatively recent pastoral nomadic groups in the Near East. It is striking that Ubaid-period figurines from southern Mesopotamia are well known for depicting men and women with clearly elongated skulls. It is also notable that one of the painted Ubaid sherds we recovered at Zeidan shows a line of dancing human figures who also appear to have shaped, elongated skulls (see fig. 19).

Archaeobotany/Carbonized Plant Remains (Thomas Hart)

During the first two weeks of the 2010 season, soil samples were collected from the different excavation areas at Zeidan to recover ancient carbonized (burned) macro-botanical remains of seeds, plant parts, and charcoal. Most of the samples collected and processed so far were collected from Ubaid-period deposits.

Tom Hart and Mahmoud al-Kaitab worked together to construct a pump-powered flotation system (similar to those used at Abu Hureyra and Hamoukar). The flotation machine worked beautifully, enabling us to process a total of 108 flotation samples. In addition, a total of 128 samples were collected for phytolith and starch grain analysis. One of the most poignant archaeobotanical finds of the 2010 season was an Ubaid-period jar burial of an infant in Operation 9. Flotation samples taken from inside the burial urn showed the dried, unburnt remains of small flowers that apparently had been placed deliberately in the jar, perhaps by the child's parents (figs. 23–24).

TELL ZEIDAN

Zooarchaeology/Animal Bone Remains (Kathryn Grossman, assisted by Miriam Hinman)

Kate Grossman analyzed and recorded approximately 9,000 fragments of animal bone from Ubaid and Late Chalcolithic 1 contexts in Operations 8, 9, 11, and 14 from the 2009 and 2010 field seasons. Miriam Hinman analyzed around 1,000 fragments of animal bone from Halaf deposits in Operation 1. These analyses show striking changes in the animal economy between the Halaf and Ubaid periods. In the Halaf period about half the bones at the site are those of wild animals such as wild cattle, wild donkey/onager, deer, and gazelle. But in the Ubaid period, 90 percent of the bones are those of domesticated herd animals such as sheep, goats, cattle, and pigs. In addition, there is a change in the proportion of sheep to goats. In the Halaf period, sheep and goats occur in roughly equal proportions, but in the Ubaid period, sheep outnumber goats by a ratio of almost three to one. Taken together, the animal bone evidence suggests that the economy of Tell Zeidan in the Ubaid period became much more focused on herding instead of hunting. The strong concentration on herding sheep suggests that the people of Zeidan may have begun to specialize in wool and textile production.



Figure 23. Ubaid-period infant jar burial ZD5902 from Operation 9. Archaeobotanical studies of soil samples from the jar showed that the child had been buried with fresh flowers

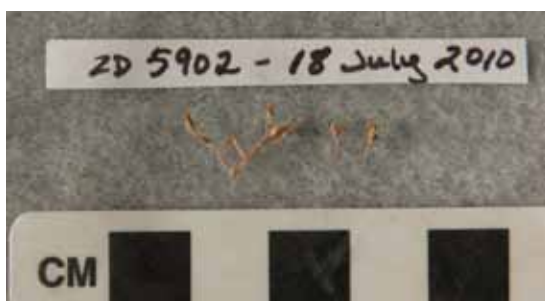


Figure 24. Unburnt dried flowers, the grave offerings recovered from infant burial ZD5902

Radiocarbon Dates and Chronology

Twenty-one samples of charcoal from Zeidan were processed by highly precise accelerator mass spectrometry (AMS) radiocarbon dating (table 1). Together with the dated samples we had processed earlier by the same method, we now have thirty-three radiocarbon samples as the basis for an absolute chronology of the site. The radiocarbon data show that the Ubaid occupation of Zeidan began around 5300 BC and lasted until about 4500 BC. These dates are consistent with the radiocarbon evidence from other Ubaid sites in north Syria, showing that the Ubaid expansion out of southern Mesopotamia began substantially earlier (in calendar years) than had traditionally been thought.

Summary: The Ubaid and Late Chalcolithic 1 Periods at Tell Zeidan

The 2010 field season at Tell Zeidan accomplished all its primary archaeological goals and made significant progress toward better understanding the structure of the settlement and

its occupational history during the fifth millennium BC. We excavated nine 10 x 10 trenches and conducted magnetometry over an additional 30,000 sq. m of the site. We were able to make large horizontal exposures of 300 sq. m of houses dating to the Ubaid period in Operations 11, 14, and 18. We also documented the existence of Ubaid domestic areas on the northwest mound in Operations 10 and 13. In addition, we located the enclosure wall of a possible Ubaid public building in Operation 9. In Operations 15 and 16 we began to explore the Late Chalcolithic 1 occupation of the south mound, while Operation 17 began to yield important data on the Ubaid-to-Late Chalcolithic 1 transition. We conducted a magnetometry survey of the site and were able to detect a large Late Chalcolithic 2 period kiln structure based on that work. Our test pits in the lower town established the presence of an intact Ubaid occupation in the lower town area at the center of the site. Our in-field laboratory analyses of human bone, animal bone, archaeobotanical remains, chipped stone, and ceramics all made great progress as well.

Overall, the 2010 field season has given us significant new information about the Ubaid and Late Chalcolithic 1 periods at Tell Zeidan. We were able to recover large areas of Ubaid residential architecture and found the first traces of what may be large-scale public architecture at the site. We found good evidence for major economic changes in the Ubaid — notably the first strong evidence for craft specialization and specialized herding economies focused on raising sheep, perhaps for the purpose of wool and textile production. We also started to gain insights into the ideology of the Ubaid-period inhabitants of Tell Zeidan through their art on pottery, burial rites, and practice of cranial shaping as a marker of social identity. We hope to continue our explorations of the roots of social complexity in future seasons of fieldwork at Tell Zeidan.

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